

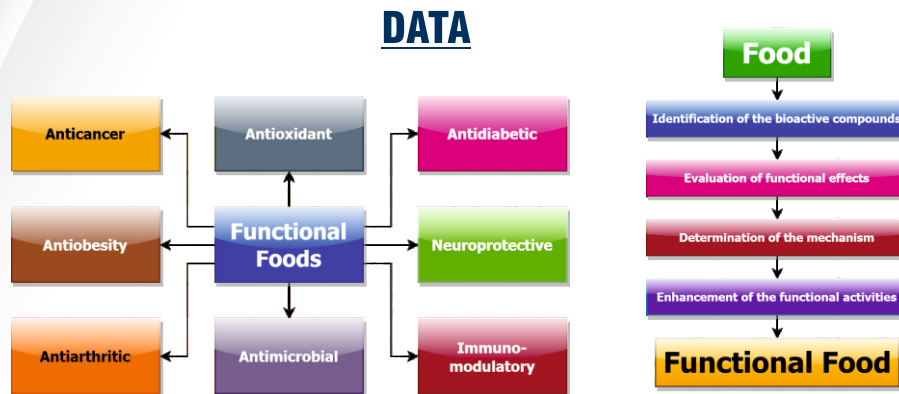
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5th Annual National Conference
of MIDNAPORE CITY COLLEGE

on
Functional Food as Dietary
Intervention for Chronic Diseases

5th
MCCCON
2024
4th-6th February



Organised by



MIDNAPORE CITY COLLEGE

(Recognised by UGC, Govt. of India & Affiliated to Vidyasagar University and West Bengal University of Health Sciences)

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5th Annual National Conference of MIDNAPORE CITY COLLEGE
on
“Functional Food as Dietary Intervention for Chronic Diseases”

5th
MCCCON-2024

4th to 6th February, 2024

Sponsored by



सत्यमेव जयते

Department of Biotechnology
Ministry of Science & Technology, Govt. of India

SOUVENIR

Organised by



MIDNAPORE CITY COLLEGE

(Recognised by UGC, Govt. of India & Affiliated to Vidyasagar University and
West Bengal University of Health Sciences)

Midnapore, Paschim Medinipur, Pin- 721 129, West Bengal, India

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Professor Susanta Kumar Chakraborty

Vice-Chancellor
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Telefax : (03222) 275329

Date: 24.01.2024

MESSAGE

It is heartening to note that Midnapore City College, Paschim Medinipur is going to organize the 5th Annual National Conference (MCCCON-2024) on *Functional Food as Dietary Intervention for Chronic Diseases* during February 4 – 6, 2024.

I commend this collective endeavour and hope that the deliberations in the Conference will really be enriching to all the participants.

I extend my greetings and good wishes on the occasion.

(Professor Susanta Kumar Chakraborty)

Dr. Pradip Ghosh,
Director,
Midnapore City College,
Kuturiya, Bhadutala,
Paschim Medinipur.



VIDYASAGAR UNIVERSITY

P.O. : Vidyasagar University, Midnapore - 721 102, Dist.: Paschim Medinipur,
West Bengal, INDIA.

Dated : 24.01.2024.

MESSAGE

I am delighted to learn that the Department of Paramedical & Allied Health Science, Midnapore City College is going to publish an Abstract Book on the eve of organizing 5th Annual National Conference "MCCCON-2024" on "Functional Food as Dietary Intervention for Chronic Diseases" scheduled to be held during 4-6th February, 2024 in the college premises. I extend my warmest wishes to the Department of Paramedical & Allied Health Science along with the Organising Secretary of "MCCCON-2024" and other associate members of the Organising Committee for taking necessary steps to release such an Abstract Book on that occasion.

I hope that the programme for publication of Abstract Books and also the National Conference "MCCCON-2024" will be a grand success.



(Dr. J. K. Nandi)

Registrar.

Registrar
VIDYASAGAR UNIVERSITY
Midnapore-721102, W.B.

To

- (1) Dr. Pradip Ghosh
Director
- (2) Dr. Shrabani Pradhan
Assistant Professor in Nutrition
Department of Paramedical & Allied Health Science
&
Organizing Secretary, "MCCCON 2024"

Midnapore City College
Kuturiya, Bhadutala,
Dist. : Paschim Medinipur,
Pin : 721 129, West Bengal.

Organising Committee

Chief Patron & Convenor:	Dr. Pradip Ghosh Founder Director.
Patron:	Dr. Sudipta Chakrabarti (Principal & Associate Professor) Dept. of Biological Sciences.
Co Patron:	Dr. Kuntal Ghosh (Vice-Principal & Assistant Professor) Dept. of Paramedical and Allied Health Sciences.
Coordinator:	Dr. Dilip Kumar Nandi (Professor) Dept. of Paramedical and Allied Health Sciences.
Joint Coordinator:	Dr. Santanu Kar Mahapatra (Associate Professor) Dept. of Paramedical and Allied Health Sciences.
Joint Convenor:	Dr. Suchismita Roy (Assistant Professor) Dept. of Paramedical and Allied Health Sciences.
Joint Convenor:	Dr. Malay Patsa (Associate Professor) Dept. of Paramedical and Allied Health Sciences.
Organizing Secretary:	Dr. Shrabani Pradhan (Assistant Professor) Dept. of Paramedical and Allied Health Sciences.
Joint Organizing Secretary:	Mrs. Manisha Phoujdar (Assistant Professor) Dept. of Paramedical and Allied Health Sciences.
Cultural Secretary:	Mrs. Titli Panchali (Technical Assistant) Mrs. Ananya Dutta (Research Scholar) Ms. Riya Kar (Research Scholar) Dept. of Paramedical and Allied Health Sciences.

Programme Schedule

5th Annual National Conference of Midnapore City College “MCCCON 2024”
on

“Functional Food as Dietary Intervention for Chronic Diseases”

Date: 4th & 6th February, 2024.

Venue: Midnapore City College

Technical Program with session wise details and name of session chair/co chair,

PROGRAMME SCHEDULE

Day-1: 4th February, 2024 (Sunday)

10:00 A.M.-11:00 NOON	—	Registration
11:00 P.M.-12.00 P.M.	—	Inauguration (Dr. A.P.J. Abdul Kalam Memorial Hall) by Inaugurator and Chief Guest Welcome address of Resource persons and Guest
12:00 P.M.-12:30 P.M.	—	Key Note Address by: Prof. Nirmal Kumar Sarkar, Emeritus Professor, Department of Biological Sciences, Midnapore City College

Technical Session 1

(Theme: Modern Weapon using dietary component to combat chronic diseases)

Chair Person: **Dr. Dilip Kumar Nandi,**

Professor, Department of Paramedical & Allied Health Sciences, Midnapore City College.

12.30 P.M.-1.15 P.M.	—	Invited Lecture 1 Prof. Debprasad Chattopadhaya, Former Founder Director & Scientist G, ICMR- National Institute of Traditional Medicine, Nehru Nagar, Belagavi 'Functional food(s): Natures weapon to counter Chronic Diseases'
1.30 P.M. -2.15 P.M.	—	Invited Lecture 2 Dr. Keshab Chandra Mondal, Professor, Department of Microbiology, Vidyasagar University 'Fermented Food & Their Perspectives'
2.30 P. M.-3.30 P.M.	—	Lunch Break

Free Communication Session

(Dr. A.P.J. Abdul Kalam Memorial Hall)

Chair Person: **Prof. Nirmal Kumar Sarkar**

Emeritus Professor, Department of Biological Sciences, Midnapore City College

3.30 P. M.-5.00 P. M.	—	Young Scientist Award Session
5.00 P.M.-7.00 P.M.	—	Cultural Programme
7.00 P.M.-9.00 P. M.	—	Dinner

Day-2: 5th February, 2024 (Monday)

8:00 A.M.-10:00 A.M.	—	Registration
9:00 A.M.-10:00 A.M.	—	Breakfast (food Court)

Technical Session 2

(Theme: Microbial Aspects of Food)

Chair Person: **Prof. Ananta Kumar Ghosh,**

Retired Professor, Department of Biotechnology, IIT Kharagpur.

