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One Day National e-Conference on "Frontiers in Biological Sciences"

BOOK OF PROCEEDINGS

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Organized by Department of Zoology in collaboration with IQAC

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Dr. Usha Karunakaran, Dr. Shashikala Prajapati

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“Frontiers in Biological Sciences”

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on

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KLE SOCIETY’s SCIENCE AND COMMERCE COLLEGE, KALAMBOLI

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About KLE Society

Karnataka Lingayat Education (KLE) Society emphasizes on the sound mind and healthy body for spiritual enlightenment and social transformation. The “Saptarshis” (Seven Saints) were determined to serve and sacrifice their lives for the upliftment of the community through education which is one of the essential constituents of life. Thus sown the seed on 13 November 1916 in the form of anglo vernacular school. The society is growing unstoppably thereafter from strength to strength. At present 293 educational institutions, in the diverse faculties like Arts, Science, Commerce, Medicine, Engineering, Dental, Pharmacy, Architecture, Law, Nursing, Ayurved, Management, Information Technology & Computer Science are catering the services from K.G. to P.G. including research. All institutions spread from unknown rural area to well-known cities are par excellence in infrastructure with high quality education which are accepted with wide acclaim by the members of society and approved by NAAC /Universities / NBA etc.

About KLE College

KLE Society's Science & Commerce College, Kalamboli is one of the proud branches of KLE Society. The College located at Kalamboli, Navi Mumbai is affiliated to the University of Mumbai since the time of its inception in 2013. "Happens to be our ardent desire and wish of being a 'Perpetual Learner forever' is the vision of KLE College, Kalamboli. A 'sound mind and healthy body for spiritual enlightenment and social transformation' is the focus of KLE group of institutions. The College is approved and has Science, Commerce streams as well as professional courses (BBI, BMS, BMM, BAF, & BSc-IT) for UG & PG courses.

Department of Zoology

The Department of Zoology was established in the year 2013 with an aim to empower students through quality education and create awareness of the basics and modern concept of Zoology along with exposure in practical and conceptual skills in the various sub-disciplines.Our faculty are dedicated and experienced with sense of commitment to help students for accomplishment of academic and professional goals. We consistently provide individualized attention and support in the process of teaching and learning.

About Conference & Scope

Conference shall be purely online, aimed to bring the academicians, scholars, industrialists and researchers from different backgrounds on one platform to share various aspects of biological sciences. Participation from diverse groups of people and discussions opens new channels and gates which may be useful in conquering challenges which mankind is facing today.

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About Themes

The conference's major themes are

- Role of biological, physical and chemical sciences in sustainable development.
- Development Biology, Endocrinology,
- Cell Biology, Physiology,
- Aquaculture, Toxicology,
- Molecular Biology, Parasitology,
- Virology, Immunology,
- Biotechnology, Marine Biology,
- Biomedical Engineering, Genetics,
- Epidemiology And Preventive Medicine,
- Entomology, Ecology,
- Agronomy, Microbiology,
- Botany, Phytopharmaceuticals

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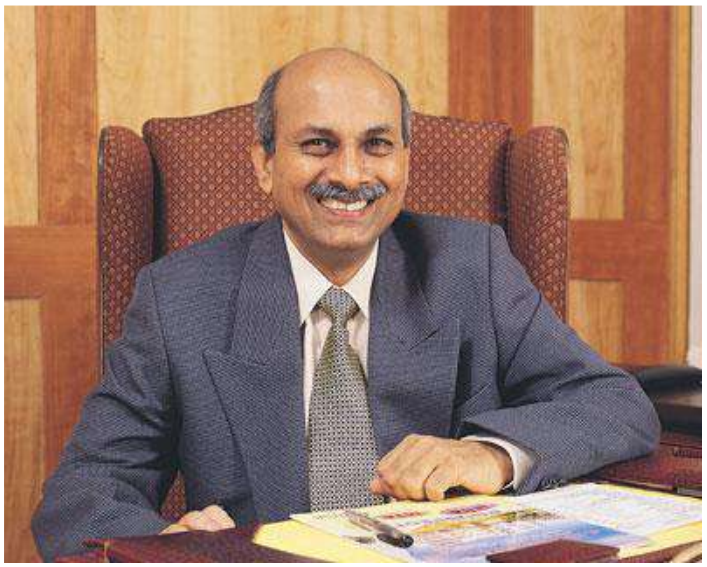
CHAIRMAN'S MESSAGE



DR. PRABHAKAR KORE
Member of Parliament

The more we learn, the more we realize that we possess less knowledge. The world we live in today is significantly different from what it was 5 or 10 years ago and the pace of change continues to rapidly increase. As human beings with intellect we need to constantly find things unknown to us. Technology driven by digitization has unravelled new paradigms including in the fields of education, research and publications. Organization is an opening platform for all students, teachers, industry persons, researchers and delegates for sharing their ideas and contributing in the deliberation on current developments in the field of Science and Technology.

Times are changing. People are beginning to realize the importance of ideas and the power of thinking and learning. We need inspiration, not just information that is gathered mechanically. We need passion and courage to bring forth the unknown to the scientific community who shall further concepts beneficial to mankind. KLE is a wonderful platform for breeding disciplined young minds with research orientation aptitude. Conferences are taking place to mould inquisitiveness into a concrete reality through exercises into experiments. KLE, Kalamboli's One Day National e-Conference on the theme, **"Frontiers in Biological Sciences"** shall provide an apt path for creation and re-creation of existing and new scientific and technological wonders now and in the future to come. I applaud the efforts of the Organizing Committee of the One Day National e-Conference and wholeheartedly welcome all distinguished speakers, scholars presenting papers and the participants to this conference.

Lastly with quotes of William A. Ward, I advise young and beautiful minds:
"PLAN PURPOSEFULLY, PREPARE PRAYERFULLY, PROCEED POSITIVELY, PURSUE PERSISTENTLY"

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GOVERNING BODY CHAIRMAN'S MESSAGE

SHRI. MAHANTESH KAVATAGIMATH
(Governing Body Chairman)

In the present-day world, we need to explore and study the various aspects of technical innovations and scientific discoveries for the development of humans as well as machines. KLE, Kalamboli has organized a One Day National e-Conference on the theme **"Frontiers in Biological Sciences"** to showcase the technological development and discoveries in Science that has evolved to the point where their synergistic combination has culminated. The theme hereby provides a platform to researchers, academicians, scholars and industrialists to share and further explore their findings.

As human beings with intellect we need to constantly find things unknown to us. I am sure that this e-Conference will provide delegates from various parts of India, a great opportunity for fruitful deliberations and enhance the knowledge of young minds in various fields thereby providing an opportunity to interact with one another and experts to enhance their research skills and knowledge. Best wishes to the Organizing Committee and researchers for the successful outcome of the Conference.

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PRINCIPAL & CHAIRPERSON'S MESSAGE

Dr. G. D. GIRI
Principal

On behalf of KLE Institutions, I extend my very warm welcome to all delegates and participants, who are present for the One Day National e-Conference on the Subject **"Frontiers in Biological Sciences"**. KLE Society was founded on November 13, 1916 by seven young visionary teachers known as 'Saptarishis'. For the last 105 years the society has been committed towards ensuring the students their own space to learn, grow and broaden their horizon of knowledge by indulging into diver's spheres of learning. Under the guidance of our management KLE continues to lead the way of success with zeal and confidence.

Presently, our nation India stands among world's top 10 countries in terms of high-quality scientific research and publications. Further, India ranks third among the most attractive investment destinations for technology transactions in the world. Science and Technology are key elements in economic growth. However, many challenges are being faced at the transformation stage in respect of strategic planning. We wish to discuss deliberate dynamics of recent changes and trends in science and technology.

The confession aims to exchange different ideas, ideologies and also to develop long term relations amongst the researchers and institutions. The main theme and subthemes for this conference are expressive of concerned research areas to give the potential participant innovative prepositions about the scope of discussion.

We have invited eminent dignitaries from different sectors for the better understanding of subject matters.

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Phytoactives of *Moringa oleifera* leaves and its medicinal properties: A review

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Abstract:- A significant crop in Asia and Africa is Moringa oleifera (MO), a plant from the Moringacea family. The numerous bioactive components, including vitamins, phenolic acids, flavonoids, isothiocyanates, tannins, and saponins, which are present in large concentrations in different parts of the plant, have all been linked to MO's health benefits. The most extensively researched Moringa oleifera leaf extract has shown promise in treating a number of chronic diseases, including cancer, non-alcoholic steatohepatitis, hypercholesterolemia, high blood pressure, diabetes, insulin resistance, and general inflammation. In this review, we outline the positive outcomes that have been observed in numerous animal models and cell investigations for the prevention and relief of these chronic illnesses. The scant data on human research currently available and

Key words:- Moringa Oleifera; bioactive components; cancer; diabetes; heart disease; hepatic steatosis

Introduction

Moringa oleifera (MO), also known as the drumstick tree, is a plant that originated in South Asia, primarily in the Indian subcontinent's Himalayan foothills. It has since been domesticated and grown in a number of other nations, including Afghanistan, Nepal, Bangladesh, Sri Lanka, South and Central America, the West Indies, the Philippines, and Cambodia. [Durgesh et,al 2013 and . Anwar et ,al 2007] It is small, quick-growing, and simple to maintain. During the dry season, it does not shed its leaves, and its leaves are very nutritious and full of natural antioxidants, vitamins, minerals, and amino acids. Bhattacharya et,al 2007, Dilard et,al 2000, Awanish et,al 2012, Amrutia et,al 2014, Mehta et,al 2011]This is well-known in African folk medicine and was referenced in the Charaka Samhita more than 5000 years ago. [Ndiaye et,al 2002]

The only genus in the family Moringaceae is moringa, a native plant of Africa and Asia that is the most extensively grown species in northwest India.(Padayachee et al,2012).13 different species, varying in size from tiny herbs to enormous trees, are found in tropical and subtropical 5 and 10 metres. .(Padayachee et al,2012). climes. Moringa oleifera is the most often grown variety (MO). The moringa oleifera plant is cultivated for its nutrient-rich pods, edible leaves, and flowers that can be used as food, medicine, cosmetic oil, or cattle feed. Its height is between flowers that can be used as food, medicine, cosmetic oil, or cattle feed. Its height is between 5 and 10 metres. .(Padayachee et al,2012).

Several demonstrated the positive benefits on people. (2015) Stohs et al. MO is known to have a significant amount of bioactive chemicals (Saini et,al 2016) ,Martin (et,al 2013) the leaves, which are the most often used plant parts, are also the most nutritious since they are loaded with vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins, and saponins [Leone. et,al 2015-16]. The high concentration of bioactive chemicals may account for the pharmacological characteristics of

MO leaves. These pharmacological capabilities have been validated by numerous studies, both in vivo and in vitro. [Leone. et,al 2015-16]

The leaves of *MO* are mostly used for medicinal purposes as well as for human nutrition, since they are rich in antioxidants and other nutrients, which are commonly deficient in people living in undeveloped countries [Popoola 2013]. *MO* leaves have been used for the treatment of various diseases from malaria and typhoid fever to hypertension and diabetes [Sivasankari .et,al.2014].

2.2 Bioactive Components On Moringa Oleifera

2.1. Vitamins.

Vitamin A is abundant in fresh leaves from MO [Ferreira.et,al.2008]. It is generally known that vitamin A plays crucial roles in cell differentiation, immunological function, embryonic growth and development, and eyesight [Alvarez.et,al 2014]. Carotenoids with pro-vitamin A potential can be found in abundance in MO leaves [Slimani.et,al 2007].

More vitamin C is present in MO leaves than in oranges, with a value of 200 mg/100 g [Ferreira et,al,and , Ramachandranet,al1980]As antioxidants, MO leaves help defend the body against a variety of harmful effects caused by chemicals, pollution, and free radicals [CChambial S.et,al.1980]. Vitamin E concentrations in MO fresh leaves are comparable to those in almonds, making them a healthy source [. Efiong .et,al2013]. Because vitamin E has been found to decrease cell proliferation in addition to acting as an antioxidant, this is crucial [. Borel.et,al.2013].

2.2 Polyphenols

Flavonoids and phenolic acids, which are polyphenolic substances, are abundant in the dried leaves of MO.

As a defense against microbial diseases, plants generate flavonoids [Kumar and Pandey .2013 And Bovicelli .et,al 2002]. Consuming flavonoids has been found to offer protection against cancer and cardiovascular disease, two chronic conditions linked to oxidative stress. Flavonoids are abundant in MO leaves [Pandey and Rizvi S.I. 2009].

Dried MO leaves contain 100 mg of quercetin per 100 g of weight [Lako.et,al 2007 and . Atawodi S.E.et,al 2009].. Strong antioxidant quercetin has a variety of medicinal uses [Bischoff and Quercetin 2008]. When administered to obese Zucker rats with metabolic syndrome, it exerts hypolipidemic, hypotensive, and anti-diabetic effects [Rivera et,al 2008]. In rabbits fed diets high in cholesterol or fat, it can lower hyperlipidemia and atherosclerosis [Juzwiak et,al 2005 And . Kamada 2005]It can guard against Streptozotocin (STZ)-induced oxidative stress and death in rat insulin-producing pancreatic cells [Coskun .et,al 2005].

Phenolic acids are a sub-group of phenolic compounds that are produced from hydroxybenzoic acid and hydroxycinnamic acid, both of which are found naturally in plants. These compounds have anti-inflammatory, anti-mutagenic, antioxidant, and anticancer activities. Gallic acid, which has a concentration of 1.034 mg/g of dry weight, is the most prevalent acid in dried leaves. Chlorogenic and caffeic acids have concentrations that range from 0.018 to 0.489 mg/g of dry weight and from 0.409 mg/g of dry weight, respectively [Prakash et,al2007, Singh et,al 2009].

A significant phenolic acid in MO, chlorogenic acid (CGA) is an ester of dihydrocinnamic acid [Amaglo N.K et,al 2010]. The metabolism of glucose involves CGA. It lowers hepatic

gluconeogenesis and glycogenolysis by inhibiting glucose-6-phosphate translocase in rat liver [Karthikesan K.et,al .2010]. Additionally, CGA has been shown to diminish the glycemic response in rodents [Tunnicliffe J.M., et,al,2011] and lower post-prandial blood glucose in obese Zucker rats [De Sotillo Rodriguez and D.V., Hadley2002]. Because it lowers plasma total cholesterol and triglycerides (TG) in obese Zucker rats or mice on a high-fat diet [48] and reverses STZ-induced dyslipidemia in diabetic rats [Verma S.et,al 2013] CGA has anti-dyslipidemic capabilities.

2.3 Alkaloids,Glucosinolates and Isothiocynates

A class of chemical substances known as alkaloids mostly contain basic nitrogen atoms. These substances have been identified from the leaves of Moringa oleifera, including N,l-rhamnopyranosyl vincosamide,phenylacetonitril pyrrolemarumine, 4′-hydroxyphenylethanamide-l-rhamnopyranoside, and its glucopyranosyl derivative [Panda S et,al 2013 and Sahakitpichan P.2011].

Plants produce a class of secondary metabolites known as glucosinolates [Forster N.et,al 2014]. Important health-promoting qualities have been discovered for both glucosinolates and isothiocyanates [. Dinkova-Kostova A.T and Kostov R.V. 2012].

2.4.Tannins:

Alkaloids, gelatin, and other proteins precipitate from tannins, which are phenolic chemicals that are water soluble. Their concentrations in dried leaves range from 13.2 to 20.6 g of tannin/kg [Teixeira E.M.Bet,al 2013/14], with freeze-dried leaves having a somewhat greater content [. Richter N.et,al 2003]. According to reports, tannins have hepatotoxic, anti-cancer, anti-atherosclerotic, and anti-inflammatory activities [Adedapo A.A.et,al 2015].

2.5 Saponins:

Additionally, MO leaves are a good source of saponins, which are organic substances made of an aglycone produced from isoprenoids that has been covalently bonded to one or more sugar moieties [Augustin J.M.et,al 2015]. In MO freeze-dried leaves, saponin concentrations vary from 64 to 81 g/kg of dry weight [Makkar H.P.S., Becker K 1996]. The anti-cancer activities of saponins are noted [Tian X.et,al2013].

3.Effects of Moringa Oleifera on the Prevention of Chronic Disease

3.1Hypolipidemic Effects

Many bioactive compounds found in MO leaves have the potential to influence lipid homeostasis. Flavonoids and phenolic compounds both play important roles in lipid regulation [. Siasos G.et,al 2013]. They inhibit pancreatic cholesterol esterase activity, reducing and delaying cholesterol absorption, and binding bile acids by forming insoluble complexes and increasing faecal excretion, lowering plasma cholesterol concentrations [Adisakwattana Set,al 2011]. MO extracts have shown hypolipidemic activity due to inhibition of both lipase and cholesterol esterase, indicating their potential for hyperlipidemia prevention and treatment [Toma Aet,al 2012].

