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DEPARTMENT OF NUTRITION AND DIETETICS

&

PG DEPARTMENT OF COSTUME DESIGN AND FASHION

Organized

National Level Conference on

"TRENDS FOR FUTURISTIC DEVELOPMENT IN: HOME SCIENCE RESEARCH AND INNOVATION"

(HSRI-2022)

CONFERENCE PROCEEDINGS

Edited by
Ms. R. POOVIZHI SELVI
Mrs. V. MAHALAKSHMI

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Ms. R. POOVIZHI SELVI RAVI

Head, Department of Nutrition and Dietetics

Mrs. V. MAHALAKSHMI

Head, PG Department of Costume Design and Fashion

Editorial……

The science of today is the technology of tomorrow. We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology. The overloading of the electromagnetic environment is one of these disastrous policies that must stop.

"The Art and Science Asking Question is the source of all knowledge"

—**Thomas Berger**—

Trends for Futuristic Development in: Home Science Research and Innovation welcomes high-quality research articles in all feature of emerging horizons on home textile. The underlying aim of all work is to develop sustainable concepts. The conference encompasses the full continuum of Home Science Research and Innovation including fashion product design, eco-friendly textile, sustainability, textile clothing sustainability, enzymes, nanotechnology, E- Textile, nutrition, novel food survey, food toxicity, safety, security, clinical and personalized nutrition, microbial aspects in food, immunology. A National conference on **"Emerging Horizons on Home Science"** was Coordinately organized by Department of Nutrition and Dietetics and PG Department of Costume Design and Fashion on 19.10.2022.

Emerging technologies play a vital role in the modernization of industries. New technologies help in transforming enterprises into a digital world. This technology is mainly helpful in manufacturing, energy and mobility markets. Home Science is both a science and an art related field of study which draws upon many disciplines such as chemistry, physics, physiology, biology, hygiene, economics, rural development, child development, sociology and family relations, community living, art, food, nutrition, clothing, textiles and home management.

We are thankful to the professors, research scholars and other well-wishers for their recentness efforts for helping us to climb the ladder of success. We also would like to show our gratitude to the dignitaries for sparing their valuable time to spend their wishes and blessings in the form of message.

தெய்வத்திரு Lion. Dr. K. S. Rangasamy MJF

தாளாளர் ஆசியுடன்

Vice Chairman

"I Started to grow microbial cellulose to explore an ecofriendly textile for clothing and accessories but, very quickly, I realized this method had potential for all sorts of other biodegradable consumer products".

-Season Leo

I Apperceive extremely delighted to know that PG Department of Costume Design and Fashion associated with Department of Nutrition and Dietetics are organizing National Conference on **–"TRENDS FOR FUTURISTIC DEVELOPMENT IN : HOME SCIENCE RESEARCH AND INNOVATION"‖**- (HSRI-2022) with full diligent. It is a part of innovation and to generate Futuristic Development of Home science Research and new innovations. This Conference will really help many Student, research Scholar and Industrialists. The future trends and innovation in nutrition and designing.

I would like to express my hearty congratulations to the organizing committee who contribute their tremendous efforts to cultivate the inventive seeds to bear fruits. I wish the Conference a monumental success and may it be a glorious path way for further researches.

Warm regards

Mr. R. Srinivasan

Vice Chairman

Executive Director

“Science has revealed that human body is made up of atoms.For

example, I am made up of 5.8x10.27 atoms”

-A.P.J. Abdul Kalam

I feel extremely jubilant to propose my regards to the PG Department of Costume Design and Fashion and Nutrition and Dietetics for organizing a National Conference on ―T**rends for Futuristic Development in: Home Science Research and Innovation” (HSRI-2022)** as a joint proffer.

It is a apperceive it is an fruitful idea to bring out the deep knowledge and new perspectives which expands the elevations in Future innovation. This conference is aimed at analyzing and researching _Home Science‘. This research truly inspires and promotes researchers to value health and to invest time for a healthy lifestyle.

It is my indeed delighted to extend my hearty wishes to both the delegates and organizers with a huge applause for the hardworking contribution to emphasize the conference a colossal success and may it witness a glory of researches in future.

Best wishes

Tmt. Kavitha Srinivasan

Executive Director

Greetings

"After a certain high level of technical skills is achieve, science and art tend to coalesce in esthetics, plasticity, and form. The greatest scientists are always artists as well"

--Albert Einstein

I am blissful to accentuate my warm greetings to the PG Department of Costume Design and Fashion and Nutrition and Dietetics for organizing National level Conference on

–Trends for Futuristic Development in: Home Science Research and Innovation" (HSRI-2022). Now a days there is an emerging horizon on home science and food nutrition proliferated their existence in the Industries which has open gateways to un traversed pathways which provide growth to the learners through new opportunities. This National Conference places the magnitude in research for the probationer in time ahead.

I glad to string out my wholehearted greetings to the systemizing panel members who gave fullest support of their endeavor in the conference. Let me bring out my desire for the excellence of the national level conference and its motion stimulating the learners.

Warm regards

Dr. M. Karthikeyan

Principal of KSRCASW

Dr. Sandhya Ravi

It gives me immense pleasure to be a part of National Conference on –Trends for Futuristic Development in Home Science Research and innovation (HSRI)-2022 with a theme –Emerging Horizons on Home Science.‖ I strongly believe that this conference will provide tools and knowledge to bring about a significant change by identifying innovative ideas and methods introduced by researchers and students.

The success of this conference will encourage us in introducing many more initiatives for innovative trends in coming years. I take pleasure in acknowledging the efforts of KSR College of Arts & Science for Women as a dedicated institution for Home Science studies. I am sure that the National Conference on Trends for Futuristic Development will be a beacon in Home Science studies. I wish all participants the best and am sure that the conference will set a trend in design and futuristic thinking.

Dr. Sandhya Ravi
Professor & Principal

Dr. S. Alamelu Mangai

As a keynote speaker it is my pleasure to address all the academicians, young researchers, delegates, and students who would attend the National Conference on "Trends for futuristic Development in Home Science: Research and Innovation" which is to be held on October 19, 2022.

This National Conference will share insight on the field of Home Science currently undertaken and its findings with the colossal and exuberant presence of adepts, young and brilliant researchers, delegates, and talented student communities.

The gamut of Home Science is based on the ardent desire to improve the wellbeing of the community through every home. This can be achieved through the systematic arrangement of resources. Home Science can take a prominent role in developing good individuality and a good sense of personality in a person. Through modern scientific knowledge, an individual's potentialities can be utilized to the maximum. The research in Home Science is an endless phenomenon, and the systematic compilation of data bowing various disciplines of Home Science plays a vital role in the development of the country.

I would like to convey my best wishes to the convenors, organizing committee members and delegates for the success of the conference and their future endeavours.

I am looking forward to an excellent meeting with young minds and sharing new and exciting view in futuristic development in Home Science.

Best wishes

Dr. S. Alamelu Mangai
Assistant Professor (SG)
PG & Research Dept of Home Science
Bharathidasan Government College for Women,
Puducherry – 605 003

Dr. PA. Raajeswari

Greetings to the participants of the conference “Trends for Futuristic Development in; Home Science Research and Innovations (HSRI) -2022” at the KS.R. College of Arts and Science for Women in Tiruchengode, Namakkal, Dear friends and colleagues, Let me convey my best regards and wishes to all for attending the conference with such important topics. There is a lot of new knowledge on Futuristic Trends in Home Science Research and Innovations and I really wish you an interesting and stimulating meeting. The scope of Home Science is based on the ardent desire to improve the wellbeing of the community through every home. This can be achieved through the systematic arrangement of resources. Home Science can take a prominent role in developing good individuality and a good sense of personality in a person. Through modern scientific knowledge, an individual’s potentialities can be utilized to the maximum. In the current era of advanced technology, knowledge on the scientific aspects engulfing Home Science as a lifestyle- oriented subject for the young in ‘New India’ is a dire need. Conference programme offers ample opportunities to share information and experiences of experts and scientists for chalking out a course of action for better contribution of Home Science in achieving sustainable development goals.

Can we, through research and analysis, develop a solution to make trends in Home Science Research and Innovation for future development? Can we develop the country to achieving sustainable development goalsby improving Nutrition Security?

I am working forward to an excellent meeting with young minds and showing new and exciting research onthe role of Edible and Eco-friendly Packaging Solution towards Greener Biome.

Best wishes

Dr. PA. Raajeswari
Associate Professor
Department of Food Science and Nutrition
Avinashilingam Institute of Home Science and Higher Education for Women,
Avinashilingam University,Coimbatore.

INDEX

EMERGING HORIZONS IN HOME SCIENCE- A STUDY OF GREEN TEXTILES

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Abstract

Numerous environmentally hazardous processes are required for clothing to go from the fibre stage to the fabric stage. Making the textile sector more sustainable is therefore crucial. Today, a wide range of textile production-related techniques and improvements have been created to prevent the world from being harmed by the dangerous effects of chemicals. The developing design philosophy and fashion of sustainability, also known as eco fashion, aims to build a system that can be sustained indefinitely in terms of human influence on the environment and social responsibility. Sustainable fashion, also known as eco fashion, is a subset of this movement. This article provides a general overview of the textile business with a focus on environmentally friendly materials, production methods, and developments.

Keywords: Eco-Friendly Fibers, Sustainability, Recent innovations, Textiles.

I. INTRODUCTION

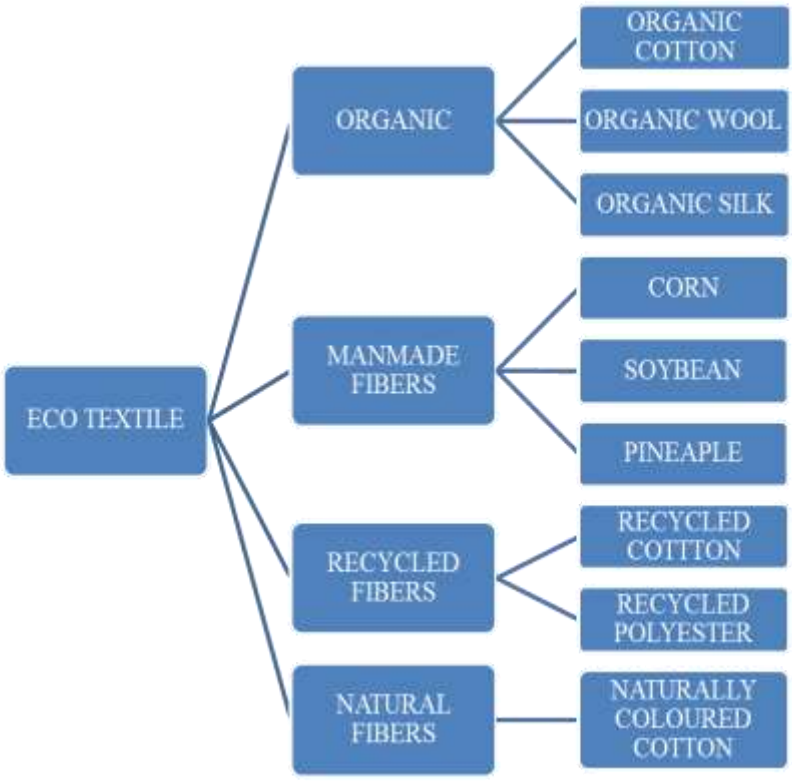
The textile business is one of the most developed and environmentally damaging industries in the world, numerous improvements are made to protect our mother planet. Bleaching, dying, and other steps are included in the textile production process. make up a significant portion of pollutants, hence improving sustainability is vital. As important as producing a product toxic-free is pollution control [5]. Therefore, we must use technologies that can maintain the balance of our ecosystem and produce a final product free from hazardous impacts in order to protect our environment. Since all clothing requires energy and water, there isn't truly such a thing as 100% eco-friendly clothes. Therefore, "eco friendly" clothing can be defined as clothing made of natural fibers like organic cotton and hemp, clothing that has been naturally dyed using plants, or any fabric that uses little water, energy, or chemicals that are

harmful to the environment. Natural fibers are particularly appealing because of their inherent qualities, which include mechanical strength, low weight, and healthy wear for the wearer [1]. Ecology is short for the term "eco." Ecology is the study of how organisms interact with their surroundings. Therefore, the word "eco friendly" ("ecology friendly") is used to describe products and services that are thought to cause little to no harm to the environment. The guiding principle of tomorrow for the global textile business is "A Brighter tomorrow starts today." [2]

II. ECO-FRIENDLY TEXTILES

Any cloth product, which is produced in an eco-friendly manner and reused under eco-friendly limits, is known as eco friendly fabrics. It's also known as sustainable fashion, eco fashion and Ecotech. It can be considered as “Eco-friendly ” on the base of colorful factors Renewability of the product Ecological footmark of coffers- how important land it takes for the full growth of a product Determining the eco benevolence of a product- quantum of chemicals needed for the product of products.

2.1 Classification of Eco Friendly Textiles



2.2 Eco-Friendly Fibers

1. BAMBOO - Bamboo is a regenerated cellulosic fibre produced from bamboo pulp.(3) It's a hardy, largely renewable lawn which is generally grown with many chemical inputs. The main factor which makes it considered as an eco-friendly fibre is its renewable property. It has natural anti-bacterial parcels and the fabric breathes. Bamboo has a wider operation due to its comfort, soft, luster and absorbency. Bamboo vesture is culminated as " Air Conditioning Dress ".[1]

2. ORGANIC COTTON - Further than 25 percent of the world's fungicides are used in conventional cotton products whereas Organic cotton is further eco friendly than the traditional system as it uses no fungicides, germicides during the growing cycle. But its further labour ferocious and likewise fields must be free of chemicals for three times before the crop can be certified organic.(4) Another recent promising trend is the product of coloured cotton or natural colorings which can further reduce the quantum of chemicals used.

3. HEMP – The most implicit eco friendly fibre is hemp. The ecological footmark is considered to be low in hemp filaments when compared to other filaments. It's fleetly renewable, requires little or no fungicides, grows without toxin, requires minimal attention and doesn " t deplete soil nutrients. So it's easy to gather. It's a long fibre which is long lasting.

4. SOY - This fabric is made from soy protein fibre left over after processing soybeans into food. The liquefied proteins are extruded into fibers which are then spun and used like other fibers. The high protein content makes it receptive to natural dyes. So they can create their own colors.[4]

5. WOOL - Wool is renewable, fire-resistant and doesn"t need chemical inputs. Organic wool is increasingly becoming available as it is produced using sustainable farming practice. Wool is a very useful textile with many important properties that make it hugely attractive. One of the major benefits of wool is that it can absorb moisture well by drawing moisture into the core of its fibers.

6. CASHMERE/SILK - The Cashmere goat is smaller than the Angora goat. The fleece of this goat has long, straight, coarse outer hair of little value, and is made into luxuriously soft wool like yarns. Cashmere is more sensitive to the action of alkali than wool. Cashmere is used in high quality apparel. Fabrics are warm, caloric in hand, and have beautiful draping characteristics. It

is used for such garments as sweaters, sports jackets, suits and overcoats when a luxurious, soft fabric is desired. It is often blended with wool to reduce the cost of the product.

2.3 Other Eco Friendly Fibers Includes

1. CORN FIBRE - Corn is available in both spun and hair forms. It's deduced from naturally being factory sugars. It balances strength and adaptability with comfort, wimpiness and drape in fabrics. Sludge also uses no chemical complements or face treatments and is naturally honey retardant. Sludge fibre manufacturers have claimed that these fibers can be used for sportswear, jacket, external fleece, apparel etc [1]

2. BANANA FIBRE - The use of banana stems as a source of fibre similar to cotton and silk is getting popular now. It's used all over the world for multiple purposes similar as making tea bags or aseptic towels to Japanese yearning notes and auto tyres. It's also known as musa fibre which is one of the strongest natural fibers. Banana stem, heretofore considered a complete waste, is now being made into banana- fibre cloth which comes in differing weights and density grounded on what part of the banana stem the fibre was taken from. The inmost pods are where the softest fibers are attained, and the thicker and sturdier fibers come from the external pods. High water absorbing property of this fabric makes this apparel cool to wear.[1]

3. MILK FIBRE - It's a veritably soft fibre with a satiny texture and is deduced from milk hence fluently accessible without causing any hazards to ecology.

4. AYURVASTRA – Ayurvastra is a Sanskrit term made up of two words- "AYUR" means "health" & "VASTRA" means "Cloth", meaning "life cloth". It is a branch of Ayurveda. Ayur vastra cloth is completely free from synthetic chemicals & toxic substances making this cloth organic, sustainable & biodegradable. Ayur vastra or medical dress is made of 100% pure organic cotton or silk, wool, jute & coir products that have been hand loomed, dyed by using various Ayurveda herbs & have medicinal qualities. Herb dyed organic fabrics act as healing agents or as an absorber through skin. Each fabric is infused with specific herbs that can help treat skin conditions. Herbs used in Ayur vastra are known to cure allergies having antimicrobial, anti-inflammatory properties .Ayur vastra is extra smooth & good for transpiration that helps in recovering various diseases. It may help treat a broad range of diseases such as skin infections, diabetes, eczema, psoriasis, hypertension, high blood pressure, asthma & insomnia.

III. FACTORS CONSTITUTING THE SUSTAINABLE TEXTILES

The four main factors of sustainable textiles are: extraction of raw materials, textile production, adding chemistry and end-of-life. Raw material extraction of these fibers, for example, addresses the land and water used to grow natural fibers like cotton and wool, or the impacts of extracting fossil fuels for synthetic fibers such as polyester or nylon. Production considerations include the water and energy. Adding of chemicals, including dyes, finishes and coatings, may affect the health of textile workers as well as consumers of the final product. Finally, the biodegradability of textiles and the infrastructure needed for their reclamation are included in end-of-life considerations.

Use of Eco Textiles Fibers – Related Industries

- Fashion and Apparel Industry
- Home Furnishing and Textile Industry
- Hygiene and Health Care Industry
- Packaging Industry – "Eco Packaging" an Important Feature
- Growing Recycling Industry- Generating Rural Employments
- Medical Textiles Industry – Growing Opportunity

IV. CONCLUSION

So we have discussed the various eco-friendly fibers that are available in the market which are designed for the purpose of reducing the harmful substances used in the textile production. Even though now many fabrics are available we can bring out new innovations in the field of eco textiles which can protect our environment from further depletion. "Fashion is not a thing that exists only in dresses. Fashion is in everything it is in the sky, in the street; fashion has to do with ideas, the way we live, what is happening." So let us go green and make the environment healthy and fashionable and more eco friendly.

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EMERGING HORIZONS IN HOME SCIENCE-APPLICATION OF ENZYMES IN TEXTILE INDUSTRY

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Abstract

The use of enzymes in the clothing industry is one of the most fastly growing fields in industrial enzymology. The enzymes used in the textile field are amylases, catalase, and laccase which are used to remove the starch, degrading excess hydrogen peroxide, bleaching textiles and degrading lignin. The use of enzymes in the cloth chemical processing is gaining global recognition because of their non-toxic and eco-friendly characteristics with the decreasingly important conditions for cloth manufacturers to reduce pollution in cloth products. The operation of cellulases for denim finishing and lactases for decolourization of cloth backwaters and cloth bleaching are the most recent marketable advances. The use of enzyme technology is seductive because enzymes are largely specific and effective, and work under mild conditions. Likewise, the use of enzymes results in reduced process times, energy and water savings, better product quality and implicit process integration. The end is to give the cloth technologist with an understanding of enzymes and their use with cloth accouterments .

Keywords: Enzymes, application, textile industries, eco-friendly characteristics

Introduction

Enzymes such as cellulases, catalase, and laccase, are generally used in the clothing industry. These enzymes are used to remove the bounce, degrading excess of hydrogen peroxide, dulling fabrics and degrading lignin. Because of the largely specific, effective, non-toxic, and eco-friendly characteristics, the use of enzymes in the clothing industry is increasing day by day. The operation of cellulases for denim finishing and lactases for decolorization of cloth backwaters and cloth bleaching are the most recent marketable advances. Likewise, the use of enzymes results in reduced process times, energy and water savings, better product quality and potential process.

Enzymes, classification, action and properties

Enzymes are bio-catalysts that can speed up chemical reactions that would otherwise proceed very slowly just by being there, without being consumed in the process. The enzyme is once more released when the reaction is finished, prepared to begin a new reaction. Most enzymes typically only perform catalytic functions once before being eliminated. Compared to inorganic catalysts like acids, bases, metals, and metal oxides, enzymes are much more specific. Specific substances can be broken down by enzymes. An enzyme's substrate is the molecule it reacts with to produce a product (or products). There is a different enzyme for every sort of reaction in a cell, and they are divided into six major categories: hydrolytic, oxidising and reducing, synthesising, transferring, lytic and isomerising. Catalytic activity is an enzyme's fundamental property.

Properties of enzymes used in textiles

At First the enzyme accelerates the response by lowering the activation energy and remains complete at the end of the response by acting as a catalyst. Secondly, enzymes operate under a milder condition. Enzymes can be used in catalytic attention at low temperatures and at pH- values near to neutral. Thirdly, enzymes are the best alternative to poisonous, dangerous, and contaminating chemicals. Fourthly, enzymes act only on specific substrates, for illustration, enzymes used in desizing does not affect cellulose hence there's no loss of strength of cotton. Fifthly, enzymes are easy to control because their exertion depends upon optimum condition. Sixthly, enzymes are biodegradable. At the end of the response in which enzymes are used we can simply drain the remaining result because enzymes are biodegradable and don't produce poisonous waste on declination hence there's no pollution

Enzymes used in textile processing

Textile processing has greatly benefited in both environmental impact and product quality through the use of enzymes. From the 7000 enzymes known, only about 75 are frequently used in textile industry processes (Quandt & Kuhl 2001).

Enzymatic desizing

Amylases are used in the textile industry to eliminate starch-based sizing for more efficient and consistent wet processing. At low temperatures (30–60 C) and an ideal pH range of

5.5–6.5, desizing procedures can be carried out using an amylase enzyme. These enzymes have the advantage of being starch-specific, which allows them to remove the starch without harming the support fabric.

Enzymatic Scouring (Bioscouring)

Scouring is the process of removing non-cellulosic particles from the cotton's surface. For bioscouring, cellulase and pectinase are typically combined. Cellulase can destroy the cotton cuticle structure by digesting the primary wall cellulose that is located immediately beneath the cotton cuticle, whereas pectinase can destroy the cotton cuticle structure by digesting the pectin and removing the connection between the cuticle and the body of the cotton fibre.

Enzymatic Bleaching

Cotton is bleached to remove any natural colours and give the fibers a bright white appearance. The primary pigments that give cotton its colour are flavonoids. Hydrogen peroxide is the most popular industrial bleaching agent. High levels of alkaline chemicals are required for traditional cotton preparation, which produces enormous amounts of rinse water. However, radical interactions between bleaching chemicals and the fibre might result in a reduction in polymerization and, thus, serious harm. Therefore, switching from hydrogen peroxide to an enzymatic bleaching system would not only result in higher product quality because less fibre damage would occur, but it would also significantly reduce the amount of water required to remove the hydrogen peroxide.

Biopolishing

A finishing technique called biopolishing reduces the fuzziness and pilling characteristics of cellulosic fibre, therefore enhancing the quality of the fabric. The method' goal is to get rid of the tiny cotton fibers by using cellulase enzymes to do it. The biopolishing process gives the fabric a smoother surface, a cooler sensation, shine, and a softer sensation.

The following are the primary properties that the biopolishing treatment imparts to the fabric:

- Getting a cleaner surface results in a cooler sensation.
- Lustre appears as a secondary effect.
- The fabric feels softer.
- The fabric's propensity to pill at the ends.

Enzymatic Denim Treatment

Heavy cotton is used to make denim. The majority of the dye in this dye is absorbed into the fiber's surface. Because of this, fading is possible without suffering a significant loss in strength. Pumice stones, also known as sodium hypochlorite or potassium permanganate, were employed in traditional processes (Pedersen and Schneider, 1998).

- These are the disadvantages of these methods:
- Pumice stones need to be used in enormous quantities,
- They leave a significant quantity of backstaining, and they deplete machine resources.

These drawbacks spurred the development of the enzyme utilisation technique. When washing denim, cellulase enzyme is utilised. Cellulase works via "Bio-Stonewashing," a technique that involves liquifying the indigo colour on the denim.

Several kilograms of pumice stones can be replaced with a tiny amount of enzyme. Less pumice stone use means less pumice dust in the laundry room and less damage to clothing and machines.(Campos et al., 2001; Pazarloglu et al., 2005).

Properties of enzymes used in textiles

1. Enzyme accelerates the reaction
   - An enzyme accelerates the rate of a particular reaction by lowering the activation energy of reaction.
   - The enzyme remains intact at the end of reaction by acting as a catalyst.
2. Enzymes operate under milder condition
   - Each enzyme has optimum temperature and optimum pH i.e. activity of enzyme at that pH and temperature is on the peak.
   - For most of the enzyme activity degrades on both sides of optimum condition.
3. Alternative for polluting chemicals
   - Enzymes can be used as best alternative to toxic, hazardous, pollution making chemicals
   - Also some pollutant chemicals are even carcinogenic. When we use enzymes there is no pollution.
4. Enzyme acts only on specific substrate
   - Most enzymes have high degree of specificity and will catalyze the reaction with one or few substrates

- One particular enzyme will only catalyze a specific type of reaction. Enzymes used in desizing do not affect cellulose hence there is no loss of strength of cotton.

5. Enzymes are easy to control

- Enzymes are easy to control because their activity depends upon optimum condition.

6. Enzymes are biodegradable

- At the end of reaction in which enzymes are used we can simply drain the remaining solution because enzymes are biodegradable and do not produce toxic waste on degradation hence there is no pollution.

Conclusion

The use of different enzymes is still in its infancy, their inventive uses are expanding and gaining ground in many facets of textile processing. For more adaptable application scenarios and a more widespread use, enzyme manufacturing businesses continuously develop their goods. If the effects of these enzymes on the textile substrate and the fundamental mechanisms involved are better understood, the textile industry can greatly profit from the wider usage of these enzymes as non-toxic, ecologically acceptable substances. Enzymes have advantages and disadvantages just like all other substances and goods. They operate regularly at mild temperature and pressure circumstances and exhibit specific behaviour without having an adverse effect on other components, but they are also sensitive to changes in temperature, pH, humidity, and pollutants.They frequently reduce the amount of time, water used, and effluent produced during the process cycle. The primary barrier to employing enzymes is their expensive price. One prominent sector where biotechnology adaptation offers significant prospects but where adoption is not yet widespread is the textile industry. The enzyme can be successfully employed in textile processing for pre-processing steps like desizing, scouring, and bleaching. These enzymatic technologies produce outcomes that are comparable to those of traditional techniques. We can decrease water use, energy use, pollution, time, and quality through these enzymatic activities. In the area of textile wet processing, enzymes are becoming much more prevalent. Enzymes can be used in a much greater capacity for textile production if their price can be controlled in textile processing applications.

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Sustainable Textile Innovation in the World from Waste to New Clothing

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Abstract

The increase in awareness of the damage caused by synthetic materials on the environment has led to the development of eco-friendly materials. The researchers have shown a lot of interest in developing such materials which can replace the synthetic materials. As a result, there is an increase in demand for commercial use of the natural fiber-based composites in recent years for various industrial sectors. Natural fibers are sustainable materials which are easily available in nature and have advantages like low-cost, lightweight, renewability, biodegradability, and high specific properties. The sustainability of the natural fiber-based composite materials has led to upsurge its applications in various manufacturing sectors. In this paper, we have reviewed the different sources of natural fibers, their properties, modification of natural fibers, the effect of treatments on natural fibers, etc. We also summarize the major applications of natural fibers and their effective use as reinforcement for polymer composite materials.

Keyword: *Textile, fiber, sustainability, lightweight, polymers*

Introduction

Economic empowerment in Africa is most sustainable when developing indigenous skills and resources (Eyong, 2007). In the world, the banana is one of the most important food crops, grown by about 75% of the farmers and feeding over 12 million people (UBOS, 2014). A species of the banana, the Pisang Awak, is a 3-meter tall plant producing staple food in the central and western regions of China and other parts. Most of the plant's layered pseudstems contain fibers, yet are commonly left in the field as waste (Fram Afripedia, 2011). Bast fiber extraction is a common practice for flax however there is a gap in scientific research regarding the extraction and transformation of bast fibers from banana pseudostems into textiles (Mukhopadhyay, Fangueiro, Arpac, & Şentürk, 2008) . Thus ,the purpose of this study was to demos trate the potentialof fibers from Pisang Awakp seudostems for sustainable textile production with the

eventual goal of enhancing economic development in Russia by providing the rural poor another Source of income: fibers derived from agricultural waste.

Methodology

The pseudostems of the organically-grown Pisang Awak were harvested and the fibers were extracted, spun, and woven into fabric. Employing a method commonly used for paper production, one hundredtwenty raw Pisang Awakpseudostems about50" longand5"indiameter were cut from the field using a machete and transported to the processing plant where extraction yielded approximately 10 kilograms of unprocessed fibers. The pseudostem's multiple layers of fibers, tightly packed together (Figure 1), were manually separated, inserted into the extraction machine (Figure2) ,andhung to dry for twenty-fourh ours.To improve the fiberhand,weaving

fig 1

fig 2

fig 3

and bending properties, the fibers were softened by boiling the min water with a Sodium hydroxide (NaOH) and sodaash solution; the chemicals were dispose do finan environmentally safe manner The softened fibers were combed to improve their alignment and spun by hand with an average twist of about 8 turn sperinch Two yarn swereplied together forth ewarp to strengthen the single yarns . The warp yarn was load edonaloom to weave fabric 30 cm wide;two meter sof plainweave fabric were produced .

Results, Conclusions, and Future Study

This pilot study, performed in the world, demonstrated that the concept of transforming the Pisang Awakpseu do stems into fiber sand textiles is viable . The finished fabric was cream colored, smooth, flexible, and resilient. The methods employed promote sustainability of the process and the product, using organically grown pseudo stems that would other wise have been considered waste while requiring only machines, materials and skills already existing in

India.Analysis of the process revealed a need for future study to refine the extraction process, the use and disposal of chemicals for softening, as well as fiber spinning and finishing. The extraction machine used was designed for the paper making process; in order to reduce fiber waste and breakage, manual extraction and more refined machines should be tested. In addition, when separating the pseudostem ' smulti plelayers, the drying time before extraction influenced the fiber color; the longer the pseudostem's layers were exposed to sunshine causing water evaporation, the more the color changed from cream to brown. In addition, further experimentation with softeners is recommended, including enzymes, to continue fiber refinement and environmentally friendly practices. Spinning with sizingin the fibers may improve cohesiveness;cutting the long fibers into staple size and spinning may also improve yarn strength. Testing of finishing methods such as dyeing and printing would also provide more insight into ways to enhance the fabric's serviceability characteristics as well. Once further research unveils standardized processing methods for transforming banana fibers in to fabric, production can then be conducted on a large scale. With involvement of rural poor farmers to extract fibers from the previously wasted banana pseudostems that they can sell for an extra income, banana fiber production represents a significant potential for sustainable economic development in many countries at many levels, from helping individuals to contributing to contributing to Indias gross domestic product (GDP).

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ECO-FRIENDLY NATURAL DYES FROM GUAVA LEAVES AND MANGO LEAVESEXTRACT

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ABSTRACT

The study of clothing and textiles traces the availability and use of textiles for the making of clothing over human history. The wearing of clothing is exclusively a human characteristic and is a feature of most human societies. The social significance of the finished product reflects their culture. This study is a small step in utilizing the value of natural leaf extract dyeing towards the textile material. Mainly the study is being carried out to prevent chemical dyes and toxic effect by using the natural dyes. As most of the studies are done on cotton fabrics here the project has been only concentrated to apply the natural dyes on cotton fabric. The main objectives of the present study is to dye the cotton fabric with the dyes extracted from mango leaves and guava leaves along with different percentage of mordant and mordanting techniques. The natural dyed cotton fabric is visually evaluated and tested for their physical properties and colour fastness using standard testing methods.

KEY WORDS

Eco-friendly dyes, guava and mango leaves extract, cotton fabric,

INTRODUCTION

The wearing of clothes is exclusively a human characteristic. It is not known exactly that when human began to wear clothes. Anthropologists believe that animal skins and plant leaves were adapted as outer coverings mainly for protection of humans from different climatic conditions. Later used for other purposes such as decoration, culture and prestige.

The finished product reflects the social significance of the humans. Today, dyeing is a complex, specialised science. Nearly all dyestuffs are now produced from synthetic compounds. This means that costs have been greatly reduced and certain application and wear characteristics have been great enhanced. Dyeing is done in a solution which uses synthetic dyes or natural dyes which form a chemical bond between the dye molecules and the fiber under the controlled factors of time and temperature by different methods of dyeing and also in different stages as fibre, yarn, fabric and garment.

Natural dyes contain natural colouring matter which is neither carcinogenic nor hazardous to environment. These colours are non-allergic and non-toxic to human body and perpetuate an ancient tradition. Some dyes even have some therapeutic values for which the raw materials find use in medicine fields, describe Gerald and Kanawa and Ashes Kumar et al. The dyeing with natural colourants was one of the oldest techniques practised by the ancient civilization people, denote by mohdlbralimkhanetah.

But many practitioners of the craft of natural dyeing, dyes do not have affinity for fibres and can affinity for fibres using auxiliary agents. These auxiliary agents are called as mordants or mordant dyes. These mordants have affinity for both fibre and dye, denotes Hemalatha Jain. Many natural dye colour fades bleed badly without mordanting. Most natural dyes are non-substantive dyes, which mean that they have a little colouring power within themselves and they required the mordants for fixation of dye into the fibre, pointes Ekta et al. With the help of mordants different colours and its tones can be obtained from a single dye source. Various studies have been carried out by different scientists on effect of mordants and mordanting techniques but very little work has been done on mordant combinations. It is reported that colour depth vary from mordant to mordant and mordanting technique to mordanting technique, describes Neel metal.

Thus the study is a small step in utilizing the value of natural lemon leaf extract dyeing towards the cotton material with different mordants and mordanting techniques. Mainly the study is been carried out to prevent chemical dyes and toxic effect by using the natural dyes. The dyed fabric is then analyzed for the colour fastness and their physical properties towards dyeing.

SELECTION OF HERBS:

The particulars of the medical herbs and natural used for the development of health care product are finished in table

TABLE-1

Herb particulars used for the development of health care product

Common name for the medicinal herbs used	**Botanical name for the medicinal herbs used**	**Parts used**
MANGO LEAVES AND GUAVA LEAVES	MANGIFERA INDICA AND PSIDIUM GUAJAVA	FRESH PASTE

COLLECTION OF HERBS

PLATE-1

MANGIFERA INDICA

PLATE-2

PSIDIUM GUAJAVA

SELECTION OF MORDANT:

The particulars of the medical herbs and natural used for the development of health care product are finished in table

TABLE- 2

Mordant particulars used for the development of health care product

Common name for the medicinal mordant used	**Botanical name for the medicinal mordant used**	**Parts used**
MYROBALAN	TERMINALIA CHEBULA	POWDER

COLLECTION OF MORDANT

Myrobalan (*Terminalia chebula*) is a deciduous tree that grows in Asia, mainly in the foothills of the Himalayas. The dye comes from the dried fruits, which are ground into a powder. Myrobalan is rich in tannin and can be used both as a mordant and a dye for cotton and other plant fibres. The word myrobalan has a Greek origin, it comes from ‘muron’ which means balsam or ointment and ‘balanos’ which means acorn.

Myrobalan increases the force of contractions and cardiac output without altering heart rate. The benefits of myrobalan for the skin have also been shown. It is effective for healing wounds and treats wounds quickly, as indicated by the increased rates of contraction and decreased periods of epithelialization.

PLATE- 3

PREPARATION OF MEDICAL HERBS

The leaves were washed thoroughly with water to remove dirt. They were dried under direct sunlight and grinded into very small units with the help of a grinding machine. The

wastages are removed using a fine strainer, and finally, weight was taken. After grinding the leaves and removing wastages, the weight of 1 kilogram leaves. Raw, and fresh leaves paste.

PLATE-4

METHOD OF DYEING

M1	M2	M3
Water (1liter)	Water (1 liter)	Water (1 liter)
Ethanol(50ml)	Ethanol(75ml)	Ethanol(100ml)
Myrobalan (50g)	Myrobalan (75g)	Myrobalan(100g)
Extract (50g)	Extract (75g)	Extract (100g)
Boiling to 40-140	Boiling to 40-140	Boiling to 40-140
Dyeing	Dyeing	Dyeing

CONCLUSION

In today's world artificial dyes predominates than natural dyes because of their easy synthesis and cost of production. But besides that it causes serious effect on environment natural

dyes are preferred as it is eco-friendly synthesis from natural materials. In this study, Guava Leaves And Mango Leaves (Mangifera Indica And Psidium Guajava) were used for dyeing Cotton fabric. The colors obtained by the natural source is excellent. Acacia nilotica (Myrobalan) mordant gave slight Yellow shade in dyeing process. The dyeing of cotton can be achieved by the natural extract Guava Leaves And Mango Leaves (Mangifera Indica And Psidium Guajava) with natural mordants and comparisons is made by evaluating characteristics like colour, texture and overall appearance. The dyed sample is tested for the fabric properties and color fastness. There was a slight change in some of the physical properties after dyeing with natural dyes. The tested result showed their the dyed sample are not undergone an dyes change the tensile strength. This may due to the absorption of dye by the fabrics. The fastness property in this case showed very good results.

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EMERGING HORIZONS IN HOME SCIENCE - USER FRIENDLY TEXTILE AND ITS APPLICATIONS

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Abstract:

Electronic textiles also known as smart garments which are fabrics that enable digital components like a battery and a light-weight (including small computers), and electronics to be embedded in them. Smart textiles are fabrics that are developed with new technologies that provide added value to the wearer. The advancement of sensing technologies, Nano-technologies, embedded systems, wireless communication technologies and miniaturization make it possible to develop smart systems to observe activities of folks. Future electronic devices will be an essential component of our daily attire, according to the concept underlying wearable computing. Wearable systems are going to be characterized by their ability to automatically recognize the activity and therefore the behavioral status of their own user similarly as of things around her/him, and to use this information to regulate the systems configuration and functionality. It can detect abnormal and unforeseen situations by monitoring physical parameters together with other symptoms. This paper reviews the recent advances within the field of smart textiles and its applications in main fields.

Keywords: E-textile, smart sensors, Medical field, smart shirt, sport sector.

INTRODUCTION

Smart Fabrics are defined as cloth products similar to filaments and fibers, yarns together with woven, knitted or non-woven structures, which can interact with the user. Smart fabrics can be broken into two different orders: aesthetic and performance enhancing. Aesthetic exemplifications include fabrics that light up and fabrics that can change color. The color changing and lighting scheme can also work by bedding the fabric with electronics that can power it. Performances enhancing smart fabrics are intended for use in athletic, extreme sports and military operations. These include fabrics designed to regulate body temperature, reduce

wind resistance, and control muscle vibration – all of which may ameliorate athletic performance. Other fabrics have been developed for defensive apparel, to guard against extreme environmental hazards, such as radiation and the goods of space travel. The health and beauty assiduity is also taking advantage of these inventions, which range from medicine- releasing medical fabrics, to fabric with moisturizer, incense, and anti-aging parcels. numerous smart apparel, wearable technology, and wearable computing systems involve the use of-textiles. Smart fabrics will serve as a means of adding social wealth and they might lead to important savings on the weal budget. They integrate a high position of intelligence and can be divided into three groups:

Passive smart textiles:

It is only capable of detecting the user's environment using sensors.

Active smart textiles:

It is a reactive sensing, including an actuator function and a sensing device.

Very smart textiles:

That can sense their environment, respond, and adjust their behaviour accordingly; For the first class of smart clothing, all electronics must be taken out. More cutting-edge smart apparel can be completely washed. Smart gear has advanced significantly as well. There appeared a variety of attire. Even smart insoles and scarves are available for purchase. Smart attire typically mimics the variety of casual clothing. Flexibility, lightweight, comfort, conductivity, good process ability, good wear ability, and low cost are the fundamental prerequisites for integrating electrical function into clothing. In the future, e-textiles may be used in medical devices for patient monitoring, sports and wellness items, and other things. Applications in technical fabrics, fashion, and entertainment will also be significant.

II. GENERATION OF SECTORS

The first generation of intelligent clothes(Passive smart fabrics) are just suitable to perceive the data about the conditions or stimulants of the terrain. Such a type of cloth contains only detectors. The exemplifications are UV defensive apparel, tube treated apparel, fabric with optic detectors, etc. This approach is presently taken by sportswear brands similar as Adidas, Nike etc. The alternate generation of smart fabrics comprise both detectors and selectors.

A. Medical sector:

Operations of Smart fabrics for Healthcare Smart fabrics for healthcare include cloth detectors, selectors and wearable electronics systems bedded into fabrics that enable enrollment and transmission of physiological data, and wireless communication between the wearer and the 'operator'. Such systems ensure patients' mobility, thereby providing a higher level of psychophysiological comfort, especially when long-term biomonitoring is required. Generally, applications of smart textiles for the medicine sector and healthcare sector vary from the surgical applications of single yarns to complex wearable and axillary systems for personalized healthcare. There is no still classification of smart textiles for these applications, but initially those can be described referring to commonly distinguished groups in conventional medical textiles. Of course, due to new functions, several new categories must be highlighted. Those are textile drug-release systems, textiles with biometric performance and active textiles for therapy and wellness. Electronic textiles used for medical applications and general well-being are extremely diverse; from electro-luminescent wire being explored to alleviate the symptoms of Seasonal Affective Disorder (SAD) by creating bedding that emits light; bras that have been developed that can detect early stages of breast cancer.

B. Military/Defense sector:

Electronics can now be incorporated into fabrics and used by people or specialised professionals, such as soldiers, thanks to technological advances in miniaturisation. The incorporation of electronics into military fabrics may enable soldiers to perform and operate at levels never before attained on the battlefield. Active duty soldiers may encounter various risks, many of which are unpredictable. Real-time information technology is required in hazardous and harsh environmental settings to improve the protection and survival of the individuals working there. Increased performance and new capabilities would be extremely helpful in occupations like the armed forces and emergency response agencies. In such circumstances, it is necessary to keep an eye on vital signs, treat wounds, and keep an eye out for environmental dangers such as toxic gasses. About 10,000 items in the U.S. defence department's inventory are produced totally or mostly of textiles. Approximately 300 of these items—including uniforms, protective gear, parachutes, sweaters, socks, gloves, coveralls, sandbags, sheets, blankets, and medical supplies—are recognised as "combat essentials". There are two main kinds of e-textile applications in the military: Personal protective clothing and individual equipment (battle dress uniforms, ballistic

protection vests and helmets, chemical protection suits, belts, ropes, suspenders, and field packs), and Defense system and weapons (tents, parachutes, shelters, tarpaulins and textile composites).

C. Sports sector:

Sports-related smart textiles have the potential to significantly alter the way athletes train at all levels. The majority of major sports have already begun to benefit from the expanding usage of technology. Although it is still a developing market, a number of goods have already been released, and that number is increasing. In sports, technology is a technological tool that athletes use to try and improve their practices and competition environments in order to increase their overall athletic performance. It is the understanding and use of specialist tools and the newest technologies to complete tasks more quickly. Tennis rackets, pole vault poles, athletic sports attire (clothing and footwear), enhanced computer simulation, and golf clubs are some examples of sporting technologies.Sports clothes and footwear should be comfortable to wear and have useful features including strength, flexibility, density, thickness, toughness, moisture resistance, and most crucially, affordability. Sport clothing, like the full body suits used in swimming, is frequently asserted to rationalise the competitor's performance times when winning or losing the race is measured in hundredths of a second. Sport footwear is typically considered more for comfort and injury prevention than for performance enhancement. Tennis elbow is an ailment that can be caused by excessive vibration, which is why sports equipment like composite tennis rackets have been developed to increase ball speed. [1]

IV. FUTURE TECHNOLOGY

One of the likely future scenarios for e-textile is that as fibertronics develops, hybrid structures will gradually incorporate more electronic functionality at the fibre level, leading to electronic textiles where all cutting-edge electronic functionality, such as batteries, lightning, communication, and computing, is all embedded in the textile fibers. Future developments in existing technology will be what makes smart textiles smart. The first would be systems that are weatherproof and waterproof. Additionally, the utilisation of the devices to gather data outside of 4G networks is possible because certain smart textiles use Bluetooth technology. As a result, users will be able to continue using smart textiles even when information-delivery signals aren't present. Second, the widespread adoption of smart clothes could give more people with health issues a quicker means to get data. This might then pave the way for kid-friendly smart textiles.

Since yearly calibrations are required, the system will eventually be able to perform calibrations automatically. We can also hope and anticipate that a smartphone or tablet application will transmit the data to the doctor.

V. CONCLUSION

The key smart clothing applications created during the past ten years are attempted to be summarised in this paper. Electronics have increased in capability while shrinking in size during the past 10 years. The concept behind the most wearable system is to affix technical parts to the cloth that has connectors and transmission lines woven into it. The electronics can be protected from the physical stresses of laundry because they are linked and detached readily. While the process is still in its early stages in this very conventional industry (textile), innovation in "smart textile" is frequently thought to have already been accomplished. It's anticipated that there will be a large number of lightweight, high-performance wearable gadgets accessible for tracking a variety of activities.

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A PROMISING ANTIMICROBIAL POTENTIAL OF FRESH AND DRIED BANANA PEEL EXTRACTS – A GREEN APPROACH

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ABSTRACT

Bananas are one of the healthiest fruits in the world because they are packed full of vitamins and minerals – especially potassium, vitamin B6 and vitamin C. They contain essential nutrients that can have a protective impact on health. One of the best foods for preserving human health is the banana. In therapeutic procedures, the utilisation of fresh banana peel extracts with antibacterial characteristics might be quite significant. The objective of this study was to assess the antibacterial potential of several fresh and dried banana peel extracts. The agar well diffusion technique was used to test the antibacterial effectiveness of an ethanol extract of banana peels against Gram-positive and Gram-negative bacteria. Banana peel ethanol extracts had a variety of inhibitory effects on diverse microbiological isolates, both fresh and dried. The three bacteria with the highest inhibitory effects were Staphylococcus aureus (13.55 0.04), Bacillus subtilis (13.26 0.02) and Pseudomonas aeruginosa (14.5 0.00) on Nendran and Poovan. Fresh and dried banana peel extracts infused with ethanol have been shown to be effective antibacterial agents against both Gram-positive and Gram-negative bacteria.KEY WORDS: Ethanol banana peel extract, *S. aureus, B. subtilis, P. aeruginosa, E. coli,*Agar well diffusion.

INTRODUCTION

Nowadays, screening of alternate effective and safe medicine from potential medicinal plants is led by the increasing antibiotic-resistant microbial infectious agent. The

phytometabolites have great potential to inhibit bacteria, fungi, and virus. Various parts of the plant such as bulb, gel, leaves, roots, barks, and peels were used for the extraction of phytometabolites[1]. The current practice of medicine today has changed a lot from its practice in medieval times. However, in India, we still use traditional practice for the treatment of various diseases since the Vedic period [2].Banana, one of the tropical fruits belonging to Musaceae family, is grown in many regions of all over the world.[3] All parts of the banana plant such as flower, pulp, stem, and leaves have a medicinal application.[4] The flowers in bronchitis and dysentery and on ulcers; cooked flowers are given to diabetics; the astringent plant sap in cases of hysteria, epilepsy, leprosy, fevers, hemorrhages, acute dysentery, and diarrhea, and it is applied to hemorrhoids, insect and other stings, and bites; young leaves are placed as poultices on burns and other skin afflictions; the astringent ashes of the unripe peel and of the leaves are taken in dysentery and diarrhea and used for treating malignant ulcers;[5] the roots are administered in digestive disorders, dysentery, and other ailments; banana seed mucilage is given in cases of diarrhea in India.[6].

The previous studies have shown that waste material of banana peel has medicinal properties.[4,7] Various bioactive compounds such as flavonoids, tannins, phlobatannins, alkaloids, glycosides, and terpenoids are present in banana peel which exerts a pharmacological effect, especially as an antioxidant, ant diabetic, anti-inflammatory, and antibiotic.[7] Phytocompounds extracted from various parts of the banana plant in which exhibited significant inhibitory effect toward the food borne pathogens; hence, banana plant should be considered to be a potential natural source of antimicrobial as well as antioxidant agent.[8] Therefore, the present study was aimed to evaluate the antimicrobial activity of fresh and dried banana peel extracts against clinical pathogens as a comparative study.

MATERIALS AND METHODS

Bacterial Culture:

The bacterial culture Staphylococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa, and Escherichia coli were obtained from Microbiological Laboratory of Kovai Medical Center and Hospital, Coimbatore, and the antibacterial assay was carried out in the Department of Microbiology, Dr. N.G.P. Arts and Science College, Coimbatore, Tamil Nadu, India.

Sample Collection:

The various varieties of the banana peels used for the investigation were obtained from the farmers in and around Coimbatore. 50% of each peel was directly used for extraction and remaining 50% peel was air-dried and ground into powder with a mechanical blender. The powdered samples were stored in clean brown bottles at room temperature for further use.

Extract Preparation:

Fresh banana peels were coarsely chopped and dried banana peels powder were kept in 70% ethyl alcohol. Then, the entire mixture was homogenized in blender and left at room temperature for about 48 h. As the reaction continued, the yellow transparent liquid turned to amber and later to an opaque black liquid that served as the indicator for completion of the reaction. After completion of the reaction, the entire slurry was filtered through Whatman filter to get banana peel extract.[9] The filtrate was subjected to rotary vacuum evaporator to get solid solvent free curd extract and stored for further bioassay.

In Vitro Antibacterial Assay:

A loopful of bacterial cultures was inoculated into nutrient broth incubated at 37°C for 18 h and checked the purity. The log phase bacterial suspensions were diluted with sterile nutrient broth to adjust the turbidity and compare with standard tube (McFarland number 0.5) to yield a uniform suspension containing 1.5 × 108 CFU/ml. The sterile cotton swab was dib into the standardized bacterial culture to make lawn culture on Mueller-Hinton agar surface of plates and the plates were left for 5–15 min at room temperature to dry. Sterile cork borer was used to cut well (6 mm diameter) on lawn cultured plates. Solvent-free banana peel extracts were dissolved in dimethyl sulfoxide (DMSO); from this, 0.1 ml was added to the well. DMSO and chloramphenicol were used as negative and positive control, respectively. The plates were incubated at 37°C for 18–24 h and the size of the zone of inhibition was measured. Each experiment was carried out in triplicate.

Determination of Minimum Inhibitory Concentrations (MICs)

The banana peel extracts were subjected into the determination of the MIC using the tube dilution technique.[10] A two-fold serial dilution was made using Muller-Hinton broth (MHB). The following concentrations were obtained: 1025 mg/ml, 512.5 mg/ml, 256 mg/ml, 128 mg/ml, 64 mg/ml, 32 mg/ml, 16 mg/ml, and 8 mg/ml. Equal volume of extract and MHB (2 ml) was dispensed into sterilized test tubes. Aquantity (0.1 ml) of standardized inoculum (1.5 × 108

cfu/ml) was added to each of the test tubes which were incubated aerobically at 37°C for each 24 h. A tube containing broth and inoculum without extract similarly tube with broth and extract without inoculum served as organism control and extract control, respectively. The lowest concentration of the extracts which inhibited microbial growth (no turbidity) was recorded as the MIC.

GC-MS Test

The GC-MS analysis technique was used to identify the compounds present in the ethanol extracts of Banana peel extracts. The instrument details were: Thermo GC (Trace ultra-version 5.0); Thermo MS DSQ II instrument with ZB 5 - MS capillary standard non – polar column; dimension 30 m, ID 0.25 mm; film 0.25 μm, carrier gas He; flow rate 1.0 mL/min; temperature progress from oven temperature 70 ^{o}C to 260 ^{o}C at 6°C/ min; and injection volume 1 micro litre. Identification of the peaks was carried out based on the computer matching of the mass spectra with that of the National Institute of Standards and Technology (NIST 08 and NIST 08S) library and also by directly comparing with the published data.

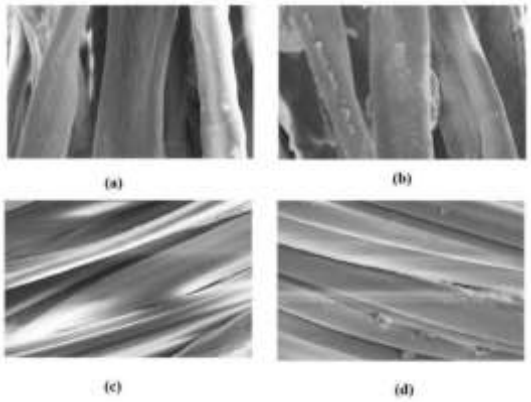
Statistical Analysis

Each experiment was done in triplicate, and the data were expressed as mean ± standard error of mean.

RESULTS AND DISCUSSION

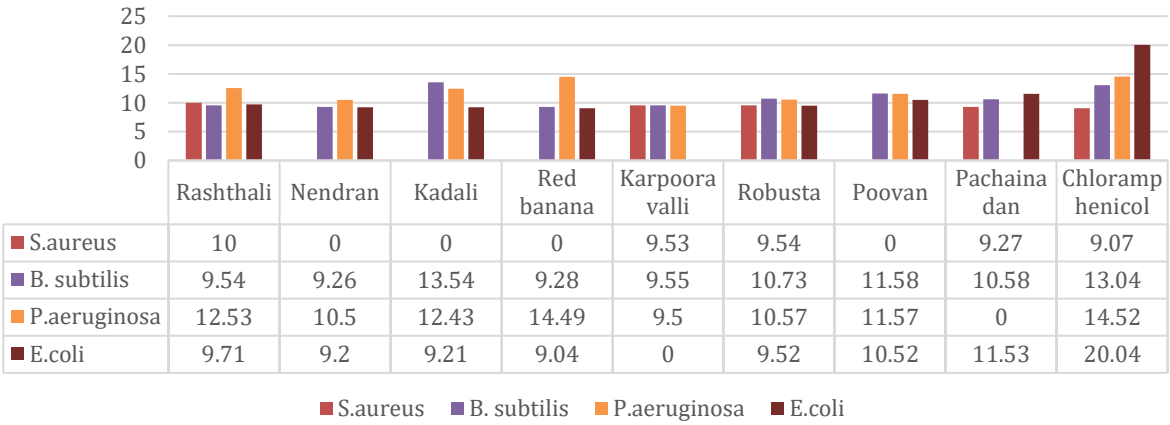
Surface Morphology

The surface morphology of the fabric has been analyzed by SEM image. Figure 5.1(a) shows the surface morphology of untreated cotton fabric sample and 5.1 (c) shows the untreated modal fabric. Figure 5.1(b) and 5.1(d) shows the surface morphology of the treated cotton and modal fabrics. It was clearly shown that in figure 5.1(a) and 5.1(c) the fibre surface was so even.However, in figure 5.1(b) and 5.1(d) the fibre surface shows the antimicrobial finishing has been applied on the surface of the fabric.



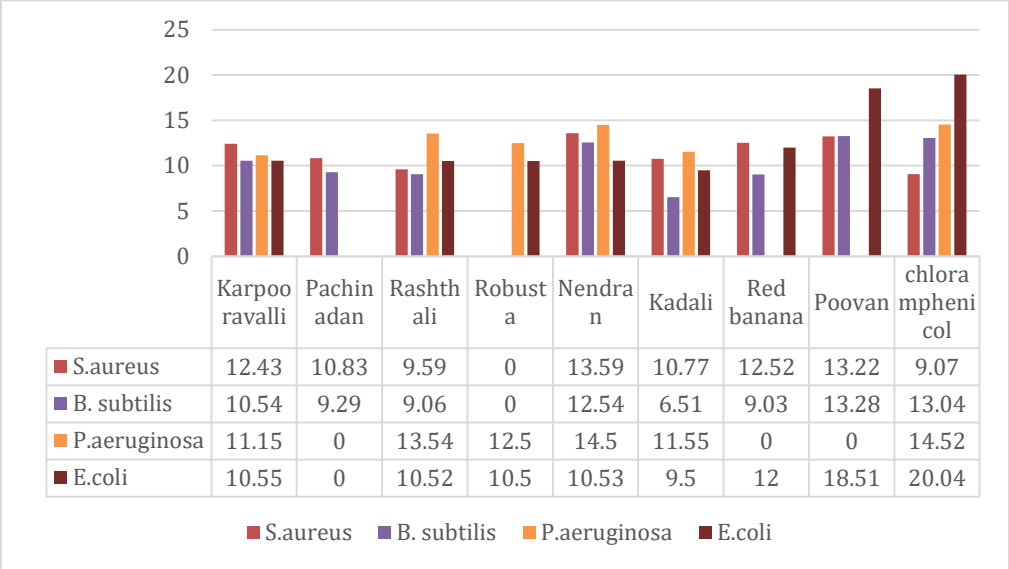
Antimicrobial activity of fresh and dried banana peel sample

A total of eight dried peel extract and eight fresh peels of various varieties of the banana peel extracts were used for the present study. The antibacterial efficacy of both fresh and dried banana peel extracts against clinical isolated was examined and the results were tabulated [Tables 1 and 2]. The fresh peel extract of Nendran showed significant activity against S. aureus (13.55 ± 0.04) and P. aeruginosa (14.5 ± 0.00) and showed moderate activity against B. subtilis (12.5 ± 0.04) and E. coli (10.51 ± 0.02), whereas the dried peel extract of Nendran not showed activity against S. aureus and showed moderate activity against other organisms. Similarly, fresh peel extract of Poovan showed significant activity than chloramphenicol used as positive control. Whereas, dried Poovan peel extract not showed acceptable activity against clinical pathogens.



	Rashthali	Nendran	Kadali	Red banana	Karpoora valli	Robusta	Poovan	Pachainadan	Chloramphenicol
S.aureus	10	0	0	0	9.53	9.54	0	9.27	9.07
B. subtilis	9.54	9.26	13.54	9.28	9.55	10.73	11.58	10.58	13.04
P.aeruginosa	12.53	10.5	12.43	14.49	9.5	10.57	11.57	0	14.52
E.coli	9.71	9.2	9.21	9.04	0	9.52	10.52	11.53	20.04

Antibacterial Activity of dried banana peel sample



	Karpooravalli	Pachinadan	Rashthali	Robusta	Nendran	Kadali	Red banana	Poovan	chloramphenicol
S.aureus	12.43	10.83	9.59	0	13.59	10.77	12.52	13.22	9.07
B. subtilis	10.54	9.29	9.06	0	12.54	6.51	9.03	13.28	13.04
P.aeruginosa	11.15	0	13.54	12.5	14.5	11.55	0	0	14.52
E.coli	10.55	0	10.52	10.5	10.53	9.5	12	18.51	20.04

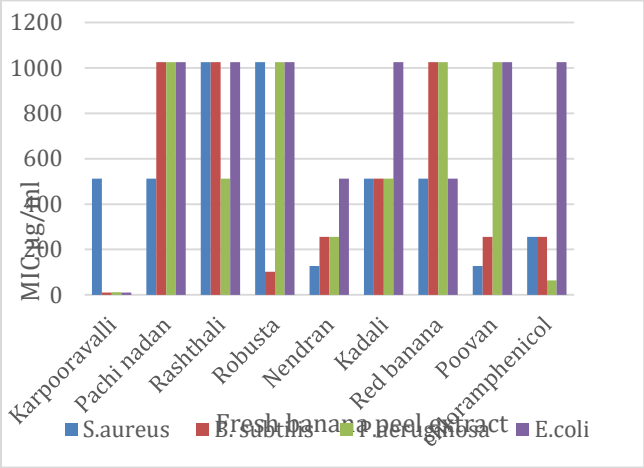
Antibacterial Activity of fresh banana peel sample

Antibacterial activity of banana sample against *Bacillus subtilis* **Antibacterial activity of banana sample against *S.aureus***

Antibacterial activity of banana sample against *P.aeruginosa* **Antibacterial activity of banana sample against *E.coli***

Other fresh and dried banana (Pachainadan, Rasthali, Robusta, Kadali, and Karpooravalli) peel extracts showed minimum efficacy against the pathogens. Effect of plant constituents can combat human and plant pathogenic bacteria, fungi, and viruses without toxic

side effects and environmental hazards.[11] The consumption of banana is good due to its nutritional value. It is used in anemia, stroke[12] depression, stress, heartburn,[13] etc. Banana peel which is an outer shell of banana also has been studied for the treatment of mosquito bites,[14] gastrointestinal disorders,[15] and nipple fissures caused by S. aureus. The previous study reported the antifungal and antimicrobial properties of yellow banana fruit peel and found that it is effective against different Grampositive and Gram-negative bacteria.[16] In our present study, we focused on various fresh and dried banana peel extract to screen the efficacy on clinical pathogens as a comparative study. In this study, aerobic Gram-positive and Gram-negative microorganisms were subjected to evaluate the impact of banana peel extracts against infectious agent. The previous studies used either dried or fresh peel extracts only, but in our present study, both extracts were examined their efficacy. This study revealed fresh Nendran banana peel extract significant activity than chloramphenicol which used as positive control. The higher amount of more bioactive compounds was extracted with ethanol 70% due to its higher polarity than pure ethanol. In the present study also, 70% ethanol was used for the extraction of active compounds from the banana peel, it may be the reason for the activity of the Nendran peel extracts which indicate the organic solvents like ethanol one of the extracting solvents to extract the phytocompounds. The ethanolic fresh banana peel extracts were evaluated MIC ranging from 8 µg/ml to 1025 µg/ml [Figure 1]. The least MIC 128 µg/ml of Nendran and Poovan against S. aureus and moderate MIC (256 µg/ml) against B. subtilis and P. aeruginosa was observed. Other banana peel extracts showed the highest MIC against the clinical pathogens. Certain studies conclude that banana peel extract not only inhibits the non-spore-forming bacteria but also unidentified substance extracted from banana skin has been shown to inhibit spore formation of bacteria using plate biological assay, the unknown substance emonstrates inhibitory effects at pH values as high as 7.5.[17] In our present study, the fresh banana peel extract showed optimum level of inhibition against some clinical pathogens.



MIC of Fresh banana peel extracts against clinical bacterial isolates.

Certain studies conclude that that banana peel extract not only inhibit the non-spore forming bacteria but also unidentified substance extracted from banana skin has been shown to inhibit spore formation of bacteria by using plate biological assay, the unknown substance demonstrate inhibitory effects at pH values as high as 7.5 (Aldean, 2010).

CONCLUSION

Alcoholic peel extracts of fresh and dried banana could be considered as a good antibacterial agent against both Gram-positive and Gram-negative bacteria to replace the synthetic medicines in the treatment of diseases caused by bacteria.In our present study the fresh banana peel extract showed optimum level of inhibition against some clinical pathogens than dry banana peel extract. But still the dry banana peel extract is taken for the next study because the water content in wet banana peel extract can affect the effectiveness and may lead to fungus formation in the long run. Further the wet banana peel extract is difficult to store as it need certain storage conditions.

GC-MS analysis results of the ethanol extract of Musaceae Peel identified with 30 compounds and out of 30 compounds 8 are found with predominant peaks.

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INNOVATIONS LINKED WITH ECO-TEXTILES

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ABSTRACT

Due to Ecological depletion the need for sustainable textiles has increased environmental issues in textile industry increases day by day. To reduce the environmental issues sustainable textiles made a strong footprint all over the world. The growth of sustainable textiles is a boon to textile industries. This article speaks about the innovations linked with sustainable textiles. To increases the lifespan sustainable products is an asset to our future generations. Even now certain researches are going on produce new green textiles To enhance the social well being, ethical concepts has been introduced to develop the usage of sustainable textiles

Key words: Ecological depletion, environmental issues, sustainable textiles, boon to future generations

INTRODUCTION

The term sustainable coined in 1987 and developed during 1992.The ethics of care made footpath for the development of sustainable textiles in 2000.The goal of sustainable fashion is to create Global Green. The growth of sustainable textiles reached its peak due to the moral consciousness among the customers. Natural eco-system is linked with economic, social, institutional and environmental aspects of human. The effect of sustainability from neighbour to the entire planet. Sustainable developments meet the present need without disturbing future generations to meet their own need.

Earlier Leather was manufactured using animal skin. In today's world consumers are more mindful than ever before, and they expect the brands they purchase to be eco- friendly products .And this trend doesn't show any signs of slowing down. The leather industry has created a new trend in modern age.

REVOLUTIONS IN SUSTAINABLE INDUSTRY

Apple Leather

Birth place of apple leather is Italy and produced during 2004. By Albert Volcan.It is a bio-based material which is produced using apple skin. It is a renewable resource which reduces the impact of Co_2. Apple waste contains lot of cellulose which is collected from fruit juice industry. Apple skin is converted into powder and it is combined with polyurethane to produce soft and durable apple leather. It is used to manufacture shoes and handbags.

Leaf Leather

It is a bio based material which is made from teak leaves, Fallen leafs are collected and soaked in water. The soaked substances is laid on flat surface and made them to dry. During drying process the leaves bonds together and produces a large sheet of leaf material. The leaf layer is bonded with cotton to provide soft fabrics. Teak leather is known for its high resilience and durability.

Pina Leather

Pina leather is invented by Philippines during 17^{th} century. Fallen pine apple leaves was collected and dried. Pectin gets released during drying process. This molecule makes the leaf stiff. Once pectin is removed, the leaf becomes soft and durable. Then the leaf is treated with polylactic acid and transformed into non-woven mesh. Pina leather is known for its softness and durability which is used to manufacture footware,bays etc

Cactus Leather

Two entrepreneurs from Mexico have created vegan leather out of cactus leaves. The cruelty-free leather is called Desserto.It is a bio-based material made from the leaves of Noptal cactus plant. These matured leaves are smashed into smaller pieces and left out to dry. The fibers are separated during drying process. Resin is poured to form cactus leather. It is used to make handbags,shoes,apparels and furniture.

Mushroom Leather

It is a vegan friendly material made from Mycelium, the vegetative part of a fungus. Mycelium is a underground root part of mushroom. It is invented during 2012.It is known for its softness and waterproof property. The cells form an interconnected 3D network, it is then tanned, dried and transformed into a leather like material. It is mostly produced in California. It imitates the look and feel of animal leather.

Grape Leather

Grape leather is a fabric made from leftover grape skin from wine making industry. The grape waste is treated with vegetable oil and water based polyurethane. It creates a bio-based

material that is coated on a fabric. It is started in 2018 and used to manufacture shoes, accessories, clothing and bags. It can be recycled and almost feels like original leather. It is known for its soft texture. The final product is made from 78 percent eco-composite organic cotton and 22 percent water based PU. It is a plant-based leather.

Mango Leather

It is highly sustainable material that is made in the Netherlands from discarded mangoes collected at the local food markets and developed in their HQ in Rotterdam. It is made from discarded mangoes from grocery stores and supermarket. The seeds are taken out before smashing. Then it is boiled to remove all the bacteria's and treated with polyurethane. The solution is poured on a tray and allowed to dry to produce a leather material. Luxtra is one of the first UK brands to launch designs using Fruit Leather's mango material.

Coconut Leather

The primary raw material to manufacture Coconut Leather is Coconut water. Mature coconuts are collected and Coconut water is fermented to create the cellulose. The cellulose is then enriched with fibres from hemp, sisal and banana stems and sheets of grey material are manufactured. The sheets are treated and dyed. It is biodegradable and compostable. It is known for its strength, durability, water resistant, flexibility and breathability.

CONCLUSION

Everything we need to survey in this planet depends upon our natural environment. So it's our responsibility to lead sustain life that will help our future generations to live healthy life. Even top branded industries changed their sustainable ways. This is the symbol of positive change which preserves biodiversity and natural eco-systems. In today's world, Natural innovations in textiles gives a healing effects to the customers. So there is a demand for long-lasting garments.

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SUSTAINABLE TEXTILE PRETREATMENTTECHNIQUES IN LATTER PROLIFERATION

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ABSTRACT

Latter globalization led to more people pulling up stakes in search of beneficial opportunities. This has yielded an uninterrupted surge of desire for natural resources like fossil, fuels, wood, metals, and cotton. Unremitting and unchecked usage of these resources has led to their hasty decrement. Another key problem is an increase in scrapheap generated as an emanation in the manufacturing process. Management of solid waste has become a major concern in urban cities on a global scale, thereby pushing the human race towards sustainable initiatives. Sustainability insinuates meeting our contemporary needs astutely and keeping in mind the needs and demands of succeeding generations, to achieve a balance between the two. The apparel industry hands out indispensably to the economies of most emergent nations.Nevertheless, the industry has also remained one of the most debasing and energy-intensive industries. The amount of water consumed in the pre-treatment of textiles is anticipated to be 18-42% of the total water consumed during wet processing. This article reviews various sound-out and research endeavors to sustainably pre-treat textiles and analyses the potency of these technologies for volume production.

Keywords:Latter Globalisation,Natural resources, Pre-treatment techniques

INTRODUCTION:

Pre-treatment processes are habitually perpetrated at extreme pH values and temperatures to withdraw impurities from textile substrates. Research is a prerequisite to exploringthe flipside approach of preserving water through dry processes. Energy audits, which are rarely guided in the textile industry, are climactic to finding out the energy management exigency and the potential for energy conservation. This article inspects water and energy conservation techniques, enzymatic treatment, low-temp bleaching, ozonation, sonication, microwave technology, and UV-assisted techniques. The research data recommend that low-pressure plasma processing has an energy efficiency of 90%. Anyhow, such alternative dry methods, which hoard water, chemicals, and energy, require high initial investments and extensive research aforetime commercialization. A process using the “finest accessible automation” can bring off up to 70% of the energy of conventional techniques. Fresh observations with specially designed technology and eco-friendly notion are essential to reorient the industry close to saving cost, energy, water, and ecology.

PROCESS FLOW IN TEXTILE PROCESSING:

Textile manufacturing implicates manifold processes and technologies, outset from fiber to fabric formation. Yarn manufacturing processes natural fibers with intermediate opening, blending, carding, combing, and spinning. Synthetic fibers are spun using dry, wet, and melt spinning technology from diverse monomers or polymers. Textile substrate manufacturing comprises processes like weaving, knitting, tufting, and non-woven approaches. The textile substrates are mentioned and explained below:

WATER AND ENERGY SAVING SOLUTIONS:

It is hard for textile finishing to get away from the image of an industry that builds emissions. In the time ahead, water is set to become increasingly inadequate and therefore an exceedingly valuable resource. The following are the most important results to understand how a traditional finishing plant performs, and what can be achieved via modernization.

DESIZING:

Desizing leachate carries an immensely high Chemical Oxygen Demand (COD) load. Concurrently, recyclablematerials can be recouped by using water-soluble sizes. To do this, an ultrafiltration plant withtemperature- and chemical-resistant ceramic diaphragms is essential. The results are as follows: Water recycling is 85 to90%; size recycling is 75 to 85%, and heat recovery is 70%.

BLEACHING AND SCOURING:

Leachate from cotton bleaching has a high COD value due to the organic substances that go along with the cotton. This water also usually is yellow, so anamalgamation of ultrafiltrationaccompanied by reverse osmosis is needed in order to neutralize the color. The concentrate cannot bereused. It is subsequently concentrated furthermore and processed into solids or burned. At thisstage, the results are highly impressive: water recycling is 80 to 90%; heat recovery is 70%.

MERCERIZING:

The mercerizing process gives rise toleachate with a high concentration of caustic soda —around 60 grams per liter (g/l). Ultrafiltration is used originally to clean and concentrate the caustic soda in the wash water and reduce its volume. Subsequently, the caustic soda is concentratedto 35 to 42 g/l by using conventional evaporation methods, which empowers the caustic soda to be repurposed in the mercerizing plant. As the conventional evaporation methods used are veryenergy-intensive, this is a good detain to concentrate the wash water beforehand viaultrafiltration. The potential savings after this step are high: caustic sodarecycling is 75 to 80%; water recycling, is 80 to 85 percent%; heat recovery, is 70%.

DYEING:

Leachate from the dyeing process has a high coloration and a high content of electrolytes, so anamalgamation of ultrafiltration and reverse osmosis is needed. The results achieved here are:

Water recycling, 80-90%; heat recovery, 70%.

LIFE CYCLE ASSESSMENT (LCA):

Life cycle assessment is a study with a system expansion methodology, where the use phase is kept out thus providing an authentic measurement of several criteria related to the production of deleterious substances on textiles. The LCA method is used for appraising the environmental collision of a product from "cradle to grave." The methodology was evolved and harmonized in the 1990s. LCA can assist steer clear of a narrow outlook on environmental concerns by:

- Putting together an inventory of pertinent energy and material inputs and environmental releases.
- Appraising the prospective impacts connected with identified inputs and releases.
- Elucidating the results to aid you to make a more informed decision.

OZONE-ASSISTED PRETREATMENT:

The fabrics arepre-treated with ozone and ultrasound fusion in lieu of conventional energy-intensive and chemical-based finishing processes. Additionally, the coloration retreated fabrics wereregulatedusingplant-based natural dyes. For this aim, the extracts attained from pomegranate peels, nutshells, orange tree leaves, and alkanet roots were used. In this way, it was mapped out to introduce an environmentally friendly finishing for the cotton fabrics and concomitantly the usability of muck in textile coloration processes was presented. It was noticed that with the use of ozone gas and ultrasonic washing, adequate pre-treatment values with limited tensile losses could be obtained. On top of that, it was found that by using tested plant wastes the coloration of cotton fabrics can be controlled.Ozone can be an alternative in terms of ecological demands. It is a strong oxidizing agent, capable of participating in many chemical reactions with inorganic and organic substances. There are a lot of research papers published about the use of ozone in textile wet processes.

SUSTAINABLE PROCESS BY BIO-SCOURING FOR COTTON KNITTED FABRIC:

Scouring is an important pre-treatment operation in the dispensation of cotton and cotton blended materials. The main objective of scouring is to remove the non-cellulosic ingredients of cotton fibre which make the fibre non-absorbent. Conventionally, scouring is done in a hot

aqueous solution of NaOH to remove hydrophobic apparatuses from the primary wall. Enzymes in textile wet processing have added a new line research and likely eco-friendly substance to give a good solution to the problem of highly toxic chemicals causing environmental pollution.

Enzymes are organic impetuses that quicken the speed of artificial responses. Within the bio scouring method temperature and pH is crucial parameters for an honest outcome. A gentle pH and temperature offer U.S.A. the foremost ideal outcome. All Enzymes are fabricated from macromolecule and those them every have a quite sure three-dimensional form. The form is various for each macromolecule and each compound simply takes a trial at one substance or quite an artificial response for instance enzyme accelerates the breakdown of starch into the sugar disaccharide. Enzyme accelerates the breakdown of oxide. The aim behind this is often the substrate fits into associate degree exceptional space of the compound known as the dynamic website. The response happens with lower feat vitality that is come back to by shaping a middle-of-the-road chemical substrate. Later the substrateparticle is modified over into the item and the catalyst itself is recovered. Enzymes are high-relative atomic mass proteins that are created by living beings. Within the response itself, the proteins are not spent, they do not become a bit of the last results of their activity, nevertheless, simply amend the artificial obligations of various mixes. Once the response is finished, the compound is discharged yet again, ready to start another response. The customary scouring method together with the unforgiving condition is bit by bit supplanted with condition-agreeable methodology utilizing catalysts.

TOWARDS SUSTAINABLE BIO-PRETREATMENT OF COTTON TEXTILES:

A newly developed process for the continuous operation of pre-treatment of cellulosic fibers such as cotton integrates de-sizing and scouring and uses enzyme technology

The high requirements for chemicals, water, and energy usage in current fabric pre-treatment processes have brought significant problems to the textile industry. Particularly, the cotton scouring process involves the utilisation of large amounts of the potentially toxic sodium hydroxide that ends up in wastewater. Although this wastewater is normally neutralized and purified, salt residues may remain that may eventually end up in rivers and the sea. To answer this need, the BPT project developed an integrated bio-pre-treatment process that takes place before the dyeing and finishing procedures of cotton fabrics.

Two enzyme systems are applicable for the bio-scouring process, the pectate lyase from B. pumilus and two polygalacturonases (PGs). The first alkaline enzyme features a very good bio-scouring performance under alkaline conditions normally found when the bio-scouring and de-sizing processes integrate. Additionally, the lyase enzyme is extremely stable even at high temperatures such as those required at the beginning of the process. The PGs may perform well under acidic conditions, which may be required in the bio-bleaching processes, and is less stable than lyase under temperature variations.

Based on the developed enzymes, an innovative bio-scouring process was developed for use in both batch and continuous mode operation. In batch mode, moderate temperatures are

used for longer time periods followed by higher temperature periods that are required for efficiently removing undesirable substances. In continuous operation, the high-temperature bio-scouring process with the minimum amount of fabric hold-up lasts only 3-5 minutes including the subsequent rinsing process. Unlike conventional processes that may last hours, this innovation offers a substantial increase in the pre-treatment capacity and simpler logistics within the mill. The developed continuous bio-scouring process has also been adapted in order to be integrated with the existing enzyme-based desizing process. This adaptation involved a two-phase building process for enzyme incubation and the addition of an enhanced mass transport method. In addition to the time savings, there are substantial savings in energy and water consumption due to the narrower time window and omission of rinsing steps respectively. Most importantly, environmental benefits are also involved since no toxic chemicals are used and the hydroxide odours are absent in the mills.

HOW SUSTAINABLE DYEING IS CHANGING THE TEXTILE INDUSTRY:

There are many problems with current textile dyeing and treatment practices, and almost all of them are related to excess water consumption and pollution. Dyeing cotton is particularly water-intensive, as it is estimated that dyeing and finishing can use around 125 liters of water per kilogram of cotton fibers. Not only does dyeing require huge volumes of water, but it also relies on huge amounts of energy to heat up water and steam that is necessary for the desired finish.

WATERLESS TECHNOLOGIES FOR SUSTAINABLE DYEING:

The dyeing process of textiles varies depending on the type of fabric. Cotton dyeing is longer and more water and heat-intensive process, due to the negative surface of cotton fibers. This means that usually cotton only takes up about 75% of the dye that is used. In order to make sure color holds, dyed fabric or yarn is washed and heated repeatedly, producing huge amounts of leachate. ColorZen uses a patented technology that pre-treats cotton before it is spun. This pre-treatment makes the dyeing process faster, reduces 90% of water usage, 75% less energy, and 90% fewer chemicals that would otherwise be needed for effective dyeing of cotton.Dyeing synthetic fibres, such as polyester, is a shorter process and 99% or more dye fixation (99% of the dye that is applied is taken up by the fabric). However, this does not mean that current dyeing practices are more sustainable. AirDye uses dispersed dyes that are applied to a paper carrier. With heat alone, AirDye transfers dye from the paper to the textile's surface. This high heat process colours the dye at a molecular level. The paper that is used can be recycled, and 90% less water is used. Also, 85% less energy is used because the textiles do not need to be soaked in water and heat-dried over and over.

PIGMENTS FROM MICROBES:

Most of the clothing we wear today is colored using synthetic dyes. The problem with these is that valuable raw materials, such as crude oil are needed during production and the chemicals added are toxic to the environment and our bodies. Even though natural dyes are less toxic than synthetic dyes, they still require agricultural land and pesticides for the plants that made up the dyes.

Labs across the world are discovering a new way to create color for our clothing: Bacteria. Streptomyces coelicolor is a microbe that naturally changes color based on the pH of the medium it grows inside. By changing its environment, it is possible to control what type of color it becomes. The process of dyeing with bacteria begins by autoclaving a textile to prevent contamination, then pouring a liquid medium filled with bacterial nutrients over the textile in a container. Then, the soaked textile is exposed to bacteria and is left in a climate-controlled chamber for a couple of days. The bacteria are "live dyeing" the material, meaning that as the bacteria grows, it is dyeing the textile. The textile is rinsed and gently laundered to wash out the smell of the bacterial medium, then let dry. Bacterial dyes use less water than conventional dyes and can be used to dye many different patterns with a vast range of colors. Faber Future, a UK-based lab, is using synthetic biology to program the bacteria to create a large range of colors that can be used to color both synthetic and natural fibers (including cotton).

TEXTILE INDUSTRY GOES GREEN:

Sustainability is essential for the healthy growth of society and the preservation of the planet. The textile industry has seen an increase in demand for sustainable products. Sustainability in the textile industry is more than the use of organic cotton or better working conditions, companies have many reasons to emphasize sustainability, including reduced costs, protection of the environment, and sustained goodwill from their customers for eco-friendly practices. In response to that, a lot of textile companies have undertaken different initiatives.Among various concerns, the two main challenges in the textile industry are complex supply chain networks and the involvement of various stakeholders dealing with a wide range of raw materials and methods.If the textile industry wants to make conscious progress without further harming nature, companies should implement manufacturing practices that reduce carbon footprint, invest in research & development to use sustainable raw materials, and produce environment-friendly finished products.