10:30 A.M.-11:30 A.M.	—	Invited Lecture 3 Dr. Anil Kumar Anal, Professor, Asian Institute of Technology, Thailand <i>'Immunomodulation and Enhancing the Immunity: Unveiling the Potential of Designer Diets.'</i>
11.30 A.M.-12.30 P.M.	—	Invited Lecture 4 Dr. Madhumita Barooah, Professor, Department of Agricultural Biotechnology and DBT-NECAB, Assam Agricultural University, Jorhat, Assam 'Fermented Culinary Traditions ...: A Gateway to Functional Foods and Health Resilience'
12:30 P.M.-1:30 P.M.	—	Invited Lecture 5 Dr. Debdutta Bhattacharya, Scientist-E/Deputy Director, ICMR- Regional Medical Research Centre, Bhubaneswar, Odisha. 'Food Borne Diseases and Food safety using a holistic approach of One Health'
01:30 P.M.-2:30 P.M.	—	Lunch (Food Court) Canteen Building

Concurrent Session

(Dr. A.P.J. Abdul Kalam Memorial Hall)

Chair Person: **Prof. Nirmal Kumar Sarkar**

Emeritus Professor, Department of Biological Sciences, Midnapore City College

- 2:30 P.M.-4:30 P.M. — **Poster Presentation by UG & PG Students**
(3rd Floor & 4th Floor of PS building)
- 4:30 P.M.-5:00 P.M. — **Snacks Break**
- 5:00 P.M.-7:00 P.M. — **Oral Presentation by Research Scholar**
(Dr. A.P.J. Abdul Kalam Memorial Hall)
- 7.00-9.00 P.M. — **Dinner**

Day-3: 6th February, 2024 (Tuesday)

- 9:00 A.M.-10:00 A.M. — **Breakfast (Food Court)**

Technical Session 3

(Theme: Bioactive Compounds for Alleviation of Chronic Disease)

Chair Person: **Prof. Nirmal Kumar Sarkar**

Emeritus Professor, Department of Biological Sciences, Midnapore City College

- 10:30 A.M.-11:30 A.M. — Invited Lecture 6
Dr. Davinder Pal Singh Oberoi,
Associate Professor & Academic Coordinator,
University Institute of Engineering (UIE)
Chandigarh University, Punjab, India.
- 11:00 P.M. – 1:00 P.M. — **Valedictory Session**
(Dr. A.P.J. Abdul Kalam Memorial Hall)
- 11:30 P.M.-12:00 P.M. — **Prize Distribution Ceremony**
- 12:00 P.M.-12:30 P.M. — **Vote of Thanks** by Seminar Coordinator
Dr. Dilip Kumar Nandi,
Professor, Midnapore City College
- 1:00 P.M. – 2:00 P.M. — **Lunch (Food Court)** Canteen Building

ABOUT THE COLLEGE

MIDNAPORE CITY COLLEGE, the first self-financing General Degree College in the South Bengal region within the state of West Bengal, has been established by MORAINÉ HUMAN RESOURCE DEVELOPMENT ORGANISATION, a registered society bearing registration S/1L/31682 on dated 02.09.2005 having its office at Aparnapalli, Satbankura, Paschim Medinipur with the sole aim to help the people as per notification of Higher Education Department, Govt. of West Bengal bearing No: W.B (Part-I)/2015/SAR-458 dated 23rd day of September, 2015 published in Kolkata Gazette and subsequent No Objection was issued to this college through the order No.197-ILC/OM-58L/2017 dated 18.07.2017 on the basis of which Vidyasagar University also extended the affiliation by its memo No: VU/R/ Circular /8EC-10/ C0383/ 2017 dated 05.09.2017 and VU/IC/BMLT/MCC/017/2019 dated 29.01.2019. The college is also recognized under section 2(f) by UGC, Govt. of India bearing File No: 8-1/2018(CPP-I/C) dated 18.01.2018 for conducting different Under Graduate and Post Graduate programmes in the faculty of Arts and Science and Allied Health Science from the academic session 2017-18. The college is located at educationally backward and rural area in the district of Paschim Medinipur within the state of West Bengal and most of our students belong to socially and economically backward sections of society. The sole aim of MORAINÉ HUMAN RESOURCE DEVELOPMENT ORGANISATION is to serve people by imparting quality education and research to the society. The institution has received recognition from Department of Scientific Industrial Research (DSIR) Govt. of India as Scientific and Industrial Research Organisation (SIRO) bearing F. No.11/762/2018-TU-V dated 26th November,2018. The institute is recognised under The Directorate of Medical Education, Government of West Bengal (ME/MISC-85-2020/M/1720/1(2) dated 13.11.2020, ME/MISC-85-2020/M/2018/1(2) dated 30.12.2020, ME/MISC-85-2020/M/167/1(2) dated 20.01.2021, ME/MISC-85-2020/M/168/1(2) dated 20.01.2021, ME/MISC-85-2020/M/169/1(2) dated 20.01.2021, ME/MISC-85-2020/M/170/1(2) dated 20.01.2021) and it is affiliated to The West Bengal University of Health Sciences, West Bengal (OG/WBUHS/2020-21/1328 dated 25.01.2021, OG/WBUHS/2020-21/1672, OG/WBUHS/2020-21/1673, OG/WBUHS/2020-21/1674, OG/WBUHS/2020-21/1675 dated 23.03.2021). The institute believes that excellent teaching can produce better students and thereby helping the institute to emerge as a centre of excellence.

Message from the President

MIDNAPORE CITY COLLEGE



She is the founder president of Moraine Human Resource Development Organisation. The idea of opening the first self-financing general degree college in south Bengal first came to her mind. The college is an epitome of her noble thoughts. "Midnapore City College is more than just a college; we are a COMMUNITY. From your first day at Midnapore City College, you will meet people who will support, inspire, and challenge you to be the best person. Because of our uniqueness, we can promise that when you will leave, you will experience tremendous growth. You will be developed into a new, more advanced and self-assured version of yourself.

At MCC, we feel proud of ourselves of our reputation for being a “caring college”. Our faculty and staff are dedicated to help students to achieve their goals. They will work with you daily to ensure a successful educational experience. Our student body is equally as welcoming and warm-hearted. They offer an environment of support, encouragement and friendship like no other.

As an accredited institution, uniquely aligned with business and industry, we also feel proud of ourselves for being a center for academic excellence. Once you begin at Great Bay, you will be exposed to a rigorous learning experience both in and out of the classroom. We will make you face challenge like never before, but the award will be a presentation of better you. Get inspired and control your destiny.

Midnapore City College is uniquely capable of answering this call, of speaking to this world. As an institution of higher education, Midnapore City College is committed to the discovery and transmission of knowledge. It also seeks to integrate excellence and distinctive commitment among the students.

As a President of Midnapore City College, I am conveying the message to all of my delegates, students and all the academic personalities. I am assuring you that by this conference entitled “**Functional foods as dietary intervention for chronic diseases**” sponsored by Department of Biotechnology (DBT), Govt. of India, will provide you to have the opportunity to strengthen your views on academic and industrial research on nutritional science. These ideas will benefit our society. The nutrition and food related research are one of the most important related things to health sciences. By these discussions people can develop their knowledge in this research connected to nutrigenomics and bioinformatics.

Thank you. All the best.

Smt. Sukrita Ghosh

President

Midnapore City College

Message from the Vice-President

MIDNAPORE CITY COLLEGE



The starting of college life from school life is a very big step in life. Students have put in so much hard work in public exams, spent sleepless nights, earned a rewarding score, and with the blessings of parent/guardian, students have joined the chosen stream of education to realize life-ambition and set the foundation for future. By choosing to create a future for themselves from our institution means that we, the teachers and management at Midnapore City College are also responsible for their successful graduation and growth.

It is their career path that have now embarked upon, which will be a remarkable journey in itself that will prepare them for a life beyond college. We hope to make students journey with us, engaging, encouraging and enlivening as ever, for them to grow as a thorough individual, ready to take on life as an adult. We pray and will work with all the students to see them become one with the society where their contribution will make a definitive difference to our world. As I mentioned earlier, the learned staff and the ever-accessible management is there to guide them through and help for nurture their dreams and fulfil them - by empowering to realize true potential.

This is a great occasion to show our care for the conference **5th MCCCON-2024** entitled “**Functional foods as dietary intervention for chronic diseases**” on dated 4th to 6th February, 2024. This National conference is an extraordinary gathering of students, researchers, scientists and professors. By this conference the students will be benefitted by the scientists and academicians from their source of knowledge's.

Best wishes.

Mrs. Anindita Ghosh
Vice-President
Midnapore City College

Message from the Chairman

MIDNAPORE CITY COLLEGE



This conference 5th MCCCON- 2024 is an important event for all of us, as it will provide us with valuable insights and information on a topic that is essential to the participants working with the field of functional foods. The theme of this seminar is "**Functional foods as dietary intervention for chronic diseases**", and we have gathered some of the most knowledgeable and experienced professionals in the field to speak to us today.

I would also like to welcome all of the students who have made an effort to attend this seminar. This seminar is a chance for us to challenge ourselves and broaden our perspectives.

As a Chairman of this College, I assure you that college will provide and assist all the students to achieve goal. In Midnapore City College (MCC) students will have a quality of life that's very high and different, both in academic pursuits for seeking professional excellence that will enrich and make efficient, confident and successful person in life. It will be more glorified by this national conference.

It is my anticipation that the conference will stimulate new thoughts. We will all be benefitted by the healthy exchange of ideas from this conference. I am confident that we are going to gather a lot of knowledge from it. And I hope that this conference will strengthen our society with the development of knowledge by application of functional foods and overall health benefits.

Wish you all the best. Again, thank you.

Prof. Pravas Ghosh

Founder Chairman

Midnapore City College

Message from the Director

MIDNAPORE CITY COLLEGE



It is my immense pleasure to welcome you all to the "5th MCCCON-2024" on "Functional Food as Dietary Intervention for Chronic Diseases" on and from 4th - 6th February, 2024 at MIDNAPORE CITY COLLEGE. This conference provides an opportunity for the meeting of Scientists, Professors, Researchers, Students, and specialists in the various research and development fields of Biological Sciences specifically Food Sciences.