MO has a significant impact on the lipid profile due to its cholesterol-lowering properties. Cholesterol homeostasis is maintained by two processes: cholesterol biosynthesis, which is catalysed by 3-hydroxymethyl glutaryl CoA (HMG-Co-A) reductase, and cholesterol absorption, which includes both dietary cholesterol and cholesterol cleared from the liver via biliary secretion. The ethanolic extract of MO inhibited HMG-CoA reductase

activity, supporting its hypolipidemic action [Hassarajani S et,al.2007]. Moringa Oleifera (MO) leaves also contain the bioactive -sitosterol, which has been shown to lower cholesterol and may be responsible for the cholesterol-lowering action in the plasma of high-fat fed rats [Halaby M.Set,al .2013].

Saponins found in MO leaves inhibited cholesterol absorption by binding to this molecule and to bile acids, resulting in a decrease in bile acid enterohepatic circulation and an increase in bile acid faecal excretion [Oyedepo T.A et,al.2013]. The increased bile acid excretion is balanced by increased bile acid synthesis from cholesterol in the liver, resulting in a decrease in plasma cholesterol [Oyedepo T.A et,al.2013].

3.2 Antioxidant Effects

MO leaves, due to their high antioxidant content [Anwar F.et,al 2007and . Mensah J.K. et,al.2012, Bamishaiye E.I et,al 2011], can be used to treat inflammatory conditions such as cancer, hypertension, and shown to act as an antioxidant. Only when antioxidants are consumed together do they have the greatest impact on free radical damage. A combination of antioxidants found in MO leaves has been shown to be more effective than a single antioxidant [Ferreira P.M.P.et,al 2008, Mishra G.et,al 2011, Tejas G.H et,al 2012], possibly due to synergistic mechanisms and increased antioxidant cascade mechanisms. A recent study in children revealed that MO leaves may be a good source of vitamin A [Lopez-Teros V et,al 2017].

MO leaf extract also contains tannins, saponins, flavonoids, terpenoids, and glycosides, all of which have medicinal properties. These compounds have been demonstrated to be effective antioxidants, antimicrobial agents, and anti-carcinogenic agents [Ayoola G.A et,al 2008 and Davinelli S. 2015]. Due to their redox properties, phenolic compounds are known to act as primary antioxidants [Murillo A.G., Fernandez M.L.2017] by inactivating lipid free radicals or preventing the decomposition of hydroperoxides into free radicals. These properties are important in the neutralisation of free radicals, the quenching of singlet or triplet oxygen, and the decomposition of peroxides [Pokorny J.et,al.2001 and, Zheng W 2001].

Siddhuraju and Becker [Siddhuraju P., Becker 2003] investigated the radical scavenging and antioxidant activities of aqueous and aqueous ethanol extracts of freeze-dried leaves of MO from various agro-climatic regions. They discovered that different leaf extracts inhibited 89.7-92.0% of linoleic acid peroxidation and had superoxide radical scavenging activities in a dose-dependent manner in the -carotene-linoleic acid system. According to Iqbal and Bhanger [Iqbal S., Bhanger M.I 2006], the environmental temperature and soil properties have a significant effect on the antioxidant activity of MO leaves.

Analgesic

3.3 Anti-Inflammatory and Immunomodulatory Effect

The production of the cytokines tumour necrosis factor alpha (TNF-), interleukin-6 (IL-6), and IL-8, which are increased by cigarette smoke and lipopolysaccharide (LPS), was reduced by an extract of MO leaves [Kooltheat N et,al 2014]. Additionally, according to Waterman et al. [Waterman C.et,al 2014], MO concentrate and isothiocyanates both reduced the gene expression and generation of inflammatory markers in RAW macrophages.

Through increases in white blood cells, neutrophil percentage, and serum immunoglobulins, MO leaf extracts boosted both cellular and humoral immune responses in

mice with immunodeficiency brought on by cyclophosphamide [. Sudha P. et,al 2010 and Gupta A et,al 2010]. By preventing the action of neutral factor kappa-beta (NF-k) and subsequent NF-kB-dependent downstream processes and inflammation, quercetin may also have contributed to the decrease of the inflammatory process [Das N et,al 2012]. Additionally, MO seems to have stronger anti-inflammatory effects after fermentation [joung H 2017]. Fermented and non-fermented MO were given to C57BL/6 mice for 10 weeks of feeding [[joung H 2017]. Researchers found that in rats given the fermented product, inflammatory cytokine mRNA levels decreased and endoplasmic reticulum stress was reduced.

3.4 Hepato-Protective Effects

Due to the presence of quercetin, the methanol extract of MO leaves has a hepatoprotective action [Anwar Fet,al 2007,and Tejas G.H et,al 2012]. In addition to lowering the levels of lipids and lipid peroxidation in the liver of rats, MO leaves also had a significant impact on the levels of aspartate amino transferase (AST), alanine amino transferase (ALT), and alkaline phosphatase (ALP) [Halaby M.S. et,al 2013].

MO leaves have been shown to reduce plasma ALT, AST, ALP, and creatinine [. Sharifudin S.A et,al 2012 Ouedraogo M et,al 2013] as well as to alleviate drug-induced hepatic and kidney damage. Similar results were observed in rats co-treated with MO leaves and NiSO4 to induce nephrotoxicity [Adeyemi O.S., Elebiyo T.C. 2014]. Das et al. [Iqbal S., Bhanger M.I.2006] found the same reductions in hepatic enzymes in rats fed a high fat diet with MO leaves. In addition, administration of MO leaf extract to mice resulted in decreases in serum ALT, AST, ALP, and creatinine [Oyagbemi A.A.et,al 2013 and Asiedu-Gyekye et,al 2014]. Treatment with MO leaves in guinea pigs prevented non-alcoholic fatty liver disease (NAFLD) in a hepatic steatosis model, as measured by lower hepatic cholesterol and triglyceride concentrations in animals treated with MO compared to controls [Almatrafi M.M et,al 2017]. This decrease in hepatic lipids was linked to decreased inflammation and the expression of genes involved in lipid uptake and inflammation [Almatrafi M.M et,al 2017]. Furthermore, MO-treated guinea pigs had lower plasma ASP concentrations. In contrast, MO leaves had no effect on guinea pig adipose tissue inflammation or lipid accumulation [Almatrafi M.M et,al 2017].

3.5 Anti-Hyperglycemic (Antidiabetic Effect)

Many compounds found in MO leaves have the potential to play a role in glucose homeostasis. Isothiocyanates, for example, have been shown to decrease insulin resistance as well as hepatic gluconeogenesis [Waterman C et,al 2015 and Fabio G.D et,al 2014]. Phenolic acids and flavonoids influence glucose homeostasis by influencing -cell mass and function, as well as increasing insulin sensitivity in peripheral tissues [Oh Y.S., Jun H.S 2014 and Oboh G et,al 2013]. Phenolic compounds, flavonoids, and tannins also inhibit the activities of intestinal sucrase and, to a lesser extent, pancreatic -amylase [Augustin et,al 2011].

Different techniques have been used to demonstrate the positive effects of MO leaves on carbohydrate metabolism, including preventing and regaining the integrity and function of -cells, raising insulin activity, and enhancing glucose uptake and utilisation [Makkar H.P.S., Becker K. 1996]. The presence of terpenoids, which are involved in stimulating -cells and the consequent production of insulin, may be the cause of the leaves of MO's hypoglycemic and antihyperglycemic effect. The hypoglycemic activity of flavonoids has also been demonstrated to be significant [Manohar V.S et,al 2012]. Rats were

administered the equivalent of 250 mg/kg of MO for 6 weeks in another investigation, which included control and diabetic animals and involved the peritoneal induction of diabetes using streptozotocin [Omodanisi et,al 2017]. Malonaldehyde levels were significantly lower and the groups using MO extract had better results.

3.6 Hypotensive Effects

Numerous bioactive substances found in MO leaves, such as nitrile, mustard oil glycosides, and thiocarbamate glycosides, have been utilised to stabilise blood pressure. The four extracted, pure chemicals from the MO leaves' ethanol extract—niazinin A, niazinin B, niazimicin, and niazinin A + B—showed a blood pressure-lowering effect in rats, potentially via a calcium antagonist function [Anwar F et,al 2007 and . Dubey D.K et,al 2013]. In rats with spontaneous hypertension, MO was found to minimise vascular oxidation, according to a recent study [. Randriamboavonjy et,al 2017].

3.7.Effects on Ocular Disease

Vitamin A deficiency is the leading cause of blindness, ranging from impaired dark adaptation to night blindness. MO leaves, pods, and leaf powder contain high levels of vitamin A, which can aid in the prevention of night blindness and other eye problems. Consumption of leaves with oils also improved vitamin A nutrition and delayed cataract development [14].

3.8.Anticancer Effects

MO has been investigated for its chemopreventive properties, and it has been demonstrated to inhibit the growth of several human cancer cells [97]. Several studies [98] have found that MO leaves can protect organisms and cells from oxidative DNA damage, which is linked to cancer and degenerative diseases. The extract of MO leaves inhibited the viability of acute myeloid leukaemia, acute lymphoblastic leukaemia, and hepatocellular carcinoma cells, according to Khalafalla et al. [99]. MO contains several bioactive compounds that may be responsible for its anti-cancer properties, including 4-(-l-rhamnosyloxy) benzyl isothiocyanate, niazimicin, and -sitosterol-3-O—d-glucopyranoside [100]. MO leaf extract is also effective in pancreatic and breast cancer cells [98,99].

MO has been shown in pancreatic cells to inhibit the growth of pancreatic cancer cells while also increasing the efficacy of chemotherapy by enhancing the drug's effect in these cells [101]. MO has also been shown to have antiproliferative effects in breast cancer cells [102]. Abd-Rabou et al. [103] investigated the effects of Moringa Oleifera extracts, including leaves and roots, and nanocomposites of these compounds on HepG, breast MCF7, and colorectal HCT116/Caco2 cells. All of these formulations were effective in terms of cytotoxicity, as measured by apoptosis [103]. Several animal studies have also demonstrated the effectiveness of Moringa Oleifera leaves in preventing cancer in rats with hepatic carcinomas caused by diethyl nitrosamine [104] and in inhibiting azoxymethane-induced colon carcinogenesis in mice [105]. Table 1 lists some of the bioactive substances found in MO leaves together with information on their potential effects in the animal model they were tested in, any diseases they may protect against, and the relevant references.

Table 1

Conclusion:

As a result of the bioactive components' prevention of fat accumulation, reduction of insulin resistance, and inflammation, several animal studies have shown that MO leaves have protective benefits against cardiovascular disease, diabetes, NAFLD, Alzheimer's, hypertension, and other diseases. These effects of MO on chronic diseases need to be confirmed by additional human research, including clinical trials. Additionally, according to certain research, MO's chemical composition may potentially offer protection against Parkinson's and Alzheimer's diseases. Figure 1 depicts an overview of the bioactive MO leaf component's effects in defending against various disorders.

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A Review: Breast Cancer and its contributing factors

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Abstract:-

This article looked into several aspects of breast cancer and the elements that contribute to it. Breast cancer was and continues to be one of the most common and rapidly developing malignant illnesses among women during the last four decades, according to the study. The necessary information for this article was gathered through a review of the literature and a keyword search (cancer, breast cancer, cell, gene, life quality, women, prevalence, productivity, age, obesity, alcohol, cigarette, menopause, genetic, Cytokine, and mortality) in credible scientific websites such as SID, Google Scholar, and the comprehensive portal of human sciences. This condition has an impact on many elements of a woman's life, including her physical, emotional, and social well-being. On the other hand, elements such as social and familial support during the illness might help to mitigate its effects.

Keywords:- Cancer, breast cancer, women, prevalence, gene

Introduction:-

Cancer's increased occurrence in recent years, as well as its influence on many physical, mental, and social elements of human existence, have elevated it to a serious challenge of the century [Poorkiani et al. 2010]. The incidence of this disease ranges from 1 to 2% in developed countries, with a 5% annual increase in less developed countries [Aghabarari M,et al.2005] Cancer kills more than 7 million people worldwide, according to estimates. The number of new cancer cases is predicted to climb from 10 to 15 million by 2020 [Hasanpoor Dehkordi , Azari]. Meanwhile, breast cancer is the most kind of cancerous growth in women [Safaee ,et.al 2008] with over one million cases diagnosed each year [McPherson et.al, 2000]. Breast cancer is the most common kind of cancer among women , accounting for 21.4 or 32% [Hosseini et al.2012]. Breast cancer is the most frequent kind of cancer among women with a 12.5% incidence rate.

Cancer and Quality of life-

The World Health Organization (WHO) defines quality of life as an individual's view of his or her place in life within the framework of culture and values. systems in which he or she lives, as well as his or her objectives, expectations, standards, and worries [Tabari F et al.2007]. Cancer has various effects on people' quality of life. The mental and emotional effects of illness, diagnostic and therapeutic measures, stress, pain, depression, and disease consequences on family, marital, and social relationships, as well as the induced economic burdens, nutritional issues, and treatment complications, are the major problems affecting patients' life quality [Shakeri J et al.2009 and, Safaee A, et al. 2008]. The determination of cancer patients' quality of life can give medical professionals a new method for assisting them in becoming autonomous in conducting life affairs in both essential and non-critical situations [. Zillich AJ,et al 2002;]. The major goal of medical and therapeutic care is to improve the quality of life of cancer patients. Job capability enhancement.

Breast Cancer and its Etiology:-

The most frequent kind of cancer and the second biggest cause of death is breast cancer. This illness is the greatest cause of death among women aged 45-55 years old [Jemal A, et al , 2009.] and the second leading cause of cancer-related death. Breast cancer affects about one in every eight women and, in most cases, necessitates full tissue resection, chemotherapy, radiation, and hormone treatment [Heravi Karimovi M, et al. 2006]. Breast cancer is a kind of tissue cancer that primarily affects the inner layer of milk glands or lobules, as well as ducts (small tubes that transport milk) [Sariego J 2010;]. Age [Steiner E,and Klubert D. 2008], high hormone levels [Yager JD andDavidson NE. 2006], race, economic position, and iodine deficiency in diet are the key risk factors for cancer [Yager JD and, Davidson NE. 2006 and Stoddard FR et.al 2008]. Breast cancer is a multi-stage illness, and viruses have a role in one of the stages.

Social Support and Breast Cancer:-

Breast cancer affects one out of every nine women throughout her lifetime. There are no exact figures on the disease's occurrence in Iran, however studies reveal that breast cancer is the second most common kind of cancer. [Kissan DW,et al. 2003] Breast cancer is one of the diseases with a significant psychological impact, since thoughts of death and surgery generate anxiety and stress in the patient. A cancer patient goes through numerous psychological phases as he or she tries to deal with and gets diagnosed with the disease. A cancer patient's world falls apart around her in the blink of an eye. The patient grows disturbed, and her modest dreams turn into huge disappointments. Nobody can fully comprehend her emotions [Love S. *Cases, 1998*and, Vanaki Z, et al2004]. Although medical team members may have got confidence in their personal and professional lives, operating on that experience limits their ability to analyze and evaluate [Hanson SMH. 2001]. Along with the principle of therapy, it is considered that therapists must know the suffering of all people, including themselves, in order to provide services in an intellectual and empathic framework [Eliopoulos CH. ; 2001.].

Family and Breast Cancer:-

Breast cancer is one of the most serious threats to women's physical, emotional, and social health. Some therapeutic problems have an impact on the patient's self-awareness, self-confidence, sense of self-worthlessness, and sense of self-acceptance. Suffering from sickness, worrying about the future of one's family, worry of death, therapy problems, decreased performance, and mental rotation disorder are all factors that affect the mental health of breast cancer patients. [Karimoi M,et al 2007] Loss of breast indicates loss of feminine identity among women. However, while chemotherapy is a vital cancer treatment strategy, it has a major impact on patients' quality of life and their physical, emotional, social, and spiritual well-being. [Heravi Karimovi M, et al. 2006]

Religion and Breast Cancer:-

Religion provides a constructive perspective for understanding disease's underlying significance. In the latest analysis, faith was seen as a powerful resource that eases worry and tension and provides genuine satisfaction, which may be useful in responding to and back to life [Gurm BK. 2008].