CONCLUSION:

There is no getting away from the image of textile finishing as a major contributor to emissions. Even in the long term, it is not going to be possible to replace wet chemical methods with physical finishing methods. This is reason enough to start looking for ways to reduce emissions. Passive protection options against emissions include process changes such as continuous dyeing instead of jet treatments, optimization of existing processes, and the use of highly efficient washing and fishing techniques. The active protection options against emissions include the use of filtration technology to recover water, energy, and recyclable materials from leachate from textile pre-treatment processes. Moreover, the sector should also focus on the three E's- Equity, Environment, and Economics. They must be dedicated to protecting and fostering the natural environment by returning more to nature than it draws from nature. The industry is moving towards eco-friendly textiles where waste materials are processed into a fiber, with this method loss of essential resources is minimized.With such initiatives, the textile industry will soon become a sustainable industry that can compete efficiently in the global market while also contributing towards environmental protection.

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BOOM OF ONLINE ADVERTISING

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Abstract

Today the boom of advertising plays a vital role to the young customers for purchasing. This process also talks about the retail, branding and quality of the product; online merchandising holds both profit and loss in marketing it also encourages customers to have a visual technique, which ensures the device of rules in every consumer's point of view. Merchandising process involves the tactics in the business process, which contributes to the sales of goods and services to gain a profit for both producer and consumer. The recognition of online shopping is simple. The concept that you can order a product for next-day transport from the alleviation of your couch is beautiful to many. These are the factors of advertising a product through digital or online mode. The profound details of online advertising are discussed in this paper.

Keywords: online merchandising, marketing- commerce, and import & export.

Introduction:

Online advertising can be defined as the willpower and presentations of merchandise and content material fabric, fabric cloth to make first class use of display actual estate. Marketing is carried out with the intent of conducting out to a wide variety of human beings at minimal cost. When the internet used to be as swiftly as though the formative years were advertising and marketing, human beings used to take into account famous media such as television, radio, handbills, billboards, newspaper , and magazines .

Consequence of Online Advertising: Exposed to the market in many methods the access to market for entrepreneurs has never been easier. Online marketplaces such as eBay and Amazon enable each person to set up a simple online store and sell products inside minutes.

Reduced overheads - promoting online can cast off the need for high-priced retail premises and customer facing staff, permitting you to make investments in higher marketing and patron trips on your e-commerce site.

Budding for speedy growth - promoting on the net capability normal constraints to retail boom - eg: discovering and paying for large are no longer main factors. With a suitable online advertising method and a layout a scale up order fulfillment systems.

Widen your market / export- one essential gain over premises based shops is the capacity to expand the market past neighborhood customers very quickly. In addition, discover a robust demand for the products in different nations which can respond to with the aid of centered marketing, imparting the website in a different language, or perhaps partnering with an foreign places company.

Intellectual - ability to use online advertising equipment to target new clients and internet site analysis tools to obtain customers needs. For recommendations on enhancing customer's onsite experience, examine the measure of online advertising

Drawbacks:

Forum costs - planning, designing, creating, hosting, securing and maintaining an expert e-commerce internet site isn't cheap, particularly if you count on massive and developing sales volumes.

Infrastructure fees - even if you aren't paying the cost of customer-facing premises, consider the prices of bodily space for order fulfillment, warehousing goods, dealing with returns and staffing for these tasks.

Surety and Trickery - the increase of online retail market has attracted the interest of state art crook elements. The reputation of the commercial enterprise could be fatally damaged by investing in the modern-day protection structures to shield website and transaction processes.

Litigation - getting to grips with e-commerce and the law can be a challenge and they will need to be aware of, and design to cope with, the additional client rights which are connected to on-line sales.

Advertising costs - while online advertising can be a very environment friendly way of getting the proper customers to products, it demands a generous budget. This is especially real if they are competing in a crowded sector or for popular keywords.

Customer believes - it can be hard to establish a trusted company name, specifically except a physical enterprise with a music file and face-to-face interplay between customers and income staff. If need to consider the charges or putting up a true client service system as a phase of your on-line offering.

Reveal in online advertising:

Communication can be defined as the process of using word, sound, or visual uses to supply information to one or more people. A communication process is defined as information that is shared with the intent that the receiver understands the message that the business intended to send. The communication process was once thought of as having the message, which is encoded, through chosen communication channel, which is then decoded by the recipient and then received.

Conclusion:

The challenges faced by the online shops are distinctive from standard shops; these challenges are across borders and geographical areas . Different buyers additionally exhibit distinct behaviour when it comes to their social lifestyles and purchasing patterns and personalities affect our intentions to save online and in regular stores.So, this study suggests that, if the online marketers center of attention improving these elements in their website, there is a higher probability to appeal to a customer and a sale to appear thereby growing the earnings of the website.

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GROWTH OF ECO COLORING ON TEXTILES

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ABSTRACT

Progression of textile industries on production stage of textile processing includes bleaching; dyeing etc. plays vital role in emitting toxins in the environment. Non-toxic and eco-friendly natural fibers on textiles have become significant salient because of the increased environmental grasp in order to avoid some from hazardous chemicals. Eco friendly clothing is a made of natural fibers that has inevitably dyed with natural products only, Eco textiles also called eco-tech, Sustainable fashion etc. In the present days eco-tech progressive new techniques and innovations, new method and concepts exploited to vanquish the environmental issues. Eco-tech products have to be environmentally safe during its entire lifecycle and even beyond. This paper presents the growth of eco-friendly dyes and expansion etc.

Keywords: Sustainable, environmental issues, non-toxic, eco-tech, textile industries.

INTRODUCTION

Textile processing industry is one of the radical environmental polluters as the effluent from these industries contains a heavy load of chemicals includes dyes used throughout textile processing. The waste from dyeing process kept up thousands of chemicals dumped on to rivers and canals nearby the industries using synthetic dyes. These hazardous waste contains heavy metals that are harmful to human health and environment, So it is essential to think about an alternate for synthetic dyes. In recent days, Natural dyes that are obtained from different sources such as plants, Insects and minerals are becoming widely recognized throughout the world Natural dyes have better biodegradability and they are non-toxic, non-allergic to skin, non-carcinogenic, Eco-friendly. Using of natural dyes has both advantages and disadvantages. Natural dyes have certain problems related to color yield, Complexity of dying process, Reproducibility, limited shades, blending problems etc. Natural dye is a great way to give your cloth a unique look and make them stand out from the crowd. Textile industries should have

developed and improved technologies and techniques for increasing the usage of natural dyes, As Day by day there is increase in usage and demand of natural dyes.

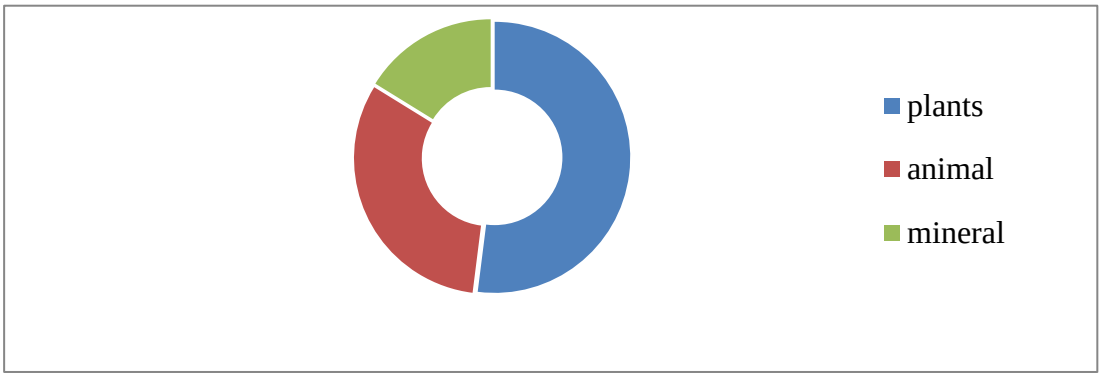
Growth of natural dyes

In growing world, the technologies are getting advanced; as modernization and industrial growth is increasing day by day the use of natural dye is also increasing. Using natural dyes in the coloration process of textile can be a step towards a new era of less polluting processing of textile. All new trends for fashion and textile is green and eco-friendly textile, All fashion brands are now stepping ahead for making the world less polluted and more livable from the very first of the 21st century, The world is going towards safer and less hazardous, Recyclable technology, thus the use of the environment friendly, biodegradable, non-toxic less polluting natural dye is increasing day by day in textile sector.

The natural dyes from plants were traced long time ago. Natural dyes can be extracted from various parts of plants such as steam, roots, leaves, flowers and seeds. In Present scenario, textile processing industries are getting advanced equipment's and technologies for extracting dyes from plants and other natural sources. The use of natural dyes replaces and reduces significant amount of toxic effluent resulting from the dyeing process. Nature has gifted us with more than 500 dye-yielding plants. Now a day's global market demand for natural dyes is increased nearly by 10,000 tons which is approximately 1% of the synthetic dyes that is consumed worldwide.

The global natural dye market is anticipated to generate revenue of approximately $5 billion by 2024, growing at a CAGR of around 11% during 2018-2024. The global level of natural dye's market is segmented on the basis of Product Type, Application, Regions and Countries. Natural dyes are continuing to be a trend during this new age of natural products, and more people are looking for a way to use them. Location of Textile industry should also be in a safe place that it doesn't affect for people and Environment.

NATURAL DYES MARKET: SOURCES



Natural dyes industry is avouching a shift from the mature market of Europe and North America to emerging economies of the Asia Pacific like India and Vietnam has availability of low labor cost and is expected to be the best area for investment for major industry players. According to a report, China will be dominating this market as it is the highest consumer as well as producer of natural dyes. India and China are the countries in the Asia pacific region that produces maximum amounts of natural dyes in the whole world.

Natural dye in textile industry has an important role in functional finishing. This type of textile finishers have increased demand, Which now requires a careful balance between compatibility, treatment and application processes to provide textile with desirable properties. Consumers worldwide are looking for clothing and other textile products, which provides greater comfort, remains fresh, hygienic and odor free with usage. Some fibers, such as silk and wool can be colored simply by being dipped in the dye.

Recently a number of commercial dyes and small textile export houses have started looking at the possibilities of using natural dyes for regular basic dyeing and printing of textile to overcome environmental pollution associated with synthetic dyes. Many retailers are exploring the use of sustainable dyes and coloring techniques in an effort to decrease their ecological impact. For instance, in August 2021, Primark introduced a new 22-piece collection using three natural dyes developed by Archroma from agricultural waste from Earth colors. Natural dyes need is predicted to grow rapidly in the coming future.

ADVANTAGES

- ENVIRONMENTAL-FRIENDLY

Natural dyes are biodegradable and Eco-friendly, they are not harmful for the

environment.

- RENEWABLE

Natural dyes are obtained from renewable sources that can be harnessed without imposing harm to the environment.

- COLORPAY-OFF

If you are going for a soft hue or soothing shade, Natural dyes can help you achive that look. Soft colors or special ones can be done with natural dyes.

- SAFE

Some of the Natural dyes are not harmful for our skin or doesn't cause health problems as there is no use of toxic or chemical elements, as they also have antimicrobial properties they can be easily used for kids garment.

DISADVANTAGES

- COST

Textiles dyed with natural dyesare more expensive, a large amount of natural dyes may be needed in order to dye a specific amount of fabric to satisfaction.

- COLORPAY-OFF

As Natural dyes fabrics can be faded quickly,they are treated with natural mordants like salt, pomegranate historically,these do not attain complete fastness then used alum,though considered safe, but are still toxic.

- AVAILABILITY

Another issue of natural dyes is their availability, It can be strenuous to produce because of raw materials. Natural colored fabrics are available in limited colors only and these natural colored fabrics are not available all over.

- HARMFUL EFFECTS

Natural dyes can also be harmful to some extent. Some natural dyed fabrics can cause skin irritation and inflammation. Natural dyes may need mordants for application,these substances help the dye stick to fabrics, Which also be toxic.

Natural dyeing requires skilled workmanship and extraction process requires large amount of plants and its take more time to extract the colors from raw materials. Natural dyes are obtained from plants and are dependent on growing seasons where as synthetic dyes are created in a laboratory.

CONCLUSION

Current study states the Growth of Natural dyes and describes the global level Growth and Evaluation of natural dyes in global level market. It also states the need for more attention and work to be done on it for it has a long way ahead for our pollution control and safe environment. Natural dyes has its own pros and cons. In upcoming years of textile processing industry, natural dying will become even more advanced and utilitarian .This research paper may pave the way to know the complete information about the growth and convenience of natural dyes.

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BIO – POLISHING IN TEXTILE INDUSTRY WITH ENZYMOLOGY

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ABSTRACT

The exploits of enzymes in textile industry is one of the accelerating technology transformation in Enzymologist. There are three types of enzymes are used in textile industry (amylase,catalase,laccase) mainly for removing starch from fabric, degrading excess hydrogen peroxide and bleaching textiles. So we are going to look into the bio – polishing enzyme technology that used in textile industry for the clean finishing in garments. The main purpose of this technology is to abolish protruding micro hairs of cotton (any other fibre) by an interaction of cellulose. The enzymology of bio – polishing establish the steps that involved during the entire process and it's advantage and disadvantage.

Keywords: exploits of enzymes, bio – polishing of enzymology, interaction of cellulose.

INTRODUCTION

Biopolishing is a finishing process that improves fabric quality by mainly reducing fuzziness and pilling property of cellulosic fiber. The objective of the process is the elimination of micro fibrils of cotton through the action of cellulase enzyme. Biopolishing treatment brings the fabric a cleaner surface, a cooler feel, lustre, and softer feel.Its an environmental friendly actionthat uses enzymes to extend the lifetime of cotton knit and son, additional fabrics.

BIO POLISHING MECHANISM (image from bdfabric.com)

BIO POLISHING IN WET PROCESSING (ENZYMOLOGY)

The bio-polishing process quaries the removal of the small fiber ends protruding from the yarn surface and thereby reduces the hairiness or fuzz of the fabrics. The hydrolysisa exploit of the enzyme weakens the protruding fibers to the extent that a small physical abrasion force is sufficient to break and remove them. Bio polishing can be consumed at any time during **wet processing** but is most convenient performed after bleaching.

It can be concluded in both continuous or batch processes. However, continuous processes require some incubation time for enzymatic degradation to take place. Removing the fuzz makes the color brighter, the fabric texture more obvious, and reduces pilling. Unfortunately, the treatment also reduces the fabric strength. Smoother yarns also increase the fabric softness, appearance and feel. Since it is an additional process, the bio-polished garments may cost slightly more.

OBJECTIVES OF BIO - POLISHING IN TEXTILE

- To removes protruding fibers & slubs
- To removes Hairiness, fluffs and pills.
- To Prevented material sticking.
- To softens fabric hand & improved handle.
- To achievement of surface smoothness and a clear structural appearance & improved luster .
- To improved material texture relaxation & increased flexibility.
- To improved sew-ability & fast to washing, low pilling tendency, no napping in use, or during care operation.
- To Converted fabrics from Poor quality, uneven, napped, knoppy material surface to lustrous, soft, elegant, top quality with a fine, high quality surface appearance.

PROCESS OF BIO – POLISHING IN TEXTILE

There are two process of Bio-polishing. They're:

- Bio – polishing before dyeing
- Bio – polishing after dyeing

A) BIO – POLISHING BEFORE DYEING PROCESS:

Scoured & bleaching sample
↓
Bio-polishing
↓
Cold wash
↓
Drying
↓
Dye addition
↓
Salt addition
↓
Soda ash addition
↓
Hot wash
↓
Hot wash
↓
Soaping (at boil temperature)
↓
Hot Wash
↓
Cold wash
↓
Drying

B) BIO – POLISHING AFTER DYEING PROCESS:

Scoured & bleaching sample
↓
Dye addition
↓
Salt addition
↓
Soda ash addition

↓
Dyeing
↓
Hot wash
↓
Hot wash
↓
Soaping (at boil temperature)
↓
Hot Wash
↓
Cold wash
↓
Enzyme treatment
↓
Cold wash
↓
Drying

APPLICATIONS OF BIO – POLISHING IN TEXTILE

Enzyme accelerates the reaction by lowering the activation energy and remains intact at the end of the reaction by acting as a catalyst. Secondly, enzymes operate under a milder condition. Enzymes can be used in catalytic concentrations at low temperatures and at pH-values near to neutral. Thirdly, enzymes are the best alternative to toxic, hazardous, and polluting chemicals. Fourthly, enzymes act only on specific substrates, for example, enzymes used in desizing do not affect cellulose hence there is no loss of strength of cotton. Fifthly, enzymes are easy to control because their activity depends upon optimum condition. Sixthly, enzymes are biodegradable. At the end of the reaction in which enzymes used we can simply drain the remaining solution because enzymes are biodegradable and do not produce toxic waste on degradation hence there is no pollution.

ADVANTAGE AND DISADVANTAGE OF BIO – POLISHING

- Depth of shade increases when enzyme treatment is given before dyeing but the depth decreases when enzyme treatment is given after dyeing.
- Wash fastness of the enzyme treated sample after dyeing is good but wash fastness of the enzyme treated sample before dyeing is very poor.

- One bath application saves energy, time & cost but the bio-polishing effect is not as good as the two bath method.
- Decreases the Pilling tendency.
- Loss in weight.
- Loss in strength.

OTHER BENEFITS OF ENZYMES IN TEXTILE INDUSTRY

❖ ENZYMATIC DESIZING:

Amylases are used to remove starch-based size for improved and uniform wet processing in the textile industry. An amylase enzyme can be used for desizing processes at low-temperature (30-60ºC) and optimum pH is 5.5-6.5. The advantage of these enzymes is that they are specific for starch, removing it without damaging to the support fabric.

❖ ENZYMATIC SCOURING:

Scouring is the removal of non-cellulosic material present on the surface of the cotton. In generally cellulase and pectinase are combined and used for Bioscouring. In this pectinase destroy the cotton cuticle structure by digesting the pectin and removing the connection between the cuticle and the body of cotton fiber whereas cellulase can destroy cuticle structure by digesting the primary wall cellulose immediately under the cuticle of cotton.

❖ ENZYMATIC BLEACHING:

The purpose of cotton bleaching is to decolorize natural pigments and to confer a pure white appearance to the fibers. Mainly flavonoids are responsible for the color of cotton. The most common industrial bleaching agent is hydrogen peroxide. Conventional preparation of cotton requires high amounts of alkaline chemicals and consequently, huge quantities of rinse water are generated. However, radical reactions of bleaching agents with the fiber can lead to a decrease in the degree of polymerization and, thus, to severe damage. Therefore, replacement of hydrogen peroxide by an enzymatic bleaching system would not only lead to better product quality due to less fiber damage but also to substantial savings on washing water needed for the removal of hydrogen peroxide. An alternative to this process is to use a combination of suitable enzyme systems. Amyloglucosidases, pectinases, and glucose oxidases are selected that are compatible concerning their active pH and temperature range.

CONCLUSION

Textile finishing involves processes for improvement in the appearance of textiles. The cradle of fabric life spans from fiber to finished fabric. The finishing step is the last step in the processing of textiles. According to my notion even though the enzymology is advanced during

this erra we must focus on how to develop these technologies for upcoming generation. So they can build Big innovation in enzymology in nearby future.

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NANO SCIENCE IN TEXTILES

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ABSTRACT

The textile industry is one of the most important industries for consumer goods worldwide generating textiles for clothing, household goods, furnishing and technical purposes. Over the last few years, there is a tremendous growth of customer's awareness for upgrading their traditional clothes and apparels necessary to be smarter than ever for improving their life.
Like other chemical processes and technologies, Nano materials are used to add or improve different functionalities of the textiles. This technology is used in various sections of the textile industry: at the fibre stage, surface finish to fibre, Fabric stage (surface finish) or garment stage. It is used to develop desired textile characteristics, such as high tensile strength, unique surface structure, soft hand, durability, water repellency, fire retardancy, antimicrobial properties, and the like.

KEY WORDS: Nano technology, Nano materials, UV protection, Abrasion resistant, Water-Repellent.

INTRODUCTION

The textile industry is one of the most important industries for consumer goods worldwide generating textiles for clothing, household goods, furnishing and technical purposes. Over the last few years, there is a tremendous growth of customer's awareness for upgrading their traditional clothes and apparels necessary to be smarter than ever for improving their life.
Increasing customer demand for durable and functional apparel manufactured in a sustainable manner has created an opportunity for Nano materials to be integrated into textile substrates.
Nanotechnology is a growing interdisciplinary technology often seen as a new industrial revolution. Nano materials are important to our lives today because they have applications in many industries including textiles, medical devices, electronics and energy technologies. This technology working with materials at the atomic or molecular scale, also known as Nano metrics.

Nanotechnology (NT) deals with materials 1 to 100 nm in length. The fundamentals of nanotechnology lie in the fact that the properties of materials drastically change when their

dimensions are reduced to nanometer scale. Nowadays also the textile industry has discovered the possibilities of nanotechnology. So, we can define nanotechnology in textile as the understanding, manipulation, and control of matter at the above-stated length, such that the physical, chemical, and biological properties of the materials (individual atoms, molecules, and bulk matter) can be engineered, synthesized, and altered to develop the next generation of improved materials, devices, structures, and systems. It is used to develop desired textile characteristics, such as high tensile strength, unique surface structure, soft hand, durability, water repellency, fire retardancy, antimicrobial properties, and the like.

NANO TECHNOLOGY IN TEXTILE FIELD

Nano technology

New fibre and yarn

1. Development of single and multi wale. Nano fibers.
2. Production of nano fibers by Electro spinning.
3. Enhancement of mechanical, chemical and functional properties of fibres and yarns.

Improved fabric finishing

1. Wet ability
2. Water and oil repellency
3. Dye ability.
4. Enhancement of functional finish using chemical finishes and coatings.

IMPORTANCE OF NANO TECHNOLOGY IN TEXTILES

Nano science offers a number of advantages over traditional technologies.

- New fabrics are created by using nano science technology, when compared to traditional methods these materials are more strong and flexible.

- Nano science make existing products better by improving their performance, for example by making them more durable or reducing their cost.

- Nano science are used to develop advanced properties in textile products that are, antimicrobial resistance, fire retardancy, water repellency, and various advanced applications in the industry of medicine.

- Nano science can also be used to do some repellent finishes which allows the repulsion of blood and prevention of the blood from getting penetrated or accumulated through the medical professionals' protective clothing.

- They could allow us to make new kinds of products and processes that can't be met by a conventional textile material.

Textiles Application of Nano technology

1. Healthcare.
2. Building and construction.
3. Home and household.
4. Clothing.
5. Industry and machinery.
6. Defence.
7. Mobility and transport.
8. Electronics.
9. Agriculture and forestry
10. Packaging.
11. Environmental protection.
12. Sport and leisure.
13. Geotextiles and civil engineering materials.

EFFECTS OF NANO MATERIALS IN TEXTILES

UV Protective finish

UV protective finish is used to protect the wearer from harmful rays of the sun. the wave length of the ultra violet rays are 150 to 400 nm. The UV-blocking property of a fabric is enhanced when a dye, pigment, delustrant, or ultraviolet absorber finish is present that absorbs ultraviolet radiation and blocks its transmission through a fabric to the skin.

Abrasion resistant

Silicon dioxide Nano particles are added to coating materials for textiles for making the fibres abrasion resistant. Nano silicon dioxide also facilitates the incorporation of active substances into the fibers and allows their subsequent controlled release. Coating with functionalized silicon dioxide Nano particles (added hydrophobic properties) makes cotton surfaces water-repellent.

Anti wrinkle cotton fabric:

Anti wrinkle finish in cotton fabric can be done with nano-engineered cross-linking agents during the fabric finishing process. This is also capable of eliminating toxic gases, while preserving the preferred comfort properties of cotton.

Odor-free fabric:

In textiles, silver can be applied in form of silver salts (e.g. silver chloride), Nano particles or Nano coating on the surface of the fibres. It reduces bacterial growth on the textile (clothing, household, and furnishing) by releasing silver ions, which are active on the fibre surface. Nasty odor caused due to the microbial activity is prevent by the application of silver Nano particles on fabrics. Stockings, socks, and undergarments fabrics are coated with silver Nano particles to develop odor-free clothing.

Water-Repellent fabric:

In nano science Water repellent finish of the fabric is improved by creating nano - whiskers, which are hydrocarbons and 1/1000 of the size of a typical cotton fiber, that are added to the fabric without lowering the strength of cotton. The gap between the whiskers are smaller than the typical drop of water but larger than the water molecules so water droplets are not penetrate into the fabric and remains on the surface of the fabric. The performance is permanent while maintaining breath ability.

EFFECT OF NANO MATERIAL IN APPAREL INDUSTRY:

Swimming Suit:

The most widely recognized application is in the shark-skin suit worn during world-record breaking Olympic swimming championship. The suit, which includes a plasma layer enhanced by nanotechnology to repel water molecules, is made for helping the swimmer glide through the water and becoming a major characteristic of the important swimming events as an attempt was made by all of the competitors to improve their winning chances.

Sporting Goods:

Nanotechnology has improved a lot of sporting goods, some of them are skin creams, golf balls, tennis racquets, and running shoes. As well as developing textiles to withstand extreme environments, scientists have looked to naturally existing viral Nano particles that live in some of the harshest environments on earth, for new building blocks for nanotechnology. A garment interacting with the wearer and sensing its surrounding is of significant interest. Such textile-based Nano sensors could provide a personalized healthcare system, monitoring your vital signs as you run up a hill or responding to changes in the weather.

Flexible Electronic Circuits:

Nano ribbons form the basis for the chips which are so flexible they can wrap around the edge of a microscope cover slip and so stretchable they can be twisted into a corkscrew. Development of applications in the healthcare industry is the focus of the researchers right now as they think that one day we would be able to monitor activity in patients at epilepsy risk by using these flexible, tiny electronic sheets, or they can monitor the vital signs of the patients during surgery by being integrated into the surgical gloves.

Lifestyle Applications:

Perhaps surprisingly the earliest commercialized applications of nanotechnology are seen in lifestyle applications. Textile and cosmetics are among the first products to use Nano materials. Bulletproof vests are one famous example of nanotechnology materials and technologies in lifestyle applications. Nano tube fibers are used to make a material seventeen times tougher than the Kevlar. Future developments are to use nanotechnology to create Smart and Interactive Textiles (SMIT) that can sense electrical, thermal, chemical, magnetic, or other stimuli.

CONCLUSION

Nanotechnology has been emerged as the essential technology, which has revitalized the material science and has the prospects for development and advancement of new range of intelligent materials including polymers and textiles. To wrap up about application of nanotechnology in textiles, definitely has the potential to being revolution in the field of technical textiles. There is however a word of carefulness because industrial commercialization of the nanotechnology based products can become a commercial reality.

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DEVELOPMENT OF JUTE AND BANANA NEEDLE PUNCHED NONWOVEN FABRIC FOR ACOUSTIC APPLICATIONS

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Abstract:

Sustainability is an act of meeting our own needs without compromising the ability of future generations to meet their own needs.The endless concern about environmental issues has directed the growth of research about eco-friendly materials. Acoustic insulation is an essential requirement for everyday human life. Natural fiber-based nonwoven fabric structures show very good acoustic insulation properties. This work is aimed to develop novel sustainable needle-punched nonwoven fabrics with jute and banana fibers. Jute and banana-based nonwoven fabricshave some added advantages invarious technical applicationslike composites, agro-textiles, industrial textiles, etc. Nonwoven fabric combinations like 100 % jute, 100% banana, 70:30 jute banana 30:70 banana juteand 50:50 jutebanana were blended and needle-punched nonwoven fabrics were produced with two different stitch densitieslike 250 and350and compared.

Keywords: Sustainable products, jute, banana, blended nonwoven fabric, acoustic, sound.

Introduction

Jute is an important natural fiber occupying second place in economic importance only after cotton. It is one of the most important fibers used for industrial applications. More importantly, it is a commodity on which millions of households in some of the countries depend for their cash earnings. India, Bangladesh, China, Nepal, and Thailand are the major producers of jute accounting for over 95% of the global output (Kozlowski et al. 1999).

Besides other natural fibers, jute is considered by the scientists in the nonwoven industry due to its physical and mechanical characteristics. It could be a replacement for the synthetic fibers that dominate nonwoven industry. Their biodegradation properties make them more and more appealing in the context of new regulations for environment protection. Different nonwoven manufacturing techniques like stitch bonding, hot calendaring, needle punching, hot-air thermal bonding, oven bondinghydro entanglement, etc. are successfully used and assessed for manufacturing jute-nonwovens (Ellison et al., 2000). It is needed to mention here that the natural fibers like jute and others might enjoy more favourable market conditions in the future on account of increasing concern with environmental issues all over the world. It was found in study that jute is more environmentally sound and less costly to society than its competing synthetic material. Even in the life cycle, the disposal stage of synthetic material is most harmful to the environment causing highest direct economic and social costs (Maity et al., 2014).

India is the world's largest producer of banana. The fiber has limited application in textiles due to its high stiffness and less cohesive properties. Banana fibre comes in the category of bast fibres and produced from the waste part of banana plant.(Parthiban et al., 2020) .It is a tropical crop and developed well in temperature range of 15–35 °C with relative humidity of 75–85%. It is one of the earlier and most important crops cultivated in tropical countries and has been valued for its application in the food industry. The banana fiber provides a better ultraviolet protection factor (UPF) and weatherproof. Since it has natural pigment, pectin, and lignin which act as UV absorbers. It also has a higher moisture content which enhances its ability to preserve the food materials naturally. If the banana fiber is softened, there is a huge scope and possibility for the development of banana nonwoven fabric by needle punching technology and utilizing the abundantly available natural waste resource to preserve vegetables and fruits with long time exposure to sun radiation (Birdie Scott et al. 2014).

MATERIALS AND METHODS

Jute and banana fibres were procured from green fiber, Coimbatore, India.The collected fibers were cut 5-13 cm in length by customized and adjusted textile fiber cutting machine, The fibers were opened, straightened and fed into Dilo nonwoven needle punching machine. During the operation, the pre-needled web was prepared and the layers of the web were entangled by needle punching using barbed needles in the needle loom. The nomenclature of the produced nonwoven samples are given in Table 1.

Table 1: Nomenclature of the samples

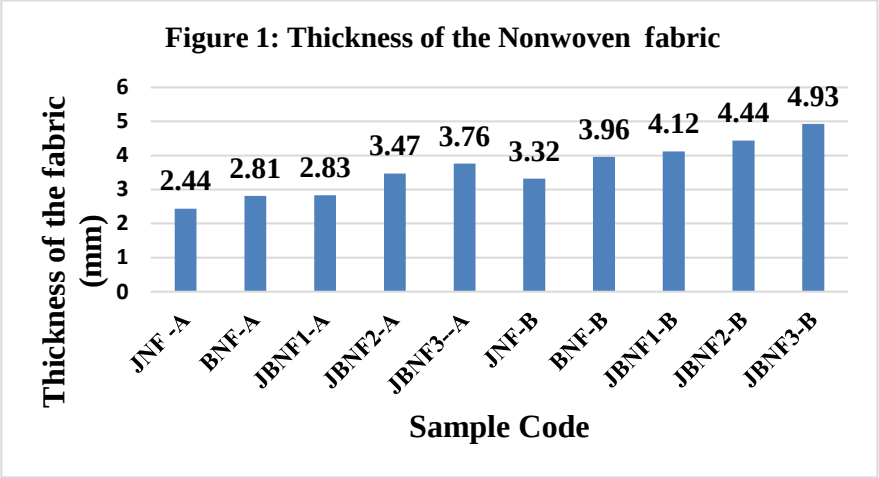
S.No	Sample particulars	Sample code (Stitch density 250	Sample code (Stitch density 350
1	100% Jute needle punched nonwoven	JNF -A	JNF-B
2	100% Banana needle punched nonwoven fabric	BNF-A	BNF-B
3	30 :70 Jute Banana needle punched nonwoven fabric	JBNF1-A	JBNF1-B
4	50 :50 Jute Banana needle punched nonwoven fabric	JBNF2-A	JBNF2-B
5	70 :30 Jute Banana needle punched nonwoven fabric	JBNF3--A	JBNF3-B

The needle punched nonwoven samples developed with stitch densities of 250 and 350 were evaluated with fabric thickness, air permeability, thermal conductivity and sound absorption tests.

RESULT AND DISCUSSION

Fabric Thickness

The fabric thickness was measured using thickness gauge as per the procedures of ASTM D1772-96 .



It is clear that from the above figure JBNF3-B have the highest fabric thickness when compared to the other samples. The fabric thickness of the sample increases linearly with the increase of stitch density due to fiber blending at a short interval of space.

Air Permeability

Air permeability is measured by using the standard test methods such as ASTM D737.

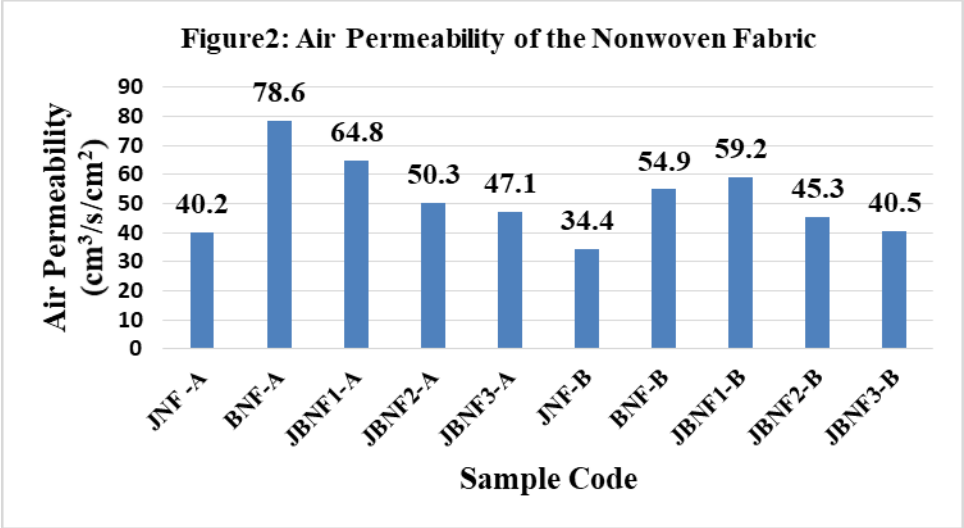


Figure2shows the influence of fiber fineness on the air permeability of needle-punched nonwoven fabric because jute fibers naturally have good fineness properties when compared to banana fiber. It is clear that the when the fiber fineness and stitch density is increased , the air permeability of the nonwoven fabric decreases. In this study, the BNF-A nonwoven fabric showed higher air permeability compared to other samples

Thermal Conductivity

ASTM C518 Lee's method is used to measure the thermal conductivity of nonwoven fabrics.

Figure 3 :Thermal Conductivity of the Nonwoven Fabric

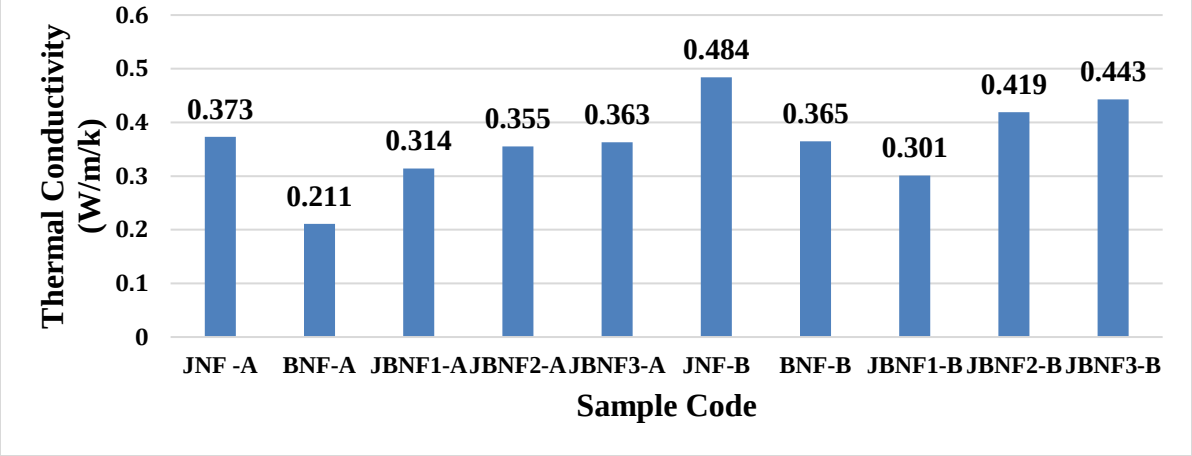
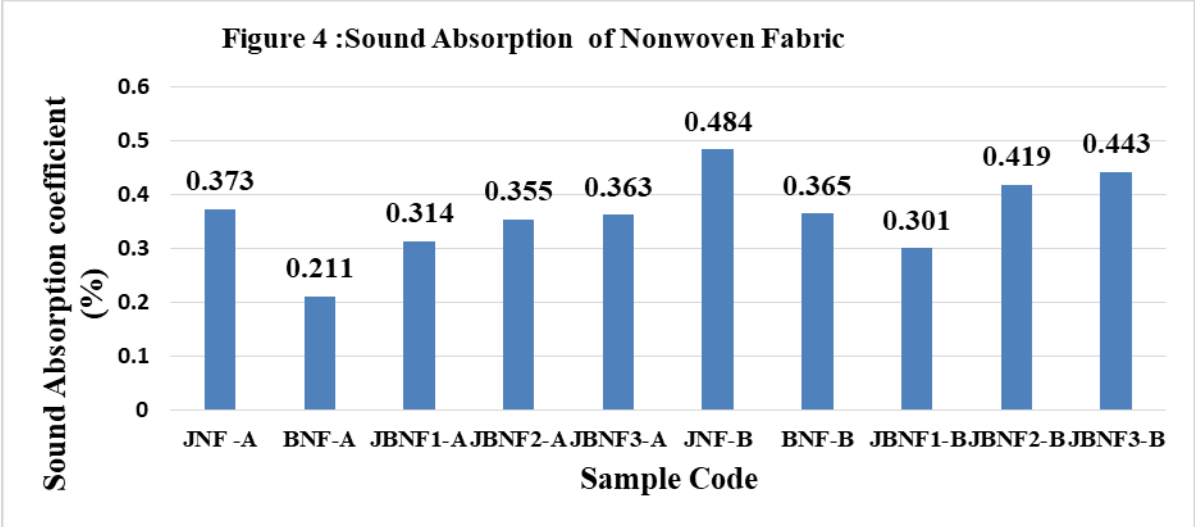


Figure3 depicts the thermal conductivity of nonwoven fabrics influenced by various blend proportions, stitch density and fabric thickness. The thermal conductivity values of nonwoven fabric increases in 350 stitch density because of short interval open space compared to other sample.Among the blend ratios JNF-Bshowed higher thermal conductivity values compared to other samples.

Sound Absorption Test:

The sound absorption of the nonwoven fabrics were tested by the impedance tube method - ISO 10534 - 2 – 1998

Figure 4 :Sound Absorption of Nonwoven Fabric



From the figure 4 it is clearly evident that increasing the stitch densities of fabric had a significant effect on improving the sound absorption capacity. JNF-B sample exhibited the highest sound absorption coefficient of 0.484.

Conclusion

The research and development is going on in natural fibre fabrics for different industrial sectors.Proper designing and development of material is needed for particular application.The influence of blend ratio and stitch density of jute and banana needle punched nonwovens was investigated with various tests. The present results showed that all the developed nonwoven samples have better thermal insulation values and it concluded that the developed samples may be used in room interiors as sound proof material.Moreover, nonwoven from jute- banana based materials has added advantage of environment friendly disposal.

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CONVERSION OF SILK NOILS INTO NON-WOVENS

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ABSTRACT:
Textile sector is one of the oldest and the most important sectors in Indian economy. Silk the queen of fabrics is historically one of the oldest and India`s most important sector. There is a wide scope for the production of raw silk but raw silk waste are weaker and considered less valuable. Raw silk waste also known as silk noil and it is obtained during production of raw silk. These silk noils with their natures of absorbency, liquid repellence, and stretch are used in various fields of technical textiles. To make use of these noils the study has been made on fabrication of the noils. The fabrication of this silk noil non-woven can be prepared by various techniques and methods. An attempt has been made in this study of fabricating the silk- noils into needle punched and thermal bonded structures to be used in the potential area in the field of technical textiles.

KEYWORDS:
Silk noils, non-woven, needle punching and thermal bonding.

INTRODUCTION

Textile industry has been one of the oldest and most important sectors in Indian economy. It is the second largest employment provider in the country next to Agriculture. Textile industries are facing challenge in field of quality and productivity due to globalization of world market. Textiles are developing into inter disciplinary high tech products. It has an integral part of everyone's life. A textile comes under three basic needs food shelter and clothing. It is to protect from social, environmental and to protect the human body from adverse climate conditions. (Rakshit, 2004)

Silk- the queen of fabrics is historically one of India's most important raw materials in industries. Asia is the largest producer of silk and produces 95% all over the world. Among Indian industries, silk industry is the second largest producer of silk contributing 18% to the world production. The strongest natural fiber with excellent properties is used extensively for

apparels; home furnishing etc, because of its lustrous property and it costs high. In olden days silk dressing was preferred during festivals. (WWW.Silkfabric.info, 2004)

Nonwovens (felt) are the oldest method of farming a fabric. Non-woven fabrics are made directly using both staple and filament fibers and are bonded together. The fibers are entangled mechanically, thermally or chemically. They are flat or tufted porous sheet that are made directly from separate fibers, molten plastic film.(Batra, 2012)

There is a wide scope for the production of raw silk among which non woven fibers are important. These non woven silk fibers with their natures of absorbency, liquid repellence, softness, stretch etc., are used in various fields of medicine and geo textile filters. The non woven fabrics can be prepared under various methods like Thermal bonding, Chemical bonding and mechanical. These methods are used to produce non-woven fabric according to needs and uses. (Agarwal, 2016)

SILK

Silk a queen of fabric in textile industry. Silk, it is proteins in nature produced by mulberry silk warm and are used for textile manufacturing process. Silk fiber is protein in nature produced by caterpillars (silk warms) to enhance in form of cocoons. Cocoons are then reeled to form yarn and yarns woven to form smooth and lustrous silk fabric. There are five major types of silk obtained from different species of silk warm. This depends upon feed on a number of food plans. Except mulberry, other varieties are non-mulberry silks. (OJHA, 2002)

SILK NOILS

Silk noil is also called “raw silk waste”, although it is a misnomer. Noils are a short fiber left during combing of wool or silk fiber. Rather than the continuous length of silk, short fibers, which are not generally, use to create high quality fabric. Silk Noil is weaker and considered less valuable. It is a nubby fabric in a natural off-white color. It is used as a decorative additive for many spinning projects, like roving. These short silk fibers are obtained from various industries and are spun into yarn just like cotton, linen, or wool yarns. (Rayners, 1989)

Field of silk and silk noils usage

- Sutures, bandages and scaffolds and in other wound dressing processes.
- Used as nerve regeneration tissues, artificial blood vessels and other therapeutic issues.

- Used for antimicrobial finishing effects.
- Silk noil is used as a decorative yarn during weaving process.
- Silk noils are used for making decorative items, and household linens.
- Silk is a natural protein fiber and is used in the manufacture of Prosthetic arteries.
- Construction of bicycle tires and parachutes.
- Silk fibers are used as background building material for pen, ink drawings and paintings
- Used for manufacturing sports attires and draperies. (Ramasamy, 2014)

NON WOVEN

Non-woven is the sheet of fabric produced by intermeshing of fibers together. Non-woven fabrics are made using of both short and staple fibers, are bonded together by chemical, mechanical, heat or solvent. These fabrics play a major role in technical textile field. These are lower cost profit materials. (Hutten, 2015)

The various methods of Bonding are:

1. Adding adhesive and bonding.
2. Fusing the fibers thermally to bond each other or the other meltable fibers or powder.
3. Fusing the fibers by first dissolving and then re-solidifying its surface.
4. Creating tuft or tangles physically.
5. Fibers or filaments stitched in its place.

APPLICATION AND USES OF NON-WOVEN FABRICS

1. Medical and health non-woven fabrics: surgical clothing, protective clothing, disinfection cloth, medicine bags, masks, diapers, civilian clothes, wipes, wet towel, magic towel, sanitary pads, and disposable hygiene with a cloth;

2. Non-woven home decoration: carpets, tablecloths, sheets, bedspreads, curtains, scouring pads, mops and the like;

3. Non-woven clothes: lining, interlining, flakes, stereotypes cotton and all kinds of synthetic leather.

4. Non-woven fabrics for industrial use; car roof sheeting, filter materials, insulation materials, packing bag, geo textiles and coated fabrics.

5. Non-woven fabrics agriculture: crop protection cloth, cloth seedlings, irrigation cloth, insulation curtain, etc.

6. Military nonwovens: high-performance fiber body armor, Caqiang cloth, and other military ground Tuji Bu

7. Other non-woven fabrics: cotton space, noise insulation materials, absorption felt, cigarette filters, tea bags, flags, etc. (Winchester, 2011)

RECYCLING

Recycling is the process of converting waste into reusable material or new material. This can prevent the waste of potentially useful materials and reduce the consumption of raw materials. Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, Recycle and Recover" (4R's) waste hierarchy. (Yoshinori, 2013)

Recycling of the Textiles has the following uses:

- Decrease in landfill space requirements as decomposition takes place and natural fibres release greenhouse gasses
- Avoided use of virgin fibres
- Reduced consumption of energy and water
- Pollution avoidance
- Lessened demand for dyes, (Lorenzo, 2006)

METHODOLOGY

PROCURING OF SILK NOILS

The silk noil which was emitted during the combing process is purchased from the silk industry (sarvodhayasangham). The purchased silk noils are not used as fibers for making saris in those industries. These mulberry silk noils which are similar to fine silk fibers are cut into pieces of (4-5 inches) to avoid raveling out of the noils in nonwoven fabrics during the process of needle punching.

PREPARATION OF SILK NOILS

The cut silk noils are mixed manually in through manner and are blended with cotton and Poly Ethylene Terephthalate (PET) fibers in ratios (80:20; 70:30) for forming web during carding

process. Cotton fibers are blended with silk fibers while needle punching in two ratios (80:20; 70:30) and Poly Ethylene Terephthalate (PET) fibers are blended with silk fibers in two ratios (80:20; 70:30) in thermal bonding. These are kept ready for further processing.

FABRICATION

The blended waste noils were converted into needle punched ad thermal bonded structures.

CARDING AND WEB FORMATION

Carding is the process of converting fibers into web formation. The fibers were carded before needle punching and thermal bonding processes. The speed of the feed roller was adjusted to 1rpm; the licker-in speed was 130 rpm; the doffer speed was kept as 4rpm; the cylinder speed was 550rpm. Thus the scent percent cotton fibers were passed into the carding machine to obtain the web for needle punching. The mixture of PET and cotton fibers of (80:20; 70:30) each was passed into the carding machine to form the web for thermal bonding.

NEEDLE PUNCHING

Needle punching is used to bond dry laid and spun laid webs. These are produced when barded needles are pushed through a fibrous cross laid web forcing some fibers through the web where they remain when the needles are withdrawn. The needle punched machine used was Trytex miniature nonwoven system needle punching machine. It comprises of 60mm downwards stroke. The working width was 500mm. number of needles per board was up to 1310. This machine is used to felts, filters, Geo Tex, blankets and synthetic leather. The knitted waste was converted into needle punched fabric using this machine.

THERMAL BONDING

For thermal bonding machine used was Tri Tex, Korean mope, the temperature was adjusted to 200 to 270^{o}C for fabrication. The speed of the machine was 2rpm.

The low melt polyethylene terephthalate fibers were used for the study. The samples take in a ratio of (80:20; 70:30) for fabric comparison. About 40 grams of PET fibers and 120 grams of silk noils were used for making two samples in ratio of (80:20; 70:30). These two fibers were mixed thoroughly andkept over the Teflon sheet and passed through the heat roller. Thus the fabric of 60cm length and width of 30cm was obtained.

EVALUATION

The prepared needle punched and thermal bonded fabrics were evaluated for salient properties such as Thermal conductivity, stiffness, thickness, weight, abrasion, wicking, sinking, and spray test. Also the test namely Thermal conductivity had also been done.

NOMENCLATURE

The nomenclature used for the samples are presented in the following Table I

Table I

Nomenclature

S.No	Nomenclature of sample	Details of Sample
1	SC_1	SILK+COTTON(80:20)
2	SC_2	SILK+COTTON(70:30)
3	SP_1	SILK+PET(80:20)
4	SP_2	SILK+PET(70:30)

***PET- Polyethylene Teropthelete**

RESULTS AND DISCUSSION

The discussions for the results obtained are presented under the following heads.

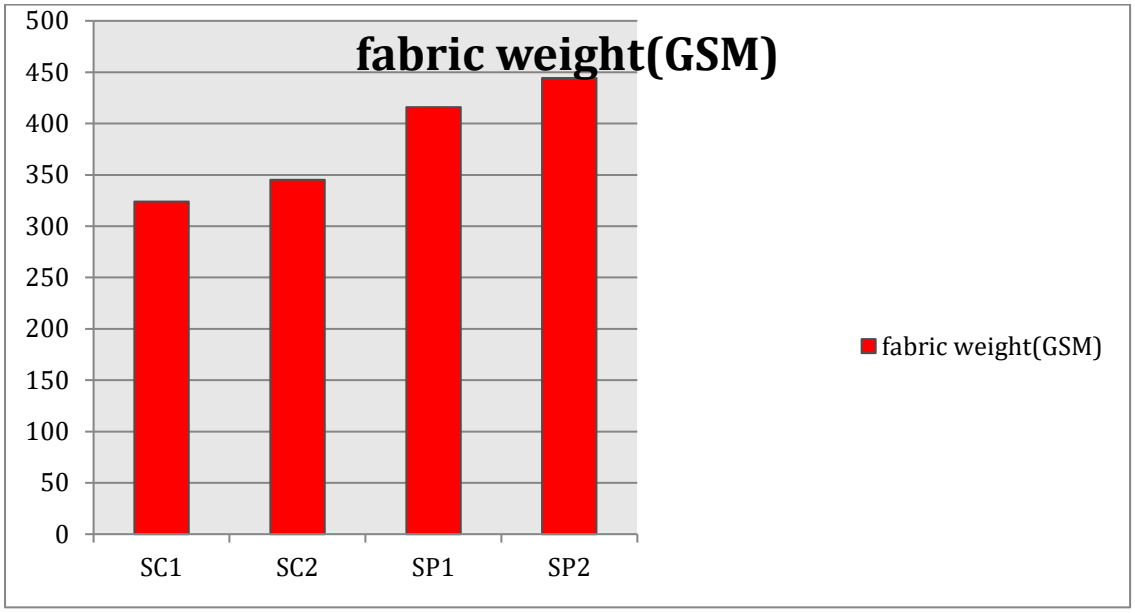
FABRIC WEIGHT (GSM)

The results of Fabric weight is presented in table II

Table II

Fabric Weight

S.NO	SAMPLE	FABRIC WEIGHT (GSM)
1	SC_1	324.0
2	SC_2	345.2
3	SP_1	416.0
4	SP_2	444.4



The weight of the needle punched fabric was noted to be higher in sample SC_1 of 345.2 GSM. The weight of the sample SC_1 was 324.0 GSM.

The weight of Thermal bonded structure was higher in sample SP_2 of 444.4 GSM than sample SP_1 of 416.0 GSM.

In the comparison made between the needle punched and thermal bonded structures the sample SP_1 and SP_2 proved to be higher weight than the sample SC_1 and SC_2.

Hence it could be concluded that the weight of the needle punched samples with more proportion of silk was lesser than the sample with lesser amount of silk. In the thermal bonded structure, also the same trend was observed. In the comparison made between the two types of fabrication, the thermal bonded structures showed more weight than the needle punched structures of respective proportions.

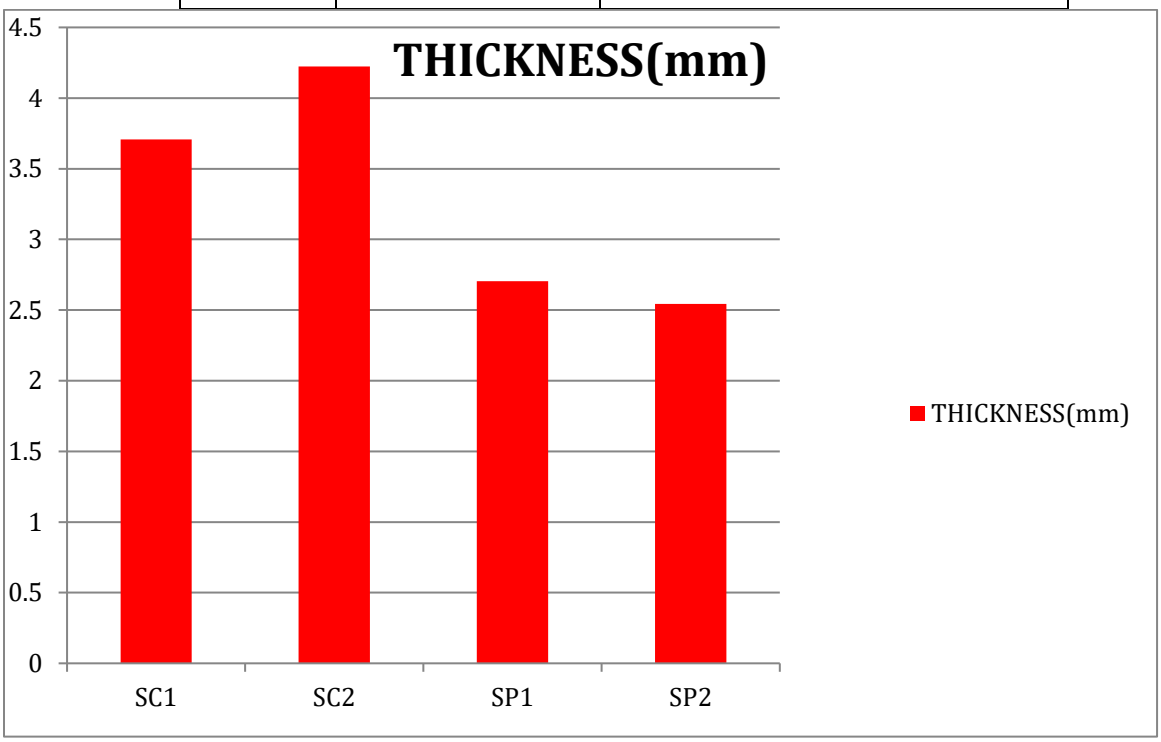
FABRIC THICKNESS (mm)

The result of fabric thickness is presented in Table III.

Table III

Fabric Thickness

S.NO	SAMPLE	THICKNESS(mm)
1	SC_1	3.708
2	SC_2	4.224
3	SP_1	2.704
4	SP_2	2.544



From the Table III it is clear that the sample SC_2 shows thickness of 4.22 mm. which is higher than the sample SC_1 OF 3.70 mm.

In the case of Thermal bonded structure the sample SP_1 exhibited a thickness of 2.70 mm. which is higher than the sample SP_2 of 2.54 mm.

In the comparison made between the needle punched and thermal bonded structures the sample SP_1 and SP_2 proved to be lesser thickness than the sample SC_1 and SC_2.

Hence it could be concluded that the fabric thickness of the needle punched samples with more proportion of silk was lesser than the sample with lesser amount of silk. But in the thermal bonded structure, it was not so. In the comparison made between the two types of fabrication, the thermal bonded structure showed lesser thickness than needle punched structure of respective proportions.

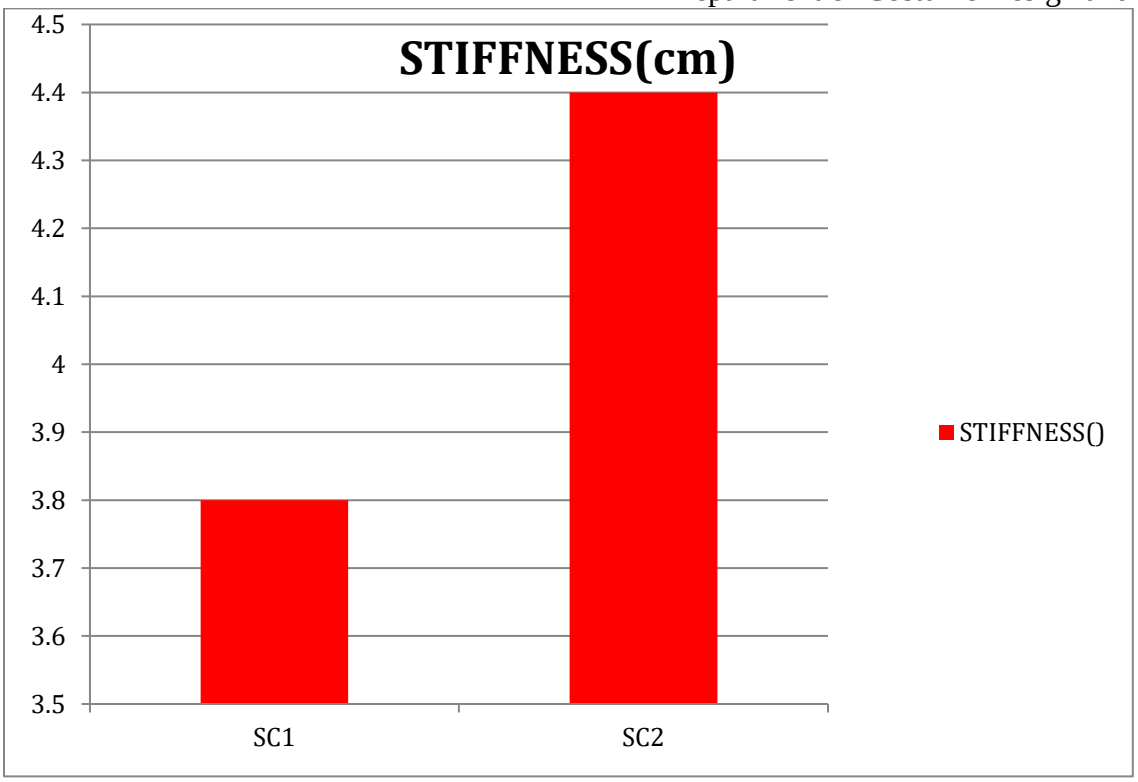
FABRIC STIFFNESS (cm)

The fabric stiffness s presented in Table IV

Table IV

Fabric Stiffness (cm)

S.NO	SAMPLE	STIFFNESS
1	SC_1	3.8
2	SC_2	4.4



From the Table IV it is clear that the fabric stiffness of sample SC_2 was higher with 4.4 cm than the sample SC_1 which showed a stiffness of 3.8 cm. The thermal bonded samples did not bend as it had more stiffness.

Hence it could be concluded that the sample SC_2 had higher stiffness than the sample SC_1.

SINKING

No sinking was observed in the sample SC_1, SC_2, SP_1 andSP_2.

Hence it could be concluded that there was no absorbency in Needle Punched and Thermal bonded samples SC_1, SC_2, SP_1 andSP_2.

WICKING

No wicking was observed in the sample SC_1, SC_2, SP_1 andSP_2.

Hence it could be concluded that there was no absorbency in Needle Punched and Thermal bonded samples SC_1, SC_2, SP_1 andSP_2.

SPRAY TEST

The results obtained from the spray test are presented in the Table V.

TABLE V

SPRAY TEST

S.NO	SAMPLE	ABSORBENCY
1	SC_1	80
2	SC_2	80
3	SP_1	90
4	SP_2	90

From the Table V it is clear that both the samples of SC_1 and SC_2 exhibited absorbency rating of 80 depicting wetting of upper surface at spray point.

The sample SP_1 and SP_2 showed the rating of 90 depicting slight random sketching or wetting of upper surface.

Hence it is concluded that both samples have poor absorbency.

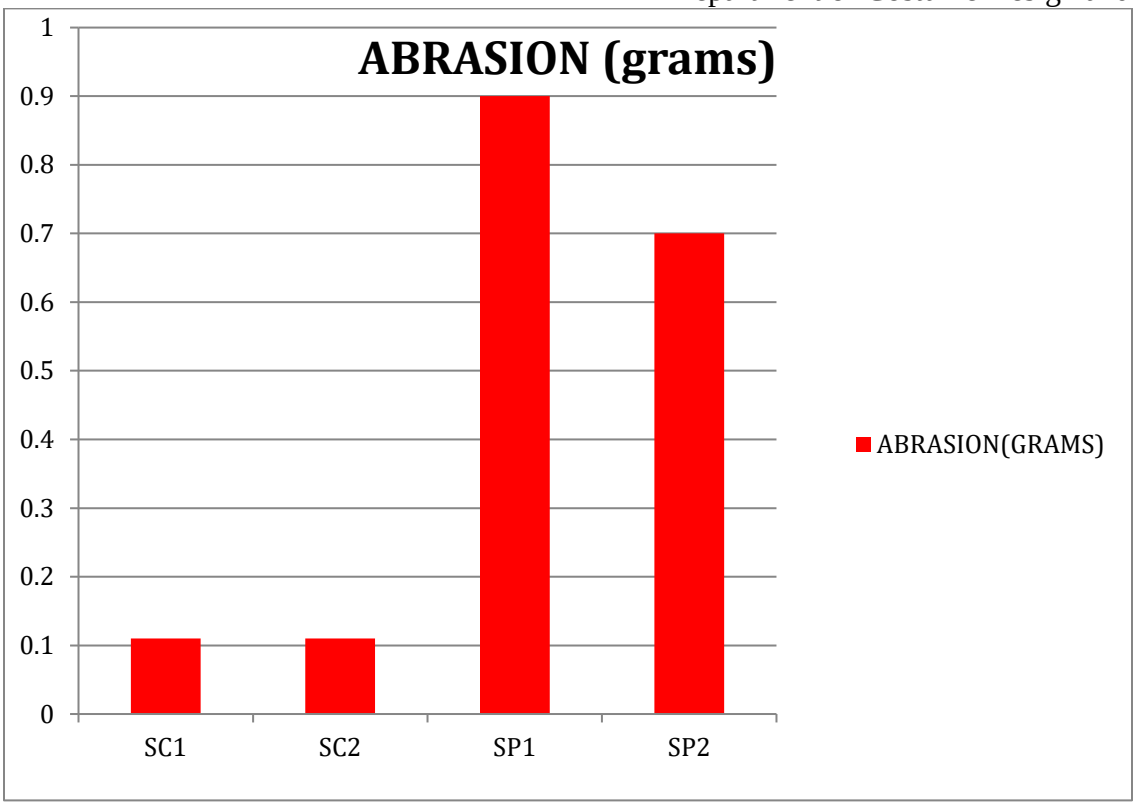
ABRASION RESISTANCE (grams)

The result obtained from the abrasion resistance tests are presented in the Table VI.

TABLE VI

ABRASION (grams)

S.NO	SAMPLE	FABRIC WEIGHT	ABRASION	WEIGHT LOSS
1	SC_1	3.74	3.63	0.11
2	SC_2	3.65	3.52	0.11
3	SP_1	4.35	4.26	0.9
4	SP_2	4.30	4.23	0.7



From the table VI it is obvious that the abrasion was higher in the sample SP_1 of 0.9gram followed by sample SP_2 of 0.7 gram.

Among the thermal bonded fabrics, both the samples SC_1 and SC_2 exhibited the same weight loss of 0.1 grams only.

Hence it is concluded that both the samples exhibited good abrasion resistance.

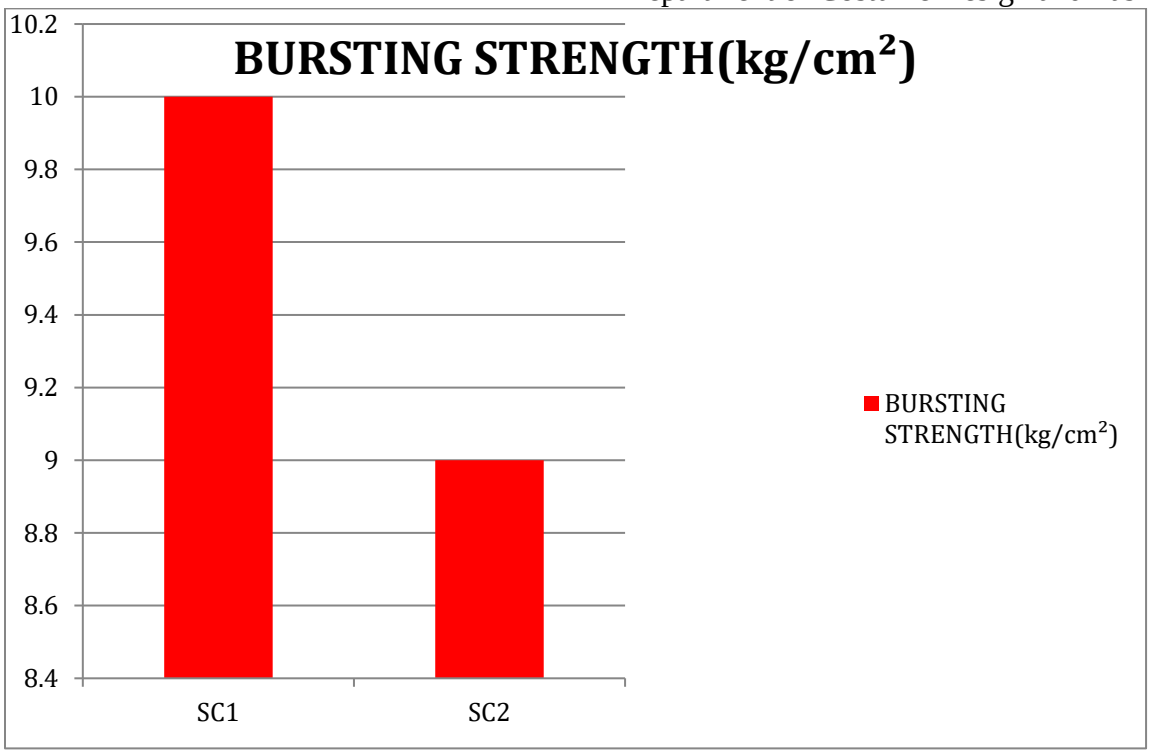
BURSTING STRENGTH (kg/cm^2)

The results obtained from the bursting strength test are presented in the TableVI

Table VII

Bursting Strength

S.NO	SAMPLE	BURSTING STRENGTH (kg/cm^2)
1	SC_1	10
2	SC_2	9



The bursting strength of the Needle punched sample SC_1 was 10kg.

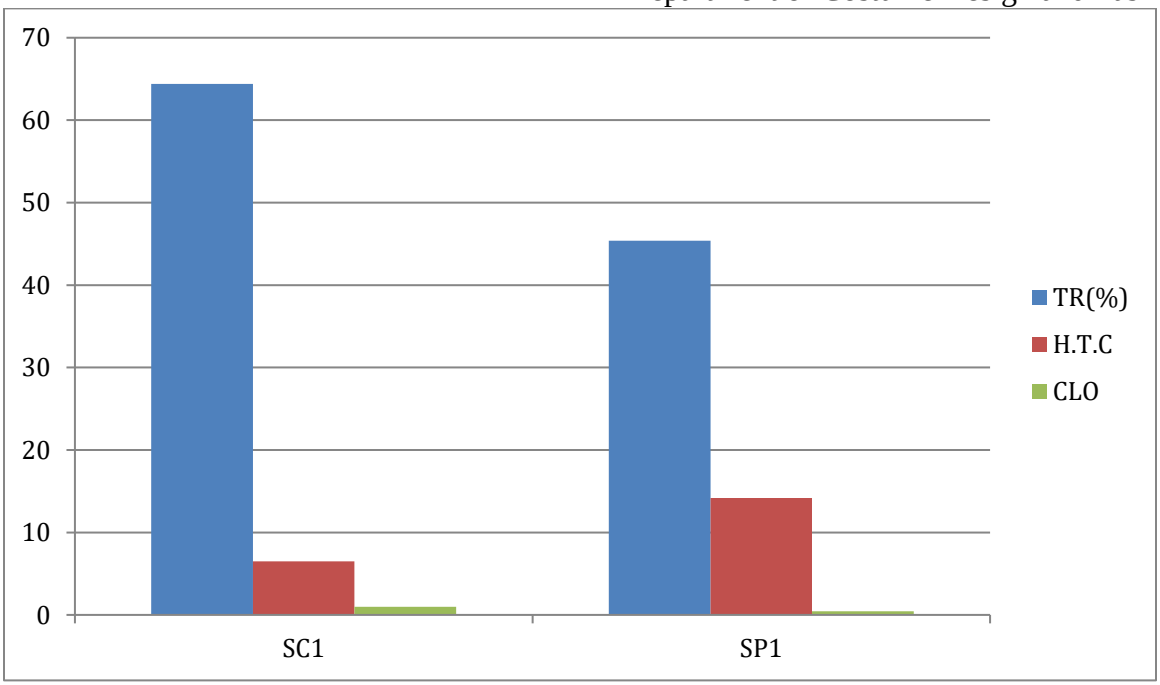
Where, SC_2 showed 9kg.

Hence, it could be concluded that the sample SC_1 had a greater strength.

FABRIC THERMAL CONDUCTIVITY TEST

The result of the thermal conductivity test are presented in Table VIII

S.NO	SAMPLE	1			2			3			AVERAGE		
		T.R (%)	H.T.C	CLO	T.R (%)	H.T.C	CLO	T.R (%)	H.T.C	CLO	T.R (%)	H.T.C	CLO
1	SC_1	64	6.60	0.98	64.7	6.38	1.01	64.4	6.47	1.00	64.4	6.48	1.00
2	SP_1	44.1	14.89	0.43	42.7	13.94	0.46	46.2	13.65	0.47	45.4	14.16	0.46



From the table VIII, it is obvious that the Thermal resistance was 64.4% in the sample SC_1. Which was higher than in sample SP_1 45.36% resistance.

Hence it could be concluded that the Thermal resistance was more in the Needle Punched sample than the Thermal Bonded structure.

RESULT

GSM: The weight of both needle punched and thermal sample was higher. When comparing this two samples weight was higher in thermal bonded structure.

THICKNESS: Hence it could be concluded that the thickness of needle punched sample is higher than needle punched samples.

STIFFNESS: Hence it could be concluded that the sample SC_2 had higher stiffness than the sample SC_1.

SINKING: Hence it could be concluded that there was no absorbency in Needle Punched and Thermal bonded samples SC_1, SC_2, SP_1 and SP_2.

WICKING: Hence it could be concluded that there was no absorbency in Needle Punched and Thermal bonded samples SC_1, SC_2, SP_1 and SP_2.

SPRAY TEST: Hence it is concluded that both samples have poor absorbency.

ABRASION RESISTANCE: Hence it is concluded that both the samples exhibited good abrasion resistance.

BURSTING STRENGTH: Hence, it could be concluded that the sample SC_1 had a greater strength.

THERMAL CONDUCTIVITY: Hence it could be concluded that the Thermal resistance was more in the Needle Punched sample than the Thermal Bonded structure.

CONCLUSION

Silk noils could be fabricated into non-woven structure namely needle punched and Thermal bonded fabrics. Thermal resistance was more and the strength was higher though absorbency was poor.

RECOMMENDATIONS

These non-woven fabrics may be used where the property of thermal resistance is most required. Products can be made where water resistance is required.

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WEBSITE

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Department of Costume Design and Fashion

SUSTAINABLE DESIGN FOR INDIGO DYE USING TIE AND DYE

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Abstract -

Sustainable fashion is a movement and process of forecasting change to fashion products and the fashion system towards greater ecological integrity and social justice. Clothing may also function as a form of adornment and an expression of personal taste or style. Style and fashion go hand in hand. It is assumed that something attractive and unusual will make clothes interesting. In search of constantly changing fashion, the designer needs to be inspired by different traditions and cultures. In the change driven market of today, traditional fabrics can be used in new ways to make fusion or western wear. The focus was on providing a much-needed flip to the Tie and Dye Cotton fabric coloured with *Indigo Dye* using it as a fabric for reversible casual wear for the modern young woman. The fabrics will be sourced, developed and designed. After the garments are designed an acceptance study will be conducted to see if the reversible dresses have an impact on the market.

Key words: Sustainable fashion, Indigo Dye, Tie and Dye, Reversible dress

Introduction

Materials play an emphatic role in our current understanding of our ways in which fashion and textiles can contribute towards sustainability. Producing fashion and textiles involves one of the longest most complicated industrial chains in manufacturing industry. (Fletcher,2014)

Fashion shouldn’t cost the earth. But the way people design, make and discard clothes have a huge environmental impact. Producing clothes requires toxic chemicals and produces climate changing emissions. Ethical fashion may not solve all problems with unsafe chemicals, water shortages, energy consumption, or overflowing landfills, it allows reducing impact on the environment and investing in safer, more sustainable practices. Designers today for the first time are thinking about product lifecycle, sustainability.

This challenges the existing ideas about the scope and potential of sustainability issues in fashion and textiles and sets out more pluralistic, engaging and forward-looking picture, slow

fashion and participatory design, as well as the knowledge of materials. It speaks about the innovative ways of thinking about textiles and garments based on sustainability values and an interconnected approach to design.

Dyes are a kind of magic, a delight to the eye and a job to use. Even a brief inquiry into the early discoveries and uses of these colouring agents conveys a sense of mystery and glamour. One of the oldest and most widely used natural dye is indigo – probably first used in India and known throughout East Asia before recorded history. (Belfer,1977)

Textile materials were generally dyed for value addition, look and desire of the customers. In ancient times, this purpose of dyeing textiles was initiated using natural source, until synthetic dyes were invented and commercialized. For ready availability of pure synthetic dyes of different types and its cost advantages, most of textile manufactures shifted towards the use of synthetic dyes.

Experimenting with natural dyestuffs for historic purposes or for the pure challenge is certainly worth doing. (Broughton,1996)

One of the treasured and rare in the plant world is blue. Indigo plant, named as "Indigofera tinctoria", was discovered around 1600s (B.C). Indigo dyestuff, extracted from its leaves, had been used in various primitive dyeing processes for years. Indigo dye is an organic compound with a distinctive blue colour. The primary use for indigo is as a dye for cotton yarn. Indigo is supposed to have poor washing fastness, fair light fastness, good perspiration fastness and poor crocking fastness.

This project is aimed at developing the indigo dyed cotton fabric using tie and dye technique. And the fabric thus created will be developed into reversible casual dress for modern women. They can change their look with in a second. And wear two entirely different looks at the cost of one garment.

Methodology

Preproduction survey is done to see the revival of natural dyes in modern world. A survey was done according to which the reversible casual dress was made. The survey was done among college girls and working women about their views and ideas about the reversible casual dress and whether or not they would purchase it and wear it. After calculation of the conclusions and forming a chart, the details of the reversible casual dress was laid out with proper construction details according to the survey. Pure cotton fabric is sourced from the cloth market. And natural

indigo dye vat is prepared for the development of cotton fabric using tie dye technique. The fabric is developed in Weavers Service Centre Bangalore. And the geometrical properties are examined.

A specification sheet was made noting all the details like description of the reversible casual dress, category, season, measurement details, seam type, seam allowance, 8 accessories to be used, fabric consumption, technical sketches (front and back) and other details. Costing sheet which breaks down all expenses and materials used was prepared. A technical pattern using brown sheet and tracing paper was used to cut the fabric for stitching. This pattern was based on the principals of pattern making and cutting. The cut fabric was then stitched using seam allowance of ½ inch all over the garment and lapped seen to avoid the fraying of the garment. The thread used was of polyester based.

After the finishing of the garment, it was properly ironed and a quality check was done to make sure that no defects are present. The quality check was done on the bases of checking of measurement details, threads fraying, stitching defects, and fitting. Acceptance study is done among the modern women to see if the indigo tie and dye reversible dresses have an impact on the market.

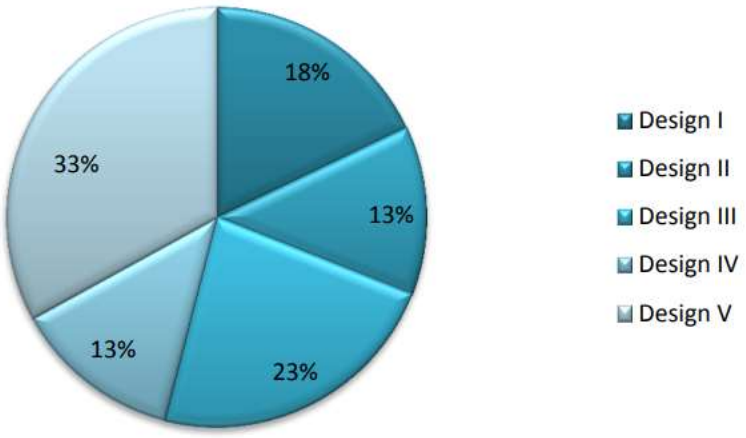
Designs - Indigo dye was used to colour cotton cloth, and various tie-dye techniques were used for each design.The dyed fabrics were made into reversible casual clothing for contemporary



wom en. They have the quickness to alter their appearance. And for the price of one outfit, they can wear two completely different styles.

Results And Discussions

A questionnaire was prepared for the survey to analyze the consumer acceptability to the reversible casual dress for women using indigo tie-dyed fabric. The study includes results from 100 women from different cities such as Bangalore, Chennai, Coimbatore, Delhi and Trivandrum. College students, working and non-working women were represented in this survey. Participant responded to the survey through written communication. Through this method the results and data which were given by the respondents were collected and discussed. This help in understanding consumer's needs even better.Through this survey, respondents ranked the designs according to their preferences.



The above chart reveals that, 33% of the respondents prefer Design V, 23% of the respondents prefer Design III, 18% of the respondents prefer Design I, 13% of the respondents prefer Design II, 13% of the respondents prefer Design IV

From the acceptance study it was observed that,

- 30% of the respondents first reaction to the reversible casual dress is very positive
- 65% of the respondents say that the reversible casual dress is comfortable to wear
- 38% of the respondents thought reversible casual dress is probably needed
- 33% of the respondents very like to buy the reversible casual dress
- 54% of the respondents think these designs will be probably successful in the market

Conclusion

The project was aimed at producing new designs for the ready to wear market. The main focus was on revival of the natural Indigo dye and Tie – Dye technique, making it interesting for the younger generation. Therefore, it was decided to development of tie and dye fabric using indigo dye and designing of reversible casual dress for women. It is a new way of providing value addition to wrap dress and increasing the aesthetic appeal. By using tie and dye technique in reversible casual dress will once again be accessible to the younger generation. This is clearly seen in the response of the public to the five designs. Design V has been liked by most the people then followed by Design III, Design I, Design II and Design IV. Maximum Respondents like the idea of reversible casual dress. Thus, the new concept of introducing reversible casual dress using natural indigo tie and dye technique was highly appreciated and well accepted. There was a positive approach by the respondents towards the good feel of the fabric and many found it trendy and comfortable. The products were designed according to the needs of the end consumers, taking into account the price points. The report includes both pre-production survey and acceptance study. Pre-production survey was conducted to understand the likes and dislikes of the customers. Acceptance study was conducted to obtain feedback from the end users. The study shows that the acceptance level of design was excellent although designs were equally accepted. It may be concluded that there is good response for this type of Design in the market.

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PALPABLE SURGE IN WEARABLE TECHNOLOGY

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ABSTRACT

Many innovations came into our daily lives. In that textiles play a major role by bringing new innovations adopted with latest technology. In that textile a new surge came into force is the wearable technology. As the name itself implies wearable technology is nothing but wearing the technology. Which helps is monitoring the wearers day to day activity. The present scenario gives a good sign for the increasing market to the wearable technology for the upcoming three years. The field of wearable technology has experienced an evidencial growth for the past 20 years. So to give a clarity on an increasingly popular field to those perhaps less familiar with it. This paper gives an overview of wearable technology and smart textiles and apparels which clarifies terminology encompassed within the field.

Keywords: Smart textiles, Motherboard.

INTRODUCTION:

Many innovations came into our daily lives. In that textiles play a major role by bringing new innovations adopted with latest technology. In that textile a new surge came into force is the wearable technology. As the name itself implies wearable technology is nothing but wearing the technology. Which helps is monitoring the wearers day to day activity. The present scenario gives a good sign for the increasing market to the wearable technology for the upcoming three years. The field of wearable technology has experienced an evidencial growth for the past 20 years.

The upcoming area of research on wearable technology benefitted in many ways. Previously the wearable technology influenced the military.

The original and main function of textiles was to protect our body from environmental conditions like sunrays, cold wind, rain etc. Later on, aesthetic as well as comfort properties came to play a role in clothing. In the new generation of textiles has arisen smart and interactive textiles. These smart textiles help to keep us safe in any extreme environmental conditions, it protects and monitors, sometimes helps to cure injuries or diseases.

Smart and interactive textiles:

Smart textile is the material which can react to the environment. These are the fabrics which can enable digital components and electronics in itself. Pailes-Friedman of the Pratt Institute states that "what makes smart fabrics revolutionary is that have the ability to do many things that traditional fabrics cannot, including communicate, transform, conduct energy and even grow". The smart textile can sense and react to environmental conditions or stimuli from mechanical, thermal, chemical, electrical, magnetic or other sources. Smart textiles must contain three components i.e. sensors, actuators and control units. Smart textile presents a challenge in several fields such as the medical, sports, military and aerospace.

Types of smart textiles

Smart textiles can be divided into four types based on their functions.