Midnapore City College is committed to providing holistic education to develop individuals with integrity, emotional and mental harmony, physical capability, social awareness as well as participation in cultural activities to become upright citizens of the nation. The college has maintained its academic standard as evident in the results and placements of the students in reputed sectors like education, health, and administration.

I hope eminent speakers of this conference will cover the theme on Functional foods & different perspectives of disease prevention. I believe that this conference will penlight the challenges on the utilization of functional foods may replace or decrease usage of the pharmaceuticals. I am also thankful to the supporting organizations and sponsoring agencies which have provided support to this conference financially and technically, in spite of the present economic scenario.

I wish for the grand success of the conference.

Dr. Pradip Ghosh

Director

Midnapore City College

Message from the Principal

MIDNAPORE CITY COLLEGE



Good morning and welcome to the 5th National Annual Conference “MCCCON 2024” to be organized at Midnapore City College, Midnapore, West Bengal from February 4-6, 2024. The college has been functioning with a noble vision and mission clearly reflecting its social responsibility and commitment to nation building. The institution provides effective and efficient support and facilities to academic mission and maintains a supportive environment for all students and staff by this symposium held in the rural area of Midnapore (Junglemahal).

This is a marvellous opportunity for me to show my support for this conference. This 5th annual national conference is an unprecedented gathering of students, researchers and scientists. It is a chance for us to discuss about the functional foods and food components are being extensively studied for their effects as they relate to the optimization of human health and well-being, and in chronic disease/condition risk reduction and management. This conference aims to bring together leading academic personalities including students and research scholars to exchange and share their experiences and researches about the scientific research work done in different disciplines related to health and nutritional science. It also provides the premier interdisciplinary forum for researchers and educators to present and discuss the most recent innovations and trends in Functional foods adopted in the field of Biological sciences specially in health science.

It is my hope that the Conference will stimulate a thoughtful dialogue. We will all be benefitted with the healthy exchange of ideas. I hope these discussions will reinforce our strong commitment.

Thank you. Best wishes.

Dr. Sudipta Chakrabarti

Principal

Midnapore City College

Message from Vice-Principal

MIDNAPORE CITY COLLEGE



It is a matter of great pleasure for me to welcome you all to the 5th Annual National Conference of Midnapore City College on **Functional Food as Dietary Intervention for Chronic Diseases (MCCCON-2024)**. This conference aims to provide a complete portrait about the possible role, challenges, and issues of the Food Informatics. Renowned speakers and the most recent techniques, developments, the newest updates in Functional Food are hallmarks of this conference. This conference gives multi-disciplinary platform for scientists, researchers, educators, young researchers, and students to give and discuss the most recent innovations regarding Functional Food. This conference will explain the interaction of bioactive compounds including polyphenols, flavonoids, terpenoids, carotenoids, alkaloids, omega-3 and polyunsaturated fatty acids, among others with critical enzymes (α - amylase, α - glucosidase, angiotensin-I converting enzyme [ACE], acetylcholinesterase [AChE], and arginase) linked to chronic diseases. The common people also get knowledge on the health and medicinal benefits of food and fruit or vegetable. The conference also helps the young academicians in the field of food science, medical science, nutrition science, agriculture, horticulture, as well as other allied sciences.

I welcome you all to Midnapore City College and hope that this conference will act as a medium for all of us present here to ponder upon the topic of discussion, challenge us to strive towards it and inspire us at the same time. Thank you!

Dr. Kuntal Ghosh

Vice-Principal

MIDNAPORE CITY COLLEGE

Message from Coordinator



It gives me immense pleasure to write the few words for forthcoming 5th. Annual Conference, MCCCON 2024 will be organized by Midnapore City College on '**FUNCTIONAL FOOD AS DIETARY INTERVENTION FOR CHRONIC DISEASES**' with supported by Department of Biotechnology (DBT), Govt. of India. I convey my deep sense of gratitude to all the members of the organizing committee, faculties, sishakarmi, researchers and students of this esteemed college for their tireless effort for success of the conference.

There are so many outstanding resource persons from India and abroad will be interacted with the participants for three days. The Midnapore City College has been established in the year 2017 and offering 19 UG and 20 PG coerces under the affiliation with Vidyasagar University and The West Bengal University of Health Sciences and more than 50 Ph.D. scholars are working under affiliated research center guided by talented, energetic, dynamic core faculties of this proud college.

I am grateful to our Hon'ble Director of this college and Chief Patron of the conference Dr. Pradip Ghosh for his continuous enthusiastic and encouraging guidance for overall monitoring regarding quality improvement of the stakeholders.

I hope our distinguish resource persons, guests, researchers and students enjoy participating in the scientific deliberations of this conference, which will cover the interesting areas of latest developments in the different field of functional foods and its prospective uses for management of different diseases.

I wish the pleasant stay during the tenure of the conference and sweet memories to carry home and transfer another for benefits of the whole society.

I wish all success for the 5th. Annual Conference, MCCCON 2024.

I conclude here with the following quotation advocated by:

Francis Bacon (1605) "If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties."

Dr. Dilip Kumar Nandi, Ph.D., FPSI,

Seminar Coordinator & Professor,

Department of Paramedical and Allied Health Sciences, Midnapore City College

Message from Organizing Secretary



Dear Guest Speakers, Chairpersons and Participants

On behalf of the organizing committee of 5th MCCCON-2024, I would like to cordially welcome you to the upcoming 5th Annual National Conference "**MCCCON-2024**" on "**Functional Food as Dietary Intervention for Chronic Diseases**" on and from 4th - 6th February, 2024 at MIDNAPORE CITY COLLEGE, sponsored by Department of Biotechnology (DBT), Govt. of India. Thank you very much for giving me an opportunity to organize this conference in my esteemed institute.

The main aim of this conference to learn about the emerging trends and health effects rendered by functional foods that are typically due to the bioactive compounds they contain. Different compounds can exert specific effects in the body, but most often work together to alter one or more physiological process in the body. To achieve the health benefits of the diverse compounds that different foods contain, it is important to consume foods in their whole form when possible. For example, whole grains contain the bran, germ and endosperm of the grain. Whole grains contain dietary fiber, B vitamins including folate, niacin, thiamin and riboflavin, as well as trace minerals such as iron, magnesium, and zinc. The main conference topics will include: effects of functional food with bioactive compounds on biomarkers of chronic diseases such as obesity, diabetes, cancer, neurological diseases, cardiovascular diseases (CVD), and other non-communicable diseases. Additionally there will be sessions on the management and prevention of chronic diseases, the safety of functional and medical foods, using OMICS technologies to characterize functional food, and the research and development of new functional food products for non-communicable diseases.

I have been involved with this organization since its early days; it is still young and budding, many a miles to go. We are very much fortunate to have the eminent speakers from different Research Institutions and Educational Institutes working in the area of "Functional Food & their role in alleviating Chronic Diseases". I am very much thankful to all the sponsors of this conference, without their generous financial support, it would not been possible to organize this conference. I am extremely grateful to Department of Biotechnology (DBT), Government of India for financial support for organizing this National Conference. I am very much thankful to Dr. Pradip Ghosh, Founder Director of Midnapore City College for continuous support and advices which have greatly helped towards the successful organization of this conference. My thanks to Dr. Dr Kuntal Ghosh, Vice Principal, Midnapore City College for his support and co-operation. I heartily thank all of the invited speakers and the delegates for their enthusiastic participation in this conference. Outside of the conference, I hope that you will enjoy the scenic beauty in and around our College. I extend my warm welcome to all of our participants, from everywhere in India, hoping the most benefits from this grand gathering in our college. Much thanks are endorsed to our all the faculty and staff members of Midnapore City College and from outside who spent valuable time and sparkling efforts and are dedicated to the success of this conference.

My best wishes to all of you for seeking this path towards gaining and spreading knowledge.

Dr. Shrabani Pradhan

Organizing Secretary and Assistant Professor in Nutrition

Department of Paramedical and Allied Health Sciences, Midnapore City College

Message from Convenor



With great pleasure, I greet the attendees of the 5th Annual National Conference "**5th MCCCON-2024**," which is sponsored by the Department of Biotechnology (DBT), Government of India. The theme of the conference is "**Functional foods as dietary intervention for chronic diseases**". The main goal of organizing this conference is to share and enhance the knowledge of each and every participant by focusing functional evaluation and mechanistic research of functional foods and ingredients in the prevention and suppression of chronic diseases.

Chronic diseases can be treated, suppressed, or prevented with the use of foods and natural products or components. Sound scientific evidence is required to support claims that the consumption of functional foods or dietary ingredients leads to positive health consequences. As a result, there is a need for research on how diet or natural products affect chronic illnesses. The findings should yield important information about diet that will direct health policy in the direction of promoting health. Functional foods go beyond their fundamental function of giving the body the necessary amount of vital nutrients like proteins, carbohydrates, vitamins, fats, and oils for its healthy existence to highlight the significance of foods in promoting health and preventing disorders. The food itself, food extracts, natural substances, certain food ingredients, and any other issue pertinent to the topic can all be considered target materials. This platform describes how important enzymes connected to several degenerative illnesses interact with bioactive components found in functional foods, such as polyphenols, flavonoids, terpenoids, carotenoids, alkaloids, omega-3 and polyunsaturated fatty acids, etc. By modifying the activity of these vital enzymes of physiological significance, many functional food bioactive substances may work in concert or additively to provide an overpowering defense against certain degenerative diseases.