Cigarette smoking and breast Cancer-

For many years, scientists have been interested in determining breast cancer as the most common disease in women and studying its risk factors [Madigan MP, et al 1995]. Kuder et al. identified a modest link between indirect exposure to cigarette smoke and the risk of breast cancer in a meta-analysis; therefore, more research is needed to verify this causal relationship [Khuder SA, andSimor VJ Jr. 2000]. According to one research (1990), the relative risk of getting breast cancer among cigarette smokers vs non-smokers was one in twelve in case studies and one in fourteen in cohort studies [MacMahon B. 1990.]. Breast cancer risk is higher in women with a family history of breast cancer, ovarian cancer, or both [Mitra AK, et al.2004;].

Cancer and Genetic factors:-

Breast cancer is a very varied illness caused by the interaction of hereditary and environmental risk factors. It causes a gradual accumulation of genetic and epigenetic alterations in breast cancer cells. Although epidemiological research indicates the presence of risk variables (such as age, obesity, alcohol use, and lifetime estrogen exposure), a family history of breast cancer is the most compelling. Almost 20% of all breast cancers have a family history and are etiologically linked to a particular predisposing gene [Antoniou AC and , Easton DF. . 2006]

Nutritional factors and breast cancer:-

Weight gain and a high calorie intake are two dietary variables that contribute to the development of breast cancer. According to Kopans and Greenwald, obesity and high BMI increase the incidence of breast cancer in postmenopausal women, but not in premenopausal women [Greenwald P. 1999]. Another study identified a link between animal protein intake and an increased risk of breast cancer [Goodwin PJ, et al 2003]. Calorie consumption causes weight gain and obesity on the one hand, but it also causes greater height in youth and premature menopause on the other. Both variables can set the stage for future cancer development [Hanf V,and Gonder U. 2005].

BRCA1 and Breast cancer:

The primary risk factors for non-genetic breast cancer are hormonal in nature. Gender, sexual maturity and menopause age, reproductive history, breast-feeding, and the use of external estrogen (of external origin) can all be noted. Non-genetic breast cancer is more common in menopausal women with high estrogen receptor expression. Estrogen plays at least two important functions in the development of breast cancer: (1) Estrogen compounds can cause

DNA damage or mutations[Ballard Barbash R.. 1994]. BRCA1 mutation increases the risk of breast cancer to 51% and 85% by the ages of 50 and 70, respectively; it also increases the risk of ovarian cancer to 23% and 63% by the ages of 50 and 70, respectively [Kumar V, et al 2004].

Immune system and breast cancer:-

BRCA1 mutation increases the risk of breast cancer to 51% and 85% by the ages of 50 and 70, respectively; it also increases the risk of ovarian cancer to 23% and 63% by the ages of 50 and 70, respectively [Malone KE, et al . 1998].

Risk factors of breast cancer:-

Female sex constitutes one of the major factors associated with an increased risk of breast cancer primarily because of the enhanced hormonal stimulation. Unlike men who present insignificant estrogen levels, women have breast cells which are very vulnerable to hormones (estrogen and progesterone in particular) as well as any disruptions in their balance. Circulating estrogens and androgens are positively associated with an increased risk of breast cancer [Key T.J 2013]. Modifications in the physiological levels of endogenous sex hormones result in an increased risk of breast cancer in menstrual irregularities and postmenopausal women; these studies were confirmed by the Endogenous Hormones and Breast Cancer Collaborative Group.[Folkerd E and Dowsett M. 2013 and Zhang X.et al. 2013 and Key T., Appleby P et al.2002]. Men have a higher risk of breast cancer due to older age, BRCA2/BRCA1 mutations, elevated estrogen levels, Genetic disease, family history of breast cancer, and radiation exposure.[Giordano S.H. 2018]. Furthermore, the risk of breast cancer increases rapidly with the number of first-degree relatives affected; the risk may be much higher when the affected relatives are under 50 years old.[Shiyanbola et al. 2017 and Baglia M.L.et al 2018 and Brewer H.R.et al2017]. Despite one's age, the incidence of breast cancer is much increased in all individuals with a family history. This relationship is generated by epigenetic modifications as well as environmental variables that function as potential triggers.[Wu H.C.et al. 2018]

Luminal Breast cancer:-

Luminal breast cancers are ER-positive tumors that account for over 70% of all breast cancer cases in Western countries.[Howlader N.et al2014]. The presence of estrogen-receptor (ER) and/or progesterone-receptor (PR) and the lack of HER2 distinguish Luminal A cancers. In this subtype, ER transcription factors activate genes that are expressed in luminal epithelium lining the mammary ducts.[Weigelt B.et al. 2010 and Prat A. 2013]. It also exhibits decreased expression of genes responsible for cell growth.[Eroles P.et al 2012]. Luminal B cancers have higher grade and have a poorer prognosis than subtype A. They are ER positive, PR negative, and maybe HER2 positive. It also has a high expression of emission genes (e.g., MKI67 and AURKA)[Ades F. 2014 and Cheang M.C.U.et al . 2009 and Raj-Kumar P. et al 2019]

Biological therapy:-

Every phase of breast therapy can include biological therapy (targeted therapy), both neoadjuvant therapy before surgery or adjuvant therapy after surgery. Patients with HER2-positive breast cancer commonly get biological therapy; popular medications include trastuzumab, pertuzumab, trastuzumab deruxtecan, lapatinib, and neratinib.[Maximiano S et al 2016,Ishii K., Morii N.et al. 2019, Nguyen X.et.al 2021,Park J.W.et al2016].Premenopausal women are more likely to receive the everolimus-TOR inhibitor with exemestane in the treatment of Luminal, HER2-negative breast cancer, while postmenopausal women are more likely to receive the CDK 4-6 inhibitor palbociclib or ribociclib concurrently with hormone therapy.[iccardi F.et al 2018,Steger G.G.et al2016,Shah A.et al. 2018]In addition to abemaciclib and everolimus, two penultimate medications can be utilized in HER2-negative and estrogen-positive breast cancer.[Kwapisz D. 2017,Royce M.E.et al. 2015]When it comes to triple-negative breast cancer, due to the rising demand is recognized, while denosumab is approved when the disease has spread to the bones.[Heimes A.and Schmidt M. 2018,Tarantino P.et.al 2020]

Conclusion:-

The most popular screening test for breast cancer is mammography and sonography, and the treatment and clinical results of breast cancer patients have improved due to the quest for prognostic biomarkers and targets for possible biological therapeutics.Breast cancer is a major malignant disease among women, affecting different physical, mental, and social aspects of life. It is not gender-specific, but rarely develops in men. Risk factors such as smoking, alcohol use, and diet can be changed, but other factors like age, race, gender, and family history are fixed and unchangeable. Hormone plays a role in some types of breast cancer, but its development and progress mechanisms are not clear. Social and family support during the illness can reduce its negative impacts.

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Phytoactives of *Musa acuminata* pseudostem extract and its medicinal properties-A review

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Abstract:

Banana sap is now classified as a waste as a result of the use of pseudo stem in the pulp and paper industry, as well as other applications that contribute to environmental degradation. The antibacterial, antioxidant, and anticancer activities of banana sap and its crude extracts were investigated in this work. The antibacterial activity of oxidised and un-oxidized banana sap against a microbiological test panel consisting of gramme positive and gramme negative bacteria, as well as Candida albicans, was assessed utilising an in vitro micro broth dilution experiment. The antibacterial potential of un-oxidized banana sap was significantly stronger, as evidenced by a lower minimum inhibitory concentration (MIC) ranging from 15.625 to 62.5 mg/mL.The present study suggested that banana sap is a promising source of bioactive compounds with relevant antimicrobial, antioxidant and anticancer properties.

Keywords:
Banana sap , phytoactives , Musa acuminata , pseudostem,antibacterial,anticancer,antioxidant,microbiological,bioactive.

Introduction:

Natural compounds produced from plants have been identified with the knowledge of the uses of various plant extracts since ancient times in India.Phyt molecules have played an imp role in the process of discovering and developing new drugs. They have proved to be very effective in creation of therapeutic interventions for the treatment of a wide range of diseases. The banana isa flowering plant belonging to genus Musa and is largely farmed for its fruits in tropical areas of the world. Different parts of the banana plant , including the leaves,flowers, pseudo-stem, sap,roots have been shown to possess medicinal or curative characteristics, which includes anti-gastric ulcer (Khamboonruang et al. 2015), antimicrobial (Budi et al. 2020),antidepressant (Kar et al. 2019), anti-snake venom (Borges et al. 2005), anti-hypercholesterolemic (Sheng et al. 2017). The plant perishes once the bananas are harvested. The dead plants from the banana farms, which are made up of leaves and pseudo-stems form agricultural waste which is released into the environment.

TAXONOMY AND CLASSIFICATION :

Kingdom: Plantae

Clade: Tracheophytes

Clade: Tracheophytes

Clade: Angiosperms

Order: Zingiberales

Family: Musaceae

Genus: Musa

Species: M. acuminate

Phytoactives of *Musa acuminata* pseudostem extract:

The chemical components of plant fibres have long piqued the interest of experts.
The following elements have been discovered in plant fibres (Li W et al,2015) :Benzene can be used to extract fat and wax, which are mainly present on the surface of plants.Galacturonic acid produces pectin, which is composed of calcium and magnesium and is water soluble. During biological retting, these chemicals are transformed into butyric and acetic acids. (Pappu A et al,2015)Amorphous short-chain polysaccharides and polyuronides are hemicelluloses. Chemically connected to or mixed with cellulose molecules are the polysaccharide hemicelluloses.
Cellulose, which is the fiber's main component.A short-chain, isotropic, non-crystalline polymer formed of phenyl propane-derived building blocks is called lignin.Boiling the dewaxed fibres yields aqueous extract in water.(Mukhopadhyay S et al,2008).The presence of tannins in diets for livestock have been reported to have anti-nutritional and toxic effects including reduced fed intake, growth, feed efficiency and net metabolizable energy.(Acamovic T,et al, 2005).The presence of these phytochemicals in the banana pseudostem confers medicinal properties on the plant and this explains the use of this plant for treatment of different ailments. The findings of this study are consistent with reports of the presence of these phytochemicals in various parts of the banana plant as documented by (Akpuaka MU et al,2011).

Musa acuminata pseudostem extract and its medicinal properties:

Anti-oxidant property:

banana sap is an excellent source of the bioactive and antioxidants phytochemicals, such as phenolic and favonoid compounds such as apigenin glycosides, myricetin glycoside, myrice tin-3-o-rutinoside, naringenin glycosides, kaempferol-3-o rutinoside, quericitin-3-o-rutinoside, dopamine and N-acetyl serotonin (Pothavorn et al. 2010). Hence in this study, we explored the antioxidant, anticancer and antimicrobial poten tial of banana sap from the pseudo stem. Literature abounds on the antioxidant activity in diferent parts of

the banana plant such as fruit (Alothman et al. 2009), pulp and peel (Sulaiman et al. 2011; Mokbel and Hashinaga 2005; Naga rajaiah and Prakash 2011), leaf (Karuppiah and Mustafa 2013), pseudo-stem and rhizome (Saravanan and Aradhya 2011; Kumar et al. 2014).

Anti-cancer property:

(DPPH) method is the most commonly used followed by ferric reducing anti oxidant power (FRAP), total antioxidant activity (TAA) to assess the anti-oxidant potential. Moreover, for the evaluation of antioxidant potential, various extracts were prepared by researchers in water (Alothman et al. 2009; Mokbel and Hashinaga 2005; Nagarajaiah and Prakash 2011), acetone (Loganayaki et al. 2010), hexane (Sulaiman et al. 2011), eth anol (Nagarajaiah and Prakash 2011), and methanol (Kumar et al. 2014). Researchers have demonstrated distinct anti oxidant activity of various parts of banana and revealed that solvent-based extracts exhibited higher antioxidant activ ity compared to aqueous extracts. Pothavorn et al. (2010) reported that the banana sap contains bioactive compounds cafeoylquinic acid or chlorogenic acid which is responsible for its antioxidant activity. In the present study, the antioxi dant potential of dichloromethane extract of concentrated banana sap has been evaluated using DPPH assay, however, the anti-oxidant activity was moderate as compared to the ascorbic acid. The antioxidant potential could possibly be attributed to non-polar compounds present in the dichlo romethane extract.

Tannins in plants have been shown to confer antidiarrhoeic and anti-haemorrhagic properties on plants (Asquith TN,et al. 1986) .This is consistent with the traditional use of the pseudo stem of Musa acuminata for the treatment of diarrhoea, fresh wounds, cuts and insect bites as they have shown to contains these phytochemicals. Saponins have been reported to have antifungal properties(Osuagwu GGE, et al,2007)as well as serve as an expectorant and emulsifying agent [18]. Alkaloids, flavonoids and tannins have been known to show medicinal activity as well as exhibiting physiological activity [19]. Flavonoids Are known to have antioxidant effects and have been shown to inhibit the initiation, promotion and progression of tumours [20]. The presence of these phytochemicals in the banana pseudo stem confers medicinal properties on the plant and this explains the use of this plant for treatment of different ailments. The findings of this study are consistent with reports of the presence of these phytochemicals in various parts of the banana plant as documented by [21].

Conclusion:

Banana plants are regarded as one of the most useful plants on the planet. Practically every component of this plant, including the fruit, peel, leaf, pseudo-stem, stalk, and inflorescence, can be used. The banana fruit is one of the most popular fruits and a valuable commodity around the world. Yet, banana pseudo-stem is typically discarded as biomass waste once banana fruit harvesting is completed. As a result, researchers have begun to separate fibres and other components from the stem and use them to create a variety of value-added goods.

A decorticator machine can remove fibres from the banana pseudo-stem. Retting and degumming of the fibres are the next steps.The fibres obtained from the banana pseudo-stem can be used to make rope, cordage, fishing net, mat, packing material, paper sheets, textile fabrics, bag, table cloth, handicrafts, absorbent, polymer/fiber composites, and other value-added products. Other ingredients obtained from the banana pseudo-stem can also be employed. The centre core can be used to make pickles, candies, and soft drinks, while the banana pseudo-stem sap (BPS) can be used to make mordant for colour fixation and organic liquid fertiliser, and the scutcher can be used to make compost and vermi-compost.

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A Survey On Knowledge and Awareness of Anemia among Female Undergraduate students of Navi Mumbai

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Abstract

Background: Anemia is a widespread health issue. Nutritional anemia is more likely to occur in adolescents. Undergraduate students are a vulnerable population who experience anaemia. Anemia, particularly due to iron deficiency during adolescence, may impair physical and mental development as well as behavioral and cognitive development.

Objective: The objective of the study was to assess the knowledge and awareness about anemia among female undergraduate students as well as measure the prevalence of anemia among undergraduate college students.and compare the socio-demographic factors related to anemia.

Methods: We conducted a cross-sectional survey of 112 undergraduate girl students were selected randomly by clustered random sampling. The questionnaire had 13 variables consisting of knowledge and awareness components which addressed nutrition, dietary diversity, and health environments related to anemia. Associations between awareness and anemia, and other factors were assessed..

Results and Conclusion: A high prevalence of anemia was observed among undergraduate students. 46% of the adolescent girls were found to be anemic. An obvious lack of awareness was observed in female students. This study highly suggests the provision of health education which can be implementation of educational, awareness, screening and nutritional programs, periodic educational interventions such as Seminars, health checkup is warranted with special reference to the adolescent age group.

Keywords: anemia, awareness survey, adolescent undergraduates

Introduction

Anemia is a global health problem. Anemia is a condition in which there is a deficiency of RBC (Red Blood Cells) or Hemoglobin (Hb) in the blood resulting in pallor and weariness [Stevens et al,2013,].

According to the WHO (World Health Organization) [Tesfaye M,,2015, Teji K,2016), Anemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development [Tesfaye M,,2015, ,WHO, 2005, 2011, Tran Td, 2018)]. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children [Sumbele IUN, 2020, Lwambo Nj,2000, Xiaoliang Y, 2009)]. In 2002, iron deficiency anemia (IDA) was considered to be the most important contributing factors to the global burden of disease. (WHO, 2001). Risk factors include a low intake and poor absorption of iron from diets high in phytate or phenolic compounds, and period of life when iron requirements are especially high [WHO, 2011, 2012, 2013, Tesfaye M,,2015, Teji K,2016),]

Adolescent girls are considered to be more at risk of anemia as they have high nutritional demands to account for their growth acceleration, sexual maturation, and future pregnancy.[3,4] Increase in growing body tissue and red cell mass causes a double iron requirement. Even when the growth spurt has passed, the risk of anemia is still high due to menstruation.[5] Furthermore, the aspect of future pregnancy becomes essential in low-resource settings where early marriage followed by early pregnancy is common.[6] Adolescents are particularly prone to develop nutritional anemia as appropriate nutritional requirements increase significantly during this period of life. Staying in hostels, skipping meals, and long schedules in college all put them at risk of developing anemia. Various sociodemographic factors like age, sex, social status, dietary habits, and infections have major influence on the development of anemia. Anemia, particularly due to iron deficiency during adolescence, may impair the physical, mental, behavioral & cognitive development. It may cause lack of concentration, irritability & impair academic performance of students.