1. **Passive smart materials:** These are the material which only senses the environmental conditions or stimuli. These are just sensors such as changing colour, shape, thermal and electrical resistivity. (Ex. a shirt with in-built thermistors to log body temperature over time.)

2. **Active smart material:** These are the material which can both sense and respond to the external conditions or stimuli. If actuators are integrated into the passive smart textile, it becomes an active smart textile as it may respond to a particular stimulus. (Ex. the shirt senses the surrounding temperature. It reacts in the form of rolling up of sleeves when the temperature gets high.)

3. **Very smart materials:** These are materials are able to execute triple functions; first there are sensors which can receive signals, secondly, they are able to give reaction based on the received singles; thirdly they can adapt and changes the shape, size, colour or act according to the given function.

4. **Materials with the even higher level of intelligence**:
   Develop artificial intelligence to the computers. These kinds of materials are not fully achieved in the current investigation of human beings. This may be achieved with research and development in the field of textile and electronics. By using the smart fabrics or smart materials with advancement in computer interface this can be possible.

Applications:

1. Thermotron

Thermotron of UNITIKA is a particular fabric which is able to absorb sunlight and convert the light energy into thermal energy. It stores heat without wasting it. Inside the thermotron, there are micro particles of zirconium carbide which allow the fabric to absorb and filter sunlight. The inner layer of the fabric holds the heat generated by the fabric and prevents it from going in surrounding atmosphere, thus providing a favorable effect on the human body. It offers a comfortable, waterproof yet breathable wearing experience.

2. Stone Island

Stone island is a jacket which is made to give information about surrounding temperature. It's a liquid crystal heat sensitive coating. At 27 degree census, the molecules which are present in the coating undergo a rotation which modifying the light course. As a result of the colour of the garment gradually begins to change from the dark colour to the much lighter and brighter colour of the fabric base. When the garment returns to its normal temperature, it recovers its original dark coating colour.

3. Polar seal

Feeling cold would be the thing about past there's a product called polar seal which gives instant heat at the touch of a button. There are three different warming levels high, med and low. There are two heating zones one in the upper back and lower back so that we can feel warm in winter. These are easy to use and are tested in alpine conditions. These are flexible, lightweight, breathable and water resistant which makes them ideal for sports or outdoor. These can be worn on gloves or inside shirts. These can keep warm up to 8 hrs in a single charge.

4. ZeroI

Zerol is a cap which is built-in with bone conduction speakers. We don't have to use earphones to listen to music or to make phone calls. As it is a cap our ears are never blocked. It is water resistant, because of which we can also use it while it's raining.

5. ORII

Orii is a ring, by using it we are able to have called. Orii is a voice assistant ring that turns our finger into smartphone all through just a touch to the ear. It uses bone conduction and bone conduction has been used in many medical grade devices. To adjust the ring there are silicon pads incorporated in design which are durable and allergy proof. It has been packed in such a way that it sends vibrations through your finger directly into your ear, so only you can hear. So that allows you to talk and listen just through your finger. There is dual noise-canceling microphone and bone conduction, we can hear and talk even in loud places. By using this we are able to do things like navigation, alarms, translation, texting, weather, messaging, calling, timer, map routes etc. it is water resistant. It has the custom notification, there are four LED lights that can tell us what kind of messages are coming through.

6. Lumo Run

Self-motivation can be runners greatest assets but self-evaluation can be greatest challenge luco run are for those who want to get trained by themselves. Luco run is a motion sensor that collects data and provides motivation all while you run and it fits in a waistband of your shorts. Luco run analyses running biomechanics then suggest judgments on your form that maximises true potential by avoiding any injury. You can access data anywhere which gives full post analyses on the smart phone. We don't need any goggles, smartwatch, wristband no cables.

7. AIO Sleeve

Aio sleeve is a sleeve which can be worn in one hand and gives information which only doctors can give. It gives you self- analyses, sleep duration, quality of sleep on your mobile phone. It can play your favorite music. While workout it measures heartbeat, ECG, steps/distance as well as calories counter. While work it measures your stress level. All these things we are able to see just on your smartphone anytime any place.

8. Talk to Each Other Using Light Pulses

Textile wearables consistently seem to hit a snag. The technology woven into them never seems to be flexible enough for their comfortable use. Engineers have created a cloth that seamlessly weaves electronic devices into its fabric. These engineers embedded high-speed optoelectronic semi conductive devices into the cloth's fibers. These devices included LEDs and diode photo detectors, giving the cloth a sort of light communication system.

9. Stretching optic fibers for everyday clothing:

Optic fibers are normally made by making a preform, or a cylindrical object, that's a larger model of the fiber and heating it. The material is then drawn under tension and the fibers get collected in a spool. In this project, the fibers needed to include preform light-emitting semiconductor diodes the size of a grain of sand in addition to copper wiring the width of human hair. The polymer performs liquefied slightly which formed a long fiber that aligned the diodes along the center and connected it via the copper wiring.

As Rein described it, "both the devices and the wires maintain their dimensions while everything shrinks around them," thus allowing the fibers to be woven into fabrics with ease. The researchers even washed the diode-embedded cloth 10 times to demonstrate just how practical it could be in regular clothing.

10. Waterproof wearable technology:

One of the biggest advantages to this new infusion of wearables is that it makes the fibers essentially waterproof. The researchers even tested the cloth and fibers within a fish tank.

A lamp outside of the tank played music through the water to the fibers in the form of quick optical signals. The fibers in the tank then converted those rapid light pulses into electrical signals and back into music.

The fibers communicated with each other despite the cloth being submerged in the water for weeks. “This paper describes a scalable path for incorporating semiconductor devices into fibers. We are anticipating the emergence of a ‘Moore’s law’ analog in fibers in the years ahead,” Fink said.

“It is already allowing us to expand the fundamental capabilities of fabrics to encompass communications, lighting, physiological monitoring, and more. In the years ahead fabrics will deliver value-added services and will no longer just be selected for aesthetics and comfort," he added.

Conclusion

This wearable technology is a trend setter for the textile industry by which it can be manipulated according to their streams. This can be adopted in many fields such as medical textiles, fashion apparels and technical textiles etc. wearable technology is going to rule the future textile world because of its uniqueness and its functions.

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EMERGING HORIZONS IN HOME SCIENCE- GREEN TEXTILES FOR SUSTAINABLE DEVELOPMENT

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Abstract

The world's most environmentally damaging industry is thought to be the textile industry. The textile industry's environmental issues start during various production steps and continue all the way to the finished product. The succeeding fabric creates harmful compounds that swell into our ecosystem throughout the production process, which includes bleaching and finally dying. As important as making a product free of toxins is, during the production process, pollution management. The use of rayon in clothes has contributed to the rapid destruction of forests and paved the way for the creation of natural, sustainable fibers like organic cotton, hemp, and bamboo. The environment is harmed by products made of petroleum. An integrated pollution control strategy is needed to protect our environment from these effects.

Key Words: - Textile Industry, Eco-textiles, Sustainable process, Fibers, Toxic Substances.

1. Introduction

For many years, the Indian textile industry has had a strong, established reputation on the global market. This is supported by the industry's expansion in terms of output and export trends. It has suffered greatly in recent years as a result of numerous difficulties brought on by industrialization. The environmental issue is one of the most difficult issues facing humanity today. As a result, eco-friendly textiles are now widely accepted as necessary to prevent or lessen environmental problems by individuals, commercial organisations, the judiciary, and the government. Industries must determine whether to change their technology and manufacturing methods globally in order to produce products that are environmentally friendly. In order to compete in the global market, the textile industry is devoted to producing eco-friendly fabrics. Eco textiles are any textile products that are created in an environmentally friendly manner and treated within environmentally friendly parameters (as determined by organisations like oeko

tex, ifoam, etc.). India is a really eco-friendly country thanks to its straightforward way of life. The terms "environmentally friendly" (also "eco-friendly," "nature-friendly," and "green") are used to describe products and services, rules, regulations, and policies that are thought to cause little or no harm to the environment. People should engage in eco-friendly activities and start investigating more eco-friendly methods of living and conducting business in order to promote the health of the environment.

2. Ecological

Eco-friendliness is important not just for exports but also for the home market. Approximately 8,000 different chemicals are said to have been employed in textile production. Chlorine gas, acetic acid fumes, kerosene, diazodization fumes, acid fumes, and other chemicals used in manufacturing are to blame for air pollution. Ecology is a new factor that is becoming more and more important today. Three categories can be made for the term "ecology" in relation to clothes and textiles:

- Ecology of production;
- Ecology of humans;
- Ecology of disposal.

Ecology of Production–The term "production ecology" refers to the process of creating fibers, textiles, and clothing that are ecologically friendly and meet logical requirements for the preservation of air and water purity, waste treatment, and noise prevention.

Ecology of human -The impact of textiles on the wearer and the health of clothing near to the skin. It is necessary to prevent the concentration of compounds in textiles that, based on current knowledge, could have harmful effects on people during normal use.

Ecology of Disposal -Effect of liquid and solid textile waste on the environment. The goal of sustainable textiles is to satisfy human needs while protecting the environment so that they can be satisfied not only for the present but also for future generations. Since the fundamental concept of sustainable development relies around the advancement that is being made in the present while somewhere keeping the future in mind. Since sustainable environmental development is one of the main objectives of the Millennium Development Goals, eco-textiles are a necessity of the hour.

3.Eco-friendly fibers:

Organic cotton, Aloe Vera, Nettle, Pineapple, Milk protein, Bamboo, Banana, Eco spun fibre, Soy silk fibre, Recycled polyester fibre, Corn fibre etc.

Processes adopted for eco-friendliness:

Some enlightened processes have been developed to nullify (or) to reduce the toxic releases. This ensures the enhancement of Eco Friendly nature. Some of them are listed below.

1. Enzyme technology
2. Foam technology
3. Supercritical carbon-di-oxide dyeing
4. Plasma technology

1) Enzyme Technology: -

There are almost 250 amino acids that make up enzymes that are protein-based materials. They can be made from bacteria, malt, and pancreatic. They are preferred for the reasons listed below: substituting harsh chemicals, Biodegradable, non-polluting, and targeted in its effects has a catalytic effect. Various enzymes are utilised for various processes: Most often, textiles use hydrolases. Using a pumice stone, bio washing is a traditional practice. Disposal issues arise because of these stones. Enzymes are currently being used to manage this unsustainable process. Several chemicals are used in the treatment of effluent. Since these compounds are dangerous, enzymes are being used in their stead. Enzyme technology applications result in a procedure that is more ecologically friendly.

2. Foam Technology:

The newest environmentally friendly method being used is foam technology. It is employed in a number of textile processing processes, including pretreatments, dyeing, printing, and finishing. Simply said, foam is a colloidal system made up of a large number of gas bubbles in a liquid continuous phase. The four methods for applying foam are as follows: horizontal pad, Gaston County, kiss roll, and vacuum suction.

3. SuperCritical Fluid Dyeing Technology:

This makes some gases an alternative to water as a solvating medium. To dissolve the dyes, high pressure and warmth are required. CO_2 is the most adaptable and widely used of all the gases being turned into supercritical fluids. because the dye may permeate the fibre because of its high diffusion rates and low viscosities. Additionally, dye and CO_2 can be recycled by

lowering the pressure at the end of the procedure. H2O, propane, CO2, and other well-known chemicals display super critical phases. CO2 is the second-most plentiful and least expensive solvent. The transformation of carbon dioxide gas into supercritical fluid requires low temperature and pressure. Surface tension and viscosity of CO2 are extremely low in the supercritical state.

4. Plasma Technology:

For environmentally friendly soil release and water repellent coatings, plasma treatment can be used. A partially ionised gas made up of ions, electrons, and neutral particles is referred to as plasma. exposing the fibers to gaseous plasma using one of two methods: depositing plasma or non-depositing plasma. Because there are no dangerous chemicals to handle during plasma treatment, there are no effluent issues. Saturated and unsaturated gases like ethylene vapours and monomers like acetone and methanol are used to apply depositing plasmas, or plasma-enhanced chemical vapours. Because plasma chemistry occurs in non-equilibrium settings, physical interactions can happen when the gas or the exposed portions are still at a low temperature.

5. Applications

Several methods can be employed to ionise plasma gas for textile treatment, including:

A. Glow-discharge method: Plasma gas is created using the glow-discharge technique under reduced pressure. Direct electric current with a low frequency is used over two electrodes in the process.

B. Corona discharge method: By passing a low frequency or pulsed high voltage over a pair of electrodes, plasma gas is generated at atmospheric pressure.

C. Dielectric barrier discharge method: To create plasma gas, a pulsed voltage is applied across a pair of electrodes, at least one of which is shielded by a dielectric substance.

6. New textile finishes respond to eco-friendly demand: -

In response to consumer demand for environmentally friendly finishes, manufacturers of textiles, chemical finishes, and finishing tools have developed unique multifunctional treatments. According to a report from Textile Outlook International, a variety of recent advances in science and engineering, including biotechnology, plasma technology, super hydrophobic and self-cleaning technology, and softening technology, have benefited chemical finishing innovation. The development of ecologically friendly treatments that dramatically cut the quantity of water, chemicals, and energy consumed in textile processing is thanks to advancements in

biotechnology. Examples include Huntsman Textile Effects' Gentle Power Bleach system, which is thought to be a more environmentally friendly pretreatment procedure than traditional ones like peroxide bleaching.

7. Conclusion: -

Textiles that are "eco friendly" are becoming more popular among consumers. Consumers who previously just gave aesthetic value thought are increasingly taking a closer look at the negative impacts of various chemicals. "It is better for society to stop pollution before it starts than to stop it after it starts." " Consumer mindfulness of environmental protection and eco-friendliness is growing. As a result, the cloth assiduity has learned about it and is making trouble producing and exporting"Eco-friendly fabrics".

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E- TEXTILE / WEARABLE TECHNOLOGIES

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INTRODUCTION

The development of wearable electronic textiles is accelerating today. New textiles with features like heat regulation, luminescence, touch, and sensitivity are constantly being introduced to the market. These features are in handy for a variety of applications in various industries, including healthcare, athletics, space travel, and video games. Gaming industry revenue from wearable electronic textiles. As technology advances, the market for mobile games on smart phones and tablets has increased from $66 billion in 2013 to an expected $78 billion in 2017. Electric circuits may now be built smaller and smaller, making it easier to integrate functionality into wearable electronic fabrics without creating a bionic stigma. Many businesses have recognized the promise of electrical wearable textiles, including Google, which is creating capacitive fabrics for its Google Jacquard project.

This project makes it possible to use wearable computing in a seamless and dependable way, allowing users to conduct daily tasks like accepting calls without interrupting a current activityhe majority of wearable electronic textiles feature incorporated capacitive, resistive, and optical sensors that enable the fabric to detect pressure, temperature, humidity, strain, and touch. The sensors are often attached to the control boards that handle the information processing.

- First, wearable e-textile technologies' relationship to various materials, connections, and production techniques are explained; then,
- Second, the explanation of textile capacitive and resistive sensors is given, emphasizing measurement ranges and manufacturing processes. Commercial wearable e-textile examples are shown and briefly described.
- A conclusion is drawn at the end, highlighting the significance of wearable electronic textile technologies and offering a brief look into the future.

DEFINITION AND CHARACTERISTICS OF WEARABLE TECHNOLOGIES:

In the literature, there is no clear definition pertaining to wearable technologies.However,

there are some relative terms which have very close meanings, even synonyms of wearable technologies. These terms are "wearable devices", "wearable computers", "and wearable electronics". Although the terms are different, it can be derived from the definitions that they have the same meaning and can be used interchangeably except wearable computers. Although the difference between wearable technology and wearable computer is vague, "wearable computers are part of the larger classification of wearable technology"(Dunne, 2004, p. 6) and support and perform complex computations (Profita,2011). One of the most comprehensive definitions of wearable technology is "an application enabled computing device which accepts and processes inputs. This device is generally a fashion accessory usually worn or attached to the body. The device could work independently or be tethered to a smart phone allowing some kind of meaningful interaction with the user. The wearable product could be on the body (like a smart patch), around the body (like a wristwatch or a headband) or in the body (like an identification sensor embedded under the skin or a sensor attached to the heart monitoring cardiac aberrations). Wearable technologies have some distinctive characteristics which differentiate them from other technological devices. In order to understand the applications and future effects of the wearable devices, firstly the characteristics and features are needed to be examined. The main characteristic of the wearable technologies is hands-free function). From this point of view, even mobile phones cannot be considered as a wearable device). Hands-free function enables people and employees to access the data while performing their daily routine activities and job tasks. In addition, in the literature several authors stated some characteristics that wearable technologies must bear

These functions are the interface, communication, data management, energy management and integrated circuits. The interface is a medium for transferring data between the wearer and the device. Data can be gathered via sensors, antennae, global positioning-systems receivers, cameras. Communication is the transfer of the information via radio frequencies, wireless systems, infrared, Bluetooth technology and personal area network. Data management refers to storing and processing of data. Energy management is another important function). However, companies have not accomplished to solve power supply issue for the wearable technologies even for today. For example, the latest Google Glass's (which is considered the most successful

wearable technology so far) battery life is just 6 hours. Although the history of wearable devices started more than 500 years ago with the invention of wristwatch, the popularity and the evolution of them have accelerated in the 21th century. These wearable technologies have been designed and used for several purposes and several industries. For each purpose and industry, the wearable devices have their own features, characteristics and applications. Consequently, grouping the wearable technologies based on their own applications and features plays an important role to analyze the wearable technologies meticulously.

TYPES OF WEARABLE TECHNOLOGIES:

It can be revealed from the literature that there are three main wearable technology categories. These categories are health related wearable technologies, textile based wearable technologies and wearable consumer electronics.

WEARABLEHEALTH TECHNOLOGY:

Nowadays, probably the most extensive use of wearable technologies has been carried out in the health sector. Moreover, in the literature, most of the studies related to wearable technologies are about the health applications. The developments in wearable technologies are expected to lead a paradigm shift in the health sector (Rutherford, 2010). In this context, the academics and industry professionals have exerted a great effort to design and develop wearable systems for health-related issues (Chan et al., 2012).

The most important contribution of wearable technologies in the health sector is enabling continuous monitoring of a patient's health status and gathering real-world information about the patient). Thus, the doctors may monitor the heart rate, blood pressure, fever, and other health indicators ubiquitously and time independently while the patients performing their daily routine). Wearable technologies can be used for diagnoses and treatments of several diseases). Chan et al. claimed that wearable technologies can be used for "'telehealth', 'telehealthcare', 'telemedicine', 'telecare','telehomecare', 'e-health', 'p-health', 'mhealth', 'assistivetechnology', or 'gerontechnology'". In addition, Bonato (2010) stated that for the treatment of "congestive heart failure, prevention of chronic conditions such as diabetes, improved clinical management of neurodegenerative conditions such as Parkinson's disease, and the ability to prompt respond to emergency situations such as seizures in patients with epilepsy and cardiac arrest in subjects undergoing cardiovascular monitoring" wearable technologies can be used. Other applications of

wearable technologies in the health sector are Cardiovascular Disease, Rehabilitation, Applications in Parkinson's Disease, Functional Assessment After Stroke (Binkley, 2003). However, today the wearable technologies in the health sector are mostly focused on data gathering, monitoring and diagnosis of health problems.

WEARABLE TEXTILE TECHNOLOGIES:

Integrating the technologies into textile products is a recent concept, which enables the development of wearable electro textiles for sensing / monitoring body functions, delivering communication facilities, data transfer, control of the environment, and many other applications (Tao, 2005). Especially, the emergence of nano-fibres and nano-coatings provide an unusual characteristics and lead breakthrough changes in the textile industry (Hurford, 2010). One of the most significant applications of wearable technologies in the textile industry is the clothes which can change their colors on demand or based on the biological indicators of the wearer.

WEARABLE CONSUMER ELECTRONICS:

In the literature, there are hardly ever studies related to the wearable consumer electronics. "Consumer electronics include electronic equipment intended for everyday use. Consumer electronics are most often used in entertainment, communications and office productivity". Major consumer electronics products are TV's, mobile phones, cameras, camcorders, music and video players. In this context, wearable consumer electronics can be defined as the electronic devices that are worn on a user's body to catalyze the daily activities. Today, the big electronic companies such as Google, Apple, Samsung, Nike, Qualcomm and Microsoft make strategic investments in wearable consumer electronics). Although there are several types of wearable consumer electronics such as wristband, headbands, rings etc., the most Besides all other wearable devices, when they complete their evolution, smart glasses are expected to lead a paradigm shift in users' everyday life. Today, the most respectable smart glasses is the Google Glass. It is a device that is worn like conventional glasses, and composed of computerized central processing unit, integrated display screen, high-definition camera, microphone, bone conduction sound transducer, and wireless connectivity

THE FUTURE WITH WEARABLE TECHNOLOGIES:

Nowadays, most of the influential electronic companies have focused on wearable technologies, some of them have launched the initial versions of their wearable products, while

others are in the prototype development stages. In this context, Wearable technology is at an 'early adopter' stage both for public and commercial use. In the future, probably the most powerful and commonly held wearable product will be the integration of smart glass and augmented reality. When these products are developed and their prices are decreased, these products will reach the maturity stage and social acceptance of these devices will accelerate. Another substantial debate pertaining to wearable technologies is that "will the wearable devices be beneficial or hazardous and detrimental for the society?" In the literature, several authors stated the hazards of wearable devices especially in the context of privacy. claimed that if the wearable technologies are left unattended and / or unsecured, private information about the individuals and companies can be stolen. stated that wearable technologies could lead to an unprecedented loss of control over the individual's personal information. Another privacy issue that people can confront is secretly videotaping or capturing the people, private properties, places, products. However, the most of the privacy issues can be solved via laws and legislations, firewall, anti-virus, anti-spyware and anti-malware software exclusively designed for wearable technologies. In this context, the benefits of the wearable technologies will outweigh the hazards.

PUBLIC AND PERSONAL SAFETY:

In contrast with the position that wearable technology will give harm to security, the wearable devices will provide the safety of the society. For example, in the near future Bio-censors will be integrated into the wearable devices, and these censors will monitor the brain activities

BUSINESS:

The wearable technologies are expected to innovate the companies' strategies and the way of doing business. In the near future, there will be no need to go to meetings physically

RESEARCH:

Wearable technologies provide several opportunities for companies in the context of market research. Researchers use some eye-tracking techniques in the laboratoryexperiments. In the future, they can gather real-life data via eye-tracking software built in a smart glass.

PRODUCTION:

In production and in the logistics, workers should work very efficiently and find and bring the necessary parts. However, sometimes they can be confused about the location of the

necessary parts or products. With Smart glasses, when the factory needs some parts, the list may be automatically uploaded to the glasses.

SALES:

Retailers can use a system that customers upload shopping list to the Smart Glasses, and the glasses will make the customers finish their shopping as fast as possible via indoor navigation.

SERVICE:

The integration of smart glass, face recognition and data management may lead to an augmented service for the customers

TOURISM:

Augmented reality integrated wearable technologies enable people to visit cities, tourist attractions virtually without going there. They also use virtual city sightseeing tours. New virtual tourism companies may emerge in the near future

CONCLUSION

In conclusion, wearable technologies have evolved gradually in parallel with technological advancements such as electronic chips, GPS systems, Wi-Fi systems, the internet, computers, and sensors. The major applications of the wearable technologies are in the health industry, textile industry and the consumer electronics industry. Today, the diffusion of the wearable technologies is just at the early adopter stage both for the society and companies. However, in the near future the evolution of wearable technologies, especially smart glasses and smart watches, will almost be completed their evolutions and these technological devices will be adopted by the societies and companies. The objective of the study is to point out how wearable technologies will be a milestone both for daily life of people and the way of doing businesses of the companies in the future. In this paper, it is proposed that wearable technologies will ease the life for the people with impairments; enable companies to interact with the other business people easier, to conduct market research more effectively, to apply sales and service strategies more efficiently; enable policemen, firemen, military members to provide public and personal safety; enhance the virtual reality in games, and enable the doctors to monitor the health indicators of the people continuously. To sum up, the future will be safer, easier, healthier, quicker, and more entertaining with the wearable technologies…

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NANOTECHNOLOGY IN TEXTILE INDUSTRY

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INTRODUCTION

Nobel Laureate Physicist Reichard Feynman pioneered the theory of nanotechnology in 1959. He explained, "There's plenty of room at the bottom," which was conveyed at the California Institute of Technology during an American Physical Society conference. Nanotechnology is a rapidly developing interdisciplinary technology that can be described as the use of structures with at least one dimension of nanometer size for the construction of materials, devices, or systems with novel or hugely enhanced properties due to their nano-size. Nano-particles widely used in commercial applications have dimensions ranging from 1 to 100 nm (1 billion nm = 1m), which is approximately 100,000 times smaller than the diameter of a single human hair. The technology can be utilized to develop advanced performance characteristics in fibres, yarns, and fabrics, such as water repellency, fire retardancy, antimicrobial resistance, and so on. There seems to be currently a wide variety of fabrication systems available that can control and produce nanostructures with the desired composition, size, morphology, shape, and crystalline structure. Top-down and bottom-up fabrication are the two most common methods.

Nanoengineered functional textiles are a major breakthrough in clothing technology. This is primarily due to the fact that traditional methods for imparting different properties to fabrics frequently do not result in permanent effects and lose their functions after laundering or wearing.Nanotechnology-enhanced textile materials are predicted to become a trillion-dollar industry in the next decade, with enormous technological, economic, and environmental benefits.In 2003, it was estimated that global government funding for nanotechnology research and development had increased to $3 billion per year, in furthermore to the millions of dollars invested by private industries. Even though the textile industry contributes a small portion of global research in emerging fields of nanotechnology, the fibres and textiles industries were the first to effectively implement these advances and demonstrate the benefits of nanotechnology for consumer use.

A better understanding of the properties of nanomaterials paves the way for the development of innovative materials in the coming years, potentially improving life quality. In this article, we have enumerated recent advances in nanotechnology and their applications to fibres and textiles. We have classified the area of study into two categories: nanotechnology fibres, nanotechnology in textiles, and health risks.

FIBRES IN NANOTECHNOLOGY

Nanofibers are fibres with diameters of less than 100 nanometers. In the textile industry, this concept is frequently expanded to include fibres with diameters as large as 1000nm.They can be created through interfacial polymerization, electro spinning, and force spinning. Carbon nanofibers are graphitized fibres made through catalytic synthesis. Nanotechnology's application is broadened with the fabrication of nanofiber.Various techniques, such as electrospinning self-assembly, force spinning, melt blowing, and island-in-sea, are used to create nanofibers (bicomponent nanofiber). Among these, Electrospinning is the most convenient of these techniques due to its low cost, higher rate of production, higher porosity, and ability to control nanofiber morphology and diameter.

Electrospinning – FabricationProcess:

The process of spinning a fine filament from polymer solution using electrostatic forces is known as electro spinning.A high voltage electrode is connected to the polymer solution during this process. After that, the solution is spun through a capillary. Taylor cones are formed at the tip of the capillary due to the high voltage electric field between the tip of the capillary and a grounded collector, resulting in sub-micron diameter fibres.As the polymer solvent evaporates, the fibres solidify and form an interconnected fibre layer on the collector's surface. Several different polymers were used to create nanofibers with diameters ranging from 50 to 1000 nanometers.

APPLICATIONS IN NANOFIBRES

Nanotechnology had a wide range of scope and its applications with the help of nanofiber production.The most important method for producing nanofibers is electrospinning.The capability to produce fibres with diameters ranging from nanometers to a few microns is an important feature of electrospinning. These nanofibers obtained on a screen can be utilized for submicron particle filtration in separation industries as well as biomedical applications, wound

dressing in the medical industry, scaffolds for tissue engineering and artificial blood vessels.It is also promising to use electrospun fibres in critical places in advanced composites to improve crack resistance.

ADVANCE FINISHES IN NANOTECHNOLOGY

Nano finishing is the process of improving some of the functionalities of a textile material by applying a colloidal solution or ultrafine dispersion of nanomaterials.Nanotechnology has advanced significantly in recent years, in large part due to improvements in fabric finishes. Nano-TexTM is one of the leading firms utilizing nanotechnology. By creating novel nanotechnologies, they were able to create a variety of fabric treatments, including (a) permanent anti-static treatment, (b) wrinkle-free treatment using moisture-wicking technology, (c) stain resistance and oil repellent treatments, and (d) "nanobeads" to carry bioactive or anti-biological agents, medications, pharmaceuticals, sunblocks, and even textile dyes (Nano- Care, Nano-Pel, Nano-Touch and Nano-Press technology). These treatments on textile substrates are said to permanently modify the qualities of the textiles and show higher durability, softness, tear strength, and abrasion resistance. They are also said to be able to add softness to hard press clothing.

Coating is another common method for incorporating nanoparticles into textiles. A surfactant, chemicals, a carrier medium, and nanoparticles are typically included in coating compositions that can change the finishing of textiles.The advancement ofNanotechnology can significantly improve water repellence, soil resistance, wrinkle resistance, anti-bacteria, anti-static, UV protection, electromagnetic and infrared protection finishes. Titanium-dioxide nanoparticles have recently been used for UV protection. It is also possible to improve the strength and flame resistance of textile fabrics by using nano-sized silicon dioxide. Contrarily, ZnO Nanoparticles (NPs) have been used to create antistatic properties. The antistatic property of the fabric decreased as the concentration of ZnO NPs in the finishing agent increased due to NP dispersion. The company's patent portfolio in nanotechnology includes PEIN NPs for antibacterial finishing of electro spinnable polymers, NPs and CNTs for substrate finishing, and microbicidal nanofibers. Aquapel is a product marketed by Nanotex LLC (Bloomfield Hills, MI) that mimics the natural water repellency of plant surfaces and animal coats.Aquapel contains an environmentally friendly and low-cost hydrocarbon polymer. Further to that, by decreasing

electrical resistivity, surface polymerization of Conducting Electroactive Polymers (Graft copolymerization) of polymer fibres has the potential to increase conductivity nearly tenfold. Coated polymeric composite materials of this type can be used for microwave attenuation, EMI shielding, and static electric charge dissipation. As a result, they can be useful in military applications such as camouflage, stealth technology, and so onLater, an increasing number of nanocompanies began to invest in the advancement of nanotechnologies (Table.1).

Table.1:

Company	Product	Advantage
Nano-tex	Fabric enhanced with nano whiskers	Water and stain resistant
Aspen Aerogel	Fabric enhanced with nano pores	Insulates against theat or chill
BASF	Fabric enhanced with nano particles(Mincor®TXTT)	Dirtrinses offinrain, similar oproperty of the lotusplant
Nano Horizons	Fabric enhanced with silvern an oparticles	Reducesodors
Schoeller Technologies	Fabric enhanced with nano particles(NanoSphere)	Water and stainresistant
Nanex	Water repellent coatings	
NanoGroup	Fabric enhanced with various nano treatments	Liquid and stainresistant, UV protection ,etc.
Odegon Technologies	Fabric enhanced with nano porous material that absorbsunderarmodors	
GlobalPhotonic	Fabric woven from thread that generate selectricity from thesun(FlexPower™)	Flexible fabric that generates Electricity
Konara	Fabricwovenfromthreadthatg enerateselectricityfromthesun (PowerFiber™**)**	Flexible fabric that generates electricity

NANOTECHNOLOGY IN TEXTILE:

Innovation in wearable technologies is changing how people think about clothing.Designer clothing is becoming more versatile as fashion designers incorporate new communication technologies, flexible electronics, and nanomaterials into their designs.Ralph Lauren, Diane von Furstenberg, Hussein Chalayan, Zac Posen, Rebecca Minkoff, Richard Nicoll, and Iris van Herpen are some of the designers who have led the way in incorporating technology into the world of fashion. Textile is an ideal substrate for the integration of nanomaterials, electronics, and optical devices because it has a universal interface.These integrated materials and technologies provide a platform that interacts to mechanical, chemical, electrical, thermal, optical, or magnetic stimuli. Wearable devices may include sensors, data transmission, and processing units.The fact that traditional approaches to functionalizing fabrics do not result in long-term effects is a significant challenge in the textile industry. Laundry, for instance, reduces the functional effects imparted. As a result, nanotechnology has the potential to play a role in introducing new and permanent functions to fabrics. The integration of various nanoparticles or the creation of nanostructured surfaces has resulted in a new level of textile performances such as hydrophobicity, antibacterial properties, conductivity, antiwrinkle properties, antistatic behaviour, and light guidance and scattering (Figure.1) in order to make chemical finishing more controllable and durable with significantly enhancedfunctionality.

Figure.1.A graphical representation of the diverse applications of nanotechnology-based textiles*(Saleem & Zaidi, et al., 2020)*.

1.WaterandOil-RepellentTextiles:

Water and oil repellency has become a requirement for a wholegarment, and this has become one of the primary targets for textile manufacturers and scientists for years.A majority of similar market needs are currently being met by improved nanocoatings or nanofinishings on superhydrophobic or oil- and water-repellent fabrics. For instance, fluorocarbon derivative audio frequency plasma can be used to coat cotton fibres in nanoparticles. Superhydrophobicity can be generated by adding roughness to the fabric's surface without reducing the fabric's abrasion resistance and softness.There are two distinct approaches that are frequently used to enhance self-cleaning textiles: (i) the lotus effectand (ii) Photocatalytic activity.

Lotus leaf nanostructures have also sparked interest in biomimetic research for textile applications. Cotton fibres were coated with pristine and surface-modified carbon nanotubes (CNTs) to mimic the nanostructure of lotus leaves. Another research inspired by lotus leaves involved the creation of a nanocoating (20 nm) to create hydrophobic textiles.In the method of photocatalytic activity, self-cleaning textiles are created using zinc oxide or titanium dioxide nanoparticle-based coating or finish formulations.The fusion of superhydrophobic SiO2 and photoactive titanium dioxide resulted in fluorine-free superhydrophobic cotton fabrics with self-cleaning photocatalytic ability

OPTICAL DISPLAYS:

Using optical fibre(OF), optical displays on textiles are possible. The first mention of O in textiles was in the 1970s and 1980s. OF were developed initially as a waveguide to transmit light between two ends of a fibre and typically consist of a transparent core covered by a lower refractive index cladding material. OF is easily shaped using textile processes due to its fine dimensions (0.125 - 2.0 mm) and relatively good flexibility (mainly by weaving). Multifunctional fibres, in order to promote aesthetics, could provide textiles with functionalities such as temperature, humidity, strain, bending, and pressure sensing, optical displays, data transfer and communication, lasing, and illumination.

ANTISTATIC PROPERTIES:

Cellulose fibres like lyocell linen, viscose, cotton, etc. do not mount the static charge due to the higher moisture content. However, synthetic fibres like nylonand polyesters are more susceptible to the production of static charge because they are hydrophilic. Synthetic fibres could benefit from nanosized TiO2, ZnO whiskers, nanoantimony-doped tin oxide (ATO), and silane nanosol. TiO2, ZnO, and TiO2 nanoparticles are electrically conductive materials that aid in static charge dissipation in these fibres.

An anti-static garment has been created using nanotechnology. Another study used Sb-NP-doped SnO2 particles to give polyacrylonitrile (PAN) fibres antistatic properties. Polyethyleneimine (PEIN) was used to disperse these particles in water, and this solution was added to the preheating bath during the spinning of PAN fibres. The particles that diffused into the fibres formed electrically conductive channels, resulting in antistatic properties.

SENSORS:

The ability to incorporate sensors and actuators into textiles is made possible by conducting polymers. Using sketching techniques, plasmonic optical fibre sensors can be created. Since plasmonic sensors offer excellent sensitivity for bio/chemical sensing, they have been researched. A spectral drop that corresponds to the phase-matching frequency in the fibre transmission spectrum indicates the presence of such a plasmonic mode. This is how a plasmonic fibre sensor operates in terms of its basic sensing principle.These sensors initiate drug release and aid in rehabilitation. Textiles now include temperature, humidity, and pressure sensors. Touch sensor fabrics have been developed using flexible fibre capacitors. Flexible and elastic fibre capacitors are ideal for use in a traditional weaving process.

WRINKLE RESISTANCE:

Cotton cloth is quite prone to creating creases while being used. Traditional methods frequently use resin-based finishings to provide textile fabrics the ability to resist wrinkles.Yet, using resin has drawbacks, such as a reduction in the tensile strength, abrasion resistance, water absorbency, dyeability, and breathability of the fibre, which can be solved by using nanoparticles like silicon dioxide and titanium dioxide.Under UV irradiation, nano-titanium dioxide was used with carboxylic acid as a catalyst to catalyse the cross-linking reaction between the acid and the

cellulose molecule. However, when nano-silica applied with maleic anhydride as a catalyst, was found to successfully increase the wrinkle resistance of silk.

ANTIBACTERIAL ACTIVITY:

The antimicrobial function has recently evolved into a necessary requirement for all clothing, medical textiles, and household products due to the increased awareness of hygiene and health. To impart textiles fungicidal and antibacterial characteristics, Ag, TiO2, and ZnO NPs can be used. Due to their huge surface areas, Ag NPs are more likely to come into interaction with bacteria and fungi. Ag nanoparticles' antiseptic method is based on how proteins in these organisms interact with them, severely altering their cellular function and preventing cell growth. Additionally, it prevents the growth and proliferation of the bacteria and fungus that result in an infection, odour, itching, and sores. Socks are frequently treated with nano-silver particles to prevent bacterial growth.

Titanium dioxide is a photocatalyst; when exposed to light with energy greater than its band gaps, the electrons in TiO2 will transition from the valence band to the conduction band, resulting in the formation of electron (e-) and electric hole (h+) pairs on the photocatalyst's surface. Oxygen and negative electrons will unite to form O –, whereas water and positive electric holes will produce hydroxyl radicals. The organic component will mix with O and OH, which are also unstable chemicals, when it lands on the photocatalyst's surface, creating carbon dioxide (CO) and water, respectively (H2O). The mechanism of this "oxidation-reduction" cascade process is depicted in (Figure.2).The photocatalyst may degrade common organic airborne particles like bacteria, viruses, and odour compounds through the process.

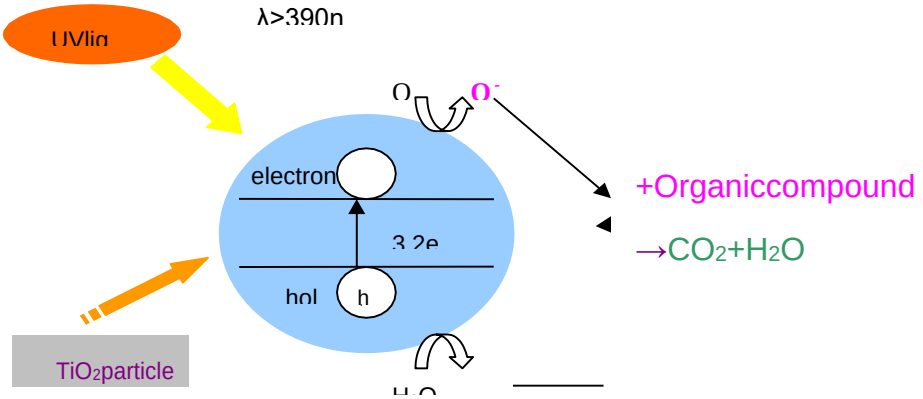

Figure.2.Mechanism of Titanium Dioxide's by Photocatalysis*(Chowdhury & Das, n.d. et al.)*

UV BLOCKING:

Since inorganic UV blockers are non-toxic and chemically stable when exposed to both high temperatures and UV, they are preferred over organic UV blockers. Typically, certain semiconductor oxides including TiO2, ZnO, SiO2, and Al2O3 act as inorganic UV blockers. Titanium dioxide (TiO2) and zinc oxide (ZnO) are two of these semiconductor oxides that are frequently employed. According to researchers, zinc oxide and titanium dioxide at the nanoscale are more effective at absorbing and scattering UV rays than their larger counterparts, which makes them superior UV blockers. When it comes to small particles, light scattering prevails at a wavelength that is around one-tenth that of the scattered light.The aforementioned nano-inorganic-ultraviolet additives are now frequently selected over the organic ones because of their remarkable qualities, including their safety and chemical stability under UV radiation as well as higher temperature exposure. The ultraviolet blocking ability of nano-sized UV additives is influenced by a variety of characteristics, including particle size, phase composition, surface qualities, crystallinity, and crystal structure.In addition to titanium dioxide, zinc oxide nanorods with a length of 10 to 50 nm were used to coat cotton fabric with UV protection. According to a study on the UV-blocking impact, cloth treated with zinc oxide nanorods displayed a high UV protection factor (UPF) rating.

HEALTH IMPACTS OF NANOMATERIAL FROM TEXTILE:

Employees in the textile industries are most exposed to nanomaterials because they are continuously exposed over a long period of time to higher concentrations of manufactured nanoparticles. The skin and respiratory tract are the most common entry points for synthesized nanoparticles. Nanomaterial piles up in the spleen, bone, kidney, and liver after entering the body. Figure.3. depicts a possible engineered nanoparticles (ENPs) pathway in the human body and its hazardous and detrimental effects.Nanoparticles' potential for toxicity varies depending on their chemical composition, surface energy, charge, structure, size, and other characteristics. They also depend on living things and their various DNA coverage ratios.Skin absorption is the main cause for concern when it comes to exposure to nanoparticles from textiles. Due to the abundance of tissue macrophages, lymphatic arteries, dendrites, and different types of sensory nerve endings in the blood and tissue, the skin is regarded as a superior absorptive material.The limits for harmful and allergenic metals and chemicals vary depending on how much a consumer's skin contacts the fabric as well as the toxicity of the heavy metals. These restrictions

only apply to the portion of the chemicals that could be extracted, not the total amount of compounds present in the fabric. The harmfulness of nanoparticles on textiles must be investigated using a similar methodology because the effects of these particles on the environment and human health are uncertain.

CONCLUSION:

The need from consumers for greater connectivity, usability, and appearance in fashion has driven the development of textiles based on nanotechnology. Nanomaterials provide great potential for enhancing the functionality of fabrics and fibres. With many features like antistatic qualities, wear/tear resistance, UV protection, flame retardancy, antimicrobial property, water/oil/ repellency,

self-cleaning ability, and wrinkle-free, nanotechnology offers creative alternatives for the development of new, innovative fabrics. There are numerous substantial scientific studies that report their suitability for cutting-edge functional textile applications, despite the fact that there are still certain problems with their use in commercial applications.Research must be conducted to prevent potential human health risks for users, including adults, but especially babies and children. The nanomaterials market could reach $4 billion by 2007. It was estimated that 2 million new job opportunities would be created in order to meet the global annual production demand of US$ 1 trillion in 10-15 years. There is no uncertainty that nanotechnology will permeate every aspect of the textile industry.

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Department of Costume Design and Fashion

GARMENT INDUSTRY AND MERCHANDISING

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ABSTRACT

Textile Industry is providing one of the most basic needs of people and the holds importance; maintaining sustained growth for improving quality of life. It has a unique position as a self-reliant industry, from the production of raw materials to the delivery of finished products, with substantial value-addition at each stage of processing; it is a major contribution to the country's economy. This paper deals with structure, growth and size of the Indian textile industry, role of textile industry in economy, key advantages of the industry, textile industry export and global scenario and strength, weakness, opportunities and threats of the Indian textile industry. The purpose of sampling is not only to get bulk orders and also give some additional benefits to the exporters. By doing sampling the exporter can estimate the yarn consumption for developing the fabric, a clear idea on costing more ever the manufacturing difficulties. Besides by doing sampling only, the exporter can optimize the processing parameters for mass production, which helps to avoid all kind of bottlenecks. All these works are carried out by the sampling department, which we led by a sample.

KEYWORDS: Industry, global scenario, opportunities, manufacturing, bottlenecks.

INTRODUCTION:

India is world's second larger producer of garment industry after China. The garment industry in India is one of the oldest manufacturing sectors in the country and currently it’s largest. The Garment industry fulfils a vital role in Indian economy. It is a major foreign exchange earner and after agriculture it is largest employee with total workforce. The garment industry covers a wide range of activities. India's garment sector earns high export revenue. These include the production of natural raw materials such as cotton, jute, silk and spun yarn and fifth largest producer of synthetic fibre and yarn. The Indian garment industry workforce predominantly comprises first generation women workers. Most of women involve in garment industries. All types women can get job in garment industries is that educated or uneducated. In India, Garment products export more product than other types of product. In 1970 - 71 near

about 12 carer and present 18000 carer products exported by nation and equity participation and 24 % by the foreign partner. The account of India's exported product for around 20 % of India's industrial output and 37 % of total exports. There are 5777 factories in India employing 3,27,397 personnel producing goods both for home market and for export. In India, Bangalore, Bombay, Delhi, Tripura etc are top cities for garment industries. There are 780 garment manufacturing units in Bangalore alone. Income of garment industries share more part in Gross Domestic product of nation. It plays an important role in economic growth. Garment industries interrelated with textile industries and Laundry industries. Garment industries produce all types' readymade cloths for all types people.

GARMENT PRODUCTION:

Garment industry is product is industrial revolution. The first advances were made in the mass production textile through the invegestion of machinery for weaving and spinning. These inventions first appeared in 18th century. Not it until 19 century was the major machines for making garment invented.

GARMENT PRODUCTION IS AS FOLLOWS

1. Cutting
2. Sewing Pressing
3. Assembly line production
4. Quality control

CUTTING:

Before materials can be sewed together to form a garment. They must cut according to a pattern. This is a three part operation. The fabric must first spread on table. Then the pattern is laid on the fabric. The arrangement of pattern on the spread fabric is called cutting lay of marker.

SEWING:

More than 10000 different kinds of industrial sewing machines have been produced. Most of these are manufactured in great Britain, United state, Germany, Italy and Japan, Sewing

machines are classified according to type of stitches. They make by the shape of machines frame. The main character is the stitch.

PRESSING:

The purpose of operation categorized as pressing is to remove wrinkles from garment to give it shape. The two basic operations are called Buck pressing and Iron pressing. There are other processes pleating, creasing, mangling, blocking, curing and casting. Many of these operations are used also in dry cleaning.

ASSEMBLY LINE PRODUCTION:

In early clothing factories, each worker assembled and finished on endive garment since 1940. At the large ready - to - wear apparel, industry has operated assembly line fashion with strict division of labour among employees. The reasons for this are to increase productivity to improve quality and to eliminate large inventories.

QUALITY CONTROL:

The quality of garment is measured by its lasts by it usefulness and by its appeal to sight and touch. If a garment tears easily, it is not durable. If a cold weather top coat does not keep it wear warm, it is not useful. If a piece of clothing is coarse to the touch, it lacks appeal.

SAMPLING DEPARTMENT:

First the job order file comes to the factory after receiving. The file + Size + Pattern + Original sample garment have to do sampling. It means as per file and pattern and for reference original garment have to see. After making the sample, they have to send it to the party for approved then once garment receive the approval from the party garment can start the order.

FABRIC DEPARTMENT:

Fabric has all types like cotton silk, checks or printed is stored in this department 100 % checking of the fabric is done here. Lot wise, color wise entries are hide to maintain the stock from here. The fabric is being issue to cutting department as per the requirement again after complication of one lot balance cut per damage parts fresh fabric is stored in this with a propend note in the stock register.

CUTTING DEPARTMENT:

This is the heart of garment unit because a minor mistake at this stage can become a major problem at next stage can become a major problem at next stage. So a good pattern cum cutting master must be there as a head of the department the cutting is done as per the order quantity plus 2 % extra fabric is said down the quality table as per the average of garment three

people are read for this paying purpose. After completing the layer cutting master is doing marking this layer. As per the pattern that garment reed from the party then after working he again checks the same and start cutting. After numbering, bundling is done. It means 10 ports or bundle number give for every bundle and now it is ready to issue for stitching

STITCHING DEPARTMENT:

One approved sample with the comments and with accessory chart is issued to this department before starting any order here group system is followed for example for one group of 32 machines, there is one supervisor one quality controller and one helper & one clerk is given.Each part of garment is made separately and then it is attached together at every stage, the Quality Control is checking for quality and the same time the supervisor is there to see that every worker should get proper feeding to improve the productivity and efficiency, helper is there to give accessories to workers and clerk is to maintain the record production of each worker.

To each worker, one paper is given to do entries of the bundle numbers. He stitched because of these entries we can search that who has made mistake in one particular bundle. In this department when the garment gets ready, there is a first stage checking department which is checking for alternations, if any alternations are there or any faultier there the garment is sent back to the particular worker who has done the mistake and then get if required from the same person.

The loose threads on garments are being cut with the help of cutters. In any garment that is produced for export purpose, loose threads are not at all acceptable so industry take maximum care at this stage. Mostly ladies workers are appointed in this department. After thread cutting, the garment is ready for checking.

CHECKING DEPARTMENT:

When the garment comes to this department, it is the stage from where the quality garments are only passed and rest are sent back to either alteration department to repair the mistakes or the garments are rejected and the rejected garments remain in stock with the job worker only. If are the percentage or rejection crosses are more than 2 % then where it may cause short shipment which is not acceptable in garment export only 1 - 2 % rejection is allowed.

Here the checkers are given measurement to check and to take the measurements of found anything wrong, they keep it aside to show the floor in charge.For open seam on for wrong stitching also the garment is being checked. This department is responsible for anything wrong, that found at packing stage. Because this is the last and final checkpoint at this the garment are ready for packing.

PRESSING AND PACKING DEPARTMENT:

In this department the garment is pressed by steam press and it is. folded with help of pattern andthen price tags are put on the garment and every garment is packed in an individual poly bag. Again, it is checked that the particular price tag is put or not, so avoid the sorting mistake. Then garments are packed in box is that carton. The packing may be solid or assorted depending on the buyers requirement. Solid making means, in one carton have to pack garment of every size as per ration given by the buyer. After packing the garment in carton the goods are ready to dispatch. The stickers of address put on the cartons.

MERCHANDISING:

Merchandiser is the interface between Buyer & Exporter. He is the responsible fromorder analysis to shipment. So Merchandising is the very valuable department in the Apparel Industry. This Article explains the main responsibilities of merchandisers. Merchandising is the department which mediates marketing and production departments. Sometimes, merchandising department will have to do costing and pricing also. In any case. the merchandiser is the person whose responsibility is to execute the orders perfectly as per the costing and pricing. So it is a very valuable department. The word merchandising has become very popular in young generation. And the job of merchandiser has also taken very popular dimension in the world. Merchandise means goods that are bought & sold. It is as simple as taking the product from a company and selling it to the customer. Merchandising is the techniques, practices, and operations used to promote, encourage and carryon particular categories of commercial activity. The concept of marketing and merchandising has somewhat emerged from the cover of the phrase merchandising.

HISTORY OF MERCHANDISING:

Historically, buyers worked in-store, but retailers have moved away from this model because of high overheads and negligible buying power. By centralising their buying power, the retailer is able to negotiate better margins, cut costs and improve efficiency by using centralised storage and processing. Buyers turned their attention overseas in a bid to gain margin, increased lead times and secure the minimum quantity of stock that could be ordered. This brought a new dimension to retail trading. As a consequence merchandisers were introduced to manage the stock, sales and intake, leading to the creation of the WSSI (weekly stock, sales and intake) report, now central to many retailers and used from department to board level.Consumers are increasingly adopting ‘disposable living' behaviour - acting on their desire to upgrade and improve on possessions rather than purchasing for necessity's sake. Trends and seasonality are speeding up in an effort to capture the attention of spontaneous consumers as well as those keen to be seen forerunners within specific product groups. In turn, effective merchandising skills are essential in keeping product ranges firmly in the mind of the consumer choosing for want rather than need's sake.

RIGHTS OF MERCHANDISING:

In modern merchandising, distribution responsibilities are absent, and focus is placed on planning and analysis. A separate team is tasked with distribution. Large organizations separate merchandisers by type. There are retail merchandisers and product merchandisers. Retail merchandisers manage store allocation and must maximize sales. Product merchandisers manage the flow of materials to suppliers and then the flow of product to stores. Product merchandisers then pass control of product to the retail merchandisers. The distribution team specializes not only in managing distribution, but they are also focused on sales and profit. They employ detailed, accurate information about distribution points sourced from product planners. They possess the ability to manage dynamic stock demands. They partner with buyers and merchandisers for any necessary repeat buying. Though they are positioned to manage stock, they still operate within the limits of the buying plan, and merchandisers ensure they remain within this realm. Buyers provide guidelines for distribution such as the type of stores where product should be distributed; for example, a product may have only been acquired for the top 3 stores. The team also supports the goals of an organization through being instrumental in responding to trends. The nature of modern analysis has allowed many merchandisers to plan as much as four seasons ahead, and they are expected to apply the data. This further increases the demands placed on their roles and emphasizes the need to task out minor details that do not require their input or much of their supervision

Fashion merchandisers follow the five rights of merchandising, or 5Rs, to ensure that they properly meet the needs of consumers; thus, turning a profit

The five rights of merchandising include:

- the right merchandise
- at the right price
- at the right time
- in the right place
- in the right quantity

By researching and answering the five rights of merchandising, fashion merchandisers can gain an understanding of what products consumers want, when and where they wish to make purchases, and what prices will have the highest demand. Both fashion retailers and manufacturers utilize the 5Rs

MERCHANDISING KEY RESPONSIBILITIES IS AS FOLLOWS:

- Product Development
- Market and Product Analysis
- Selling the concept

- Booking orders
- Confirming Deliveries
- Designing and Sampling
- Costing
- Raw Material
- Flow Monitoring
- Production Follow Ups
- Payments Follow
- Internal & external communication,
- Sampling
- Lab dips
- Accessories & Trims
- Preparing internal order sheets
- Preparing purchase orders
- Advising and assisting production,
- Advising quality department about the quality level
- Mediating production and quality departments
- Giving shipping instructions and the following shipping,
- Helping documentation department
- Taking responsibility for inspections and
- Following up the shipment.

MARKETING MERCHANDISING:

The main function of marketing merchandising is

- Product Development
- Costing
- Ordering Marketing merchandising is to bring orders costly products development and it has direct contact with the buyer.

PRODUCT MERCHANDISING:

Product merchandising is done in the unit. This includes all the responsibilities from sourcing to finish i.e, first sample onwards, the product merchandising work start and end till the shipment

FASHION MERCHANDISING:

Merchandising can be defined as the planning and promotion of sales by presenting a product to the right market at the proper time, by carrying out organized, skillful advertising,

using attractive displays, etc. Merchandising, within fashion retail, refers specifically to the stock planning, management, and control process. Fashion Merchandising is a job that is done world-wide. This position requires well-developed quantitative skills, and natural ability to discover trends, meaning relationships and interrelationships among standard sales and stock figures. In the fashion industry, there are two different merchandising teams: the visual merchandising team, and the fashion merchandising team. The visual merchandising team are the people in charge of designing the layout, floor plan, and the displays of the store in order to increase sales.

CONCLUSION:

The merchandise budgeting can be applied at a traditional retail as a tool for the retailer to balance the expectation of the target customers and the strategy of business. The owner must be able to prepare the available money to fulfill the replenishment each month. The money can be taken from the modal or loan from bank. Then, determine the sales target of the Mitra Mart. The owner has the option to decide the sales target of Mitra Mart. The more sales target, the more projection sales From the Findings discussed under 5, it is evident that the problems faced by the local textile weaving industry could be best resolved by taking appropriate corrective actions by the respective stakeholders of the industry. This includes employees and owners of firms, suppliers, creditors including banks and other financial institutions, buyers, industry associations and chambers and the government. Certain measures such as elimination of wastes and improving labor productivity which are internal and firm specific should be taken up by the respective organizations. The macro issues such as inconsistent tariff structures and concessionary funding for new investments in the industry could be implemented with the assistance of the state and the private sector.

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ENZYME APPLICATION IN TEXTILE INDUSTRY

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Abstract

One of the most quickly expanding areas of industrial enzymology is the use of enzymes in the textile industry. Amylases, catalase, and laccase, proteinase which are used to remove starch, break down excess hydrogen peroxide, bleach fabrics, and break down lignin, are the enzymes utilized in the textile industry. Since it is becoming more and more crucial for textile manufacturers to prevent pollution in textile production, the use of enzymes in chemically processing textiles is quickly gaining awareness on a global scale. Due to their substrate selectivity and environmentally friendly chemistry, enzymes as biocatalysts have been astonishingly well-received in a variety of industries. It is recognized that using enzymes specifically for textile processing is beneficial since they can replace harsh chemicals used in traditional methods and save water and energy. However, their uses were frequently impeded by their high cost and lack of long-term stability under storage and process conditions. The objective is to educate the textile technologist about enzymes and how to employ them with textiles. Enzymology and molecular biology developments offer opportunities for the discovery of novel enzymes, the modification of existing enzymes, and the development of enzyme-based processes that are environmentally friendly

Key words

Enzyme, biology, textile processing, chemicals, catalyst, industry, environment, development

Introduction

The textile industry has become increasingly popular with enzyme treatments because of their stereo specificity, non-toxicity, environmental friendliness, and energy efficiency. A textile chemical process typically involves the use of enzymes at each step of the manufacturing process. A few important enzymes to mention in this category are amylases for textile designs, celluloses for washing denim and leather, and proteases for wool modification. Due to extreme pH and temperature conditions, enzymes have limited industrial acceptance despite lot potential.

Enzymes have been around mankind since thousands of years. They are living organisms and have been used to carry out chemical reactions to make items like cheese, beer and wine. As it has become crucial to reduce pollution in textile processing, the textile manufacturers have increased the use of enzymes in various textile processes. Today, enzymes are widely used and well known for their non-toxic and environment friendly nature. Enzymes work only on renewable raw materials. Fruit, cereals, milk, fats, cotton, leather and wood are some typical candidates for enzymatic conversion in industry (Uhlig, 1991; Ruttloff, 1994). Out of the 7000 enzymes known, only about 75 are used in the textile industry (Quandt&Kuhl 2001).

Classification of Enzymes

Enzymes are biocatalyst, and by their mere presence, and without being consumed in the process, enzymes can speed up chemical processes that would otherwise run very slowly. After the reaction is complete, the enzyme is released again, ready to start another reaction. Usually most enzymes are used only once and discarded after their catalytic action. Enzymes are very specific in comparison to inorganic catalysts such as acids, bases, metals and metal oxides. Enzyme can break down particular compounds. The molecule that an enzyme acts on is known as its substrate, which is converted into a product or products. For each type of reaction in a cell there is a different enzyme and they are classified into six broad categories namely hydrolytic, oxidising and reducing, synthesising, transferring, lytic and isomerising. The International Commission on Enzymes (EC) classification system is divided into six categories of basic function:

EC1 - Oxidoreductases: catalyze oxidation/reduction reactions.

EC2 - Transferases: transfer a functional group.

EC3 - Hydrolases: catalyze the hydrolysis of various bonds.

EC4 - Lyases: cleave various bonds by means other than hydrolysis and oxidation.

EC5 - Isomerases: catalyze isomerization changes within a single molecule.

EC6 - Ligases: join two molecules with covalent bonds.

Each enzyme is described by a sequence of four numbers preceded by “EC”. The first number broadly classifies the enzyme based on its mechanism. Enzymes can work at atmospheric

pressure and in mild conditions with respect to temperature and acidity (pH). Most enzymes function optimally at a temperature of 30ºC-70ºC and at pH values, which are near the neutral point (pH 7). Enzyme processes are potentially energy saving and save investing in special equipment resistant to heat, pressure or corrosion. Due to their efficiency, specific action, the mild conditions in which they work and their high biodegradability, enzymes are very well suited for a wide range of industrial applications. Enzymes work only on renewable raw materials. Fruit, cereals, milk, fats, cotton, leather and wood are some typical candidates for enzymatic conversion in industry. Enzymes are used in the textile industry because they accelerate reactions, act only on specific substrates, operate under mild conditions, are safe and easy to control, can replace harsh chemicals and enzymes are biologically degradable i.e. biodegradable (Uhlig, 1991; Ruttloff, 1994).

Properties of enzymes

1. Enzyme accelerates the reaction

An enzyme accelerates the rate of particular reaction by lowering the activation energy of reaction. The enzyme remains intact at the end of reaction by acting as catalyst.

2. Enzymes operate under milder condition

Each enzyme have optimum temperature and optimum pH i.e. activity of enzyme at that pH and temperature is on the peak. For most of the enzyme activity degrades on the both sides of optimum condition

3. Alternative for polluting chemicals

Enzymes can be used as best alternative to toxic, hazardous, pollution making chemicals. Also some pollutant chemicals are even carcinogenic. When we use enzymes there is no pollution

4. Enzyme acts only on specific substrate

Most enzymes have high degree of specificity and will catalyze the reaction with one or few substrates. One particular enzyme will only catalyze a specific type of reaction. Enzymes used in desizing do not affect cellulose hence there is no loss of strength of cotton

5. Enzyme are easy to control

Enzymes are easy to control because their activity depends upon optimum condition

6. Enzymes are biodegradable

At the end of reaction in which enzymes used we can simply drain the remaining solution because enzymes are biodegradable and do not produce toxic waste on degradation hence there is no pollution

Enzymes used in Textile Processing

Textile De-sizing

Bio enzymes like amylases are used for textile de-sizing. When producing cotton textiles starch and other sticky materials are used (collectively called 'Size') for weaving cotton fabrics. Amylases are used to remove starch-based size for improved and uniform wet processing in the textile industry. An amylase enzyme can be used for desizing processes at low-temperature (30-60ºC) and optimum pH is 5.5-6.5. . Before enzymes were introduced, corrosive substances like salt were used at very high temperatures for the de-sizing process. The advantage of these enzymes is that they are specific for starch, removing it without damaging to the support fabric

3. Enzymatic Bio-Scouring

Bio-Scouring means cleaning the non-cellulosic material from cotton textiles. For this purpose, cellulase and pectinase are mixed and used. In this pectinase destroy the cotton cuticle structure by digesting the pectin and removing the connection between the cuticle and the body of cotton fiber whereas cellulase can destroy cuticle structure by digesting the primary wall cellulose immediately under the cuticle of cotton. Pectinase separates the material from the cotton fibers and cellulase deconstructs it.

4. Enzymatic Bleaching

The purpose of cotton bleaching is to decolorize natural pigments and to confer a pure white appearance to the fibers. Mainly flavonoids are responsible for the color of cotton. The most common industrial bleaching agent is hydrogen peroxide. Conventional preparation of cotton requires high amounts of alkaline chemicals and consequently, huge quantities of rinse water are generated. However, radical reactions of bleaching agents with the fiber can lead to a decrease in the degree of polymerization and, thus, to severe damage. Therefore, replacement of hydrogen peroxide by an enzymatic bleaching system would not only lead to better product quality due to less fiber damage but also to substantial savings on washing water needed for the removal of hydrogen peroxide. An alternative to this process is to use a combination of suitable

enzyme systems. Amyloglucosidases, pectinases, and glucose oxidases are selected that are compatible concerning their active pH and temperature range.

2. Bio Finishing and Polishing

Bio polishing is a finishing process that improves fabric quality by mainly reducing fuzziness and pilling property of cellulosic fiber. The objective of the process is the elimination of micro fibrils of cotton through the action of cellulase enzyme. Biopolishing treatment brings the fabric a cleaner surface, a cooler feel, lustre, and softer feel. Bio-finishing and polishing used for washing of different textiles like cotton, rayon, linen, etc.

5. Canvas and Denim Finishing

Denim products like jeans, shirts, and jackets are 'finished' or faded to various degrees for achieving the 'denim look'. This is done by stone and acid washing the denim products by putting them in big washing containers along with large stones, chlorine, bleach, and potassium permanganate. This will achieve a soft and faded look but weaken the integrity of the fabric. To prevent this, cellulases are introduced. They quicken the fading of the fabric from the outside and leave the inside part intact.

Conclusion

Enzymes have tremendous progress in textile chemical processing to meet up the green and sustainable demand in 21st century. There are several commercially successful enzymes are amylases, cellulases, pectinases and catalase for textile wet processing. Enzyme immobilization is another important technique for highly efficient textile processes. This chapter highlights the integration of enzyme based bio-treatments in textile processing. In this context, different enzymatic processes have already been developed or in the process of development for textile processing. In this regard, this chapter summarizes current developments and highlights the environment-friendly enzymatic applications. So, extensive research is required for the implementation of enzyme-based processes for both synthetic and natural fibers. Due to wide variations in the properties of individual enzyme
s and their reaction mechanism, there are still considerable and reliable tools for potential applications in different textile processing.

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ECO FRIENDLY TEXTILES

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ABSTRACT

Sustainable fashion, also called eco fashion, is a part of the growing design philosophy and trend of sustainability. So it is very important to make textile industry more sustainable. Now- a- days a wide range of techniques and innovations related to textile production have been developed to save the world from being affected by the effects of chemicals. During the production process controlling pollution is as vital as making a product free from the toxic effect.The goal of which is to create a system which can be supported indefinitely in terms of human impact on the environment and social responsibility. . Eco-friendly fibers, techniques and innovations that are developed to make textile industry more sustainable.

Keywords: Eco fashion, sustainability, Textile industry

INTRODUCTION

Improvement in standard of living and global population growth has led to increase in textile consumption and production in the recent years. Numerous inventions are made to protect our mother planet because the textile business is a prime example of the most developed and environmentally damaging industry in the world. Making textiles more sustainable is vital since the production steps, which include bleaching, dyeing, and other processes, contribute significantly to pollution. Controlling pollution is just as important as creating products without hazardous consequences. As a result, in order to protect our environment, we must use technology that can both maintain the eco-balance system's and produce products without toxic effects. Since all clothing requires water (for the fibers to grow), there isn't truly such a thing as 100% eco-friendly clothes.Clothing composed of natural fibers, such as organic cotton and hemp, clothing that has been naturally dyed using plants, or other materials that require little water, energy, or chemicals that are harmful to the environment can all be categorized as eco-friendly clothing. Natural fibers are particularly appealing because to their inherent qualities,

which include mechanical strength, low weight, and healthy wear for the wearer. Ecology is short for the term "eco." Ecology is the study of how organisms interact with their surroundings. Therefore, the phrase "eco-friendly" (or "ecology-friendly") is used to describe products and services that are thought to cause little to no harm to the environment. The guiding principle of tomorrow for the global textile business is "Think globally, act locally."

ECO FRIENDLY TEXTILE

Textiles need to be created from renewable resources if they are to be sustainable. The textiles used to create the eco-friendly textile are made without the use of chemicals or pesticides during the growth process. We are profiting greatly from environmentally friendly textile. For instance, it is naturally free of disease and mould immunity.

It is a great choice for those who have allergies. Naturally, not only for them. It's excellent and probably the only choice for everyone because the world is changing and everything we do and produce moving forward must be sustainable. Given that nature provides us with so many options in this area, using eco-friendly textiles is a terrific place to start. Among them are hemp, bamboo, and linen are eco friendly fibers.

Needs of Eco Friendly Textile

The textile sector is regarded as the one that harms the environment the most globally. The environmental issues in the textile industry start during some stages of production and continue all the way to the finished product. During the production process, such as bleaching after dyeing, the resulting fabric produces a poison that spreads throughout our ecosystem. so there is a need accessories made from recycled and organic materials.

Environmental concerns have grown significantly in recent years, particularly in the textile and garment sector, an industry not known for its eco-friendliness. Every textile product emits environmentally hazardous effluents.

The conventional textile business uses a significant quantity ofpollutes the environment as a result of their manufacturing and processing, depleting the planet's natural resources. Green fabrics are consequently required because of chemically intensive applications. As important as developing a product toxic-free is the procedure of pollution control.Utilizing lower impact products or reducing the environmental impact of fabric products over their whole life cycle can help to actively improve the problem. There are four main environmental elements that are

particularly important for the production of textiles pollution, use of non-renewable resources, water, and energy.

Importance of Eco friendly Textile

Textiles must be produced using renewable resources if they are to be sustainable. Individual change in this world is challenging, but collectively, we can all contribute to the eco-friendly sector. Of certainly, everyone should be concerned. We all want to live in a safe and healthy environment on the same planet. Although it is difficult to alter the world on your own, everyone may contribute when we discuss eco-friendly business.

The organically produced fabrics used in the eco-friendly textile's construction were grown without the use of pesticides or chemicals during the manufacturing process. The environmentally friendly textile offers us a lot. It is, for instance, disease-free and naturally mold-resistant. For those with allergies, it is an excellent choice.Naturally, not just for them. Because the world is at a turning point and everything we do and generate moving forward must be sustainable, it is a fantastic option for all of us and likely the only one. Since nature provides us with so many options in this area, using eco-friendly textiles is a terrific place to start. Hemp, bamboo, and linen are three excellent eco-friendly fabrics.

Eco Friendly Fibers

1. BAMBOO - Made from the pulp of bamboo plants, bamboo is a regenerated cellulosic fiber. It is a tough, highly regenerative grass that typically requires few chemical inputs to flourish. Its renewable nature is the primary aspect that qualifies it as an eco-friendly fiber. The cloth breathes, and it has natural antibacterial characteristics. Bamboo offers a larger range of uses since it is cosy, plush, lustrous, and absorbent. Air conditioning Dress has been crowned as bamboo clothing**.**
2. ORGANIC COTTON - Organic cotton is more environmentally friendly than regular cotton since it doesn't use pesticides or insecticides during the growth cycle. Conventional cotton production utilizes more than 25% of the world's pesticides. However, it requires more labour and requires fields to be chemical-free for three years before a crop can be certified organic. The manufacture of colored cotton or natural dyes, which can further minimize the quantity of chemicals used, is another recent and encouraging innovation.

3. HEMP - Hemp has the greatest potential as an eco-friendly fiber. Hemp fibers are thought to have a smaller ecological impact than other fibers. It is quickly regenerative, uses little, if any, pesticides, doesn't deplete the nutrients in the soil, thrives without fertilizer, and needs little maintenance. This makes harvesting simple. It is a long fiber that is durable.
4. SOY CASHMERE/SILK - This material is created from the soy protein fiber that is left over after soybeans are processed to make food. Proteins that have been liquefied are extruded into fibers, which are spun and used in the same way as other fibers. It is amenable to natural dyes because to its high protein content. in order to design their own hues.
5. WOOL -Wool is a renewable resource that resists fire and doesn't require chemical inputs. Wool that is produced utilizing sustainable farming methods is becoming more and more readily available. Wool is a very practical cloth with several significant qualities that make it incredibly alluring. One of wool's main advantages is that it effectively absorbs moisture by luring it towards the fibers centre. A recent development in the wool industry is a product called WoJo that was developed in New Zealand, a country well-known for its sheep.

ECO FRIENDLY FABRICS

Hemp, wool, organic cotton, soy silk, bamboo fabrics, jute, corn fiber etc are considered as eco-friendly fabrics due to their availability from nature without any harmful effects of chemical or toxics. Moreover, as compared to other synthetic fibers they are available in a cheap rate. Textile chemical processing is shifting to undeveloped countries due to easy availability of low-cost labor and minimum eco-restrictions. This is also because of various manufacturing processes undertaken by developed countries and awareness about the related health hazards amongst these people. However, such measures though may be beneficial for the employer, but they are unsafe for the society and therefore their control is very much needed.

Cultivation of cotton

Cotton cultivation requires large amount of pesticides, fertilisers and water. With the increasing use of cotton, 22.5 percent of insecticides are used globally for it. Subsequently, this

increasing use of cotton requires approximately 257 gallons of water for one T-shirt. Pesticides are biologically active chemical compounds, which curtail the growth of organism like bacteria, fungus, algae, insects, etc. Averting the augmentations of these unwanted organisms improve the crop yield make the quality of fibre better. Water if utilized in too much quantity in irrigation of cotton, can increase the salinity of land and thereby decrease its fertility.

- **Spinning**

  In the spinning process, individual fibres float in the air and thus pollute the atmosphere in the spinning department. Such floating fibres are dangerous to human beings who inhale it. To minimize the effect of these floating fibres or impurities, the humidified air which is scattered in the spinning department is filtered so as to remove these floating impurities from the air.

- **Sizing**

  In the sizing function, starch is used in sticky paste form to the yarn to enhance its strength and abrasion resistance. The starch paste consists of preservations in order to protect it from the attack of microorganisms. Some preservatives like pentachlorophenol, which are obtained from phenolic and/or chlorinated compound, possess a toxic effect on human skin. Hence, such preservations should be avoided. Utilizing a synthetic starch decreases the use of such preservations, thereby decreasing the health hazards likely to occur because of phenol and/or chlorinated preservative.

Loom shed

There are two types of pollutants created by the loom shed, namely floating particles like fibrous substances and size particles and noise pollutions. If proper measures are not taken during the weaving operations, oil stains are formed. Before textile chemical processing, these oil stains are removed in subsequent gray folding department by applying stain remover. Hence, measures are taken to lessen oil stains in the cloth and probably the application of carbon tetra chloride based products should be avoided in stain remover and other textile products.

Textile processing regarded as non-eco-friendly

Use of chemicals like potassium dichromate, sodium hypochlorite or peroxide and sodium hypochlorite in the preparation process of desizing, scouring and bleaching with their related wash-off stages, produces heavy Biological Oxygen Demands (BOD) in the effluents.

Chlorine is not used in bleaching because it creates halogenated organic substances, of which some are suspected to be carcinogenic, e.g., chloroform.

Table 1: Desizing, Scouring and Bleaching: Pollution loads in cotton processing

Process	Water Consumption of total (%)	BOD of Total	Pollution load of total (%)
Desizing	5	22	>50
Scouring	1	54	10-25
Bleaching	46	5	3
Mercerising	2	2	<4
Dyeing	8	5	10-20
Printing	7	6	10-20
Finishing	1	7	15

Table-1 indicates that the maximum use of water and production of Biological Oxygen Demand (BOD) in effluent process-houses of composite mills comes from desizing, scouring and bleaching procedures.

For decreasing BOD, it is recommended to choose the size recipes offering a low COD (Chemical Oxygen Demand) and BOD value. A change from pure starch to synthetic starch decreases BOD because of starches by approximately 90 per cent. Wool industry uses chlorine based compounds for anti-shrinking dealing, and suchpractice also generates toxic effluent. For removing rust stains in bleaching, before bleaching the cloth is treated with oxalic acid. The oxalic acid is lethal to aquatic organisms and it increases COD and BOD to a significant level.

Approaches for eco friendly practices

Prevent: To prevent is to give up a process or product in favor of noticeablyImproving the environmental situation.

Decrease: This can be attained by reducing the pollutant load, exhaustion andFixation of dyes close to 100 per cent and responding to water and energyrequirement.

Re-utilize: Re-utilization of the dye bath is a vital deliberation under the pressureOf dwindling resources. This has now turned into pragmatism because ofaddition of new auxiliaries, modern filter technology and spectrophotometers that calculate the substance of the dye in the dye bath accurately.

Recycle: This recycling of natural fibers is achievable, but it has a limitation ofapplication because of natural degradation. Synthetic fibers can be recycled byMelting down and retranslating with or without applying fresh granules. This**Eco Labeling**"Ecolabeling" is a

voluntary method of environmental performance certification and labeling that is practiced around the world. An ecolabel identifies products or services proven environmentally preferable overall, within a specific product or service category.

Eco Mark on Textiles

Eco mark is a certification mark issued by the Bureau of Indian Standards (the national standards organization of India) to products conforming to a set of standards aimed at the least impact on the ecosystem. The marking scheme was started in 1991. One of the purposes of the mark is increasing awareness among the consumers towards reducing environment impact. The mark is issued to various product categories and the development of standards for more products is in progress.

THE ECOMARK LOGO

Earthen Pot

CONCLUSION

So far, we have talked about the several environmentally friendly fibres that are on the market and intended to cut down on the toxic chemicals used in textile manufacture. Although there are numerous materials available, we can still develop new eco-friendly textile technologies that guard against future environmental degradation. "Dresses aren't the only item that may be considered fashion. The sky and the street are both full of fashion with ideas. So let us go green and make fashion more eco-friendly.

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DEVELOPMENT OF FRAGRANCE NATURAL DYE ADDED NON-WOVEN FABRIC

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INTRODUCTION

In the fabric production health care and hygiene sectors are vast increasing field the world textile manufacturing is moving rapidly towards the manufacture of high-added value.Textile structures and product such as medical textile, defensive textile and smart textile. Textile materials used in the medical and applied health care and hygiene sector are on main and increasing part of the textile industry (L. Kananga lakshmi 2008).

In recent years there has been a very fast growth in non woven fabric division of the textile industry. A demand for nonwoven textiles has greater than before many folds over the years in the domestics and export market (Abijithmujamdar, 2011). Primarily nonwoven fabrics were utilize in technical applications like geo-textiles, medical & healthcare, agriculture and horticulture, filters, packaging, home furnishing, etc. But, sadly only 1% nonwoven fabrics is utilized for apparel applications (Vaibhav K. Dhange2012). However multiplicity of medical textile product has been innovated in non woven fabric. Non woven materials are now-a-day mainly produced from manmade and natural fiber. Nonwoven are often application selected as either durable or non-refundable (L.kanagalakshmi 2008).

SCOPE OF THE STUDY

The main scope of the study is to develop fragrance finished nonwoven fabric using cardamom and Rosa damascene which would reveal the newer dimension of textile technology and facilitate further research in exploring discovering newer necessitate and develop innovative idea in developing fragrance textile.

OBJECTIVE OF STUDY

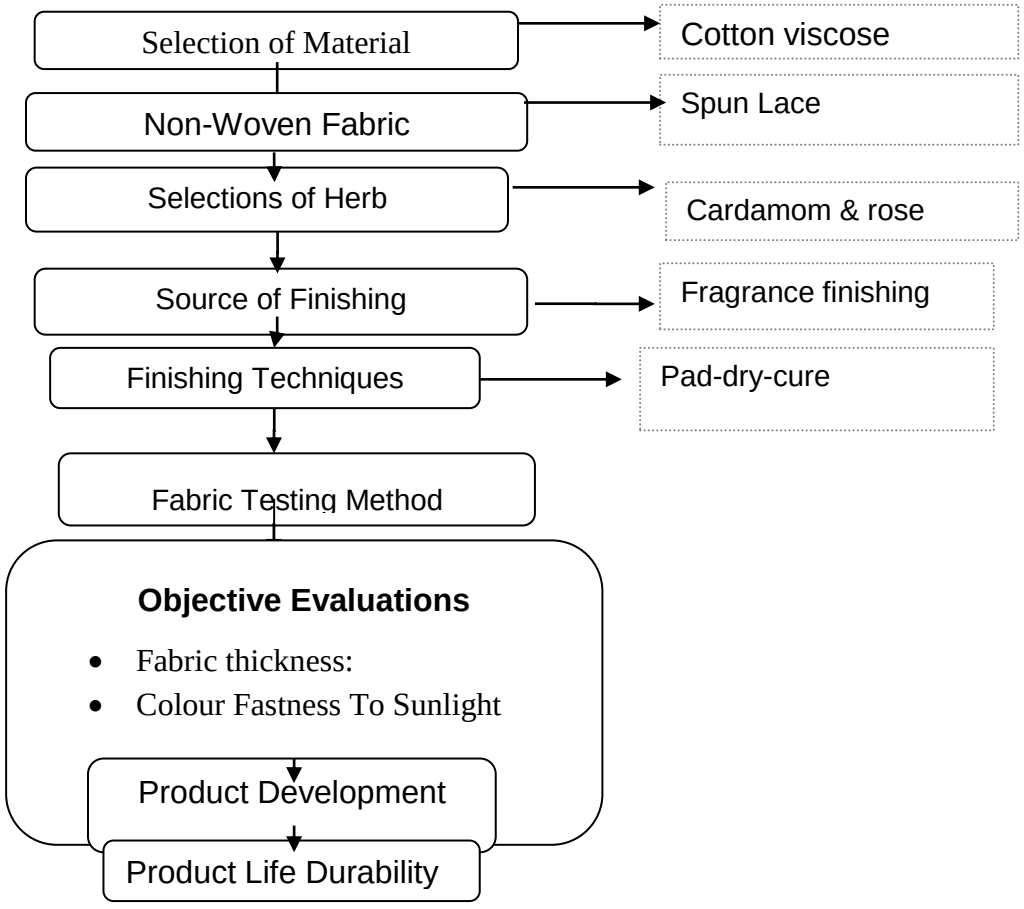
- To select the suitable fabric for the study.
- To identify the suitable natural herbs for fragrance finish.

- To study to properties of selected herbs for fragrance finished.
- To optimize the method of herbal extraction.
- To apply the fragrance finish to the suitable fabric.
- To evaluation the physical properties of finished fabric.
- To develop product using finished fabric.
- To study the product fragrance finished life durability.

EXPERIMENTAL PLAN OF THE RESEARCH WORK

The experimental plan to carry out this research work has been given in using a flow chart.

FIGURE 3.1 EXPERIMENTAL PLAN OF THE RESEARCH WORK



SELECTION OF MATERIAL

The 50% Cotton and 50% Viscose Nonwoven fabric using spun lace technique is selected for purchased from “South Indian Textile Research Association” Tamil Nadu.

TABLE PARTICULARS OF FABRICS

Fabric Used	Disposable
Fiber blend	Cotton viscose
Composition	50% cotton50% viscose
Manufacturing process	Spun lace

PLATE NON-WOVEN MATERIAL

SELECTION OF HERBS

The herb is selected for finishing of non-woven is cardamom and rose. The effective component of natural product. The cardamom and rose damascene are show in the Plate

CARDAMOM

ROSE DAMASCENA

HERBAL EXTRACTION

PROCESSING OF HERBS

Two herbs are cardamom and rose flowers processed from side to side various processes namely, garbling and grinding.