Additionally, this conference will enable participants to present and exchange a variety of innovative ideas. The conference's technical and scientific program will undoubtedly provide the attendees with a wealth of opportunities for exciting interactions and productive conversations.

There will be lots of chances for you to expand your network and knowledge. A conference this size is the result of many people's efforts. I would like to thank Dr. Pradip Ghosh, Founder Director of Midnapore City College for his encouragement, guidance & providing a stimulating environment for such educational developments. I want to express my gratitude to the conference committee for giving up so much of their important time to plan the program, as well as to all of the writers, reviewers, and other participants for their tireless work and unwavering faith in the success of the 5th MCCCON - 2024.

I want to send out my best wishes for the conference's success in accomplishing its goals.

Dr. Suchismita Roy

Convenor and Assistant Professor in Nutrition

Department of Paramedical and Allied Health Sciences, Midnapore City College

IMMUNOMODULATION AND ENHANCING THE IMMUNITY: UNVEILING THE POTENTIAL OF DESIGNER DIETS

Anil Kumar Anal, DVM PhD

Professor, Food Innovation, Nutrition and Health
Food Engineering and Bioprocess Technology
School of Environment, Resources and Development
Asian Institute of Technology
Klong Luang, Pathumthani 12120, Thailand

E-mail: anikumar@ait.ac.th

Executive Summary

The estimated increase in world population will lead to a deterioration in global food security, aggravated in developing countries by hidden hunger resulting from various macro and micronutrient deficiency, Food insecurity is higher in developing countries where most people suffer from hidden hunger resulting, such as from protein deficiencies. An estimated 149 million children under the age of 5 years had stunted growth, which is a feature of under nutrition characterised by suboptimal height-for- age. Similarly, the prevalence of overweight in children under 5 years old has risen to 40.1 million, with almost half occurring in Asia and one-quarter in Africa. These conditions have been projected to worsen because of the food system disruption caused by the COVID 19 pandemic. The body's immune system is a crucial defence mechanism against harmful pathogens that cause infections. The immune system works in tandem with both the naturally occurring and acquired immunity to protect the body. However, a lack of proper nutrition can weaken the immune system, making less effective in defending against infections. Malnutrition, particularly in childhood, can increase the risk of infections and complications and lead to increased mortality rates. This can be due to a deficiency of macronutrients like fat Protein, and carbohydrates or a lack of specific micronutrients such as vitamins, bioactive compounds, and minerals.

To reduce or avoid this crisis, a dietary shift towards the consumption of sustainable, nutrient-rich, and calorically efficient food products is essential providing wholesome, safe, and nutritious food for undernourished and unprivileged populations has been an emerging challenge for the developing countries. There is a growing development of emerging food technologies with promise in generating functional and bioactive ingredients for promoting human health and nutrition security. Other fundamental research developments

involve reducing nutritional deficiencies, integrating neglected and underutilized crops in product development, and altering the food matrix to enhance nutrient bioavailability and reduce nutrition deficiencies, etc. Recently, diets and food consumption trends have shifted, resulting in a food plate with inadequate bioactive compounds and immune-enhancing foods. Part of this shift is attributed to changes in lifestyle, busy schedules, and emergence of ultra-processed ready-to-eat (RTE) foods around the world that arose as a need to improve food availability, accessibility, transportation, and shelf life. Modulation as well as improvement of immune function through intake of essential dietary components as supplements, nutraceuticals, functional foods, super foods etc. has been reported to be an effective and efficient strategies. Improving immunity prepares the individual against infections and other chronic diseases. The consumption of food and its bioactive ingredients in a balanced manner is important for protecting against viral infections and enhancing the immunity. The term 'designer foods' encompasses all functional foods incorporating bioactive molecules, such as proteins, essential amino acids, vitamins, minerals, essential fatty acids, dietary fibers, probiotics, antioxidants, etc. The underlying mechanism by which these designer foods provide health benefits is attributed to their ability to scavenge free radicals, counter oxidative stress, and enhance immune responding cells and antibodies. Designer foods are excellent source of functional components to discover the new elements for the development of healthy lifestyle preventive or therapeutic approaches for viral infections.

However various health problems including obesity, cardiovascular disease, diabetes and others, are related to the high lipid digestion and absorption within the GI tract. Therefore, understanding the mechanism and controlling the lipids digestibility within the human GI tract is gaining interest in food and pharmaceutical industries to design a lipid-based delivery system to encapsulate, protect, improve bioavailability and control delivery of bioactive components. Various functional bioactive compounds need to be delivered in the designed edible forms, such as food, pharmaceutical and medicinal products. These bioactive components such is essential fatty acids, carotenoids, antioxidants, phytosterols and others differ in their molecular, physiochemical, and physiological properties which address the need of designing the delivery system unique to each of these bioactive components. In order to improve the dispersibility, stability, and bioavailability of lipophilic nutrients, the microencapsulation system is one of the most effective delivery systems and enhances the bioavailability and bioaccessibility of bioactive molecules.

FERMENTED CULINARY TRADITIONS OF NORTHEAST INDIA: A GATEWAY TO FUNCTIONAL FOODS AND HEALTH RESILIENCE

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Abstract

The North East of India holds a unique position within the broader Indian context, owing to its distinctive geographical, historical, social, cultural, and political characteristics. This region is a rich tapestry of diverse ethnic groups, encompassing approximately 225 tribes and various non-tribal communities. Not only do these communities exhibit differences in racial origins and languages spoken, but they also boast diverse socio-cultural traditions, customs, and dietary practices, manifesting in a variety of cuisines. Embedded in the culinary heritage of the North East is the longstanding practice of fermenting agricultural bio-resources for both sustenance and nutrition. This age-old tradition has given rise to a myriad of ethnic fermented foods and alcoholic beverages, known and lesser-known alike, that are crafted and savored by the region's inhabitants. These include fermented bamboo shoots known as *Khorisa* in Assam, *Kharoli* and *Pani-tenga*-fermented mustard seeds, *Poita bhat* - fermented rice and many more which, are acknowledged for their nutritional superiority over the original raw materials as they undergo a transformative process breaking down complex compounds. Fermented foods also harbor probiotics, essential nutrients, vitamins, immunomodulating bioactive compounds, and growth factors. Furthermore, the fermentation process mitigates the presence of toxic and anti-nutritional elements, such as phytic acid, cyanogenic glycoside, enzyme inhibitors, and flatulence, thereby augmenting the nutritional and functional attributes of the final products. Beyond their role in preserving seasonal ingredients and ensuring food security, these foods offer an array of health benefits. These fermented foods and alcoholic beverages are also recognized for their ability to enhance nutritional benefits, including vitamins, proteins, minerals, phytochemicals, phytosterols, and dietary fibers consumed by the people. They are considered to be effective in curing diarrhea, urinary problems, headache, body aches, inflammation, and even treatment for various types of worms. The preparation of certain fermented foods and beverages involves collective efforts, fostering a sense of unity and cooperation among communities, contributing significantly to their social well-being. Beyond nourishment, these culinary traditions have become livelihood sources for many, supporting local economies and standing as cornerstones of culture and community in the region.

FOOD BORNE DISEASES AND FOOD SAFETY USING A HOLISTIC APPROACH OF ONE HEALTH

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Abstract

Food safety refers to the handling, preparation, and storage of food in a way that prevents contamination and foodborne illnesses. It encompasses various practices and regulations aimed at ensuring that food is safe for consumption. Foodborne diseases are illnesses caused by consuming contaminated food, often due to bacteria, viruses, parasites, or chemical substances present in the food.

The One Health approach recognizes the interconnection between human health, animal health, and the environment. In the context of food safety, One Health emphasizes the close relationship between the health of animals, the environment in which they live, and the safety of the food produced from these animals. For instance, the health of livestock and the conditions they are raised in can directly impact the safety of meat and dairy products. Additionally, the use of antibiotics in animal agriculture can contribute to antibiotic resistance, affecting both animal and human health.

Applying the One Health approach to food safety involves collaboration between various sectors such as agriculture, veterinary science, public health, and environmental health to address and prevent foodborne diseases. By understanding the complex interactions between humans, animals, and the environment, it's possible to develop more effective strategies to ensure the safety of our food supply, protect public health, and promote sustainable practices in food production.

FUNCTIONAL FOOD(S): NATURES WEAPON TO COUNTER CHRONIC INFLAMMATION, LEADING TO CHRONIC DISEASES

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Abstract

Chronic diseases, accounting for about 70-80% global deaths, are characterized by low-grade long-term inflammation leading to altered metabolism to organ damage. Long-term silent inflammation in living system may lead to incurable chronic conditions. Thus, chronic inflammation is the major cause of chronic diseases. *Functional foods* (FF) contain the bioactive phytonutrients, nutraceuticals, dietary fibers, and probiotics with health-promoting and disease-preventing ability. FF are bioactive, safe at beneficial concentration, provide the required amount of essential nutrients for healthy living and prevent oxido-reductive inflammatory diseases. Several functional foods demonstrated anti-inflammatory and antioxidative properties in diverse cell lines and animal models; but inconclusive in humans. To prevent such condition modern science is looking into the healing power of dietary ingredients. Inflammation regulating foods broadly includes fruits, vegetables and spices of diverse plant families, and low-fat dairy products. Here, we will highlight the interaction of the functional components of some specific food(s) on oxidative and inflammatory pathways along with some clinical trials with specific dietary ingredients that alter inflammatory and metabolic mediators. This presentation will also explain the interaction of bioactive components of selected functional foods, including polyphenols, flavonoids, stilbenes, lignans, terpenoids, carotenoids, alkaloids, and polyunsaturated fatty acids; with critical enzymes (α -amylase, α -glucosidase, angiotensin-I converting enzyme, acetylcholinesterase, arginase) that are linked to degenerative diseases like type-2 diabetes, hypertension, Alzheimer's diseases. Diverse bioactive components are found to protect human health, synergistically/additively, against some degenerative diseases by modulating or altering those critical enzymes.