Knowledge is an important factor, which is a cornerstone of attitude and practice changes to prevent anemia.[18] Limited access to knowledge has been postulated as one of the distal causes of the increase prevalence of anemia and stunting.[19] Greater nutrition-related knowledge, attitude, and practices (KAP) toward anemia are reported to enhance health behavior[20] that potentially helps prevent the occurrence of anemia and other health problem

Objectives

The objective of the study was to assess the knowledge and awareness about anemia among female undergraduate students as well as measure the prevalence of anemia among undergraduate college students.and compare the socio-demographic factors related to anemia. Poverty, limited education and access to knowledge, inadequate dietary and nutrient intake and infectious diseases, are suggested to contribute to anemia as well as co-occurence of stunting.

Materials and Methods

Study Design and Participants

112 undergraduate girls, aged 18 to 21, who lived in Navi Mumbai, Maharashtra, participated in the study.

Socio-demographic factors Access to the Knowledge, Attitude, Practice (KAP) source of information is also acknowledged as a factor to anemia. As the proximal causes of iron and other micronutrient deficiencies, these factors can have an impact on the quality of the food, access to nutrient-rich diets, health, cleanliness, sanitation, and underlying disorders. Anemia is a risk factor for deficits in iron and other micronutrients.

The questionnaire had two sections. Section I dealt with Questions related to socio demographic factors that may influence adolescents' knowledge towards anaemia include name, residence, age, class, course of study, institution, state, family type, education of parents and occupation of the head of home. Section II included variables consisting of knowledge and awareness components which addressed various aspects related to anemia.

The total components of knowledge and awareness consisted of 13 variables: (1) What is anemia? (2) What is hemoglobin?, (3) What is the normal range of hemoglobin in females? (4) causes of anemia, (5)What is the normal range of hemoglobin in females? (6) How to prevent anemia?(7) Does heavy bleeding cause anemia? (8)What is the treatment for anemia? (9)Which are foods rich in iron content? (10) What are the foods that worseness the anemia?,

(11)What are the effects of anemia?, (12) From where did you gain information about anemia?, (13) Are you anemic?

The association between awareness and anemia as well as other factors were assessed. The correct answer was marked as aware and incorrect as unaware and data converted to percentage. The completed data were collected, entered in excel sheet and the results were analyzed

Result and Discussion :

This study was aimed at assessing the knowledge and awareness of anemia among 112 undergraduate adolescent girls, aged 18 to 21, who lived in Navi Mumbai, Maharashtra. According to the data analyzed, 80% of the responders were from Commerce Stream. Nearly half of the adolescent girls were anemic (47 %). About 60% of the adolescent girls had heard about anemia. 45 % knew that there is a decrease in RBC count/Hb concentration.(Figure 1). 39.6% of responders had knowledge of the effects of anemia. Almost all of those who had heard of anemia knew about at least 1 symptom of anemia. Some were also able to identify the cause of anemia and its prevention; however, fewer girls (20%) knew of the knowledge of foods that worsen anemia.(Figure 2). 46.6% of girls were aware of the prevention of anemia.

Of the 47% anaemic responders, 38 % came from a nuclear family in comparison to an extended or joint family. There seems to be an impact of mothers' education in their children's knowledge, awareness and incidence of anemia. Similarly a correlation of incidence of anemia (46.4%) with that of nature of job of house heads occupation (non permanent or not working), and that of responders who were anemic.

Almost 60% of the adolescent girls used mass and social media as sources of anemia information. (Figure 3).A few were informed about anemia by school and health staff (24.1%), their families, and their peers (15.6%).(Figure 3)

Table-1: World Health Organization criteria for the classification of anaemia.

#	Anemia	Hemoglobin Level
1	No anaemia	>12 g/dl
2	Mild anaemia	10-11.99 g/dl
3	Moderate anaemia	7-9.99 g/dl
4	Severe anaemia	< 7 g/dl

Figure 1: Response received of 112 adolescent girls included in this study.

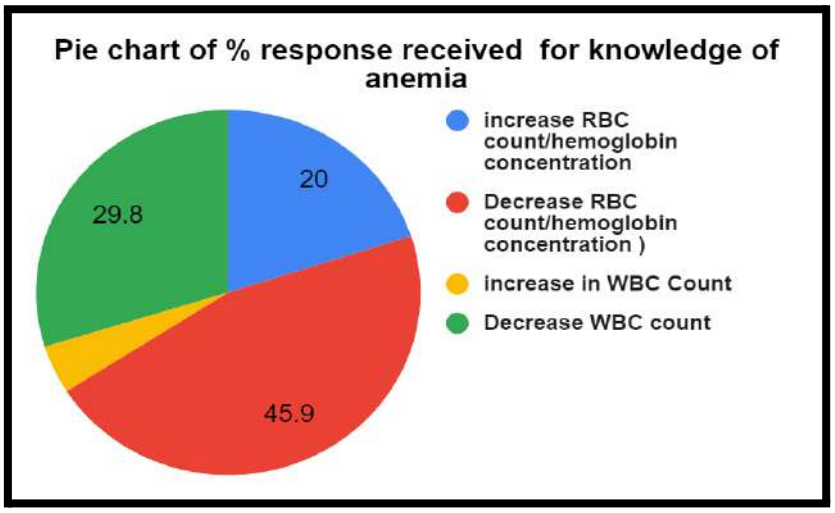


Figure 2: Response received of 112 adolescent girls included in this study.

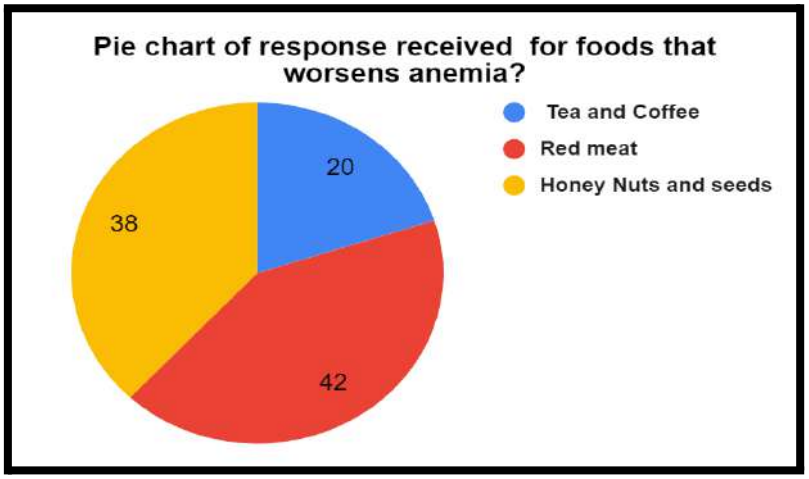
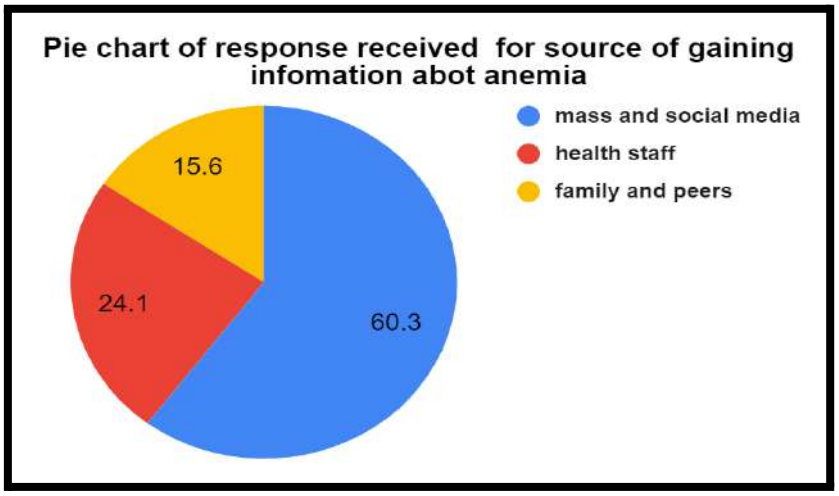


Figure 3: Response received of 112 adolescent girls included in this study.



Conclusion:

This study reflects that the basic knowledge of anemia and proper information pertaining to the condition, effects and treatment of anemia is lacking in undergraduate students. Strategy to reduce the risk of anemia in this population should combine KAP improvement with other known effective nutrition intervention (eg, micronutrient supplementation). Public health and nutrition education should integrate aspects that could contribute to anemia prevention.This study highly suggests the provision of health education which can be implementation of educational, awareness, screening and nutritional programs, periodic educational interventions such as Seminars, health checkup is warranted with special reference to the adolescent age group.

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Evaluation of phytochemicals and antioxidant activity of *Musa acuminata* floret extract

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Abstract
The current study was conducted to investigate the phytochemicals and the free-radical scavenging capabilities of Musa acuminata flower extract. This study uses methanol to extract Musa acuminata flower extract. Alkaloids, phlobatannins, triterpenoids, flavonoids, lipids, steroids, and terpenoids were found in the banana extract after phytochemical analysis. The DPPH assay was employed to test the floral extract's antioxidant properties using a range of concentrations (0.1, 0.3, 1, 3, and 10 mg.ml) to determine IC50 value. The floral extract showed significant antioxidant activity. Musa acuminata floral extract exhibited an IC50 of 2.55 mg/ml when compared with Ascorbic acid and Butylated Hydroxytoluene as standard compounds. Our results conclude that M. acuminata floral extracts prove to be a good natural source of antioxidant. It exhibits promising antioxidant effects due to the presence of phytochemicals which are rich in phenolic and flavonoid compounds. The present study is a preliminary evaluation of activity of Musa acuminata and provides a scientific validation for the use of this plant for treatment of a plethora of diseases in folklore medicine. Further detailed screening of extract shall lead to validation and understanding why the indigenous people used banana florets as a good nutritional source and to treat and heal a number of diseases.

Key words: Musa acuminata, floral extract, phyto molecules, antioxidant DPPH assay

Introduction

Banana, commonly known as Musa sp. (Musaceae), is one of the biggest herbaceous flowering plants that is known to exist today. It is considered one of the most popular fruits. Worldwide, tropical and subtropical regions consume more bananas than any other region. Bananas are considered a tropical fruit because they are native to the southwestern Pacific.
Almost every component of the banana plant has a significant application that benefits humanity in a variety of ways. Musa acuminata is a clump-forming, spindly plant that exhibits considerable polymorphism. Several Musa species are employed in traditional medicine and cuisine.
It is a member of the family Musaceae, which include the genus Musa, and the kingdom Plantae. It belongs to the order Zingiberales. There are numerous subspecies of Musa. It is a monocotyledonous perennial herb. Musa is a bisexual flower with upper and lower spathes that contain two rows of blooms each, lower spathes that do the same for female flowers, and a few middle spathes that do the same for bisexual flowers. The blooms are syncarpous, tricarpellary, with an inferior ovary, a placentation axile, a long style, and a capitate stigma 2 to 3 weeks after plantation, Musa acuminata takes about 28 days to reach anthesis.
Natural compounds produced from plants have been identified with the knowledge of the uses of various plant extracts since ancient times in India. Phyto molecules have played an important role in the process of discovering and developing new drugs. They have proved to be very effective in creation of therapeutic interventions for the treatment of a wide range of diseases. It is frequently used to stop food rotting and has a strong protective effect. Regarded as a vegetable, banana flowers are cooked in a variety of recipes .Different parts of the banana plant, including the leaves, flowers, pseudo-stem, sap, roots have been shown

to possess medicinal or curative characteristics, which includes anti-gastric ulcer (Khamboonruang et al. 2015), antimicrobial (Budi et al. 2020), antidepressant (Kar et al. 2019), anti-snake venom (Borges et al. 2005), anti-hypercholesteraemic (Sheng et al. 2017). The plant perishes once the bananas are harvested. The dead plants from the banana farms, which are made up of leaves and pseudo-stems form agricultural waste that is released into the environment. Musa species are extensively utilized as decorative plants since they are recognised for their evergreen nature.

Humanity benefits from the Musa species, which is well known for its medical properties. Different parts of the Musa acuminata plant have shown potential for disease prevention in traditional medicine, which may be attributed to the rich and diversified content of phytochemicals present in them. It aids in nerve cell responsiveness and muscular contraction. The banana also helps to keep blood pressure in check. The banana blossom can be used to treat diabetes, asthma, and endocrine disorders like heart disease. Banana leaves can be consumed to relieve stomach pain and diarrhoea. The consumption of banana leaves by women helps lessen menstrual pain and menopausal bleeding. Malnutrition among children.

Antioxidants are substances that stop free radicals from causing harm to DNA, proteins, and lipids, therefore lowering the level of oxidative stress. Musa acuminata has established itself as a potent source of secondary antioxidants [Karuppiah, P., & Mustaffa, M., 2013]. The antioxidant substances included in Musa acuminata include ascorbic acid, beta-carotene, phenolic groups, and dopamine. The functional food sector has prospects because of Musa acuminata, a good source of bioactive phytochemicals.

Methodology:

Identification and Handling of Sample:

Musa acuminata arid flowers were gathered from Kannur plantation. The plant and flowers were authenticated by normal procedures prior to initiation of study. The harvested flowers were taken to the lab in sterile containers. They were then dried and finely ground, sieved, and powdered dry flowers were kept in non-toxic plastic bags.

Plant Extract Preparation:

All chemicals (Analytical grade) were purchased from SD Fine Chemicals, India. Methanol solvent (200 ml) was used to extract 10 gm of powder bulk. For the extraction procedure, dark maceration for 72 hours at 27 °C was adopted and muslin fabric was employed for filtration. After the filtrate was condensed at 45^0C, the extract was further used for experimentation. (Arunava et al, 2020)

Qualitative Phytochemical Screening:

Phytochemical screening of the crude methanol extract of *M. acuminata* was carried out using standard phytochemical procedure [Sumathy, V. et al, 2011]

Test for alkaloids:

Mayer's reagent was added to 3 ml of the extract and thoroughly mixed; the white precipitate at the bottom showed the presence of alkaloids.

Test for phlobatannins:

10 cc of an aqueous floral extract were heated in 1% HCl. The dense red precipitate deposition at the bottom revealed the presence of phlobatannins.

Test for triterpenoids:
The Salkawasaki Test, which involved adding 5 drops of concentrated sulphuric acid to 2 ml of extract and shaking the mixture, was used to determine the presence of terpenoids in the extract. The emergence of a greenish blue colour suggested the presence of triterpenoids.

Test for flavonoids:
To detect the presence of flavanoids in the extract, alkaline reagent was utilised. Flavonoids were detected by a bright yellow colour, which vanished upon the addition of a few drops of diluted acid, to 1 ml of the extract after the addition of three drops of a 10% NaOH solution.

Test for lipids:
A drop of phenolphthalein and 0.5 N alcoholic potassium hydroxide were added to 10 ml of the extract. For an hour, the mixes were heated in a water bath. Foam or a soapy coating formed, indicating the presence of lipids.

Test for steroids:
A few drops of concentrated H2SO4 and 2 ml of chloroform were added to 5 ml of the aqueous extract. Red coloration in the upper layer and yellow with greenish fluorescence in the H2SO4 layer were indicators of the presence of steroids, respectively.

Test for terpenoids:
To 1 ml of the aqueous extract 1 ml of chloroform was added and mixed well and left for 5 minutes, 1ml concentrated H2SO4 was added after 5 minutes. The emergence of a greyish coating served as a clue that terpenoids were present.

Antioxidant Assay: DPPH radical scavenging activity

Quantitative measurement of radical scavenging properties of Musa acuminata flower extract was tested using DPPH assay with slight modifications. (Sangeetha et al., 2008). The reaction mixture contained 50 µL of test sample using varied concentrations (80% Methanol as blank) and 5 ml of 0.004% of 2, 2-diphenyl-1- picrylhydrazyl radical (DPPH) scavenging in methanol. Commercial antioxidant butylated hydroxytoluene (BHT, Sigma) and Ascorbic acid was used as standard in this study. The tubes were incubated for 30 min in dark room and the optical density (OD) was measured at 517 nm. The colour change from violet to yellow indicated the presence of antioxidants. Quantification was calculated by absorbance. The tests were performed in triplicates. DPPH radical scavenging can be expressed in terms of IC50, the concentration required to achieve 50% scavenging of DPPH radical under experiment condition IC50 value was calculated from the graph of absorbance at 517 nm against methanolic extract concentration and compared with those of standard antioxidant.