Garbling Process

Garbling refers to the taking apart of that scrap of the plant to be used from other parts of the plant, dirt and other unrelated matter. This step was performed by hand.

Grinding Process

Grinding was working in the production of herbal extracts. grind or mincing of the cardamom was passed out in a blender. The fine powder obtain after grinding was used for extraction and the fine fine particles was stored under good requirement to reduce the threat of the contamination.

Aqueous Extraction

The process cardamom powder and rose flowers were taken in separate container. One and half liters of distilled water was added to each storage place and boiled for 2 hours. The extract was filtered using Whitman no.1 filter paper. The excess was collected and cooled at room temperature. The concerted take out was further used for finishing the selected fabric. The extracted cardamom fine particles and grinding of rose is distil water was used bring out the active part present in the herb.

Herbal Extractions

S.NO	HERB	PARTS	TECHNIQUE	SOLVENT
1.	Cardamom	Shell	Powdering	Distilled water
2.	Rose	petal	Grinding	Distilled water

Finishing By Padding Mangle

Cotton ViscoseNon-woven fabric is complete by using the aqueous extract of cardamom and rose petal by pad-dry-cure method . In padding technique, fabric was approved through two iron rollers rotating at different speed in opposite direction as the application of finish by

padding is more suitable and many of the problem related to tire out techniques can be avoided primarily in filling stage.

Cotton Viscose Non Woven Fabrics using lagging mangle. The fabrics sample were immersed in the organized herbal extracts and were accepted through a padding mangle run at a speed of 20 rpm/min and a mash pressure of 40 kgf/cm^2. The padded material was air dried and then cured for 3 min at 140 ˚C

RESULT AND DISCUSSION

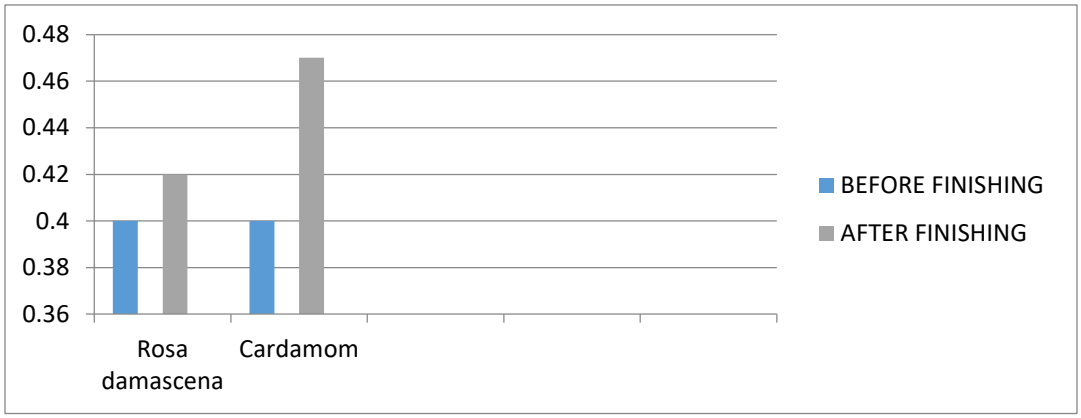
Fabric Thickness

The unfinished and finished fragrance fabric was subjected to the evaluation such as fabric thickness and shown in Table

TABLE FABRIC THICKNESS

S.NO	NAME OF THE FABRIC	HERB USED FOR FRAGRANCE FINISH	FABRIC THICKNESS(IN GMS)	
			BEFORE FINISH	AFTER FINISH
1	Nonwoven	Rosa damascena	0.40	0.42
2	Nonwoven	Cardamom	0.40	0.47

PLATE FABRIC THICKNESS



The Table show the fabric thickness of finished and un-finished fragrance fabric. It is found that there is slight different in fabric thickness when compared to finished and unfinished fabric shows 0.42 mm 0f Rosa damascene finished fabric thickness against 0.40 mm of the fabric thickness of un finished non-woven fabric. And the cardamom finished fabric shows 0.47mm of fabric thickness against 0.40 0f the fabric thickness of unfinished non woven fabric

COLOUR FASTNESS TO SUN LIGHT

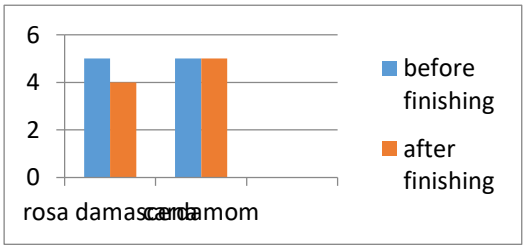
Colour fastness due to sun light showed, samples finished and unfinished were rated excellent. Whereas samples finished and unfinished were rated as fair.The result analysis presented in Table and Plate show the colour fastness test

TABLE COLOUR FASTNESS ASSESSED BY SUN LIGHT

S.No	Name Of The Fabric	Herb Used For The Fragrance Finish	Colour Fastness To Sunlight	
			Before Finish	After Finish
1	Nonwoven	Rosa damasena	5	4
2	Nonwoven	Cardamom	5	5

Maximum score-5

PLATE COLOUR FASTNESS TO SUNLIGHT



Colour fastness to sun light of Rosa damascene fabric the scores 4-very good against 5-excellent fabric colour fastness to sunlight of finished fabric the colour fastness to sun light of cardamom finished fabric against The score 5-excellent of the colour fastness to sunlight of the unfinished non woven fabric.

SUBJECTIVE EVALUATION OF FRAGRANCE FINISHED NON-WOVEN PRODUCT

The subjective evaluation of fragrance finished non-woven product is given in Table.

TABL SUBJECTIVE EVALUATION OF FRAGRANCE FINISHED NON-WOVEN FABRIC

S.No	NAME OF THE PRODUCT	EVALUATION OF FRAGRANCE FINISHED CAR CURTAIN														
		PRODUCT DESIGN			MATERIAL USED			FRAGRANCE FINISH			END PRODUCT			OVER ALL PERFORMANCE		
		G	F	P	G	F	P	G	F	P	G	F	P	G	F	P
1	Rosa damascene finished nonwoven car curtain	95	5	-	80	20	-	84	16	-	93	7	-	95	5	
2	Cardamom finished nonwoven car curtain	97	3	-	88	12	-	90	10	-	95	5	-	97	3	

G-GOOD, F-FAIR, P-POOR

From the Table 4.5 the result of visual inspection is highly encouraging as the 97% of the end users appreciated the cardamom finished nonwoven car curtain. As a whole maximum of judges appreciate the product design, material selection, fragrance finish of end product of cardamom finished non woven car curtain against Rosa damascene finished nonwoven car curtain. The overall appearance of garment in evaluated by 97 percent of the judge of the cardamom finished nonwoven car curtain and 95 percent of judge for the Rosa damascene.

PRODUCT LIFE DURABILITY TEST

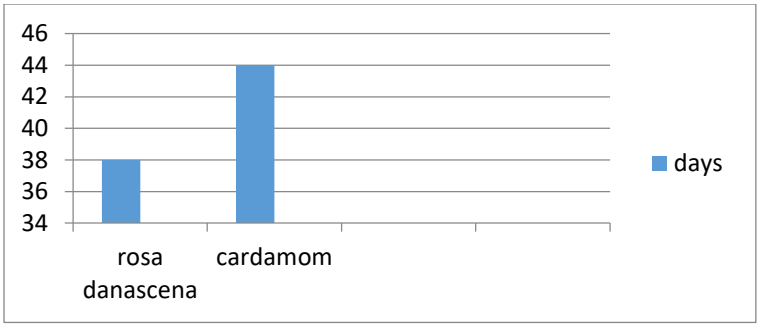
The fragrance finished fabric was subjected to the evaluation of the product life durability test and the results are shown in Table and Plate

TABLE PRODUCT LIFE DURABILITY TEST

S.NO	NAME OF THE FRAGRANCE FINISHED PRODUCT	LIFE DURABILITY TEST DAYS
1	Rosa damascene Finished nonwoven car curtain	38 days

2	Cardamom finished nonwoven curtain	44 days

PLATE PRODUCT LIFE DURABILITY TEST



The Table and Plate shows the fragrance finished life durability test for Rosa damascene finished nonwoven car curtain and Cardamom finished nonwoven car curtain . It found that there is difference in life durability test when compared to the cardamom and rosa damascene finished car curtain.

CONCLUSION

Fragrant finishing to textile is the process of enhancing the value of the product. The finish is done pad dry cure process; this process can effectively control the release rate of the fragrance compounds as required. Fragrant finishing to curtain with gives good smell and enhances the product and the smell gives freshness. The search of natural, regenerated and non woven fabrics with many positive properties for the consumers who expect innovations in the Home textile and fashion industry has been achieved by this research.

THE FUTURE RECOMMENDATION RELATING THIS RESEARCH STUDY.

- This study can be attempted to increase the product life durability of fragrance finish with reusable non woven fabric.
- The further study can be carried out on other fragrance herbs for their curative property and their application on fabric.

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INFLUENCE OF POLYESTER, COTTON FIBRES, THEIR BLENDS, STRUCTURE AND LOOP LENGTH ON THE THERMAL COMFORT PROPERTIES

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ABSTRACT

Fabric comfort is achieved on improving the thermal behavior of the knitted fabrics. In our research, the thermal comfort characteristics of polyester and cotton fibres blended in the ratios of 100:0, 50:50 and 0:100 in four different structures such as single jersey, cross tuck, cross miss and twill at two different loop lengths 0.29 cm and 0.32 cm were studied. Objective fabric tests were carried out for analyzing the thermal comfort properties of the various knitted fabrics.The results evidently proved that the knitted fabrics made from 100% polyester shows better thermal comfort properties, possessingan appreciable level of comfort; so they are applicable for active sportswear. The structure of the fabric and the loop length of the fabric influence the thermal property to a greater extent.The fabric knitted made from 100% polyester with a cross-miss structure on a loop length of 0.32 shows an excellent thermal comfort characteristic compared to all the other samples due to its appreciable behaviors suitable for thermal conduction.

Key words: knitted fabrics, polyester, comfort, thermal comfort, wicking, capillary action.

INTRODUCTION

The clothing plays a major role in determining the thermal comfort properties between the human body and the outer environment. It acts as a transmission medium for the heat and liquid moisture [1]. The main property of any active sportswear is moisture management property which enhances the comfort level of the fabric. Comfort is defined by the wearers in many ways according to his perception. In general comfort is defined as the temperature regulation of the body which is highly influenced by the physiological and psychological

reaction of the wearer. Thermo physiological comfort is highly influenced by the moisture transmission of the textile. Thermo physiological comfort is the maintenance of the thermal equilibrium. Thermo physiological comfort includes all the various parameters such as air transmission, water vapour transmission, thermal conduction sweat absorption, etc[2-4]. In general at normal conditions, the single jersey fabrics knitted from cotton is suitable for the sport textiles but in conditions such as high active sportswear the players sweat a lot making the sweat get absorbed and cling on the surface of the fabrics. In general cotton possess a very less wicking characteristics so they are not suitable for high active sportswear, but fibres such as polyester, acrylic , polypropylene are more suitable for these strenuous activity as they have a good excellent wicking property making it suitable for active sportswear garment.[5].

Transferring of water plays a major role in determining the comfort characteristic of the sport textile. This transferring of water is wicking and this wicking activity takes place through the capillary action of the fibers. The pore diameter and surface energy of the material governs the capillary action in a porous material. Better capillary action occurs when the pore diameter is small or surface energy is more. Micro size fibres form capillaries which are narrow and this result in effective moisture transport [6]. The wicking occurs only when the liquid wets fibers assembled with capillary spaces between them. Spontaneous wetting in a capillary system results in the wicking of the fibers. The micro and macro capillaries present in the fibers are mainly responsible for the wicking to takes place. Through the kinetics for micro and macro capillaries, by using Washburn equation it is found that short term wicking takes place through the macro capillaries and the long term wicking takes place through the micro capillaries and it reaches a maximum height of wicking with a slow diffusion rate. Also another key impact to wicking is produced by the surface tension influence. It is observed that wicking height increases as the surface tension increases [7].A better moisture transport and wicking behavior is observed in the micro fibers having a denier less than 1.0.

The diameter is apparently smaller if the fibers are closely packed in yarn which results in a ready wicking due to narrow capillaries [8]. Wicking is a spontaneous flow of liquid in a porous medium and occurs through capillary force. It is found that a liquid having non wetting property on the fiber have a non-wicking property on the fabric [9]. The shape of the fiber in the yarn or the structure of the fabric also affects the rate of wicking [10]. Wicking performance is

also affected by the pore size and arrangement of void space in a fabric [11]. The wicking property can also be analyzed theoretically by focusing on four forces namely capillary force, gravity, viscous drag and inertia [12, 13]. Researches were carried to study the wicking behavior of spun yarns by imparting various twist levels to the yarns. The research found that applying twist has a negative impact on the wicking behavior of the yarn. As the twist level increases the wicking height starts decreasing [14]. Researches also stated that with the increase of twist, the wicking height descends. This means that the water molecules start dropping down the capillary pores that are formed between the fiber surfaces [15].

S.No.	Sample	Count (Tex)	Loop Length	Fabrics	GSM (g/m^2)	Thickness (mm)	CPI	WPI
1	Single Jersey	19.66	0.29 cm	100 % Cotton	173.33	0.683	30	40
2				50:50 % Cotton :Polyester	155.56	0.599	26	38
3				100 % Polyester	143.37	0.555	24	35
4	Single Jersey	19.66	0.32 cm	100 % Cotton	155.23	0.593	26	36
5				50:50 % Cotton :Polyester	137.4	0.537	24	33
6				100 % Polyester	133.37	0.491	22	31
7	Cross Tuck	19.66	0.29 cm	100 % Cotton	215.66	0.855	34	46
8				50:50 % Cotton :Polyester	195.66	0.782	33	44
9				100 % Polyester	175.66	0.687	30	40
10	Cross Tuck	19.66	0.32 cm	100 % Cotton	190.35	0.742	32	42
11				50:50 % Cotton :Polyester	167.23	0.632	28	39
12				100 % Polyester	150.4	0.573	26	36
13	Cross Miss	19.66	0.29 cm	100 % Cotton	156.37	0.601	28	38
14				50:50 % Cotton :Polyester	145.23	0.555	24	35
15				100 % Polyester	120.3	0.437	21	30
16	Cross Miss	19.66	0.32 cm	100 % Cotton	145.23	0.56	25	35
17				50:50 % Cotton :Polyester	110.23	0.401	20	30
18				100 % Polyester	100.1	0.387	20	27
19	Twill	19.66	0.29 cm	100 % Cotton	188.23	0.736	30	41
20				50:50 % Cotton :Polyester	185.23	0.691	30	41
21				100 % Polyester	157.23	0.605	28	38
22	Twill	19.66	0.32 cm	100 % Cotton	170.35	0.663	28	40
23				50:50 % Cotton :Polyester	150.35	0.571	26	35
24				100 % Polyester	135.56	0.533	23	33

Table 1. Thermal comfort properties of the knitted fabric

MATERIALS AND METHODS

In this research, polyester fibres (150 denier) and cotton fibres(36s) were selected andwere blended in the ratios of 100:0, 50:50 and 0:100 in four different structures such as single jersey, cross tuck, cross miss and twill at two different loop lengths 0.29 cm and 0.32 cmin circular knitting machine, Mayer &Cie, model 2016 with a diameter of 28" and 29 gauge, at 20 rev/min. Polyester is suitable for wicking characteristics and cotton for absorption property.

Dimensional properties

The loop length, thickness and areal density of the four different knitted fabrics were measured. The wales and courses per unit length were evaluated using the ASTM D 3887 standard[16]. Shirley thickness gauge has been used for measuring the thickness of the knitted fabrics as per the ASTM D1777-96 standard[17]. The areal density of the knitted fabrics has been measured using the ASTM D3776 standard [18].

Comfort properties

The air permeability of the knitted fabrics was measured as per the standard by means of KES–F8 AP1 at BS 5636 1990 standard [19]. The thermal conductivity of the various knitted fabrics was observed using Lee's disk instrument as per the Standard ASTM D7340 [20]. The water vapour permeability of the knitted fabricswas measured as per Standard BS 7209:1990 [21].

S.No.	Sample	Count (Tex)	Loop Length	Fabrics	Thermal conductivity (W/mK x 10^{-3})
1	Single Jersey	19.66	0.29 cm	100 % Cotton	39.91
2				50:50 % Cotton :Polyester	43.63
3				100 % Polyester	49.52
4	Single Jersey	19.66	0.32 cm	100 % Cotton	44.44
5				50:50 % Cotton :Polyester	48.89
6				100 % Polyester	53.33
7	Cross Tuck	19.66	0.29 cm	100 % Cotton	36.04
8				50:50 % Cotton :Polyester	39.43
9				100 % Polyester	44.52
10	Cross Tuck	19.66	0.32 cm	100 % Cotton	40.54
11				50:50 % Cotton :Polyester	43.99
12				100 % Polyester	47.03
13	Cross Miss	19.66	0.29 cm	100 % Cotton	43.31
14				50:50 % Cotton :Polyester	48.63
15				100 % Polyester	53.53
16	Cross Miss	19.66	0.32 cm	100 % Cotton	47.04
17				50:50 % Cotton :Polyester	50.88
18				100 % Polyester	56.33
19	Twill	19.66	0.29 cm	100 % Cotton	37.01
20				50:50 % Cotton :Polyester	40.33
21				100 % Polyester	46.52
22	Twill	19.66	0.32 cm	100 % Cotton	43.44
23				50:50 % Cotton :Polyester	45.89
24				100 % Polyester	50.03

Table 2. Thermal comfort properties of the knitted fabric

RESULTS AND DISCUSSION

The geometrical characteristics of the knitted fabrics were analysed, and the average values of 15 tests conducted were taken. From Table 1, it was clearly observed that if there is a change in the yarn type, fabric structure and blend proportion it have an impact on geometrical properties of the fabrics such as course and wales per centimetre thickness and GSM of the fabric. As the yarn type changes the areal density of the fabric gets changed. For each and every knitted fabric, 15 tests were conducted to analyse the thermal comfort properties, and the average values are used for the tabulation in table 2.

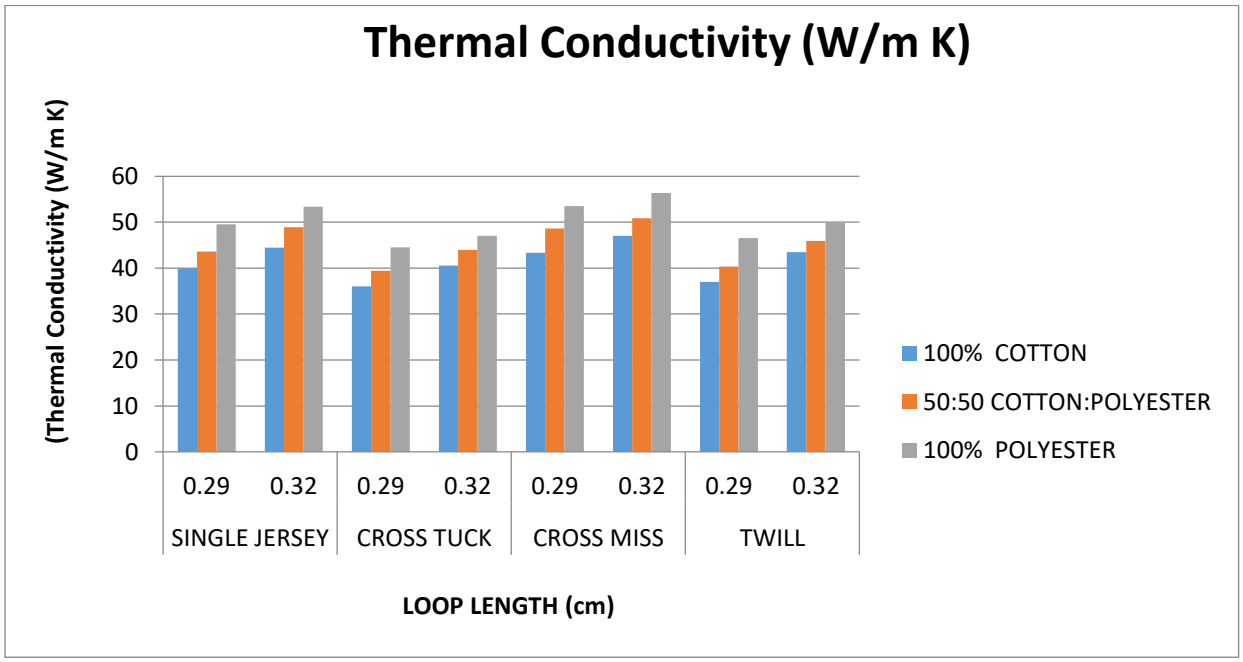

Figure 2 Thermal Conductivity values of knitted fabrics

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SUSTAINABILITY AND ENVIRONMENTGRAPE LEATHER

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ABSTRACT:

We know that fruits and vegetables are good for our health, but they could also be beneficial for the fashion industry. Most vegan leathers on the market are made entirely from synthetic materials such as polyvinyl chloride (PVC) and more recently polyurethane (PU), both of which are made entirely from fossil fuels but to create change the leather is formed in the grapes It is sustainable and eco-friendly to nature. The waste comes out during the process of wine making is used for vegan leather like grape skin and seed .the grape marc, are dried. In viticulture it is called grape marc. The grape marc is then combined with vegetable oil and water-based polyurethane (PUD) to create an eco-composite material. Vegan grape leather is difficult to recycle. VEGEA makes the grape leather used in the grappa Sac through a patented, non-toxic process. It is combined with the natural fiber for the soft, texture of this process consumes very little water, and that the water can be used over and over again. This is in stark contrast to the animal-based leather industry, which uses immense amounts of water to sustain cows before they are slaughtered for their skin, and in the leather making and tanning processes, which are quite water intensive and often pollute waterways. Grape leather is used to make shoulder bag ,cross bag, back pack ,and clutch etc..

INTRODUCTION

These vegan materials made from grapes are increasingly being used by the fashion industry to limit its impact on the planet .Everything that is not used in the production of wine is recovered, then transformed and made available to the fashion industry. Vega grape leather was born out of a desire to reclaim and repurpose waste from the Italian winemaking industry. This is eco friendly to nature. The solid remains of grapes after pressing (grape pomace, including the skins, pulp, seeds and stems) are combined with vegetable oil and water-based polyurethane (PUD). This creates an eco-composite (a combination) material. This bio based material is then coated onto organic cotton, resulting in a leather alternative made of more than 70% renewable and recycled raw materials. Grape leather, also known as grape skin , is a bio-based material made using the leftover pomace and peel from the fruit juice and compote industry. Due to the freshness of this innovation, it has been found that the alternative is not yet biodegradable and can be hard to recycle; its useful life however can be extended through low-wash to make it long-lasting. Grape leather by VEGEA

is unique vegan leather made from grape skins from winemaking a waste product added to plant oils and natural fibers from agriculture. These plant-based raw materials combine to form a bio-compound that is spread onto an organic cotton backing. Grape leather is sustainable and eco friendly.

MATERIAL AND METHODOLOGY:

Vegan grape leather consists of the solid remains of grapes after the pressing process is complete – grape pomace includes the skins, pulp, seeds and stems of the fruit. It is combined with the vegetables oil and water-based PU. It is made for its soft texture. Only minimal water is used in this process which can be reused in the process. The vigialeather consists of alternative method which consists of 78%of eco composite cotton and 22% of water-based PU. This is a collaboration of the grape's natural bio-oils and dried remaining grape materials. Grape leather is similar to animal leather in its softness and texture. 10 liters of wine — 2.5 kg of grape marc — 1 sq meter of grape wine leather



The leather manufacturing process is divided into three sub-processes: preparatory stages, tanning and crusting. All true leathers will undergo these sub-processes. A further sub-process, surface coating may be added into the sequence. There is process is done to get the leather, in that the first process is to recovery the grape marc after the preparation of grape wine the grape remains are collected for the process the grape remains are called grape marc. Then its grape marc is dried in Sun and it is grinded to a fine powder form. The fine powder is then treated with vegetables oil and water-based to solidify the material and ensure its resistance over time. Then it is spread in large stripe to dry and the thick white paste obtained is dyed according to the desired color. The grape leather is cut and assembled.

SUMMARY AND CONCLUSION:

Grape leather is a more sustainable alternative to traditional leather. Low Environmental Impact. This material has lower ecological and carbon impacts, being a friendlier alternative once it uses a reduced quantity of water that is recyclable and it replaces animal leather, which has one of the highest emissions of GHG.The material in a product that is low-wash and long-lasting. It is more sustainable and ecofriendly. It is not only bio based it is also comfortable, extremely stable, soft, durable, fashionable etc. From the grape leather vegan handbags, vegan back bag, vegan shoes, other fashion product is made from the grape leather. Product that makes the most sense in terms of sustainability, functionality and purpose.

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ECO FRIENDLY TEXTILES
BACTERIAL CELLULOSE BASED LEATHER BOOT

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Abstract
This paper is about the overview of the ecofriendly fibers in the textile industry that are more sustainable. Now a day a wide range of technique and innovation has been developed to save the world. This is the technique of synthesizing to produce Hydro gel Bacterial Cellulose (HGBC). The bacterial cellulose is produced through the oxidative fermentation process. Bacterial cellulose is a kind of cellulose grown on the gas-liquid interface by bacterial culture. Hydro gel bacterial cellulose material is obtained by copolymerization between the bacterial cellulose and gelatin. After the process, it is noted that there is an increased in thermal stability. Hence, the bacterial cellulose can be produced and therefore the leathers boots are used in fireplaces.
Keywords: Bacterial cellulose, Kombucha, thermal stability, leather boots

INTRODUCTION

There is an increasing need to develop biodegradable fibers with low toxicity level to the environment, which makes ecofriendly products in textile field. Cellulose fibers from bacteria are sustainable. A very few bacterial species can synthesize cellulose. Bacterial cellulose, which can be obtained from the microorganism like bacteria from genera Gluconaetabacter, Sarcina, and agro bacterium. The bacterial cultivation is a very easy and cheap method. It is produced by the Kampuchea culture which enhances physicochemical and mechanical properties. There are many plant derived cellulose which results in formation of lignin. The bacterial cellulose is derived from the yeast/ bacteria of "Tea fungus". However, Nano cellulose is mostly extracted from bacterial cellulose than plant cellulose because it has chemical purity, larger contact angle, and elevated water holding capacity. Compared to plant cellulose, cellulose of bacteria has high purity that is free from hemicelluloses, lignin, and pectin. As the hydro gel bacterial cellulose possess a thick leather texture and the thermal stability properties, it can be applied in the leather boots in fire working places.

MATERIALS AND METHODOLOGY:

The materials used for the production of bacterial cellulose leather boots are the bacteria of genera Komagataeibacter, which can be cultivated from Kombucha culture and chemicals like Vinyl-triethoxysilane (VS) and 3-aminopropyl triethoxysilane (APS)

FERMENTATION:

The Kombucha is a fermented, lightly effervescent, sweetened black tea drink commonly consumed for its purported health benefits. Kombucha is produced by symbiotic fermentation of sugared tea using a symbiotic culture of bacteria and yeast (SCOBY). The bacterial component

usually includes Gluconacetobacterxylinus to oxidize yeast-produced alcohols to acetic acid. Kombucha can be prepared at home or commercially. Kombucha is made by dissolving sugar in non-chlorinated boiling water. Tea leaves are steeped in the hot sugar water and discarded. The sweetened tea is cooled and the SCOBY culture is added. The mixture is then poured into a sterilized beaker along with previously fermented kombucha tea to lower the pH; this technique is known as "backs lopping". The container is covered with a paper towel or breathable fabric to prevent insects such as fruit flies from contaminating the kombucha. The tea is left to ferment for a period of up to 10 to 14 days at room temperature. A new "daughter" SCOBY will form on the surface of the tea to the diameter of the container. After fermentation is completed, the SCOBY is removed and stored along with a small amount of the newly fermented tea. The remaining kombucha is strained and bottled for a secondary ferment for a few days or store at a temperature of 4 ℃.

SCOBY LEATHER PRODUCTION:

In a large container, bring the water and tea leaves then boil and leave it for 15 minutes. Add the sugar and mix until it is fully dissolved and allow it to cool down. Cut a 3 inch squared hole on the lid of the container and use the cloth patch to cover it. Use the duct tape to hold it tightly in place. Use alcohol to make the container sterilize and close the lid properly and allow it to evaporate. Pour the freshly prepared tea to the container. Add the symbiotic culture of bacteria and yeast (SCOBY) to the tea and mix in the starter tea.

Gently place the container on top of heating mat and set the temperature at 75 degree Fahrenheit. Check-in on the growth progress every week and use only sterilized gloves while handling the container. You can make more tea and add it to the growing SCOBY if the levels goes down too much due to evaporation. In about 4 weeks, the SCOBY will have grown about an inch thick which has suitable thickness to work with. Gently lift the SCOBY from the container and dip it into a dye solution of choice. Drain out the dyed SCOBY leather on top of the wooden board to dry. Allow the SCOBY to dry until it becomes a soft sheet.

THERMAL STABILITY ACTIVITY:

The BC leather has the properties of thermal stability. The surface of the BC membrane can be altered by treating the BC with vinyl-triethoxysilane (VS) or 3-aminopropyl triethoxysilane (APS). After the treatment, it is noted that there is an increase in contact angle value. Similarly, the crystallinity degree was reduced to 69.6% and 72.9% after APS and VS treatments as compared with 84.1% to the untreated BC. However, the highest increase in thermal stability was observed for silanes treated membranes.

SUMMARY AND CONCLUSION:

The Bacterial Cellulose fiber has physiochemical properties like high crystallinity, high specific surface are, and high elasticity and high mechanical strength in the wet state, hydrophilicity and excellent biocompatibility.

The bacterial cellulose produced from three different Kombucha fermentation conditions. The scanning electron microscopy images revealed the crystalline structure of the bio films. The energy-dispersive x-ray analysis exhibited the chemical composition of the crystals. The thermo gravimetric analysis showed a rate of degradation between 490°C and 560°C and the differential scanning calorimetry confirmed the presence of crystalline and amorphous regions in the bacterial cellulose samples.

The result obtained from the various fermentation process confirmed that BC has a good biocompatibility and thermal stability. Hence, this property is enough to make a bio leather for boots.

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ECO FRIENDLY TEXTILEWET WIPES PRODUCTION PINEAPPLE LEAVES

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ABSTRACT

In developing countries, are different approaches of deal with organic waste? Wet wipes are developed and produced as an alternative for cloth handkerchiefs there tissue paper products get the name from being soft , absorbent and disposable papers that are suitable for use on the face due to the covid 19 pandemic , there is an increase in awesomeness about hygiene which has in turn, increased the demand for more disposable tissues. Then main objective of this article is potential of using pineapple leaves and pineapple fruit used to baby wipes and facial wet wipes production. The advantages of solvent pulping process over other technique in terms of scale production water energy and chemical consumption and pulp quality. It production of Collagen, a protein matrix that gives your skin its structure while maintaining its plasticity. Pineapple leaves including vitamins c, can help prevent damage to skin cells caused by free radicals this product are Eco- friendly and easy disposable**.**

Key word: pineapple leaves, polyester non woven

INTRODUCTION:

The pineapple plant, Ananiascomosusl is a member of the planet family Bromeliaceous. It has a rosette of waxy long – pointed leaves that grow 20-72 inches long with sharp up curved spins on the margins. Pineapple leaves are purported to have healing properties that either prevent treat or cure many ailments. Prevent and cure tuberculosis, heal burn wounds faster treat Hemorrhoids, improve vein dislocation stop nosebleeds.

The wet wipes, also known as a wet towel or a moist towelette, disposable wipes or a baby wipe. Wet tissues is a small to medium – sized moistened piece of plastic or cloth that either comes folded and individually wrapped. They can help remove dirt and impurities from your skin so that you feel refreshed. The main purpose of wet wiper is absorbing, retain, and release dust or liquid. It allows to perform routine task in substantially less time for people. These wipes

are consisting of a Nonwoven fabric material and a liquid part, which is also known as 'juice or solution of typically water ethanol – or oil based, and 90%-98% of the liquid for makeup remover wipes.

Material/ Methodology:Material:

- **Disodium cocoamphoacetae**
- **Silicon oil**
- **Mineral oil**
- **Fatty ac**
- **Fatty alcohol**
- **Plant oils**
- **Pineapple leaves, pineapple**
- **Polyester or polypropylene- non woven**

Methodology: Non-woven preparation

There are two primary methods of assembling non-woven fabrics: the wet laid process and the dry laid process.

Step: 1

One dry laid process is the "melt blown" method, which is used to make non-woven fabrics from plastic resins. In this method, plastic pellets are melted and then extruded, or forced through tiny holes, by air pressure. As the stream of fibres cools, it condenses to form a sheet. Hot metal rollers are used to flatten the fibres and bond them together.

Step: 2

A wet laid process is typically used for softer cloths, like baby's wipes, that use cotton blends. In this wet process, the fibres are made into liquid slurries; pineapple leaves pulp with water and other chemicals. The resultant paste is pressed into flat sheets by rollers and then dried to form long rolls of fabric. These rolls are then further processed and slit into narrow widths and then perforated or cut into individual sheets. The finished cloths are classified by their dry weight that is at least lowest weight (1.4).Absorbency of the wipes is also an important requirement.

Formula preparation:

Step: 3

The ingredients used in the wipe solution are prepared in large batch tanks. Depending on the formula requirements, the tank is charged with the first ingredient which is usually water. The tank may be heated during manufacturing to facilitate blending of powders that must be dissolved or other solids that must be melted. The other the ingredients are added sequentially and mixed until homogenous.

Non-woven treatment:

Step: 4

Once prepared, the non-woven cloth is fed from storage rolls onto coating machinery, where the cleansing solution is applied. The cleansing solution can be added by running the fabric through a trough of the solution, or sheets of fabric may be sprayed with the formula from a series of nozzles.

Step:5

Alternatively, individual to this process, sheets of laminated foil are fed into automated equipment which folds them into a small pouch and heat seals three sides to form an open envelope. Simultaneously, another conveyor line feeds the non-woven cloths into the pouch. A liquid feed mechanism, including conduits extending through the stuffing bars, injects moisturizing liquid into the towelette packet simultaneously with the stuffing of the towelette material.

Immediately following this operation, another heat sealer closes the pouch tightly.

Packaging operations

Step: 6

The finished cloths are automatically folded, stacked, and transferred to their final package. In one patented method employed by Rocklin Inc. the novelette are folded and stacked so that they can easily be removed one at a time and then the stack is placed in an inner plastic pack. This inner pack is subsequently inserted into an outer tub with a hinged cover.

Summary and Conclusion:

Eco -friendly products can significant improve the environment by reducing waste, energy, and chemical. These products won't be harmful to the environment during production use, or disposable low in chemical while high in natural ingredients.

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ANTI-BACTERIAL DRESS FOR HANDICAP CHILDREN

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ABSTRACT
The textile industry has grown rapidly. So it is important to make it eco-friendly. In this study, a bandage for handicapped children is made with antibacterial and antifungal finishes. A non-toxic antibacterial and antifungal finish is important for medical and sanitary purposes. Natural herbs such as neem (antifungal and antibacterial), aleo vera (antibacterial) and spearmint (antibacterial) are used here to provide an antibacterial and antifungal finish. There are many difficulties faced by disabled children, including bathing. Since it is quite difficult for them to bathe themselves, outside help is required. If help isn't available, they can skip the bath for a few days. So clothes must be efficient enough to protect them from various infections and they should also be sustainable for the environment. Wearing the wipes with anti-fungal and anti-fungal properties can help them avoid these infections.

INTRODUCTION
Clothing is one of the basic needs of all human beings and a subject of universal interest .A Disability is any condition that makes it difficult for a person to perform certain activities or interact with the world around them. Today, the number of disabled children is increasing and The development of appropriate clothing for this type of children is in demand. Most children have little difficulty in purchasing attractive clothing for their personal needs, for those who are physically challenged. At the same time, disabled children have many difficulties bathing them. So they refrain from bathing. Since it is quite difficult for them to bathe themselves, outside help is needed. Functional elements such as antibacterial and antifungal properties play an important role in this content. Clothing must be efficient enough to protect you from various infections and it should also be sustainable for the environment. They wear clothes with these antibacterial and antifungal properties to avoid infection. Since neem has powerful antifungal properties, it will kill the germs. At the same time aloe vera have an antibacterial content because mint controls body odor and also has antibacterial properties. These three herbs are a power pack for this dress.

MATERIALS AND METHODS
Materials:

- **Cotton factory**
- **Mint**
- **Aloe vera**
- **Neem**

Methods:

1. Herbal source:

The work prepared the natural antibacterial textile finishing extracts from neem, mint, aloe Vera.

Aloe Vera finish

For the production of an environmentally friendly and natural finish from aloe Vera extract for various textiles Materials. Citric acid and methanol are used to apply the aloe Vera finish to fabric. T he concentration of the antibacterial agent is 1, 2, 3, 4 and 5 gpl. Fabrics treated with a concentration of 5 gpl of aloe Vera extraction are excellent. Reduction of bacteria in this case up to 99%. Finished the wash durability of the sample treated with antibacterial property was 98% after 50 washes.

Processing and extraction of neem

Azadirachta Indica was again received for review as a possible treatment Amount in the leaves; they were kept in the shade at room temperature. After that are the leaves powdered and sorter.20 grams of powdered herbal powder are suspended in 100 mm methanol and infused overnight. The supernatant was filtered twice with what man #1Filter paper and filtration before being used to treat cotton clothes.

Methods of Extraction

The mint is collected from the local market. The mint were cleaned, washed and dried in the shade. The dried mint was pulverized. A total of 30g mint powder was weighed and placed in a Soxhlet tube. A little cotton is inserted into the extraction tube and mint powder is added over the cotton. 300 ml of ethanol solvent is placed in the bottom flask of the Soxhlet extractor. Then the Soxhlet temperature is set to 40°C and the extractor is turned on, the process is carried out for 24 hours. This process is repeated five times.

MICROENCAPSULATION

Tiny particles or droplets are encased in small capsules with useful properties. Most microcapsules have pores with diameters between a few nanometers and a few micrometers. Coating materials are rubber, carbohydrates, cellulose, lipids and proteins.

Method

A small piece of sample is taken. Sterilized nutrient agar is poured into a Petri dish and allowed to stand to solidify. 24 hours. Old broth culture mixed with sterile distilled water. Gently press the sample across the strip. The stripe lines should continue without any interruption. Load a full loopful of diluted inoculums and mark the strip. Incubate at 37°–2°Cfor 18-24 hours.

AGAR DIFFUSION PLATE

This method allows us to determine the effects of antibacterial agents applied to fabrics Materials. This method is only suitable for diffusive test materials. It is easy to perform and easy.

Method

The test sample was circularly cut. Placed in the room in the pre-conditioning zone Temperature for 12-24 hrs. Used as a standard cotton fabric with no antibacterial activity negative control. Pour the prepared Petri dish and let it solidify. Inoculate sterile melted Nutrient agar with bacterial culture (top layer). Sterilized nutrient agar is poured in Pour into sterilized Petri dish and allows solidifying (bottom layer). Press the test sample onto the agar Pop up. Incubate at 37°C for

18-24 hours. The presence of antimicrobial activity is indicated by the lack of bacterial growth directly beneath the test sample.

BACTERIAL REDUCTION METHOD

The ability of fabrics or textile materials to inhibit the growth of microorganisms or kill them, over a contact period of 24 hours. The evaluation of antibacterial finishes on textile materials and textile finishes is determined by the degree of antibacterial activity. This method is used to demonstrate antimicrobial performance against standard bacteria. The standard microorganisms tested are Staphylococcus aurous and Klebsiellapneumoniae. The test germ is cultured liquid culture. This procedure consists of the six main steps of sample preparation, sterilization, and inoculation, incubation, washing/shaking and counting. Shapes of the treated samples are cut out a circle from the fabric. Stack the patterns in a wide-mouth, screw-topped jar. The amount of fabric swatches to use depends on the fiber type and fabric construction. Samples of equivalent fiber type and fabric construction as test samples, but containing none antibacterial finish (negative control). Sterilization of samples is the optional step. It depends on the type of fabric. Apply the dilution to the test sample for 24 hours to allow it to recover un treated control swatches or treated test swatches at "0" contact time. That the test organism should be diluted in nutrient. Incubate additional jars with in osculated untreated control specimens and vessels inoculated with treated test specimens at 37±2°C for 18-24 hours. After the incubation, add the neutralizing solution to the vessels with untreated control samples and lenses with treated test samples. Shake a glass for oneMinute. Then compare the sample before the test and after 18 hours.

APPLICATION TO ANTIBACTERIAL ON COTTON

Herbal extracts of neem, aloe Vera and mint were applied to cotton fabric by the Methods of direct application, microencapsulation, resin cross linking and their combinations. All treatments show good antibacterial properties for the fabrics. Except for the director Method of use, other treatment shows good wash resistance up to 15 washes.

SUMMARY AND CONCLUSION

After applying herbal extract on cotton fabric, it is ready to make a garment for the disabled Children. Neem must avoid infection by harmful microorganisms. Control and kill Bacteria. Neem increase to luster of cotton fabrics. Aloe Vera have a reduction in bacteria. Mint have control body odor and kill bacteria. The antibacterial activity of cotton fabrics finished with neem, aloe Vera and mint was qualitatively evaluated by Parallel Streak Method (AATCC 147-1998) bacteria. It has been observed that there are no visible ones Growth of bacteria (both Staphylococcus aurous and Escherichia coli) on the cotton fabric treated with 200 3% (w/v) antibacterial concentration. However, there is no clear zone of Inhibition found around 201 the treated tissue.

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RECREATING A CUTTING WASTE TO MAKE NEW FASHION ACCESSORIES

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ABSTRACT
We use our imaginations in recovering and reusing textile waste in different ways, so it's essentially a celebration of expressing ourselves. Making waste tissue look good can be a challenge. Cutting scraps of fabric and who wants a chance to bring them back to life? This research targets available clothing materials as a kind of finished fabric product. It connects with the characters of the clothing style and uses innovative design thought and craftsmanship to further change the available style of fabric appearance. Creating for a second life by repurposing, reconstructing, re cutting and adding decorative elements (embroidery, stitching, threads, crochet techniques, mirror work and etching) to transform the original appearance for a new fashion trend. In the textile and clothing industry, the waste generated by the industry has become an important factor in the increasing cost of waste management and its image. Various useful materials can be recreated from this waste through innovative ideas and processing. In the following study, 30 high-values up cycled fashion and home accessories designs were enhanced from textile off cuts generated during the manufacturing and sewing process of fashion accessory products. The designs resulting from the following study were evaluated for consumer acceptance.
Keywords: up cycling, industrial fabric cutting, fashion and home accessories, design, added value

Introduction

Nowadays, in the world of modern technologies, high demands and consumption, large amounts of waste are dumped in landfills every year. This causes economic and environmental problems for the society and also represents a serious depletion and waste of resources. In this scenario, recycling of wastes resulting from the production and consumption of products seems to be the emerging alternative. The textile and clothing industry is one of the most important consumer goods industries.

However, the textile industry is also accused of being one of the most polluting industries. Not only the production, but also the consumption of textiles and clothing produces waste. To counteract the problem, the industry has taken many measures to reduce its negative contribution to the environment. One of these measures is the recycling and reuse of textiles and clothing. However, this has not sufficiently reduced the environmental impact of the fashion and textile industry. Several companies are attempting to manufacture their products in more environmentally friendly ways to meet the demands of the environmentally conscious consumer.

Thus, if one can add economic, intellectual, emotional, or material value to a product through the process of reuse, this can be termed as "up cycling" (Modi, 2013) resources that went into making certain materials, but those in them contained resources, embodied value increases through the application of knowledge as it is re circulated." Unlike reuse or recycling, up cycling uses existing materials to enhance the original ones. The process requires a high degree of creativity and foresight, as well as a foundation for thrift and environmental awareness. The end result is usually a product or item that is unique, handmade, sustainable and cost-effective. Up cycling is the process of creating something new from old products, waste materials and unwanted better quality products and materials for better environmental value.

Methodology

In this section, the methodology chosen for the present study is presented. It was divided into two phases -

1. Experimental phase
2. Evaluation phase

Experimental phase

In this phase, a survey was conducted to collect data from various clothing collections and commodity manufacturing industry of Agra. Information was gathered regarding the demographics of the leather industry and an estimate of the trimmings it produced. The next part of the phase involved creating innovative up cycled products through waste prevention. The produced sustainable up cycling products and accessories were divided into two categories:

Home accessories: products developed

1. Pillowcases
2. Placemats
3. Holders and folders

Fashion accessories: products developed

1. Handbags and purses
2. Yokes and collars
3. Earrings and necklaces

Evaluation phase

In this phase, a self-made questionnaire was formulated to record consumer acceptance of up cycled products made from textile waste. The questions were based on the following points: Evaluation of the fashion products made from industrial waste. Classification by interests with the help of consumers. Determining consumer acceptance of up cycled products made from off cuts. Since the assessment is a basic knowledge of design and aesthetics, 50 students with a background in clothing and textiles were selected as test subjects.

Results and discussions

Based on a survey conducted in 10 different leather production units, most of the industries were unfamiliar with the term up cycling, but they had an opinion on creating new products from waste: such as children's shoes, purses, key chains, belts, etc. For this reason, the Garment industry to reduce waste by employing skilled labor and using the latest machines, new techniques and

CAD/CAM software to produce residual products with minimal waste. The resulting waste came in the form of chips, small parts, strips, etc. in an amount of 20 kg/day. This waste was collected from these industries to develop new up cycled products. In the present study, a total of six product categories, each with five different designs, were developed. A total of 30 different up cycling products were designed. These designs and patterns were created using techniques of braiding, gluing, sewing or cutting additional parts. The developed products are shown in the following figures.

Home Accessories-Product-Pillowcases

CUSHION COVER-1

CUSHION COVER-2

CUSHION COVER-3

CUSHION COVER-4

CUSHION COVER-5

Fashion Accessories - Product - Necklace & Earrings

EARRING-1

EARRING-2

EARRING-3

NECKLACE-4

NECKLACE-5

Conclusion

The "Jewelry Design from Waste" study was creative enough to recycle solid waste. People preferred jewelry from textile remnants such as trimmings, fabric, some decorative things are used to make accessories. They have been identified as the best raw material for reproduction in light jewellery. 68% of people would prefer to wear recycled jewelry made from solid waste. The designs offered scope for good marketability. The study served the purpose of recycling the waste into usable and wearable jewelry.

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ECO FRIENDLY TEXTILES
SURGICAL MASK MADE OUT OF LOTUS FIBER AND SOLANUMTRILOBATUM

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ABSTRACT:
The corona virus 2019 has spread the whole world with high death. Since droplet transmission is the main route of transmission, wearing a mask serversa important to preventive measures. However, the virus has spread quality causing severe mask shortage to rescue from the harmful effects of the those chemical waste the research work was focused on eco friendly natural face Mask prepared from Lotus Fiber &Solanumtrilobatum leaves were applied onto organic Lotus Fiber yarn with no using of chemical and mordents .it is breathable and no itchingness on skin and medical purpose used it help to prevent the infection, like COVID .this s very Used for children's and adults kids also wear. it gives softness, protect the respiratory infection disease . They may treat to make them softer the filament was applied on the yarn to treat the mark manufacturing process. Lotus plant is pure by virtue and they radiate the purity through their Fibers. By weaving Lotus Fiber fabric one feels calm, peaceful and meditative. it cures, headache, heart ailments, asthma & lung issue .the fabric are 100,% organic and hence are environmentally friendly. Like weaving the fabric to insect the Solanumtrilobatum to weave the surgical mask to manufacturers.
Keywords: Lotus Fiber, Solanumtrilobatum(Thuthuvalai)

INTRODUCTION:

Higher classification: Scientific name: Solanumtrilobatum
Rank: Species
Family: Solanaceae
Kingdom: Plantae
Order: Solanales

Now a day, environment issues are becoming & major all over the world. this product is eco friendly and it made on natural Lotus Fiber and Solanumtrilobatum was treated on the face mask.it is not irritated on skin. Rashes also not caused because no chemical properties was add .it will produce hygiene, it control & prevent the disease.it will not caused pollution on our environment.this choice of fabric material is different and the number of material layer such as filtration effiency, breathability . Lotus is a natural protein Fiber.the Lotus Fiber are naturally prevent.it cures headache, heart ailments, asthma and lungs .we will also treat solanum for extracting the extra natural medicine Solanumtrilobatum to mainly used in the treatment of respiratory disease like bronchial asthma.solanumtrilobatum is a amazing plant that has been used as medicine since ancient times. It's a popular medicinal plant both in siddha and Ayurveda . It may protect against neurotoxicity solanumtrilobatum is well know for its protective effect against several toxicitys .this mask are treated as medicine it made only organically.kids also wear without fear .it helps to prevent . This type of mask not introduced by any others.it is eco friendly it not caused pollution on environmental issues.it highly strong and healthy.

MATERIALS & METHODOLOGY:

Wearing of cloth or disposable surgical face mask has no effect on vigorous exercise performance in healthy. Surgical mosque is an infection control device designed to help prevent the spread of infection from the wear exhaled the spread of infection from the beer exhibile the breath to potentially suspect able individuals. A surgical mosque may help reduce contamination of the enrollment by providing a barrier for large droplet expelled by the wearer. In the context of COVID-19, surgical masks may be used for several different purposes, including being placed on suspected or confirmed COVID-19 patients to limit the spread of infectious respiratory secretions to others. These face masks may also help the wearer to keep contaimenthands away from the mouth and nose.

Surgical face masks are manufactured into a multi-layered structure, generally by covering a layer of textile with non-woven bonded fabric on both sides. Non-woven materials, which are inexpensive to make and clean due to their disposable, are made up of three or four layers. These disposable masks are often fabricated with two filter layers effective at filtering out extremely small particles such as bacteria above 1 um in size. It should be noted, however, that the filtration level of a mask Lotus Fiber , the manner by which the fabric is manufactured, the mask son solanumtrilobatum extract to the , and the fiber's cross-sectional shape. For example, the material most commonly used to make surgical masks is polypropylene, either 20 or 25 grams per square meter (gsm) in density; however, masks can also be made from Lotus Fiber, solanumtrilobatum, antibacterial, or polyester composition . The 20 gsm mask material is made from a spun-bond process, which involves extruding the melted plastic onto a. The material is extruded into a web, in which strands bond with each other as they cool. On the other hand, the 25 gsm fabric is made via melt-blown technology, a similar process by which plastic is extruded through a die with hundreds

of small nozzles and blown by hot air to become tiny fibers, again cooling and binding on a conveyor belt . After these manufacturing steps, masks are then stamped with nose strips, ear loops, and other attached pieces such as ties . Lotus Fiber is very healthy and expensive Fiber Solanumtrilobatum cures the disease so that we prefer this method.

CONCLUSION:

Nevertheless, many essential workers in healthcare and other fields will have to continue with unwanted exposure to people with the virus. Thus, it is important that they are well informed about the best possible practices in order to protect their own health and the health of those whom they care for. Several investigations have shown that respirators are effective for reducing HCP exposure to airborne viruses and bacteria. Although some studies indicate no difference between the effectiveness of surgical masks and respirators, other data demonstrate that respirators should be used over surgical masks when performing solanumtrilobatum to made mask procedures, as the tight fit and regulated filters in respirators are better equipped for deterring airborne transmission.

However, surgical masks are still considered an important role in world, since they do provide some respiratory protection and can be placed upon infected individuals to prevent the transmission of contagious respiratory droplets. On the other hand, the effectiveness of cloth and homemade masks is difficult to determine since there are limited extract involving the use of these masks.8 However, studies conducted in some laboratory settings and one clinical investigation indicate that they provide minimal respiratory protection in comparison to surgical masks or respirators. It is continue further inquiries on the efficacy and reusability of surgical masks, respirators, and homemade face masks, so that both healthcare providers and the public can help reduce the destructive impact o CoV-2 and work toward improving prevention of this highly infectious, potentially deadly transmissible disease . This Mask is no chemically treated it only made on organic products. This type of surgical mask is help’s to prevent the infection. All types of people to use like kids , adult, some health issues people can also wear . It is eco friendly and not pollute on earth. Easily controlled the asthma, cold , respiratory problems to cure .The use of natural fruits that are non-toxic, non-allergic and eco-friendly on textile as antimicrobial has become a matter of significant importance, may be, as a result of increased environmental…

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MEDICINAL SOCKS FOR VERICOSE VEIN

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ABSTRACT:

Medical textile has evolved over the years, which is a good thing. It is also important that we focus on making the textile industry sustainable and eco-friendly. So, many cloths have been introduced with different anti-bacterial and anti-fungal finishes. Varicose vein is common condition in which veins become enlarged, dilated and overfilled with blood. Moreover 25 percent of the adults have varicose vein especially in women. Compression socks are used to reduce varicose veins. In this study, we are going to discuss about socks used to treat varicose vein which is finished with garlic and olive oil. Garlic soaked olive oil can be used to treat varicose vein. So when the compression socks is finished with garlic soaked olive oil it can be more effective in treating.

INTRODUCTION:

Textile material (Natural or synthetic) used to be colour for value addition, look and desire of the customers. The fields of application of technical textile are unlimited and the ideas often revolutionar. Hygiene and health care textile (SOCKS) consist of adsorbent disposable products. Are mostly single use items designed to receive, absorb and retain body fluids and solid wastages? In this content I use garlic and olive oil for socks to cure this varicose vein. Because, Garlic is an excellent herb for reducing the inflammation and the symptoms of varicose vein. It also helps to break up the harmful toxins in the blood vessels and improves blood circulation. Then olive oil has to increasing the blood circulation. It inessential to treating the varicose veins. Olive oil heavy anti-inflammatory property, toning and soothing properties that eventually helps to reduce the eularged veins. So, I could add this super ingredient to socks. It will cure that disease.

MATERIAL:

Olive oil
Garlic
Cotton fabric
Single jersey knitted fabric

METHODS:

Cotton single/jersey knitted socks. This is a prepared by natural source. The natural finish for extracted from garlic and olive oil. This for a medical sense is varicose veins disease will cure.
Selection of socks material pre processing, natural scouring, natural finishing.

PREPARATION:

Extraction of garlic powder and olive oil: Solvent extraction technique using Soxhlet apparatus was employed to extract varlic. 15 g of garlic powder and olive oil was taken in the thimble and 300 ml of ethanol-water mixture was added to the extraction ask. Complete assembly of the apparatus was kept on a heating mantle and its temperature was adjusted to boiling and taking out cooling is done every 15 min. · e extraction was continued for 3 hours. Finally, the literates oil is pooled and kept

Treatment of cotton fabric with garlic:

For 5 g of socks and kitchen fabric 50 ml of garlic and olive oil was used. the fabrics were treated with garlic and olive oil by using pad-dry-cure process using the following procedure. The padding is carried out with three pad three nips and the squeezed fabric sample was dried at 60°C for 3 min and curing is performed at deferent temperatures (130°C, 150°C, 165°C) for 3 min.

A) Procedure for agar zone of inhibition test

1. Materials like petri dish, cotton swab and other equipments used for the testing process must be sterilized.
2. A nutrient agar solution is prepared by using 36 g of nutrient agar (consisting of peptone, yeast extract, NaCl, agar) with 1 litter of water.
3. The nutrient solution is sterilized in a steam sterilizer machine at a temperature of 121°C for 15 min.
4. 16 petri dishes were prepared with sterilized nutrient solution and kept until it is solidi · ed.

B) Procedure for soil burial test:

Azadirachta indica oil treated and untreated cotton fabric samples are buried in standard atmospheric soil for 28-30 days and the strength loss is compard.

SUMMARY AND CONCLUSION:

Based upon the result of finishing on wet rubbing and dry rubbing, finishing can be applied for socks. In this content I use garlic and olive oil for socks to cure this Varicose veins. Garlic is a excellent herb for reducing the inflammation and the symptoms of varicose veins. Olive oil has to increasing the blood circulation. Is it essential to treating the varicose veins. So, I could add this super ingredient to socks. It, will cure that disease. Based upon the tone produced, this finishing can be used for cotton fabrics. The process is eco_friendly and not harmful and it obeys ISO 14000 certification. The method of producing and handing is easy. The cost of the herbal eneaper. The natural source for the herbal extract finishing is easy to cultivate the recommended to apply this finish and procedures followed in the results of this research can be a right solution for this inner feeling and production of modern health and hygiene care products. Then the fabric finishing rating is also quite in good value of average of 4 ratings.

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EXTRACTING A FIBER FROM VELDT GRAPE PLANT AND MAKING A CLOTH SANITARY PAD

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ABSTRACT:

The evolution of clothing from its fiber stage to fabric requires a lot of process. Some of the metals involves in the result of harmful to our environment. In this case we make a product to remove all of this issue. Generally, veldt grape plant can save as from many diseases. Veldt grape is one of the most commonly used as a medical plantain this research we made a cotton sanitary pad by extracting a fiber from cissus quadrangularis (veldt grape). Basically, this plant has a power of reducing cramps during periods. The absorption of moisture content is very high in this plant so it is very helpful for making a sanitary pad.

INTRODUCTION:

Natural fibers like hemp, flax, jute, sisal and veldt grape have been well recognized as good potential reinforcement for engineering fiber composites. Natural fibers are preferred by many eminent scientist and researchers because of their remarkable properties such as their ease of ability, low density, cost effectiveness and environmental compatibility. The botanical name of veldt-grape stems fiber and wild date palm leave. Stalk fiber are known as cissus quadrangularis. veldtgrape stem fiber possessed the lowest diameter and density of approximately 0.2668 mm and 1.2128gm/cm.veldt grape stem fiber has highest strain to failure of around 6% in comparisons with other fiber. Fashion is not something that exists only in dress. Fashion is in the sky, in the street, fashion has to do with ideas the way we live what is happening. So let us go green and make fashion more eco-friendly.

MATERIALS AND METHODS:

Collection of raw material:

The raw materials are collected from the local area of hills station and available area.

Preparation of veldt grape fiber:

The veldt grapeis immersed in the water for 5-6 days. And the fibers are extracted by using soaking process.

Fiber extraction:

By using manual method, the fibers were extracted after retting process. The extracted fibers were thoroughly washed with fresh water for removing unwanted impurities from the fiber surface. The washed fibers were dried at room temperature for 3 days and later kept them in a hot air oven at 100^0c for about 2hr for removing moisture from the fiber surface. Finally, the dried fibers were cut at 40mm length and these sized fibers were used for fabricating the composites.

Chemical analysis and fiber diameter:

This analysis was carried out to determine the content of lignin cellulose, wax, moisture and ash of VGF. The lignin content was determined according to the klaxon method. The fiber chemical is to be added with the fiber.

SUMMARY AND CONCLUSION:

Many like-minded individuals and corporation have started to make bio degradable, natural, chemical and plastic free sanitary napkins for women looking for alternatives to synthetic pads that are safe for the women and environment-friendly as well. The pads made of calotropis gigantean have a wide range of medicinal properties. It is also widely used in ayurveda for management of various health hazards. The investigation on absorption of these pads is to be made using gelatin solution and is to be made using gelatin solution and is too compared against commercial sanitary pads. This investigation can be done to increase school attendance, improve the education levels attained by girls and be key step towards gender equality.

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BIODEGRADABLE NAPKINS USING CALOTROPIS GIGANTEA

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ABSTRACT:
This paper focuses on developing on eco-friendly sanitary napkin with multi layer construction by using biodegradable recourses. Sanitary napkin is needed by every young woman aged from 14 years to 45 years. The average women require 4500 napkins through other lifetime. Girls in low and middle income countries struggle to maintain good menstrual hygiene due to lack of affordable sanitary products. Low cost bio-degradable absorbents were investigated in gelatine solution in terms of their absorption for use in menstrual hygiene. Biodegradable sanitary napkins use materials such as banana fibre, corn starch, water hyacinth, organic cotton. This paper explains about the production of biodegradable sanitary napkins usingcalotropisgigantia (MILKWEEDS). Calotropis gigantea belongs to APOCYNACEAE family. It's native to India, China, Malaysia, Indonesia and Cambodia. This plant grows on sandy soil and dry uncultivated land, with periodic dry periods. The fibre is extracted from the stem of the plant and rendered in a twist form. As the product is bio-degradable it prevents non-biodegradable waste generation. Calotropis gigantean is absorbent, eco-friendly and hygienic alternatives to the sanitary napkins available in the market. The absorbency of calotropisgigantean pulp is 25% equilibrium moisture content. These fibers are the natural organic fibres. This simple research of a physical material can increase school attendance, improve the education levels attained by girls and be a key step towards low and middle income countries.

KEYWORDS: Calotropis gigantean, Napkins, Biodegradable.

INTRODUCTION:

Did you know that there are over a billion non-biodegradable sanitary napkins clogging India's sewage systems, water bodies and landfills? The commercial pads and tempons consists of 90 percent plastic and are also bleached with chlorine. In India one of the major culprits of the plastic pollution are the mainstream menstruation options available here. It may not be comfortable with switching to menstrual cups and cloth pads overnight but we can easily move to eco- friendly pads or tampons as an alternative choice. To produce natural products which are chemical free and prevent waste on landfills we strive to make green products, durable, repairable, energy efficient and made with recyclable materials to minimize the environmental impact through manufacture, packaging, distribution use and disposal. To design and develop biodegradable sanitary napkin based on naturally available resources. Among the various fibres used for napkins, calotropis gigantea has a wide range of advantages. It can also be readily available for affordable price.

MATERIALS AND METHODOLOGY:

Materials:

- Top sheet – calotropis gigantean fruit pulp
- Individual packaging – calotropis gigantean leaf pulp
- Packaging – calotropis gigantean leaf pulp
- Absorbent core(absorbent paper and air laid paper) - cellulose based fluff pulp
- Back wing release paper – silicon coated paper
- Bottom layer(back sheet) adhesive – polylactic plastic(PLA)

Methodology:

STEP 1- Fibre extraction:

The fibre is to be extracted from the plant of calotropis gigantean by natural methods. The leafs of the plants are to be washed to remove the dust particles. The mid rib of the leaves are removed and cut into small pieces and dried under sun. After drying any extraneous matter that may still be adhering to them was removed. The extracted fibre is made as a pulp.

STEP 2- Calotropis paper:

The paper sheets consists of multiple layer of calotropis pulp. The paper should beable to absorb all kinds of fluids as it is a critical material for the pad.

STEP 3- Plastic bottom layer and non-woven top layer:

The bottom layer of the pad consists of non-biodegradable plastic material. The top layer consists of nonwoven materials. This nonwoven material is also done with the calotropisgiganteafibre. A textile nonwoven material consists of unstructured fibres. Non-woven is an effective material in pad production as it lets the fluids into the absorbing material as it is soft against the skin.

STEP 4- Gum and label papers:

A gum is sprayed on the pads in order for them to stick between the layers of plastic and nonwoven. The gum consist of a soft a glue which is mixed with half part of water. The gum is also used for sticky papers for attaching the pads to the underwear. The label papers have matte side and a slippery side where the glue is added. They come in two different sizes for both the wings and the bottom of the pads.

STEP 5- Packaging bags:

The packaging bags are made with biodegradable materials. This material is made using calotropis gigantean leaf pulp. This biodegradable packing is done considering the health aspects for the purpose of storing pads.

SUMMARY AND CONCLUTION:

Many likeminded individuals and corporations have started to make biodegradable, natural, chemical and plastic free sanitary napkins for women looking for alternatives to synthetic pads that are safe for the women and environment-friendly as well. The pads made of calotropis

gigantean have a wide range of medicinal properties. It is also widely used in Ayurveda for management of various health hazards. The investigation on absorption of these pads is to be made using gelatine solution and is compared against commercial sanitary pads. This investigation can be done to increase school attendance, improve the education levels attained by girls and be key step towards gender equality.

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SUSTAINABILITY AND ENVIRONMENT
VEGAN LEATHER FROM CACTUS PLANT

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ABSTRACT:
The paper is overview the more eco-friendly leather alternatives have recently been developed .It is widely known that the production of animal leather is very harmful to the environment, but the leather is stable of many industries. In answer to these concerns about animal cruelty there been a boom in alternative made from Opuntia cactus that has been developed in Mexico. It is called dessert and is highly sustainable plant –based vegan leather made from cactus ,often distinguished by its great softness touch which offering great performance for a wide variety of applications and complying with most rigorous quality and environmental standards.100percent biodegradable vegan leather is short. In another plus for the environment, cactus leather is partially biodegradable and does not contain plastic-another issue with synthetic leather this makes for a true alternative to animal leather that does not harm the planet. Hence the cactus is converted to leather to an eco-friendly environment.
KEYWORDS: Cactus, Vegan leather, Polyurethane and Bio –oil, Eco friendly .

INTRODUCTION:

Until recently, pretty much all vegan leather was made of plastic-based materials. But over in these past few years, innovators have discovered many ways to make vegan leather out of everything from pineapples to cactus leaves to flowers. The vegan leather industry has come so far from the days of good old leather, so to celebrate; we have rounded up some of the most exciting plant-based leathers on the market. Cactus leather is a sustainable leather alternative made from Opuntia Cactus that has been developed in Mexico. It is called desserto and is highly sustainable plant-based vegan leather made from cactus, often distinguished by its great softness to touch while offering great performance for a wide variety of applications and complying with the most rigorous quality and environmental standards. This was developed by two Mexicans who used to work in the automotive and fashion industries – where they identified strong environmental impact in both sectors – this vegan leather aims to offer a cruel-free and sustainable alternative, without toxic chemicals, phthalates, and PVC. Rom the immense amount of toxic chemicals required to stop it from rotting when we carry it, to the water required to grow the grass used to feed the livestock in the first place, leather is one of the most resource intensive processes available. It is believed to require 17,000 litres of fresh drinking water to make 1kg of leather.

Desserto offers different levels of sustainable materials, its most sophisticated version delivers up to 92% organic carbon content from plants which makes the material highly biodegradable. It is backed with a range of different textiles, depending on the purpose of the textile. Working with Desserto has been an incredible journey as they consider every step of the value chain to ensure sustainability. From land resource and management, all the way through to

the actual material. The greatest thing about leather is that it lasts forever but this is also a part of another problem. Things that are lasts forever always need a place in this world where ever whether it in your wardrobe, thethrift store or just dumped into the landfills.

MATERIALS AND METHODOLOGY:

The materials used for converting cactus plant into a leather products Testing was performed at Cal Poly Pomona in the Apparel Merchandising and Management building. During the time of testing, the room temperature ranged from 72-75 degrees Fahrenheit and 57% relative humidity.

Weight: The weighting of leather involved using a scale to measure the weight of 2 x 2-inch leather specimens in grams. The weight was converted to ounces per square yard.

THICKNESS: Thickness was measured with a digital calliper.

Mature leaves are been cut from organically grown cactus plants, cleaned, mashed and then left out in the sun to dry out for more to three to four days until the desired humidity levels are achieved, before processing. This process of cactus leather involves using either the young leaves or the mature leaves of the plant. This also can be dyed naturally using methods developed by certain companies. This certified organic can be hold up regular usage for nearly a decade.“The idea of using this raw material was conceived because this plant does not absorb any water to grow, and there is plenty of it throughout the Mexican Republic. Besides, to be able to intake this material into various industries, it is essential to count on a stable, abundant supply of raw material. We currently have 2 hectares where they cultivate nopals, as well as an expansion capacity of 40 hectares. Regarding production capacity, we have 500,000 linear meters a month.”

The production of the PVC used in the production of many artificial leathers requires a plasticizer called a phthalate to make it flexible and soft. PVC requires petroleum and large amounts of energy thus making it reliant on fossil fuels. During the production process carcinogenic by-products , dioxins, are produced which are toxic to humans and animals. Dioxins remain in the environment long after PVC is manufactured. When PVC ends up in a landfill it does not decompose like genuine leather and can release dangerous chemicals into the water and soil. Polyurethane is currently more popular for use than PVC.cactus leather is processed with non-toxic chemicals, unlike animal leather, which is chromium-tanned - an extremely poisonous process that releases toxic slush of chromium salts and tanning liquor.

Zero animal cruelty: Cactus leather doesn’t required any input from animals .So animal advocates can rest assured that no animal is killed or mistreated during its production .



LEATHER FABRIC RAW LEATHER CACTUS PLANTPLANT BASE

SUMMARY AND CONCLUSION:

The study of cactus converting in leather is to bring up the fabric into eco-friendly .Vegan leather is made from synthetic materials like Polyurethane, while real leather comes from animals like cow and sheep. The type of materials that vegan leathers goods are often made from plastic-like materials ,such as PVC and PU and an contain toxic chemicals like Phthalates which may lead to hormone disruption among other things in human .Cactus leather is a natural sustainable, easy-to-grow alternative to traditional leathers .The best NOPAL leaves are selected for their resilience and strength because of their inherits ability to handle extreme temperature ,the leaves can handle low temperatures during the cold months .

1. Desserto saves 878.26%CED compared to animals leathers, and 78.96%compared to polyurethane (PU)

2. If incinerated, Desserto saves 1,416.66% Greenhouse gas emissions compared to animals leather, and 90.55% compared to polyurethane (PU).

3. Desserto saves 164,650% of water compared to animals leather ,and 190% compared to polyurethane (PU)

4. Desserto saves 500% Eutrophication impact compared to animal leather ,and 100%compared to polyurethane (PU)

Different compositions of the leather-like materials are successfully fabricated using waste maple leave (5-10%) and apple f Different compositions of the leather-like materials are successfully fabricated using waste maple leave (5-10%) and apple fruit (0-10%) pulp, mixed with additives such as kombucha biomass cellulose (25-40%), biodegradable polyesters (0-25%), and plasticizers (5-20%). The prepared bio composite materials are characterized for morphology, mechanical, adhesion, and water absorptive properties. SEM results confirm that the fabricated bio composites are porous and breathable.

To conclude, this material may be considered as the eco-friendly leather which harm less animals and hurt them by producing leather from cactus plant which absorbs less amount of water to been grown. This fabric is gives on the low source of degradable of the product or fabric. As it gives us high life time for the product produced by cactus leather.

CACTUS PLANT

TEXTURE OF CACTUS LEATHER

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ANTIBACTERIAL BEDSPREAD FOR BABIES

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ABSTRACT

Our world is now focusing on environmental friendly and sustainable products.There is an increasing demand for natural fibers.Now a days a lots of techniques & innovations have been developed to reduce the harmful effects of chemicals. In this modern era so many natural fibers are used, Kenaf fiber is one of them. Kenaf fiber is one of the most strong & soft material ,also this fiber has good mechanical property.It is the eco-friendliest fabric and commonly cultivated in India.Many researchers are done so many tests to characterize the property &uniqueness of this fiber.Thisstudydiscuss ,how kenaf fiber can be used as bed spread for new born babies.since, new born babies can be infected easily.Antibacterial property in Kenaffiber can be used to protect them.kenaf fiber has good moisture content so it has better water observing capacity. Since this natural antibacterial agents are less irritant, less toxic, it can be used as antibacterial protection for baby spread.

INTRODUCTION

There is an high demand for natural fibers worldwide, due to their renewable and biodegradable nature. Textile industry uses a variety of fibers as raw materials. Some of these fibers were known and used in the before civilization, as well as in the modern period. Kenaf fiber is one of the popular natural fiber used as reinforcement in polymer matrix composites. It is mainly used as jute substitute. The fibers in are taken in the baste and core. Due to low cost, reduced environmental impact, attractive properties & high absorbency it plays an leading role in textile industry.

Good sleeping habits are important for baby's physical and mental well-being. An important part of establishing good sleeping habits is – where your child sleeps, the kind of mat, bedspread, the type of mattress, and so on. When a baby passes urine onto the bed spread, it creates the favorable conditions for thegrowth of micro organisms which will result in the occurrence of nappy rashes. And also, the cellulosic materials used in baby spread easily degraded by microorganisms which in turn affects the sensitive skin of babies. Bacterial growth is one of thehighest fallout of non-hygienic atmosphere. Further microorganisms such as bacteria, fungi also cause deterioration of textiles. Hence there has been greater interest in textiles and garments that offer enhanced comfort as wellas protection to the wearer. For,preventing such rashes some kind of an antibacterial finishes is needed. Plants and plant product are traditionally used for healing wounds, burn injuries, anti-fungal, anti-viral against baby infection.

The current study focuses for developing natural fibers with herbal protection. Kenaf which has higher absorbency, economical, good feel, and has antibacterial property which helps the babies for absorbing urinary waste &protects from infection.

MATERIALS & METHODS

Preparation of Baby Spreads

Baby spread were prepared from four layers. The fibers were opened and blended using Shirley opener. The bottom sheet was made by polypropylene film, which is nonporous hydrophobic substance that helps the baby clothing remains dry. Superabsorbent polymer of about 5g was sprinkled over the layer of bedspread. About 12g of fiber weigh accurately compressed and placed between the top two sheets of polypropylene non-woven and bottom sheet of the same size .The top sheet allows the urine to flow through it , but does not allow the liquid nearby baby skin. After placing it, all the sides of the bedspread was sealed by applying heat and the edges was seal with adhesive.

Performance Testing of Baby Spread

Liquid Strike through Test

A drop of solution was allowed to fall on the sample and the time taken for the solution to transport from the upper layer of the spread to the inner layer was noted. The measurement was done closely observing the drop , such that a dull wet spot is seen on wet area of the sample.

Absorption capacity

The basic purpose of bedspread is to absorb the urine, dispersing it quickly and to retain the absorbed fluid without re wetting the surface. The total absorbency capacity of the bedspread was determined using EDANA method.

Product Density and Thickness

Each bed spread was conditioned for 24h at 24°c and the weight are measured using weighing scale .The thickness measurements were carried out at three places of the bedspread, on both sides and at middle, which were marked as S,M,L.

Mechanical properties	Characteristics
Density (g/cm3)	1.2
Breaking Strength	100.64
Elastic Modulus	23
Yarn Breaking load (N)	79
Tensile Strength	283-800
Elongation (%)	17.3
Moisture Absorption (%)	8.3

Antibacterial activity of fiber

“Kenaf leaves have antibacterial activity against Staphylococcus aureus and Escherichia coli. Strong correlation was found between antioxidant activity with polysaccharide (DPPH, r = 0.893; ABTS, r = 0.819; FRAP, r = 0.864) and total phenolic content (DPPH, r = 0.850; ABTS, r = 0.959; FRAP, r = 0.953).

Evaluation of the designed baby spread: The designed baby spread posses good absorption capacitywhich is well supported by the wicking values, both in longitudinal and transverse. The value proves that, thedesigned baby spreads were able to float for several minutes before it became completely wet and cannot prevent the rewetting of the liquid when subjected to pressure. The fluid run off value proves the designed baby spread have a tendency to bleed, after attaining the saturation point.

Performance of Designed Baby Spread:

Based upon the usage of the mother for their infants it is clear that baby spread were comfortable and good on usage. They were satisfied with the physical properties like size, weight and thickness. But the properties like colour were express as not satisfactory 52.5 per cent of mothers. The mothers also expressed leakage of the designed baby spread on over wetting.

SUMMARY AND CONCLUSIONS

Newborn babies, the most wonderful creator on the earth, rather the ultimate wonder of the Almighty is dream of every married man and women. Each individual take care of their tiny ones and tries to give the best to bring them the most effective manner. The young mother always wants their kids to healthy. Each individual take care of their tiny ones and tries to give the best to bring them most effective manner.

The results of this research can be perfect solution for this inner feeling and production of modern health and hygiene care products. The antibacterial skin touching layer proved to be safe, laying a foundation to reduce health problems like nappy rashes, patches, red allergy, itching sensation on the baby's skin. The kenaf fiber incorporated with wood pulp at the 30:70 showed good absorbency property. The other physical such as thickness, shape, size, and odor were satisfied by the mothers. The result of the research study proved, that the antibacterial finished baby spread were to reduce health problem and to produce eco friendly products.

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GARMENT INDUSTRY AND MERCHANDISING TOWN OF EXPORT EXCELLENCE

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ABSTRACT

The knitwear capital of India also known as, Tiruppur accounts for 90 percent of the India's cotton knitwear export. Everyone who is familiar with textile sector knows Tiruppur is the textile hub of India. The city functions successfully for more than three decades and also provides employment opportunities for more than 6 lakh people. When someone wants know about garment industry and merchandising there is no way they can leave Tiruppur out of focus. A good garment industry should be updated to the latest technology and the merchandising department is the most important department when it comes to exporting. Let's take an overlook on garment industry and merchandising.

INTRODUCTION

The apparel industry includes both knitted and woven fabrics. Tiruppur plays a dominant role in producing and exporting knitted garments. Tiruppur is the seventh largest town in Tamil Nadu which is spread across 27.20 sq. kms and 60 kms away from Coimbatore, Manchester of South India.

Garment industry also known as clothing industry. The garment industry means producing garments from raw materials. This industry consists of two main industries like textile industry and fashion industry. These industries are the major contributes to economies of many countries.

Merchandising is the important factor for garment industry. Merchandising refers to marketing and sales of garments produced. Every garment industry has their own merchandising department which is responsible for orders taken and following those orders.

GARMENTS INDUSTRY IN TIRUPPUR

Tiruppur, is the heartland of knit wear, there are around, 9,000 garment manufacturing units in Tiruppur which employs around 6 lakh workers directly, women's population is higher in garment industries when compared to other industries. Export houses have been increased over the two decades. Tirupur textile industry has units all along the value chain of knitwear starting from spinning, knitting, processing, printing, garments manufacturing and exporting overseas.

Garment industries usually develop garments, which starts from sampling and ends with shipping it to the customer. There are many steps involved in manufacturing a garment. The steps are,

1. MARKETING DEPARTMENT

   Marketing department is responsible for finding new customers. And delivering the products to the hands of the customer. This department has a marketing head who leads the department. Their main aim is to attract new customers through advertising

2. DESIGN DEVELOPMENT

The buyer sends his needs in a tech-pack which contains all the information about the garment to be constructed. This contains every little details. Even the small things like trims and finishes are mentioned in the tech-pack

3. MERCHANDISING DEPARTMENT
   Merchandising department acts as a middle person between the company and the buyer. They are the communicators between buyer and the company.

4. PATTERN MAKING

   Pattern making is done by the CAD department they use the tech-pack sent by the buyer to make patterns. They use marker efficiency to cut the fabrics with less wastage. The patterns should be approved by the merchandising department to proceed the further processes

5. SAMPLING DEPARTMENT
   After the designs are made the samples are constructed according to the tech-pack. The sampling should be approved by the merchandising department.

6. FABRIC STORE AND FABRIC SOURCING DEPARTMENT
   Fabric sourcing is done by the fabric department they should understand the needs of the customer and source them. The fabrics also should be approved by the merchandising department.

7. TRIMS AND ACCESSORY
   This department basically contains all the trims that is required for the garments. They should hand out a purchase order to buy more trims from outside.

8. PRODUCTION PLANNING AND CONTROL DEPARTMENT
   Production planning helps to plan the process on production. They decide on which time the garment should be produced.
   .
9. CUTTING DEPARTMENT
   In this department the patterns are cut in the garment. The department should aim for low wastage.

10. SEWING DEPARTMENT
    They stitch the garment. They either work on assembly line or group system. Altering, checking is also done by the sewing department.

11. FINISHING DEPARTMENT
    The garments after stitching are finished before packing. The finishes like ironing, labeling are done in finishing department.

12. PACKING AND SHIPPING

The final process is packing and finishing. In packing metal detection is done for the safety of the customers. And finally, shipped to the customers.

MERCHANDISING

Young generations are highly attracted by the merchandising department. The person who manages the merchandising department is called as merchandiser. Communication is the important trait for a merchandiser. The role of a merchandiser is not an easy one they should be concentrated and concerned about their responsibilities. Carelessness won't bring results to their job they have to pay more attention.

In merchandising department there is a senior and junior merchandiser. Senior merchandiser should have more years of experience. They can have assistant merchandiser if needed. They have a tight schedule as they are the ones who should oversee everything in a garment production processes. They have to coordinate the concerned departments in order to manage the production process in time. They have no option to show negligence in their profession.

RESPONSIBILITIES OF A MERCHANDISER

- Communication between buyer and the company. There should not be any miscommunication to buyer or the company. Internal communication is also important.
- Sampling, they should oversee sampling and send the samples to the buyer and get his approval.
- Lab-dips before dyeing the fabric a sample cloth of 5X5 fabric should be dyed and approved by the buyer.
- Accessories and trims every garment has their own trims and accessories they should be assigned correctly
- Preparing internal order sheets and purchase order to buy the necessity for particular garment.
- Setting quality level to the quality department, different orders require different quality levels. Its merchandiser's job to make sure the quality is correct. It is also merchandiser's duty to advice the quality department.
- Mediating quality and production department.
- Giving shipment instructions and following shipment is also the duty of the merchandising department

CONCLUSION

Tiruppur is a major textile center in Tamil Nadu also "knit wear capital" of India. The city is successfully growing for three decades. The quality of the city has improved after it started to export many countries. It has around 10,000 manufacturing units and employs over 6 lakh people directly. The success in Tiruppur is achieved by the manufactures unity despite their competition. The city has shown significant growth in last 3 decades.