PROBIOTIC ATTRIBUTES OF AN ISOLATED *Saccharomyces cerevisiae*

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Abstract

The presence of eukaryotic microbes in the human gut have the potential to benefit the host as they are the commensal organisms and antibiotic non-responsive. The most common yeast with strong probiotic effects is *Saccharomyces boulardii* which is well marketed due to immunomodulatory effects. This study highlights the probiotic potential of *Saccharomyces cerevisiae* AKP1, a newly isolated yeast strain from an ethnic alcoholic beverage. Both *S. boulardii* and *S. cerevisiae* are genetically very similar, each containing 16 chromosomes with greater than 99% relatedness by average nucleotide identity. The studied strain exhibited significant *in vitro* probiotic potentialities with the cumulated probiotic score of 87.50%. Pre-clinical trials with rat models indicate that it can alleviate symptoms from gastrointestinal (GI) tract infections particularly protective to gastric ulcers through modulation of pro-inflammatory cytokines level. This organism's probiotic attributes largely stem from being able to modulate host immunity and could be a potential therapeutic agent in future.

Key words: Yeast probiotics; *Saccharomyces cerevisiae*; Gastric ulcer

PERSPECTIVE AND PROSPECTIVE OF NUTRACEUTICALS IN INDIA

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Introduction

The word nutraceutical was initially defined in 1989 by Dr. Stephen L. DeFelice, chairperson of the Foundation of Innovation Medicine, which was also known as the FIM. Dr. DeFelice coined the term nutraceutical as an amalgamation of the word’s ‘nutrition’ and ‘pharmaceutical’, meaning a substance that is obtained by isolation or purification of foods and is sold in forms that are usually not related to food and bear a resemblance to pharmaceuticals, having potential physiological advantages. The early denotation of nutraceuticals as a supplemental food has now evolved to specify a broad range of substances such as tablets, capsules, powders (potions) etc. containing a wide array of vitamins, minerals, herbs and other botanicals, and dietary products meant to be utilised by human beings as a supplement diet. Although the concept of nutraceuticals has gathered steam with the turn of the century, the original nutraceutical revolution started back in the early 1980’s when a clinical study publicised the probable clinical merits of calcium and fish oil. At the same time, registered practitioners of various medical branches took it upon themselves to educate their colleagues and the public about the potential benefits associated with the adoption of nutraceuticals, via the mass media.

Nutraceuticals History in India

In India, the prevalence of Ayurveda, the ancient Indian medicinal system, has also helped in the acceptance of modern-day nutraceuticals. Ayurveda, which has its roots in herbal sciences, has long promoted the use of products such as Chyavanprash, containing fortified ingredients aimed at improving the overall health of an individual, and botanicals like ashwagandha, triphala etc. Ingredients such as turmeric, chillies and garlic have been added to the Indian diet for centuries now due to their nutritional and therapeutic benefits. Apart

from this, in recent years, fortified products such as Vanaspati with vitamin A and salt with iodine have also been made available in the market. (“Potential for functional foods in the Indian market,” 2018).

The Indian nutraceutical market valued at \$ 1,480 million in 2011 could grow to \$ 2,731 million in 2016. According to the report by business research and consulting firm Frost & Sullivan, functional foods will be the quickest growing category followed by dietary supplements until 2015. However, dietary supplements specifically herbal and dietetic supplements, will form the greatest opportunity.

Nutraceuticals scope and opportunity in India

Nutrition is a poorly understood concept in India. The percentage of people who are properly nourished is very small. The imbalances of nourishment patterns give rise to three categories of people: Over-nourished (about 80 million); Under-nourished (about 380 million) and nourished with calories but not nutrients (about 570 million). The entire population below the poverty line have been considered as undernourished; irrespective of their calorie intake. Similarly, the people who consume less than 175gm of fruits and vegetables in a day have been considered deficient in micronutrients. Thus the pressing need of the consumer is to supplement food with external nutrients (nutraceuticals) to avert disease conditions in India. Nutraceuticals are playing an important role in the development of future therapeutics but it depends on the control of purity, efficacy and safety. The focus areas should be product evaluation for each active ingredient in the context of permissibility, standards and dosage of vitamins/minerals allowed, product classification as per various Indian healthcare laws (legal definition of the product), India-specific label claims and advertising.

Today, the nutraceutical market in India is advancing at a brisk CAGR of 17.1% and is nearly worth a whopping Rs 22000 Cr (\$3.0 billion) (“Potential for functional foods in the Indian market,” 2018). Nutraceuticals have bested the pharma dominated supplement market, which is evident by the 67% share occupied by the nutraceutical market. Increased public understanding and health responsiveness have contributed to this shift in consumerism towards nutraceuticals. As per recent estimates, the nutraceutical market in India is significantly condensed in the South, followed by the East and is gaining serious traction in rural areas as well with the population there getting familiar with the concept of lifestyle diseases.

Nutraceutical value in India with context to abroad

In India, the nutraceuticals markets are still in nascent stage, but the growth rate is picking up rapidly. Indian market contributes 2% of the global share, where the same is expected to reach 7% by 2023 due to population growth, urbanism and awareness of the health benefits rendered by the nutraceuticals products. India will soon become the desirable destination for the nutraceuticals manufactures across globe, since Indian consumers are not yet fully tapped about the product and their expenditure on nutraceutical products are less. In India, the dietary supplements are predominantly manufactured by pharma companies and its growth is higher than Functional foods. This will raise the awareness for a healthy life style. It contains the main components such as dietary supplements, nutrition and herbal supplements will create a greater demand for the Nutraceuticals process. This critical health situation in India will allow nutraceutical products to get deeply penetrated into the lifestyle of Indians in near future. India is one country with many cultural differences, hence it is very essential to understand the different types of consumer preferences and products need to be customized to suit their needs. For Example, certain community/region of people in India doesn't eat garlic and few communities doesn't eat non vegetarian. Hence the supplements derived from Fish and garlic should be replaced with other ingredient which provides same health benefits should help companies to reach the target audience more effectively. The awareness of the gastro intestinal health has been spreading rapidly which will drive the probiotic drinks which are prepared with good microorganisms such yogurt sales in the market. Out of 1.21 billion populations, 39% of populations are children, hence targeting this segment of people with products with customization to their likings and reasonable pricing will attract more children customers towards the nutraceutical products. The elderly population where the age is above 60, which was over 100 Million in 2014 has been anticipated to reach 143 Million by 2021 and this segment can be targeted for nutraceuticals. Based solely on respondents from the second WHO worldwide survey conducted in 2012 among 133 member states, the regional nutraceuticals-Ayurvedic medicine, herbal medicine, homoeopathy, natural medicine, osteopathic natural medicine, Chinese medicine, as well as unani therapy medicine are practiced worldwide based on individual preferences. The rising trend of nutraceutical use in the majority of industrialized nations is mostly attributed to patients trust in the therapy, accessibility and simplicity of selecting a traditional healer.

Current trends in nutraceutical formulations in India

- ❖ Development of new dosage forms
- ❖ The emergence of capsules
- ❖ Novel liquid-filled capsules
- ❖ Liquid encapsulation technique: the future

Types of Nutraceuticals

➤ ***Functional nutraceutical components in ginger (Zingiber cinale)***

Ginger (*Zingiber officinale*) is a tropical flowering plant that was originally cultivated in southeastern Asia. The annual production of ginger was reported to be about 3.3 million tons in India. The ginger rhizome contains 60–70% carbohydrates, 3–8% crude fiber, 9% protein, 8% ash, 3–6% fatty oil, and 2–3% volatile oil, phenolic compounds, and terpenes. The terpene components in ginger include zingiberene, beta-bisabolene, alpha-farnesene, beta sesquiphellandrene, and alpha-curcumene, while phenolic compounds include gingerol, paradol, and shogaol. These gingerols and shogaols are of higher concentration than other Compounds. It is used to treat various gastrointestinal problems such as upset stomach, diarrhea, dyspepsia (discomfort after eating), morning sickness, bloating, heartburn, and loss of appetite. Its fresh juice is also used locally as an anti-inflammatory agent that helps to reduce joint problems, osteoarthritis, rheumatoid, arthritis, and muscle pains. Fresh juice from ginger was also used to treat skin burns. It lowers high blood pressure and boosts the circulation of blood by warming the body. This warming effect enables ginger to act as an antiviral for treating flu and cold. Chronic inflammation and oxidative stress are key drivers of Alzheimer’s disease and the cognitive decline that accompanies age.