DPPH radical's concentration was calculated using the following equation:

DPPH scavenging effect (% Inhibition) = A0 – A1 / A0 x 100%
where A0 was the absorbance for the control (i.e., DPPH solution without sample) and A1 was the absorbance for sample/standard with addition of DPPH solution.

$$\%\ DPPH\ radical\ Inhibition = 100 - \left[\frac{Abs\ (sample) - Abs\ (blank)}{Abs\ (control)} \times 100\%\right] \quad \ldots\ldots\ldots\ldots (2)$$

Statistical Analyses

The results were expressed as Mean values ± Standard Error Mean (SEM) of three replicates. Significant variations achieved were evaluated by Student's t test. The statistical analysis and graph were prepared with $p \leq 0.05$ treated as significant.

Result:

The crude extract of *Musa acuminata* was obtained from maceration with 80% methanol. The phytochemical analysis of *Musa acuminata* flower extract reveals the presence of Alkaloids, Phlobatannins, Triterpenoids, Flavonoids and lipids in the methanolic crude extract The phytochemical constituents of *Musa acuminata* flower extract is tabulated in Table 1.

Table 1: The qualitative phytochemical constituents of Musa acuminata flower extract

Phytochemical constituents	**+: Present - : Absent**
Alkaloids	+
Phlobatannins	+
Triterpenoids	+
Flavonoids	+
Lipids	+
Steroids	-
Terpenoids	-

Determination of Antioxidant Activity Using the 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) Radical Scavenging Method:

DPPH assay method is a simple, rapid, reproducible, and inexpensive method to evaluate the antioxidant activity of fruits and vegetables. Using the DPPH radical scavenging assay, the antioxidant activity of Musa. acuminata flower extract was examined using a range of concentrations to determine IC50 value. (0.1, 0.3, 1, 3, and 10 mg.ml) as depicted in Table 2 DPPH radical scavenging was expressed in terms of IC50, the concentration required to achieve 50% scavenging of DPPH radical under experiment conditions.

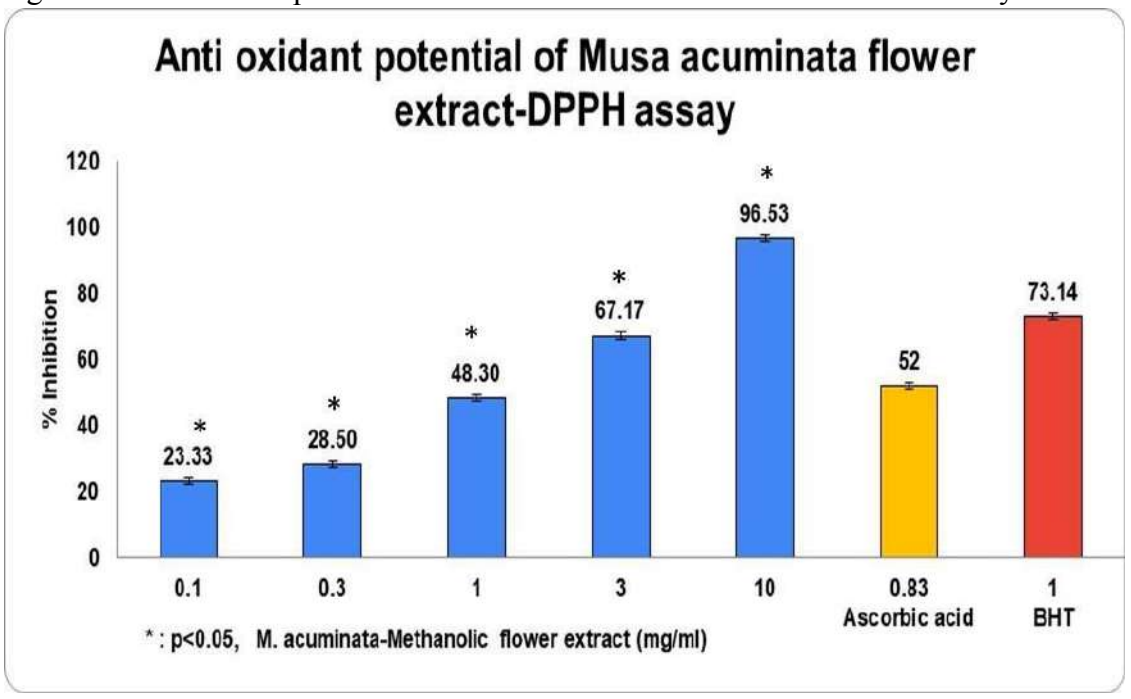
Table 2: Antioxidant activity of methanolic flower extract of M. acuminata by DPPH assay

#	Test samples	Concentration (mg/ml)	Mean SEM % Inhibition	IC50 (mg/ml)
1	Methanolic flower extract	0.1	23.33 ± 2.12	2.552
2	Methanolic flower extract	0.3	28.50 ± 0.35	
3	Methanolic flower extract	1.0	48.30 ± 0.07	

4	Methanolic flower extract	3.0	67.17 ± 1.41	
5	Methanolic flower extract	10	96.53 ± 3.54	
6	Positive Control- Ascorbic acid	0.83	52.0 ± 0.08	
7	Positive Control-BHT	1.0	73.14 ± 0.4	

Methanol fraction of *Musa acuminata* flower extract exhibit the highest radical scavenging activity at 10 mg/ml with an IC50 value of 2.55 mg/ml. Positive control samples included Ascorbic acid and Butylated Hydroxytoluene (BHT) which depicted scavenging activity of 52% and 73% at a concentration of 0.83 and 1.0 mg/ml respectively compared to crude *Musa acuminata* flower extract. (Figure 1). Statistical significance was established at $p < 0.05$.

Figure 1: Anti oxidant potential of Musa acuminata flower extract-DPPH assay



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The effect of antioxidants on DPPH is because of its electron donating capacity (Chen et al., 2020). Radical scavenging is very important in order to inhibit the harmful effect of free radicals. DPPH assay also indicates the presence of phenolic and flavonoid compounds in plant extracts (Aryal et al., 2019) and is a popular mechanism to study the antioxidant property of plant extract. Our result revealed significant antioxidant activities in all concentrations of methanolic extracts and the values were noted higher with mounting concentration. (Table 2, Figure 1)

Discussion

The current study concerning the qualitative phytochemical analysis of the floret extracts agrees with the aforementioned findings from different researchers. Since ancient times,

flavonoids have been used as anti-inflammatory and for cosmetic purposes in Chinese traditions. It has been reported that flavonoids possess many pharmacological properties like antifungal, antioxidant, antiallergenic, anti-inflammatory, antithrombic, anticarcinogenic and hepatoprotective in nature.(Pothavorn et al. 2010).

Flavonoids and tannins are reported to have antiulcer and anti-inflammatory activities and hence could be a wonderful remedy for ulceritis. (Govindaraj et al, 2022). Banana flowers are a good source of dietary fiber in the form of soluble and insoluble fiber. Soluble fiber dissolves in water and forms a gel, which allows food to pass easily through the digestive tract. The insoluble fiber in banana flowers does not dissolve in water and it helps provide bulk to undigested waste products. Both types of dietary fiber promote healthy digestion and absorption of food in the gastrointestinal tract. Intake of dietary fibre exerts beneficial role in the prevention and management of gut related problems,

Antioxidant activity, in its simplest form, describes the ability of a molecule to slow down or stop the oxidation of other molecules. Due to the use of numerous plant species as a source of phytotherapeutic products, the study of their antioxidant activity has boomed in recent years [Natividad C, 2020, Londoño-Londoño, J., 2012, Moon, J.-K, 2009, Dávalos, A.; 2003,].

The available methods to quantify antioxidant activity can be classified based on the mechanism of action by which the applied compounds stop chain-breaking reactions. They can be divided into two groups: hydrogen-atom transfer (HAT) (hydrogen atom transfer reactions) and single electron transfer (SET) (compound reduction reactions through electron transfer from an antioxidant) [11, 12]. Among the SET methods, the most used are 2,2-di-phenyl-1-picrylhydrazyl (DPPH radical scavenging capacity assay), ferric reducing (FRAP) assay, Trolox equivalent antioxidant capacity (TEAC or ABTS) assay, copper reduction (CUPRAC) assay and reducing power assay (RP). Hydrogen atom transfer reaction assays include the crocin bleaching assay, the total peroxyl radical-trapping antioxidant parameter (TRAP) assay, total oxyradical scavenging capacity (TOSC) assay, and the oxygen radical absorbance capacity (ORAC) assay [Natividad C,2020,Prior RL,2005].

For medical purposes, antioxidants that scavenge free radicals are crucial. There are a few synthetic antioxidants in the market, such as butylhydroxtoulene (BHT) and butylhyroxyanisole (BHA), but they must be substituted due to their side effects. Thus, the hunt for substitute antioxidants derived from natural sources is currently receiving a lot of interest.

Conclusion

The present study demonstrated that crude methanolic extracts of flower of *Musa acuminata* is rich in phenolic and flavonoid compounds and has considerable antioxidant activity. Musa extracts acts as good antioxidant source and can be a good substitute for synthetic compounds, which exhibit adverse effects. However, more investigation is required to isolate and identify the reliable antioxidant and the other molecules present in the crude extract which correlates with other applications.

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Effect of music therapy on mental health

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Abstract:

Music is an integral part of everyday life and plays a central role in all human cultures. Music therapy is the clinical use of music to accomplish individualized goals such as improving mood, self-expressions and reducing stress. Music therapy is used to get rid of the physical discomfort. It is done by improving respiration, improved cardiac output, reduced heart rate and relaxed muscle tension (Peterson family foundation 2016). Music therapy experiences may include playing different instruments, composing music, singing, and listening to music. This therapy may help you psychologically, spiritually, socially, physically and cognitively. It is very useful and can positively affect a person's mental health. Music therapy has many benefits as it can help in lowering blood pressure, improving a person's memory power, enhancing communication and social skills, and reducing pain. It also helps in increasing motivation, self-reflection by observing our own thoughts and emotions and can develop healthy coping skills to manage our own thoughts and emotions. Music therapy is of different types and can also cooperate in the treatment of the symptoms of Parkinson's disease, fibromyalgia and depression. Enhancement in the growth of newborn babies and improvement in the activity of the neural system is found according to the studies of many researchers.

Key Words: Music, Therapy, Mental Health, Diseases.

Introduction:

Music is the language of the soul. It is an art of producing pleasing or expressive combinations of tones especially with melody, rhythm, and usually harmony. People have always found music significant in their lives, whether for enjoyment in listening, performing or composing music (gilbertgalindo.com).Your Entire Brain can be Activated When You Listen To Music. Music may cause you to feel joyful, sad, angry, hyped up, relaxed etc., and sometimes you can feel more than one emotion while hearing a song. Music therapy is a type of expressive arts that uses music to improve and maintain the psychological, physical, and social well-being of individuals. It involves many activities, such as playing different musical instruments, listening, composing music,etc.(goodtherapy.org). It uses the naturally mood-lifting properties of music to help people by improving their mental health and overall well being. Different types of music therapy are there such as Analytical music therapy, benenzon music therapy, community music therapy, the Bonny Method of guided imagery and music (GIM), Cognitive behavioral music therapy (CBMT), Vocal psychotherapy and many more. Music therapy is an effective component of treatment of depression, Insomnia and can help in pain management. Music can activate regions of the brain that influence things like memory, emotions, movement, sensory relay, some involuntary functions, and decision-making. It helps to lower the heart rate and blood pressure and relaxes the muscle tension. It also strengthens motor skills and brings improvement in communication for children and young adults who face learning disabilities. Use of music therapy releases

endorphins which helps in relieving stress and pain. These hormones trigger positive feelings in the person's body and make them happy.

Objectives:

- To find the effect of music therapy on the mental health of an individual.
- To evaluate positive effects of Music on mental health.
- To highlight the importance of music being used as medicine.

Hypothesis:

H_0: Music therapy has no positive effect on mental health.

H_1: Music therapy has a positive effect on mental health.

Material and Methods:

I have used secondary data from effectsofmusicenquiryweebly.com. The vibroacoustic therapy technique involves the user lying on a mat, lying in bed, or sitting in a chair equipped with speakers that send out vibrations that can be both heard and felt at precise computer-generated frequencies. According to another research, Mozart music was used to study the effects on the growth of premature babies.

Result:

Music is an excellent healing tool for the brain, because it activates so many parts of it which truly have a good effect on a person's mental health.

Music therapy has brought a huge impact on people's psychological health, enabling patients to suffer less pain, so that they can live without stress and anxiety.

Music is truly amazing!

According to the studies patients diagnosed with mental disorders have shown a visible improvement in their mental health after using music therapy (Lavinia Rebecchini, 2021)

Overall music therapy can increase positive feelings.

Discussion:

Vibroacoustic therapy is a good example of music therapy being used as a medicine. Music is sound, and it is established in vibration. Led by Lee Bartel, PhD, a music professor at the University of Toronto, and several researchers were exploring whether sound vibrations absorbed through the body can help treat the symptoms of Parkinson's disease, fibromyalgia and depression. In this method sound of low frequency is used to make vibrations which is then applied straight to the body. During this therapy, the patient sits on a chair or lies on a mat or bed embedded with speakers that transmit vibrations at specific computer-generated frequencies that can be heard and felt. Researchers led by Lauren K. King of the Sun Life Financial Movement Disorders Research and Rehabilitation Centre at Wilfrid Laurier University, in Waterloo, Ontario, found that short-term use of this vibroacoustic

therapy with Parkinson's disease patients led to improvements in symptoms, including less rigidity and the patients began to walk with a good speed and by taking bigger steps and also with less tremor.

One more study was conducted by Dr. Dror Mandel and Dr. Ronit Lubetzky at Tel Aviv University. They played half an hour of Mozart every day to premature babies, and got amazing results. The babies that were listening to the music grew a lot faster than the babies who weren't. The cause of the impact is yet unknown, but the researchers believe it has something to do with the relaxing qualities of classical music, which can assist listeners of all ages, reduce stress and strengthen their immune systems. Research shows that there can be improvement in the activity of the neural system if the musical training is given to the child.

Conclusion:

Overall, music therapy is found to be effective on a person's mental health.

so, the present study favours H_1 according to which, 'Music therapy has a positive effect on mental health'.

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Study the difference between wings of moth and butterfly

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Abstract:

The order Lepidoptera includes insects like butterflies and moths which are well-known and captivating insects. Examining the antennae is one of the simplest methods to distinguish between a butterfly and a moth. The antennae of a butterfly have a club-like form, a long shaft, and a bulbous tip. The antennae of a moth are saw-edged or feathered. Moths and butterflies both have scales covering their bodies and wings, which is one of their numerous similarities. These scales are really just repurposed hairs. There are around 160000 identified species of Lepidoptera, many of which are significant model organisms. Butterflies frequently fold their wings over their backs in a vertical fashion and Moths frequently hold their wings in the shape of a tent to conceal their abdomen. The wings and patterns of butterflies are frequently wider and more colourful. Moths frequently have smaller, duller-colored wings.

Key Words: Lepidoptera, Wings, Moth, Butterfly.

Introduction:

One of the four insect super-radiations, the order Lepidoptera, which includes about 160000 known species of butterflies and moths, is made up of these insects, even though the real number of species may be up to 500,000. Lepidoptera, is the biggest group of insects that eat plants, serve ecological purposes as both pollinators and prey. They also have a significant impact on people and many other creatures. Important model systems for the study of genetics, physiology, development, ecology, and evolutionary biology are also provided by lepidoptera. All efforts to comprehend the diversity, adaptability, and ecological roles of Lepidoptera require a strong evolutionary framework. These insects rule the terrestrial environment both during the day as butterflies and at night as moths. Lepidoptera are primarily herbivores and pollinators, and it is believed that they were a key component in the angiosperm mega-radiation.The variety of species in moths is far more than that of butterflies.. Moths make up 89-94 percent of the Lepidoptera order, whereas butterflies and skippers make up 6 to 11 percent. It is incorrect that a butterfly won't be able to fly if any of the "powder" on its wing rubs off when you touch it.The substance is actually very thin scales that a butterfly sheds during the course of its life. Compared to butterflies, moths make up a far larger portion of the ecosystem. Lepidoptera, which contains moths, butterflies, and skippers, is one of the twenty-nine orders of insects in the world. In North America, there are about 13,700 species of Lepidoptera, and there are 180,000 species worldwide. A frenulum, which connects the wings, is a feature of moths. Frenulums are not present in butterflies. In order for the wings to function together during flight, frenulums connect the forewing to the hind wing.

Objectives:

1. To study the difference between the moth and butterfly .
2. To study the difference in the wings of moths and butterflies .
3. To study the difference in the life cycle of moths and butterflies .

Hypothesis:

H_0: There is no difference between the wings of a moth and a butterfly.