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ANTI-BACTERIAL DRESS FOR HANDICAP CHILDREN

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ABSTRACT

The textile industry has grown rapidly. So it is important to make it eco-friendly. In this study, a bandage for handicapped children is made with antibacterial and antifungal finishes. A non-toxic antibacterial and antifungal finish is important for medical and sanitary purposes. Natural herbs such as neem (antifungal and antibacterial), aleovera (antibacterial) and spearmint (antibacterial) are used here to provide an antibacterial and antifungal finish. There are many difficulties faced by disabled children, including bathing. Since it is quite difficult for them to bathe themselves, outside help is required. If help isn't available, they can skip the bath for a few days. So clothes must be efficient enough to protect them from various infections and they should also be sustainable for the environment. Wearing the wipes with anti-fungal and anti-fungal properties can help them avoid these infections.

INTRODUCTION

Clothing is one of the basic needs of all human beings and a subject of universal interest .A Disability is any condition that makes it difficult for a person to perform certain activities or interact with the world around them. Today, the number of disabled children is increasing and the development of appropriate clothing for this type of children is in demand. Most children have little difficulty in purchasing attractive clothing for their personal needs, for those who are physically challenged. At the same time, disabled children have many difficulties bathing them. So they refrain from bathing. Since it is quite difficult for them to bathe themselves, outside help is needed. Functional elements such as antibacterial and antifungal properties play an important role in this content. Clothing must be efficient enough to protect you from various infections and it should also be sustainable for the environment. They wear clothes with these antibacterial and antifungal properties to avoid infection. Since neem has powerful antifungal properties, it will kill the germs. At the same time aloe vera have an antibacterial content because mint controls body odor and also has antibacterial properties. These three herbs are a power pack for this dress.

MATERIALS AND METHODS

Materials:

Cotton factory
Mint
Aloe vera
Neem

Methods:

- Herbal sourceThe work prepared the natural antibacterial textile finishing extracts from neem, mint, aloevera.

Aloe vera finish

For the production of an environmentally friendly and natural finish from aloe vera extract for various textiles Materials. Citric acid and methanol are used to apply the aloe vera finish to fabric.

The concentration of the antibacterial agent is 1, 2, 3, 4 and 5 gpl. Fabrics treated with a concentration of 5 gpl of aloe vera extraction are excellent. Reduction of bacteria in this case up to 99%. Finished the wash durability of the sample treated with antibacterial property was 98% after 50 washes.

Processing and extraction of neem

AzadirachtaIndica was again received for review as a possible treatment Amount in the leaves; they were kept in the shade at room temperature. After that are the leaves powdered and sorter.20 grams of powdered herbal powder are suspended in 100 mm methanol and infused overnight. The supernatant was filtered twice with What man #1Filter paper and filtration before being used to treat cotton clothes.

Methods of Extraction

The mint is collected from the local market. The mint were cleaned, washed and dried in the shade. The dried mint was pulverized. A total of 30g mint powder was weighed and placed in a Soxhlet tube. A little cotton is inserted into the extraction tube and mint powder is added over the cotton. 300 ml of ethanol solvent is placed in the bottom flask of the Soxhlet extractor. Then the Soxhlet temperature is set to 40°C and the extractor is turned on, the process is carried out for 24 hours. This process is repeated five times.

MICROENCAPSULATION

Tiny particles or droplets are encased in small capsules with useful properties. Most microcapsules have pores with diameters between a few nanometers and a few micro meters. Coating materials are rubber, carbohydrates, cellulose, lipids and proteins.

Method

A small piece of sample is taken. Sterilized nutrient agar is poured into a Petri dish and allowed to stand to solidify. 24 hours. Old broth culture mixed with sterile distilled water. Gently press the sample across the strip. The stripe lines should continue without any interruption. Load a full loopful of diluted inoculum and mark the strip. Incubate at 37°–2°Cfor 18-24 hours.

AGAR DIFFUSION PLATE

This method allows us to determine the effects of antibacterial agents applied to fabrics Materials. This method is only suitable for diffusive test materials. It is easy to perform and easy.

Method

The test sample was circularly cut. Placed in the room in the pre-conditioning zoneTemperature for 12-24 hrs. Used as a standard cotton fabric with no antibacterial activity negative control. Pour the prepared Petri dish and let it solidify. Inoculate sterile melted Nutrient agar with bacterial culture (top layer). Sterilized nutrient agar is poured inPour into sterilized Petri dish and allows solidifying (bottom layer). Press the test sample onto the agar Pop up. Incubate at 37°C for 18-24 hours. The presence of antimicrobial activity is indicated by the lack of bacterial growth directly beneath the test sample.

BACTERIAL REDUCTION METHOD

The ability of fabrics or textile materials to inhibit the growth of microorganisms or kill them, over a contact period of 24 hours. The evaluation of antibacterial finishes on textile materials and textile finishes is determined by the degree of antibacterial activity. This method is used to demonstrate antimicrobial performance against standard bacteria. The standard microorganisms tested are Staphylococcus aurous and Klebsiellapneumoniae. The test germ is cultured liquid culture. This procedure consists of the six main steps of sample preparation, sterilization, in oculation, incubation, washing/shaking and counting. Shape of the treated samples is cut out a circle from the fabric. Stack the patterns in a wide-mouth, screw-topped jar. The amount of fabric swatches to use depends on the fiber type and fabric construction. Samples of equivalent fiber type and fabric construction as test samples, but containing none antibacterial finish (negative control). Sterilization of samples is the optional step. It depends on the type of fabric. Apply the dilution to the test sample for 24 hours to allow it to recover untreated control swatches or treated test swatches at "0" contact time. That the test organism should be diluted in nutrient. Incubate additional jars within oculated untreated control specimens and vessels inoculated with treated test specimen sat 37±2°C for 18-24 hours. After the incubation, add the neutralizing solution to the vessels with untreated control samples and lenses with treated test samples. Shake a glass for one Minute. Then compare the sample before the test and after 18 hours.

APPLICATION TO ANTIBACTERIAL ON COTTON

Herbal extracts of neem, aloe vera and mint were applied to cotton fabric by the Methods of direct application, microencapsulation, resin cross linking and their combinations. All treatments show good antibacterial properties for the fabrics. Except for the director Method of use, other treatment shows good wash resistance up to 15 washes.

SUMMARY AND CONCLUSION

After applying herbal extract on cotton fabric, it is ready to make a garment for the disabled Children. Neem must avoid infection by harmful microorganisms. Control and kill Bacteria. Neem increase to luster of cotton fabrics. Aloevera have a reduction in bacteria. Mint have control body odor and kill bacteria. The antibacterial activity of cotton fabrics finished with neem, aloe vera and mint was qualitatively evaluated by Parallel Streak Method (AATCC 147-1998) bacteria. It has been observed that there are no visible ones Growth of bacteria (both Staphylococcus aurous and Escherichia coli) on the cotton fabrictreated with 200 3% (w/v) antibacterial concentration. However, there is no clear zone of Inhibition found around 201 the treated tissue.

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SUSTAINABILITY AND ENVIRONMENTPROTECTING THE ENVIRONMENT BY MAKING SHOES FROM MYLO COMPOSITE

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Abstract

The research aims shoe making to reduce material toxicity and product the environment. The textile industry is discovering new types of fibers. The mushroom fibers discovered in this way were found in the underground mycelium of the roots of mylo mushrooms. From these roots there is a flexible breathable fabric that is similar to animal skin and hence Leather is made from it. The root system of mushrooms is called mycelium, which binds substrate materials together as they grow. the research review take four types of mushrooms(reishi, oyster, king oyster, and yellow oyster).Find out the methods and characteristics of making shoes from Mylococompound

Introduction

The standard for the name "mushroom" is the cultivated white button mushroom, Agaricusbisporus; hence the word "mushroom" is most often applied to those fungi (Basidiomycota, Agaricomycetes) that have a stem (stipe), a cap (pileus), and gills (lamellae, sing. lamella) on the underside of the cap. "Mushroom" also describes a variety of other gilled fungi, with or without stems, therefore the term is used to describe the fleshy fruiting bodies of some Ascomycota. These gills produce microscopic spores that help the fungus spread across the ground or its occupant surface. Forms deviating from the standard morphology usually have more specific names, such as "bolete", "puffball", "stinkhorn", and "morel", and gilled mushrooms themselves are often called "agarics" in reference to their similarity to Agaricus or their order Agaricales. By extension, the term "mushroom" can also refer to either the entire fungus when in culture, the thallus (called a mycelium) of species forming the fruiting bodies called mushrooms, or the species itself.

Mycelium (plural mycelia) is a root-like structure of a fungus consisting of a mass of branching, thread-like hyphae. Fungal colonies composed of mycelium are found in and on soil and many other substrates. mycelium may form fruiting bodies such as mushrooms. A mycelium may be minute, forming a colony that is too small to see, or may grow to span thousands of acres as in Armillaria.

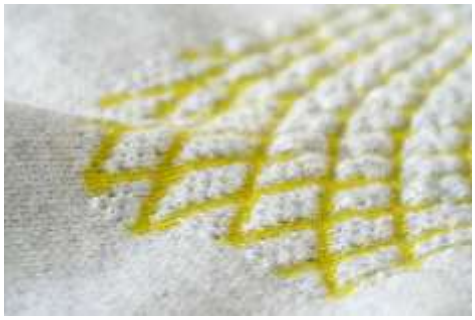
Material and Methodology

Mushrooms mycelium Mycelium (plural mycelia) is a root-like structure of a fungus consisting of a mass of branching, thread-like hyphae. Fungal colonies composed of mycelium are found in and on soil and many other substrates. mycelium may form fruiting bodies such as mushrooms. A mycelium may be minute, forming a colony that is too small to see, or may grow to span thousands of acres as in Armillaria.

The natural properties of the shoe's fabric provide water absorption and exhibit anti-static properties. For the face' of the shoes, the integration of the 3Dknitting technology, enabling computer aided designs to be transferred to a piece of clothing seamlessly, provides the opportunity for both individual customisation and on-demand production, utilising remarkably lower energy levels vis-à-vis other industrial production processes. Through a literal minimalism displayed in limiting the overall material count of the product to only three, a significant reduction in the thickness, breathability, and weight of the shoes is achieved. For additional comfort, pedobaro graphic measurements of the foot pressure during walking were also taken into account, along with the physiological conditions of the foot. Resultant, the slip-on sock shoe's sole is subdivided into three distinct sections, capturing the foot's pressure points and enabling additional

bending at the base without tearing. An additional insole further stabilises the ankle as well as the sides of the foot.

Mycelium Footwear shoe



Summary and conclusions

The review of research environment product and recycle the material from mycelium Footwear. In a world that finally seems to be coming to terms with the largely wasteful "regularity of the way we live and the products we use, or of "business as usual", the latest design innovation is bound to be one that looks at 'minimisation' without compromising on aesthetics. Signature, a completely compostable footwear design innovation using biomaterials, impresses on more Counts than one, from its genesis to the material it is built of, to the overall user experience for a potential buyer. The idea for Signature is born from the life cycle, the final destination, and the post-discarding impact of a regular sneaker. Trainer sand sneakers occupy a prime spot among the range of unsustainable apparel that is often discarded after a relatively shorter lifespan. To add to that, the complicated construction and the use of different materials including rubber, textile, and plastics make it nearly impossible and un profitable to disassemble and recycle a pair of trainers after the wear and tear. The focus was on the use of natural, renewable raw materials, the integration of functional requirements for a shoe, the possibility of individual customisation to the user, on-demand production with the lowest possible energy consumption and biodegradability of the products after their use," states an official release on the innovation at each of the stages of design. In order to approach the problem and conceptualise a solution, a fundamental factor for the ecological properties of every product, its material, was examined. The design is based on a series of material experiments with natural raw fibres after it was segmented into functional and structural areas: the membrane, the sole, and the transition between them.

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PRODUCTION OF TEXTILE FROM CITRUS FRUITS

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ABSTRACT:

Nowadays, lot research going on about a better alternative to cotton. So more focus is on making fibers out of waste collected which the innovation and sustainability process in orange fiber fabric. Orange is rich in fiber, vitamin and disease fighting polyphenols. They also contain limonene, a chemical that may be protected against skin cancer. Aside from looking pretty and feeling nice the orange yarn has on additional benefit, thanks to nanotechnology (NT) the material still contains essential oils and vitamin c . The skin absorb these oils and is nourished by them making the fabric is wearable body cream. Globally **7, 00, 000** tons of citrus peel waste every year are thrown away in landfills without proper recycling alternative. These peels are collected from the juice maker in the city and washed, cleaned, processed them. And their pantened technology 'PASTAZZO' that separate the cellulose from the material. And this extracted from the entire peel of citrus fruits which includes both inner and outer layer. This will be than mixed with material are made into filament, which can be used for weaving and knitting, or a blend with silk and cotton to make satin and poplin. 100 % orange peel waste fiber is also available which is similar to viscose. Fiber out of waste collected which leads to the innovation sustainability.
Keywords: Orange peel waste, eco- friendly fiber, regenerated cellulose, organic fiber .

INTRODUTION:

The orange is a fruits belongs to the family, rutaceae probably originated from regions comprising if southern china. Today is grown almost all over the world as a source of food for human. Orange is well known for most rich sources of vitamin c and it also contains considerable amount of carotenoids, flavonoids, essential oil and some material. In the world production of orange in **2017-2018** was around **54.28** million tons of product produced, so all of which results in around **38** million tons peel waste per year. So the textile industry starts – up rescue the peels into the fiber. And its growing interest on utilization of bio resource waste derived from the fruits as an important step sustainable development step sustainable development. Most of the textile from orange peel and developed a luxury material of waste from orange. Therefore, that review describes the various application of orange he peel waste as sustainable material in textile industry.

MECHANISMS:

The peel of citrus fruits in composed by two portions epicarp/ flavedo, colored portion of peel and mesocarp/albedo, inner white, highly rich in cellulose.

EXTRACTION FROM INNER SKIN OF ORANGE PEEL:

- Alpha cellulose is obtained from the inner white – colored portion of peel orange (mesocarp/albedo) which can be spun and from filament extraction procedure is chlorine-free.
- Preparation of a cellulose yarn by a cellulose material composed of alpha – cellulose extracted from orange.
- Treating raw materials derived from the citrus fruits with 2 % hydrogen peroxide in basic with 0.5-6 wt% sodium hydroxide.
- Carried out at a temperature from 65℃ to 90℃ with PH of 11 to 12, solution is filtrated. The solid comprising cellulose to recover.
- After filtration, it is washed and with distilled water and optionally with acetone, washing is carried out until a neutral PH is achieved.
- The solid recovered after filtration is air dried or dried in an oven.

EXTRACTED FROM BOTH OUTER AND INNER LAYER OF ORANGE PEEL :

- When the raw materials comprises both the albedo and flavedo, is treated with solvent preferably ethanol and toluene before extraction. The raw material deriving is suspended is a solution of hydrogen peroxide under mechanical spring.

- A temperature is kept between 65℃ to 80℃, PH 11 – 12 with sodium hydroxide. The solution is filtrated and solid recovered. The solid then undergoes extraction into a solution comprising, acetic acid and/or formic acid to which hydrogen peroxide is added.
- Temperatures kept 60℃-90℃, filtered then a second solid is recovered, which is suspended in a solution of 0.5 – 6 wt % sodium hydroxide with temperatures fro. 90℃ to 110℃ and final cellulose products is recovered by filtration

BENEFITS OF ORANGE FIBER :

- This mean that hundreds of thousands of tonnes of orange peels find good use as ethereal fabric perfectly suited in highly – quality textile and fashion.
- Organic of this fiber is wonderfully soft, cuddy and strong it's drape beautifully and anti – national wrinkles.
- It's avoiding a all pollution in the world. And orange fiber is sustainability and eco – friendly fabric.

ORANGE FIBER IN FASHION INDUSTRY:

- Textiles are rightly called as a SECOND SKIN due to its close positioning to body.
- Orange fiber and fabric is new development made which is sustainable as per the market trends and also sustainability and environmentally friendly.
- The fiber which has also been used by well known designed Salvatore ferragamo for his collection seems like the fiber of the present time.
- And, the designer created high-end shirts dresses, using orange fiber and many designs that they launched as capsule collection on earth day.
- Victoria alberta museum in condon organized on an exhibition displaying 300 words on the title FASHION FROM NATURE displaying over 3000 garments along with ferragamo orange fiber collection.

CONCLUSION

As per the call of the current scenario sustainable fibers are the need of the hour. orange fiber and fabric is the new development made which is suitable as per the market trends and also sustainability. the fiber which has also been used by well known designer salvatoreferragamo for his collection seems like the fiber of the present time. also these sustainable fibers are indeed the fiber of the present and growing future.

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-TRENDS FOR FUTURISTIC DEVELOPMENT IN:HOME SCIENCE RESEARCH AND INNOVATIONI (HSRI-2022)
Department of Costume Design and Fashion
FASHION AND TEXTILE PRODUCT DESIGN

NATURAL DYE

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ABSTRACT

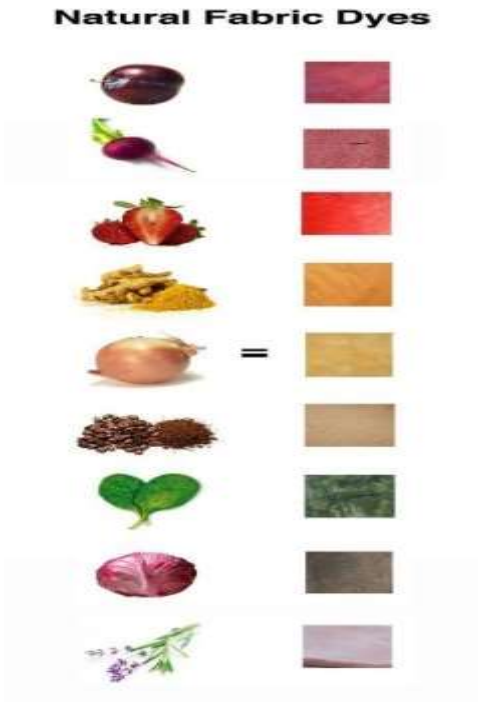
We are nowadays talking more and more about natural dyes. Nature offers us multiple possibilities of colours to dye fabrics. In Natural dyeing each other carries subtle and harmonious shades. Indeed of natural dyes are not harmful to the environment. Since, they come 100 % from natural and renewable sources. They are obtained from fruits, plants, minerals and insects

Keywords: dyeing, extractions of natural dyes, color fastness.

INTRODUCTION

Then the textile to be dyed are added to the pot, and held at heat until the desired color is achieved. In combination with metal salt mordant's including tannin from oak galls and a range of other plants such as plant-derived oxalic acid, and ammonia from stale urine

In combination with metal salt mordents'—including tannin from , pseudo-tannins , such as plant-derived oxalic acid , and ammonia from stale urine. Dyes such as cochineal and logwood were brought to Europe . The treasure fleets and dyestuffs. The discovery of manmade in the mid-19th century triggered a long decline in the large-scale market for natural dyes. The majority of the natural dyes are vegetable dyes. There are some technical issues and disadvantages related to the application of natural dyes which reduced its applications that are Mostly applicable to natural fibers (cotton , linen , wool and silk) , Poor color fastness properties , Poor reproducibility of shades , No standard color recipes and methods available , Use of metallic mordents', some of which are not eco friendly .



The types of natural dyes currently popular with craft dyers and the global fashion industry includes. Cellulose fibres: cotton, linen, hemp, ramie, bamboo, rayon. Protein fibers are wool, angora, mohair, cashmere, silk, soy, leather, suede.

Colors in the range of reds , browns, and oranges are the first basic colors in a number of ancient textile industries ranging from the Neolithic to the BronzeAge across the Levant, Egypt, Mesopotamia and Europe , followed by evidence of blues and then yellows , with green appearing later . There are some technical issues and disadvantages related to the application of natural dyes. Turkish carpets are recognized for their beauty made with natural dyes.

MATERIALS AND METHODOLOGY

- Cutting board ,
- Vegetables or plants (we used beets, spinach, tumeric and red cabbage) etc .,
- Knife ,
- Water ,
- Large bowl or measuring cup ,
- Salt ,
- Condiment bottles ,
- White t-shirt or other dyeable material ,

- Rubber bands ,
- Baking sheet with rack ,

Methodology

To make the dye Wearing gloves, chop up raw ingredients and place in a blender using a ratio of two cups of very hot (almost boiling) water to every two cups of raw material. Blend mixture until it becomes a very fine slurry. Dissolve 1 tablespoon of table salt in the liquid. Use rubber bands to create a pattern on your shirt (or other cotton item such as socks, bag, onesie, etc). Pinch, pleat or fold fabric to make design. Mix 1 cup of salt with 16 cups of water and bring to a boil (or ½ cup of salt with 8 cups of water). When done simmering, run under cool water. Wring out a bit of the excess water.

CONCLUSION

A natural dye does not create any side effects. Dyes are taken into the vegetables, plants, animals. Dyes are used to print in the textile industry and also used in home furnishing such as Turmeric. Turmeric is a anti bacterial agency. So, it doesn't create any cause.

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Department of Nutrition and Dietetics

ASSESSING THE PHYSICO-CHEMICAL PROPERTIES AND STORAGE STABILITY OF BLENDED OILS

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Abstract

Fats and oils are the most abundant lipids in nature. They provide energy for living organisms, insulate body organs and transport fat-soluble vitamins through the blood. The objective of this study is to provide healthy oils with the correct ratio of SFA:MUFA:PUFA , recommended by WHO. The study was conducted by blending rice bran oil with sesame oil/ groundnut oil/ sunflower oil in the ratio of 85:15, 80:20 and 90:10 respectively, so as to meet the WHO specification for healthy oil and to improve the thermal and oxidative stability of oils during frying and storage. Rice bran oil was selected as it has very high smoking point, hypoallergenic and is rich in antioxidants (tocopherols, tocotrienols and oryzanol). The blended oils were stored in brown bottles as it prevents the entry of UV rays which cause damage to the oils. The study was conducted for 80 days. At the end of every 20^{th} day, the fresh and used oil blends were tested to predict its physico- chemical properties such as moisture content, free fatty acid, peroxide value, iodine value, kries test and silver nitrate test (AOCS procedures). The result showed that the oxidative stability of all the blends was at satisfactory level for 40 days, but when stored for 60 days it undergoes oxidation and the acceptability of oils decreases. Blending increases the thermal stability and oxidative stability and it does not impart any flavor or blurred taste to the fried products. Rice bran oil has excellent oxidative stability, antioxidant property and high smoking point. Therefore blending rice bran oil with other oils will provide Saturated and Unsaturated fatty acids in recommended ratio which is good for the all human beings.

Introduction

Fats and oils are likely the most crucial ingredients used in cooking. They are obtained from a huge assortment of plant and animal sources. The difference between fat and oil is simply that the former is plastic or semi solid at room temperature while the latter is liquid (Manley 2000). Edible fats and oils are composed of triacylglycerols. The type of fatty acid at every position profoundly affects the physical behavior of the fat and oil and also the

comparative proportions of every triacylglycerol in the fat and oil are crucial to their overall performance and stability.

The importance of fats and oils commences from their functionality which is due to their chemical composition and structural aspects (Belton 2000). According to deMan (1998) the functional properties of commercial fats are strongly allied to their fatty acid and triacylglycerol compositions.

Edible oils and fats are recognized as essential nutrients of our daily diet and contribute significantly to the regulation of different body functions. Numerous physical and chemical parameters are used to assess their quality (Nielsen, 2003; Febrianto & Yang, 2011). Edible oil quality is largely determined by physicochemical characteristics due to its nature and processing procedure, and the environmental factor when it stays in the market shelf. However, these diverse groups of organic substances are prone to oxidation. Autoxidation is the main cause of edible fats and oils quality deterioration (Farhoosh, 2007). Oil shelf life is principally affected by its susceptibility to autoxidation, which is determined in large part by its fatty acid composition (Broadbent & Pike, 2003; Merrill, Pike, Ogden, & Dunn, 2008). In the course of the autoxidation reaction, a series of compounds are formed, causing off-flavors and rancidity, loss of nutritional value and finally consumer rejection (Alonso, Campos, Salvador, & Frangipane, 2004).

Even though proper care is taken during preparation, packaging, and storage of every food, they are wholesome only for a certain period called shelf-life. The shelf life of a product begins from the time the food is prepared or manufactured. The period is dependent on many factors including the types of ingredients, manufacturing process, type of packaging and how the food is stored (NZFSA, 2005). So, shelf-life dating of foods is a mandatory requirement of all processed foods. It provides a guide to consumer in food purchase. This requires a valid and reproducible shelf life study (Kramer & Twigg, 1968). There are two test methods for conducting a shelf life study; direct method and indirect method (New Zealand Food Safety Authority (NZFSA), 2005). The direct method also known as real-time shelf life study involves storing the product under specific conditions for a time longer than its expected shelf-life and checking it at regular intervals to see when it begins to spoil. The two indirect methods allow for shelf life prediction without conducting a full-length storage trial and are useful for products with a long shelf life. These are predictive model: calculate shelf-life based on information from a database that

predicts bacterial growth under specific conditions, and accelerated shelf life study: which involves deliberately increasing the rate, at which a product will spoil, usually by increasing the storage temperature (Robertson, 2010).

There were many reasons for the push to study the physicochemical characteristics and evaluation of shelf-life of edible soybean, peanut and cottonseed oils produced in Ethiopia. They are important in daily use as cooking, salad making and in various food processing industries. Quality problem in finished products has been among the major challenges of the manufacturing sector in Ethiopia as identified through industry level survey (AACCSA, 2014). Also, edible oil qualities analysis and shelf life testing are an important part of the quality maintenance in the edible oil industry for quality and safety reasons. Inappropriate labeling of the best before date and aging are usually pointed out as the main reasons for failures that can lead to legal actions for mislabeling and bad experiences for consumers (Moore, Spink, & Lipp, 2010). The development of an effective tool to predict oils shelf-life is considered of paramount importance in order to protect consumers and to avoid the commercialization of oils that do not comply with the regulatory parameters for the commercial grade stated on the label.

Besides, nutritional and toxicological effects of lipid oxidation in foods have attracted much interest recently (Frankel, 1995; Blumenthal, 1996; FAO, 2003). Oxidation reduces the essential fatty acid content of edible oils. However, a more serious problem is associated with toxicological effects of oxidation products. Since oxidative rancidity is a free radical chain reaction; lots of free radicals are formed, which can pose a major threat to health by damaging the human body at the cellular level (Holt, 2011). Excess free radicals can cause premature aging, heart disease, cancer, chronic fatigue syndrome and a host of other conditions (Alonso et al., 2004; Greyt et al., 2000). The purpose of this research was to achieve the accelerated shelf-life prediction of edible cotton, peanut and soybean seeds oils using an empirical model and quality characterization of the produced oils in Ethiopia.

WHO recommends that healthy oil should contain 1:1,5:1 ratio of SFA: MUFA: PUFA. So, the present study was done to mix. Rice bran oil with sunflower oil/groundnut oil/ seasame oil so as to satisfy WHO recommendation of healthy oil.

Methodology of the study is as follows:

Rice bran oil was blended with sesame oil/groundnut oil/sunflower oil in the ratio of 85:15, 80:20 and 90:10 respectively so as to meet the WHO specification for healthy oil and to improve the thermal and oxidative stability of oils during frying and storage. Rice bran oil was selected as it has very high smoking point, hypoallergenic and is rich in antioxidants (tocopherols, tocotrienols and oryzanol) which increase shelf life of oil, making it perfect for deep frying and is a premium choice for the replacement of oils. The other three oils such as sunflower oil, sesame oil and groundnut oil were selected based on the result of our the pilot study which was conducted in Namakkal district)using questionnaire method with 20 subjects.

The selected blended oils were stored in brown bottles as it prevents the entry of ultra violet rays which cause damage to the oils. Blended oils were stored in sterilized brown bottles for two months. At the end of every 20 day, the fresh and used oil blends were tested to predict its physico chemical properties such as moisture content, free fatty acid, peroxide value, iodine value, kries test and silver nitrate test were analysed according to AOCS procedures. To evaluate the acceptability of oil as a frying media selected oils were used for deep fat frying (tapioca chips) on every 20th day of storage. Sensory quality of the tapioca chips was evaluated by 15 panel members by "Numerical scoring method" on a three point score card.

Result of the present study are summarised below.

- **Changes in moisture content**

Moisture content of the blended oils was increased significantly on storage and after frying. Maximum difference in moisture content (0.03) was observed in 80 days of stored RBO + SSO blends before and after heating when compared with other blends due to long storage period. After heating the 60 days blends shows slight variation in the moisture content (0.02) in RBO + SSO and RBO + GNO. There was no variation in fresh blend, 20 and 40 day stored blended oils (0.01) in both before and after heating. Hence the moisture content was within the accepted level.

- **Changes in free fatty acid content**

The free fatty acid content of unprocessed oils ranges from 0.36 to 1.2 and processed oils ranges from 1.1 to 2.1 on the various storage period. The results revealed that the free fatty acid content of unprocessed blended oils were seem to be within the normal range for 40 days

whereas for processed oil it seem to be increased on 20 day itself due to oxidation on frying. Hence free fatty acid content of the blended oils was increased gradually on frying.

- **Changes in peroxide value**

The peroxide value was found to be normal for fresh oils for both processed and unprocessed oil blends. Whereas the peroxide value was found to be increased on storage and also after frying. Maximum increment were observed in the blends like RBO SSO and RBO + GNO, when compared to RBO + SSO. The peroxide value for processed blends were higher when compared to unprocessed due to oxidation of oils.

- **Changes in iodine value**

The results revealed that, the number of double bonds were found to be decreased in the blended oils when the oils were heated and also when they stored for a longer period. The minimum decrease in the double bonds were noted for the blended oils which was stored for 20, 40, 60 and 80 days of storage. Similarly when the oils were fried there was decrease in the degree of unsaturation and the iodine value was found to be decreased.

- **Changes in Kries test**

Kries test is a predictor of early stages of racidity and measures primary stages of oxidation. The oils which was stored for 0, 20 and 40 days does not undergoes any oxidation for both the processed and unprocessed oils whereas, the oils stored for 60 days or about shows the positive result (appearance of pink colour), which indicates that the blended oil undergoes oxidation. Hence the oils stored upto 40 days was highly acceptable when compared to that of oils stored for 60 days.

- **Changes in silver nitrate test**

` It is a measure of secondary stage of rancidity.

The result shows that, the presence of white precipitate was noted in both processed and unprocessed blended oils such as RBO + SSO and RBO +GNO, which was stored for 60 days. All the blended samples which was stored for 80 days obtained pale white precipitate which indicate the secondary rancidity. Hence, the oils stored upto 40 days was highly acceptable when compared to the oils which was stored for 60 days or above.

Sensory evaluation of tapioca chips

Tapioca chips fried in fresh blended oils and oils stored for 20, 40 and 60 days had no significant difference. Hence it was highly acceptable. Blending improves the nutritional quality, thermal stability and oxidative stability. But the chips fried oils which was stored for 80 days showed slight difference in taste and texture.

Conclusion:

From the results of the above study, it can be concluded that the oxidative stability of all the blends were in satisfied level for 40 days, but when stored for 60 days it undergoes oxidation and the acceptability of oils decreases. Blending was found to increase the thermal stability and oxidative stability and it does not impart any flavour or blurred taste to the fried products. Rice bran oil because of its excellent oxidative stability, antioxidant property and high smoking point it was blended in commonly used cooking oil, to make it more available to all the areas of population.

Future recommendation

- Evaluating the storage stability of blended oils stored in various containers.
- Awareness of blended oils among the down troddens and nutrition education about blended oils.
- Stability of antioxidants in RBO during deep fat frying and storage.
- Storage stability trials of RBO + GNO, RBO +SFO, RBO + SSO blend in different ratios and its acceptability.

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Department of Nutrition and Dietetics

NEUROPROTECTIVE AND PARKINSON DISEASE - ALTERNATING EFFECTS OF THE KETOGENIC DIET

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Abstract

Parkinson's syndrome is a chronic, severe, and degenerative neurological condition characterized by dopamine (DA) and non-DA neuron degeneration, the development of Lewy bodies in practically every cell, and motor impairments. While the majority proportion of Parkinson's disease (PD) cases are rare, distinct genetic flaws in a small number of familial instances have revealed unique insights into the disease's pathophysiology (PD). After Alzheimer's disease, Parkinson's disease is the most common neurodegenerative disorder. Insight into the molecular pathways of Parkinson disease (PD) is being gained through the development of animal and cellular models of mutations in LRRK2 and α-synuclein (When a person gets Parkinson's disease, they have excessive quantities of the protein α-synuclein, which is thought to be the cause of the brain damage), which are also linked to autosomal - dominant Parkinson disease (PD), and mutations in parkin, DJ-1, and PINK 1, which are responsible for Parkinson disease (PD) [1]. The mutated genes impair mitochondrial energy production and function while raising ROS levels and oxidative stress. The loss of dopaminergic neurones in the substantia nigra of the midbrain is the cause of the most typical clinical symptoms. According to the theory, a proper ketogenic diet reduces ROS levels and inhibits gene mutation and dopaininergic cell death in the substantia nigra pars compr.a (SNpc). As a result, we propose the ketogenic diet (KD) as a modern, side-effect-free treatment for Parkinson's disease (UD).

Introduction

The ketogenic diet (KD) was introduced in the 1920s and has been used in medical practice for over 80 years, mostly to treat epileptic symptoms [2]. The KD is a high-fat, low-protein diet. In healthcare, a low-carbohydrate diet is used to treat epilepsy in children. The body is forced to burn fats rather than carbohydrates as an outcome of the diet. Ketone bodies are developed as a result of consuming a ketogenic diet. In the absence of glucose, other fuels such

as acetone, acetoacitic acid, and β-hydroxy buterate can be used to meet the body's energy needs in other words it is a sort of metabolic therapies in which the body uses ketones as a primary energy source rather than glucose [3]. The Metabolic therapy tries to improve neuron metabolism, development, and repair while also protecting neurons. There has recently been renewed interest in the ketogenic diet's potential in the treatment of neurological illnesses other than Parkinson's disease and Alzheimer's disease. These neurodegenerative illnesses led to the concept that the ketogenic diet could have not just suggestive benefits, but also favourable disease-modifying action for neurological disorders [4]. Other symptoms or associated problems with Parkinson's disease may be alleviated by following certain diets or adding medicinal herbs to the diet, such as Turmeric (Curcumin longa, C. domestica), which has shown potential in treating of Alzheimer's disease due to its anti-MAO activity and is expected to have a similar effect on Parkinson's disease. Curcumin has been demonstrated to suppress both MAO-A and MAO-B, making it potentially beneficial for Parkinson's disease (related to low dopamine) and depression (because to low serotonin). The Amazonian plants embauba, mulungu, manaca and suma, among others, are possible therapeutic herbs for Parkinson's disease [5].

The ketogenic diet metabolism

This KD metabolism works by substantially lowering carbohydrate consumption and substituting fat for it. This decrease in carbs causes your body to enter a metabolic state known as ketosis. When this happens, your body becomes very effective at burning fat for energy. It also causes fat to be converted into ketones in the liver, which can be used to provide energy to the brain. KD metabolism has an impact on brain activity, and metabolic disruption has been linked to a number of neurological illnesses. The cause-and-effect relationship among metabolic and neural dysfunction, followed by the KD, may partially ameliorate seizures and other pathological conditions by increasing ATP levels and energy synthesis in the brain. Models of Parkinson's illness (Cheng et al, 2009; Yang and Cheng, 2010), amyotrophic lateral sclerosis, and Alzheimer's disease have all shown that KD feeding had a positive effect. In addition, KD feeding reverses aging-related biochemical changes in animals' brains. Direct application of ketones is also beneficial in Parkinson's and Alzheimer's disease models.

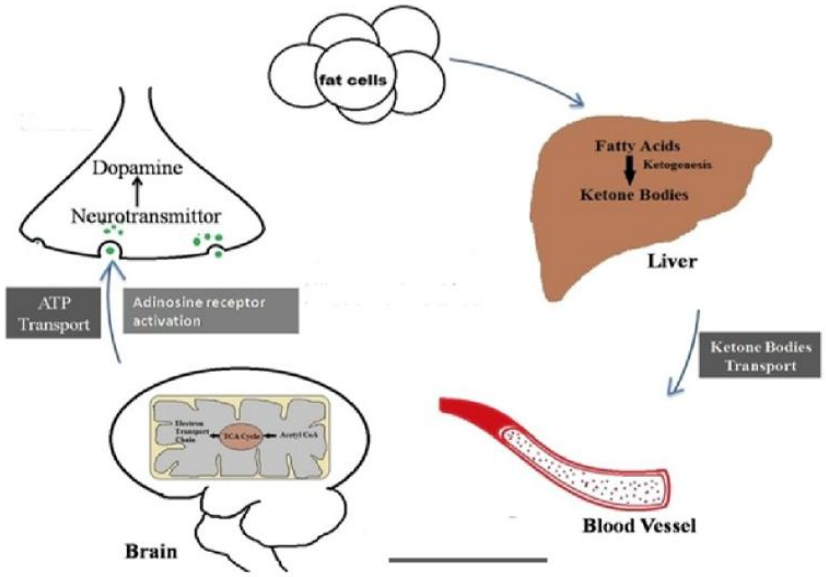


Figure 1: oxidation of ketone bodies: the KD provide the ketone bodies such as acetone, acetoacetic acid and β – hydroxy buterate and released into the circulation as an alternative energy source to generate ATP ("ketolytic" metabolism) within tissues, including the brain and spinal cord.

Furthermore, the KD appears to increase mitochondrial biogenesis by causing a coordinated upregulation of mitochondrial genes and genes involved in energy metabolism, as measured by electron microscopy.[6].

Levodopa withinside the Treatment of Parkinson's disease

As our understanding of the pathogenesis of PD has progressed over the last 25 years, the preference for pharroacotherapy for PD has increased significantly. Anticholinergics were the only drugs used to treat Parkinson's disease until the 1960s, and they were ineffective and had a high rate of gastro intestinal and neuropsychiatric adverse effects. [7] The introduction of levodopa has a draitiatic effect, lowering disability and mortality while also lengthening patient life.

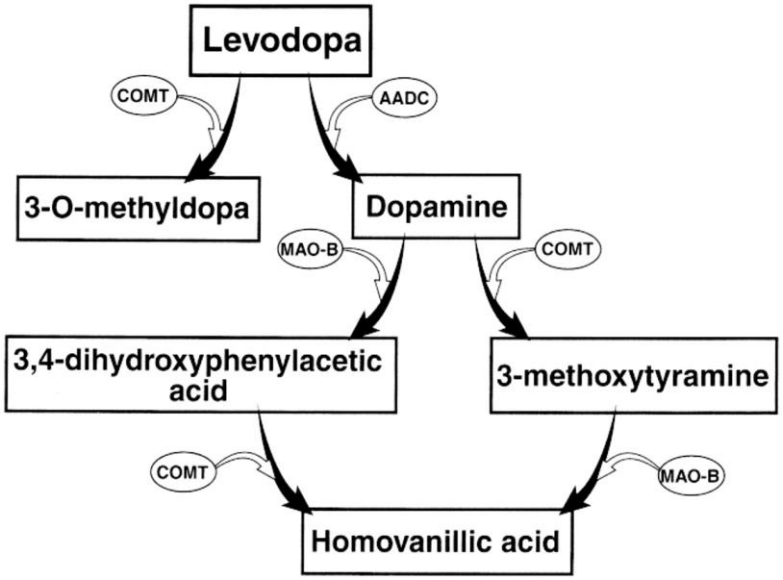


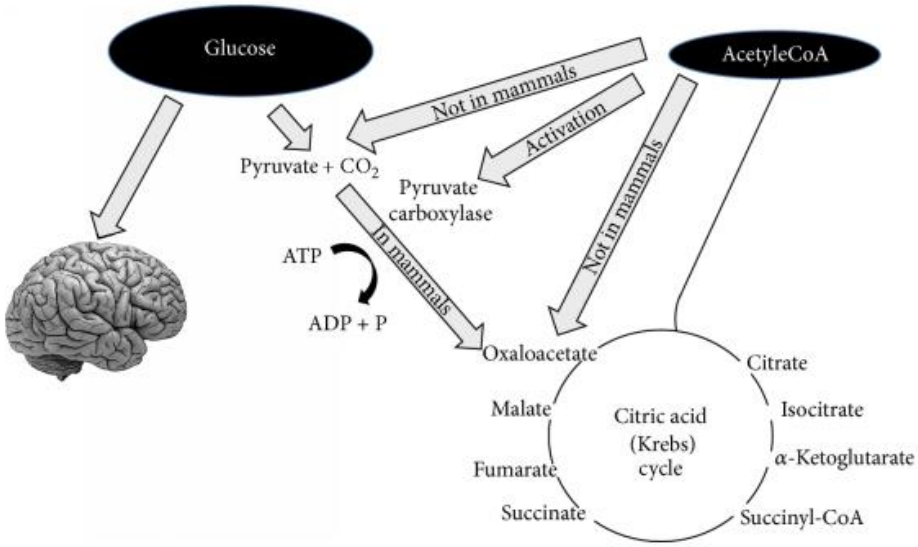
Figure 2: Metabolism of levodopa and dopamine [8].

Despite the introduction of a slew of novel dopaminergic medicines for Parkinson's disease, such as dopamine agonists and dopamine reuptake inhibitors, levodopa remains the gold standard treatment for the disease 40 years later [9]. However, these medications have some negative effects, such as nausea, vomiting, and breathing problems [10]. The use of levodopa as a dopamine-replacement medication is successful in decreasing illness symptoms and is still the benchmark against which other treatments are measured [11].

Effect of KD in gene mutation of PD

The precise mechanisms of SNpc cell death in PD is unknown, but several sources of evidence point to mitochondrial dysfunction as a feasible prime cause, given mitochondria's central role in energy production, as well as oxidative stress, ubiquitin system impairment, and excitotoxicity, all of which could be interconnected. When the SNCA gene interacts with electron transport chain complex I in the mitochondrial matrix, it promotes the production of lewy bodies, which exacerbate mitochondrial damage [12].

Parkinson Disease and Ketogenic Diet:



The pathogenesis of sporadic Parkinson's disease (PD) is unknown, but several studies suggest that excitotoxic degeneration of dopaminergic neurons within the substantia nigra is the primary cause, leading to movement abnormalities, a growing volume in cognition, and other cortical characteristic disorders. It has been suggested that a mitochondrial feature connected to the substantia nigra impairment plays a key role in the onset and progression of Parkinson's disease. For example, in cultured mesencephalic neurons, Kashiwaya et al. used the heroin analogue 1-methyl-4-phenylpyridinium, MPP (+), which causes dopaminergic substantia nigra cells to die by inhibiting the mitochondrial NADH dehydrogenase multienzyme complex, resulting in a syndrome similar to Parkinson's disease. MPP (+) toxicity neurodegeneration was protected by -Hydroxybutyrate [14]. In animal models, 1-methyl-4-phenol-1,2,5,6-tetrahydropyridine (MPTP) is used to cause selective death of dopaminergic neurons inside the substantia nigra, simulating the symptoms of Parkinson's disease. Regarding the aforementioned disorders, the positive effects of KD on mitochondrial function may be a crucial factor within the use of such a diet as ketones can also help to avoid the disease in complex I hobby implicated in PD. Infusion of -hydroxybutyric acid protects mice from dopaminergic neurodegeneration and motor impairments caused by MPTP. In a rat model of Parkinson's disease, KD protected dopaminergic neurons in the substantia nigra from 6-hydroxydopamine neurotoxicity. VanItaille

et al. discovered that in persons who were capable of preparing a "hyper ketogenic" eating regimen at home and sticking to it for 28 days, a high level of KB was linked to a rise in the Unified Parkinson's Disease Rating Scale score [15].

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Department of Nutrition and Dietetics

NOVEL FOOD PROCESSING TECHNIQUES FOR CARROT MALT

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Abstracts:

The present experiment is to study the new food product of the carrot malt. Carrots are good source of beta carotene which is a natural pigment that is used by the body to make vitamin A and it has good amount of fibre. Individuals with low vitamin A levels are more likely to experience night blindness, a condition that may diminish by eating carrots or other foods rich in vitamin A or Carotenoids. A good nutritional base is essential for the infants to grow. Complementary foods are foods other than breastmilk or infant formula introduced to an infant to provide nutrients. The malt was analysed for nutritional qualities such as moisture, ash, protein, fat, fibre and β-carotene, Organoleptic characteristics of colour, Texture, taste, aroma and overall acceptability and microbial studies to assess the suitability of these CFMs for consumption and its shelf life.

Key words *– Carrot malt, Malt, Carotene, Vitamin A, infant healthy drink.*

Introduction:

Carrot is the most important crop of Apiaceae family. It is one of the most popular root crops grown throughout the world. It is important source of dietary carotenoids mainly for high β-carotene, which is lipid soluble carotenoid having high vitamin A activity. The total carotenoids content in edible portion of carrot roots range from 6,000 to 54,800 µg/100g. Protein energy malnutrition [PEM] is the most lethal form of malnutrition [Tiencheu et al., 2016]. Cereals form the major part of most complementary mixes and contribute to 70-80% of daily energy intake. Vitamin A deficiency is a major public health problem in developing countries [Bonsi et al., 2014]. One way to increase vitamin A intake of infants and pre school age children's is incorporate high carotenoid food in their diet. The children in most of developing countries suffer from malnutrition due to improper eating habits during the weaning period and

preschool children. the vitamins are accessary food factors which are organic in nature and must be supplied from outside to maintain health, growth and the state of well-being of a person. Vitamins cannot be synthesized in the body. The must be supplied from outside, e.g., through foods. In the body, vitamin A can also function in aldehyde (retinal) or acid (retinoic acid) forms. Vitamin A plays a critical role in vision in dim light, in the retina of the eye. Absorption of β-carotene for carrot is 73-97%. With the little effort fruits and vegetables can be converted into valuable products which makes theme accessible throughout the year. This can help to mitigate micronutrient deficiencies. Now a day's health drink is gaining popularity among the health-conscious society.

The present research work was aimed to formulate health drink powder using carrot. Health drink powder was developed and evaluated for sensory and nutritional properties.

Materials and Methods

2.1 Selection and Processing of Carrot malt

Raw materials such as Carrot, jaggery, almond, cashew nut and cardamom were procured from an organic shop. Jaggery were procured and stored in gunny bags at room temperature.

Table 1:

INGREDIENTS	QUANTITY
Carrot	2kg
Jaggery	2kg
Almond	15g
Cashew	15g
Cardamom	8g

2.2 Processing of Carrot malt

Select good quality carrot was peel the skin and wash it. Cut into small pieces to cook. Grind to a fine paste without lumps. Take carrot paste in heavy bottom vessel and take 2kg of jaggery and make it to thick syrup. Heat the paste to evaporate the water and get thick solid form. Now add almond and cashew nut powder. Add 8g of powder cardamom. Leave it for shade drying. After dried blend in the mixer. Weight the mixture of blended Carrot malt. Store in an air tight container.

2.3 Packaging of carrot malt

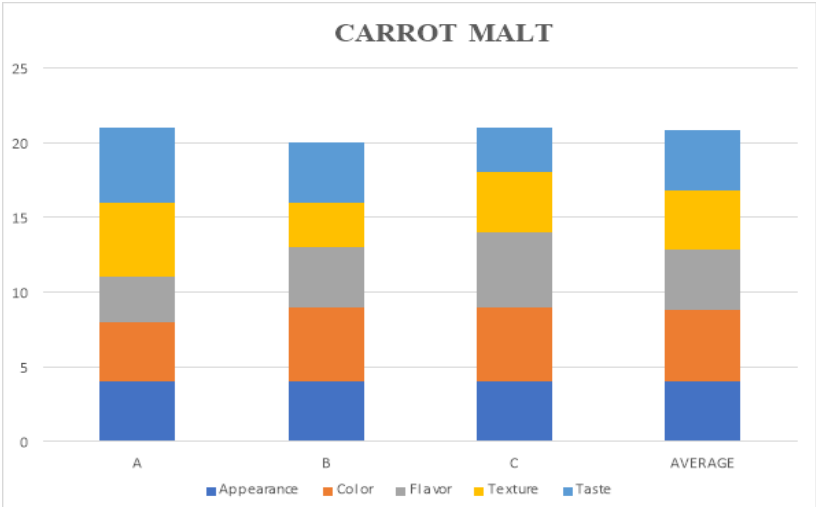
Carrot malt is packed in an air tight glass container. Glass containers are among the most popular as glass doesn't stain and is odor free. Air tight containers keep your food fresh and also prevent rancidity. No contamination of food. Shelf life is increasing. Foods with the longest shelf life.

2.4 Labelling

Labelling is the display of label in a product. A label contains information about a product on its container, packaging, or product itself. Nutrition facts of carrot malt is 100g such as Energy is 264kcal, Carbohydrates is 48.1g, protein is 3.1g, fat is 6.5g, vitamin A is 484.68µg.

2.5 Evaluation of Carrot malt

Developed carrot malt was mixed with 100 ml of warm milk and was evaluated by 3 panel members using a 5-point scale where (1= Poor, 2= Fair, 3=Good, 4=Very good, 5=Excellent) was used.



The sensory evaluation was conducted for carrot malt. The appearance of carrot malt was very good. Color of carrot malt was excellent. Texture was good. Flavor and taste were good. Overall acceptability was excellent.

3) Result and Discussion

Sensory evaluation is critical factor that needs to be considered for evaluating the ability of ingredients to fortify food formulations and the acceptability of final products by consumers. Sensory evaluation scores for carrot malt mixed with warm milk. There were no significant

differences for the variables such as texture, flavor and taste. Sensory evaluation scores for overall acceptability was excellent.

Carrots may not be everyone's cup of tea, but there's no denying the fact that it comes with a host of health benefiting properties. So, this carrot malt is a great option if you are looking to add carrots in daily diet. The deliciously sweet flavor of this health boosting drink comes packed with vitamins A, C, K, beta carotene, polyphenols & antioxidants among other important micro nutrients.

4) Conclusion

In the present study carrot malt was prepared with carrot, Jaggery, nuts. The formulated complementary food contained nutrients to satisfy the recommended dietary requirement and easily affordable. Thus, highly nutritive. Consuming malted drinks is associated with higher micronutrient intakes and higher levels of physical activity. This drink is very rich micronutrients thereby making it a healthier choice for people suffering from liver disorders, hypertension, cardiovascular diseases, rich in vitamin A, rich in beta carotene, promotes eye health.

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Department of Nutrition and Dietetics

NOVEL FOOD PRODUCT TECHNIQUES ON PEANUT BAR

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Abstract

Peanut is an important crop grown worldwide. Commercially it is used mainly for oil production but apart from oil, the by-products of peanut contains many other functional compounds like proteins, fibers, polyphenols, antioxidants, vitamins and minerals which can be added as a functional ingredient into many processed foods. Recently it has also revealed that peanuts are excellent source of compounds like resveratrol, phenolic acids, flavonoids and phytosterols that block the absorption of cholesterol from diet. It is also a good source of Co-enzyme Q10 and contains all the 20 amino acids with highest amount of arginine. These bioactive compounds have been recognized for having disease preventive properties and are thought to promote longevity. The processing methods like roasting and boiling have shown increase in the concentration of these bioactive compounds. In the present paper an overview on peanut bioactive constituents and their health benefits are presented.

Keywords ; Peanut, Jaggery,

Introduction

Peanuts or “groundnuts” as they are known in some parts of the world are the edible seeds of a legume. India is second largest producer of peanuts in world, with total production of approximately 7.131 million metric tons per year (USDA, PS&D database 1996–2000). Peanut (Arachis hypogaea) is technically considered as pea and belongs to the family (fabaceae) of bean/legume. Although a legume; it is generally included amongst the oilseeds due to its high oil content. Peanuts are rich in protein, oil and fibers (Suchoszek-Lukaniuk et al. 2011). Apart from oil, peanuts are widely used for production of peanut butter, confections, roasted peanuts, snack products, extenders in meat product formulation, soups and desserts.

Table 1

Popular peanut based branded products available in the local market (Mumbai)

Peanut product	Brand and company details	Price in Rs/100 g
Roasted peanuts	Planters	110
	Bhikharam Chandmal Bhujiawala (Plain peanut)	25
	Haldirams (Salted nuts)	25
	Haldirams tasty nuts	42
Peanut snacks	Gardens fried nuts	38
	Snackup Masala peanuts (MTR)	40
	Skippy (Unilever)	78
	Peterpan (ConAgra Foods)	68
Peanut butter	Savoury (Bajaj foods)	58
	American Garden Foods	68

There are thousands of peanut cultivars around the world. Certain cultivars groups are preferred for particular uses because of differences in flavor, oil content, size, shape, and disease resistance. For many uses the different cultivars are interchangeable however, the most popular cultivars are Spanish, Runner, Virginia and Valencia. Most peanuts marked in the shell are of the Virginia type, along with some Valencia's selected for large size and the attractive appearance of the shell. Spanish peanuts are used mostly for peanut candy, salted nuts, and peanut butter. Most Runner cultivars are used to make peanut butter (Woodroof 1983). China leads in production of peanuts, having a share of about 45 % of overall world production, whereas India has (16 %) share and the United States of America has (5 %)

Chemical Composition of Peanut Bar

Peanuts are consumed all over the world in a wide variety of forms, most of which are traditional cuisine. Peanuts are being used as the complete dietary source for people on expeditions to diverse areas like Antarctica, space and trekking. It has notably been the source of elimination of malnutrition amongst the population in many African countries in the recent year. Peanut oil is obtained by different extraction methodologies and is mainly consumed in the Asian subcontinent especially India. Maximum amount of the peanut production around the world is utilized for oil production. The world production of peanut oil has risen from 4.53 million metric tons in 2000 to 4.91 in 2010. Production across the countries of the world, where China (44 %), Indian (20 %), and Nigeria (11 %) are the largest producers, is expected to account for almost 75 % of the world's peanut oil.

Protein, fats, and fiber are the major components that make up peanuts (Table 2). All these components are present in their most beneficial forms. The protein is plant-based: the fat is unsaturated, and the fiber is complex carbohydrate which are all proved to be the best for human nutrition.

Materials and Methods:

All the materials required for nut brittle Preparation i.e. pea nut, chickpea, jaggery, sugar, Corn syrup, butter and sodium bicarbonate (NaHCO3) Were procured from the local market, Sangrur, Punjab, India.

Preparation of Peanut Bar:

To formulized the peanut energy bar firstlypoure a thick bottomed pan dry roasted peanut on a medium to low heat then took grated jaggery and poured 1 tbsp. water it begins to dissolve on a low medium heat after that checked the syrup consistency and caramelized the jiggery after that stirred the peanuts, pumpkin seed powder and amaranth seed with jaggery syrup now transferred to the steel plate greased, spreader with the help of a small cup to smoothen the top. Allow it to cooled for a minute, and when it‘s still warmed cut into pieces. Lastly, served Peanut bar once cooled completely and stored in air tight jar.

Procurement of raw material :

The raw materials for the development of food products like Peanut, Jaggery, Pumpkin seeds, and Amaranth seeds were purchased from the local markets of Prayagraj.

Food Processing Procedure :

- Weigh 50g of groundnut. Roasted and remove the outer skin.
- Add 50g of jaggery and add little water to jaggery and prepare a syrup.
- Heat the syrup with thread stage and filter the syrup in the cloth.
- Add the nuts mix well and transfer to cutting board.
- Cut into desired shapes.

Packing:

Traditional foam packing peanuts are made from polystyrene, a material commonly used to make foams and certain hard plastic products, also referred to as Styrofoam.

Polystyrene packing peanuts interlock within a package, filling in the gaps to provide additional compression, padding, and support during transit without adding significant weight to the package.

Labelling

The peanut bar to be labeled with the picture of peanut and the brand name (the picture attached is just shown for the illustration purpose only) at the front page however the rear page of the packet is followed by nutritional facts, manufacturer's date and expiry date.

Result And Discussion:

Peanut Bar

Score Card For Peanut Bar

Panel	Apperance	Colour	Flavour	Texture	Taste
1	5	5	5	4	5
2	5	5	5	4	4
3	3	4	4	3	4
Average	3.6	4.8	4.8	3.9	4.5

The sensory evaluation was conducted for peanut ball. The appearance of peanut ball was good. Color of peanut ball was excellent. Texture was excellent. Flavor and taste were very good. Overall acceptability was excellent.

Conclusion:

Peanuts are a great source of nutrition. They can be abundantly utilized especially in a country like India which is one of the leading producers of peanut but ironically also has largest counts of malnourished population. Peanut allergies are comparatively less prevalent in India. Peanut is used amongst many traditional dishes in the country through the schemes of Mid-day meal and on the lines of plumpy nut, the under nourished can be feed and the double burden of malnutrition and obesity can be reduced. Thus Organizational initiatives and greater commercialization of peanut products can be taken as a dual approach to build a healthy population.

It is clear that there is a huge scope for the commercialization of peanut products and the market trends look extremely positive owing to all the above mentioned factors. Also, there is a greater need of spreading awareness that peanut can prevent undesired supplementations through non dietary sources on regular consumption in Indians, particularly.

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Department of Nutrition and Dietetics

CREATING AWARENESS NUTRITION DURING PREGNANCY

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Introduction

Nutrition plays an important and definite role in the course of pregnancy for the maintenance of sound maternal health. It is vitally important to eat more healthy foods in pregnancy than at any other time in a women's life. If maternal reserves are adequate, the fetus is well protected. When nutritional status is poor and nutritional intake is less, then hormonal balance and maternal reserve is jeopardized. If pregnancy is healthy, the body undergoes many changes to allow for the growth of fetus and to prepare the mother for labour, delivery and lactation. Many of these changes increase the nutritional requirement of the mother. To meet nutritional needs, pregnant women are encouraged to consume a diet rich in vegetables, fruits and whole grains and to take a daily vitamin and mineral supplement to guarantee adequate intake of iron and folic acid.

Maternal weight gain is a necessary physiologic change during pregnancy. Interestingly the fetus, placenta and amniotic fluid account for less than half of the total amount of weight gained. Most of the added weight is found in maternal reproductive tissue, fluid, blood and maternal fat stores, which serve as an energy reserve during pregnancy and lactation. It is a well- understood scientific concept that the nutritional status of the pregnant woman affects the outcome of the pregnancy, especially related to birth weight. Low birth weight is associated with an increased risk for infant deaths and developmental disabilities and seen more often in children from under nourished and under weight mothers.

Iron deficiency anemia is one of the most prevalent nutritional deficiency disorders among women during pregnancy in the developing countries. The prevalence of anemia at global level is reported to be 55.9 per cent among the expectant mothers. It is common for pregnant women to experience fluctuations in appetite and food intake due to change in hormonal balance and gastrointestinal tract as the fetus develops. During the first trimester and sometimes extending into later

month of pregnancy, women suffer from morning sickness, nausea and vomiting which may decrease appetite and limit food intake. Excessive vomiting may cause loss of water and electrolytes which leads to dehydration. Many pregnant women experience intense food cravings and food.

The sense of taste and smell is frequently altered during pregnancy. These changes can lead to excessive consumption of certain foods or food groups and insufficient consumption of other foods. However, this is typically a concern only if the food that is frequently consumed contains lots of calories, fat less vitamins and minerals or if the women are unable or unwilling to eat any fruits or vegetables due to food aversion or altered taste.

Nutritional status during pregnancy is one of the most vital factors in obtaining a successful outcome of pregnancy in terms of healthy baby and maintenance of her own health. Maintenance of an optimum nutritional status of expectant mother is of utmost important because the overall development of a child is determined to a great extent by the type of nourishment it receives right from its conception. Various studies have revealed a direct relationship between maternal diet and the nutritional status of the newborn. Inadequate diets have been related to clinical problems during the course of pregnancy. It is evident from several research studies that inadequacy in the intake of food results in high incidence of nutritional disorders during pregnancy. Malnutrition including anemia is a major underlying cause of maternal morbidity and mortality. It is especially a grave problem for the pregnant women of teenage and multi-gravida with short interval between pregnancies. Moreover, considerable number of undernourished women ends in abortion, miscarriage or still births. A positive correlation between nutritional status and has also been reported by several researchers.

In the past, several reports issued by expert Food and Nutrition Board (FNB) committees on maternal nutrition have given detailed consideration to certain vitamins, minerals, and protein. One of these reports contained an overview of laboratory indices of a broad spectrum of nutrients another covered certain practices, such as pica (the ingestion of nonfood substances such as laundry starch) and vegetarianism, that may influence nutritional status during pregnancy. Fours reports recommended 30 to 60 mg of supplemental iron per day and two recommended supplemental folic acid during pregnancy as a means of reducing the risk of anemia. No FNB reports have recommended the routine use of multivitamin-mineral supplements.

Objectives

- To assess the effect of nutritional status of Pregnant women during Gestation period.

- To study the dietary pattern of the selected Pregnant women.
- To create awareness on the need and importance dietary intake pattern, physical activity, meal behaviours and sleeping pattern the selected Pregnant women**.**

Methodology

Selection Of Area And Subjects:

About 250 participants were randomly selected for this study. The area selected for the conduct of the study were Pallipalayam,Erode, Tiruchengode & Salem. These area were selected for easy approach and convenience.

Screening Of Subjects:

From the selected samples, 30 sub sample were selected for the dietary assessmentbased on the acceptance and willingness given to participate in this study.

Data Collection:

Data collection is the process of gathering and measuring information on subjects. The primary data were collected through Survey. The interview with the subjects were conducted through Google meet.

Socio-Demographic Status

Socio-demographics are nothing more than characteristics of a population. Generally, characteristics such as age, gender, income, type of client, martial status, number offamily member & occupation. These data were collected from 250 subjects.

Weight Changes

Women experience many significant physical and emotional changes during pregnancy.Third trimester weight gain is an important part of later pregnancy and is not usually a cause of concern

BMI before pregnancy	Weight gain recommendations for women pregnant with one fetus	Weight gain recommendations for women pregnant with Twins
<18.5	28-40lb	50-62lb
18.5-24.9	25-35lb	37-54lb
25-29.9	15-25lb	31-50lb
>30	11-20lb	25-42lb

Dietary Intake Pattern

24-hour dietary recall is a structured interview intended to capture detailed information about all foods , beverages & dietary supplements consumed by the subjects (30 sub sample) in the past 24 hours, from midnight to midnight the previous day.

Meal Behaviours

Survey questions examining meal behaviours (i.e. meal skipping and consuming meals away from home) during pregnancy. The food frequency list during gestation period consumption helps to acknowledge meal pattern, food habits and personal food preferences or avoidances. Special care taken during pregnancy with regard to foods.

Physical Activity

The Physical Activity Questions were used to assess physical activity levels during pregnancy. These data helps to estimate the changes of physical activity.

Sleeping Pattern

78% of the pregnant woman to complain about sleep disordered breathing,insomnia,restless legs syndrome.The frequency of sleep disorders increases as pregnancy progresses. Obstructive sleep disordered breathing increases from 10.12% to 31.7%.

Nutritional Requirements During Pregnancy

The caloric requirements for healthy, normal weight women with a moderately active lifestyle, undergoes a moderate increase during pregnancy (dependent on pregnancy stage), which can be met by slightly increasing energy intakes, in a balanced equilibrium between macronutrients within the recommendations of nutritional guidelines. Excess of calories and macronutrients during pregnancy may, in fact, be just as damaging as their deficiency, especially in overweight and obese women, with an increased risk of miscarriage, gestational diabetes, pre-eclampsia and also of obesity and type 2 diabetes for their children in adulthood. In addition, during lactation only a moderate increase in the mother’s energy needs is necessary for milk production.

The 2014 Italian RDA, specifically, indicate an additional requirement of 69 kcal/d for the first trimester, 266 kcal/day for the second and 496 kcal/day in the third trimester of pregnancy (for a grand total of an additional 76,530 kcal). Very similar amounts have been established by the EFSA

(70 kcal/day in the first trimester to 260 and 500 kcal/day in the second and third, respectively), with an increase of about 500 kcal/day during the first 6 months of exclusive breastfeeding .

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Department of Nutrition and Dietetics

AN EXPERIMENTAL REVIEW IN NUTRIGENOMICS: A MOLECULAR MEDICINE

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Abstract

Background

Individual's genetic makeup best describes the properties regarding its growth and development. It is accumulate and pass around to generations and is in dynamic equilibrium with the environmental and other non-living factors. Molecular medicine is a extensive province, where physical, chemical, biological, bioinformatics and medical techniques are used to delineate molecular structures and mechanisms, identify rudimentary molecular and genetic errors of disease, and to develop molecular interventions to precise the data.Nutrigenetics and nutrigenomics are defined as the science of the effect of genetic variation on dietary response and the role of nutrients and bioactive food compounds in gene expression, respectively.

Methods

In this project, we conducted a experimental review of the primary literature to assess the current evidence of nutrigenomics counseling. The excitement about nutrigenomics comes from a growing awareness of the potential for modifications of food or diet to support health and reduce the risk of diet-related diseases. It is an emerging field that tends to unfold the role of nutrition on gene expression which brings together the science of bioinformatics, nutrition, molecular biology, genomics, epidemiology, and molecular medicine. Nutrigenomics explains how the nutrients cajole the expression of the response of different gene variants to nutrients or different dietary components is called Nutrigenetics.

Conclusion

From the experimental review We were scrutinized with these themes: inadequate training with nutrigenomics, lack of awareness, underdeveloped nutrigenomics counseling skills, and unreliable evidence-based practice information in Diet-gene interaction

Department of Nutrition and Dietetics

A REVIEW ON FOOD SAFETY AND HYGIENE PRACTICES AMONG FOOD HANDLERS.

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Introduction

Food handlers are critical to ensuring food safety and preventing food-borne illnesses. The majority of food safety research focuses on the microbiological and chemical properties of foods, with less emphasis placed on food handlers. As a result, the focus of this review is on food safety and hygiene practises among food handlers.

Food safety and quality concerns are becoming more prevalent in India and other countries. Today's health-conscious consumers demand safe food as their awareness grows. Catering industries must follow food safety standards to ensure safe food for consumers. [(1)] The Food Safety and Standards Act is a single law that ensures that all food provided to consumers is safe.

Food safety, as defined by the Food Safety and Standards Act of 2006, means ensuring that food is safe for human consumption in accordance with its intended use [(2)]. Food contaminated with pathogenic bacteria, viruses, parasites, or chemical substances can cause over 200 diseases [(3)].

2) Methods

2.1) Information sources and Search Strategy:

Records from different databases, including PubMed, Web of Science, Google Scholar, Research gate, and Science Direct were searched to collect informations related to either food safety practices or hygiene practices of the food handlers.

2.2) Inclusion criteria:

This review included articles that met the following predetermined inclusion criteria.

2.2.1). ***Population*** : Any article relevant to food handlers with special reference to food borne diseases, food safety and hygiene practices and food safety training programs.

2.2.2). ***Outcome*** : Articles reported on the presence of microorganisms that cause food borne illnesses, food handler's knowledge, their attitude and practices towards food safety and hygiene.

2.2.3) ***Study design*:** A cross-sectional study that provides quantitative results.

2.2.4) ***Study location*:** Full-text articles conducted in developing and non-developing countries

2.2.5) ***Publication issue*:** Articles published in peer-reviewed journals for a period of ten years from 2012 to 2022

2.2.6) ***Language*:** Full-text articles written in English.

3) Results and Discussion :

The findings of the selected studies have been discussed under following topics:

3.3.1) Food borne illnesses and their causes.

3.3.2) Knowledge, attitudes and practices of food handlers on food safety and hygiene practices.

3.3.3) Food safety training programs for food handlers.

3.3.1) Food borne illnesses and their causes:

Food borne disease is a major public health concern around the world, and it is primarily associated with poor food handling and sanitation practises. (4).

Every day, millions of people around the world become ill as a result of eating microbiologically and chemically contaminated foods. (5). it has been estimated that 1 out of 10 people in the world (about 600 million) get sick from consuming contaminated food (6)

Food handlers who are knowledgeable and sensitive about food safety issues may be able to help create a hygienic and sanitary environment in the food handling premises. Evidence suggests that food handlers who are educated and trained in food safety practises keep the food handling premises clean. (7).

Food-borne illness transmission is primarily exacerbated by poor food hygiene practises. Food hygiene is defined as "a set of fundamental concepts used to keep environmental conditions stable during food storage, processing, and preparation" [8]. One of the leading causes of foodborne disease outbreaks, ranging from diarrhoea to cancer, is poor food handling and hygiene standards. [9].

Various pathogenic bacterial species such as Staphylococcus aureus, Salmonella, Shigella, and Escherichia coli that are present in ready-to-eat food in excess of the maximum allowable limit and may be harmful to human health. The authors recommended that relevant national and international organisations should take corrective action to prevent foodborne diseases and protect human health(10).

It was found that food handlers with untrimmed fingernails and poor hygiene habits were 2.23 times more likely to be infected with Intestinal Parasites and Enteric Bacterial Infections than their counterparts. Untrimmed fingernails among food handlers may serve as a vehicle for transporting Intestinal Parasites and Enteric Bacterial Infections from source to food due to cleaning difficulties. If food handlers with untrimmed fingernails are infected, they may contaminate food while serving customers and can be identified as potential public health threats. Furthermore, this could be due to a lack of awareness, poor hygiene practices, and socioeconomic characteristics among food handlers[(11)].

3.3.2) Knowledge, attitudes and practices of food handlers on food safety and hygiene practices.

A study was conducted on the University of Malaysia campus to assess food safety knowledge, attitude, and practices of food handlers. This study included all food handlers who worked in university campus canteens. The university had 18 canteens with 250-300 food handlers (including permanent and contract workers), of which 111 only participated in the study. 41 food handlers (36.9%) completed both the questionnaire and the microbiological hand hygiene assessment, while 26 (23.4%) and 44 (39.6%) completed only the questionnaire and the microbiological hand hygiene assessment, respectively. The food safety knowledge, attitude and practices among food handlers (n = 67) was assessed using a questionnaire. The food handlers had moderate levels of food safety knowledge (61.7%) with good attitude (51.9/60) and self-reported practices (53.2/60)[(12)].

In a cross sectional study,of the 1609 records screened through abstracts, 12 studies were included for review. Food handlers were studied in a variety of settings, including restaurants, street food, retail markets, the food industry, and households. Eight of the twelve studies reported food safety knowledge of food handlers. Poor food safety knowledge of food handlers was reported in five of them (62.50%). Food safety practises were reported in 11 studies, with eight (72.73%) studies reporting poor food handler practises. Experience and attitude were discovered to be related to food safety knowledge.Knowledge, education, and training on food handling skills were found to be associated with good practices. Restaurant and street food handlers were found with worse practices than others. Knowledge, education, and training on food handling skills were found to be associated with good practices. On the other hand, education, training,

years of food handling experience, and attitude were found to be associated with food safety knowledge[13].

A study was conducted in 2017 to assess food safety knowledge, attitudes, and practices among food handlers in Turkey, using face-to-face interviews and a questionnaire. Of the 764 food handlers who responded, 9.6% were involved in routinely touching or distributing unwrapped foods and used protective gloves while at work. The vast majority of participants (47.8%) had never received basic food safety training. The average level of food safety knowledge was 43.4 ,16.3. The study found that food handlers in Turkish food establishments frequently lack basic food hygiene knowledge (critical temperatures of hot or cold ready-to-eat foods, acceptable refrigerator temperature ranges, and cross-contamination etc.). There is an urgent need for education and raising awareness among food handlers about food safety and hygiene practices [14].

Consumers' and food handlers' willingness to engage in risky behaviours when purchasing, preparing, and consuming meals is linked to behavioural and cognitive factors, such as beliefs, perceptions, feelings, trust, and culture

3.3.4) Food safety training programs.

Food contamination can be caused by improper food handling. To prevent food contamination, the food handler should be knowledgeable, have a positive attitude, and follow proper food handling procedures. In addition to positive attitudes toward food safety, socio-demographic factors such as food handlers' level of education and food safety training play an important role in encouraging food handlers to implement proper food handling practises. [16]

Attitude scores were found to be significantly higher among food handlers who reported attending a previous food safety training course ($p = 0.002$), with ($r = 0.302$) indicating a weak uphill (positive) linear relationship between attitude scores and training that food handlers attended. In this study it was further discovered thatthere was a significant relationship between food handler knowledge and attitude, but no significant relationship between knowledge or attitude and food handling practises [17].

A meta-analysis on the effects of food safety training interventions on the KAP of food handlers discovered that food safety training interventions had a significant effect on knowledge changes, with an SMD of 1.24 (CI = 0.89 to 1.58; p-value = 0.0001). In terms of attitude,

analysis results show that food safety training has a positive effect, with an SMD of 0.28 (CI = 0.07 to 0.48; p-value = 0.008) for food handler attitudes toward food safety and hygiene[18] .

Food handler training is seen as one strategy whereby food safety and hygiene practices can be increased, offering long-term benefits to the food industry . While food safety training might increase knowledge , the knowledge might not always translate into improved behaviours . Such transfer problem has been linked to a number of factors including trainee characteristics, training design, and work environment . Though, several studies conducted on the effectiveness of food safety training on behaviour in foodservice establishments yielded inconsistent conclusions; many studies found that training was effective while others drew the opposite conclusion .

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Department of Nutrition and Dietetics

NUTRITION IN HEMOPHILIA

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Abstract

Hemophilia is a rare disorder in which the blood doesn't clot in the typical way because it doesn't have enough blood-clotting proteins (clotting factors). The person with hemophilia might bleed for a longer time after an injury . Hemophilia is almost always a genetic disorder. Hemophilia is a life long condition and till now there is no cure but intake of some nutrition prevent from severe problem . Signs and symptoms of hemophilia vary, depending on level of clotting factors. Hemophilia is of two types where the person born with disorder called Congenital Hemophilia and the person affected with no family history called Acquired Hemophilia . The clotting factors differ on the types . Males are much more likely to have hemophilia than are females. Treatment includes regular replacement of the specific clotting factor that is reduced. Newer therapies that don't contain clotting factors also are being used. About 1 in every birth of male born with Hemophilia . In this review paper and aim of this study is to prevent the Hemophilia from severe problems by controlling the diet by the intake of proper nutrition.

Key Words : Hemophilia , genetic , types , treatment , aim

1.Introduction

Hemophilia is usually an inherited bleeding disorder in which the blood does not clot properly. This can lead to spontaneous bleeding as well as bleeding following injuries or surgery. Blood contains many proteins called clotting factors that can help to stop bleeding. People with hemophilia have low levels of either factor VIII (8) or factor IX (9). The severity of hemophilia that a person has is determined by the amount of factor in the blood. The lower the amount of the factor, the more likely it is that bleeding will occur which can lead to serious health problems.

In rare cases, a person can develop hemophilia later in life. The majority of cases involve middle-aged or elderly people, or young women who have recently given birth or are in the later stages of pregnancy. This condition often resolves with appropriate treatment.

1.1 History Of Hemophilia

Incidences of excessive or abnormal bleeding were first recorded hundreds of years ago.

A Royal disease

Hemophilia is sometimes referred to as "the royal disease," because it affected the royal families of England, Germany, Russia and Spain in the 19th and 20th centuries. Queen Victoria of England, who ruled from 1837-1901, is believed to have been the carrier of hemophilia B, or factor IX deficiency. She passed the trait on to three of her nine children. Her son Leopold died of a hemorrhage after a fall when he was 30. Her daughters Alice and Beatrice passed it on to several of their children. Alice's daughter Alix married Tsar Nicholas of Russia, whose son Alexei had hemophilia. Their family's entanglement with Rasputin, the Russian mystic, and their deaths during the Bolshevik Revolution have been chronicled in several books and films. Hemophilia was carried through various royal family members for three generations after Victoria, then disappeared.

2. Types of hemophilia

There are two types of Hemophilia

- Type A
- Type B

Hemophilia A

- Occurs due to a lack of clotting factor VIII.
- This type of hemophilia is four times more common than hemophiliaB.
- Of those, more than half of people with hemophilia A have the severe form.

Hemophilia B

- It is known as Christmas disease
- It happens due to a lack of clotting factor IX.
- Hemophilia B occurs in around 1 in every 25,000 males born worldwide.

3.Causes

Hemophilia is typically an inherited disorder, which means that a person is born with the condition. The CDC Trusted Source states that hemophilia is a sex-linked recessive condition.Hemophilia tends to occur in males. The reason for this has to do with inherited

genes.Males inherit one X chromosome from the female parent and one Y chromosome from the male parent. Females have two X chromosomes, inheriting one from each parent.The genetic change that causes hemophilia is a recessive change in the X chromosome. Males have one copy of the genes in the X chromosome, and females have two copies.As a result, males have a 50%Trusted Source chance of developing hemophilia if their biological mother is a carrier of the gene. If they inherit the affected X chromosome, they have hemophilia.Females can also inherit hemophilia. However, this is rare. For females to inherit hemophilia, the affected gene is in both X chromosomes, or the affected gene is in one X chromosome, and inactive or missing in the other.Females with one altered gene can be carriers and pass the condition to any children they may have.In some cases, a person may spontaneously develop a gene mutation that causes hemophilia. In these cases, the person does not have a family history of the condition, and the biological mother is not a carrier. Rarely, a person may develop acquired hemophilia. They typically have no family or personal history of hemophilia. Instead, acquired hemophilia is an autoimmune condition where the body's immune system starts to attack the clotting factors found in the blood.

Hemophilia is also caused by two following types :

Congenital hemophilia

- Hemophilia is usually inherited, meaning a person is born with the disorder (congenital).
- Congenital hemophilia is classified by the type of clotting factor that's low.
- The most common type is hemophilia A, associated with a low level of factor 8
- The next most common type is hemophilia B, associated with a low level of factor 9.

Acquired hemophilia

- Some people develop hemophilia with no family history of the disorder. This is called acquired hemophilia.
- Acquired hemophilia is a variety of the condition that occurs when a person's immune system attacks clotting factor 8 or 9 in the blood.
- It can be associated with:
  - Pregnancy
  - Autoimmune conditions
  - Cancer

- Multiple sclerosis
- Drug reactions

4.Symptoms

The common symptoms are

- Bruising
- hematomas, which is when there is bleeding into the muscle or soft tissues
- Bleeding from the mouth and gums
- Bleeding after a circumcision
- Blood in the stool
- Blood in the urine
- Nosebleeds that are frequent and difficult to stop
- Bleeding after vaccinations or other injections
- Bleeding into the joints

In mild cases, a person will most likely experience:

- Spontaneous nose bleeds
- Bleeding from the mouth or gums
- Easy bruising or hematomas
- Excessive bleeding following dental or other surgical procedures or injury

In moderate cases of hemophilia, a person may experience:

- Easy and excessive bruising
- Excessive bleeding following surgeries or trauma

6.Diagnosis

Many people who have or have had family members with hemophilia will ask that their baby boys get tested soon after birth. About one-third of babies who are diagnosed with hemophilia have a new mutation not present in other family members. In these cases, a doctor might check for hemophilia if a newborn is showing certain signs of hemophilia. To make a diagnosis, doctors would perform certain blood tests to show if the blood is clotting properly. If it does not, then they would do clotting factor tests, also called factor assays, to diagnose the cause of the bleeding disorder. These blood tests would show the type of hemophilia and the severity.

7. Treatment

The best way to treat hemophilia is to replace the missing blood clotting factor so that the blood can clot properly. This is done by infusing (administering through a vein) commercially prepared factor concentrates. People with hemophilia can learn how to perform these infusions themselves so that they can stop bleeding episodes and, by performing the infusions on a regular basis (called prophylaxis), can even prevent most bleeding episodes. Good quality medical care from doctors and nurses who know a lot about the disorder can help prevent some serious problems. Often the best choice for care is to visit a comprehensive Hemophilia Treatment Center (HTC). An HTC not only provides care to address all issues related to the disorder, but also provides health education that helps people with hemophilia stay healthy.

8.Inhibitors

About 15-20 percent of people with hemophilia develop an antibody (called an inhibitor) that stops the clotting factors from being able to clot the blood and stop bleeding. Treatment of bleeding episodes becomes extremely difficult, and the cost of care for a person with an inhibitor can skyrocket because more clotting factor or a different type of clotting factor is needed. People with inhibitors often experience more joint disease and other problems from bleeding that result in a reduced quality of life.

Nutrition in hemophilia

A special diet isn't required for people with hemophilia A, but eating well and maintaining a healthy weight is important.

9.Healthy eating tips

The United States Department of Agriculture (USDA) body-weight calculator can help you determine how many calories you should be consuming on a daily basis to maintain or reduce your weight.

Sometimes it's difficult to estimate the number of calories you're eating, or how many calories your child is eating. But it's good to be aware of what amount you or your child should be striving for each day as a general guideline. Packing your child's lunch, as opposed to your child buying something in their school cafeteria, and being aware of serving sizes are ways to better manage how much and what kinds of foods they're eating.