➤ ***Nutritional attributes of turmeric (Curcuma longa)***

Turmeric (*Curcuma longa*) is a flowering plant used as a condiment that belongs to the family Zingiberaceae. The plant grows in Asia, especially in India and Central America. Curcumin is the principal curcuminoid found in turmeric. Curcuminoids are diarylheptanoids that consist of curcumin and its various derivatives such as demethoxycurcumin, biscurcumin, and cyclic curcumin. Chemical groups are added to them to make curcumins more soluble which enhances.

their suitability for drug use. Turmeric was used in Ayurvedic medicine for different health issues. Turmeric containing anti-inflammatory properties helps to reduce the pain of people who are suffering from arthritis. Turmeric has antioxidant abilities that help to protect the liver from being damaged by toxins. It adds flavor to food and spice and plays a role in the digestion of food. It is an effective aid in reducing blood cholesterol. Other possible uses include treatment for cancer, pre-diabetes, tuberculosis, and Alzheimer’s disease. However, pregnant

women should avoid taking turmeric supplements because of their blood-thinning effects. The stomach produces more gastric acid due to stimulations from turmeric. It could positively affect the digestive system of some people while others could be negatively affected.

➤ ***Garlic (Allium sativum) as a potential functional nutraceutical***

The main quality feature of garlic products is the distinct flavor of cloves, because of complex biochemical reactions. It comes in different forms such as paste, powder, and extracts. The chemical constituents present in garlic are mainly sulfur-containing, non-volatile amino acids (thiosulfonates), which include alliin or S-allyl-cysteine, ajoene, diallyl polysulfides, vinylthiols, Alliinase, and saponins. A clove (3 g) of raw garlic contains manganese (2%), vitamin B6 (2%), vitamin C (2%), selenium (1%), fiber (0.06 g), and trace amounts of iron, vitamin B1, potassium, calcium, phosphorus, and calcium based on the human daily requirement. Diallyl disulfide, diallyl trisulfide, and allyl propyl sulfide are principal components of essential added to food to complement it and have medicinal properties. Garlic has a wide range of health benefits to the body system. It is known to amplify the function of the immune system. The active compounds in garlic help to reduce high blood pressure or hypertension and improve cholesterol levels. The antioxidants in garlic support the mechanism provided in the body to prevent health issues because of oxidative stress, Alzheimer’s disease, itching, ringworm, and athlete’s foot.

Silibinin nutraceutical effects

Silibinin that is, flavanolignan from milk thistle “Silybummarianum” seeds have potent anti-carcinogenic effects for a plethora of tumors including prostate cancer (PCa). A pre-clinical animal model shows significant anticancer activity of silibinin in the treatment of PCa, and phase II clinical trials bioavailability studies have also been evaluated. There is still a need of

larger clinical trials to be performed to confirm the biological efficacy and effectiveness of silibinin as a nutraceutical for effective clinical management of advanced or localized form of prostate cancer.

Catechin efficacy as potential nutraceutical

Catechins are polyphenols found in tea, red wine, etc. They account for 75% of the polyphenol compounds in tea leaves, with many chemical features, for example the hydroxy group Epicatechin, catechin, and epigallocatechin are a few types of catechin. They help with anti-allergenic activities. Since allergy is an abnormal immune cell response, by controlling the amount of histamine binding to histamine receptors, we can prevent allergy. Studies are conducted with catechin, which was extracted from tea and analysed; it was confirmed that it prevents the binding of histamine to receptors. Also help in antiinflammatory, anti-microbial, antioxidant, and anti-arthritis activities. Catechins play an important role in protecting the human body against UV radiation, promoting cell activity. Catechins are extensively used in medical, pharmaceutical, cosmetic, etc.

Conclusions and Future Prospects

To conclude, nutraceuticals area potentially growing sector and are engaged in both the fields, either medical treatment or nutrition so as to assure integrated medical assistance. These act as potential dietary supplements, prevention of diseases such as CVD, the support and treatment of various types of cancer, and other healthcare benefits. Therefore, nutraceutical industries now understand and perceive extensively about the potential success of nutrients that affect people in healthcare. At present, medical care is assessed to be the domain of drugs. On the contrary, nutrition is only appraised to be a product for healthy living. In the forthcoming years, it is anticipated that work will be performed, as they both interact and complement each other. The implementation of newer technologies such as the application of genetically modified technology in the food industry, nanotechnology-based nutraceuticals, etc., leads to better medical treatment and health care benefits, which further extended the increase in the nutraceuticals revenue market. The scientific research ratifies that the improved safety and potential effects of newly developed nutraceutical products will further stimulate the investments in newer technologies, such as nutrigenomics, converging techniques, varied imaging technologies and its applications in nutrition development and healthcare.

POPULAR FUNCTIONAL FOODS AND LIFE STYLE DISORDERS

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Abstract

Food is first line treatment of any disease, without proper diet including food and nutrition, no disease can be cured. International Diabetes Federation (IDF), National Cholesterol Education Program (NCEP), World Health Organization (WHO), European Group for the Study of Insulin Resistance (EGSIR) and American Heart Association (AHA) state that the half of the adult population in the world is suffering by life style diseases like diabetes, hypertension, heart diseases, kidney diseases and others which may strictly be cured by healthy diet. Indian Heart Association estimated that by 2020, cardio vascular disease will be the largest cause of disability and death in India. Indian Diabetic Association and IDF with World Diabetic Fund (WDF) estimated that 10.1 % of Indian population is suffering from Type-II Diabetes Mellitus. Functional foods as “whole foods along with fortified, enriched, or enhanced foods that have a potentially beneficial effect on health when consumed as part of a varied diet on a regular basis at effective levels. Nutraceuticals is a term derived from ‘nutrition’ and ‘pharmaceuticals’ and it is defined as ‘any substance that is a food or a part of a food and provides medical or health benefits, including the prevention and treatment of disease’. Flavones from fruits and vegetables, catechins from tea, anthocyanidins from red fruits, flavanones from citrus fruits, lignans from vegetables, lutein from green-vegetables, lycopene from tomato, quercetin from onion and grapes, omega-3 fatty acids from sea fish, like salmon, sardines, trout and herring, dietary fiber from whole grains and others various foods contains many functional components which can reduce blood pressure as well as blood glucose. If a person modified his or her regular diet as per guidelines of therapeutic diet, it may as potential against these diseases. Many scientists have proven by experimentally using garlic, onion, black cumin, ginseng, guava leaves, propolis, grape extracts, etc., are effective in reducing the extent of cardiovascular disorders and hypertension. So, it has been revealed that functional modified foods are good source of anti-hypertensive and anti-hyperglycemic modified diet.

Key words: Functional foods, IDF, WHO, blood glucose, hypertension.

MARINE BPMS22-PPI INDUCED TLR-4 DEPENDENT MACROPHAGE M2 TO M1 REPOLARIZATION AUGMENT ANTI- LEISHMANIAL IMMUNE RESPONSES

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Abstract

The potential of a novel serine protein protease inhibitor (PPI), purified from marine *Oceanimonas sp.* BPMS22, induced M2 to M1 repolarization of the macrophages to treat visceral leishmaniasis (VL) was studied in this work. The PPI was able to decreased the expression of dipeptidyl peptidase of *L. donovani*. The IC₅₀ of PPI were 25.28±1.675 µg/mL and 0.415±0.015 µg/mL against promastigotes and intracellular amastigotes, respectively, indicating the host-directed therapy using PPI. The PPI induced TLR4-dependent effector molecule i.e., nitric oxide (NO), and dampened the arginase activity in parasitized macrophages. PPI also repolarize *L. donovani*-infected M2 macrophages to M1 phenotype *in vitro* in TLR-4 dependent manner. A decrease in parasite burden after treatment with PPI indicated the acceleration of the parasite killing by enhancing the macrophage effector functions. Further, PPI treatment reduced hepatic and splenic LDU up to 93.34 % and 87.63 %, respectively which were withdrawn during TLR-4 suppressed condition. This was followed by a surge in pro-inflammatory cytokines and dampening anti-inflammatory cytokines ($p<0.01$), which exhibited anti-VL immunity. These observations might open new perspectives on PPI in macrophage repolarization to treat VL.

Keywords: *Oceanimonas sp.* BPMS22, *Leishmania donovani*, TLR-4; macrophage polarization.

ANTIBACTERIAL AND MOSQUITO LARVICIDAL PROPERTIES OF GREEN SYNTHESIZED SILVER NANOPARTICLES (AGNP) FROM *Alangium salviifolium* FRUIT

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Abstract

Nanotechnology is currently one of the most active areas of research in the realms of biological, industrial, and medicinal science. This work assesses the antibacterial and mosquito larvicidal properties of green synthesized silver nanoparticles (AgNP) against four human pathogenic bacteria, including *Escherichia coli*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*. The mature fruit pericarp of *Alangium salviifolium* was used as a reducing agent in the preparation of silver nanoparticles (AgNP). To characterize the stabilized AgNPs, a time-dependent UV-Vis Spectrophotometric study was employed. Its oval shape was verified by HR-TEM examination, and the average particle size ranged from 13.99 nm to 28.08 nm. The unique Bragg peaks in the XRD spectrum confirmed the crystalline structure of the AgNPs. In the lab bioassay, AgNPs exposed third instar *Culex quinquefasciatus* larvae for 24, 48, and 72 hours respectively, and demonstrated 100% larval mortality with LC₅₀ values of 19.96 ppm, 14.39 ppm, and 5.75 ppm. The antibacterial activity of the produced silver nanoparticles was evaluated using the conventional zone of inhibition (ZOI) assay. AgNPs exhibited antibacterial efficacy against *S. aureus* and *B. subtilis*, but not against *P. aeruginosa*. The produced nanoparticles demonstrated an inhibitory zone diameter of 6 mm against *B. subtilis* and 15 mm against *S. aureus*.