H_1: There is a difference between the wings of a moth and a butterfly.

Material and Methods: Secondary data was collected and analysed.

Result and Discussion:

It is observed that butterflies have long, narrow antennae, and moths have thick, feathery antennae. Moths lacklustre whereas butterflies have vivid colours. Their wings' have many colours and patterns that serve important communication purposes in addition to being purely ornamental. By serving as camouflage, warning possible predators that the butterfly's body is toxic, or luring potential mates, the patterns on butterflies' wings can assist them to avoid being eaten by humans or other animals. It is believed that these two species did not give birth to their offspring simultaneously. Some biologists believe that butterflies descended from various species of moths.

Wings

Butterflies frequently fold their wings over their backs in a vertical fashion. Moths frequently hold their wings in the shape of a tent to conceal their abdomen.

Anatomy

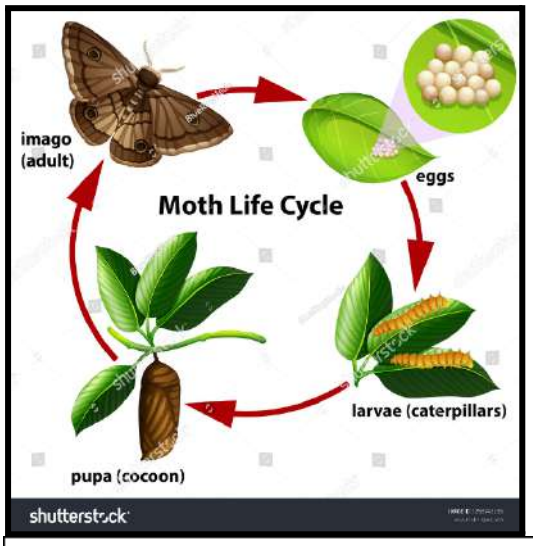
A frenulum, which connects the wings, is a feature of moths. Frenulums are not present in butterflies. In order for the wings to function together during flight, frenulums connect the forewing to the hind wing.

Behavior

The majority of the time, butterflies only fly during the day. Moths typically fly at night and are nocturnal creatures. However, certain butterflies are crepuscular, which means they only fly at dawn and twilight, and other moths, like the buck moth, are nocturnal.

Cocoon/Chrysalis

The pupa is covered in chrysalides and cocoons as protection. The transitional stage between the larva and the adult is the pupa. A silk-covered cocoon is made by a moth. A chrysalis, which a butterfly forms, is tough, smooth, and free of any silk coating.



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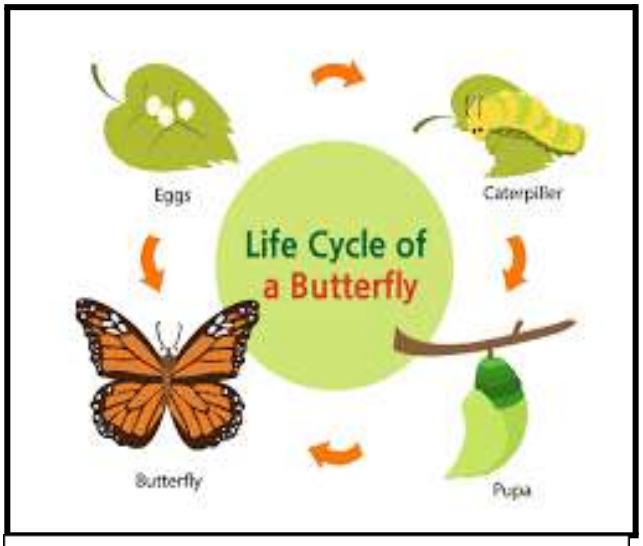

Butterflies Vs Moth- A Detailed Explanation Their Lifecycle and Lifespan - Pest Wiki

Conclusion:

All members of the lepidoptera order, which includes butterflies and moths, undergo a four-stage life cycle. Each stage of the insect's life, including the egg, larva, pupa, and adult, has a specific function.

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Study of Water Quality and its effect on residents in Navi Mumbai, India

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Abstract:

In order to establish industries, IT Parks, office spaces, and housing facilities, Navi Mumbai, a rapidly expanding industrial city in Maharashtra, was developed in the 1970s as a satellite city of Mumbai. Dams provide the water for Navi Mumbai, but urban settlements were not connected to the city's water system until 2015, they had to rely on municipal taps or tankers to meet their needs. The researchers have studied the effectiveness of the links as well as their impact on the region's health problems (Sengupta et al., 2019). Water is yet a scarce resource and its accessibility and effectiveness is yet questionable. In Navi Mumbai, the fair distribution of fresh drinking water is still in partial function. The study observed that drinking water supply is through pipeline in urban areas of Navi Mumbai but 24 x7 supply is still a challenge that is mandatory to maintain water quality as well as prerequisite as per Sustainable Development Goals (Sengupta et al., 2019). A NMMC report on water quality was used for the study.

Key Words: Water supply , Quality , Harmful effects ,

Introduction:

Urbanization is gradually taking over the planet as a result of economic growth and job distribution. Population growth is stable in affluent nations, and the urban population is currently a sizable population, but in developing nations, the urban population is growing, and by 2050, the world's population should be over nine billion, with the majority living in cities of the urbanisation that is taking place (Anonymous, 2019, Sengupta 2019). NMMC is blessed with abundant water resources in terms of both surface and groundwater. The surface water resources include 24 major lakes and ponds, 11 holding ponds and creek fronts of about 22 km. In terms of managing floods, water logging, surface runoffs, and other environmental and physical issues, the NMMC offers a variety of essential services. The levels of surface and ground water resources are periodically checked by NMMC. With the exception of suspended particles, hardness, and sulphates, all criteria in the NMMC area lakes are adequately managed by NMMC authorities. NMMC in 2018-19 noted that the amount of suspended solids has decreased, in all lakes, with the exception of Mahape Gaon Lake (117 mg/l). Similar decreasing trend was observed in case of hardness where 2 lakes namely Shirvane (889 mg/l) and Vashigaon (1024 mg/l) recorded higher annual average concentration than the permissible limit (600 mg/l) in 2018-19. Sulphate concentration, however, was found exceeding the permissible limit (40 mg/l) in 14 lakes. The highest annual average sulphate concentration was found in Vashi Gaon lake (2158 mg/l) followed by Savaligaon lake (1415.0 mg/l and Shirvane lake (909.9 mg/l). All other parameters including DO, BOD, COD, pH, chloride, phosphate and nitrate were found to be within permissible limits. In terms of groundwater resources, there are 132 wells regularly monitored by NMMC for their water quality. Even though all the parameters were well within the limits for groundwater, the samples detected the presence of Escherichia coli and faecal coliforms.

Objectives:

1. To study the water quality in Navi Mumbai
2. To know the factors affecting the water quality

Hypothesis:

H_0: There is no effect of Water Quality on residents in Navi Mumbai, India.

H_1: There is an effect of Water Quality on residents in Navi Mumbai, India.

Material and Methods: Secondary was used for the study.

Result and Discussion:

Lakes that are within the purview of NMMC are periodically monitored for water quality (Table No. 1). Following sample analysis, it was discovered that all of the lakes' pH values fell well within the acceptable range. Only Mahape Gaon Lake near Koparkhairane Node had high levels of suspended solids (S.S.) (117 mg/l), although the allowed maximum is 100 mg/l.

Table 1: Annual average water quality of lakes in NMMC area 2018-19

Node	**Name of lake**	**PH**	**S.S (mg/l)**	**TDS (mg/l)**	**DO (mg/l)**	**B.O.D (mg/l)**	**C.O.D (mg/l)**
CPCB Limits [32]		5.5-9.0	<100	<2000	4.0-7.0	<100	<250
Airoli	Airoli Naka	7.7	19	521	6	2	32
	Diva	7.6	42	846	5.5	4	45
Belapur	Belapur	7.7	10	372	6.6	6	55
	Darave	7.5	53	696	6.6	5	45
	Karave	7.5	16	354	5.8	4	26
	Killegaonthan	7.7	45	473	6	9	72
	Agroli	7.2	19	436	7	4	26
Digha	Khokad	7.6	31	635	6.4	1	17
Ghansoli	Rabada	7.8	14	518	6.6	3	31
	Gumali	7.4	43	787	5.7	2	23
	Talvali	7.4	29	663	6.1	2	34
	Gothivali	7.8	37	375	6	1	19
Nerul	Nerul Sector 20	7.6	16	669	6.4	5	38
	Shirvane	7.7	33	1369	5.8	7	58
Turbhe	Turbhegaon	7.7	41	1243	6.6	5	35
	Sanpada	8.1	32	1118	6.4	4	37
Vashi	Vashigaon	7.9	55	1662	6.1	6	35
	Juhugaon	7.8	32	459	7.3	4	41
Koparkhairane	Koparkhairane	7.8	30	546	6.9	8	49
	Khairane	8.1	39	1291	6.9	4	31
	Savaligaon(Kopri)	7.8	52	902	6.7	4	37

	Bonkode	7.8	36	847	6.9	3	29
	Mahapaegaon	8	117	676	7.2	3	39

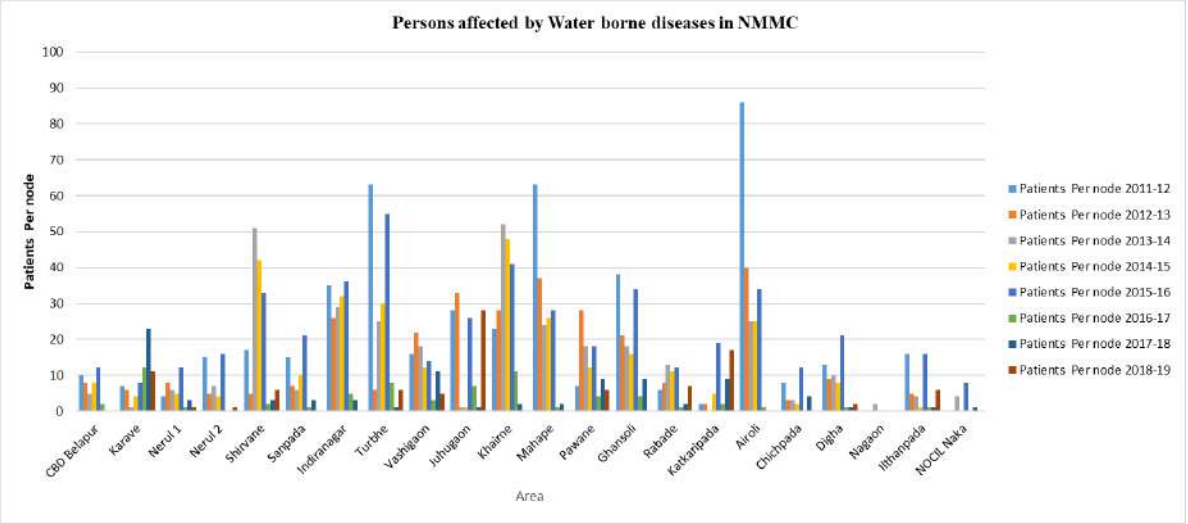
Source: Environmental Status Report of Navi Mumbai Municipal Corporation 2018-19

Table 2: Persons affected by Water borne diseases in NMMC 2018-19

Area	**Patients Per node**							
	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
CBD Belapur	10	8	5	8	12	2	0	0
Karave	7	6	1	4	8	12	23	11
Nerul 1	4	8	6	5	12	1	3	1
Nerul 2	15	5	7	4	16	0	0	1
Shirvane	17	5	51	42	33	2	3	6
Sanpada	15	7	6	10	21	1	3	0
Indiranagar	35	26	29	32	36	5	3	0
Turbhe	63	6	25	30	55	8	1	6
Vashigaon	16	22	18	12	14	3	11	5
Juhugaon	28	33	1	1	26	7	1	28
Khairne	23	28	52	48	41	11	2	0
Mahape	63	37	24	26	28	1	2	0
Pawane	7	28	18	12	18	4	9	6
Ghansoli	38	21	18	16	34	4	9	0
Rabade	6	8	13	11	12	1	2	7
Katkaripada	2	2	0	5	19	2	9	17
Airoli	86	40	25	25	34	1	0	0
Chichpada	8	3	3	2	12	0	4	0
Digha	13	9	10	8	21	1	1	2
Nagaon	0	0	2	0	0	0	0	0
Ilthanpada	16	5	4	1	16	1	1	6
NOCIL Naka	0	0	4	0	8	0	1	0
Total	**472**	**307**	**318**	**302**	**476**	**67**	**88**	**96**

Source: Environmental Status Report of Navi Mumbai Municipal Corporation 2018-19

Figure : 1 Persons affected by Water borne diseases in NMMC 2018-19



Water Borne Diseases : Water contamination by pathogenic bacteria, viruses, or protozoa is the cause of water-borne illnesses. When individuals use water for drinking, cooking, or other domestic or recreational activities, these chemicals are transferred to them. When such dangerous bacteria contaminate drinking water, either at the source, through seepage of contaminated runoff water, or inside the piped distribution network, an individual's health is jeopardised. In addition, dirty water handling during transportation or at home might contaminate clean water. The Health department at NMMC has taken aggressive steps to stop the spread of these illnesses, and its devoted, qualified staff has been working relentlessly to mitigate these illnesses through its yearly preventive efforts.

Drinking water quality at the tap end : Before being supplied and distributed to the NMMC area, the Morbe Dam, the area's main source of drinking water, is treated at the Bhokarpada water treatment plant. Three categories — domestic, commercial, gaothan, and slums define the city's area. The potability of the drinking water is continuously checked and monitored by NMMC at several locations throughout the city. The firm took preventative precautions in case there is any contamination. A total of 20,376 samples were examined during the 2018–19 academic year, and 5.17% Non-potable samples (1053) were found in the samples.

Conclusion:

It is concluded that water quality has negatively affected the health of citizens in Navi Mumbai to great extent especially Airoli in 2011-12, but later it was minimized with the efforts of NMMC through various programs.

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Study of Bird biodiversity and Mangroves in Navi Mumbai, India

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Abstract:

The Indian subcontinent reported 1313 different species of birds (Grimmett et al. 2011). BirdLife International (Stattersfield et al. 1998) designated this area as an Endemic Bird Area (EBA 128) in recognition of its remarkable bird diversity and local endemism. Pawar et al. (2020) over the course of a year, used point counts method to survey birds in various locations at dawn and dusk (from June 2019 to May 2020). A wide variety of birds were seen, including 102 species from 16 orders, 48 families, and 84 genera. Prabhakar Pawar (2011) recorded that mangroves of the Uran coast are home to 56 species of birds, spanning 29 families, 11 orders, and 46 genera. Of the species that were recorded, 33.93% belonged to the Order Passeriformes, 26.79% to the Order Ciconiiformes, 8.93% to the Order Charadriiformes, 7.14% to the Order Anseriformes, 5.36% to the Orders Coraciiformes and Falconiformes, 3.57% to the Orders Columbiformes and Gruiformes, and 1.79% to the Orders Cuculiformes.

Key Words: Birds, Biodiversity, Navi Mumbai, Species

Introduction:

Biodiversity affects the scope and stability of a wide range of ecological features, with bio diverse systems which are regarded as functionally more robust. Asia was once thought to be the continent with the greatest diversity, but as the population of the continent grew, so did the demand for food and shelter, which led to an intensification of agriculture as well as urbanisation, industrialization, and pollution. In tropical and subtropical intertidal zones, mangroves are one of the most productive and biologically varied ecosystems that have been created along estuary sea beaches and river mouths (Chanda et al., 2015). According to Pawar et. al. (2020), the rapidly growing urban population is a major global driver of ecosystem alteration and land use conversion, which has led to a large loss in biodiversity,

particularly in tropical cities. Birds are highly diversified and noticeable components of ecosystems, making them great bio-indicators of how urbanisation affects ecosystems. Because they are widely spread, readily observable, and emotionally resonant to us, they are important species in various ecosystems. Although they make up a significant portion of urban biodiversity, birds are greatly influenced by the urban environment, geography, floral diversity, degree of anthropogenic disturbances, invasion, and predation (Maurice et al., 2020). The variety of bird species that are now present in a given location, their distribution patterns, and the severity of the threats to all the species support conservation efforts. According to Dey et al. (2013), India is home to more than 1300 bird species, or more than 13% of all bird species worldwide. Unfortunately, India ranks third among Nations in terms of the number of threatened and rare species, after Indonesia and Brazil (Rajashekara and Venkatesha, 2015).

Objectives:

1. To understand the variability of Bird occurrences in natural situations.
2. To comprehend how disturbance and habitat alteration affect bird communities.
3. To learn more about how birds keep an ecosystem in balance.