The USDA developed MyPlate to help you visualize what a healthy meal looks like. The Harvard School of Public Health along with Harvard Medical School created a modified version of My Plate based on the best and most current nutrition science available. The plate illustrates how to build a healthy meal using a colorful variety of foods:

- Fill one-half of your plate with fruits and **vegetables**, but mostly vegetables, such as broccoli or sweet potatoes.
- Choose a lean **protein** source, such as fish, chicken, turkey, eggs, beans, nuts, or tofu. Eat seafood at least twice a week.
- Include whole **grains** by choosing brown grains over highly refined white and processed grains.
- Complete the meal with a cup of fat-free or low-fat **milk**, or **water**, with the goal being to avoid sugar-sweetened drinks at meals.

When deciding on which foods to eat, consider these tips:

- Choose a rainbow of colorful fruits and vegetables. Dark leafy greens are great sources of vitamins, minerals, and fiber.
- Baked, broiled, or grilled lean meats are healthier than fried.
- Whole grains, like oats and brown rice, and whole grain breads can help curb your appetite and stabilize your blood sugar. This may help reduce cravings for sweets and increase your energy levels.
- Aim for foods low in saturated fat, but pay close attention to the sugar content. Some foods advertised as low fat or fat free may contain a large amount of sugar instead. The American Heart AssociationTrusted Source (AHA) recommends no more than 6 teaspoons (25 grams) of added sugar per day for women, and 9 teaspoons (36 grams) for men. One 12-ounce can of regular soda contains 8 teaspoons of sugar.
- Unsaturated fats are considered healthy fats. These are found in fish, avocados, olives, walnuts, and soybeans, for example. Oils such as corn, safflower, canola, olive, and sunflower are also unsaturated fats. These may help improve your cholesterol when you use them in place of saturated and trans fats like butter, lard, or shortening.

10.Calcium- and iron-rich foods

Calcium and iron are particularly important for children and adolescents. During this time, bones will grow rapidly. Calcium is required to build strong bones and to maintain healthy teeth. It’s important that people with hemophilia A have healthy teeth, because gum disease and dental work can lead to bleeds.

Calcium-rich foods include:

- low-fat or fat-free milk
- low-fat cheese
- Greek yogurt and 2 percent milk fat cottage cheese
- calcium-fortified soy milk and orange juice
- calcium-fortified cereals
- beans
- dark leafy greens like spinach and broccoli
- almonds

Body uses iron to make red blood cells, which carry oxygen to y muscles. When the person bleed, iron is lost. If the person have a bleeding episode, iron-rich foods may help you recover more quickly.

Iron-rich foods include the following:

- lean red meat
- seafood
- liver
- beans
- peas
- poultry
- leafy green vegetables (spinach, kale, broccoli, choy)
- fortified cereals
- dried fruit like raisins and apricots

Iron is better absorbed when the person eat a source of vitamin C along with an iron-rich food, such as:

- oranges and other citrus fruits
- tomatoes
- red and green bell peppers
- broccoli
- melons
- strawberries

If the person is a female with a heavy menstrual period, in that case the person will be at a higher risk of iron deficiency. There should be particular attention to how much iron you're getting in your diet.

13.Conclusion

Hemophilia comprises a group of hereditary disorders caused due to the deficiency of clotting factors leading to prolonged clotting time and excessive bleeding tendencies.Hemophilia cannot be cured but can be get treated and prevented from serious conditions . Eating iron rich foods and calcium rich foods helps to make red blood cells and calcium helps to build strong bones and teeth .

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INTEROGATIVE REVIEW ON FOOD TOXICOLOGY

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Abstract

This review summarizes the current trends related to Despite the many potential health risks associated with foods, in practice the degree of risk associated with the modern food supply is extremely high. By far the most important hazards of significance are those from biological agents: pathogenic bacteria, viruses, fungi and a few toxic seafoods. Trends to larger-scale production, longer distribution chains in the food supply, increased eating away from the home and the emergence of new pathogens means foodborne illness continues to be a significant public health issue. The assessment of the safety of food additives is led internationally by JECFA, but each individual country still develops and determines their own local regulations and food standards. The ADI is defined as the amount of a chemical that might be ingested daily, even over a lifetime, without appreciable risk to the consumer Genetically modified foods, novel foods and nano-materials pose new challenges for traditional safety assessment processes but, as the food supply becomes increasing global, food regulations about food safety are becoming more harmonized internationally.

Keywords : Food, toxicity, safety , microbes.

Introduction

Food toxicology studies how natural or synthetic poisons and toxicants in diverse food products cause harmful, detrimental, or adverse side effects in living organisms.

Food Toxicology covers various aspects of food safety and toxicology, including the study of the nature, properties, effects, and detection of toxic substances in food and their disease manifestations in humans. It will also include other aspects of consumer product safety

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Food is one of the most essential materials for the survival of living organisms, in addition to oxygen and water. Food toxicology deals with the substances found in food that, when consumed, may cause harm to the consumers. Therefore, the practice of food toxicology involves detecting toxic substances in food, characterizing their properties, studying their fate in the body (absorption, distribution, metabolism, and excretion), and investigating their adverse health effects. Toxic substances can be naturally present in food, formed when the food is cooked, added directly to food, or they can find their way into food from the immediate environment, such as packaging. Among various sub disciplines of toxicology, food toxicology has received wider public attention in recent years

Food Toxicants

Toxicants: Toxicants (toxic chemicals) are man-made products, artificial products introduced into the environment due to human activity. Examples are industrial waste products and pesticides, carcinogens like asbestos, VOCs like benzene, etc. Food contains natural chemicals, including carbohydrates, sugars, proteins and vitamins. But some foods contain potentially harmful natural toxins. Sometimes a toxin is present as a naturally occurring pesticide to ward off insect attack or to protect the plant from spoilage when damaged by weather, handling, UV light or microbes. Food Toxicants covers different aspects from the field of analytical food toxicology including emerging analytical techniques and applications to detect food allergens, genetically modified organisms, and novel ingredients (including those of functional foods).

Types Of Toxicology

- Food toxicology
- Aquatic toxicology
- Chemical toxicology
- Clinical toxicology
- Ecotoxicology
- Environmental toxicology
- Forensic toxicology
- Medical toxicology
- Occupational toxicology

- Regulatory toxicology

Natural Toxicants

Natural toxins are toxic compounds that are naturally produced by living organisms. These toxins are not harmful to the organisms themselves but they may be toxic to other creatures, including humans, when eaten. These chemical compounds have diverse structures and differ in biological function and toxicity. Natural toxins in food plants and animals, cancer modulating substances, microbial toxins in foods (algal, fungal, and bacterial) and all groups of contaminants (i.e., pesticides), persistent organic pollutants, metals, packaging materials, hormones and animal drug residue Some toxins are produced by plants as a natural defence mechanism against predators, insects or microorganisms, or as consequence of infestation with microorganisms, such as mould, in response to climate stress (such as drought or extreme humidity).

Toxicity In Fermented Products

Fermented foods (FF) are widely consumed around the world, and FF are one of the prime sources of toxins and pathogenic microbes that are associated with several foodborne outbreaks. Mycotoxins (aflatoxins, fumonisins, amines, and cyanogenic glycosides are the common toxins found in FF in addition to the pathogenic microbessterigmatocystin, nivalenol, deoxynivalenol, zearalenone, ochratoxin, and alternariol), bacterial toxins (shiga toxin and botulinum), biogenic amines, and cyanogenic glycosides are the common toxins found in FF in addition to the pathogenic microbes

Fermented foods are foods and beverages that have undergone controlled microbial growth and fermentation 1. Fermentation is an anaerobic process in which microorganisms like yeast and bacteria break down food components (e.g. sugars such as glucose) into other products (e.g. organic acids, gases or alcohol). This gives fermented foods their unique and desirable taste, aroma, texture and appearance.

There are thousands of different types of fermented foods, including:

1.Cultured milk and yoghurt

2.Wine

3.Beer

4.Cider

5.Tempeh

6.Miso

7.Kimchi

8.Sauerkraut

9.Fermented sausage

EFFECTS ON EATING FERMENTED FOODS

During fermentation, bacteria can produce vitamins and useful metabolites. Fermented foods contain potentially probiotic microorganisms such as lactic acid bacteria. And, despite the short time these bacteria spend in the gut, they help with food digestion and boost our immune system.

Bloating. The most common reaction to fermented foods is a temporary increase in gas and bloating Headaches and migraines Histamine intolerance Food-borne illness Infection from probiotics Antibiotic resistance

Toxicity In Bakery Foods

A section of bakery owners across the country are using toxic chemicals for baking cakes, pastry cakes, biscuits and different types of bread to reduce their production cost, sources .The bakers use dyes, expired food colours, artificial flavours and custard paste in preparing biscuits, cakes, pastry cakes and different other bakery items, said the sources.

Effects On Eating Bakery Items

Consumption of such food items may cause various ailments, including stomach upset, gastrointestinal problems, indigestion, diarrhoea, kidney and liver problems, nutritionists said.The conventional chemical preservatives in baked goods include propionic acid and propionates, sorbic acid, sodium diacetate, potassium sorbate, methylparaben, sodium benzoate, and propylparaben (Smith et al.,Sandwich, loaf, or bakery breads available at the store often contain preservatives to prevent mold and increase shelf life. Without preservatives, bread lasts 3–4 days at room temperature (1). Some common bread preservatives include calcium propionate, sodium benzoate, potassium sorbate, and sorbic acid.

Toxicity In Fruits And Veggies

Many common foods that are widely consumed in temperate countries contain natural toxins. These include potatoes (Solanum tuberosum), which contain glycoalkaloids; rhubarb (Rheum rhabarbarum), which contains oxalic acid and toanthraquinones; and eggplant

(aubergine – Solanum melongena), which contains histamines. Consumption of these foods has not been restricted because consumers know how to handle them properly, resulting in a tolerable risk. Traditional fruits and vegetables from developing countries that also contain natural toxins, like cassava (Manihot esculenta), which contains cyanogenic glycosides, bok choy (Brassica rapa), which contains glucosinolates, and ackee (Blighia sapida), which contains hypoglycin A (HGA), are also now among food choices in developed countries. This chapter examines the issue of the food safety of plant-based foods that contain known natural toxins with a focus on traditional food from developing countries

Summary

Food and nutritional toxicology is the field devoted to studying the complexity of the chemicals in food, particularly those that have the potential of producing adverse health effects. The field includes studies of human health impacts of food containing environmental contaminants or natural toxicants. The field includes investigations of food additives, migration of chemicals from packaging materials into foods, and persistence of feed and food contaminants in food products. Also, the field covers examining the impact of contaminants on nutrient utilization, adverse effects of nutrient excesses, metabolism of food toxicants, and the relationship of the body's biological defense mechanisms to such toxicants. Finally, because the study of food and nutritional toxicology has obvious societal implication, one must examine the risk determination process, how food is regulated to ensure safety, and the current status of regulatory processes.

Conclusion

Toxicology provides critical information and knowledge that can be used by regulatory agencies, decision makers, and others to put programs and policies in place to limit our exposures to these substances, thereby preventing or reducing the likelihood that a disease or other negative health outcome would occur Moreover, food toxicology is an increasingly important consideration as the food supply chain is becoming more multinational in origin, and any contamination or toxic manifestation, whether natural or synthetic, may cause serious, widespread adverse health effects.

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DEVELOPMENT OF EDIBLE CUP WITH PARTIAL SUBSTITUION OF THE TAMARIND SEED FLOUR

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Abstract

Cups used for hot drinks like tea and coffee are constructed of materials like steel, glass, plastic, etc. Cookie cups provide an option to introduce some flavor to drinks and are edible as well as biodegradable. It's a reconstituted Crisp & Crunchy biscuit constructed of baked biscuit fragments. Agglomerated inside a binder containing at least one carbohydrate and fat. It has unique property of keeping its crunchiness and softness at negative temperatures. Generally refined wheat or wheat flour is used for making the cup. As a healthy alternative, tamarind seed powder is used for preparing cup. Tamarind seed powder has excellent nutritive properties such as protein, carbohydrate, fibers, fat and micro nutrients such as calcium, magnesium, potassium and sodium and other properties like solubility in water, adhesive nature and emulsification. These cups are mainly preferred as they do not generate solid waste. It also has a polysaccharide called xyloglucan. To prevent the absorption of moisture by the cups, a coating can be given by carrageenan.

Keywords: Edible cup, tamarind seed flour, eco-friendly

Introduction

Although there is evidence that they were used as long back as Imperial China, the precise history of the edible cup makes it unlikely that anybody will ever be able to identifywho created the practical disposable beverage holder. What is known is that edible cups became more common around the turn of the century when people realized that using the same tin or ladle to drink from water barrels also meant sharing germs.

An extremely huge tree with lush foliage and long, heavy drooping branches is the tamarind. Trees can grow up to 80 feet tall when fully mature. Numerous nations in Asia, Africa, and South America produce tamarind (Tamarindus indica). The tamarind crop can grow in any environment since it can withstand five to six months of drought.Tamarind

pods are composed of 30% pulp, 40% seed, and 30% shell by weight. Traditionally, tamarind pulpis used to make dishes,various culinary and pharmaceutical goods. Seventy percent of the pod's weight is made up of the tamarind seed and shell. Mandarin pod shell can be used as fuel and as an absorbent to remove aqueous solutions of the colours methylene blue and amaranth.

The use of edible cups as a means of preventing infection during the 1918 First American Flu Epidemic increased in favor very quickly. Since then, the edible cup has changed from being just a health remedy to a commonplace convenience item. Millions of disposable cups are used every day to allow individuals to carry their liquids with them wherever they go, which is essential in today's busy environment. Due to the fact that they can simply be reused at the end of the day rather than thousands of cups needing to be washed, edible cups are another excellent choice for usage at big events like festivals and concerts.

There are two primary categories of cups: hot and cold, and both of their applications are very obvious. To prevent the edible from getting wet and collapse from liquid absorption, cold cups frequently have a waxy coating inside. Additionally, cold edible cups come in a variety of shapes and sizes. from small Dixie Cups to huge 20/24 oz. cups used forcarbonated beverages in theatres. If you place an order with us, you will receive free graphic design as part of the pricing. The designs can range from stock to bespeak. These options come in a variety and can be utilised for everyday use, coffee shop logos, and kid's birthdayparties. The choices are literally limitless.

The manufacturing cost of an edible-based cup is minimal, but it may be recycled. There is no doubt that several studies have shown that the decomposition of edible takes time. There are various health risks associated with the chemicals and glue used in the manufacture of edible cups. The least amount of chemicals and manufacturing processes areused in plastic cups, which causes the deadliest sickness in customers. Even thoughthe cost of paper and plastic cups is too low, using them for hot beverages may have some negative health effects.

Even while paper cups and plastic cups are inexpensive, they may create health problems when consumed with hot beverages. Here comes the edible cup whose

manufacturing cost is a little pricey, but it will be very beneficial for health and bring additional benefits to the consumer. With its unmatched characteristics, it has the capability to attract the customers from all over the world. This cookie cup is a tasty, crunchy, and a fully organic alternative to all disposable cups. They are zero waste cups made into differentsizes and shapes. For every cup eaten, we are saving a plastic cup from entering the landfill.Billions of plastic cups are entering the landfill every year.it would be cost effective and reduce paper cup use.

The objectives of the present work is to prepare tamarind seed flour and to formulate an edible cup to analyze its baking properties.

Materials And Methods

The tamarind seed was obtained from the farm at Karur. Maida was purchased from local super market Perundurai, Erode District. Sugar and butter were purchased from Jaisurya's Departmental Store, Erode, cocoa powder was purchased from Amazon online store. Preparation of Tamarind Seed Flour Fig 1 shows the process flow diagram used for preparation of tamarind seed flour. The Tamarind seeds were washed and soaked in hot water for about 24 hours. Then seed coat is removed. The seeds were dried in hot air oven at 105℃ for 10mins. Then seeds were powered using ball mill. The powder was sieved through a sieve shaker and packed in an air tight bag. Fig 1 Flow chart for the preparation of tamarind seed flour Manufacturing Process of Edible Cup Fig 2 shows the process flow diagram used for manufacturing of edible cup. The raw materials like Maida and tamarind seed flours were mixed. Then butter, sugar, and water is added at several proportion. It is mixed well for several minutes to make them into a dough. Then the mould is greased with butter or ghee and the formed dough is applied on it. Now pre heat the oven and bake the dough to form a cup.

Determination Of Compositional Attributes Of Edible Cup

Protein content of edible cup was determined by using Kjeldahl method. Ash content of edible cup was determined by AOAC method. Moisture content of edible cup was determined by AOAC method.

Results And Discussion

Experimental Data

The experiment was carried out to optimize the texture and overall acceptability of edible cup using different combinations. Results and interpretation In each attempt, tamarind seed flour is put in a varied quantity. In the initial test, only maida flour (100g) and icing sugar (30g) were used. Mold made from a cup. The composition of the flour is placed between two tumblers as one tumbler is made to be inserted into another. As a result, the cup's bottom is cracked. The second attempt used maida flour (95g), crystal sugar (30g), tamarind seed flour (5g), and butter. Here, maida flour (95%) is used in place of tamarind seed flour (5%), and crystal sugars are used in place of icing sugar to make certain adjustments. There are several cracks in the finished product. In the third test, 90g of maida flour, 30g of icing sugar, and 10g of tamarind seed flour were added. Small adjustments are made to the substitution of the tamarind seed flour in this third trial. In (90%) of maida flour, 10% of tamarind seed flour is utilised. Butter is always used as a lubricant in trials, but not in this one. The end effect was that the cup broke when it was being removed from the mould. In the fourth trial, butter, icing sugar, 15g of tamarind seed flour, and 85g of maida flour were added. We increased the amount of tamarind seed flour (to 15%) by adding icing sugar, butter, and the three testing procedures. The cup's outcome was excellent. It tastes great and is slimmer. In the fifth trial, 80g of maida flour, 30g of sugar, 20g of tamarind seed flour, and butter were added. No differences in the texture and flavour were observed when tamarind seed flour was added up to 20% to maida flour. Beyond 20%, the texture of the cup hardened, the crunchiness diminished, and the flavour became slightly bitter. Due to the inclusion of more excess seed flour, the protein level was also raised. Tamarind seeds have a 19.46% crude protein concentration,3% of ash content,5% of moisture content which gives the finished product more nutritional value. These seeds are more readily available for less money, which makes them more affordable and practical for use in a variety of applications.

Conclusion

The various nutritional aspects and properties of tamarind seeds remain underexposed for so many days. This project helps in exploring and analyzing all the essential benefits from the seeds. They serve as important source of various micro and macro nutrients. Also the biodegradable and edible nature of the cup helps in effective waste management and thus increase waste utilization. Incorporation of the tamarind seed powder into edible cups significantly increases their content of bioactive phytochemicals with an associated increase in

the antioxidant activity. Based on sensory analysis, it may be concluded that the amount of TSP that can be added to the cup need to be limited to ensure consumer acceptability. The findings confirm the potential to utilize tamarind seed powder as a source of natural antioxidants and stabilizer in our search for good human health

AN OVERVIEW ON DIETARY FIBER : A SPECTULAR NUTRIENT

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Abstract

Dietary fiber or roughage comprises the edible plant parts which cannot be digested by the human digestive system, but it can add bulk to the diet and had a optimal role in the hunger process. The dietary fiber has been classified into Soluble and Insoluble fibers in which it comprises celluloses, hemicelluloses, lignin, pectins and gums. They are well known prebiotics which had a crucial role in human nutrition by maintaining the blood sugar, blood cholesterol, Gastro intestinal health by regulating the process of digestion. The sources of dietary fiber comprise nuts, seeds, beans, wheat bran and flour. These dietary fibers help in controlling the blood sugar level by lowering the absorption of sugar and reduce the risk of developing the type-2 diabetes. Soluble fiber regulates the bowel health and decreases the risk of colorectal diseases especially the colon cancer .The soluble fiber allievate serum total and Low density lipoprotein cholesterol concentrations and these gel forming fibers beneficially affects the CVD risk factors. Prebiotic Dietary fibers are specific, microbiota-shaping compounds that function as a carbon source for growth of beneficial taxa, thus delivering a specific or selective change that confers the host health related to its metabolism. As a prebiotic , its exclusive mechanism of action is fermentation in the colon and changes in gut microflora.

Key words: Dietary fiber, soluble fiber, In soluble fiber, Gut micro biota, Digestion

Introduction:

Dietary fibre consists of non-digestible forms of carbohydrate, usually as polysaccharides that originate from plant-based foods. Over recent decades, our diet within Westernised societies

has changed radically from that of our hominid ancestors, with implications for our co-evolved gut microbiota. This includes increased ingestion of ultra-processed foods that are typically impoverished of dietary fibre, and associated reduction in the intake of fibre-replete plant-based foods. Over recent decades, there has been a transformation in our understanding of the health benefits of dietary fibre

Dietary Fibre -Definition

Dietary fibre or 'roughage' comprises the edible parts of plant that cannot be digested or absorbed in the small intestine and passes into the large intestine intact. This includes non-starch polysaccharides (Example: cellulose, hemicellulose, gums, pectins), oligosaccharides (Example: inulin), lignin and associated plant substances (Example: waxes, suberin). The term dietary fibre also includes a type of starch known as resistant starch (pulses, partly-milled seeds and grains, some breakfast cereals) because it resists digestion in the small intestine and reaches unchanged the large intestine. Official definition of dietary fiber differs a little among different institutions:

Organization (reference)	Definition
Institute of Medicine	Dietary fiber consists of nondigestible carbohydrates and lignin that are intrinsic and intact in plants. Functional fiber consists of isolated, nondigestible carbohydrates that have beneficial physiologic effects in humans. Total fiber is the sum of dietary fiber and functional fiber.
American Association of Cereal Chemists	Dietary fiber is the edible parts of plants or analogous carbohydrates that are resistant to digestion and absorption in the human small intestine, with complete or partial fermentation in the large intestine. Dietary fiber includes polysaccharides, oligosaccharides, lignin, and associated plant substances. Dietary fibers promote beneficial physiologic effects including laxation, and/or blood cholesterol attenuation, and/or blood glucose attenuation.

Codex Alimentarius Commission	Dietary fiber means carbohydrate polymers with ≥10 monomeric units, which are not hydrolyzed by the endogenous enzymes in the small intestine of humans.

Types Of Dietary Fibre:

Dietary fibre can be divided into two types based on its properties and its effects on the body. These two types are insoluble and soluble fibre. The difference is mainly based on solubility in water. The Dietary fibres that are soluble in water is known to be soluble fibres. Soluble fibres, such as gums, pectin and mucilage dissolve in water and form a thick gel and are generally fermented by bacteria in the colon into gases and by-products such as short-chain fatty acids *(Rana et al., 2012)* **.**They take up fluid in the gastrointestinal tract, thus forming a thick gummy substance. It also delays gastric emptying and intestinal transit time. Since soluble fibre has large water binding capacity it binds to kill acid and further helps to lower blood cholesterol levels and also helps in regulation of blood glucose levels by altering their absorption rates *(NIN, 2020).*

Insoluble fibre also known as roughage includes cellulose, hemicellulose and lignin. They are found in foods such as wheat bran, whole grains, vegetables, nuts and seeds. Insoluble fibres do not dissolve in water and generally cannot withstand fermentation by the bacteria in the colon.

Properties Of Dietary Fibre:

Physico-chemical properties:

- Particle size and bulk volume
- Characteristic of surface area

Hydration properties

- Solubility and viscosity

Physical properties

- Bacterial degradation
- Water holding capacity
- Cation exchange capacity
- Adsorption of organic materials

Chemical properties:

Department of Nutrition and Dietetics

Dietary fibre is a complex mixture of polysaccharides with many different functions and activities as it passes through the gastrointestinal tract. Many of these functions and activities depend on their physico-chemical properties.Dietary fiber cannot be enzymatically degraded in human small intestine. It is fermented to varying degress by micro flora naturally occurs in large intestine. The degree of degradation various among the poly saccharides and depends on factors such as types, components and poly saccharides structure of DF, water holding capacity physical structure of plants and bacteria flora in large intestine. The extent of bacterial degradation of several potential consequences;

1. Short chain fatty acids (SCFAs) produced during bacterial metabolism may influence physiological responses to fiber.

Ex: SCFAs can be used by cells in colon for energy and absorption of SCFAs influence hepatic metabolism of lipid and glucose.

2. The fermentation process may lower the pH of large bowl and affect the activity of bacterial enzyme.

Functions Of Dietary Fibre

Normalizes bowel movements

Dietary fibre, particularly insoluble fibre, helps prevent constipation by increasing stool weight and decreasing gut transit time. This effect is enhanced if fibre intake is paralleled by an increase in water intake. The short chain fatty acids, produced when fibre is fermented by gut bacteria, are an important source of energy for colon cells and might inhibit growth and proliferation of gut tumour cells. A bulky stool is easier to pass, decreasing your chance of constipation. If you have loose, watery stools, fiber may help to solidify the stool because it absorbs water and adds bulk to stool*(De Vries, J,2003).*

Role in obesity:

The role of dietary fiber in obesity prevention has been the subject of systematic reviews and meta-analyses. The analysis suggested significant effects of viscous fiber on body weight, percentage body fat and BMI, but not weight circumference.It is clear that the effects depend on the type of fiber and the host effects. A study showed that there was a significant inverse

association between wholegrain intake and BMI, as well as risk of overweight and obesity, in both men and women.

Role in diabetes mellitus:

Diets low in fiber, especially insoluble types, may increase the risk of type 2 diabetes (T2DM). Large cohort studies of women found that a diet low in fiber (especially lacking cereal fibers) but containing foods with a high glycemic index (causing blood glucose surges) increased the risk of developing T2DM.Diabetes mellitus is a condition of abnormally high levels of glucose in the blood because either the body is not making enough insulin or can't properly use the insulin it makes. Normally, blood glucose rises after eating a meal but then drops in 1-2 hours as the glucose is shuttled out of the blood and into cells. In people with diabetes, their blood glucose may remain elevated for several hours. Their blood glucose may also rise much higher aftereating meal than someone who does not have diabetes.

Role in cancer:

A prospective cohort study on premenopausal women found that a higher fiber intake as well as eating fiber during adolescence reduced breast cancer risk. When comparing the highest to lowest intakes of fiber, there was a 25% reduced risk of breast cancer.It was found protective from both premenopausal and postmenopausal breast cancers .A high-fiber diet was also associated with a lower risk of benign breast disease, a risk factor in adolescents for the later development of breast cancer.It has an important role in the prevention of Colorectal cancer.

Maintenance of blood cholesterol:

Triacylglycerols and HDL cholesterol were not significantly influenced by soluble fiber. Lipid changes were independent of study design, treatment length, and background dietary fat content.Various soluble fibers reduce total and LDL cholesterol by similar amounts. The effect is small within the practical range of intake. For example, 3 g soluble fiber from oats (3 servings of oatmeal, 28 g each) can decrease total and LDL cholesterol by approximately 0.13 mmol/L. Increasing soluble fiber can make only a small contribution to dietary therapy to lower cholesterol.

Role in GI Health:

Epidemiological studies have consistently demonstrated the benefits of dietary fibre on gastrointestinal health through consumption of unrefined whole foods, such as wholegrains,

legumes, vegetables and fruits. Mechanistic studies and clinical trials on isolated and extracted fibres have demonstrated promising regulatory effects on the gut (for example, digestion and absorption, transit time, stool formation) and microbial effects (changes in gut microbiota composition and fermentation metabolites) that have important implications for gastrointestinal disorders.

Types & properties of soluble fibre

Pectin -They are component of the cell wall , generally soluble in water and is gel forming.

Gums -Secreted at the site of plant injury and are generally u sed in food and pharmaceuticals.

Mucilage -Synthesized by pl ants and prevent desiccation of spe ed endosperm. Us ed in food industry, hydrophilic and stabilizer.

Sources of dietary fibre:

Plants foods are the only source of dietary fibre. Among them whole grains breads and cereals, fruits and vegetables, and dried beans and peas are good source of fibre. These foods provide both soluble as well as insoluble fibre.

Legumes, oats, and barley as well as vegetables such as carrots, broccoli, onion and fruits including bananas, berries, apples, and pears are good source of soluble fibre. Insoluble fibres are found in foods such as wheat bran, whole grains, vegetables, nuts and seeds

Conclusion:

To conclude, much evidence supports an important role for dietary fibre intake as a contributor to overall metabolic health, through key pathways that include insulin sensitivity. Many factors contribute towards the impoverishment of dietary fibre intake in the typical Western diet. Some of these will, doubtless, include lifestyle choices that our ancestors enjoyed in the pre-industrialised era, including, fundamentally, the adoption of a non-processed diet that is full of fibre. *(Thomas M. Barber, Stefan Kabisch, [...], and Martin O. Weickert)*

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PHYTOCHEMICAL SCREENING AND ANTIOXIDANT OF *Coriander sativum L.* and *Foeniculum Vulgare* MICROGREENS

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Abstract

Microgreens are a popular food item right now because of its qualities as a flavouring agent, a garnish, and a rich source of phytonutrients. These are cotyledonary leafy greens that are young, delicate, and tasty. They grow quickly and are taken as shoots after sprouting. It can be grown in any medium and needs a safe environment. They include several bioactive ingredients. Microgreens' short shelf life is a result of their quick degeneration. They can enhance food and nutritional security and conserve and improve biodiversity and environmental sustainability, either directly or indirectly. More than 150 plants have been designated as GRAS by the FDA, with no consumption restrictions. Plants like fennel and coriander are included in this list. The Antioxidant DPPH assay and phytochemical screening of two microgreens namely coriander and fennel were investigated.The current research revealed that a natural source of micronutrients and antioxidants against a variety of oxidative stress-related disorders can be found in microgreens. As a result of our findings, coriander and fennel microgreens may be proposed as a new potential source of natural antioxidants and may be employed as a food additive.

Key Words: Antioxidant Activity, Phytochemical Screening, Microgreens, Coriander and Fennel

Introduction

Microgreens are a good source of dietary antioxidants, according to an increasing body of research in recent years. Antioxidant dietary intake is frequently linked to lowered risks of developing certain deadly diseases. Vitamin C, Vitamin E, Beta-Carotene, Polyphenols, and other Bioactive Components are some of the Dietary Antioxidants. Antioxidants are substances that can prevent certain biomolecules from oxidizing and aid in the healing of tissue damage caused on by oxidation processes in the body. Numerous studies have focused on the usage of antioxidants from natural sources in order to employ them as beneficial additives and potential antioxidants in our regular food intake habits. Antioxidants in food have beneficial effects on

human health and disease prevention (Anindya Bose *et al*., 2016). *Coriandrum sativum* also known as coriander. *C. sativum* leaves and roots are used frequently in many kinds of Asian cookery because they have a flavourful aroma that is rich in aroma. The plant's components have historically been used to treat giddiness, pneumonia, gout, gastrointestinal ailments, and spasms. The medical benefits of this herb have been studied and include anti-diabetic, anti-oxidant, hypocholesterolemic, anti-bacterial, hepatoprotective, anti-cancer, and anxiolytic effects (Tang *et al*., 2013).

A perennial herb and spice plant known as fennel is called *Foeniculum vulgare*. Due to its historical use for industrial, culinary, and medicinal applications, it is well-known throughout the entire world. The extracts from fennel seeds showed anti-inflammatory, antioxidant, anti-allergic, anti-stress, nootropic, and memory-improving properties. Additionally, fennel extracts and essential oil are used to treat glaucoma, hypertension, gastritis, mouth ulcers, gum disease, arthritis, fever, diarrhoea, and comics (Razavi. S.M *et al*., 2021). A parameter that can be used to describe plant materials is antioxidant activity. Instead of encouraging the use of natural chemicals, the food business today uses a wide variety of synthetic additives. Without any limitations, the FDA has given GRAS approval to more than 150 plants. a number of plants, including cumin, fennel, and coriander.

Materials And Methods

Selection and Cultivation of microgreens

The seeds of coriander and fennel were purchased from the Tamil Nadu Agricultural University, Coimbatore. The seeds are weighed and cultivated in agriculture land which was situated in Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. The soil fertility test was carried out at Joint Director of Agriculture, Coimbatore. Coriander and fennel microgreens require 15-30 days of time periods. It takes longer period of harvesting compared to other type of microgreens. The overall size of the microgreens is between 7 to 10 cm in length. Harvested microgreens are shade dried for 7-10 days and make it fine powder for further analysis.

Soil Fertility Analysis

Soil fertility test was carried out at Joint Director of Agriculture shown in Table II

Extraction of microgreens

The microgreens powder is extracted using an aqueous method in the following proportion of 3 grams of microgreens powder, added 120 ml of distilled water for 20 minutes at 20°*C* to 30°*C* in water bath. The solution was chilled to 4°C and filtered using Whatman filter paper. The aqueous extraction of coriander and fennel powder are tested for qualitative analysis of phytochemical screening and quantitative analysis of antioxidant by DPPH assay.

Qualitative analysis of Phytochemical Screening of microgreens:

Alkaloids, flavonoids, sterols, terpenoids, anthraquinone, anthocyanin, proteins, phenolic compounds, quinones, carbohydrates, tannin, saponins, phytates, cardiac glycosides, lignin, glycoside's test, coumarins and volatile oils. The total 18 metabolites were screened using phytochemical analysis, which was carried out using the aqueous extraction.

Antioxidant DPPH Assay

The aqueous extraction of microgreens powder was tested for DPPH assay andcompared with standard ascorbic acid. DPPH (2,2-diphenyl-1-picrylhydrazyl) radical is a reagent in this spectrophotometric antioxidant assay.

Results And Discussion:

Development Analysis of Coriander and Fennel Microgreens:

The seeds were taken for 100 grams of coriander and fennel microgreens. Harvested period of coriander microgreens is 25 days and for fennel microgreens is 20 days were taken. Height of the microgreens are measured along with roots using measuring scale. Quantity of microgreens yield are weighed together with roots; it is shade dried and powdered. Final quantity of microgreens powders also weighed shown in the Table I.

TABLE I ANALYSIS OF GROWTH OF SELECTED MICROGREENS

S.No	Microgreens	Quantity of Seeds (g)	Harvested days (n)	Height of the microgreens along with root (cm)	Quantity Obtained without Drying (g)	Quantity of Powder (g)
1.	Coriander	100	25	10	178	23
2.	Fennel	100	20	7.5	275	20

Soil Fertility Analysis:

The acidity or alkalinity of the soil is determined by the pH of the soil. In actuality, the pH scale measures hydrogen ion concentration. Less than 6.5 is acidic, less than 7.5 is alkaline,

and soils with a pH of less than 5.5 are thought to be extremely acidic. The variance in soil pH as determined in a lab Soil has a pH range of 7.86. It is regarded as neutral.

The measurement of macro nutrients in soil using standard AOAC Procedures. Nitrogen, phosphorus, and potassium are macronutrients. A crucial component for plant growth is nitrogen. 53 Ppm of nitrogen were found in the soil. Phosphorus promotes early root and plant growth, speeds up maturity, and aids in the transport of solar energy to plants.

The soil phosphorus range is 6.3 Ppm. Potassium helps plants generate carbohydrates, sugars, and oils and can improve the quality of their fruit. It also makes plants more vigorous and disease-resistant. The soil has 165 ppm of potassium in it. This soil has the necessary amounts of iron, manganese, zinc, and copper. It is necessary for the development and growth of plants. In addition to having a 4.2 percent iron content, soil also contains 1.0 percent manganese, 0.9 percent zinc, and 0.8 percent copper.

Qualitative analysis of Phytochemical Screening of microgreens:

Table III shows the qualitative analysis of microgreens under aqueous extraction method

TABLE III
Qualitative Phytochemical Screening Of Coriander And Fennel Microgreens

S. No	Metabolites	Coriander Microgreens	Fennel Microgreens
1.	Alkaloids	+	+
2.	Terpenoids	+	+
3.	Anthraquinone	+	+
4.	Carbohydrates	+	+
5.	Saponins	+	+
6.	Cardiac glycosides	+	+

The Phytochemical screening of coriander and fennel microgreens under aqueous extraction reveals that presence of alkaloids, terpenoids, anthraquinone, carbohydrates, saponins and cardiac glycosides presence in both microgreens show in the above Table III.

Antioxidant DPPH Assay:

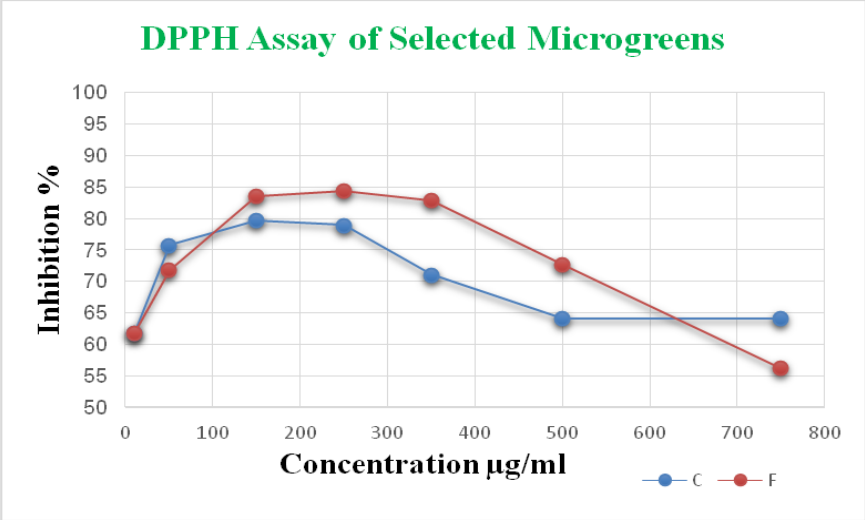

Figure 1 DPPH Assay of Selected Microgreens

In DPPH assay results inferred that coriander microgreens are more effective in concentration of 150 µl it shows that highest inhibition of 79.6 percent. In fennel microgreens shows 83.5 percent of inhibition in same 150 µl concentration. In concentration of 350 µl, both microgreens reveal the decline range of inhibition while compare the concentration of 50 µl, 150 µl and 250 µl. Meanwhile, the DPPH inhibition of standard ascorbic acid in 150 µl shows the 96.09 percent. More or less fennel microgreens have best inhibition percentage in 150 µl compared to coriander microgreens with consideration of standard ascorbic acid.

In Coriander microgreens the concentration has increases in 10 µl, 50 µl, 150 µl, 250 µl,350 µl, 500 µl and 750 µl it shows the inhibition of 61.7 %, 75.7 %, 79.6, % 78.9 % 71 %, 64 %, and 64 % respectively. In fennel microgreens the concentration has increases in 10 µl, 50 µl, 150 µl, 250 µl,350 µl, 500 µl and 750 µl it shows the inhibition of 61.7 %, 71.8 %, 83.5, % 84.3 % 82.3 %, 72.6%, and 56.2 % respectively. The comparison of coriander and fennel microgreens extract with standard ascorbic acid shows that concentration of 30 µl, 60 µl, 90 µl, 120 µl and 15 0µl shows the inhibition of 65.63 %, 75 %, 79.69 %, 92.97 %and 96.09 %respectively.

Conclusion

The potential antioxidant and phytochemical content of coriander and fennel microgreens has been assessed in the current study using their aqueous extracts. Microgreens and other natural sources of antioxidant compounds are excellent sources of antioxidant activity for use as

natural supplements. The extract from both microgreens may have strong antioxidant properties because of the amount of phenolic content in it. Therefore, it would be advised to combine mature leafy equivalents with microgreens to receive enough amounts of phytochemicals for a healthy diet in order to obtain the greatest benefits in terms of dietary antioxidants. Thus, including these microgreens in food will aid in avoiding or reversing a number of oxidative stress-related ailments.

In addition to these, medicinal plants are valuable sources for the food industry due to their possible antioxidant effects. Further research is required to determine whether coriander and fennel microgreens may be used as a food preservative and as an antioxidant neutraceutical.

Further concentration of aqueous extracts, extraction of phenolic compounds, and assessment of their biological activity in vitro and in vivo are required in order to comprehend their mode of action as bioactive components.

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DEVELOPMENT OF CABINET-DRIED MIXED MILLET MALT: ITS SENSORY AND NUTRIENT ANALYSIS

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Abstract

Millets are known as one of the most important cereal grains which are consumed by more than 1/3rd of the world's population. Millets have high nutritional value and are rich in protein, vitamins, minerals, fibres, antioxidants, essential amino acids, magnesium, phosphorus, calcium, and iron. Malting of millets improves the digestibility and bioavailability of nutrients and improves sensory and nutritional quality. With this above background information, the present study was undertaken to develop mixed millet malt with finger millet, pearl millet, little millet, and foxtail millet powder processed through the cabinet dryerand to perform sensory analysis and nutrient composition of mixed millet malt. The developed mixed millet malt has good overall acceptability with high nutritional value and it can be recommended for all age groups.

Keywords: Finger millet, foxtail millet, pearl millet, millet malt

Introduction

Millets are a Gramineae family of small-seeded cereal crops. Millets are warm-season cereal grains with small-seeded grains that are available in seven varieties like samai, kuthiravali, kambu, ragi, thinai. They contain a lot of dietary fibre, phytochemicals, and micronutrients(Takhellambam et al., 2016).

Millets contain a high concentration of phytonutrients and biologically active components, such as dietary fibre, phenolic acids, flavonoids, and phytosterols, which have been linked to a lower risk of many degenerative diseases. Millets have antioxidative, anti-ulcerative, hypoglycemic, and anti-inflammatory properties, as well as the potential to lower

cholesterol(Banerjee et al., 2020). The ancient food processing technique malting enhances the nutritional value of cereal through biochemical changes (Elliott et al., 2022).

Cabinet dryers have a simple structure and can be used in almost any environment. Hot air is typically introduced into conventional cabinet tray dryers to remove moisture (Amanlou&Zomorodian, 2010).

With this background information the study has been carried out with the following objectives:

1. To develop mixed millet malt using cabinet-dried mixed millet powder; and
2. To perform sensory analysis and nutrient composition of developed mixed millet malt.

Methodology

Selection and Collection of Ingredients

The millets namely Pearl millet (Kambu), finger millet (Ragi), Foxtail millet (Thinai), and Little millet (Samai) were selected and procured from local market in Dindigul for the development of mixed millet malt. The ingredients used are given in plate 1.

Plate 1

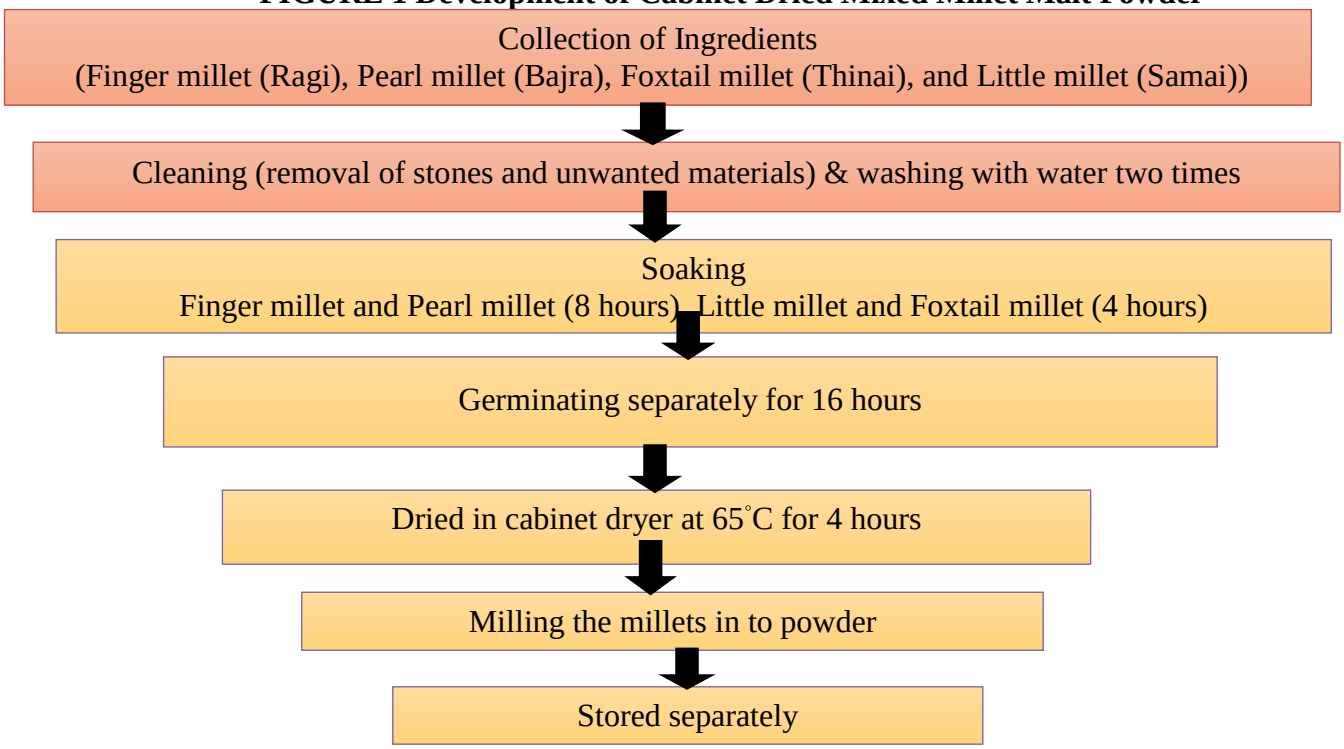
<table>
<tr><td> 
Pearl Millet (Kambu)</td><td> 
Finger Millet (Ragi)</td></tr>
<tr><td> 
Foxtail Millet (Thinai)</td><td> 
Little Millet (Samai)</td></tr>
</table>

Development of Cabinet Dried Mixed Millet Malt powder

The selected millet was cleaned and washed twice a time with water and soaked in water for 4 to 8 hours. Then germinated for 16 hours. The germinated millets were dried in cabinet dryer. After the drying process, the millet is grinded into fine powder and stored separately.

The procedure followed for the development of cabinet-dried mixed millet malt powder is given in Figure 1.

FIGURE 1 Development of Cabinet Dried Mixed Millet Malt Powder

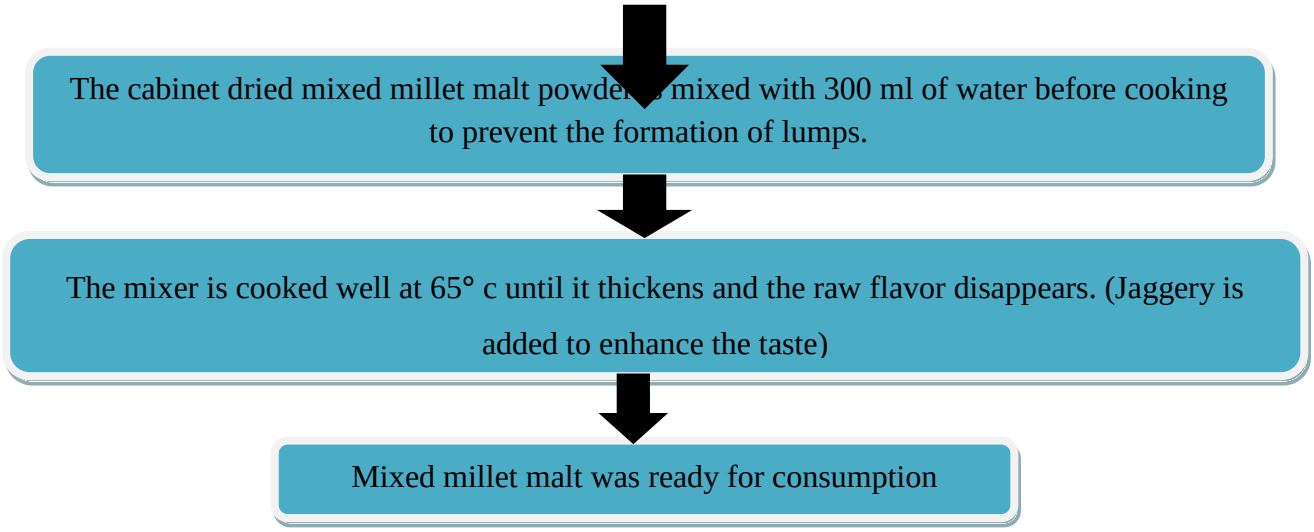


Development of Mixed Millet Malt

Malting is a low-cost traditional food processing method that involves biochemical modifications to improve the nutritional quality of cereals and millets. The procedure followed for the development of mixed millet malt is given in Figure 2.

Preparation of Mixed Millet Malt

Mixed the cabinet dried mixed millet malt powder in given proportion (Finger millet malt (5 gm), Pearl millet malt (5 gm), Little millet malt (5 gm) and foxtail millet malt (5 gm))



Sensory Analysis of Mixed Millet Malt

Sensory analysis of the Mixed millet malt was carried out for the overall acceptability with the help of 30 non- trained panellists using score card in which attributes like appearance, color, flavor, consistency, and taste were included. A **5-point Hedonic scale** was used to assess the sensory quality of the mixed millet malt.

Nutrient Composition of the Mixed Millet Malt

The prepared mixed millet malt was analysed for its nutrients namely carbohydrate, protein, calcium, vitamin- C, crude fibre using standard procedure.

RESULTS AND DISCUSSION

Development of Mixed Millet Malt from the Cabinet Dried Mixed Millet Malt Powder

The cabinet-dried mixed millet malt powder was taken in equal proportions, Finger millet malt (5 g), Pearl millet malt (5 g), Little millet malt (5 g), and foxtail millet malt (5 g) for the preparation of malt. Additionally, jaggery was added in the malt to enhance the taste. The proportion of ingredients used for malt preparation is given in Table 1.

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TABLE 1 The Proportion of Ingredients Used for Malt Preparation

Ingredients	Amount (g)	Total Yield	
		Before Cooking(g)	After Cooking(g)
Finger millet (Ragi)	5	20 gms	175 gms
Pearl millet (Kambu)	5		
Foxtail millet (Thinai)	5		
Little millet (Samai)	5		

Sensory Analysis of Developed Mixed Millet Malt

The results for the sensory evaluation of the developed mixed millet malt are given in Table 2

TABLE 2 Sensory Analysis of Developed Mixed Millet Malt

Attributes	Appearance	Flavour	Colour	Consistency	Taste	Overall Acceptability
Cabinet Dried Mixed Millet Malt	3.9± 1.09	3.2± 0.87	3.7± 0.71	4.3 ± 0.6	4.2 ± 0.8	4.5± 0.5

Table 2 shows the sensory evaluation of the developed mixed millet malt. The Overall acceptability of the developed mixed millet malt is 4.5± 0.5 out of 5 points.

Nutrient Composition of Developed Mixed Millet Malt

The results for the nutrient composition of developed mixed millet malt are given in Table 3

TABLE 3

Nutrient Composition of Developed Mixed Millet Malt

Nutrients	Mixed Millet Malt Nutrients/ 100g
Carbohydrate (g)	70.35 ± 2.616
Protein (g)	4.95 ± 0.2121
Calcium (mg)	33.66 ± 0.93
Vitamin C (mg)	2.23 ± 1.085
Crude fibre (%)	1.935 ± 0.362

Table 3 shows the nutrient composition of developed mixed millet malt. The developed mixed millet malt has a good amount of carbohydrate (70.35 ± 2.616), Protein (4.95 ± 0.2121), calcium (33.66 ± 0.93), Vitamin C (2.23 ± 1.085), and Crude fibre (1.935 ± 0.362).

Conclusion

From the above study, it is concluded that the developed mixed millet malt has high overall acceptability with a good amount of carbohydrates and calcium. Thus, the developed mixed millet malt can be recommended for all age groups.

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REVIEW ON CLINICAL AND PERSONALIZED NUTRITION IN HEALTH AND DISEASES

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Abstract

Nutrition has an extensively important life-long environment consequence on human health. While nutrigenetics addresses how an individual's genetic identity predisposes to dietary exposure, nutrigenomics inquires about how nutrition impacts the nature of the genome. Nutrigenomics erects on the three omics domains transcriptomics, proteomics, and metabolomics. At current national, European, and international levels, there is real predisposition to clarifiessonalized nutrition, perceived to be that food can have a positive impact for one person and a negative for another and has occurred as an alternative to solving several health crises. Personalized nutrition encompasses nutrigenetics ad nutrigenomics research that clarifies how diet and genes interact and modifies gene expression. Clinical nutrition was specified as a domain that deals with the prevention, diagnosis and administration of nutritional and metabolic alterations associated with acute and chronic disorders and conditions inflicted by inadequacy or excess of energy and nutrients. Comprehending the detailed molecular mechanisms underlying the food-gene interaction and their impact to preclude the disorders like cancer, diabetes, obesity, thyroid, chronic degenerative illnesses, etc, are expected to analyse the significance of personalized nutrition and functional foods as future tools are enhancing human health.

Keywords*: nutrigenomics, nutrigenetics, personalized nutrition, genome, nutrients*

1. Introduction:

Human beings have realized that their surroundings, particularly diet, can intrude n their health. Nutrition is now realized as a determinant in incurable and acute diseases. The efficacy of nutrition care has been greatly recorded and has facilitated development in healthy and biochemical markers, aspect of existence, and deduction in mortality, and morbidity, as well as in the duration of hospitalization and rehospitalizations. Additionally, there is the evolving fact that nutrition may provide the cost-effectiveness and financial sustainability of the healthcare system. Personalized nutrition moves toward delivering healthful consuming recommendations altered to the nutritional needs of a person. Although there is no explanation for personalized

nutrition, guidance has generally been based on the person's behaviours, biological aspect and intercourse. The various goals of personalized nutrition are to enhance dietary patters for the prevention or therapy of chronic disorders, eventually rendering developments in community health. Two phases of the personalization of nourishment guidance have been designed, which are established on the inquiry of recent aspects, phenotypic factors, and biological reactions to diet. The initial phases of personalized nutrition encompass recent aspects and phenotypic factors (such as adiposity) to formulate tailor-made dietary needs. The next phases of personalized nutrition assemble on the initial phase but also brings into concern the various reactions to diets or nutrients that are based on genotypic or other biological factors. Although there is some randomized controlled trial (RTC) indication for the significance of personalized nutrition guidance, the scientific purpose for personalization of dietary guidance is still in its infancy. The researches in this particular matter of "nutrients" make together a progression of recent clinical examinations and review articles that illustrate modern data and revise crucial reviews to the recent scientific purpose that underpins personalized [12].

2. The Interaction Between Genes And Nurients Is Moderated By Three Apparent Mecahnisms

a. Direct interaction, where nutrients governed as transcription factors and bind DNA to organize the expression of associated gene.

b. Epigenetic interaction, where nutrients alter the hierarchy of DNA occurring in altered genetic expression;

c. Genetic variation: single genetic variations liken nucleotide polymorphisms (SNPs) can control the functionality or representation of genes.

2.1. Direct Interaction: there is proof that indicates that gene expression can be controlled by cholesterol, carbohydrates and the metabolites can act as immediate effectors of transcription characteristics. when there is additional intake of simple carbohydrates in the diet, a primary portion of carbohydrates is restored as triglycerides in the liver, controlling hepatic enzymes. Pyruvate kinase (glycolysis) acetyl CoA carboxylase and malic enzyme (fatty acid biosynthesis), glycerol-3-phosphate acyltransferase (triglyceride synthesis) are provoked by a carbohydrate diet due to elevated levels of mRNA. Cell membrane biosynthesis in mammals needs cholesterol

which may emerge from diet or be synthesized by cells. Low density lipoprotein (LDL) catalyses the cholesterol uptake in cells. Low cholesterol levels generate the generation of extra LDL receptors to uptake additional cholesterol and vice versa. Depleted cholesterol upregulates the synthesis of two rate-limiting enzymes dependable for the biosynthesis of cholesterol, namely HMG-CoA synthase and HMG- CoA reductase.th cell assures that it obtains the necessary amount of cholesterol from the diet and preserves the transcriptional regulation of genes that encode HMG -CoA synthase and HMG-CoA reductases (12)

2.2. Epigenetic Interaction:

Nutrients withpotential bioactive molecules can provoke protecting epigenetic transformation. The three-dimensional conformation of chromatin is organized b environmental aspects like pollutants, chemicals and nutrients which promptly influences gene expression. Detailed knowledge of molecular mechanisms by which environmental aspects (nutrients, pollutants, chemicals) exerts their epigenetic impacts will direct the evolution of personalized nutrition techniques to prevent many diseases including cancer (Tiffon 2018), the nutritional status at an earlier stage of a person has a long-term impact on DNA methylation configuration which in turn is concerned with chronic degenerative diseases (Lillycroop et al.,2014). The nutrients alter the epigenetics by hindering DNA methyltransferases (DNMTs), histone deacetylases (HDACs) or histone acetyltransferases (HATs); or alters the substrate availability for theses enzymes to accomplish the enzymatic action. This eventually directs to controlling of gene expression associated with pathophysiological procedures like aging, embryonic development and carcinogenesis (Choi et al., 2010). Personalized nutrition and bioactive nutrient compounds can occur as epigenetic therapeutical representatives to prevent type 2 diabetes mellitus, inflammation, obesity, cancer, neuro degenerative diseases. Through there are a few studies contemplating the preventive standard and disease management with this method nutritional epigenetics consents a reasonable awareness of the molecular mechanisms of the bioactive nutrients' compounds. Some illustrations of bioactive food elements and their functions are as follows (Tiffen, 2018):

- Folic acid, vitamin B12, and vitamin B6 play role in methionine synthesis
- Choline function as a methyl donor to S-adenosyl methionine (SAM)
- Methionine plays role in SAM synthesis

- Betaine lyses the toxic by-products formed during synthesis of SAM
- Resveratrol, a prominent compound against breast cancer, can eliminate the acetyl group from histone
- Diallylsulfides, butyrate, sulforaphane, turn on the anti-carcinogenic gene's by enhancing histone acetylation
- Genistein improves DNA methylation and has anti-cancer actions

2.3. Enetic Improves:

The Majority of the characteristics have variations in small sequences – polymorphisms – that fluctuate among population. Single nucleotide polymorphisms (SNPs) are the greatly well-know type of variety (Debusket al., 2005). (3).

3. Dietary Habits Affects Gene Expression

These genetic polymorphisms direct the transformation of the response to the dietary components by influencing ingestion and digestion. Epigenetic circumstances can incite modifications in DNA methylation illustration and along these lines affecting general quality emphasis that can be modified because of the food components. Nutrition has influenced a recognizable and prominent part of the administration of health. Nutrigenetics is the science that comprehends and characterizes the gene deviations related to the response to supplements and pertaining this variation to several disease state primarily cancer, diabetes, obesity and other diseases. Multiple dietary constituents impact post interpretation circumstances and many records for any occurrence part of the variation in light of the dietary components. [12]

4. Clinical Nutrition

This domain clarified as discipline that endeavours with the prevention, diagnosis and administration of nutritious and metabolic modifications associated with acute and chronic illnesses and conditions influenced by an absence or extravagance of energy and nutrients [2]

5. Personalized Nutrition

Personalized nutrition is an arena that leverages humans. Individuality to utilize nutrition protocols that prevent, manage, and treat illness and maintain fitness [6].

6. Obesity

Obesity treatment have two objectives:

- To attain healthy weight
- To maintain that healthy weight.

Because a bad diet and a lack of physical activity are the extensively common reasons for adiposity, there are some moderately modest therapies for obesity. By encompassing increases natural foods into your diet, drinking increased amounts of water, avoiding junk food, and getting into the pattern if exercising several times every week, you can drastically decline your weight and reduce your chances of becoming obese. If you endure ad illness like hypothyroidism, though, you will be required to see the physician and seek out different alternatives [1].

6.1. Dietary Modifications

- ✓ Exercise and activity
- ✓ Behaviour alteration
- ✓ Prescriptions weight-loss drugs
- ✓ Weight-loss surgery

7. Effect Of Carcinogen In Foods Cause Cancer

Pertaining carcinogenic components identified in some foods, which are the major path of human disclosure, are evaluated as extensively dangerous. Researchers analysed them into representatives with elevated, intermediate and depleted levels of carcinogenicity. Aflatoxin is by far the considerably dangerous carcinogen that has a source aspergillus flavus that can spoil peanuts, nuts and cereals. The consumptions of infected components by animals furnishes infected animal food commodities that will be disseminated to human and have the liver as a mark. Regardless, tumours in the colon and kidney also are affected by this carcinogen (peers and linsell,1973; Haye et al.,1984; Abnet,2007). Nitrites, which occur naturally in fruit and vegetables, are modified in the stomach to nitrous acid and after their response to amines in foods; they can generate other carcinogenic agents, which are known as nitrosamines (Oliver et al., 1995). Polycyclic aromatic hydrocarbon (PAHs), generated by cigarette smoke, is also a dangerous carcinogen to humans. It includes irreversible destruction to the genome after its interaction promptly with DNA. This authorizes the destructive function of cigarette smoke, which according to studies comprises 60 carcinogen and they analysed 15 of then as

carcinogenic to humans (DeVita et al.,2005). However, it is unfettered into the atmosphere after the burning of carbon-containing and from substances influenced by high temperatures such as cooking and household heating (world health organisation,2000). An additional component that was observed and evaluated as the outcome of high-temperature cooking processes is Acrylamide but had a more depleted carcinogenic impact than PAHs [2][10] [13][14].

8. DIABETES MILLETS

Several factors induce diabetes killers such as physical inactivity, unhealthy eating habits, being overweight, and family history. Portion size for eating vegetables includes choosing as much as you can hold in both hands, drinking up to 1 cup or 250 ml of low-fat milk per day, choosing fruits as much as alternatives choosing an amount of size of your palm and thickness of your finger [9][11][12][15].

9. Cardiovascular Disease

Cardiovascular disease is caused by various factors involved such as tobacco, smoking, high fat-sugar diet, high sodium diet, physical inactivity, etc… And can e treated with changes in the lifestyle pattern, and dietary management which comprises of DASH and Mediterranean diet, Anti-platelet therapy, avoid alcohol and smoking [13].

10. Kidney Disease

Making healthy food choices is important to us all, but it is even more important if you have chronic kidney disease (CKD), why? Good nutrition gives you energy to:

1. Physical activity
2. Prevent infection
3. Build muscle
4. Assist maintain a healthy weight
5. Protect the kidney disease from getting worse [5].

11. Other Disease Condition:

For metabolic diseases, the early and most significant step is the execution of a different lifestyle with modifications in diet and physical activity, as well as the obtainment oof healthier habits. Weight loss and lifestyle modifications may enhance that personal quality of life behavioural interventions make it easier for people to execute and maintain this modification in

their everyday pattern. Weight reduction was the major purpose of most intervention research. Osteoporosis is one of the most common conditions which occurs due to calcium & vitamin D deficiency, age, improper diet, physical inactivity, and also certain drugs. Treatment may include malnutrition are dietary modifications, such as consuming foods high in energy and nutrients. Treatment for any underlying medical situations resulting in malnutrition [4][6].

12. Conslusion

The improvement of personalized nutrition can be promoted by formulating practical theoretical knowledge of the topic to specify the most important personal aspect on the explanation of which particular diet will be administered. The effectiveness of the suggested diet and cost-effectiveness of the suggested diet and cost-effectiveness data should be well recorded from factual intervention researches. Furthermore, initiatives should be seized by the policymakers to instruct regulatorily framework and formal protocols for health experts ad dieticians to enlighten personal and clinical nutrition concept to community. The current state of insight considering personalized nutrition consents a rise in scientific proof.

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EXTRACTION OF PECTIN FROM ORANGE PEEL AND ITS CHARACTERIZATION

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Abstract

The aim of this study was to extract pectin from orange peels. Pectin is a natural product which can be found in the cell walls of all higher plants and it has long been used for its gel formation, thickening and stabilizing properties in a wide range of applications from food to the pharmaceutical and cosmetic industries. An orange, specifically, the sweet orange (*Citrus sinensis (L*.) is the most commonly grown tree fruit in the world. The present work addresses to the development of the part of the process needed for the extraction of pectin from orange peel, which is the waste of orange juice processing industry. Pectin extraction from orange peels is done by mainly two methods such as fresh orange peels and from dried cake remains after steam distillation. Due to increased demand for the pectin in food, pharmaceutical and therapeutic applications thus require efficient extraction processes. The outcome of the present work highlighted that the sweet orange peels are good source of pectin and does have the potential to become important raw material for food processing industries. These results demonstrate the successful extraction of pectin, providing potential benefits for industrial extraction of pectin from an economic and environmental point of view.

Key Words – Pectin, Orange Peel, Citrus fruits, Extraction

Introduction

Citrus fruit peels which are discarded as waste materials have valuable natural polymers in it where that can be reformed as biodegradable films for food packaging by the presence of gelling ability of pectin and the strength of cellulosic fibers. Pectin has great attention for its application in food packaging mainly due to its non-toxicity, edibility and biocompatibility. Research studies show that 30 % of citrus peels are composed of pectin. This bio packaging can replace single use plastics which give environmental consequences like long term decomposition

and damage to natural ecosystem. Bio degradable packaging is produced using biopolymers, biomolecules often found in the living organisms.

Pectin is a white, amorphous and colloidal carbohydrate of high molecular weight occurring in ripe fruits, especially in apples, currants, etc., and used in fruit jellies, pharmaceuticals and cosmetics for its thickening and emulsifying properties and ability to solidify to a gel. Pectin is a natural, biocompatible, biodegradable and renewable polysaccharide characterized as an emulsifier, gelling agent, glazing agent, stabilizer, and as thickener in commercial applications; all of which are in fact subsets of the term rheology modifier. Pectin gels are formed when the molecule chains are cross-linked, forming a three dimensional network where water and co-solutes are retained. All these properties and applications have put pectin in the market of the biopolymers with great potential and possibilities for future developments. Pectin substances are present in the primary cell walls and middle lamellae of many plants and fruits, and they are frequently associated with cellulose, hemicelluloses and lignin structures.

Their presence in the cell is important for some essential functions:

(a) Adhesion between cells

(b) Mechanical strength of the cell wall

(c) Ability to form stabilizing gels

(d) They play a significant role in the growth of plant cells.

Citrus waste is a globally abundant and environmentally challenging waste that is underutilized. Orange waste also contains pectin, soluble sugars, hemicelluloses, cellulose, starch, protein, lignin, ash, fat, and Flavonoids which have been shown to be beneficial to many yet imperfect disposal and recovery applications. These compounds on the other hand could be interesting for bioplastics applications.

Materials and Methods

Extraction of pectin from the orange peel

Orange peels are major commercial sources of pectin. Extraction is the most important process in the pectin production. Pectin is a sugar present in the walls of the plants which is used as the gelling agent. The traditional and commercial source of the pectin is the citrus peels. Citrus peel has often been preferred material for pectin production due to its high pectin content and good colour properties. Generally lemon and lime peel are the preferred sources of citrus

pectin. Lime treatment of the peel would hydrolyze all the pectin to pectic acid. Pectin extraction in a hot diluted strong mineral acid solution is the most commonly used method. Pectin extraction from orange peels is done by mainly two methods such as fresh orange peels and from dried cake remains after steam distillation. Due to increased demand for the pectin in food, pharmaceutical and therapeutic applications thus require efficient extraction processes. In order to increase the yield of pectin, various extraction methods have been adapted to obtain insoluble pectin present in the middle lamella of plant cells, one of them being heating in acidic medium that makes insoluble pectin as soluble. Ripening of fruits also converts insoluble pectin in to soluble pectin. Pectin can be extracted from various kinds of fruits, but the most commercial form of pectin is extracted from the peels of the citrus fruit by alcoholic precipitation. Citrus fruit contain 0.5 to 3.5 % pectin which is largely present in the citrus peels.

i. **Selection of the fruit**

Peels of the sweet orange (Citrus sinensis) are the good sources of pectin having the potential to become important raw material for the food processing industry and it is the most commonly grown tree. Pectin was first extracted using technique of water bathing or drying followed by acid extraction of pectin was most suitable for industrial production for isolation of pectin. Citrus fruit contains 0.5%–3.5% pectin which is largely present in peel portion of the fruit.

ii.Removal of the rind

Pectin is present in the rind of the orange peels which should be removed carefully to get the pure pectin without allowing t the oil and the astringent present in the orange peel. That would affect the quality and the purity of the pectin extraction.

iii. **Boiling**

For the pectin to obtain, the medium should be maintained in the acidic pH by adding acid (Hydrochloric acid) in to the solution and frequent testing of pH using pH meter. At neutral pH pectin will not react with heat and formation will not occur. Boiling takes place for one and half hours till the rind completely cooks and the water becomes cloudy in nature and it will give an odd odour.

iv. Filtration

Filtration is the process for the separation of the formed pectin solution and the orange rind. Filtered solution appears as a white cloudy colloidal solution

v. Alcohol precipitation

Ethanol is added directly to the solution for the formation of the pectin to get precipitated for the further process. The amount of ethanol adding should be equal to the pectin solution. Added ethanol solution should be kept undisturbed for half an hour or can leave overnight till the complete precipitation of pectin occurs. After precipitation the precipitate is collected separately, it is then washed with acetone solution for the removal of the excess acid present in the pectin (Several washes may also be helpful in retaining the colour of the pectin).

vi. Purification

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vii. Drying

Pectin is then dried at room temperature for overnight or using oven drier for one hour at 40°C. Drying can eliminate the hydrolysis, Hydrolysis is a chemical reaction in the polymer that breaks the covalent bonds in its chain, reducing its mechanical properties.

Viii: Factors affecting pectin production:

1. pH: pH is considered as one of the more crucial parameters affecting the amount and properties of extracted pectin.
2. Temperature: At the lower temperature the yield of pectin is low while at high temperature it Combustible. As compared to low and high temperature range the pectin yield is high at moderate temperature.
3. Solvent used for extraction: Solvents are used for the extraction of pectin such as Citric Acid ($C_6H_8O_7$), Hydrochloric Acid (HCL), Sulphuric Acid (H_2SO_4), Nitric Acid (HNO_3), EDTA, Ammonium Oxalate ($C_2H_8N_2O_4$) and oxalic acid ($C_2H_2O_4$). The high yield is obtained by using Citric Acid as a solvent. The yield of pectin extraction is reported in literature up to 55-60% by using Citric Acid as a solvent.
4. Time of extraction: As the time range of extraction increased the pectin yield increases but up to a limit. The time of extraction increased to a extreme there is less effect on

yield of pectin reported and also decreased from the maximum level due to the thermal degradation of the extracted pectin.

5. Agitation Rate: The yield of pectin keeps on increase with increase of agitation rate. This situation is due to the fact that increase stirring rate may reduce the thickness of the diffusion layer which can enhanced the extraction process.

Result and Discussion

Food source	**Initial amount taken**	**Grams of pectin obtained**	**% of pectin extraction**
Orange peel	750 g	300 g	40 %

Characterization of Extracted Pectin The dried pectin obtained from the various peels of the oranges was subjected to the following characterization parameters.

a.Color: This was done by visual observation and the pectin is important as it affects the appearance of the gel produced. And it was observed to be white red.

b.Solubility of dry pectin in cold and hot water: The pectin samples were separately placed in a conical flask with 10 mL of 95% ethanol followed by 50 mL distilled water. The mixture was shaken vigorously to form a suspension which was then heated at 80°C for 15 min. It has been observed to be soluble.

c. Sugar and organic acids: One gram of the pectin sample was placed separately in 500 mL flask each and moisture with 5 mL ethanol, 100 mL water poured rapidly, shaken and allowed to stand for 10 minutes. To this solution, 100 mL ethanol containing 0.3 mL hydrochloric acid was added, mixed and filtered rapidly, 2.5 mL of the filtrate was measured into a conical flask (25 mL), the liquid has evaporated on a water bath and the residue dried in an oven at 50°C for 2 hours. It has been checked as it is organic compound.

d. PH determination: The choice of the pH was made by preparing a buffer at pH 7.0 and the temperature adjusted to 28°C, the glass electrode standardized with standard buffer solution with the electrode rinsed with distilled water before inserting into the pectin solution and pH determined read off. It has been found that 5.0 of pH reading.

e. Equivalent weight determination: Pectin sample (5 g) was weighed into a 300 mL conical flask and moistened with 5 mL ethanol, was added to the mixture followed by 100 mL distilled water and few drops of phenol red indicator. Care was taken at this point to ensure that all the

pectin had dissolved and that no clumping occurred at the sides of the flask before the solution was then slowly titrated (to avoid possible de-esterification).

FORMULATION, STANDARDIZATION AND QUALITY EVALUATION OF EDIBLE WAFFLE CUPS ENRICHEDWITHFRUITS AND SPICES

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Abstract

Edible waffle cups, a kind of edible cutlery formulated from oats, enriched with fruits and spices. This research focused on formulation, standardization, enrichment and quality evaluation of edible cups from oats with fruit extracts and spices powder to enhance the nutritive value, phytochemical content and to produce economicallysoundedible wafflecupsin reducing the environmental carbon load. For standardization, thin batter wasprepared by adding oat flour, melted butter, palm candy, vanilla extract, salt and water along with fruit extracts or spices powder. It was baked with waffle maker and molded as cups. Fruit extracts frompomegranate, guava and apricot and spices powder from cardamom, pepper and dry ginger wereselected for enrichment.Sensory evaluation showed pomegranate and dry ginger waffles were the best in all organoleptic parameters. Physical and mechanical properties like thickness,fracturability and drop resistance and shelf life ofwaffle cups wereanalysed. The thickness of waffles was1.5mm with a weight of 18 g that holds 45-50 g of solids or 60ml of liquids. Dropresistance of fruit extract and spice powders enriched waffle cups were stable when dropped from theheight of 70 centimeter. Guava and pepper waffle cup found to have less microbial load due to their anti-microbial property. Fruit extract enriched waffle cup (FWC) could be used to serve all kind of sweets and spice powder enriched waffle cup (SWC) to serve hot snacks, savoryandtraditionalsnacks. Edible Waffle Cups can be used to reduce and eliminate the use of

Single Use Plastics in hospitalization industries at all level and consumed by all age group community.

Key words: waffle cups, formulation, standardisation, sensory evaluation, thickness, fracturability,dropresistance,shelflife.

Introduction

Edible packaging is a foresight food packaging technology made from food items that are nutritious, biodegradable and natural. It is made from different biopolymer that protects food from spoilage and doesn't affect the quality of food it carries or packed. Waffles are a crunchy snack that can be made into edible cutlery and crockery. Ice cream cones, coffee cups, spoons are available in market through different waffling techniques. (Janjarasskul andKrochta,2010). The waffles fortified with fruit extracts possess higher antioxidant activities and good amount of phenolic compounds than control waffle. Waffles are sweet convenience products baked between two iron plates, give sacharacteristic size and shape (Huber and Schoenlechner, 2017).

Oats (*Avena sativa* L.) rich in *β*-glucan, a dietary fiber that reduces blood glucose level and a better nutritional grain in gluten free diet for daily consumption. It also contain high protein, lipid, starch and phytochemicals. It exhibits anti-diabetic and anti-carcinogenic property (Rasane et. al., 2015). Oats used in different baking products like cake, bread, and biscuits and found that inclusion of gluten, xanthan gum increased the baking quality (Liu *et al*., 2010; Huttner *et al*., 2010)

Pomegranate (*Punica granatum*) fruits are rich in nutritive value and its extract haspharmacologicalandtoxicologicalproperties (Rahimi *et al*., 2012). Presence of Ellagic acids, punicalagins, punicic acid possess antioxidant property and lowers systolic blood pressure and LDL (Saeed*etal.*,2018).Guava(*Psidiumguajava*L.) is a tropical fruit, efficacious against gastrointestinal and respiratory infections, malaria and cardiovascular disorders (Diaz-de-Cerio*etal.*,2017,Daswani*etal.*,2017). Its extracts increase the shelf-life stability and reduce oilr ancidity (Khalifa *et al.*, 2016). Apricot (*Prunusarmeniaca*) fruit contains good amount of polyphenols and phytochemicals such as β-carotene and ascorbic acid with ample amount of nutrients (Wani*et al.*,2017, Fatima*et al.*,2018).Its extract is used in treatment of ulcerative colitis, dermatitis, necrosis and possessanti-inflammatoryproperty(Minaiyan*etal.*,2014).

Department of Nutrition and Dietetics

Cardamom (*Elettariacardamomum*) is acarminative, stomachic, diuretic, antimicrobial, anti-oxidant, anti-inflammatory agent that induces the level of Glutathione-S-Transferase, decreases lipid peroxidation, reduces the risk of fattyliver(Rahman*et al.*,2017; Bhattacharjee*etal.*,2007).Pepper (*Pipernigrum*),knownforitsspicyflavor, used in treating neurological, broncho-pulmonary and gastrointestinal disorders and poses analgesic, anti-pyretic, anti-tumour and anti-inflammatory property (Majeed and Prakash, 2000; Meghwal*et.al*,2012). Ginger (*Zingiber officinale*) is a rhizome withpungent flavor, shows anti-inflammatory, anti-hyperlipidemic, anti-cancer, anti-diabetic properties and anti-tumor activity is due to the presence of gingerol, shogaol,paradol and zerumbone (Mashhadi*et al.,* 2013; MalhotraandSingh,2003). These fruits and spices can be enriched into the waffles to increase the nutraceutical value, toaddvarietytothe productandtomakeitmoredelicious.

Materials and Methods

Selection, procurement and processing of RawMaterials

Oat flour, butter, palm candy, vanilla extract, salt and water along with fruit extracts or spices powder was selected to develop waffle cups. Oat flour was selected as the base ingredient, a substitute for the all-purposeflour as itwas selected forits richness in nutrients, phytochemicals and anti-oxidantproperties. Palm candy was selected as alternative natural sweetenerforsugar. Oats wascollected as flakes and powdered as fine powder. Palm candy was collected as crystals and homogenizedbeforeuse. Butter, palm candy, vanilla extract and salt were added to improve the consistency, taste and flavor of batter. To increase the nutritive value as well as functional properties, fruits extracts from pomegranate, apricot, guava and spices powder from cardamom, pepper, dry ginger has been incorporated. All the raw materials were procured from the local supermarket.

Fresh pomegranate and guava were collected, washed, dried. Arils of pomegranate and pulp of guava was separated for extracting juice. Dried Apricots were soaked for four hours in water before juice extraction. Cardamom and black pepper seeds were ground, sieved and finely powdered forincorporation.Dry ginger was further driedinthe sun for two hours and the skin was removed, ground into finepowderandsieved forenrichment.

Formulation, standardization and making of waffle cups

Oat flour, butter, palm candy, vanilla essence, salt and water were the basic ingredients and made into thin batter consistency. The procedure for the preparation of batter was modified from the procedure of Sorghum icecream cones developed by Kigozietal.,(2016). 50 g of oat flour and10g ofpowderedpalmcandywere measured and transferred intoa measuring bowl. 10 ml of melted butter along with 5ml of vanilla extract and apinch of salt were added. Al measured ingredients were mixed well with 70 to 80ml of watertogetathin consistency. 25 ml of fruit extracts from pomegranate, guava andapricot and 10 g of spice powder from cardamom, pepper and dry ginger was added to enrich nutritive and functional properties of standardized waffle cup and standardized composition were given in table1.

Table1 – Ingredients of the batter and the quantities used

Ingredients	Quantity
Flour	50g
Butter	10ml(melted)
Palmcandy	10g
Vanillaessence	5ml
Salt	Apinch
Water	70 – 80 ml
Fruitjuice / Spice powder	25ml / 10 g

A waffle iron or waffle maker model Chef buddy 82-MM1234 was usedtobake waffles. Grease the wafflemaker with butter, preheated at 80°C, and then 20 ml ofbatterwaspouredatthe centerofthe bakingplate at 120°C for 20 minutes in closed atmosphere. After doneness, it was mould as cups.Many trials were conducted to improve the standards of the waffle cups to improvethethickness,stability,crispnessand shelflife. Three fruits and spices were incorporated to enrich the nutritive value and functional properties of standardized waffle cup (WC). Fruit extract incorporated waffle cup (FWC), spice powder incorporated waffle cup (SWC) were also standardized.

Sensory Evaluation of Standardized Waffle Cups

30 semitrained panel members were selected for sensory evaluation and the degree of liking for each waffle was assessed. Five points hedonic rating scale was used for evaluating the acceptance of colour, taste, texture, appearance and flavor of standardized WC, FWC and SWC.

Proximate Analysis of Waffle Cups

Proximate analysis like moisture, ash, energy, carbohydrate, protein, crude fat, crude fiber calcium, iron, and vitamin C of WC, FWC and SWC was done by the standardized procedure mentioned in table -2.

Table 2 - Procedure for Proximate Analysis of Waffle Cups

S.No	Proximate Analysis	Reference
1.	Moisture	AOAC 930.15
2.	Ash	AOAC 942.05
3.	Energy	Bomb Calorimeter
4.	Carbohydrate	Anthrone Method
5.	Protein	Khejdhal ‘s Apparatus – AOAC 2001.11
6.	Crude fat	AOAC 2003.05
7.	Crude fiber	AOAC 978.10
8.	Calcium	Titration against $KMnO_4$
9.	Iron	Folinciocalteau method
10.	Vitamin C	Ascorbic acid assay

Characterization ofWaffleCups

Textural analyzingparameters like Thickness, Fracturability and Dropresistanceof the standardized WC, FWC and SWC were analyzed.The thickness of the waffle cups were measured using Screw gauge, an instrumentused for accurate measurement of thickness. Fracturability was tested by texture analyzer (Shimadzu EZ-XS) and measured the first compression to the waffle cup at particular force (kg) in specific time (s). Drop resistance measured using drop tester, a qualitative test used to assess thestrength of the packaging material dropped from certain height.