Keywords: Silver nanoparticles, bacteria, laboratory, antibacterial activity, Bragg peaks.

FUNCTIONAL FOOD: ROLE TO PREVENT DISEASES

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Abstract

Functional foods include a variety of foods. Minimally processed, whole foods along with fortified, enriched or enhanced foods, can all be functional foods. Generally, these foods have a potentially beneficial effect on health when consumed on a regular basis and at certain levels.

These foods play an important role of human health and decreased the risk of various types of diseases. Various types of food contains some adequate amount of functional components and that's functional components are improve the health. Functional foods always have health benefits. Many studies regarding functional food has confirmed that nutrition has great impact for prevention of various types of chronic diseases. Functional food components are normal diet. Fresh natural foods are act as functional food in our body. Most of the food categories like fruits, cereals, vegetables, meat, fish, and diary are contents functional food. These products are easily available in our locality. Functional foods act as safeguarding, increase and improvement of health benefits. This study is reviewed to explain the role of fresh foods and their functional component to wellbeing of our health.

Keywords: Functional Food, Fresh Food, Health benefits, Chronic disease, Nutrition.

IMPACT OF CLIMATOLOGICAL FACTORS ON THE LUCTUATIONS OF *Tryporyza incertulas* POPULATION

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Abstract

Insects are cold-blooded animals. Their Growth is under the control of several climatic factors such as rainfall, relative humidity, temperature, and movements in air current. These factors usually do not depend on the density of insect species population. Such climatological factors may affect the reproduction, population dynamics distribution, survival, behavior, migration, and outbreaks of insect pests of rice. They have a large body surface relative to their body volume. They are also very sensitive to dryness and hence to humidity. Paddy stem borer (*Tryporyza incertulas*) is a serious rice pest. The damaged plants transform into dead hearts or white tassel. The present work has been carried out in the district of Purulia, West Bengal which has an appreciably hot summer, high humidity during monsoon and more or less well distributed rainfall during monsoon months. In the present investigation the effect of climatological factors like rainfall, temperature and humidity on the fluctuation of a major paddy pest, *Tryporyza incertulas* population was observed in this district. The investigation revealed that *Tryporyza incertulas* population increase is positively correlated with rainfall during study period. Similarly increase in temperature rapidly decreases this pest population. Humidity fluctuation during study period does not create any adverse effect on this species population growth. Similarly depression with cloudy weather promotes *Tryporyza incertulas* population growth. So climatic factors directly regulate the population growth. However, much more conclusive evidence is required to substantiate numerous suggestions in the literature that climatic factors are related to, or cause, certain biological events.

Keywords: rainfall, humidity, temperature, population, pest, economic loss.

A REVIEW ON CONCEPT OF BIOACTIVE COMPOUNDS OF SPICES AND ITS EFFICACY

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Abstract

The fame of Indian spices is older than the recorded history. Today when spices cost so little, it is considered a royal luxury and that people were pre-disposed to risk their lives in crusade of them. Although the earliest evidence of the use of spice by human was around 5,000 B.C., their biological activities have been investigated last several decades. Spices transmit fragrance, colour and taste to food preparations. Volatile oils give the aroma and oleoresins impart the taste. Spices are classified by functional groups, e.g., alcohols, aldehydes, amines, esters, ethers, ketones, terpenes, thiols and other miscellaneous compounds. In spices the volatile oils constitute these components. In black pepper the major compounds are trans-linalool oxide and α -terpineol, β -pinene, β -caryophyllene. Cinnamon possesses a delicate, spicy aroma, the oil from the stem bark contains 75% cinnamaldehyde and 5% cinnamylacetate, which contribute to the flavor. The minor constituents like methylamyl ketone, methylsalicylate etc are responsible for the characteristic pleasant odour of cloves. The volatile oils of nutmeg constitute the compounds: monoterpene hydrocarbons, monoterpene alcohols, aromatic ethers, sesquiterpene, alkenes. Turmeric, dried and cured, generally yields from 1.5 to 5.0% volatile oil. There are two major ketonic sesquiterpene – ar-turmerone and turmeone ($C_{15}H_{20}O$, $C_{15}H_{22}O$). In coriander spice oil β -pinene, dipentene ρ -cymene α and γ -terpinenes, n-decanal, geraniol and l-borneol were also identified as constituents. The majority of herbs and spices constitute important bioactive secondary metabolites which possess versatile pharmacological and medicinal properties, may have a considerable impact on human health.

Keywords: Spices, volatile oils, Monoterpene, sesquiterpene, pharmacological, β -pinene, Medicinal properties.

STUDIES OF PHYTASE PRODUCTION BY *Klebsiella* sp: CONTROLLING ENVIRONMENTAL POLLUTION

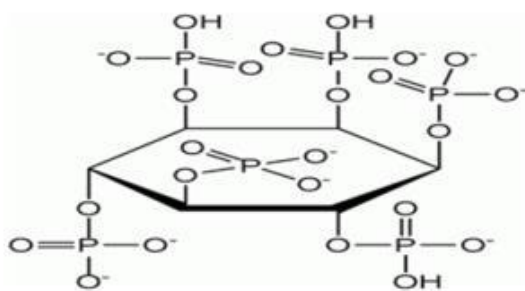
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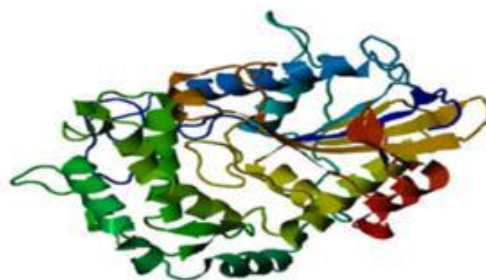
Abstract

Phytate is the main storage form of phosphorous (P) of many plant parts and these phosphorous is not available to certain monogastric animals including fish, poultry etc. since it is in bound form. Thus, it requires hydrolysis by specific enzymes i.e. phytase and microorganisms are efficient in this aspect. These enzymes improve the bioavailability of phosphorous, other minerals and trace elements. Phytase increase the bioavailability of phosphorous and decrease the phosphorous pollution including eutrophication.

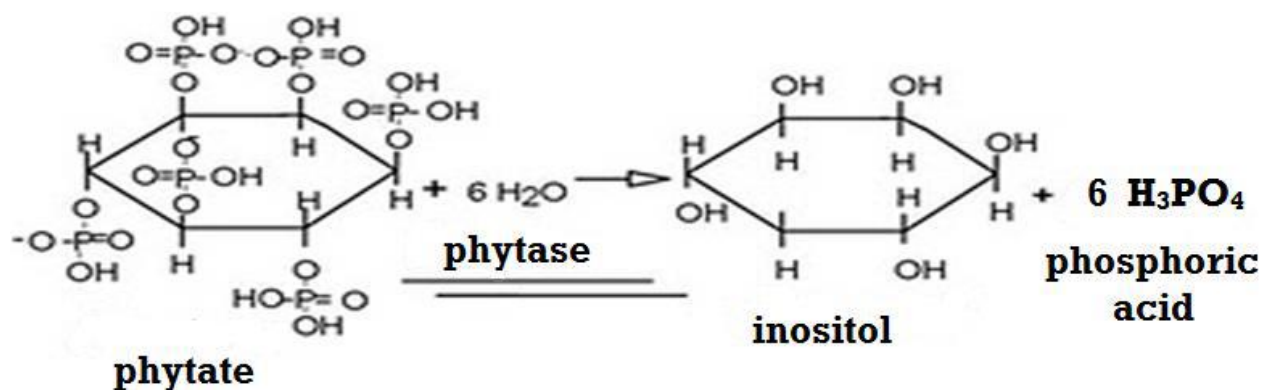
In an attempt to screen phytase producing bacteria from soil environment, SCTb2 was selected, out of 200 isolates as potent and identified as *Klebsiella* sp, following 16SrDNA sequencing. The environmental conditions both physical and nutritional were optimized for phytase production through spectro-photometric analysis. The enzyme was purified near homogeneity after extraction from fermentation broth, following chromatographic techniques. The enzyme characters were determined through SDS-PAGE, MALDI-TOF analysis and understanding other standard parameters.



Phytic Acid



Phytase protein from *Klebsiella* sp.



References:

1. Das K, Bandyopadhyay D and Sen S K (2013) Optimization of fermentation condition for phytase production by the novel isolate *Klebsiella* sp. The Bioscan. 8(4): 1315-1320.
2. Sinha S, Chattopadhyay P, Pan I, Chatterjee S, Chanda P, Das K, Bandyopadhyay D and Sen S.K (2009) A Review on Microbial Transformation of Xenobiotics for Environmental Bioremediation. African Journal of Biotechnology. 8(22): 6016-6027.