Hypothesis:

H_0: There is no relation between Bird biodiversity and Mangroves in Navi Mumbai, India.

H_1: There is a relation between Bird biodiversity and Mangroves in Navi Mumbai, India.

Material and Methods:

We researched secondary data and utilized it for our studies.

Result and Discussion:

From the literature review it is clear that a wide variety of birds were seen, including 102 species from 16 orders, 48 families, and 84 genera. The distribution of bird species shows that the Passeriformes family, which contains 45 species, is followed by the Charadriiformes family (12 species), the Pelecaniformes family (10 species), the Accipitriformes family (8 species), the Coraciiformes family (7 species), the Columbiformes family (3 species), the

Piciformes family (2 species), the Gruiformes family (2 species), the Anseriformes family (2 species) Prabhakar et al. (2019). As can be seen in Table 1, the Passeriformes family showed 44% representation over the others and some families do not showed such representation such as Cuculiformes(0.980), Galliformes(0.980), and Phoenicopteriformes (0.980). In Table 2, a total of 20 species of mangroves and mangrove associates belonging to 17 genera, 13 families and 13 orders were recorded. There are a total of 8 species of real mangroves, which are found in 6 genera, 4 families, and 4 orders.Mangrove associates were represented by 12 species, 11 genera, 9 families and 9 orders . Out of the 20 species identified during the study, species from the families Fabaceae, which includes mangrove allies, and Acanthaceae, which includes true mangroves, had the largest diversity, with 9 species each Prabhakar et al (2019). The impact of factors like food, shelter, human presence, significant habitat loss, invasive plant species, and plantation clearance had a negative impact on bird diversity and dispersion in various ecosystems was reported by Altaf et al. (2018). According to Allen et al. (2019), agriculture intensification has a negative influence on the diversity of birds due to the use of insecticides, fewer nesting sites, bird deaths brought on by farming activities, and an increase in predation rates following crop harvest. Additionally, it has been observed that areas with plenty of trees and a large bird population have a favourable relationship with the diversity of birds since trees provide food and shelter for birds (Asefa et al., 2017; Allen et al., 2019; Maurice et al.,2020). The study's findings support those of Lepczyk et al. (2008), Debnath et al. (2018), and Katia et al.(2019) about the influence of anthropogenic activity on avian diversity.

Table 1: List of families with number of order, genera and species of birds recorded in and around Navi Mumbai.

Sr. no	Order	Family	Genera	Species	Percent Representation
1	Accipitriformes	**01**	**08**	**08**	**7.849**
2	Anseriformes	**01**	**01**	**02**	**1.960**
3	Bucerotiformes	**01**	**02**	**02**	**1.960**
4	Charadriiformes	**05**	**10**	**12**	**11.765**
5	Columbiformes	**01**	**03**	**03**	**2.941**
6	Coraciiformes	**03**	**07**	**07**	**6.863**
7	Cuculiformes	**01**	**01**	**01**	**0.980**
8	Galliformes	**01**	**01**	**01**	**0.980**

9	Gruiformes	**01**	**01**	**02**	**1.960**
10	Passeriformes	**23**	**31**	**45**	**44.118**
11	Pelecaniformes	**03**	**09**	**10**	**9.804**
12	Phoenicopteriformes	**01**	**01**	**01**	**0.980**
13	Piciformes	**02**	**03**	**03**	**2.941**
14	Psittaciformes	**01**	**01**	**01**	**0.980**
15	Strigiformes	**02**	**03**	**03**	**2.941**
16	Suliformes	**01**	**01**	**01**	**0.980**
Total	**16**	**48**	**84**	**102**	

Source: Prabhakar et al (2020)

Table 2. Genera, families & species of true mangroves and mangrove associates from Panvel.

Sr. No	Family	Genera	Species
True mangroves			
1	Acanthaceae	**2**	**3**
2	Primulaceae	**1**	**1**
3	Rhizophoraceae	**2**	**3**
4	Sapotaceae	**1**	**1**
	4	**6**	**8**
Mangrove Associates			
5	Aizoaceae	**1**	**1**
6	Amaranthaceae	**1**	**1**
7	Apocynaceae	**1**	**1**
8	Fabaceae	**2**	**3**
9	Poaceae	**2**	**2**
10	Pontederiaceae	**1**	**1**
11	Rhamnaceae	**1**	**1**
12	Salvadoraceae	**1**	**1**
13	Verbenaceae	**1**	**1**

	9	**11**	**12**
Total	**13**	**17**	**20**

Source : Prabhakar R. Pawar* Atul J. Pore, Anil G. Rokade, Namdeo B. Pawar and Shreya R. Patil

Accipiter badius

Elanus caeruleus

Lanius schach

Motacilla albas

Ardea alba

Bubulcus ibis

Tyto alba

Milvus migrans

Alcedo atthis

Ceryle rudis

Ceryx erithaca

Columba livia

Vanellus indicus

Sterna aurantia

Prinia socialis

Pavo cristatus

Source : Google.com

Conclusion:

It is important to take into account additional potential factors that could have a stronger impact on bird species composition and diversity in order to gain a better understanding of these topics. Birds play a significant role in sustaining biodiversity since they are keystone species that ensure the survival and reproduction of a variety of other species. Therefore, the loss of birds could have a significant impact on the environment and reduce biodiversity. So, present analysis favours an alternate hypothesis which says that there is a significant relationship between biodiversity and mangroves in Navi Mumbai, India.

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A review on physiochemical properties of water

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Abstract:-

Drinking water is an important natural resource that supports human health, economic development and ecological diversity. Groundwater resource assessment involves a detailed study of sub-surface water, including geology and hydrogeology, monitoring and production of well data. Water quality guidelines provide a Limit Value for each parameter for drinking water, and it is important to check the quality of drinking water at regular intervals. Physico-chemical parameters such as color, temperature, acidity, hardness, pH, sulphate, chloride, DO, BOD, COD, alkalinity used for testing of water quality. Guidelines of different physic-chemical parameters also have been given for comparing the value of real water sample. Drinking Water Quality was analyzed by various standards and analytical methods.

Keywords: Drinking water, Physico-chemical water quality parameters, underground water.

Introduction

One of the most significant and abundant components of the environment is water. Water is a necessity for the life and development of every living thing on Earth. Only Earth has 70% water on the planet as of yet. But, as a result of human activity, industrialization, the use of fertilisers in agriculture, and rising human population, the environment is severely contaminated. Because the human population contracts a variety of water-borne diseases as a result of using contaminated drinking water, it is imperative that the quality of the drinking water be examined on a regular basis. It is challenging to properly comprehend biological phenomena since the chemistry of water reveals a great deal about the ecosystem's metabolism and explains the overall hydro-biological processes. (Basavaraja Simpi et al. 2011).

In order to avoid infections and enhance quality of life, it is essential to have access to clean water. Natural water contains a variety of pollutants that enter aquatic systems in a variety of ways, such as through the weathering of rocks and the leaching of soils.Aerosol particles dissolve from the atmosphere and from a variety of human activities, such as metal mining, processing, and consumption. (Adeyeye 1994)

The government's growing use of metal-based fertilisers in agriculture could cause metal contamination levels in fresh water reservoirs to continue to rise as a result of water runoff. Moreover, drinking leads to faecal contamination.

Millions of people have died as a result of water-borne diseases. (2010) Adefemi

Ground water quality is determined by a variety of chemical components and their concentration, which are mostly obtained from the geological information of the specific place. One of the main contributors to surface and ground water pollution is now recognised to be industrial and municipal solid waste. Due to the presence of heavy metals in excess, existing water is rendered unusable in many areas of the nation. Due to a lack of water and rainwater runoff, the situation worsens over the summer. One of the main major health issues is the heavy element, metal ion, and hazardous microbe contamination of drinking and domestic water supplies. A research in Haryana (India) found that the poor quality of ground water is being caused by a high rate of exploration followed by recharging, inappropriate dumping of solid and liquid wastes, a lack of severe enforcement of the law, and lax governance (Guptaa 2009).

Physico- Chemical Parameters

Before using water for drinking, residential, agricultural, or industrial purposes, it must first be tested. A variety of physical-chemical factors must be used to test water. Selection of parameters for testing of water is solely depends upon for what purpose we going to use that water and what extent we need its quality and purity. Several kinds of floating, dissolving, suspended, microbiological, and bacteriological pollutants are present in water. Physical tests should be carried out to evaluate the substance's physical characteristics, such as temperature, colour, odour, pH, turbidity, TDS, etc. Chemical tests should be carried out to evaluate the substance's BOD, COD, dissolved oxygen content, alkalinity, hardness, and other characteristics. Water should be analysed for trace metal, heavy metal, and organic (pesticide residue) content in order to acquire water of higher and higher quality and purity. Drinking water must obviously pass all of these tests and contain the necessary quantity of minerals.

All these characteristics are properly controlled only in industrialised nations. The tiny levels of organic and heavy metal pesticide contaminants in water necessitate the use of highly specialised testing equipment and skilled labour. Water quality is periodically checked using the following physical and chemical characteristics.

Temperature:-

In a stable system, the water temperature controls the frequency of all chemical reactions and has an effect on fish immunity, growth, and reproduction. Fish can suffer from sudden temperature changes.

pH:-

pH plays an important role to determine the toxicity of water .The more toxic water is, lower the pH value. Total alkalinity and electrical conductivity had a positive correlation with pH.

(Guptaa 2009). Low oxygen levels corresponded with high temperatures during the summer due to decreased chlorophyll content, with absorption of carbon dioxide and bicarbonates, which eventually leads pH to rise. The pH of water can change due to a number of factors. The higher pH value represents that the change in physicochemical conditions has a greater impact on carbon dioxide, carbonate-bicarbonate balance (Karanth 1987).

EC (Electrical Conductivity):-

Temperature, pH, alkalinity, total hardness, calcium, total solids, total dissolved solids, chemical oxygen demand, chloride concentration, and iron concentration are 10 characteristics that significantly correlate with conductivity. According to Navneet Kumar et al. (2010), managing the conductivity of water can be used to regulate water quality in other research areas as well as effectively check the quality of the underground drinking water in the study area. The resistance provided by the water between two platinized electrodes is measured using an EC tester. The instrument has known conductance values that are measured using a standard KCl solution.

Carbon Dioxide:-

Almost all aquatic ecosystems produce carbon dioxide as the by product of organic carbon decay, and its variance is frequently used as a gauge of net ecosystem metabolism (Smith 1997,1993, Hopkinson 1985). Hence, it is desirable to measure characteristics that define the carbon dioxide system in aquatic biogeochemical investigations. The most significant greenhouse gas on Earth is CO2. One of the most significant issues in studies of global change is its fluxes through the air-water or sediment-water interface, which are frequently used as indicators of the net ecosystem production or metabolism of the aquatic system.

Alkalinity

Alkalinity serves as a pH stabiliser and is mostly composed of bicarbonate (HCO_3^-) and carbonate (CO_3^-). The toxicity of numerous compounds in the water is influenced by alkalinity, pH, and hardness. It is determined using a standard dil HCl titration in the presence of a indicators phenolphthalein and methyl orange. The main causes of alkalinity in boiler water are hydroxyl and carbonate ions. The presence of hydroxyl alkalinity (causticity) in boiler water is required to prevent corrosion in the boiler. Other operational issues like foaming result from too much causticity. An embrittlement caustic impact on the boiler can occur when the causticity levels are excessively high.

Dissolved Oxygen:-

One of the most important parameter is DO. Its connection to a water body provides both direct and indirect information, such as stratification, bacterial activity, and photosynthesis (Premlata Vikal, 2009). As summer progressed, dissolved oxygen levels dropped as a result of rising temperatures and increasing microbial activity (Moss 1972; Morrissette 1978 and Kataria 1996). The high DO in the summer is brought on by a rise in temperature and the length of intense sunlight, which affects the percentage of soluble gases (O_2 & CO_2).

Biochemical Oxygen Demand (BOD):-

Water contamination is determined by BOD, which is expressed in mg/L. The amount of dissolved oxygen required for the metabolic breakdown of organic molecules and the oxidation of some inorganic elements is known as BOD (e.g., iron, sulfites). Usually, the BOD test is performed over the course of five days (Milacron Marketing Co.)

Chemical Oxygen Demand (COD):-

Another indicator of organic material contamination in water is COD, which is measured in mg/L. The COD, or the concentration of dissolved oxygen, is the quantity required to chemically oxidise the organic material in water. Critical factors of the environmental health of a surface water supply include BOD and COD. They are frequently employed in the treatment of waste water, but not often in the treatment of ordinary water. Milacron Marketing Company.

Carbonate:-

The presence of carbonates is indicated if the pH reaches 8.3. It is determined using the titration of phenolphthalein with calibrated hydrochloric acid. The carbonates are transformed into an equivalent number of bicarbonates below pH 8.3. Potentiometric or pH titration methods are further options.

Bicarbonate:-

Besides that, methyl orange is used as an indicator during a titration with standardised hydrochloric acid to measure it. Below pH 4.0, methyl orange turns yellow. The carbonic acid breaks down at this pH to produce carbon dioxide and water.

Some physicochemical analysis study of polluted water sample in India (Literature Review)

Physico chemical parameter study is important to assess the quality of water and compare results of different physico chemical parameter values with standard values. Aftab Begum et al. (2005) studied various physico-chemical parameters and found that the parameters such as COD, BOD, EC, TDS, TSS, and the amount of ammonia were high compared to permissible limits of CPCB (1995). Dey Kallol et al.(2005) found that dilution during the rainy season decreases the metal concentration level, but enrichment of these metals by bio-magnification and bioaccumulation in edible components produced in water is accepted to produce a remarkable effect on the water of the river Brahamani. Manjesh Kumar and Ramesh Kumar conducted experimental work on physicochemical contamination of ground water in Jhansi (Goramachia). Six different sites were selected for sample testing, and physic-chemical parameters such as pH, D.O., E.C., T.D.S., alkalinity, turbidity, Ca (calcium) and Mg (magnesium) hardness, total hardness, NO3 (nitrate), F (fluoride), Fe+3 (iron) and Cl- (chloride) were tested. Sharma Madhavi et al. studied ground water quality of industrial area of Kishangarh for various physicochemical parameters seasonally without and after addition

of marble slurry in different proportions. Singhal et al. and Chavan et al. studied the treatment of pulp and paper mill effluent by Phanerochaete chrysosporium and found that the pH, colour, COD, lignin content and total phenols of the effluent significantly declined after bioremediation. Premlata Vikal studied various parameters like air and water temperature, pH, free CO2, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, conductivity, total dissolved solids, hardness, total alkalinity, chloride, nitrate, phosphate and sulphate. Gupta et al. analyzed water samples from 20 sampling points of Kaithal for physicochemical characteristics and found that some of the samples are non-potable for human beings due to high concentration of one or the other parameter. Basawaraj simpi et al.(2011) studied monthly changes in various physic chemical parameters of Hosahalli water tank in Shimoga district Karnataka. Saravanakumar and Ranjith Kumar (2011) studied groundwater quality of Ambattur industrial area in Chennai City. Manjare et al. (2010) studied the Physico-chemical Parameters of Tamadalge Water Tank in Kolhapur District, Maharashtra. The results indicate that the tank is Non-polluted and can be used for Domestic and Irrigation, but highly impure water has various effects on human beings, domestic purpose, and industrial use. Level-I Laboratories are located at 258 field water quality monitoring stations, while Level-II Laboratories analyse 25 different physico-chemical characteristics and bacteriological parameters of river water.

Water Quality Parameters of ground water sample from study area, and comparison with Permissible values

Water must be tested with different physic-chemical parameters to determine its quality and purity. Physical tests such as temperature, color, odour, pH, turbidity, TDS etc. and chemical tests such as BOD, COD, dissolved oxygen, alkalinity, hardness and other characters should be performed to determine its trace metal, heavy metal contents and organic residue. Only in developed countries are these criteria monitored.

Conclusion:-

It is important to test water before it is used for drinking, domestic, agricultural or industrial purposes. Groundwater is the most important source of water supply for drinking, irrigation and industrial purposes, but its quality cannot be restored by stopping the pollutants from the source. Therefore, it is important to regularly monitor the quality of groundwater and to device ways and means to protect it.

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Impact of Junk Food and Fast Food Consumption among Adolescent in Kalamboli, Navi Mumbai, India

Shashikala Prajapati and Alfiya Bhakshe

Abstract:

Fast food is described as conveniently accessible food that may be swiftly purchased at restaurants or cafes, but junk food is defined as food with a very low nutritional value. Instead of eating home-cooked, healthy diets, we purchase fast food and junk food from these locations.

Keywords : fast food, junk food, consumption, adolescent , conveniently, nutritional value.