ShelfLife Analysis ofWaffleCups

Shelf life was an important attribute to all food products, shows the time until which the foodproduct will remain safe and retain its chemical, physical and microbial characteristics (Earle andEarle,2007). Series dilution test was done to check microbial load in WC, FWC and SWC. A series of dilutions of the food homogeny ate was mixed with an a garm medium and incubated at 35°C for 48 hr. The result of multiplicationsofasinglecellonthesurfaceoftheagar was assumed by each visible colony.

Results and discussions

Sensory Evaluation of Edible Cups

The sensory evaluation of waffles incorporated with fruit extracts showed that the waffle cupincorporated with pomegranate and dry ginger propound to be best in all organoleptic parameters, especially more acceptable in terms of flavor and taste with 4.5 points. Guava waffle cup wascrispierintexture, pepper waffle was harder and flavor of cardamom waffle was mild amongotherwaffles with 4 points respectively.

Proximate Analysis of Waffle Cups

Moisture and Ash

The moisture per cent of waffle cups developed are below six per cent to increase the keeping quality. WC showed 1.47 per cent of ash content whereas FWC and SWC showed 1.56 to 1.94 per cent that was more than WC as inclusion of fruit extract and spice powder increases the micronutrient content.

Energy and Macronutrients

WC provides 220.86 Kcal of energy. Pomegranate, guava and apricot waffles contains approximately 224.01, 222.85, 244.09 Kcal of energy. SWC contains approximately 226.23, 218.6, 220.83 Kcal of energy for cardamom, pepper and dry ginger waffle cups. The carbohydrate of WC was 36.12g whereas FWC contains about 38 to 43 g and SWC provides 37 to 38 g. The protein content of WC, FWC and SWC were between 4.91 to 6.16 g. Pepper waffle cups provide more protein as compared to others. WC provides 2.89 g of crude fat. FWC contains about 3.37 g and SWC contain about 3.39 g of fat. Apricot and pepper showed more crude fat content among FWC and SWC. The crude fiber content of WC, FWC and SC were around 4.13, 5.64 and 4.56 g. Pomegranate and dry ginger showed more crude fiber.

Vitamins and Minerals

The calcium content of WC was 62.31 mg. Pomegranate, guava and apricot waffle cups contains 68.38, 68.38, 76.71 mg of calcium respectively. Cardamom, Pepper and dry ginger waffle cups showed between 68.22 to 82.27 71 mg of calcium. Apricot and Pepper showed more Iron content than other WC with 1.21 mg. Guava waffle cups shown more vitamin C with 17.66 mg. The proximate analysis of WC, FWC and SWC were tabulated in table-3.

he weight. It holds 45-50 g of solid material or 60ml of liquids. Increase in thicknesses of waffles was found to affect the mechanical properties (Kigozi*etal.*,2016).

Fracturability of Waffle Cup

On analyzing the fracture ability, FWC showed a slightly hard texture and pretend to absorb moisture when kept at room temperature and SWC exhibits acrisper texture than FWC. The forcerequired to break pomegranate, guava and apricot waffle cup was 1.594 kg, 2.043 kg and 0.830 kg force respectively. Cardamom, pepper and dry gingerwaffle cup brokeat2.348kg,1.170 kg and 1.00 kg force respectively. The graphs possess more gradients slope for FWC and SWC poses less gradient slope asdepictedinfigure 1.Among FWC, Guava waffle cup and among SWC, Cardamom waffle cup possessed high fracturability.

Drop Resistance of Waffle Cup

The drop resistanceof waffle depends more on the thickness of waffles. The changes occur to the waffles whendroppedfromstandardheights weretabulated in table 5. WC was cracked at 120 cm. Corners damaged for pomegranate, guava and apricot waffle cup at 100 cm, 110 cm and 110 cm height respectively. Cardamom, pepper and dry gingerwaffle cup brokeat60 cm,70 cm and 70 cm height respectively. It showed that FWC are stable whendroppedfrom theheightof 70cm andthedamagewasnotedprogressivelyfrom 100cm to 130 cm. In SWC, thedamage was noted progressively from 100 cm to130 cm. At the height of 130 cmallthe spice incorporated waffle cup and at 150 cm fruit incorporated waffle cup were brokenintopieces. Drop resistance test showed that the SWC were found to becrisper than the FWC.

Shelf Life Assessment of Waffle Cup

The total microbial count was done to assess the shelf life of the waffles and to indicate the overall microbiological quality of the waffles. The microbial load analysis of FWC and SWC

were carriedout using manualguide.The resultsobtainedweretabulated in table 6. The total microbial count obtained for FWC were 150cfu/g, 120cfu/g, and200cfu/g for pomegranate, guava and apricot waffle cup respectively. Cardamom, pepper and dry ginger waffle cup counted 180cfu/g, 120 cfu/g and 150cfu/gtotal microbial count respectively. Pepper and guava waffle cup are found to have less microbial count due to their phytochemicalandanti-microbialproperty.

Table6 –Microbial Load Analysis of Waffle Cup

S.No	Parameter	Total Microbial Count
1	Standard waffle cup	180cfu/g
2	Pomegranatewaffle cup	150cfu/g
3	Guavawaffle cup	120cfu/g
4	Apricotwaffle cup	200cfu/g
5	Cardamomwaffle cup	180cfu/g
6	Pepperwaffle cup	120cfu/g
7	Drygingerwaffle cup	150cfu/g

Conclusion

The waffles produced with value added benefits aids in increasing the intake offunctional nutrients from fruits and spices. Each waffle cup was unique in its specific characteristics and suits for different dishes and occasions. The waffles enhanced with fruit flavors (FWC) could be used to serve sweets especially ,icecreams, salads, custards, cakes and other desserts. The spice flavored waffles (SWC) could be used to serve hot snacks and savory items such as panipoori, sev and traditional snacks. These low cost functional ingredients available at our doorstep should be consumed in a regular basis to attain maximum health benefits and thesewafflesdeveloped in this study was an small attempt to achieve the goal of enhancing nutrients as well as to reduce single use plastics in food and its related industries. These delicious waffles made with different natural flavorsattract attention from young children to old people due to its evergreen likeness. Edible cutlery and crockery are the boon to environment and this kind of research are the pressing priority to find unique environment friendly solutions for non-synthetic polymer pollution everywhere.

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DIET REFORM: A REVIEW ON GANDHIAN DIET

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Abstract

Being healthy is the best wealth one can have among all others on this modern world. A healthy diet and a personalized nutrition have indulged the minds of the older adults. The healthy diet alleviates the risk of communicable and the chronic diseases and it is having a significant role in the prevention of diseases. Inclusion of variety of foods comprising Fruits and Vegetables, limiting empty calorie foods, avoidance saturated &transfats will correspond to the healthy diet. In the modern world with enchanting foods, the younger generation are motivated to search for the traditional foods for its Nutrition and Disease prevention properties the Father of our Nation has made reform in the Diet as he knows that Diet and health are the key factors for fruitful nation.Gandhi's views on health including diet reforms, vegetarianism and other issues are as fascinating as his ideas on the most important political or social issues. Food he knew was not only linked to bodily health but it was also an effective indicator of social health. Gandhi's insistence on mass food was also a way to bring together people with different food habits across Community.

Key Words*: Health, Diet, Nutrition, Disease, Social Health, Food*

Introduction:

Gandhiji was a strict vegetarian both by custom as well as by choice. He classified foods into three broad diets – vegetarian, mixed and flesh foods. He not only practised but also professed vegetarianism. In his opening lines on 'Moral Basis of Vegetarianism', Gandhi opined that man requires food as much as he needs air and water. When food is considered as life, it is to be healthy and easy to digest. While the medical fraternity recommends both vegetable and animal food (meat), there is also an equally strong opinion that the physiological and anatomical evidence shows that man is best suited for vegetarian food.

Gandhiji's view on Health: Health should be attained by the several factors including the best dietary practices.On the view of Gandhi the health can be attained only when these factors were fulfilled as depicted in the Figure-I

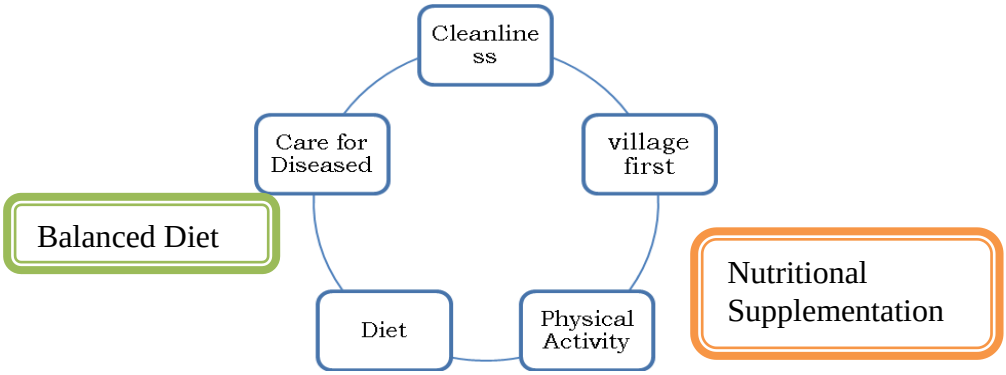

FIGURE-I
GANDHIJI'S VIEW ON HEALTH

Significance of Uncooked Foods:

As on the Gandhiji view on the food consumption apart for vegetarianism, he had thought on the cooking methods, it is to be noted that he insisted to have a the fireless cooking methods in order to have healthy life,as on his thought the well ripen fruits are eaten as such to have a complete utilization of nutrients and he recommends to have small quantities of raw vegetables without cooking with complete mastication will yield complete nutrients than the large quantities of cooked food. Therefore, whether regarded from the viewpoint of dietetics or that of Ahimsa, the use of uncooked vegetables is not only free from all objection but is to be highly recommended. Of course, it does without saying that if the vegetables are to be eaten raw extra care will have to be exercised to see that they are not stale, over-ripe or rotton, or otherwise dirty. (Young India, 15-11-1928)

A Reformed Diet:

Rice: Babuji has a greater fond of Whole, unpolished rice than the milled,polished rice. On his view the paddy in which the husk ehich cannot be separated by grinding should be boiled first and then the outer husk should be removed and it is said to be more nutritious and cheapest (Harijan, 25-1-1935)

Wheat: The whole wheat flour is healthier as like unpolished rice and the money for grinding the wastage of bran where the highest amount of nutrient has exist can be retained while using the whole wheat. **(**Harijan, 1-2-1935)

Sprouted pulses: The sprouted pulses are packed with Nutrients In Young India, 8th August 1929,he quoted that many medical concepts were buried by the Sanskrit medical records and its should be unraveled and the wisdom in the real sense of term should be depicted

Milk: He as a vegetarian,he completely avoids animal milk ,as on his coat the milk which was given to the human when he was born is enough and he strongly accepts that man will became, as what he eats. His diet should consist of nothing but sunbaked fruits and nuts . He can secure enough nourishment both for the tissues and the nerves from fruits like grapes and nuts like almonds.(Autobiography, p. 200, Edn. 1958)

Honey: In the young india 8th august 1929 he quoted experience of taking honey mixed with hot water extends to more than four years and have experienced no ill-effect what so ever. Most of them who condemn the use of sugar in unmeasured terms speak highly of honey which they does not irritate as refined sugar or even gur (Jaggery) does.

Drinks and Beverages: Gandhiji firmly believed that tea, coffee and cocoa were absolutely not required for the human body. Arguing on the available scientific basis of those times, he even listed the negative aspects of tea like the presence of tanins, etc., which would hinder nutrient absorption (Key to Health). Instead, he suggested that honey, hot water and some lemon would make a healthy nourishing drink. He was a firm believer of abstention from alcoholic drinks.

Gur: According to medical testimony gur is any day superior to refined sugar in food value, and if the villagers cease to make gur as they are beginning to do, they will be deprived of an important food adjunct for their children. (Harijan, 1-2-1935)

Fruits: As our country with varied climatic conditions and liberal supply of fruits and vegetables for retaining the health freah fruit and fresh vegetables will form the main part of the Indian diet.The uncooked fresh vegetables has natural good taste which can be destroyed by the cooking process. Harijan, 15-3-1942

Condiments: On his view, Condiments like chilli, turmeric, pepper, mustard, methi, asfotida are not important condiments,as they are used in accordance to increase the palatability including

salt which should be considered as the King among the condiments. Even salt was naturally present in all the foodstuffs during the preparation of cooking like washing rice and vegetables will decrease the natural salt and to meet out the deficiency addition of common salt is indulged.All condiments, even salt, destroy the natural flavor of vegetables and cereals. etc. Those whose palate has not become vitiated enjoy the natural flavor of the foodstuffs much more than after the addition of salt should be taken when necessary as an adjunct.(Key to Health, pp. 27-29, Edn. 1956)

Ghee and oil: A certain amount o f fat is also necessary. This can be had in the form of ghee of oil. If ghee can be had oil becomes unnecessary. It is difficult to digest and it not so nourishing as pure ghee. An ounce and a half of ghee per head per day, should be considered ample to supply the needs of the body.

Diet Proposed by Gandhi for sedentary men: Gandhiji has proposed a diet for a sedentary men comprising of Cow's mik or Butter,cereals,leafyvegetables,raw& other vegetables,Ghee /butter and Gur/White sugar which is given in the Figure-II

Food	Suggested quantity *
Cow's milk.. or Butter 2 oz	2 lbs. (907 ml)
Cereals (wheat, rice, bajri, in all)	6 oz. (170 g)
Vegetables leafy	3 oz (85g)
Vegetables others	5 oz (142g)
Vegetables raw	1 oz. (28.35g)
Ghee or Butter	1.5 oz. (42.5g) or 2 oz (56.7g)
Gur or white sugar	1.5 oz (42.5g)

OTHER SUGGESTIONS:

- Fresh fruit according to one's taste and purse.
- In any case, it is good to take two sour limes a day.
- Salt should be added afterwards according to taste.
- How often should one eat? Many people take two meals a day. The general rule is to take three meals: breakfast early in the morning and before going out to work, dinner at midday and supper in the evening or late. There is no necessity to have more than three meals.
- In the cities some people keep on nibbling from time to time. This habit is harmful. The digestive apparatus requires rest.

* All weights are of raw foods
Source: Key to Good Health (p 19)

FIGURE-II DIET GIVEN BY GANDHIJI FOR SEDENTARY MEN

Minimum Diet :

Only one grain should be used at a time combination of wheat,oil,milk, ghee,Jaggery and oil is regarded as a unhealthy combinations.thoseeho animal protein does not need pulses because it contains the plentiful of essential proteins on contrary the financially low ,the poor people get only the vegetable protein in the form of pulses with oils.They should considered to have half quantity of raw foods along with pulses and oils which contributes to the nutrients of ¼ th of the

cooked vegetables Any medical man who has studied the science of dietetics will certify that what I have suggested can do no harm to the body, on the contrary it must conduce to better health. (Harijan, 25-1-1942)

Gandhiji's Experiments with diet:

Gandhiji fasted on 17 occasions during the freedom struggle, the longest being for 21 days. The only thing he allowed himself to consume during his fasts was water and a little lime juice (Rajan, 2015). He experimented with his diet all his life and shared and discussed the results of such experimentation and wrote elaborately in *Harijan* and *Young India* about his experiments and conclusions.

Conclusion:

While society knows him as a role model for peaceful protest, Gandhi also spent his 78 years studying one personal passion: nutrition. Some of Gandhi's diet choices were protest-based, such as fasting for days on end. Others tied back to his dedication to nutrition, including his distrust of processed foods. Gandhi loved the natural world and chose to live a fulfilled life as a vegetarian very early-on in his life. Adhering to a vegetarian lifestyle has countless benefits.

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Department of Nutrition and Dietetics

DETOX DIETS FOR TOXIN ELIMINATION AND WEIGHT MANAGEMENT : A CRITICAL REVIEW

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ABSTRACT

Detox diets are popular dieting strategies that claim to facilitate toxin elimination and weight loss, thereby promoting health and well-being. The present review examines whether detox diets are necessary, what they involve, whether they are effective and whether they present any dangers. Although the detox industry is booming, there is very little clinical evidence to support the use of these diets. A handful of clinical studies have shown that commercial detox diets enhance liver detoxification and eliminate persistent organic pollutants from the body, although these studies are hampered by flawed methodologies and small sample sizes. There is preliminary evidence to suggest that certain foods such as coriander, nori and olestra have detoxification properties, although the majority of these studies have been performed in animals. To the best of our knowledge, no randomised controlled trials have been conducted to assess the effectiveness of commercial detox diets in humans. This is an area that deserves attention so that consumers can be informed of the potential benefits and risks of detox programmes.

Keywords: *Detoxification; Dietary intervention; Energy restriction; Toxins; Weight loss.*

Introduction

Detoxification or ‘detox’ diets are short-term interventions designed to eliminate toxins from the body, promote health and assist with weight loss. Detox diets range from total starvation fasts to juice fasts to food modification approaches and often involve the use of laxatives, diuretics, vitamins, minerals and/or ‘cleansing foods’ (1).A selection of popular commercial detox diets . In a recent survey of naturopathic doctors inthe USA, 92% of respondents reported using detoxification therapies to treat patients, with 75% reporting theuse of diet-based detox measures . The most commonreasons cited by naturopathic doctors for prescribingdetox therapy are environmental exposure to toxins, general cleansing/preventative medicine, gastrointestinal

disorders, autoimmune disease, inflammation, fibromyalgia,chronic fatigue syndrome and weight loss .Despite the widespread popularity of detox diets, theterm ‘toxin’ remains ill-defined. In conventional medicine, toxins generally refer to drugs and alcohol, and‘detox’ is the process of weaning patients off these addictive substances .

Approaches to detoxification generallyexploit pathways that promote the excretion of chemicalsand their metabolites in urine and faeces or extrarenalexcretion in sweat or sebum. In the context of commercial detox diets, the term ‘toxin’ has adopted a much hazier meaning; encompassing pollutants, syntheticchemicals, heavy metals, processed food and other potentially harmful products of modern life. Commercial detoxdiets rarely identify the specific toxins they aim to removeor themechanisms by which they eliminate them, makingit difficult to investigate their claims. The detox industryfounds itself on the notion that chemicals can be neatlydivided into ‘good’ and ‘bad’ categories; in reality, for thevast majority of chemicals, it is the ‘dose that makes thepoison’.To the best of our knowledge, no rigorous clinicalinvestigations of detox diets have been conducted. Thehandful of studies that have been published suffer fromsignificant methodological limitations including smallsample sizes, sampling bias, lack of control groups, reliance on self-report and qualitative rather than quantitative measurements.The clinical evidence available tosupport the use of commercial detox diets, there aranecdotal reports that they are useful for health promotion and weight loss. Because the lack of research in thisfield precludes the possibility of a systematic review, wepropose preliminary evidence regarding the possible bene-fits and harms of detox diets and highlight future avenuesfor research.

In particular, attempts will be made toaddress the following questions:

- What are the specific chemicals to which we are exposed and are they harmful at current exposure levels?
- Is there a role for nutrition in the elimination oftoxins?
- Are detox diets useful for weight management?
- Are there any health risks associated with detox diets?

Considering the popularity of detox diets, our opinionis that consumers and medical professionals should bebetter informed about their possible risks and benefits,and that legislation should be put in place to protect consumers from unsubstantiated claims.Exposure to chemicals: should we be concerned?Global

industrialisation has seen a marked rise in the number of chemicals to which we are exposed. In both the European Union (EU) and the USA, approximately 80 000chemicals are currently in use .In the EU, regulationintroduced in 2007 requires any chemical substanceused or produced by companies to be registered Fora chemical to be registered, the potential risks and hazardsmust be assessed (the amount of testing depends on thetonnage produced). To date, the European ChemicalsAgency has registered approximately 12 600 substances,meaning that there are thousands still to be tested).In the USA, an estimated 2000 new chemicals areintroduced into foods and consumer products every year,many of which have not been tested for adverse healtheffects (9).It is well-established that some synthetic chemicals accumulate in the human body and that high doses can be toxic Persistent organic pollutants (POPs).

For example, are industrial chemicals that accumulate in human adipose tissue POPs have been used in flame retardants, pesticides and paints,as well as in coolants and lubricants in electrical equipment. In Spain, a 50-year-old man died from manganese poisoning after consuming Epsom salts as part of a liver cleansing diet . Epsom salts are made from magnesium sulphate heptahydrate, although the supplier had mistakenly sold hydrated manganese sulphate instead

What is detoxification and why do it?

Detoxification described in this handout includes the ways our bodies identify, neutralize, and eliminate things that are unhealthy for us. These include physical substances such as toxins (poisons) from our environment or by-products from the chemical processes that keep us alive. It also includes emotions or behaviors that are unhealthy. Alcohol and other narcotic withdrawal therapies are serious medical conditions requiring close supervision and are not discussed here. We live in a polluted and stressful world. A person’s body can become overburdened and strained by contaminants.

This contamination can lead to health problems.

1. There are several types of toxins.

2. Anti-nutrients such as high fructose corn syrup, trans-fats, caffeine, alcohol, and processed foods

3. By-products from the chemical processes that keep us alive such as nitrogen, carbon dioxide, bile, urea, and stool

4. Medications used improperly, inappropriately, or too often

5. Heavy metals such as mercury, arsenic, lead, cadmium, tin, and aluminum

6.Chemicals such as pesticides, herbicides, cleaning products, solvents, and glues

7. Allergens such as food, mold, dust, pollen, and chemicals

8.Causes of infections such as bacteria, viruses, yeast, and parasites Further, there are social, emotional, and spiritual challenges that affect health and well-being:

9.Stress such as lack of personal time, too much work, excessive worry, too little rest, and financial strain

10. Unhealthy mental states such as addictions, overeating, and destructive mental patterns

11.Distractions that surround us such as constant noises, smells, lights, and images

12. Over-stimulation from advertisements, radio, computers, TV, phones, and pagers

13. Lack of spiritual connection, a loss of meaning and purpose

14.Isolation, the lack of social support and community

15. Nature deprivation, being disconnected from natural environments

16. Negative emotions and persistent self-defeating thoughts such as anger, fear, guilt, hopelessness

Our bodies and minds already have the ability to handle these challenges. This process of maintaining physical and emotional balance is called homeostasis.

The major body systems that work together to maintain health and balance include our:

Liver and gallbladder

- Kidneys
- Gut
- Skin
- Lungs
- Lymphatics/Circulation
- Mind/Brain

There are no exact symptoms to suggest that your body's natural detoxification system is not working well. Your body may have a problem with detoxification if

1) you have a number of the following symptoms and

2) a clinician has seen you to determine that they are not caused by other medical conditions:

- ❖ Fatigue with sleep disruption and brain fog
- ❖ Mood disturbance, especially depression, anxiety, fear, and anger
- ❖ Muscle aches and joint pain
- ❖ Sinus congestion, dark circles under the eyes, and post-nasal drip
- ❖ Headaches with neck and shoulder pain
- ❖ Bloating and gas
- ❖ Irritable bowel, foul-smelling stools, and dark urine
- ❖ Weight changes and loss of muscle tone
- ❖ Heartburn, recurrent colds, and persistent infections
- ❖ Infertility and low interest in sex
- ❖ Premature aging and weakness
- ❖ Fluid retention and excess weight
- ❖ Rashes and canker sores
- ❖ Bad breath and body odor

We currently have very little research that proves that detoxification therapies are helpful. However, if you are a patient experiencing these symptoms, you may be quite frustrated, wondering, "What can I do to find relief?" Detoxification therapy is one option to try. Unfortunately there are many gimmicky, expensive, unnecessary, and potentially harmful products, programs, and practitioners who exaggerate the helpfulness of their detoxification plans. In general, we recommend that you avoid any approach that sounds dramatic or extreme. If you are going to try one, follow guidelines that seem reasonable and safe, and that promote a healthy lifestyle. Choose one that helps you feel in control and that does not promise results that seem unrealistic.

The five basic components of any detoxification program should include:

- Exercise: every day such as yoga and walking (especially in nature)
- Regular sweating: a sauna, steam room, or hot room yoga class
- Healthy nutrition: rich in organic fruits and vegetables and filtered water
- Self-reflection: such as meditation and breathing-focused relaxation
- Body-work: such as massage and acupuncture.

General guidelines for selecting complementary or alternative healing therapies

If you are considering a complementary or alternative therapy such as detoxification, first seek

the answers to the following questions.

 Is this treatment safe and what are the risks?

 Is there evidence to support this therapy?

 Does this therapy appropriately address my condition, concerns, and expectations?

 What are the qualifications and intentions of the practitioner offering the therapy?

 Am I open and receptive to this approach, and do I believe in it?

 How expensive is the treatment? Is the cost in line with the possible benefits and risks?

If all answers are reassuring, then it is likely you will benefit from this treatment.

A Suggested 7-Day Detoxification Program

There are many detox approaches, and there is very little evidence to suggest that one is better than the next. However, a 7-day commitment to healthy activities can be helpful for many symptoms. It can help your body find balance. It is important to be creative and adapt a program to your needs. The following plan offers general guidelines for self-guided detoxification.

- ✓ This regimen is not intended to be all things to all people. Nor is it a test of will endurance. It is designed to be a safe, useful, empowering, health guide. You can change it as necessary to meet your own needs. However, this process does and require planning and preparation, so read through it and make preparations ahead of time.
- ✓ In addition to physical approaches, this plan equally emphasizes mind-body approaches. These can help you relax and unravel negative and unconscious mental patterns that often result in pain and discomfort. (See our handout Mind/Body Awareness Writing Exercises).
- ✓ The most important part of going through a detox program is to first ask why you are doing it. Being clear about your intentions helps avoid disappointment and expectations that are too high. Write down your reasons for going through a detox program using language that is meaningful to you.
- ✓ The five basic ingredients of this detox regimen are self-reflection, exercise, sauna, nutrition, and manual-therapy. The program offered here is designed to support and enhance your own ability to heal and experience well-being. It is intended for most people, and you can do it on your own. However, first check with your primary care clinician to make certain this is a healthy option for you.
- ✓ We encourage you to use organic, sustainable, local, responsible, gentle, natural, whole, balanced, and easeful products and methods. These honor the global and spiritual aspect of health

Precautions and Expectations

- Healing crises commonly occur during a detoxification regimen. Common and Temporary symptoms of detoxification include feeling lousy, headache, lightheadedness, Diarrhea, cramps, bloating, body aches, fatigue, mood changes, and weakness. These Symptoms are due to a combination of factors including the

how toxins in the body are Affected, low blood sugar, low fluids, electrolyte imbalance, withdrawal from various Substances (such as alcohol, caffeine, sugar, nicotine), and even changes in your daily Routine.

- If you develop any of these symptoms, usually the best approach is to continue with The detox. However, you may need to stop or alter the detox if you experience ongoing Distressing symptoms.
- Dehydration is common during a detox. Make sure that you drink a lot of fluids.
- Address your particular needs as you go along, such as more frequent snacks, larger Meals, increasing protein and healthy fats, working less, resting more, and less striving For goals.
- In general, continued use of prescribed daily medications is recommended. Use other Medications sparingly (for example pain medication taken as needed for headaches or Other problems).
- Communicate with your health care provider, therapist, or other healing practitioners

For any concerns that arise during the detox as needed.In the end, you will likely find that you feel better, have more energy, and may require less Medication

CONCLUSION :

At present, there is no compelling evidence to support the use of detox diets for weight management Or toxin elimination (97,98). Considering the financial costs to consumers, unsubstantiated claims and potential health risks of detox products, they should be discouraged by health professionals and subject to independent regulatory review and monitoring. It is hoped that this review will encourage systematic evaluations of commercial detox diets, so that an evidence base can be established to inform future legislation.Perhaps an important question to ask is why are detox diets so appealing? The seductive power of detox diets presumably lies in their promise of purification and redemption, which are ideals that are deep-rooted in human psychology.

These diets, of course, are highly reminiscent of the religious fasts that have been popular throughout human history. It would be useful for future studies to examine the psychological aspects of detox diets and investigate why people are drawn to extreme diets that have no proven

benefits. Unfortunately, equating food with sin, guilt and contamination is likely to set up an unhealthy relationship with nutrition. There is no doubt that sustained healthy habits are of greater longterm value than the quick fixes offered by commercial detox diets.

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Department of Nutrition and Dietetics

NOVEL FOOD PROCESSING TECHNIQUES FOR ABC

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Abstract

ATP-binding cassette (ABC) transporters use the energy of ATP hydrolysis to transport a large diversity of molecules actively across biological membranes. A combination of biochemical, biophysical, and structural studies has established the maltose transporter MalFGK2 as one of the best characterized proteins of the ABC family. MalF and MalG are the transmembrane domains, and two MalKs form a homodimer of nucleotide- binding domains. In this review, we present an integrated molecular mechanism of the transport process considering all currently available information. Furthermore, we summarize remaining inconsistencies and outline possible future routes to decipher the full mechanistic details of transport by MalEFGK2 complex and that of related importer systems.

Introduction

This ABC Kids Malt is the wonderful combination of one fruit, two vegetables and someroasted nuts which are carefully made into a malt powder that is just LIP-SMACKING. The 'Malt' is the term usually used to denote the germinated cereals which are then dried to make a powder. Though we don't use any Cereals here, I use the term 'Malt' to mention the health mix powder thinking that it is not an big offense. As we don'tuse Wheat, this kids malt is completely gluten-free. The making part is a little bit tricky one which could be easily done if you follow my tactics.Having said all of these, this ABC Kids Malt is the idea that hatched from my mind after seeing the Beetroot malt video of Healer Baskar.

Materials and methods

2.1 Selection and processing of abc malt

Raw materials such as Carrot,apple, beetroot,jaggery, almond, cashew nut and cardamom we were procured from an organic shop. Jaggery were procured and stored in gunny bags at room temperature.

INGREDIENTS & QUANTITY

Apple, beetroot,carrot	2kg
Jaggery	2kg
Almond	15g
Cashew	15g
Cardamom	8g

2.2Processing of abc malt

Select good quality apple, beetroot, carrot was peel the skin and wash it. Cut into small pieces to cook.Grind to a fine paste without lumps. Take abc paste in heavy bottom vessel and take 2kg of jaggery and make it to thick syrup. Heat the paste to evaporate the water and get thick solid form. Now add almond and cashew nut powder. Add 8g of powder cardamom. Leave it for shade drying. After dried blend in the mixer. Weight the mixture of blended abc malt. Store in an air tight container.

2.3 Packaging of abc malt

Abc malt is packed in an air tight glass container. Glass containers are among the most popular as glass doesn't stain and is odor free. Air tight containers keep your food fresh and also prevent rancidity. No contamination of food. Shelf life is increasing. Foods with the longest shelf life.

2.4 Labelling

Labelling is the display of label in a product. A label contains information about a product on its container, packaging, or product itself. Nutrition facts of abc malt is 100g such as Energy is 374.98kcal, Carbohydrates is 91.04g, protein is 2.31g, fat is 0.09g, Iron is 6.03mg .

2.5 Evaluation of abc malt

Developed abc malt was mixed with 100 ml of warm milk and was evaluated by 3 panel members using a 5-point scale where (1= Poor, 2= Fair, 3=Good, 4=Very good, 5=excellent was used.

Panel	Appearance	Color	Flavor	Texture	Taste
A	4	4	3	5	5
B	4	5	4	3	4
C	4	5	5	4	5

Results and discussion

Sensory evaluation is critical factor that needs to be considered for evaluating the ability of ingredients to fortify food formulations and the acceptability of final products by consumers.Sensory evaluation scores for abc malt mixed with warm milk. There were no significant differences for the variables such as texture, flavor and taste. Sensory evaluation scores for overall acceptability was excellent. Abc may not be everyone's cup of tea, but there's no denying the fact that it comes with a host of health benefiting properties. So, this carrot malt is a great option if you are looking to add in daily diet. The deliciously sweet flavor of this health boosting drink comes packed with vitamins A, C, K, beta carotene, polyphenols & antioxidants among other important micro nutrients.

Conclusion

In the present study abc malt was prepared with carrot, Jaggery, nuts. The formulated complementary food contained nutrients to satisfy the recommended dietary requirementand easily affordable. Thus, highly nutritive. Consuming malted drinks is associated withhigher micronutrient intakes and higher levels of physical activity. This drink is very rich micronutrients thereby making it a healthier choice for people suffering from liver disorders, hypertension, cardiovascular diseases, rich in vitamin A, rich in beta carotene, promotes eye health.

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Department of Nutrition and Dietetics

SURVEY ON MILLETS

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Abstracts:

The present experiment is to study the effect Millets are one of the oldest foods known to humansand possibly the first cereal grain to be used fordomestic purposes. Millets have been main staples ofthe people of semi-arid tropics of Asia and Africa forcenturies where other crops do not grow well. Sinceancient times, millet has been widely consumed inAsia and India as well.Millet grain is highly nutritious with goodquality protein, rich in minerals, dietary fibre, phyto-chemicals and vitamins.The fibre content of kodo, little, foxtailand barnyard millet is higher. Finger millet has aremarkable amount of calcium 344.00mg / 100g.

Key words: Millets Origin, Production, Nutritivevalue, Value Addition.

Introduction:

Millets are one of the oldest foods known tohumans & possibly the first cereal grain to be usedfor domestic purposes. It is a cereal crop plant belonging to the grass family Graminae.The origin ofmillet is diverse with varieties coming from bothAsia and Africa. Millets have been main staples ofthe people of semi-arid tropics of Asia and Africafor centuries where other crops do not grow well.They have been cultivated since time immemorial.There are around 6,000 varieties of millet grownthroughout the world. Millets are underutilized inmany developed countries. There is an immensepotential to process millet grains into value addedfoods. Millet is a collective term referring to a number of small-seeded annual grasses that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, subtropical and tropical regions. The most important species are pearl millet, finger millet, proso millet and foxtail millet. The various species differ in their physical characteristics, quality attributes, soil and climatic requirements and growth

duration. Millets are better adapted to dry, infertile soils than most other crops, and are therefore often cultivated under extremely harsh conditions - for example, high temperatures, low and erratic precipitation, short growing seasons and acidic and infertile soils with poor water-holding capacity. Most millets have strong, deep rooting systems and short life cycles, and can grow rapidly when moisture is available. As a result, they can survive and reliably produce small quantities of grain.

Objectives And The Study :

1.To produce and distribute quality seeds in small millets.

2.To popularize mechanization in small millets to mitigate labour scarcity.

Research Methodology :

Review was conducted based on the methodology reported earlier with slight modification [19]. The current topic was selected based on a literature survey to identify the gap between the available literature resources pertaining to the effect of processing treatment on specific nutrient components of millet with respect to the Indian scenario.

Effect of Processing on Nutritional Properties of Millets :

Proteins :

Millets are a rich source of proteins and are widely consumed by vegans. They are regarded as an excellent plant protein with negligible amounts of saturated fats compared to animal proteins. The presence of antinutrients inhibits protein digestibility.

Carbohydrates :

Carbohydrates of the millets range around 60–75%, with foxtail millet containing the minimum carbohydrate and little millet containing the maximum carbohydrate. Starch is the principal carbohydrate of the millets like other cereals.The effect of fermentation and germination on the carbohydrates of pearl millet revealed that germination greatly increases the total soluble sugar concentration, as well as the reducing and non-reducing sugar concentration.

Dietary Fiber :

The millet bran fraction is a major and abundant source of dietary fiber, which is characterized as complex polysaccharides that are not readily available. It was reported that dehulling of about 12% to 30% to remove the kernel is suitable for millet grains as it

does not result in significant loss of fiber.

Vitamins :

Millets when polished/debranned contain a lower nutritional value since the bran and germ components of refined millet flour are eliminated, resulting in a loss of vitamins. The germination of finger millet showed increased vitamin C content, from 0.04 to 0.06 mg/100 g.

Fats :

Fats are necessary for calorie supply, brain development, and the absorption and transport of vitamins A, D, E, and K in the body. The germination time has an impact on fat content. For instance, the raw and optimized flour of germinated foxtail millet had 4.4% and 3.6% fat, respectively which was substantially lower than the non-germinated sample.

Health Benefits of Millets :

Millets have many nutraceutical properties that are helpful to prevent many health problems such as lowering blood pressure, risk of heart disease, prevention of cancer and cardiovascular diseases, decreasing tumour cases etc. Other health benefits are increasing the time span of gastric emptying, provides roughage to gastro intestine [32]. Millet is an alkaline forming food. Alkaline based diet is often recommended to achieve optimal health, meaning when it combines with digestive enzymes. The soothing alkaline nature of millet helps to maintain a healthy pH balance in the body, crucial to prevent illnesses.

*Millets are anti acidic.

* Millets are gluten free.

* Helps to prevent type 2 diabetes;

* Effective in reducing blood pressure;

*Reduces risk of gastrointestinal conditions like gastric ulcers or colon cancer;

*Eliminate problems like constipation, excess gas, bloating and cramping;

*Millet act as a probiotic feeding micro flora in our inner ecosystem.

Advantages of Millet :

1. Good Digestion

Millet products are healthy to all it helps to heal the illness and diarrhea and gastric

disorders.

2. Asthma Prevention

Asthma is considered as a major issue in every Huma lives. It affects many people and major health problems arise, so the millet products are highly used as the beneficiary for the consumers to avoid all the health issues and also they prevent many diseases like asthma.

3. Cholesterol Regulation

A toxin-unfastened frame is a intention. Recent researches have made it pretty clean that a toxic bloodstream can be the reason of contracting multiple sicknesses without delay.

4. Diabetes Management

One of the maximum commonplace sicknesses affecting millennials, diabetes is the gateway to a host of sicknesses. It has been found that human beings who have included millet into their diets are less likely to be affected by this ailment.

5. Cancer Prevention

Free radicals, the culprits liable for inflicting oxidative harm each inside and outside. This oxidative damage is the cause of many sicknesses such as cancer.

6. A Healthy Heart

The coronary heart is a important organ that is chargeable for pumping the blood all through the body an bad coronary heart has intense effects. The great manner to make sure a wholesome frame and thoughts is to be privy to the proper alternatives of meals.

7. Prevents Gallstones

Some studies indicate the function of insoluble fiber in stopping the formation of gallstones. There is a lot of studies which shows that consumption of millet and other comparable fibers helped lessen the hazard of gallstones.

Discussion :

Millets and millets products form a significant part of the diet as contributors of energy and many nutrients. Our findings-based food category contributed 687kcal, which means 30.4% of total energy supply in the average diet and almost 28% in comparison to the energy reference value for the diet. Millets contribution to dietary energy intake is widely diversified between regions and countries. In developing Asian countries with rice- based diets, millets contribute as much as 70-80% of energy intake; while in high income countries

with predominantly livestock-based diets millets provide only 20-30% of total dietary calories. Of the analysed macronutrients, millets and millets products are important sources of carbohydrates, dietary fibre and protein.

Conclusion :

This research helps the researcher to understand the perception level of millet products among households. differences consumers belonging to different socioeconomic classes on factors influencing their perception for product extension is a significant contribution and so the examination of the differences among households with various levels of experience. The household's opinion about the millet products is healthy nutrition and also they feel that millet products can be available for the regular usages.

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Department of Nutrition and Dietetics

PERSONALISED NUTRITION FOR COVID-19 FEVER

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Introduction:

COVID-19 is the disease caused by a new corona virus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China. People of all ages who experience fever and/or cough associated with difficulty breathing or shortness of breath, chest pain or pressure, or loss of speech or movement should seek medical care immediately. If possible, call your health care provider, hotline or health facility first, so you can be directed to the right clinic.

NORMAL BODY TEMPERATURE – 37degree Celsius/98.6F

COVID BODY TEPERATURE -38degree Celsius/ 100.4F

Symptoms:

The most common symptoms of COVID-19 are

- Fever
- Dry cough
- Fatigue

Symptoms of severe COVID- 19 disease include:

- Shortness of breath,
- Loss of appetite,
- Confusion,
- Persistent pain or pressure in the chest, High temperature **(above 38 °C).**

Some people who have had COVID-19, whether they have needed hospitalization or not, continue to experience symptoms, including fatigue, respiratory and neurological symptoms. WHO is working with our Global Technical Network for Clinical Management of COVID-19, researchers and patient groups around the world to design and carry out studies of patients beyond the initial acute course of illness to understand the proportion of patients who have long

term effects, how long they persist, and why they occur? . These studies will be used to develop further guidance for patient care.

Although most people with COVID-19 have mild to moderate symptoms, the disease can cause severe medical complications and lead to death in some people. Older adults or people with existing medical conditions are at greater risk of becoming seriously ill with COVID-19.

Complications can include:

- Pneumonia and trouble breathing
- Organ failure in several organs
- Heart problems
- A severe lung condition that causes a low amount of oxygen to go through your bloodstream to your organs (acute respiratory distress syndrome)
- Blood clots
- Acute kidney injury
- Additional viral and bacterial infections.

Causes:

The virus that causes COVID-19 spreads easily among people. Data has shown that the COVID-19 virus spreads mainly from person to person among those in close contact. The virus spreads by respiratory droplets released when someone with the virus coughs, sneezes, breathes, sings or talks. These droplets can be inhaled or land in the mouth, nose or eyes of a person nearby. The COVID-19 virus can spread from someone who is infected but has no symptoms. This is called asymptomatic transmission. The COVID-19 virus can also spread from someone who is infected but hasn't developed symptoms yet. This is called presymptomatic transmission.

Natural history and clinical characteristics

Huang et al. first reported clinical features of 41 patients confirmed to be infected with COVID-19 on January 2, 2020, which include 13 ICU cases and 28 non-ICU cases. More than half of the cases (66%) had been exposed to the Huainan Seafood Wholesale Market. Almost all the patients had bilateral lung ground glass opacity on computed tomography imaging. The initial symptoms include fever (98%), cough (76%), dyspnea (55%), myalgia or fatigue (44%), sputum production (28%), headache (8%), hemoptysis (5%), and diarrhea (3%). Only one patient

did not present fever in the early stage of disease. Twelve (29%) cases progressed to acute respiratory distress syndrome (ARDS), 5 (12%) had acute cardiac injury, 3 (7%) had acute kidney injury (AKI), and 3 (7%) had shock. At the data cutoff date, 28 (68%) patients were discharged and 6 (15%) had died. On January 20, 2020, Chen et al. reported 99 cases with SARS-CoV-2–infected pneumonia. This case series revealed that older males with comorbidities as a result of weaker immune function were the most susceptible to COVID-19 incidence. The symptoms, complications, and treatments in this study were similar to the previous published study by Huang and colleagues. At the data cutoff date, 31 (31%) were discharged and 11 (11%) died, and 57 (58%) of the patients were still hospitalized. A study of Li et al. reported on 425 COVID-19 cases in Wuhan confirmed between January 1 and 22, 2020. The mean incubation period was 5.2 days, with the 95th percentile of the distribution at 12.5 days, though uncertainty remains.

Two subsequent studies confirmed the pattern of signs and symptoms. At the time of this writing, the most recent published case series[9] of 138 confirmed cases included 36 requiring intensive care by the data cutoff date of February 3, 2020. It also found the common presenting symptoms of fever (136, 99%), fatigue (96, 70%), and dry cough (82, 59%), though there were two patients who did not present any signs of fever at the onset of illness. A higher proportion of cases presented with gastrointestinal symptoms including diarrhea and nausea (14, 10%) than in previous series. Forty-seven (34%) were discharged while 6 (4%) died, while the remainder were still hospitalized. The organ failure complications were similar to the original studies.

Taken together, these studies indicate the main clinical manifestations of COVID-19 are fever (90% or more), cough (around 75%), and dyspnea (up to 50%). A small but significant subset has gastrointestinal symptoms. Preliminary estimates of case fatality, likely to fall as better early diagnostic efforts come into play, is about 2%, mostly due to ARDS, AKI, and myocardial. Both SARS-CoVs enter the cell via the angiotensin-converting enzyme 2 (ACE2) receptor. The SARS-Cov-2 first predominantly infects lower airways and binds to ACE2 on alveolar epithelial cells. Both viruses are potent inducers of inflammatory cytokines. The “cytokine storm” or “cytokine cascade” is the postulated mechanism for organ damage. The virus activates immune cells and induces the secretion of inflammatory cytokines and chemokines into pulmonary vascular endothelial cells.

Basic virology:

Several efforts to develop vaccines are underway, but the WHO estimates it will take 18 months for the COVID-19 vaccines to be available. At present, most treatment is symptomatic and supportive, though anti-inflammatory and antiviral treatments have been employed. Supportive treatment for complicated patients has included continuous renal replacement therapy (CRRT), invasive mechanical ventilation, and even extracorporeal membrane oxygenation (ECMO). No specific antiviral drugs have been confirmed effective. The first reported patient with 2019-nCoV infection in the USA was treated with remdesivir, and others have used antiretroviral like ritonavir, with trials of both in progress. A recent study conducted by the "front-line" health care providers combating COVID-19 in Wuhan indicated that systemic corticosteroid treatment did not show significant benefit Baricitinib has been suggested as a potential drug for the treatment in the hope that it might reduce the process of both virus invasion and inflammationCoronaviruses are widespread in humans and several other vertebrates and cause respiratory, enteric, hepatic, and neurologic diseases. Notably, the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2003 and Middle East respiratory syndrome corona virus (MERS-CoV) in 2012 have caused human epidemics. Comparison with the current virus shows several significant differences and similarities. Both MERS-CoV and SARS-CoV have much higher case fatality rates (40% and 10%, respectively). Though the current SARS-CoV-2 shares 79% of its genome with SARS-CoV, it appears to be much more transmissible.

METHADOLOGY:

Proper nutrition and hydration are vital. People who eat a well-balanced diet tend to be healthier with stronger immune systems and lower risk of chronic illnesses and infectious diseases. So you should eat a variety of fresh and unprocessed foods every day to get the vitamins, minerals, dietary fiber, protein and antioxidants your body needs. Drink enough water. Avoid sugar, fat and salt to significantly lower your risk of overweight, obesity, heart disease, stroke, diabetes and certain types of cancer.

ABOUT PATIENT:

- **Patient name :**mrs.suganya
- **Gender:** female

- **Age:**27yrs
- **Diagnosis:** fever and tiredness
- **Present complaints:**covid fever
- **Past medical history**: nil
- **Diet order:** high protein diet
- **Reason for diet**: energy content will increase.

Nutritional Status Evaluation:

Ideal body mass weight=64

Body mass index= 20.5

The nutritional status of the patient shows that she is normal.

Grade of **BMI: normal**

Biochemical Test:

Test name	Result	Reference
Hemoglobin	11.9	11.5 to 15.0
Red blood cells	4.59	4.5 to 6.0
Pcv	36.1%	36.0 to 45.0
Tlc	7.13%	5.13 to 8.15
Platelet	492	140.0 to 400.0
Blood urea	40.3	10.0 to 40.0
Creatinine	0.57	0.0 to 1.1

Food allergy:

- vegetarian
- Non vegetarian

Do You Have Food Allergy?-Yes

PAST DIETARY INTAKE:

Time	**Menu**	**Quantity**
Early morning	Milk	100ml
Breakfast	Dosa,dhal sambar	100g,50ml
Mid morning	Pomegranate juice	150ml
Lunch	Rice,rasam,carrot poriyal	250g,50ml,35g
Evening	Tea, biscuit	100ml,60g
Dinner	Chapatti, chunna masala	200g,50ml

Daily recommended RDA in this patient:

Energy: 2119.5/2250

Protein: 112.91/55g

Fat: 89.146/75g

Carbohydrate: 188.06

Fiber: 103.7562/92g

Dietary assessment:

s.no	Food items	Daily	weekly	monthly	occasional
1	Cereals	Yes			
2	Pulses	Yes			
3	Green leafy vegetables	Yes			
4	Root and tubers		Yes		
5	Other vegetables	Yes			
6	Fats and oils		Yes		
7	Sugar and jiggery			Yes	
8	Deep fried food	Yes		Yes	
9	Fruits	yes			
10	Chocolate and ice cream		Yes		
11	Non veg		Yes		
12	Nuts				
13	Egg		Yes	Yes	
14	Junk foods				Yes

Physical activity:

- Exercise
- Yoga
- Medication

Which medicine intake of covid -19?

Follow Health Care Provider instructions: It is very important to strictly follow your health care provider's instructions for any medication during COVID-19.

Antiviral drugs. Researchers are testing the antiviral drugs favipiravir and merimepodib. Studies have found that the combination of lopinavir and ritonavir isn't effective.

Anti-inflammatory therapy. Researchers study many anti-inflammatory drugs to treat or prevent dysfunction of several organs and lung injury from infection-associated inflammation.

Dexamethasone. The corticosteroid dexamethasone is one type of anti-inflammatory drug that researchers are studying to treat or prevent organ dysfunction and lung injury from inflammation. Studies have found that this drug reduces the risk of death by about 30% for people on ventilators and by about 20% for people who need supplemental oxygen.

Immune-based therapy. Researchers study immune-based therapies, including convalescent plasma, mesenchymal stem cells and monoclonal antibodies. Monoclonal antibodies are proteins created in a lab that can help the immune system fight off viruses.

Conclusion:

To conclude, as there is no known effective treatment or treatment method for the life-threatening pandemic of COVID-19, all potential therapeutics, interventions, and prevention strategies that can reduce the incidence or severity of infection are crucial. Examining the results of this study and other studies, healthy nutrition is vitally important during the pandemic process. Taking into consideration the budgets reserved for treatments in hospitals during the pandemic, improving the nutritional status of patients with COVID-19 is an economically viable option that might improve the outcomes for patients.

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Department of Nutrition and Dietetics

SURVEY ON CEREALS

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Abstract

Whole grains may assist in reducing risk of non-communicable disease, but consumption is limited in many countries. The aim of this study was to investigate consumer's knowledge, attitudes and identification of whole grains, incorporating an exploration of factors influencing consumption, promotion and provision. Although 92./. of respondent consumed grains. Whole grains with of high proportion describing whole grain as less processed 72./. or high in dietary fibre 67./. two thirds were aware of health benefits but stated that if they had further information, they would be more likely to swap to whole grain. Further education, increasing exposure, accessibility and availability. Furthermore, breakfast cereals consumption is associated with diets higher in vitamins and minerals and lower in fat but is not associated with increased intakes of total energy and it will be necessary to improve consumption. The results document the importance of cereals and cereals products in the polish diet, which should be emphasized from a nutritional and health point of view.

Keywords: *cereals; cereals products; energy intake; nutrient intake by cereals; food sources; adult consuming survey*

INTRODUCTION

Cereals and cereals products are staple foods in most human diets, in both developed and developing countries, providing a major proportion of a dietary energy and nutrients. They are consumed of approximately 75% carbohydrates, mainly starch and about 6-15% protein, contributing in global terms more than 50% of energy supply. The importance of cereals and cereals products is also supported by the fact that global food security depends to the greatest degree on cereals production.

In terms of the importance of cereals and changes in food consumption patterns, it should be highlighted that the analysis of energy and nutrient sources is crucial to assure the adequate

nutritional quality of diets. The aim of this study was to identify food sources of energy and 28 nutrients from cereals. The results from the contribution of energy and nutrients with people.

Objectives

To analysis the people intake of cereals

How much of nutrients in the cereals and cereal products

Research Methodology

Sources of energy and nutrient supply from cereals and cereals products were studied. The analysis covers energy and 28 nutrients; carbohydrates, dietary fibre, protein, total fat, saturated fatty acids (SFA), monounsaturated fatty acids, polyunsaturated fatty acids, cholesterol, calcium, phosphorus, sodium, potassium, magnesium, iron, zinc, copper, iodine, manganese, thiamine, riboflavin, folate and vitamins B12, B6, A, D, E and C.

Results

Sixty-one percent of surveys were completed in full, from 735 responses (n = 448). Partially completed questionnaires were included in the final analysis, as question responses were independent of one another. Most respondents were female (86.9%; n = 637), from two defined age groups 18–25 (23%; n = 168) or 36–45 years (23%; n = 168) and a larger proportion were employed full time compared with other employment categories (37.6%; n = 276). Most participants had achieved qualifications post high school of a certificate or diploma (37.4%; n = 274) or degree (26.6%; n = 195). Most commonly, participants stated that they lived in a regional area (42.4%; n = 311) and three-quarters (76.6%; n = 579) of participants were not following a specific diet. Special diets were noted by 134 participants and included vegetarian/plant based (n = 37), gluten free (n = 32), low carbohydrate/ketogenic (n = 23), ‘for medical purposes’ (n = 22), and dairy free (n = 20).

Demographic Variable	Frequency
Gender(n=733)	
Male	93 (12.7)
Female	637(86.9)
Prefer not to answer	3(<1%)

Age in years (n=733)	
18-25	168(22.9)
26-35	137(18.7)
36-45	168(22.9)
46-55	142(19.4)
Employment status (n= 734)	276 (37.6)
Employment working full time	140(19)
Employed, working part time	140(19)
Student	62(8.5)
Education status n=733	
Some high school	81(11)
Certificate / diploma	125(17)
Bachelor degree	274(37.4)
Master degree	195(26.6)
Rural	149(20.3)

SAMPLE SELECTION METHOD

The method of data collection approach on online survey with both open and closed questions. Consumer perspectives were sought from over the age of 18 years, as adult are more likely to responsible for their own food choices, and parental consent was not possible for children. Individuals with formal nutrition qualification or who were currently involved in nutrition education were excluded through the promotional materials for the survey.

The survey comprised 15 questions and was designed to gain information on general dietary information, consumption of grains, understanding and Identification of whole grains. In addition to this, participants were asked whether they diet, if they believed whole grains were important in their diet, if they were the recommended daily intake of grains and whole grains, and any health benefits associated with their consumption.

The questions associated with food labels and claims including such as high in protein, contains whole grains, high in fibre and low glycaemic index were also included. The survey

used multiple choice, check multiple choice box selection and rank. Recorded demographic characteristics were age, gender, employment status, highest level of education and residential area.

Consumption Of Grain Foods

Ninety -three percent of participants stated that they consume grain foods (n=679/728). More than three-quarters of participants n=433/ 487 reported consuming less than the recommended serves of grains per day, the with only 8% n=40 reporting quantities consistent with the recommended quantity foe their age and gender. Over half 54% n=3 of males reported consuming 2-3 serves of grains per day.

Discussion

Cereals and cereals products form a significant part of the diet as contributors of energy and many nutrients. Our findings-based food category contributed 687kcal, which means 30.4% of total energy supply in the average diet and almost 28% in comparison to the energy reference value for the diet. Cereals contribution to dietary energy intake is widely diversified between regions and countries. In developing Asian countries with rice- based diets, cereals contribute as much as 70-80% of energy intake; while in high income countries with predominantly livestock-based diets cereals provide only 20-30% of total dietary calories. Of the analysed macronutrients, cereals and cereals products are important sources of carbohydrates, dietary fibre and protein.

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REVIEW ON BLACK RICE

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Abstract

There are many local black rice cultivars in Indonesia, yet only a few of these are formally described in the literature. It has been reported that black rice has many phytochemical variants which may contribute to its use as a functional food, including nutraceuticals and secondary metabolites such as anthocyanin, oryzanol, and more. There have been several studies of black rice due to its alleged beneficial health effects when consumed regularly. This review focuses on the historical aspects, chemical composition, and nutritional value. you can eat black rice daily as it contains a lot of fiber, improving digestion. Eating black rice daily helps lose weight as fiber and nutrient content are more than fat or cholesterol properties of black rice. The result showed the lipid content in all black rice higher than white and red rice.

Keywords: black rice cultivar, functional food, Phytochemical, historical aspects

Introduction : Black rice has a deep black color and usually turns deep purple when cooked. Its dark purple color is primarily due to its anthocyanin content, which is higher by weight than that of other colored grains. It is suitable for creating porridge, dessert, traditional Chinese black rice cake, etc.

After Cooked: Eating black rice can give you a worthwhile boost on your heart health and overall fitness. Along with protective anthocyanin, black rice contains high amounts of lutein and zeaxanthin, two carotenoids known for their role in supporting eye health.Black rice, also known as purple rice or forbidden rice, can refer to more than 20 varieties of Oryza sativa rice high in anthocyanin pigment, the same antioxidant pigment that gives eggplants and blackberries their deep color.

3 Common Varieties of Black Rice

1. Black sticky rice, a long-grain glutinous rice used in Thai desserts and often mixed with white sticky rice and cooked by steaming.

2. Black Japonica rice, a mixture of 25 percent black short-grain japonica rice and 75 percent medium-grain red rice developed in California that's good for rice salads.

3. Chinese black rice, aka forbidden rice, grown in Zhezhiang in northern China and eaten as junk (congee or porridge), is firm, not sticky, and cooks more quickly than brown rice.

Phytochemical analysis: The black rice contains phytochemical compounds such as flavonoids, anthocyanin, proanthocyanidins, tocopherols, tocotrienols, oryza- nols, and phenol. Anthocyanin and proanthocya- nidins are a type of flavonoids and include bioactive com- pounds found in black, brown and red rice.Phytochemical content of the various rice types were divided into several groups such as carotenoids, phenolics, alkaloids, nitrogen and organosulfur containing compounds. Phenolic compounds were sub-grouped as phenolic acids, flavonoids, coumarins and tannins. Similarly, anthocyanidins are one of such flavonoid compounds.

Determination of antioxidant activity: 1, 1-diphenyl-2-picryl-hydrazil (DPPH) free-radical-scavenging activity of extracts was determined as described by Rattanachitthawat et al. (2010) & Herch et al. (2014). The DPPH radical-scavenging activity was calculated by linear regression analysis.

Parameter		Fermented Black Rice Bran	Non-fermented Black Rice Bran
Flavonoid		Positive	Positive
Alkaloid	Wagner	Negative	Negative
	Mayer	Negative	Negative
	Dragendorf	Negative	Negative
Tannin		Negative	Positive
Saponin		Positive	Negative
Quinon		Negative	Negative
Steroid		Negative	Positive
Triterpenoid		Positive	Negative

Nutritional value:

A 1/4 cup (45 grams) of uncooked black rice provides (3Trusted Source):

Calories: 160kcal	Carbs: 34 grams
Fiber: 1 gram	Iron: 6%mg
Fat: 1.5 grams	Protein: 4 grams

Anthocyanin is a pigment that's responsible for the black-purple color of forbidden rice. It's also been found to have potent anti-inflammatory, antioxidant, and anticancer effects. of the Daily Value (DV). Black Rice has been eaten in regions of Asia for thousands of years; in fact, for centuries it was reserved for only Chinese royalty. Today this type of rice is picking up in popularity and popping up in more health food stores across the US, Australia, and Europe, as people discover the numerous health benefits that whole grain black rice has to offer.

Black Rice also known as "forbidden rice"

In ancient times, Chinese Emperors reserved this wonderfully nutri rice for their own consumption because it was thought that it would extend their lives. Black Rice does provide many health benefits that we are just finding out about now; including prevention and treatment of very serious ailments. Avoiding diseases and conditions such as heart disease, cancer, diabetes, high blood pressure, and others is surely a great way to extend the length and quality of your life.

Black rice powder in cakes

Cakes are important bakery products in which wheat is the main ingredient to provide structure to the cakes due to the presence of gluten. Black rice is also rich in protein content and can be used as a substitute for wheat flour in the preparation of cakes. Black rice is milled to flour/powder and incorporated at different levels 0,10,20,30,40,50,60,70,80,90 and 100% (W/W) of wheat flour in chiffon cakes. The proximate composition of the black glutinous flour was 8.0% protein, 0.4% fat, 1.5% ash, 0.9% crude fiber and 89% carbohydrates on dry basis. It was observed that the specific gravity of cake batter increased but the batter viscosity decreased on substitution of black rice powder. On evaluating the properties of black rice powder incorporated baked cakes, it was found that the crumb hardness, crust and crumb color, chewiness increased. The cakes also observed a dense crumb structure instead of airy porous nature. The moisture content, cake volume, springiness and resilience decreased in baked cakes. Further there was a positive increase in antioxidant activity of the cakes. The sensory scores showed good results for incorporation levels of black rice powder between 10-60%, but replacement level between 70-100% reported less sensory scores. The high protein content of black rice flour increases the overall nutritional profile of cakes and makes it a healthy alternative to traditional cakes made from refined wheat flour.

Black rice powder in bread

Bread is a fermented bakery product produced by yeast fermentation (saccharomyces cerevisiae). The major ingredients used in the preparation of bread are refined wheat flour, salt, water and yeast. During fermentation, yeast acts upon the carbohydrates present in flour along with sugar to release carbon dioxide which is trapped in the protein network (gluten) causing the dough to raise. The viscoelastic nature of gluten is responsible for good texture and quality of bread. Till now many ingredients like hydrocolloids (xanthum gum), transglutaminase and proteases are being substituted in wheat flour to get the same viscoelastic properties. Recently attempts were made to substitute black rice flour in small quantities in wheat flour for bread preparation as it also has high protein content. Black rice flour has Nutraceutical properties and can be used for fortification of bread. In a study black rice flour was replaced at 2% level substitution in wheat flour and was found that there was no significant difference from control bread (0% black rice flour). At 4% level of substitution, it was observed that baked bread had a dense crumb structure and less elasticity. Further in this study a mathematical model was designed to examine the digestion rates of black rice flour substituted bread. The results showed that the digestion rates were lowered in both the cases (2% and 4% substitution level). Thus it was concluded that replacing black rice flour in wheat flour can increase the health benefits and can serve as a functional food especially for diabetic patients as it lowered the starch digestion rates and maintains the blood glucose levels.

Conclusion

The overall results suggested that polar extracts of highly pigmented rice variety is rich in phytochemicals, anthocyanin, and free radical scavenging compounds. Although sample size was minimal in the present study, Northern Thailand rice cultivar variety (CBlR) is found superior in phytochemical content and bioactive properties than other tested rice varieties. In order to explore the nutritional values and the superior rice cultivar variety of Thailand, further, increased sample sizes that have different rice varieties with respect to different extraction system is required.Black rice is a variety of rice which has several promising health benefits. The high antioxidant activity of black rice makes it a super food and its application as an ingredient in other food products can create highly nutritious foods. Anthocyanin, the main pigment of black rice has gained attraction among the researchers due to its high antioxidant activity, health

benefits and natural coloring properties for use in other food applications. Black rice is rich source of tocopherols (vitamin E), iron, antioxidants and the overall nutritional profile of black rice has made it a functional and novel ingredient in food processing. Consumption of black rice by individuals those who show allergic symptoms to other cereal grains has proved to be beneficial and also helps in reducing the risk of developing cardiovascular diseases, diabetes and obesity. There is a dire need to include black rice as a novel ingredient in food processing to explore its complete benefits.

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Department of Nutrition and Dietetics

FORMULATION & DEVELOPMENT OF *Moringa Oleifera* FLOWER INCORPORATED BREAKFAST RECIPES

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Introduction :

Moringa oleifera Lam. Commonly known as a Miracle tree owing to its immense medicinal properties belongs to the monogeneric family Moringaceae. Moringa oleifera and Moringa concanensis are the only two species of this genus recorded in India. This family has members with typically soft-wooded, deciduous trees . Moringa oleifera known as Murungai in Tamil is a small to medium sized tree cultivated all over the plains of India. It has now become widely known as a multi-purpose tree as it is grown for its nutritious pods, edible leaves and flowers in addition to the beneficiary properties as a source of food, medicine, cosmetic oil, forage for livestock and as a water ccoagulant.

Moringa oleifera leaf is a natural anthelminthic, antibiotic, detoxifier, outstanding immune builder used in some countries for the treatment of malnutrition and malaria. Proximate analysis found that percentage of dry weight of proteins, ash, lipids, dietary fibre and nonstructural carbohydrate suggest a comparable nutritional profile for leaves and flowers . Total antioxidant content of flower is also found higher than other plant parts.

The vitamin C content in flowers was found to be in highest when compared to other parts. A number of qualitative analysis of various flower extracts confirmed the presence of saponins, tannins, alkaloids, flavonoids, steroids, glycosides, terpenoids and phenols . According to Fuglie 2000 , Moringa is used in alley cropping, biogas.

International Journal of Botany Studies 91 fertilizer, nutrient, gum, honey and sugar from flower nectar and for medicine. Murungai poo is the dried flower of Moringa oleifera used as cure for inflammations and muscle diseases . In Siddha flower of Moringa oleifera is used in

the preparation of Panca cuta meluku which is administered for curing cough, chest diseases, chronic bronchitis, urticaria caused by beetle sting, syphilitic ulcer, etc.

Nutritional Value Per 100gm :

Nutrients	Amount / 100gm
Energy	64 kcal (270kg)
Carbohydrates	8.28 g
Dietary fibre	2.0 g
Fat	1.40 g
Protein	9.40 g
Vitamin A	378 mg (47%)
Thiamine B1	0.257 mg (22%)
Riboflavin B2	0.660 mg (55%)
Niacin B3	2.220 mg (15%)
Pantothenic acid B5	0.125 mg (3%)
Vitamin B6	1.200 mg (92%)
Folate B9	40 mg (10%)
Vitamin c	51.7 mg (62%)

Health Benefits Of Moringa Oleifera:

Moringa is believed to have many benefits and its uses range from health and beauty to helping prevent and cure diseases. The benefits of moringa include:

1. **Protecting And Nourishing Skin And Hair:**
2. **Treating Edema:**
3. **Protecting The Liver:**
4. **Preventing Treating Cancer:**
5. **Treating Stomach Complaints:**
6. **Fighting Against Bacterial Disorder**
7. **Making Bones Healther:**
8. **Protecting The Cardiovascular System:**
9. **Treating Diabetes:**

10. Treating Asthma:

11. Protecting Against Kidney Disorder:

12. Reducing High Blood Pressure:

.**Methodology**

The methodology pertaining to the study entitled "Physical properties, sensory characters and nutritional quality of products developed using drumstick flowers". Drumstick flowers were harvested in Aastampatti at Salem district. The following standardized procedure were Used to determine the nutrient content and antioxidant Substance presence in the selected moringa flowers powder.

Collection Of Samples:

The flowers were collected from the fresh and disease free Moringa tree. After cleaning the flowers were allowed to shade Drying. The dried flowers were grinded and stored in a air tight Container.

Secrening And Selection Of Moringa Oleifera:

The Natural colourant and powder are important alternative to potentially harmful synthetic powder. Since synthetic powder may cause serious health problems and harmful hazardous effects.

Vegetable flowers are more perishable and hence the flowers remain underutilized. Moringa oleifera flowers are highly Nutritious and possess medicinal properties but it was rarely used by the people. Plant foods play an important role in the diet as They provide essentials micronutrients and minerals. Vegetable flowers are in particular season of the year. When compared to Other parts of Moringa, flowers are having more therapeutic value. Moringa oleifera flowers are rich in carotene, protein, vitamin C and potassium and act as a good source of natural antioxidants. Among the various types of processing techniques dehydration is Considered to be an inexpensive method and imparts properties that are unmatched by any other preservation technique. The Nutrient loss can be minimized through the dehydration technique and helps to retain the nutrient content. Hence, Moringa oleifera was selected for the study and product development.

Preparation Of Moringa Oleifera Powder :

Election Of Raw Material: Raw material for preparation of Herbal powder was fresh Moringa flowers from the different Yard of the Allahabad.

Process Equipment: Sieve, Electronic weighing balance, Grinder (mixer), LDPE bags

Washing: Collected leaves are washed in running tap water Till the removal of dirt. After this flowers are soaked in 1% Saline solution (NaCl) for 5 minutes to remove microbes. Leaves are further washed with 70 % ethanol followed by Twice washing with distilled water. This step plays a Substantial role in removal of dust, pathogens as well as Microbes present on the surface of flowers.

Draining: The excess water can be removed by spreading The flowers in sunlight for a brief period till the removal of Water present on the flower surface.

Drying: The flowers are further dried in shade drying and Also by tray drying to obtain complete removal of moisture.

Grinding: Dried flowers are grinded in grinder to obtain fine Powder to utilize it for further use and consumption. Hence, the brown fine powder can be used in the recipe preparation to make value add product.

Formulation Of Value Added Recipes:

A.Development Of Value Added Products Using Moringa Oleifera Powder:

The processed Moringa oleifera powder was used in the following recipes.

Recipes:

1. Poori
2. Milkshake
3. Omelet
4. Panniyaram

.Standarisation Of Recipes:

Standard Recipe

The standardized recipe of poori , Milkshake, Omelet & Panniyaram were prepared using murungai poo powder.

Formulation Of The Product Using 5%

The value added recipe was preparation with 5% of Moringa oleifera powder and organoleptically evaluated.

Formulation Of The Product Using 15%

The value added recipe was preparation with 15% of Moringa oleifera powder and organoleptically evaluated.

. **Organoleptic Evaluation Of Recipes:**

Organoleptic evaluation were conducted to determine if food products can transfer or odours to the materials and components they are packaged in. Shelf life studies often use taste, sight, and smell (in addition to food chemistry and toxicology tests) to determine whether a food product is safe to consume. Organoleptic analyses serves as a primary screen as a primary screen to determine which samples must be analysed samples sensory analysis.

Preparation Of Moringa Oleifera Powder:

Drying (dehydrating) of murungai poo powder is one of the methods of preservation. Dehydration is the process of removing water or moisture from a foods makes them smaller and lighter. Dehydrated foods are ideal for backpacking, hiking, and camping because they weigh much less than their non-dried counterparts and do not require refrigerator.

Reducing the moisture content of food prevents the growth of these spoilage-causing microorganisms and slows down enzymatic reactions that take place within food. The combination of these events to helps to prevent spoilage in dried food. (https://pubs.ext.vt.edu/)

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Department of Nutrition and Dietetics

FOOD MARKET SURVEY ON FOOD SAFETY LOGO's

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Abstract

Food is essential to life, hence food safety is a basic human right. Billons of people in the world are at risk of unsafe food. The food chain starts from farm to fork/plate while challenges include microbial, chemical, personal and environmental hygiene. In this survey I came to know that people not aware of food safety and food authority organization. The food producers, distributors, handlers and vendors bear primary responsibility while consumers must remain vigilant and literate. Government agencies must enforce food safety laws to safeguard public and individual health. Medical providers must remain passionate to prevent foodborne illnesses and may consider treating diseases with safe diet therapy under proper medical international pervision. Foo safety is vital for people,, the planet, world economies and our future, yet millions of people every year still fall ill from eating contaminated food.

Introduction :

Food safety is vital for people, the planet, world economies and our future, yet millions of people every year still fall ill from eating contaminated food. Food safety is essential to achieve more efficient, inclusive, resilient and sustainable agri-food systems which provide healthy foods for everyone and everywhere.food safety refers to the condition of the food and preserve the quality of tha food .the food quality where we analysis behind the product back cover there were mention quality of the food product symbols by food safety and standard authority of India.food safety is called as handling the food , storage of food, preparation of food And preservation of food. Food safety is an umbrella term that encompasses many facets of handling, preparation and storage of food to prevent illness and injury. Included under the umbrella are chemical, microphysical and microbiological aspects of food safety. A priority of food chemical quality is control of allergens which can be life threatening to some people that are high .the food safety symbols have various type simple,for example , The International

symbols for “food safe “Material is wine glass and a fork symbols .the symbol indicates that The international symbol for "food safe" material is a wine glass and a fork symbol. The symbol indicates that the material used in the product is considered safe for food contact. This includes food and water containers, packaging materials, cutlery etc.Food safety is an umbrella term that encompasses many facets of handling, preparation and storage of food to prevent illness and injury. Included under the umbrella are chemical, microphysical and microbiological aspects of food safety. A priority of food chemical quality is control of allergens which can be life threatening to some people that are highly sensitive.

In general, consumers rely on government to ensure all food products not only are safe but are sold as what they claim to contain. For example, a jar of olive oil labeled as 100% virgin olive oil must contain exactly what the label says except the naturally occurring trace elements that are part of olive oil and which cannot be extracted or eliminated completely without destroying the olive oil. Prevent contamination of food with pathogens spreading from people, pets, and pests ,separate raw and cooked foods to prevent contaminating the cooked foods, Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens, Store food at the proper temperature ,Use safe water and safe raw materials. Personnel suffering from communicable disease is likely to be transmit infection through food. So they must be restricted from production and food handling areas. Persons who are with infected wound, skin infection or health problems must be restricted from the kitchen and serving. Food safety and quality are important at the home level, but are critical in large scale production Food safety and quality are important at the factory level production

Area And Subjects:

About 200 people are selected by this study. The areas selected for the conduct of the study were Erode, thiruchengode, Salem ,karur. These areas were selected for easy and convenience approach .

What Are The Five Priciple Of Safe Food Storage?

- Keep clean
- Separate raw and cooked
- Cook thoroughly
- Keep food at safe temperature
- Use safe water and raw materials family sick. But if food is contaminated in a

Food Safety Symbol :

International Food Safety Icons are simple pictorial representations of important food safety tasks that can be recognized and understood regardless of a person's native language. Uses of the Icons include, but are not limited to: Food safety training materials. Signs or reminders at food and beverage workstations.

- 100./. vegetarian symbols is donate vegan option of menu and. Sometimes a leaf may be used instead. At many restaurants, "V" is used to denote vegetarian, while "VE" is used to denote vegan.
- Brown circle is to indicate the presence of non-vegetarian ingredients
- while a green circle indicates that the food item is vegetarian. The green circle and brown circle in a square are indicated as veg & non-veg logos respectively.

HACCP certification is an international standard defining the requirements for effective

control of food safety. It is built around seven principles: Conduct Hazard Analysis of biological, chemical or physical food hazards. Determine critical control points.

- The Food Safety and Standards Authority of India
- The Food Safety and Standards Authority of India (FSSAI)
- Has been established under Food Safety and Standards Act, 2006 has which consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments.

Conclusion:

In this paper prepared based on the survey of the people,because most of the 75 % Where not aware of food safety and food safety symbols.food is one of the basic necessities of human. Therefore, there should not be such problem that can cause serious health issues to protect consumer rights. A wide variety of scientific techniques have been developed to protect consumers and to screen for adulteration in food.

Department of Nutrition and Dietetics

GROUNDNUT DE-OILED CAKE - AN ALTERNATIVE POTENTIAL RESOURCE FOR FOOD FORMULATION

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Introduction: Oilseed cakes are the residues obtained after the extraction of oil from the plant source such as oilseed, by expelling or solvent extraction. Groundnut cake is a by-product of the oil industry.

Objective: This study aimed to formulate a healthy meal using food mixes that are incorporated by groundnut de-oiled cake.

Materials and Methods: Raw ingredients were procured from the local market and were processed. The groundnut de-oiled cake was obtained from the oil milling shop and it was dried, powdered, and sieved to get uniform powders. The individual powdered samples were mixed in the ratio of whole wheat grain (150g), bajra (150g), green gram(150g), Pineapple (25g) and red ponnanganni (Alternanthera Sessilis) (25g) for the preparation of nutritionally adequate food mixes. The developed food mixes were incorporated by adding de-oiled groundnut cake in the ratio of T0(0%), T1(10%), T2(20%), T3(30%), T4(40%) and T5(50%). The different mixed samples were used for preparing chapathis and they were tested organoleptically for acceptability. The most accepted incorporation was tested for its nutritional content using standard AOAC method.

Results and Discussion: The results revealed that the developed chappathis using deoiled groundnut cake incorporated food mixes were nutritionally adequate and comparable. All the prepared samples were accepted and scored good results. The nutritional content of the groundnut de-oiled cake powder showed to be rich in proteins, antioxidants, fibres, vitamins and minerals. It also possessed higher antioxidant scavenging activities.

Conclusion: This study concludes that deoiled groundnut cake can also be used as a potential food resource since it possesses higher nutritional content and antioxidant properties.

Keywords: Ground de-oiled cake, Nutritional Content, Food mixes, Chappathis

AN EXPERIMENTAL REVIEW PROBE FOOD SAFETY INGREDIENTS

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Abstract

Food can never be entirely safe. Food safety is threatened by numerous pathogens that cause a variety of foodborne diseases, algal toxins that cause mostly acute disease, and fungal toxins that may be acutely toxic but may also have chronic sequelae, such as teratogenic, immunotoxic, nephrotoxic, and estrogenic effects. Perhaps more worrisome, the industrial activities of the last century and more have resulted in massive increases in our exposure to toxic metals such as lead, cadmium, mercury, and arsenic, which now are present in the entire food chain and exhibit various toxicities. Industrial processes also released chemicals that, although banned a long time ago, persist in the environment and contaminate our food. In addition, there is increasing evidence that they exhibit neurodevelopmental toxicities in human infants and children. They share this characteristic with the dioxins and dioxin-like compounds. Other food contaminants can arise from the treatment of animals with veterinary drugs or the spraying of food crops, which may leave residues. Among the pesticides applied to food crops, the organophosphates have been the focus of much regulatory attention because there is growing evidence that they, too, affect the developing brain. Numerous chemical contaminants are formed during the processing and cooking of foods.

Keywords: Food safety, reproductive organ, chemical contamination, processing and cooking, dicholorophenyl dichloroethene.

Introductions:

Food is a major determinant of health, nutritional status and productivity of the population. It is, therefore, essential that the food we consume is wholesome and safe. Unsafe food can lead to a large number of food-borne diseases. You may have seen reports in the newspapers about health problems caused by contaminated or adulterated foods. Globally, food-borne illness is a major problem of public health concern. In India, the National Family Health Survey, 2015 – 2016 stated that more than 9 lakh children less than five years of age suffered from acute diarrhea.

Food-borne illness can not only result in mortality but can damage trade and tourism, lead to loss of earnings, unemployment and litigation and thus can impede economic growth, and therefore food safety and quality have gained worldwide significance.

Food safety is a basic need but there is a danger that it may be overlooked in the development of effective and efficient processes. Food safety remains a critical issue with outbreaks of foodborne illness resulting in substantial costs to individuals, the food industry and the economy (Kaferstein, Motarjemi, & Bettcher, 1997).Within England and Wales the number of food poisoning notifications rose steadily from approximately 15,000 cases in the early 1980s to a peak of over 60,000 cases in 1996 (Wheeler et al., 1999).Unsafe food has been a human health problem since history was first recorded, and many food safety problems encountered today are not new. Although governments all over the world are doing their best to improve the safety of the food supply, the occurrence of food-borne disease remains a significant health issue in both developed and developing countries.

The World Health Organization (WHO) has long been aware of the need to educate food handlers about their responsibilities for food safety. In the early 1990s, WHO developed the Ten Golden Rules for Safe Food Preparation and introduced the Five Keys to Safer Food in 2001. Recognizing the importance of safe food in human health WHO has selected the theme of Food Safety for the World Health Day 2015 with the objective of ensuring safety of food from farm to plate(Subba Rao GM et al., 2007).

Methodology:

Food Contamination During Food Processing:

The food processing steps are shown in figure. The presence of unwanted materials such as dust and particles during the manufacturing and transportation time is called contamination. term contaminants include any unwanted matter that is found in the product. These contaminants affect the quality of the product or the process. It has been demonstrated that food contamination, either from microbiological or chemical origin, is the highest concern for consumers. Sample treatment devices, such as micro extraction techniques able to remove the matrix interferences and to concentrate the analyses from the sample, have been developed and proposed as powerful tools for food analysis. But the task of identifying the contaminants, either those coming from the food production, the food processing or the packaging is still a challenge. The information about the likely contaminants coming from each step of the food processing is essential. In

the following paragraphs the description of the main contaminants in each step, how to control them and how to prevent or diminish them from the food are discussed. This information is essential to identify the origin of the contaminants in the final food.

1.External raw food contamination:

Several methods have been developed for determining antibiotic residues in foodstuff such as meat, eggs (Donkor, Newman, & Tay, 2011) or milk, such as using the microbial inhibition plate test (Koenen-Dierick et al., 1995) or by liquid chromatography methods (Freitas, Paim, & Silva, 2014).

2.Contamination during food transport:

Food contamination can also take place during transportation. It can be cause by from vehicle exhausts of petrol and diesel orbecause a cross contamination in the vehicle used for food transportation. This cross-contamination can create a serious risk for food safety. In 1999, a major illness in the European Economic Community was attributed to fungicide-contaminated pallets used for transportation and storage of food packaging materials. Long distance transport ship has been also several times affected by cross contamination from chemicals used for disinfection or from other sources (Nerín, Canellas, Romero, & Rodríguez, 2007). The study carried out by (Nerín et al., 2007) is a good example of thecontamination of food by permeation of naphthalene, methyl bromide, toluene, ethyl benzene and ortho par a xylenes through a theoretical high barrier material.

3.Contamination caused by cleaning process:

Cleaning and disinfecting during food processing eliminate the presence of possible microorganisms and therefore, they are crucial to reduce food contamination. Chemicals used as cleaners or disinfectants must be appropriate for food contact surfaces and need to be accepted by the legislation. Products such as glass cleaners or some metal cleaners can't be used because they might leave unsafe residues. The addition of sanitizers in quantities far above permitted levels could leave some residual concentration on treated materials or food even in minimum processed fruits and vegetables, and therefore, to quantify the residual chemicals present in the food is important in order to certify that they have been completely removed.

4. Contamination due to heating steps:

Other processing contaminants formed during heating include polycyclic aromatic hydrocarbons (PAHs), present in grilled and smoked products, ethyl carbamate and other products

or furan derivatives present in a variety of heat-treated foods, especially coffee and canned/jarred food. Furan contributes to the off flavor of the food and can be formed from a variety of precursors, like ascorbic acid, carbohydrates degradation, amino acids degradation as well as oxidation of fatty acids. The production of mutagens is much lower in absence of fat.