Introduction:

Junk foods are foods that are easily accessible, typically inexpensive, and have low nutritional value. These foods include more calories, more salt, a greater saturated fat content, and less iron, calcium, and dietary fibre. Fast food, fizzy drinks, chips, sweets, and chocolates are examples of common junk foods. (Mandoura N, et, al.2017).

Frequent consumption of junk foods can also increase the risk of diseases such as hypertension and stroke. Hypertension is also known as high blood pressure and a stroke is damage to the brain from reduced blood supply, which prevents the brain from receiving the oxygen and nutrients it needs to survive. Hypertension and stroke can occur because of the high amounts of cholesterol and salt in junk foods.

Furthermore, junk foods can trigger the “happy hormone,” dopamine, to be released in the brain, making us feel good when we eat these foods. This can lead us to wanting *more* junk food to get that same happy feeling again (Reichelt, A. C,et al, 2016).Other long-term effects of eating too much junk food include tooth decay and constipation. Soft drinks, for instance, can cause tooth decay due to high amounts of sugar and acid that can wear down the protective tooth enamel. Junk foods are typically low in fiber too, which has negative consequences for gut health in the long term. Fiber forms the bulk of our poop and without it, it can be hard to poop!

Alternatives of junk food

1. Beef, Hamburg -Grilled chicken.
2. Fried appetizers- Salad.
3. Pasta or potatoes- Vegetables.
4. Shakes or soda- Orange juice or water.(Bailey R et al,2009)
5. Chowder or cream soup- Vegetable soup.
6. Bologna, salami, ham- Turkey breast on oatmeal bread.
7. Regular dressing, mayonnaise, oil- Low fat salad dressing.
8. White bread or sub roll- Oatmeal, Syrian or Wheat bread. (Coon KA et al,2002)

Problems with junk food

Increased fat

Junk foods, like burgers, pizza, seared chicken, and chips, typically include a lot of soaked fats. An excessive amount of soaked fat in the diet will cause people to gain weight, and being overweight poses a risk to heart health and other infections.

Increased salt content

Junk frequently contains too much salt. Currently, there is a lot of salt in food, such as bread, breakfast oats, and buns. So when people eat junk food, they consume more salt than they need, and too much salt is bad for maintaining a healthy lifestyle.

Types of junk food:

There are many different forms of junk food accessible in the market, with soft drinks, pizza, hamburgers, potato chips, ice cream, hot dogs, pakora, chowmins, French fries, cheese chilli, pav bhaji, etc. being the most popular. Fast food in the north, like hamburgers and fries from McDonald's, KFC, and Pizza Hut, is frequently seen as junk food, whereas identical meals from more upscale restaurants like Pizza Express or Nando's frequently have the same or worse nutritional value. Gyros, pakoras, gyozas, and chicharrons are examples of traditional or ethnic meals that are not typically seen as junk food, despite the fact that they all have minimal nutritional value and are frequently rich in fat from being fried in oil. (Lacy LM et al,2006).

Hypothesis:

H_0: There is no Impact of Junk Food and Fast Food Consumption among Adolescents.

H_1: There is Impact of Junk Food and Fast Food Consumption among Adolescents.

Material and Methods: A self-administered questionnaire was used for data collection from the adolescents.

Result:

TYPE OF QUESTION	ANSWER	
	YES	NO
Do you eat Junk food	391	109
Do you have any Health Issues?	54	446
Do you have any peer influence	109	391
Do your parents allow to consume junk food?	204	293
Do you do regular exercise?	260	240

TYPE OF QUESTION	ANSWER
What type of junk food you eat?	1.Salty snacks-391 2. Sweets-109
How frequently you eat junk food?	1.Daily-76 2.Occassionally-196 3.thrice-228
What type of health you have?	1.Healthy-326 2.Lean & Thin -120 3.Overweight-54

Conclusion:

Because of globalisation, junk foods have completely slashed the Third World. It is a vital part of life in the produced and also the generating scene, and it is accompanied with a massive increase in weight and linked concerns. Balance, accidental consumption, and, ideally, small portions are the best ways to consume these junk foods. It is not difficult to fight a war against solid foods with junk foods.

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Study of Genetic Traits - Rolling Tongue and its relation with Blood Group in India

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Abstract:

Humans can vary, and this is typically due to a number of physical anthropologically significant causes, particularly when examining population variation and human variety. Physically observable qualities called morphogenetic traits can be acquired through a single gene or through a multifactorial pattern. The codominant hereditary trait of having an ABO blood type has been linked to a variety of physiologic and morphological differences. Ebeye Oladunni Abimbola (2019) investigated 400 volunteered adult subjects (176 males and 224 females) between the ages of 18 and 60. The tongue type were observed and examined physically thus classifying subjects into rollers/none-rollers, folders/none-folders type. Results indicates that tongue rollers (72.9%) were more than non-rollers (27.3%), in the same manner, tongue folders (68.3%) were also more than non-folders (31.7%) in the studied population. There are, however, only a few studies that have connected certain morphogenetic features to ABO blood groups. Forensic investigators and anthropologists may find this information useful.

Key Words: Tongue, Rollers, Folders, morphogenetic trait.

Introduction:

It may follow an autosomal, sex-dominant, or sex-recessive pattern. It is currently thought that several of these genetic traits show interactions between genetic and environmental factors rather than just following Mendelian law. Morphogenetic traits, such as facial shape, hair colour, eye colour, and disease, are physical characteristics that can be passed from parent to child.

The tongue is a flexible organ with many different shapes and forms that is formed of muscle tissues and covered in mucosa membrane (Keith and Arthur 2006). It contributes to taste, deglutition, and sound generation. Tongue rolling is the propensity to roll the lateral edge of the tongue upward into a tube. The ability to roll the tongue's lateral edges up and into a tube is known as tongue rolling. Some people can shape their tongues into particular forms thanks

to the intrinsic muscles in their tongues. It's common to think of tongue rolling as a dominant trait inherited through a straightforward Mendelian process. Afred Sturtevant (1940), a geneticist, found that 30% of Europeans do not roll their tongues, compared to 70% who do. No two people are completely alike, according to studies; human variances may stem through migration, selection, or inheritance patterns (Bhasin et al., 1992). The method of passing biological qualities from parents to children through gene inheritance is called inheritance (Ordu et al., 2014).

Alleles, which are made up of two or more variations, make up genes. Individuals may receive two alleles from each parent, either the same or different, and these alleles may interact in dominant and recessive ways. For instance, tongue rolling and folding alleles predominate over neither rolling nor folding (Ebeye Oladunni Abimbola, 2019).

Objectives:

- To study the genetic traits of rolling tongue and its relation with blood group in India.
- To identify the relation between blood group and its effect on rolling tongue.

Hypothesis:

H_0: There is no relation of Rolling Tongue with Blood Group in India.

H_1: There is a relation of Rolling Tongue with Blood Group in India.

Material and Methods: Secondary data was obtained from https://udel.edu/~mcdonald/mythtongueroll.html and used for study.

Result and Discussion:

Family Study:

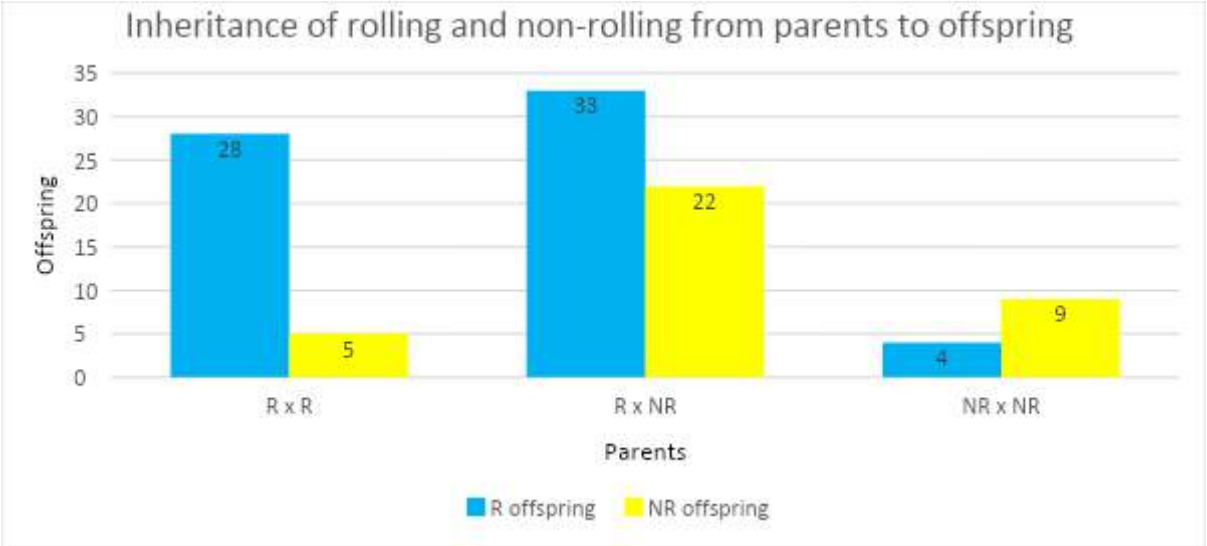
Sturtevant (1940) compared parents and offspring, with the following results.

Table 1: Inheritance of rolling and non-rolling of tongue from parents to offspring.

Parents	R offspring	NR offspring
R x R	28	5
R x NR	33	22
NR x NR	4	9

Source: https://udel.edu/~mcdonald/mythtongueroll.html

Figure 1: Inheritance of rolling and non-rolling of tongue from parents to offspring



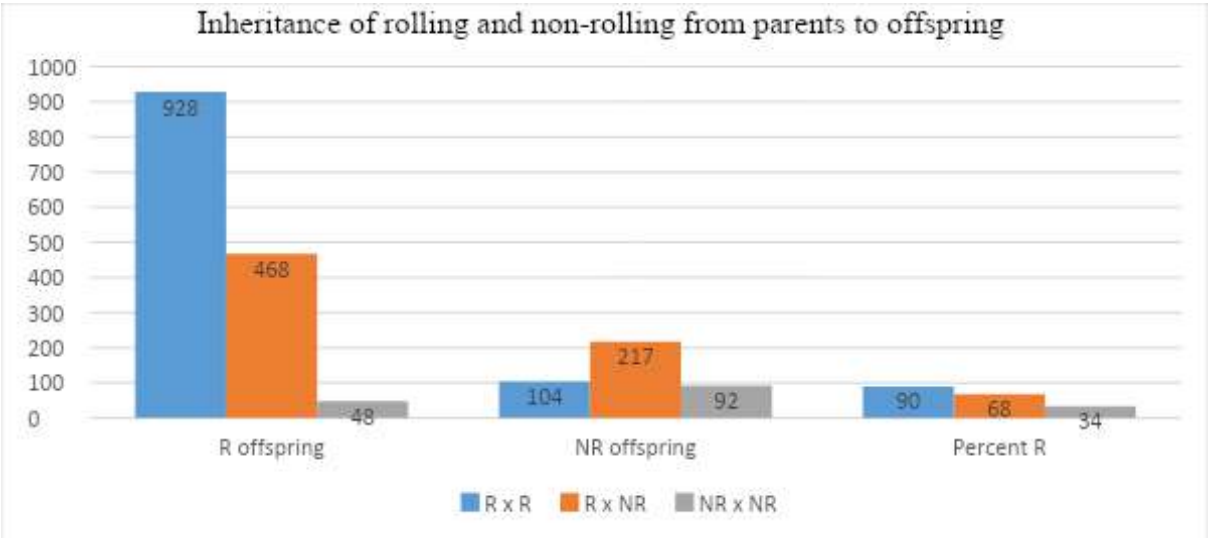
He concluded that tongue rolling was at least partially genetic, with rolling dominant to non-rolling, despite the four R offspring of NR x NR parents.

Komai (1951) performed a similar study with much larger sample sizes, and found similar results:

Table 2: Inheritance of rolling and non-rolling of tongue from parents to offspring.

Parents	R offspring	NR offspring	Percent R
R x R	928	104	90%
R x NR	468	217	68%
NR x NR	48	92	34%

Source: https://udel.edu/~mcdonald/mythtongueroll.html



In both family studies, those who have tongue-rolling parents are far more likely to roll their tongues than people who don't. This similarity amongst relatives shows that there is a

significant genetic influence on tongue-rolling because it is difficult to understand how the typical family environment could affect it.

However, if this characteristic were a straightforward one-gene, two-allele genetic character, with rolling entirely dominant to non-rolling, then two non-rolling parents could not conceive a rolling child. Since rolling children of non-rolling parents were observed in both trials, the feature must be more nuanced than the myth suggests. The gap could be due to more sophisticated genetics, involving several alleles or many genes, or some form of environmental influence.

Twin studies

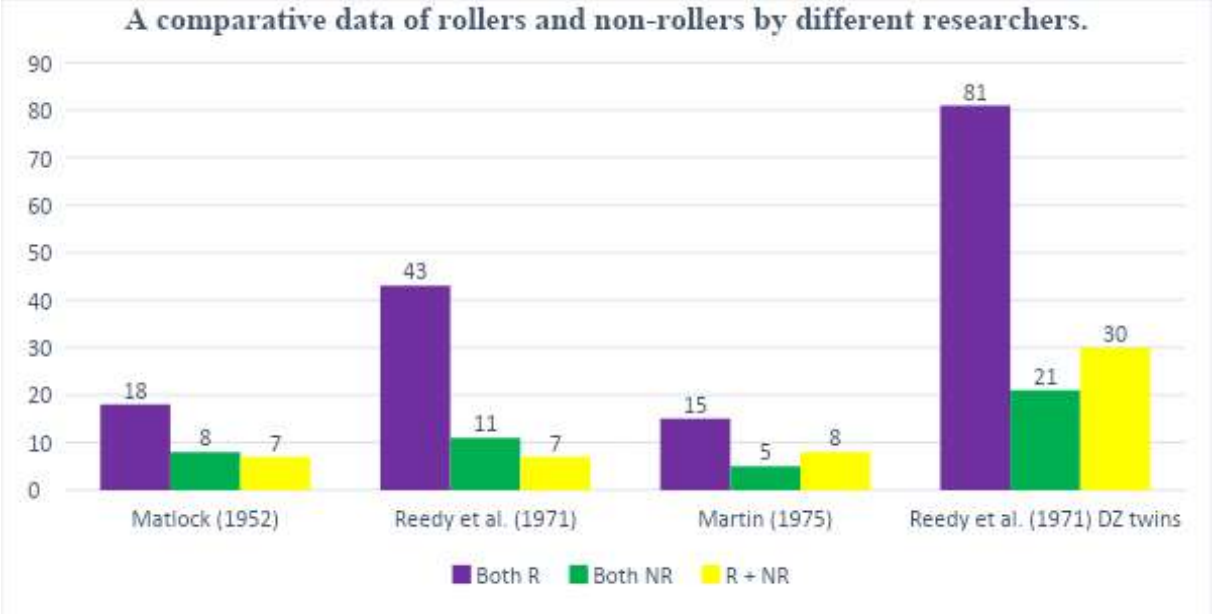
Out of 33 pairs of monozygotic (identical) twins, Matlock (1952) discovered that 7 pairs included a R and an NR twin. This demonstrates unequivocally that significant non-genetic factors play a role in tongue rolling and persuaded Sturtevant (1965) that genetics alone do not account for tongue rolling. Numerous pairs of monozygotic twins with different tongue rolling behaviours were also discovered by Reedy et al. (1971) and Martin (1975). Additional proof that there is some genetic influence on this feature can be found in the fact that dizygotic twins were twice as likely to differ in tongue-rolling ability as monozygotic twins (Reedy et al. 1971).

Table 3: A comparative data of rollers and non-rollers by different researchers.

	Matlock (1952)	**Reedy et al. (1971)**	**Martin (1975)**	**Reedy et al. (1971) DZ twins**
Both R	18	43	15	81
Both NR	8	11	5	21
R + NR	7	7	8	30

Source: https://udel.edu/~mcdonald/mythtongueroll.html

Figure 3: A comparative data of rollers and non-rollers by different researchers



This made it impossible to link the morphogenetic pattern of tongue rolling to the ABO blood group. While participants with blood groups B and AB recorded an equal number of tongue rollers and non-rollers, those with blood groups A and O recorded a larger distribution of tongue non-rollers. While there was a significantly higher distribution of right hand clasping among the people with blood groups A, B, and O, there was a significantly lower distribution of left hand clasping among those with blood group AB.

Conclusion:

In conclusion, the H0 is proved to be true that there is no relation between the rolling of tongue with one's blood group. Although the ABO and Rh blood group systems are among the most significant, they are inherited differently in populations with various genotypes. Nevertheless, it does not play any role in rolling of one's tongue.

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