5.Food Packaging:

Food packaging provides many advantages such as physical protection, barrier protection and it also allows a better food preservation that will increase the shelf life of the product. The direct or indirect contact between the food and the packaging material can end up the transference of these substances from the packaging to food, in a phenomenon called migration (Catala & Gavara, 2002). Migrants can pose a health risk for consumers if they have a toxic effect. To protect the consumers, there is a strict legislation in FDA, Europe, Mercosur, Australia and Euroasia as well as in many countries to avoid the contamination from the materials and articles to the food in contact with them.

In Europe, food packaging materials must comply with the framework Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food (European-Commission, 2004) and with Regulation (EC) No 2023/2006 on good manufacturing practice (European-Commission, 2006). migration from plastic food contact materials must fulfill the Regulation EU/10/2011 from the European Commission (European-Commission, 2011). Any compound with a molecular mass lower than 1000 amu can migrate and cross the polymeric or paper layers, arrive at the food and be dissolved in it.

When metallic cans are used for food packaging, corrosion phenomena in the metallic surface of the can could produce a migration of metallic ions to food, such as iron or tin (Buculei, Gutt, Sonia, Adriana, & Constantinescu, 2012). Minor by-products from the manufacture of epoxy resins, such as bisphenol A, bisphenol A diglycidyl ether (BADGE) or cyclo-di- BADGE among others can migrate to food (Cabado et al., 2008). Another common material used in marmalades, jams, vegetables, beans or sauces packaging is glass. In this case, migration comes from the metallic lids used for closing the glass jars. Epoxidized soybean oil (ESBO) is one of the additives used as plasticizer in PVC and its migration to food has been reported by several authors (Pedersen et al., 2008). Paper andboard are commonly used for packaging dry food, such as flour or sugar, or products such as rice, cereals or frozen food. Migration from paperboard additives or from printing inks to foodstuff can take place. The most recycled packaging material and the use

of recycled materials can produce food contamination of substances such as mineral oils or plasticizers coming either from printing inks or adhesives (Nerin, Contin, & Asensio, 2007).

The substances intentionally added to food packaging materials, non-intentionally added substance (NIAS) can also migrate to food and can have also adverse effects. Degradation processes of the polymer itself due to high temperatures or high irradiation energies that take place during polymer manufacturing (Dabrowska, Borcz, & Nawrocki, 2003) and also from degradation processes of polymer additives (Burman & Albertsson, 2005). NIAS can also come from impurities present in the raw materials.

6. Contamination during food storage:

Food storage conditions are key parameters in food quality and safety. Proper storage extends the shelf life of food, which depends on the food type, packaging and storage conditions, particularly temperature and humidity. Organoleptic changes should not occur during food storage and therefore packaging materials used for long term storage should exhibit very good barrier properties. Moisture can lead to the breakdown of some packaging materials (e.g., paper degradation and metal rusting). The optimal range of temperature is the cool to moderate range, between 4 and 210C. Direct sunlight can speed deterioration both on the food and on the packaging Depending on the barrier properties the transference of compounds through the packaging material will be different as was demonstrated (Nerín et al., 2007)

7.**Food safety hazard:**

Food safety hazards are contaminants that may cause a food product to be unsafe for production. Hazards are defined by Codex 1997 as follows: “Hazard: a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect”.

Hazards may enter a food product from its ingredients or may contaminate during processing or handling. It is important to understand the likely hazards that might be encountered in the chosen ingredient types, or that might be present in the processing environment. This allows the development team to identify the best ways to control these hazards, either by preventing their entry to the process, destroying them or reducing the contamination to a level.

It is no longer process a food safety risk. This information on likely hazards and proposed control options should link with the prerequisite good manufacturing practice programs and HACCP systems to ensure everyday control is established in the manufacturing operation.

CONCLUSION:

Food can be contaminated, often by different variants such as microorganisms, heat, moistness, or water, contributing to many foodborne diseases. Food safety and security are important to maintain the wellness of human beings. Thus, to ensure food safety, biodegradable packaging materials are exclusively used since they are eco-friendly. The procurement of suitable packaging materials and technology plays a crucial role during the delivery and storage process to properly preserve quality and freshness. Food adulteration entails incorporating irrelevant, deleterious chemicals into food, which diminishes the food's quality and has become a significant problem to people's well-being. Though a massive number of analytical tools and techniques are used for food analysis, there are still a decent number of problems that need to be improved. People around the globe have changed their diets from mainstream food for the increment of the immune system.

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Department of Nutrition and Dietetics

AN ANALYTICAL STUDY ON CONSUMERS ATTITUDE TOWARDS FOOD WASTE AND ITS MANAGEMENT

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Abstract

In the developing countries and in under developed countries, demand for the food and raw materials is still increasing where all the countries are about to face the food crisis in the upcoming years due to various factors like climatic conditions, pollution and ozone layer depletion, an increased food waste also contributes a huge in food crisis. A finding shows that, 40% of food produced were being disposed of nearly about 7 tons of food on a daily routine, Among that major portion was discarded as a edible food waste and if it is reused it can fed nearly about 2000 individuals on a day. Among the various factors the food waste management plays a prominent role in the sustainability in food, measuring food wasting behavior at the consumer level is challenging. Most existing methods focus on food wasting at the household level, which in turn limits the possibility to study the situational and individual factors shaping food wasting behavior in a single person. In our study random sampling was done and responses were collected through the self structured questionnaire. The findings of the study indicates that Expired products are highly avoided by the respondents of about 45.8% and a little damage in the packaging or seal will lead to the avoidance of the particular food products of about 30.8%.And the awareness on food waste for invaluable reasons have found in 46.4% participants.

Keywords: *Food waste, Edible food waste, population, demand, Food crisis*

Introduction

In our country like India with 1.417 billion people , out of the world population of 8 billion people, don’t have enough food to lead a healthy life or they are undernourished. that is approximately one out of nine people on earth. the reasons can be; firstly, that there is a shortfall in the food produced worldwide or second, there is massive food wastage phenomenon occurring. Looking further into these reasons, today the world is yielding one and half times more for an individual, roughly that is enough to feed close to 10 billion people. Despite this massive number, people across the globe don’t have sufficient food, to conclude we can say that the food produced for the consumption of people is being intentionally wasted. Food waste is an ethical issue of global scale. According to the Food and Agriculture Organization (FAO) of the United Nation,

roughly one-third of all the food produced worldwide each year, for human consumptions is either lost or wasted. Every piece of food wasted is an opportunity lost to improve world hunger and global food security. To define food waste, it means food supplies (grain, vegetables, poultry,& meat) or drinks which was predetermined to feed people now lies in landfills as garbage despite it being fit for human consumption. the food thrown is either spoiled or expired chiefly due to economic behaviour, poor stock management and neglect. This is happening is developed, developing and underdeveloped countries with each's contribution higher than the other.*(references: Amity journal of energy &Environment studies,2017,volume 3,number 2,copyright 2017 by ABS,Amity University Uttar Pradesh, Noida Campus)*

Materials & Methods

A self structured questionnaire was prepared and the participants were selected by using the random sampling method of age 17 to 40. The questionnaire was shared through various social media like whatsapp,facebook and instagram.The responses were collected and analyzed. Totally 117 responses were recorded from the districts of salem, namakkal, erode etc., Among that, responses were collected from the 47.7% males & 52.3% females through google forms.

Results & Discussion

Food Waste signifies waste generated during the preparation of meals and any food that is not consumed. It includes food that has been thrown away not used or partly used. It does not include packaging materials. Food waste may have meat excluded i.e.: vegetable peelings, fruit scraps, teabags, coffee grounds, egg shells, and dairy and bread products. Alternatively food waste can have meat included and so include cooked food, meat, fish, bones, etc. *(Mills, C. and Andrews, J., Food Waste Collection Guidance, Waste and Resource Action Program (WRAP ROTATE), Oxon, 2009)* Roughly one third of the food produced in the world for human consumption every year (approximately 1.3 billion tonnes) gets lost or wasted. Every year, consumers in rich countries waste almost as much food (222 million tonnes) as the entire net food production of sub-Saharan Africa (230 million tonnes). The amount of food lost or wasted every year is equivalent to more than half of the world's annual cereals crop (2.3 billion tonnes) (*UNEP, United Nations Environment Program, Environment for Environment, http://www.unep.org/wed/about/)*

Association Of Gender With Food Waste

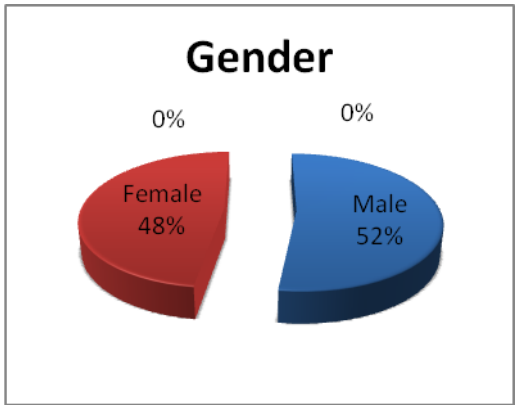

FIGURE-I FOOD WASTE AND GENDER

In our study the random sampling was done and the data were collected through the self structured questionnaire. Now a day peoples have some awareness in food waste but most of the people didn't take any steps to avoid food waste . In our study with random 117 people with age group between 16 to 40 .As on the data depicted in the FIGURE-I, Among the 48% of Female participants 52% were aware that they are wasting the food and 52% male participants, it is found to be high food wastage of about 69% of participants. In a CSR journal report, it is stated that Indians are wasting foods as the whole of United Kingdom consumes.

CORRELATION OF RESIDENTS & FOOD WASTE

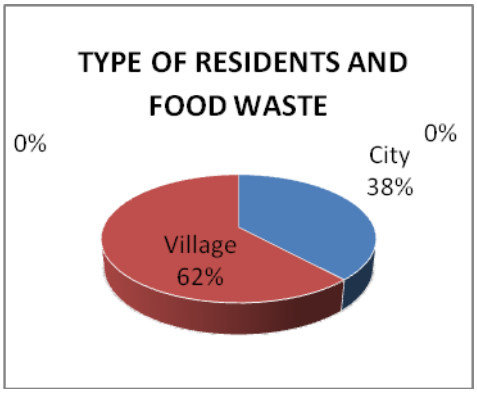

FIGURE-II TYPE OF RESIDENTS AND FOOD WASTE

As per the participants response depicted in the FIGURE-II among the 62% of village people 54% of the people are wasting the food at various level of food processing and preservation. As per the collected data among the 38% of city residents, food waste is tends to be higher with 55%.There is a adherent correlation between the resident place and the food waste percent.

91% of people prefers their own home for their place of preference to eat and 91.8% of people were think that wasting food is bad thing to our society as they are aware the the food which is wasted can help the people with hunger.

FACTORS ACCELERATING IN FOOD WASTE

Food in landfill breaks down in a way that can create greenhouse gases. In our study , we prefer three options for people that they have more possibilities to waste the food

- Food waste due to expiry
- Food waste due to little damage
- Food waste due to damaged package

CONCLUSION

Food waste is a result of throwing away good eatable food before it even reaches its expiry. Now a day , people have careless in food waste and our environment . really that will never be a good thing for our society . In our world still there are many children and people who was starving for food for a day . so we want to do awareness about food waste in people's mind to prevent food waste through many social media's like instagram , whatsapp, youtube ,facebook ..etc,

Don't Waste Food, It's Like Wasting One Of The Most Precious Things Given By God To Us

Recommendations

- Survey can be taken at household level, Village level and in catering services to analyze the Food waste at the preparatory stage itself.
- To Conduct a study based on the food preferences influencing the food waste at various levels
- To aware the community regarding the food waste and its adverse affect on the population by nutrition education.

IMPACT OF SOCIAL MEDIA IN INFLUENCING FOOD HABITS OF ADULTS

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Abstract:

The term social media refers to a computer-based technology that facilitates the sharing of ideas, thoughts and information through virtual network and communities. Social media is internet-based and gives users quick electronic communication of content, such as personal information, documents, videos, and photos. Users engage with social media via a computer, tablets or smart phone via web-based software or applications. A study shows that an average Indian spent nearly two and half hours day on social media. Undeniably, social media has been shaping our food choices and influencing the budding population of future generation. In addition, advertisements and cooking videos are targeting the younger population by increasing their palatability to taste the particular food devoid of the health concerns. A self -structured questionnaire was framed and responses were collected from the participants who were selected using the random sampling considered the age, types of social media used, their eating habits were considered. This study shows an alarming warning of about 79% of the participants are having a bad food choices influenced from the advertisements and other food delivery apps. Nearly 68% of participants are using all the social media like what's app, face book, you tube and Instagram and 58% were using the social media for about 3hours and more per day.

KEY WORDS: Social Media, Food choices, Advertisement, Eating habits, Palatability.

Introduction:

Social Media is a key for all the questions. Social Media includes face book, snap chat, You tube and other essential communications. Now a days most of the people are using social medias. These days no doubt that adults, especially university student have their own social media accounts on their own accounts. There are beauty influencers, fashion influencers, food influencers, fitness influencers and etc. These influencers initiate trends over the social networks, and play a significant role in shaping the opinions of users on the internet(Qualman,2012). Nowadays, the SMIs also influences the attitude and behaviour of young adults over their dietary choices (Khalid et.al.,2018). When it comes to dietary choices, it is significant to practice a well-balanced diet as bad diet such as consuming junk food, skipping meals, as well as a lack of

adequate diet are known to trigger different health issues. A well dietary choices it is an essential part of life since it may influence long-term health consequences (Ansar et al.,2015). Maintaining healthy diets is a challenge for adolescents (ages 10-19) and young adults (ages 18-5). In recent years, nutrition education interventions have increasingly relied on computing and information technologies, particularly mobile platform and social media. University students are continuously challenged to make healthy food choices. According to the World health Organisation (WHO), more than 1.9 billion adult aged 18 years are overweight, and 650 million were obese (WHO, 2017). Worldwide, in 2018, more than 80% of adolescents and 1 in 4 adults were physically inactive (WHO, 2018). Many factors can affect university students' dietary choices and physical activity levels, including the macro environment, media, and advertising, particularly the advertising of certain types of food (Deliens et al., 2014). Therefore, the current study aimed to determine the impact of social media use on adults' dietary habits and physical activities.

Materials & Methods:

A self-structured questioner was prepared and participants were selected by using the random method. Mostly 16 to 20 aged people gave their response in google forms by using various social media like whatsapp and gmail . This survey is shared through whatsapp and gmail and the responses were collected and analysed. The responses were collected and responses were recorded from Namakkal, Erode and Karur. Among them 84.4% of females and 15.6%of males responded and 53.1% of people were living in rural and remaining 46.9% were living in urban. They expressed their views about social media in influencing their food choices.

Results And Discussion:

Usage Of Social Media:

From this study, it is clearly viewed that 98.4% people using social medias.Social media also addict people. Normally adults of these are using social media more than 3hours per day. People were interested in various sources of social media's.especially Instagram,youtube and whatsapp. As depicted in the Figure-I,54.7% were most interested to see food related advertisements and the rest of them as negligent the advertisements by skipping it in social media apps like instagram,Youtube and Whatsapp.

Food Applications And Junk Food Consumption:

From this study ,it clearly indicates that people were interested to order food via online. And they were get attracted by the colourful advertisements. They were using social medias like zomato and swiggy to order their needed foods. From this survey it is clearly noted that most of

the adults were interested to eat junk foods nearly 45.3%. And some people were interested to eat traditional foods.

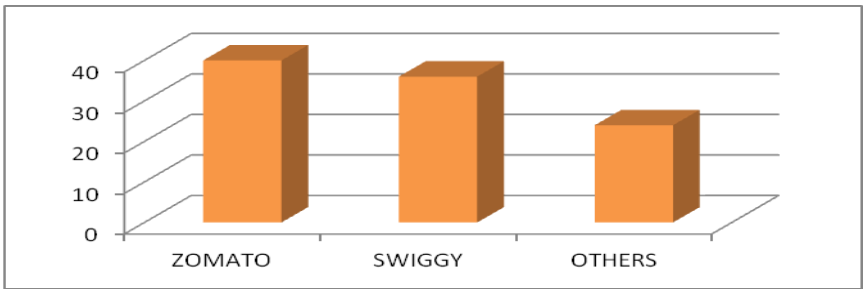

Figure-II - Food Applications

Advertisements And Food Behavior:

Advertisements and paid promotions are sticky topics when it comes to describing their impact on behaviour through social media. Advertisements are designed to trigger an action that will lead you to make a purchase. From this study nearly 54.7% adults are interested to see food related advertisements.

Junk Foods Consumption:

As the table –I depicts, there is a regular consumption of fast foods in a week,and parotta is tend to be higher in consumption of about 35%.The consumption of spicy snacks and pizza is trnd to be equal and consumption of burger tend to be 15%.

TABLE-I Consumption Of Junk Foods

Type Of Junk Foods	Consumption Pattern (%)
Parotta	35
Pizza	20
Burger	15
Spicy Snacks	20
Others	10

Summary & Conclusion:

From this survey it is concluded that people were distracted by social media's and they were changed their food habits. Nowadays slowly the adults are entering into unhealthy dietary life and they become junk food lovers, this leads to grow unhealthy generation.

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Department of Nutrition and Dietetics

FOOD CONSUMPTION PATTERNS AND LIFESTYLE PRACTICES OF ADULTS (18-24 YEARS)

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Abstract:

Food consumption pattern has changed from millenium to millienium,influenced by the knowledge and interest. In this modern world ,adults are highly aware about the different food habits and are interested to taste the different flavors of various countries having the combination flavors of spicy,tangy,salty and highly sugared foods. Food patterns can be defined as the quantities, proportions, variety, or combination of different foods and drinks in diets. In order to find out the significant changes in the food consumption and life style practices of the younger adults who are the incredible citizens of future Nation about to influence the health and the prosperity of the community was done by the adoption of random sampling method of age between 18-24 years. The self structured questionnaire was framed to collect the Food consumption patterns and life style practices of younger adults were collected. Acknowledging the impact that nutrition may have on building societies and transforming the lives of adults and their families. Food patterns, which account for inter-relations of food choices, represent the cumulative exposure to different diet components, and may have stronger effects on health than any single component. On this study about 71% of participants thought that they are following a healthy diet. The key findings were the consumption of fruits and vegetables were very low about 30%, Influence of Social media is higher in the food choices of about 80% among the selected participants. The fond and consumption of Fast foods were high and the exercise were done by the 50% of the selected participants in order to keep themselves fit and healthy.

Key words: Food Pattern, Adults, Health, Nutrition, Food Choices, Diet, Social media

Introduction

This survey investigated a group of students' food consumption patterns that included apart from the number , types of meals and snacking in-between meals, sleeping hours, consumption of salt and sugar, breakfast routine associated with food consumption such as the frequency of consumption of fast foods, home-cooked meals, ready-prepared / convenience meals and type of residence. These often include having to take responsibility for their own food choices and meal patterns (Cluskey et al.,2009).The increasing incidence of overweight and obesity

among young adults due to the nature of their eating patterns is a public health concern globally (Laska et al., 2009) Young adulthood, typically defined as between the ages of 18 and 25 years, is the transition phase from adolescence to adulthood. The lifestyle Practice is changed because of junk food.

Materials And Methods

Self structured questionnaire was prepared and participants were selected by using the random sampling method of ages between (18-24 yrs). The question was shared by various social media platforms like Whatsapp, Instagram and Facebook. The response was collected and analyzed using the Google forms. The participants response were collected from the districts of Salem, Namakkal ,Coimbatore, were collected. There were about 52% of Males and 48% of female participants were responded for this survey.

Results And Discussion:

Food Consumption Pattern:

Through the survey 70.7% were self awareness on eating the healthy food and assured about the healthy food consumption pattern.About 29.3% of were having their eating habits which are highly healthy but due to the personal choices they are opting for the unhealthy food choices like empty carbs and fast foods. 52.4% of adult eats three meals per day and 19.5% of adult eat one meals in a day.They eat only one meal per day it can increase their blood pressure and cholesterol.

Milk Consumption And Junk Food Consumption:

33.8% responded adults consume milk sometimes 35% consume milk daily and 22.5% they didn't consume milk, 8.8%they don't like milk. Milk consumption is recommended by many nutritional guidelines for meeting daily requirements for calcium, animal proteins and vitamin B12 intake. Consumption of snack foods high in fat, sugar and sodium is followed by the one third of the respondents despite of their health concerns .In the diet related survey 63.7% of adult limit the amount of salt and sugar in the diet for their betterment of health. 36.3% of adult were not considered about their sugar and salt intake in their routine diet is given in the Figure-I

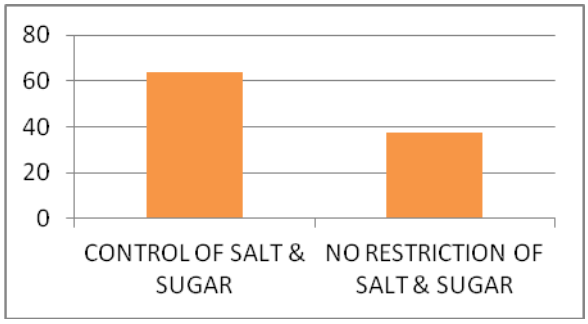

FIGURE-I SALT AND SUGAR INTAKE

Breakfast Routine Among Young Adults:

Multiple studies in adult populations have demonstrated an association between breakfast skipping and obesity in comparison to every day or frequent breakfast consumption (e.g. 5–7 days/week), suggesting the importance of breakfast consumption behavior in relation to weight status(Guiter et al 2019). 6.1% of people are having their breakfast after 3 hours after their wake up. 42.7% eats breakfast with in a hour after they gets up.12.2% are not having their breakfast and skipping their breakfast as a routine.

Fruit Consumption Pattern:

Most of the respondents were aware on the importance of fruit consumption and they have the daily routine of having at least one fruits in a day and 1/3rd of the participants are not consuming fruits on the daily basis. As of the fruits vegetables consumption is estimated to be an average of 50 % is including vegetables on their daily routine in their diet. Vegetables and fruits are the important foods to be included on the diet which provides Vitamins, minerals and dietary fiber is depicted in the Figurre-II

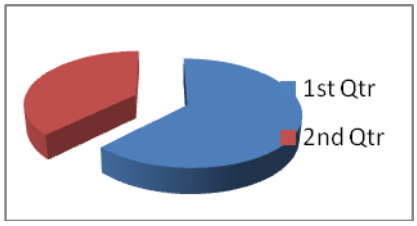

FIGURE II FRUIT CONSUMPTION

Summary And Conclusion

Despite limitations, this study does contribute to filling the knowledge gap around on the food practices of adults. In this work, food consumption patterns represented situations in which breakfast was either eaten or not; snacking between meals; consuming fast foods, home-cooked meals and ready-prepared, convenience type of meals. No statistically significant

differences were found between these food consumption patterns and the students' type of residence or the BMI categories of the male and female students. It is known that certain behaviors are related to a high prevalence of overweight and obesity. Especially important too is the confirmation that this young adult life stage is critical in the shaping of food-related behaviors that will not only affect their own future health, but also that of their future families. Thus the low reported intake of fruit, vegetables and dairy products rises significant concerns as the majority of respondents did not include these items in their daily meal patterns.

Recommendations:

- Anthropometrical assessment is to be done for the significance of BMI and the food habits influencing the health.
- Lifestyle habits should be keenly identified to ensure the correlation of lifestyle habits and the healthy body weight.
- The statistical analysis should be done inorder to identify the correlation of respondents life style habits and their BMI.

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BIODEGRADABLE PACKAGING FOR SHELF-LIFE EXTENSION OF BUTTER

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Abstract:

In India, 6.5% of all milk production is used to make butter, while 27.5 % is used to make other fatty products like ghee. Butter is essentially milk fat that has been obtained through churning. According to our observations, butter has a six-month shelf life between -12^{o}C and -18^{o}C. Butter has a shorter shelf life when the temperature drops. In terms of microorganisms, yeast and moulds are the main microorganisms behind butter spoiling since they create surface discolorations and the formation of unpleasant flavours. Our solution is to create a biodegradable film that contains antifungal agents (lemongrass oil and aloe vera) in various concentrations to prevent the formation of fungus. To stop fungus from growing on the butter's surface, a film will be placed on top of it. Antifungal properties, tensile strength, moisture content, water solubility, and permeability qualities of developed film will be analysed. This antifungal film will be an effective material for preventing the growth of fungi, extending the shelf life of butter, and lowering the price needed for refrigeration as well.

Key words: Butter, Antifungal, Biodegradable film, Fungi

Introduction:

Butter is a fat rich dairy product consisting of about 80% fat. It has good flavor and is frequently used in baking, cooking, and as a spread. It is prepared by separating the cream from milk and then churning the obtained cream. The milk fat membrane breaks during churning, causing all of the milk fat molecules to clump together and leave the liquid portion (butter milk) behind. With more than 400 distinct fatty acids, butter is one of the most complex dietary fats. It has a reasonable quantity of monounsaturated fatty acids (around 25%) but is highly high in saturated fatty acids (about 70%). About 2.3% is made up of polyunsaturated fats. Cholesterol and phospholipids are two other fatty compounds that can be present in butter. Several vitamins, notably fat-soluble ones, are abundant in butter. One tablespoon of butter can provide 11% of the RDI of Vitamin A. Vitamin K2 also known as menaquinone, is a kind of vitamin K that may

guard against osteoporosis and heart disease is present in butter. India was the world's biggest producer of butter in 2020, producing close to six million metric tonnes in total.

Food packaging is a critical medium for food quality preservation, reducing food waste, and lowering the quantity of preservatives used in food. It is categorized into three: primary, secondary, and tertiary. The packaging serves an important function by containing the food, protecting it from chemical and physical damage, and providing important information to consumers. Traditional packaging has limitations, such as not being able to indicate the freshness and quality of packaged food at the time of purchase, and it is difficult to predict whether the product is safe and fit for consumption. The active packaging consists of active ingredients incorporated into the packaging material that helps in extending the shelf life of food, inhibits the growth of microorganisms. It has been observed that, Active packaging helps to maintain temperature, moisture level and microbial and quality control of the food.

Cymbopogon citratus, a perennial grass in the Poaceae family, is grown for its flavor-enhancing, fragrant leaves and stalks. The grass has numerous stiff stems, narrow, blade-like leaves that droop toward the tips, and it grows in thick clumps. The leaves are blue-green in hue by becoming red in the fall. When they are broken, they release a potent lemon scent. When cultivated in the tropics, lemongrass yields substantial compound flowers on spikes, but it rarely blooms when grown in more northern latitudes. Since the bacteria and fungus species were strongly inhibited and eliminated by the lemongrass essential oil. Studies have shown that lemongrass oil has antifungal properties against yeasts of the Candida species (Candida albicans, C. glabrata, C. krusei, C. parapsilosis and C. tropicalis).

Aloe vera is a cactus-like plant that grows in hot, dry climates. It is grown in subtropical places all over the world, including Texas, New Mexico, Arizona, and California's southern borderlands. It also exhibits antibacterial and antifungal property against different species like Staphylococcus sp, Aspergillus sp.

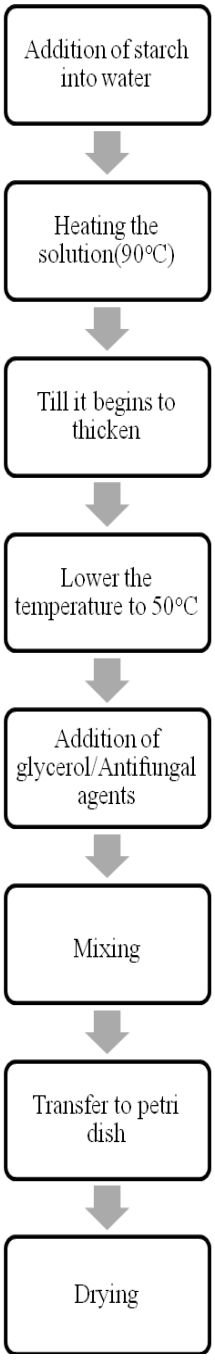
Materials And Methods

Collection of Plant Material:

The raw material such as Corn Starch, Glycerol, Antifungal agents (Aloe vera, lemongrass essential oil) was used for preparing film. Corn Starch and Food grade glycerol was purchased from a local market in Erode, Tamilnadu, India. Lemongrass oil were purchased online.

Preparation Of Biodegradable Film:

Starch of different concentration is added into 100ml of distilled water. The solution is placed on a heater and heated till it reaches 90^{o}C for complete starch gelatinization. The temperature is lowered to 40^{o}C of different concentrations is added. The film forming solution is poured into the Petri plate of uniform thickness and dried in tray dryer at 40^{o}C for 24 hours.



ANALYSIS OF THE FILM:

The properties of film like Tensile strength, Water solubility, Moisture content and colour of the film is analyzed. Antimicrobial properties were also analyzed.

TENSILE STRENGTH:

Tensile strength is an important property of a film to determine their mechanical performance. It is the film's ability to withstand tearing due to an external tension. The tensile strength was measured using the Tensile Strength tester with load cell according to the American society for testing and materials (ASTM) standard method D882-88 (1989). The tensile strength was found by cutting a sample piece of film in the size of 20mm×70mm. Then sample was with hold in between the grips and it was tightened, whereas the top grip was hung on the load cell hook. Before starting the calibration, peak button was pressed. In order to start the machine, the Down button was pressed and then stop button was pressed when the film breaks.

$$\text{Tensile Strength (N/m)} = \text{Average Breaking Force / Width}$$

WATER SOLUBILITY:

The dispersion or resistance of the film structure when contacted with water is referred to as water solubility. A film of sample 20mm diameter was taken. Initial Weight of the sample film was weighed and noted down. Then the sample film was immersed in a certain quantity of water which was covered tightly with an aluminum foil and kept for 24 hrs. Later the sample was carefully taken out and dried in hot air oven at 40°C until constant weight was obtained. After Drying the sample final weight was noted down.

$$\text{Solubility (\%)} = [(\text{Initial weight} - \text{Final weight})] \times 100$$

WATER ABSORPTION:

Water absorption is the ability of film to absorb moisture from its environment. Dried Jackfruit seed starch /curcumin blend films were immersed in distilled water at room temperature for 24 hrs. Moisture on the surface of the films was removed, and the weight of the films was determined.

$$\text{Water absorption } (\%) = [\frac{Wa - Wi}{Wi}] \times 100$$

Where Wa is the weight of the film after absorption and Wi is the initial weight of the dry film.

MOISTURE CONTENT:

Moisture content is the amount or quantity of moisture contained in a material. The films were weighed as m1, then they were dried at 105 ◦C until a constant weight (m2).

$$\text{Moisture content}(\%) = [\frac{m1 - m2}{m1}] \times 100$$

COLOR ANALYSIS:

The colour of the curcumin incorporated film is were measured using colour flex meter from hunter associate laboratory, U.S.A & model: $45/0^{o}$. The hunters colour lab's colour flex Spectro calorimeter gives reading in terms of L*, a*, b* indicating variation in reflection.

L* - represents darkness to lightness and varies from 0-100 (black at 0 and white at 100)

a* - represents greenness to redness with values of -128 to +127

b* - represents blueness to yellowness also with values from -128 to +127.

ANTIMICROBIAL ACTIVITY

Film is prepared with starch (5 g/100 ml) and antifungal agents (lemongrass essential oil and aloe vera) in three different concentrations (0.5%,1% & 1.5%). Butter was streaked onto the MacConkey agar and the antifungal films were cut into uniform discs and placed on top of it.

RESULT AND DISCUSSION:

Initially trials were done to formulate film using corn starch and glycerol. Glycerol was added in the ratio of 40g/100 g starch. It exhibited good tensile strength but with more water absorption and reduced moisture content. Then experimental trials were done with same concentration of starch and glycerol but varying the antifungal agents in three different concentrations. On comparing the three trials, trial 3 had better results in terms of physical, barrier and microbial properties. There no growth of microorganisms for 2 days in all three concentration of petri plates. Then bacteria started to grow in all petri plates, and on 7^{th} day fungi started to appear in 0.5% concentration of lemon grass oil and aloe vera film. There was no growth of fungi till 7^{th} and 10^{th} day on 1% and 1.5% concentration. This indicates that there is some sort of inhibition of fungi species as concentration of antifungal agents increase.

Department of Nutrition and Dietetics

DEVELOPMENT AND STANDARDIZATION OF BEETROOT INCORPORATED RASGULLA

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Abstract:

Rasgulla is a syrupy dessert popular in the Bengal region of the Indian subcontinent. It is made from ball shaped dumplings of chhana and semolina dough, cooked in light sugar syrup made of sugar. Milk and milk products have a good balance of protein, fat and carbohydrates and are a very important source of essential nutrients, including: calcium, riboflavin, phosphorus. Beetroot is a good antioxidant. It is rich in Vitamin C, which helps in absorption of Iron. The ingredients used in the preparation are milk, sugar, beetroot and citric acid. Hence the objectives of this present study are to develop a Rasgulla incorporated with beetroot extract; to analyse the sensory evaluation of Rasgulla incorporated with beetroot extract; and to analyse the nutritive value of Rasgulla incorporated with beetroot extract. The beetroot extract incorporated rasgulla was developed by the ingredients such as milk, sugar, citric acid with beetroot extract. Four variations were prepared by using various proportions. Sensory evaluation was conducted by semi trained panel members and nutrient analysis was done by standard procedures. In this sensory evaluation, variation II was highly acceptable by the panel members. The nutritive value of the developed beetroot incorporated rasgulla shows that 1.41g of Carbohydrate, 0.48g of protein, 10.3 mg of calcium, 0.34g of fat, 0.28g of fibre.

Keywords: Antioxidant, Rasgulla, Sensory evaluation, Sugar syrup

I. **Introduction:**

Rasgulla is a very popular dairy-based sweet across all over India. It is basically a sweetened syrupy cheese ball which is white in color (mainly) has a very soft texture and excellent taste. Rasgulla is a syrupy dessert popular in the Bengal region of the Indian subcontinent (Tesoriere et al. ,2003). It is made from ball shaped dumplings of chhana and semolina dough, cooked in light sugar syrup made of sugar. Milk and milk products have a good balance of protein, fat and carbohydrates and are a very important source of essential

nutrients, including: calcium, riboflavin, magnesium, zinc, phosphorus and thiamine. It is also a great source of Vitamin A and Vitamin D. Milk is very high in B12. It is also rich in riboflavin (vitamin B2) and phosphorous, which plays an important role in many biological processes. It has been suggested that some milk peptides have antihypertensive effects, both by inhibiting angiotensin-converting enzyme. Milk contains a wide array of proteins with biological activities ranging from antimicrobial ones to those facilitating absorption of nutrients, as well as acting as growth factors, hormones, enzymes, antibodies and immune stimulants (Pan XL, Izumi T 2000) Milk contains two different types of proteins namely casein and whey protein. The casein content of milk represents about 80% of milk proteins. Casein's biological function is to carry calcium and phosphate and to form a clot in the stomach for efficient digestion. Whey protein is rich in amino acids such as leucine, isoleucine, and valine. Beet root, scientifically known as Beta vulgaris (L) is one of the well-known plants belonging to the family Chenopodiaceae Beetroot contains Betalain pigments, which are water – soluble, nitrogen containing pigment, found in high concentration in red beet. Betalain pigments are very good antiviral, anti-oxidant, anti-inflammatory and antimicrobial component. (Zakharova & Petrova 1998) It is rich in Vitamin C, which helps in absorption of Iron. Beetroots are a great source of fiber, folate (vitamin B9), manganese, potassium, iron, and vitamin C. Beta vulgaris var. rubra revealed significant tumor inhibitory effects in skin and lung cancer (Kapadia et al., 1996). It makes an excellent dietary supplement being not only rich in minerals, nutrients and vitamins but also has unique phytoconstituents, which have several medicinal properties. Beetroot significantly reduces systolic and diastolic blood pressure. The ingredients used in the preparation are milk, sugar, beetroot extract and citric acid. Citric acid is used for curdling the milk. Citric acid gives slight sour taste to the rasgulla. Citric acid has protective effects in the body. Citric acid used in medicine can kill bacteria and lower the acid in urine

Objectives: 1. To develop a Rasgulla incorporated with beetroot extract; 2. To analyze the sensory evaluation of Rasgulla incorporated with beetroot extract; and 3. To analyze the nutritive value of Rasgulla incorporated with beetroot extract II.

Materials And Methods: 2.1 Selection and collection of ingredients Rasgulla was selected because of its high demand among all age groups. Beetroot extract has high nutritional value. The ingredients used for development of Beetroot extract incorporated

rasgulla were fresh full cream milk procured from Aavin (Tamil Nadu Dairy Farm). The milk is converted to paneer using citric acid crystals from Eagle. The sugar used was purchased from Parry's White Label. The beetroot used was purchased from local market. Dough is kneaded well Add the balls in sugar syrup Make small balls from the dough 2.2 Preparation of beetroot extract incorporated rasgulla Initially, Milk is heated at 70ºC Add few of citric acid Drain the excess water from milk Tied tightly in a cloth for further removal of water. Boil in it for 10 minutes and cool down to room temperature 2.3 Development and standardisation of beetroot extract incorporated rasgulla Developed by using sugar, milk, Beetroot extract and citric acid. The beetroot extract incorporated Rasgulla was developed using 4 variations

Iii. Result And Discussion:

The result of the present study pertaining to the following title "Development and Standardization of Beetroot extract incorporated Rasgulla" have been discussed under their various sensory aspects such as appearance, colour, texture, flavour, taste and nutrient content of selected and best product

Conclusion:

From the present study, it is concluded that the Rasgulla incorporated with 10 g beetroot extract was developed and accepted by the semi-trained panel members. The developed product is rich in nutrients like calcium. The formulated product is very cost effective and mostly liked by all age groups from the present study, it is concluded that the Rasgulla incorporated with 10 g beetroot extract was developed and accepted by the semi-trained panel members. The developed product is rich in nutrients like calcium. The formulated product is very cost effective and mostly liked by all age groups.

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DEVELOPMENT AND SUBJECTIVE EVALUATION OF WOOD APPLE JAM

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Abstract

The bulk of the population in the country has limited access to fruits due to their seasonality and the lack of suitable storage and processing facilities. Fruit jams make a better bread spread than any other food product because they provide a balanced diet and antioxidants like vitamin C and A, which are crucial for avoiding cancer, cardiovascular disease, and improving vision. The study's goal is to use wood apple to manufacture preserved goods. The cheaper, more nutrient-dense, readily perishable, and seasonally available wood apple was chosen for preservation for human consumption all year long. Therefore, several degrees of combining wood apple and sugar were used at (50 & 50%), (45 & 55%), and (40 & 60%). The product's proximate composition and organoleptic evaluation were both examined. Overall, it can be concluded that jam with good sensory qualities and nutritional value can be made by combining sugar and wood apple in a 50:50 ratio.

KEYWORDS: wood apple, jam, jam process

I.Introduction:

Jam, jellies, fruit bar and preserves are manufactured as one of the important fruit by product in industries and based upon the high solids-high acid principle. Not only are such fruit concentrates an important method of preserving fruits, but it is an important utilization of fruits. In addition to the pleasing taste of such preserved fruits, they possess substantial nutritive value also. Jams are of two kinds one prepared from a single fruit and another is prepared from a combination of two or more fruits **(Manay and Shadaksharaswamy, 2005).**

The Wood apple (Limonia acidissima) is the only species of its genus, in the family Rutaceae. Another related species, Feronia limonia popularly known as kathbel (elephant apple) is a highly demanding fruit. The wood apple is native and common in

dry plains of India and Ceylon. Wood apple is used in the preparation of chutneys and for making jelly and jam. **(Morton, 1987).**

Wood apple has got high medicinal value. Every part of the fruit has got medicinal property. The Fruit is much used in India as a liver and cardiac tonic and when unripe, as a means of halting diarrhea and dysentery and for effective treatment for hiccough, sore throat and disease of the gums **(Anonymous, 1996).**

Wood apple fruits contain an innumerable number of phytochemicals such as polyphenols, vitamins, saponins, coumarins, amino acids, tri-terpenoids, phytosterols, tannins, tyramine derivatives, etc. **(Dar et. al., 2013).**

Wood apple is known to possess excellent amount of nutrients which many. Fruit is lacking. It is having significant amount of Vitamin A, Vitamin B1 and Vitamin B2. It has trace amount of vitamin C as well **(Poongodi et. al., 2013).**

II.OBJECTIVES:

- To develop and characterize the wood apple jam.
- To evaluate / analyze the proximate composition of the developed jam.
- To analyze the sensory attributes of the developed jam.
- To evaluate the cost calculation of developed jam.

III.MATERIALS AND METHODS

3.1 Selection of ingredients

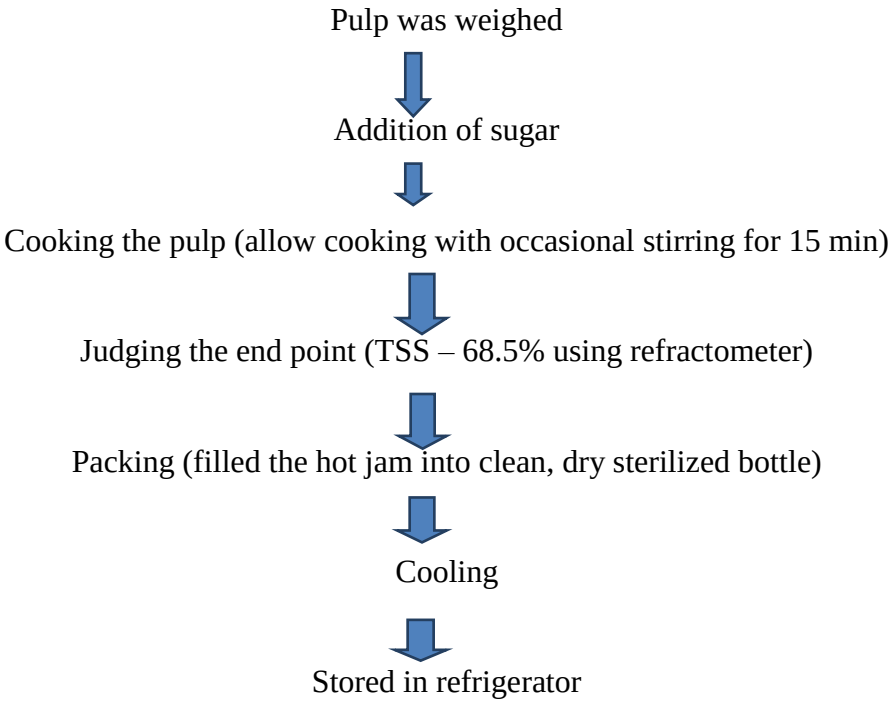
The following are the ingredients which I have selected for the preparation are wood apple and sugar which are bought from local market in Namakkal. Wood apple is excellent source of energy. It also has a good Mixture of vitamins and minerals including calcium, iron, phosphorus, carotene, Thiamine, riboflavin and niacin.

3.2 Processing of ingredients

Sorting and grading is essential to get suitable quality of fruit which was done by hand. The fruits were first washed to remove the dirt. From the graded wood apple the pulp was extracted manually. It was homogenized in a mixer to obtain fine pulp. Jam is prepared by boiling the fruit pulp with sufficient quality of sugar to a reasonably thick consistency, firm enough to hold fruit issues in position.

3.3 PREPARATION OF WOOD APPLE JAM

Selection and preparation of fruit



3.4 Standardization Of Wood Apple Jam

Standardization was done to obtain reproducible results. The ingredients were selected for development of jam by adding wood apple and sugar was formulated into three different variations.

Table no:3.1 standardization of wood apple jam

S.NO	INGREDIENTS	VARIATION I	VARIATION II	VARIATION III
1.	Wood apple (gm)	50	45	40
2.	Sugar (gm)	50	55	60
	Total (gm)	100	100	100

In the present study, the varying proportions of wood apple and sugar is developed in the proportion of (50,50)

3.5 Sensory Analysis Of Developed Jam

Sensory quality is combination of different sense of perception coming into play in choosing and eating a food. Appearance, flavor, mouth feel decide the acceptance of the food. **[Sri Lakshmi, 2010]**

The recipes prepared using all the variations were subjected to organoleptic evaluation for its quality attributes like appearance, color, texture, taste, flavor, and overall acceptability using 5point hedonic scale where, 1-Poor, 2- Fair, 3. Good, 4. Very good, 5. Excellent. A total 25 semi trained panel members were used in this study. The variation which was most acceptable among the recipe was selected and used for further analysis of nutrient content and cost effectiveness.

IV. RESULT AND DICUSSION

4.1 ORGANOLEPTIC EVALUATION OF DEVELOPED WOOD APPLE JAM

Table no: 4.1 Organoleptic evaluation of developed wood apple jam

CRITERIA	VARIATION -I	VARIATION-II	VARIATION-III
Appearance	4±0.8	4±0.8	4±0.8
Color	4± 0.8	4± 0.9	4± 0.8
Taste	5± 0.8	4±0.8	4±0.9
Texture	4± 0.8	4±1	4 ±1
Overall Acceptability	4±0.7	4± 0.6	4± 0.7

From the above table, in terms of appearance, the variation-1 has scored (4±0.8), variation-2 has scored (4±0.8) and variation-3 has scored (4±0.8). In terms of color, variation-1 has scored (4±0.8), variation-2 has scored (4±0.9) and variation-3 has scored (4±0.8). In terms of taste, the variation-1 has scored (5±0.8), variation-2 has scored (4±0.8) and variation-3 has scored (4±0.9). In terms of texture, variation-1 has scored (4±0.8), variation-2 has scored (4±1) and variation-3 has scored (4±1). The overall acceptability of variation-1 has scored (4±0.7), variation-2 has scored (4±0.6), and variation-3 has scored (4±0.7). Compare to all other variations the variation-1 secured highest mean score for taste. So, it was selected for further study.

4.2 Nutritional Composition Of The Developed Jam

The nutrients like Carbohydrate, Protein, Fat, Fibre, phosphorous, calcium are calculated for the selected wood apple, sugar are selected in the form of 50g and 50g respectively.

S.no	Ingredients	Quantity	Energy (Kcal)	CHO (g)	Protein (g)	Fat (g)	Fibre (mg)	Phosphorous (mg)	Calcium (mg)
1.	Wood apple	50g	39.08	3.76	1.57	1.81	2.61	42.16	27.86

2.	Sugar	50g	200	50	_	_	_	_	_
	Total		**239.08**	**53.76**	**1.57**	**1.81**	**2.61**	**42.16**	**27.86**

Table no: 4.2 Nutritional Analysis

The nutrient content of the developed wood apple is different for each variation. variation I has high amount of nutrients than other variations. It contains 53.76gm of carbohydrate, 1.57gm of protein, 1.81 gm of fat, 27.86 mg of calcium, 42.16 gm of phosphorous and 2.61gm of fiber.

V. Packaging Of Wood Apple Jam

Package design and construction plays a significant role in determining the shelf life of the good product. The right selection of packaging materials and technique maintains the product quality and freshness during distribution and storage. Materials that have traditionally been used in food packaging include glass, metals, aluminum foils and laminates, tinplate and tin-free steel, paper and paperboards and plastics. Moreover, wider varieties of plastics have been introduced in both rigid and flexible forms. Today's food packaging often combines several materials to exploit each material functional or aesthetical property.

The principle role of food packaging is to protect from outside influences and damages, to contain the food and to provide consumers with ingredient and nutritional information. Until now, packaging has been presented in different contexts in marketing.

- Packaging as an instrument of marketing jam.
- Packaging in relation to a product, price, distribution and promotion.
- Functions and values of packaging in relation to the needs and requirements of consumers.
- Packaging in the strategy of the product.
- Packaging in a promotion strategy (advertising, basics for promotion, an element of the design).
- Packaging and its design as a source of emotion and experience of consumer packaging as a platform of information and education for consumers.

VI. Labelling Of Wood Apple Jam

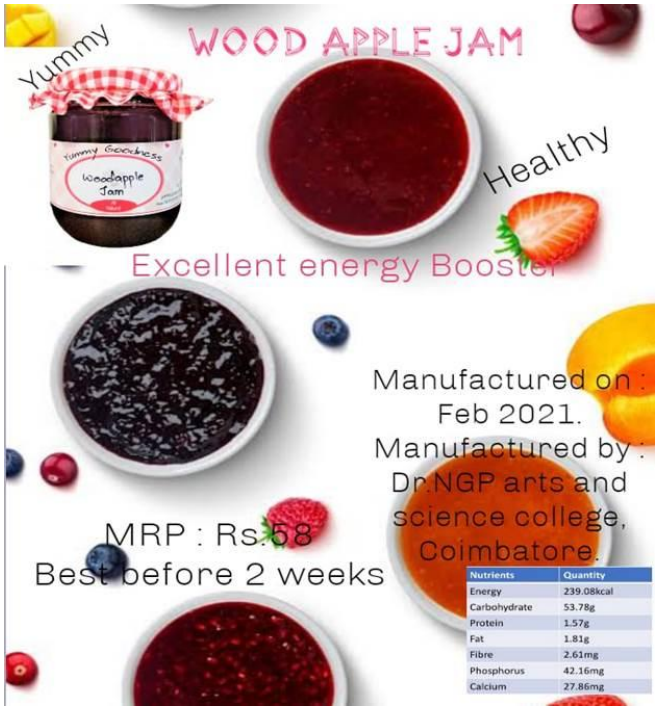
According to food safety and standards (labeling) regulation:-

Mandatory information:

- Name of the product
- List of ingredients

- Nutritional information
- Name and complete address of the manufacturer
- Net quantity
- Batch number
- Date of manufacture or packaging
- Best before and use by date
- Instruction for use
- Vegetarian or non-vegetarian symbol

The companies are strictly following the mandatory rules of FSSAI on their products.



VII. Conclusion:

Wood apple jam is good source of energy, carbohydrate, protein, fibre, vitamins and minerals. Variation-1 is highly acceptable compared to variation-2 and variation -3. On the basis of obtained result it could be concluded that taste and texture of wood apple jam is highest among other physical parameters. The sensory characteristics were most acceptable according to the consumer preferences which authenticates it would be a healthy and nutritious product for children, adolescents and adults.

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CHARACTERISATION AND ENUMERATION OF BIO BASED ACTIVE PACKAGING FILM FROM ORANGE PEEL

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Abstract

The aim of this study was to characterize edible films developed from the pectin extracted from orange peel. Edible films and coatings have received considerable attention in recent years because of their advantages including use as edible packaging materials over synthetic films. This could contribute to the reduction of environmental pollution. New materials have been developed and characterized by scientists, many from abundant natural sources that have traditionally been regarded as waste materials. Pectin is a natural product which can be found in the cell walls of all higher plants and it has long been used for its gel formation, thickening and stabilizing properties in a wide range of applications from food to the pharmaceutical and cosmetic industries. An orange, specifically, the sweet orange (Citrus sinensis (L.) is the most commonly grown tree fruit in the world. The films developed from this pectin were tested with several parameters like property analysis includes solubility, Thickness, Degree of swelling, Water vapor permeability, Puncture test, Moisture content, Moisture permeability and the characterization of the film with Scanned Electron Microscope and Fourier Transform Infrared Spectroscopy analysis. The functional groups present within the biofilms were determined Fourier Transform Infrared Spectroscopy. The surface topographic image of the films, quantification of the minerals and the composition present were analyzed by Scanned Electron Microscope. Key Words – orange peel, pectin, films, characterization

Introduction:

Edible films are defined as a thin l Edible films are defined as a thin layer of material that can be consumed and provides a barrier to moisture, oxygen, and solute movement for the food. They provide barrier and protection, while enhancing quality and

safety of food products (Bourtoom, 2008). The fact that edible packaging systems are an inherent component of the food product and may be consumed without having to open and discard the packaging makes them preferable to synthetic packaging systems. These films also frequently contain edible and renewable materials, giving them the significant advantages of being biodegradable and environmentally benign. They are not yet meant to replace conventional packaging, in fact they are currently used with no-edible materials to protect and improve food shelf life (Janjarasskul and Krochta, 2010). Citrus fruit peels, which are typically thrown away as garbage, contain important natural polymers that can be transformed into biodegradable films for food packaging thanks to the presence of pectin and the durability of cellulosic fibres. Pectin has received a lot of attention for use in food packaging, mostly because it is non-toxic, edible, and biocompatible. Pectin makes up 30% of the peels of citrus fruits, according to research. This biodegradable packaging can take the role of single-use plastics, which have negative environmental effects such as long-term degradation and harm to the natural ecosystem. Biopolymers, which are macromolecules frequently present in living creatures, are used to create biodegradable packaging. Citrus waste is a globally abundant, environmentally problematic, and underutilized waste. Pectin, soluble sugars, hemicelluloses, cellulose, starch, protein, lignin, ash, fat, and flavonoids are other elements of orange wastes that have been proven to be helpful in a variety of improper disposal and recovery applications. On the other hand, these components might be useful for bioplastics applications However, it is expected that more studies will address the practical applications of edible films and coatings within the food industry.

OBJECTIVES: \

- To utilize the valuable natural bio polymers, present in orange peel which are considered as bio waste.
- To obtain the bio active and environmentally friendly packaging films.
- To discover underutilised eco-friendly sources for biofilm production.

METHODOLOGY

A. Extraction of pectin from the orange peel

B. Preparation of the solvent suspension (Aqueous solution)

C. Casting of the aqueous solution

D. Drying of the film E. Property analysis of the Bio Film

F. Film Characterization

Results And Discussion:

Property Analysis Of The Bio Films

The results of properties of pectin-based bio films that has evaluated by the testing parameters

VARIATION – 1 (Pectin: Starch – 1:0.25) Glycerol – 10 ml

VARIATION –2 (Pectin : starch – 1: 0.5) Glycerol – 25 ml

VARIATION – 3 (25 ml of Glycerol) Pectin – 25 g; Starch – 25 %

VARIATION – 4 (10 ml of glycerol) Pectin – 25 g; Corn – 25% SOLUBLITY Solubility is the first parameter determined According to Irissin-Mangata et al. (2001).

From the table 3 and it reveals that the solubility of the film is higher in the variation wherehigher amount of glycerol concentration is used. From the table II it is evident that the results obtained for the Variation 1(V1) of Pectin films in triplicates V1A, V1B, V1C showed 5.55, 6.01, 6.10 of solubility respectively. The variation 2 (V2) of pectin films in triplicates V2A, V2B, V2Cshowed 9.74, 8.53, 9 of solubility respectively. The variation 3 (V3) of pectin films in triplicates V3A, V3B, V3C showed 10, 9.74, 9.62 of solubility respectively. The variation 4 (4) of pectin films in triplicates V4A, V4B, V4C showed 7.08, 5.64, 7.22 of solubility respectively. N. B. Faria-Junior et al (2013) stated that the High solubility may relate to the anti microbial activity of these materials.

Summary And Conclusion

Food packaging gives protection to both food and environment which plays a major role during various parts of the food supply chain. Biodegradable or active packaging is potential alternative for the plastics which gives harm to the environment and also sometimes prevent incident of packaging material react with the food. Biopackaging is the packaging made of renewable materials which are compostable. Advanced packaging systems have been developed in order to protect the product and extend its stability. This type of packaging is known as active packaging. Development of new active packaging materials has rapidly increased in the last few years. Biodegradable packaging can be broken down by the microorganisms like bacteria and fungi by the natural processes. Biopolymers are long chain compounds made up of long chain molecule subunits. There are many bio degradable polymers exist like starch, cellulose, PolyLactic Acid, Polyhydroxy Benzoic

Acid and Polyhydroxybutarate -hydroxyvalerate, PolyCaproLactone, PolyHydroxyAlkanoates. Biopolymers are present in the plant cell walls which are categorized in to three, firstly the polymers which directly extracted or removed from the bio mass like proteins. Secondly polymers produced by classical chemical synthesis using renewable biobased monomers. And thirdly are the polymers produced by microorganisms. Bio packaging and active packaging can be synthesized and used in a more functional way such antimicrobial coating, encapsulation with nutrients, antimicrobials and antioxidants. Hence the present study is a small foot print in the path of innovation at affordable cost with the objectives to, prepare Eco friendly packaging films aimed at producing the bio degradable and active packaging films by the natural pectin extracted from orange peel. Films were tested with several parameters like property analysis includes solubility, Thickness, Degree of swelling, Water vapor permeability, Puncture test, Moisture content, Moisture permeability 37 and the characterization of the film with Scanned Electron Microscope and Fourier Transform Infrared Spectroscopy analysis.

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DEVELOPMENT OF CHIKKI INCORPORATED WITH QUINOA SEEDS

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Abstract

Brittle is commonly known as chikki. In present study the utilization of quinoa seeds, white sesame seeds and cucumber seeds is carried out in chikki to evaluate the acceptance of consumers. The aim of the study is to develop the product rich in energy, gluten-free and high fibre. This attempt is taken to formulate the product to improve the nutritive value of the product. In this study three variations of quinoa chikki are formulated by using the following ingredients are quinoa seeds (50,45,40%),sesame seeds (30,25,20%) and jaggery (20,30,40%) and are subjected to Organoleptic evaluation , the selected variation is chosen for the quality analysis. The sensory analysis is done for all three variations were evaluated, but the variation-III gives the highest mean score are (4±0.9) for color, (4±1) for taste, (4±0.6) for texture, (4±0.8) for appearance, (4±0.6) for overall acceptance. The 100g of quinoa chikki contains, Energy-375kcal,Carbohydrate-56g,Protein-10g, Fat-11g and Fibre-10g.The selected combination of chikki was appealed to have good taste, low cost of production and better nutritional value .So it can be used as a alternative for healthy indigenous sweet and snacks.

Key words: Quinoa seed, Chikki, Indigenous sweet.

I Introduction

India with divergent food habits is having a number of traditional foods, including sweet products. Chikki is the popular Indian traditional sweet snacks. Chikki is prepared by using roasted peanuts or sesame seeds and jaggery sweetener. Sweets with jaggery are gaining popularity due to the awareness of its health benefits. (FAO, 2002)

Cereals can be defined as a grain or edible seed of the grass family, *Gramineae* (Bender DA, 1999). Cereals are grown for their highly nutritious edible seeds, which are often referred to as grains. Cereals are the most important sources of food (FAO, 2002), and cereal-based foods are a major source of energy, protein, B vitamins and minerals for the world population.

There are different varieties of chikki in addition to the most common peanut chikki. Special chikki are made out of cashew nuts, Almonds and pistachio. The chikki prepared with

added sodium bicarbonate were lighter, more yellow than other products (McKee et al. 2003). The process of making chikki with added soda was patented (Shelesky and Anderson 2000).

Peanut chikki, peanut and sesame seed chikki and peanuts and spices mixed with Bengal gram meal were developed. And evaluated the sensory and nutritional properties with regard to their and use as nutritional supplements for school children (Chahal and Sehgal 1996). This attempt was made to further enrich with nutraceuticals by incorporating quinoa seeds.

Quinoa is a flowering plant in the amaranth family. It is a herbaceous annual plant grown as a crop primarily for its edible seeds; the seeds are rich in protein, dietary fiber, B vitamins, and dietary minerals in amounts greater than in many grains. Quinoa grain is a pseudocereal of the *Chenopodiaceae* family and is appreciated for its significant contribution to good nutrition and as a weaning food (Caperuto et al., 2000). The quinoa grain is high in protein and contains essential amino acids, especially lysine. It is also an excellent source of lipids, fiber, and minerals (calcium, magnesium, iron, copper, and zinc). The quinoa grain is rich in polyphenols (Vega-Galvez et al., 2010).

The nutritional quality of quinoa is well recognized. The protein content ranges 13–17g/100g,with an amino acid score above 1.0 and it is gluten free. The grain contains starch and free sugars, with a glycemic index ranging from 35–53.The glycemic was depend on the cooking time.It also contains bioactive phytochemicals such as dietary fiber, carotenoids, phytosterols and squa-lene.(Mariane Lutz., et.al .,2017)

The rationale for the reintroduction of quinoa into the diet is strongly related with the epidemiological situation prevailing, which is similar in many nations around the world: growing rates of child obesity, high prevalence of obesity during/after pregnancy in women, high rates of NCD such as cardiovascular, diabetes, cancer, which are associated with the major causes of death. .(Mariane Lutz., et.al .,2017)

Jaggery is the natural sweetener containing protein, minerals, vitamins, iron and copper (Manay and Swamy, 2001). The jaggery is most common sweetener, used during the preparation of chikki, sugar can also be used as a base sweetener in certain types of chikki, of which glucose is commonly used in chikki (Kundu and Sarkar, 2017).

Jaggery is obtained by concentrating sugar cane juice to solid state. It is a natural sweetener with sweet winy flavour (Shahi 1999) and contains protein, minerals and vitamins and is a potent source of iron and copper (Manay and Swamy 2001).

Cucumber, [*Cucumis sativus L*, (2n=2x=14)], belongs to the *Cucurbitaceae* and it is indigenous to India. The cucumber fruit is rich in minerals, thiamine, niacin and vitamin C. Fruit consist about 80% edible portion, which contains 95% water, 0.7% proteins, 0.1% fats, 3.4% carbohydrates, 0.4% fibers and 0.4% ash. It is useful for people suffering from jaundice and allied diseases as well useful in preventing constipation. Among cucumber fruits, the peel and seeds are the most nutrient-dense part, contain phyto-nutrients, fibre and antioxidants, helps immunity and prevent cancer. The seeds contain oil, which is helpful for brain development and smooth body; it is also being used in ayurvedic preparations (Robinson and Decker-walter, 1999).

II Objective

- To develop the white sesame Chikki incorporate with quinoa**;**
- To optimize the composition of ingredients of the cereal incorporated of the developed chikki;
- To analyze the sensory attributes of the developed Chikki and
- To evaluate the nutrient calculation of the formulated Chikki.

III Materials And Methods

3.1 Selection of ingredients

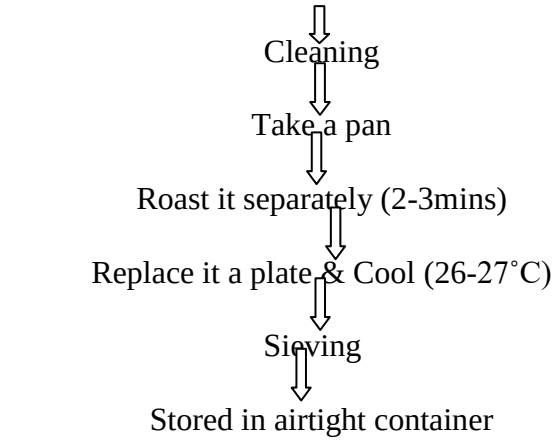
Quinoa seeds, it is a good source of plant protein, gluten-free and fiber. (Vega-Galvez et al., 2010). White sesame seeds, rich in copper and iron. Cucumber seeds rich in minerals. Jaggery is an excellent source of pant based iron. (Manay and Swamy 2001) .All were purchased from D-mart departmental stores in Coimbatore.

3.2 Processing of ingredients

All the raw ingredients were washed away in the running water to remove the sand, stone and foreign matters. All the ingredients were roasted separately, cooled and kept in a airtight container.

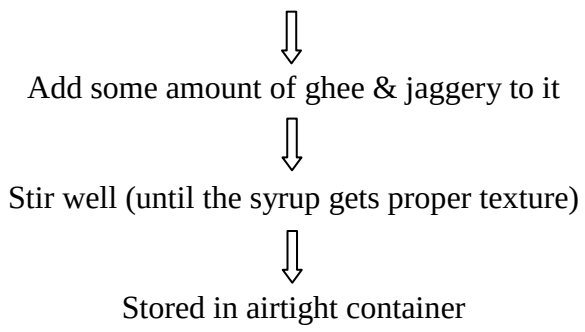
3.3 Preparation of quinoa seeds, white sesame seeds and cucumber seeds

Figure 3.3 Preparation of quinoa seeds, white sesame seeds and cucumber seeds



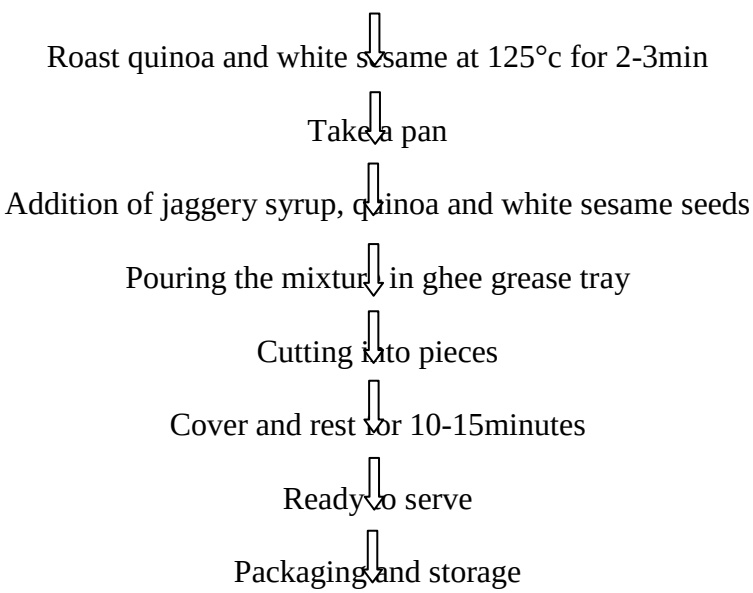
3.4 Preparation of Jaggery Syrup

Figure 3.4 Preparation of Jaggery Syrup



3.5 Development of Quinoa Chikki

Figure 3.5 Development of Quinoa Chikki



3.6 Standardization of Quinoa Chikki

Table 3.6 Standardization of Quinoa Chikki

S.No	INGREDIENTS	VARIATION-1	VARIATION-2	VARIATION-3
1.	Quinoa seeds(g)	50	45	40
2.	White sesame seeds(g)	30	25	20
3.	Palm jaggery(g)	20	30	40

In the present study, the varying proportions of quinoa seeds and white sesame seeds was incorporated for the development of quinoa chikki in the proportion of (50g, 30g, 20g) and with addition of cucumber seeds and ghee.

3.7 Sensory Analysis of Formulated Product

Sensory evaluation consists of judging the quality of food by a panel of judges. The evaluation deals with measuring, analyzing, and interpreting the qualities of food, as they are perceived by the senses of sight, taste, touch, and hearing. By the sense of sight, the size, shape and colour of foods, and other characteristics, such as transparency, opaqueness, turbidity, dullness and gloss, can be perceived (N.Shakuntala Manay, 2008).

The recipes prepared using all the variations was subjected to organoleptic evaluation for its quality attributes like appearance, colour, texture, taste, flavour and overall acceptability using 5 point hedonic scale 5- excellent, 4- very good, 3- good, 2- fair, 1- poor. A total of 25 semi trained panel members were used in this study. The variation which was most acceptable among the recipes was selected and used for cost effectiveness.

Iv Result And Discussion

4.1 Organoleptic Evaluation of Formulation of Chikki Incorporation With Quinoa Seeds

Table 4.1 Organoleptic evaluation of formulation of chikki incorporated with quinoa seeds

CRITERIA	VARIATION-1	VARIATION-2	VARIATION-3
APPEARANCE	4±0.8	4±0.9	4±0.8
COLOR	4±0.8	4±0.9	4±0.9
TASTE	4±1	4±0.7	4±1
TEXTURE	4±0.9	4±0.8	4±0.6
OVERALL ACCEPTABILITY	4±0.6	4±0.7	4±0.6

From the above table, in terms of color, the variation-1 has scored (4±0.8), variation-2 has scored (4±0.9) and variation-3 has scored (4±0.9). In terms of taste, variation-1 has scored (4±1), variation-2 has scored (4±0.7) and variation-3 has scored (4±1).In terms of texture, the variation-1

has scored (4±0.9), variation-2 has scored (4±0.8) and variation-3 has scored (4±0.6). In terms of appearance, variation1 has scored (4±0.8), variation-2 has scored (4±0.9) and variation-3 has scored (4±0.8). The overall acceptability of variation-1 has scored (4±0.6), variation-2 has scored (4±0.7), and variation-3 has scored (4±0.6).Compare to all other variations the variation-2 secured highest mean score for overall acceptability. So, it was selected for further study.(for bargraph you have to give the name of the graph and figure number should be given).

4.2 Nutritional Analysis of the Formulated Product

Table 4.2 Nutritional analysis of the formulated product

S. No	Food Item	Quantity	Energy (Kcal)	CHO (g)	Protein (g)	Fat (g)	Fibre (g)	Calcium (mg)	Magnesium (mg)	Omega-3 fatty Acids (mg)
1.	Quinoa Seeds	45g	147.7	24.14	5.9	2.4	6.6	89.1	53.55	91.8
2.	White Sesame Seeds	25g	103.9	2.17	4.34	8.6	3.4	256.6	372	24
3.	Jaggery	30g	123.8	29.7	0.06	0.06	-	37.45	40.25	-
	Total	100g	375.5	56.01	11.15	11	10	383.1	465.8	115.8

The ingredients of the formulated product are checked for different nutritional analysis, different quantity of food items are analysed for different nutritional properties .45g of quinoa seeds ,25g of white sesame seed and 30g of jaggery are taken respectively in the formulation of the product. Different nutritional values are obtained with 375.5kcal of energy,56.01g of carbohydrate,11.15g of protein,11g of fat,10g of fibre,383.1mg of calcium,465.8mg og magnesium and 115.8g of omega-3 fatty acids.

V Packaging Of Quinoa Chikki

Package design and construction plays a significant role in determining the shelf life of the good product. The right selection of packaging materials and technique maintains the product quality and freshness during distribution and storage. The materials that have traditionally been used in food packaging include glass, metals, aluminium, foils and laminates, tinplate and tin-free steel, paper and paperboards and plastics. Moreover, wider varieties of plastics have been introduced in both rigid and flexible forms. Today’s food packaging often combines several materials to exploit each materials functional or aesthetical property.

The principle role of food packaging is to protect from outside influences and damages, to contain the food and to provide consumers with ingredient and nutritional information. Until now, packaging has been presented in different contexts in marketing.

- Packaging as an instrument of marketing mix.
- Packaging in relation to a product, price, distribution and promotion.
- Functions and values of packaging in relation to the needs and requirements of consumers.
- Packaging in the strategy of the product.
- Packaging in a promotion strategy (advertising, basics for promotion, an element of the design).
- Packaging and its design as a source of emotion and experience of consumer packaging as a platform of information and education for consumers.

5.1 Polyethylene Packing:

Chikki stored in low density polyethylene bags (LDPE) showed good quality characters than that stored in polypropylene pouches (PP). The chikki samples remained in good condition at ambient temperature during storage period of 3 months.

The quinoa chikki packed in polyethylene packing and then it is sealed. To ensure that the pack is free from the air it is checked for twice and then it is packed. If there is any air or oxygen it may lead to easy spoilage. By storage of packed product the shelf life also get increased.

Vi Labelling Ofchikki Incorporated With Quinoa Seeds

According to food safety and standards (labelling) regulation:- Mandatory information:

- Name of the product
- List of ingredients
- Nutritional information
- Vegetarian or non-vegetarian symbol
- Name and complete address of the manufacturer
- Net quantity
- Batch number
- Date of manufacture or packaging
- Best before and use by date
- Instruction for use

The companies are strictly following the mandatory rules of FSSAI on their products

CONCLUSION:

Quinoa chikki is a good source of energy, carbohydrates, protein, fibre, B-vitamins and antioxidants. Variation – 2 is highly acceptable. The appearance and the texture of quinoa chikki is highest among all the physical parameters. It would be a healthy and nutritious snack for children, adolescents and adults. Disease conditions like Celiac disease, Obesity, Type-2 Diabetes, Cancer and dyslipidemia patients can consume quinoa chikki because it is gluten-free.

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DEVELOPMENT AND ACCEPTABILITY OF *Clitoria ternatea* INCORPORATED TEA

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Clitoria ternatea (Sangu Poo) commonly known as Butterfly Pea Flower and Cocos is an evergreen climber belonging to the Fabaceae family. It is also rich in anthocyanins (ternatins), and antioxidant compounds so that it has unique colour. Objectives of this present study is to develop tea from *Clitoria ternatea;* to perform the sensory analysis in the developed tea; and to evaluate the nutrient and phytonutrient content present in developed tea. Initially *Clitoria ternatea* plucked from the home garden and subjected to shadow drying for about 4 days. These petals are ground into powdered form along with a few cardamon and mint leaves. The processed ingredients made into tea in various proportions, by boiling it in water along with required amount of sugar. Further sensory analysis was done by the semi trained panel members and the nutrient composition (AOAC method) were done by standard procedures. Phytochemicals such as flavonoids, alkaloids, terpenoids, anthocyanins, tannin, saponins, anthroquinone. Results revealed that the *Clitoria ternatea* incorporated tea variation III is highly acceptable contains 10.7 gm of carbohydrate, 3 gm of protein, calcium (2.5mg), ascorbic acid (1.11mg), phosphorous (0.57- 2.9 mg), iron (1.7 mg). Phytochemical composition of the develoloped *Clitoria ternatea* tea shows the presence of flavanoids, terpenoids and anthocyanins. This may help to reduce the oxidative stress and it may act as an anticarcinogenic agent.

Keywords: *Clitoria ternatea*, Anthocyanins, Phytochemicals, Anticarcinogen

Introduction:

Clitoria ternatea (Sangu Poo) commonly known as Butterfly Pea Flower and Cocos is an evergreen climber belonging to the Fabaceae family. It is recognised by its vibrant blue colour. It is rich in anthocyanins, which are the antioxidant compounds responsible for its unique color. For this reason, manufactures may use butterfly pea flower in cosmetics or as a natural dye for foods, drinks, and textiles. When the acidity of the pea flower tea changes, the color changes as well. This quality makes butterfly pea flower a popular ingredient among mixologists for specialty cocktail. Additionally, it's known for its medicinal properties and has been associated with a variety of potential health benefits (Journal of food science and technology, 2021)

It has been used traditionally in Ayurvedic medicine in which various parts of the plants are used to treat health issues such as indigestion, constipation, arthritis, skin diseases, liver and intestinal problems. Butterfly pea flowers are rich in anthocyanin compounds called ternatins,

which can alleviate inflammation and prevents cancer cell growth. The plant contains several other antioxidants, including: **Kaemphferol.** This compound has been studied extensively for its cancer-fighting properties. **p-Coumaric acid.** Some research suggests that p-coumaric acid could have anti-inflammatory, antimicrobial, and antiviral effects. **Delphinidin-3,5-glucoside.** According to one study, this antioxidant may help stimulate immune function (Journal of Science and Technology, 2018)

Butterfly Pea Flowers are riding the hype around 'superfoods' with globalization and the internet providing consumers with access to scientific studies and media content linking diet with health and beauty. Consequently, consumers are becoming more selective about what goes into their diet with products that claim to provide health and beauty benefits readily embraced (Asian Journal of Ethnobiology, 2020)

The Butterfly Pea Flower's potent anthocyanins, resulting in strong antioxidant activity, anti-inflammatory properties (IOSR 2016) coupled with its roots in Asian cosmetics and medicine appeals to health and wellness conscious consumers. Consumers are transitioning to products with natural, simple, and clean-label ingredients and are putting pressure on brands to replace chemical dyes with natural, less processed, and non-allergenic food colors (GlobalData 2019) Plant-based colours such as the extract from the Butterfly Pea Flower

help products and offerings align with clean labelling and consequently appeal to consumers. Cold Juice Company's Cold Blossom Juice Drink (Indonesia) comprises of butterfly pea flower, raw honey, lemon juice and water and is described as fresh, and contains no additives (Mintel 2018)[1]

Based on this background information, this study was carried out by the following objectives:

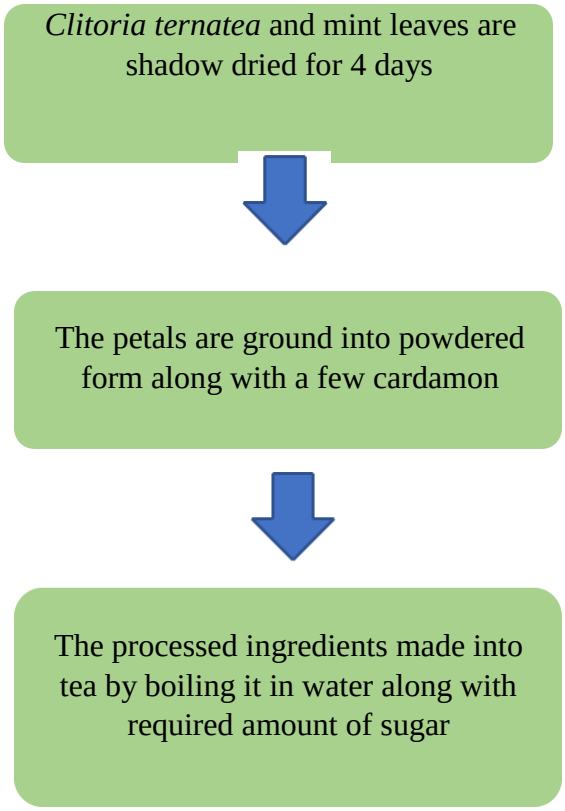
a. To develop and standardise tea from *Clitoria ternatea.*
b. To perform the sensory evaluation of *Clitoria ternatea* tea.
c. To evaluate the nutrient content present in *Clitoria ternatea* tea.

II. MATERIALS AND METHODS:

2.1.Selection and Collection of Ingredients

The major ingredient *Clitoria ternatea* (Butterfly pea flower) and mint leaves are plucked freshly from garden. The cardamom is bought from the nearest store.

2.2.PREPARATION OF STANDARD BUTTERFLY PEA FLOWER TEA:



2.3.DEVELOPMENT OF *Clitoria ternatea* INCORPORATED TEA

Variations:

Ingredients	BPFT1	BPFT2	BPFT3
Butterfly pea flower	6g	8g	10g
Mint	9g	7g	5g
Cardomom	3g	3g	3g
Sugar	5g	5g	5g

2.4. Nutrient Composition of developed tea: The varieties of prepared *Clitoria ternatea* tea were subjected to the estimation of nutrients namely, carbohydrate, protein, calcium, phosphorous, iron and Vit C using AOAC method.

2.5. Phytonutrient composition of the developed tea: Phytochemicals are the chemicals that present naturally in plants, fruits and vegetables. In recent years, phytochemicals have become more popular due to their countless medicinal uses. Qualitative analysis of phytonutrient was carried out, using the standard procedures.

III. Result And Discussion:

Sensory evaluation of *Clitoria ternatea* incorporated tea is done by 25 selected semi- trained panel members and the score was given based on the criteria such as appearance, colour, taste and texture. The mean values are stated below.

TABLE 3.1 – SENSORY EVALUATION OF THE DEVELOPED TEA

CRITERIA	BPFT1	BPFT2	BPFT3
Appearance	4±0.6	4.2±0.5	4.5±0.5
Colour	4.2±0.5	4±0.4	4.5±0.3
Taste	4±0.7	4.5±0.6	4.5±0.4
Texture	4±0.4	4.1±0.7	4.5±0.4
Overall acceptance	4±0.7	4.2±0.2	5±0.1

From the above table, it is clear that the scores for third variation is high when compared with the other two products. The overall acceptability is 5.

TABLE 3.2- NUTRIENT COMPOSITION OF *CLITORIA TERNATEA* TEA

Nutrients	BPFT1	BPFT2	BPFT3
Energy (Kcal)	24.43	25.07	26.48
Carbohydrates (g)	12.05	13.14	14.5
Vit C (mg)	0.55	0.71	1.11
Calcium (mg)	12.54	13.76	15.1
Phosphorous(mg)	0.57	1.23	2.94
Iron(mg)	0.67	1.08	1.72

The above table shows the nutrient composition in the three variations of tea. Among the variations, the third variation (BPTF 3) has the highest nutrient as Carbohydrates (14.5g), Vit C (1.11mg), Calcium (15.1mg), Phosphosphous (2.94g), Iron (1.72 mg). This variation was standardised.

TABLE 3.3- QUALITATIVE PHYTONUTRIENT COMPOSITION OF *CLITORIA TERNATEA* TEA

Tea incorporated with *Clitoria ternatea* tea	**Variations**	**Flavanoids**	**Alkaloids**	**Steroids**	**Saponins**	**Tanins**	**Anthroquinone**	**Phlobatanins**	**Terpenoids**	**Anthocyanins**	**Glycosides**
Butterfly pea flower	BPFT1	+	+	-	-	-	-	-	+	+	-
	BPFT2	+	+	-	-	-	-	-	+	+	-
	BPFT3	+	+	-	-	-	-	-	+	+	-

The phytonutrient composition are as follows in table. reveals the phytonutrient composition of the *Clitoria ternatea* incorporated tea. The *Clitoria ternatea* tea showed the presence of flavanoids, alkaloids, anthocyanins and terpenoids.

Conclusion

It may be concluded from the study that all three standardized variations of *Clitoria ternatea* incorporated tea has quantity of proximate nutrients and phytonutrients. The carbohydrates, iron, calcium, vitamin C, phosphorous content were found to be high in the developed tea. Thus, floral tea with nutraceutical components can be used as a dietary supplement to prevent and control the onset of degenerative disease among the population.

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