CHARACTERIZATION OF A NOVEL LYTIC BACTERIOPHAGE VPMCC5 A NEW GENUS UNDER *ZOBELLVIRIDAE* FAMILY WHICH EFFICIENTLY CONTROL *Vibrio harveyi* IN *Penaeus monodon* CULTURE

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Abstract

Vibrio harveyi is a gram-negative bacterium that causes mass mortality of shrimp and is responsible for economic losses in aquaculture. To control this bacterial infection bacteriophage has been considered a potential biocontrol agent. In this study, we have characterized the *Vibrio*-infecting bacteriophage VPMCC5 and evaluated its efficacy in laboratory scale. This bacteriophage exhibited 10 min latent period and burst size was 20 PFU/cell. VPMCC5 was stable pH 3-9, 0-45 °C temperature, and salinity up to 40 ppt. Liquid culture inhibition could completely lyse the host bacteria after 3 h at MOI 1 and 0.1. Similarly, VPMCC5 could control *V. harveyi* S2A infection and reduce the mortality of tiger shrimp on a laboratory scale. The genome of bacteriophage was 48938 bp long and 71 ORFs were found. Comparative genomic analyses strongly suggested that bacteriophage VPMCC5 might be a new genus in *Zobellviridae* family. Clearly, VPMCC5 might be used in shrimp aquaculture as a biocontrol agent.

Keywords: *Zobellviridae*, *biocontrol*, *Penaeus monodon*.

IMMUNOMODULATORY ROLE OF SNP-ApAGP IN EXPERIMENTAL TUBERCULOSIS *IN VITRO*

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Abstract

Tuberculosis (TB) is an ongoing battle for the humankind. The development of drugs based on nanoparticles (NPs) are getting attention due to their ability to fight against infectious diseases. In this study, we synthesized the bio-conjugated nanoparticles, SNP-APAGP, and, evaluated its immunomodulatory ability to inhibit *M. tb.* growth inside the macrophages.

Silver nanoparticles were prepared by arabinogalactan protein extracted from *Andrographis paniculata* (SNP-ApAGP), which was confirmed by UV-visible spectrum scan. TEM image confirmed the size of SNP-ApAGP was approx. 20 nm. MTT assay suggested its non-cytotoxic dose upto 2.5 µg/mL. SNP-ApAGP significantly ($p < 0.01$) decreased the CFU in *M.tb.*-infected macrophages and increased the nitrite generation. It also modulated the differential TLRs expression in uninfected and infected macrophages. It decreased the mRNA expression of anti-inflammatory markers and increased the pro-inflammatory markers in uninfected and infected macrophages. Hence, SNP-ApAGP might promoted the anti-tubercular immune responses *in vitro* that abled to restrict the intracellular *M.tb.* growth with in host cell.

Keywords: Mycobacterium tuberculosis; SNP-ApAGP; TLRs; Nitrite; Anti-inflammatory markers.

EFFECT OF CHLOROFORM FRACTION OF *Asparagus racemosus* ROOTS AGAINST CISPLATIN INDUCED NEPHROTOXICITY IN MALE ALBINO RATS

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Abstract

Acute kidney injury (AKI) a global problem leads to end stage renal disease, a condition with no further effective treatment options available. *Asparagus racemosus* (AR) contains many bioactive phytochemicals that may be effective for protecting kidney from the toxic exposure to several nephrotoxic agents like cisplatin (CP). This study designed to investigate the protective effects of chloroform fractions of AR roots on CP-induced AKI. This specific fraction contain different types of flavonoids, as results obtained from LCMS analysis. An AKI model was established using CP and nephroprotective properties of this fraction was observed by orally feeding chloroform fraction of AR roots at different doses (50, 100 and 200 mg/kg body weight/day for 15 days) followed by CP injection at 10th day of experimentation to the rats. Results showed that the high doses of chloroform fraction i.e., 100 and 200 mg significantly attenuated CP-induced nephrotoxicity and resulted in low levels of blood urea nitrogen (BUN) and serum creatinine (sCr), reducing the urinary levels of KIM 1, IL 18, NGAL, and cystatin C. Furthermore, it inhibited CP-induced oxidative stress by increasing the activities of GSH, SOD levels, and mRNA expression of Nrf2, as well as inhibiting the NF-κB signaling transcription factor. Additionally, these studies was confirmed by analysing histology of kidney tissues. Rats orally feed with high doses of this fraction showed a control like histoarchitecture due to nephroprotective properties of AR roots and kidney tissue of CP treated rats exhibited acute tubular damage, rapture glomerulus, renal fibrosis, and presence of hyaline casts. It may be concluded that chloroform fraction of AR roots possesses nephroprotective properties against CP induced AKI due to presence on many bioactive compounds.

Keywords: *Asparagus racemosus*, Oxidative stress, Acute kidney injury; Cisplatin, NGAL.

IMMUNOINFORMATIC APPROACH FOR DESIGNING OF A MULTI EPITOPIC EPITOPE PEPTIDE (MEBP) VACCINE AGAINST WHITE SPOT DISEASE

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Abstract

The white spot disease commonly known as “Ich” causes significant damage to aquaculture production globally and symptoms like small white dots, blisters, or salt grains on the skin or fins of the fresh water fishes. An outbreak of “Ich” is an emergency situation which requires immediate treatment; if left untreated, this disease may result in 100% mortality and which lead to shortage of fish supply of the market creating scarcity of fish food products. But the available drugs against this disease now become less effective due to multi drug resistant pathogenic variants. Need a vaccine, eliciting the immunogenicity of freshwater fishes against *Ichthyophthirius multifiliis* yet to be developed. Thus, Immunoinformatics work implemented to find out the potential epitopes from the surface immobilization antigen or I-antigen proteins. Herein, B-cell derived T-cell epitopes remain a very prominent elements for new generation peptide-based vaccine designing. A total of 8 common B and T-cell epitopes filtered out and linked up with EAAAKEAAAKEAAAK linker peptides. Subsequently, L7/L12 ribosomal protein adjuvant added at N-terminal for elicited the immune response in a better way. The tertiary structure of the vaccine peptide was built through SPARKS-X server. Afterward, three globally used validation servers had used for justify 3D structure of vaccine candidate. This was followed by Molecular docking, MDS, NMA analysis, *in silico* cloning and vaccine dose-based immune response simulation to estimate the immunogenic effectiveness of the vaccine construct.

Keywords: Spot disease, Immunoinformatics, MD simulation, NMA, B-cell, T-cell, Docking.

BIOEFFICACY OF *Ganoderma lucidum* SUPPLEMENTATION FOR BETTER HEALTH EFFICIENCY

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Abstract

Background: *Ganoderma lucidum* has recently come under scientific investigation to analyze its content of bioactive components such as polysaccharides and triterpenes that affect human physiology, and has been exploited for potent elements in pharmacology, nutraceuticals. **Objectives:** Regulating gut flora, maintaining hematological and biochemical indicators to track the protective effectiveness of *Ganoderma lucidum*. **Methodologies:** To compare between pre and post-intervention groups of *Ganoderma lucidum* (500mg/day and 1000mg/day) supplementation for 30 days and different parameters measured by using a hematoanalyzer, semi-auto analyzer, different selective media, and genomic DNA isolation observed by gel electrophoresis, apoptotic study by flow cytometry, antibiotic sensitivity test. Statistically assessed using one-way ANOVA. **Result:** On the 30th day of observation glucose, Urea, uric acid, and Creatinine levels were significantly changed ($p < 0.05$) some enzymatic (SGOT and SGPT) modulations were observed. RBC, Hb, and platelet significantly increased ($p < 0.05$) in the post-treatment group. *Ganoderma lucidum* modulates the gut microbiota environment by decreasing harmful bacteria ($p < 0.05$). Increase the beneficial bacteria significantly ($p < 0.05$). **Conclusion:** According to the study's findings, evidence is building on the potential of this mushroom species as a promising functional food or nutraceutical.

Keywords: *Ganoderma lucidum*, Polysaccharide and triterpenes, Hematological parameters, Biochemical Markers, Gut microbiota, and Nutraceuticals.

EXAMINING THE CHARACTERISTICS OF MARINE TOPSE (*Polynemus paradiseus*) FISH OIL AND ITS POTENTIAL EFFECTS ON THE HIGH-FAT DIET-INDUCED BALB/C MICE MODEL IN ORDER TO COMBAT OBESITY

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Abstract

Background: The alarming rise in obesity prevalence worldwide is a public health problem. Considering the adverse effects of marketed drugs, we isolated and analyzed topse fish oil in this work for very first time and examined its effect on obesity.

Methods: Inbred twenty-four male albino BALB/c mice (4–5-week-old males) with an average weight of 21.2 ± 2.1 g experienced 1 week of acclimatization with a standard chow diet and were randomly divided into four groups such as control group (C), normal chow feeding (protein with 20% kcal, carbohydrate with 70% kcal, fat with 10% kcal); obese control (OC) group, high-fat diet (HFD) feeding (protein with 20% kcal, carbohydrate with 35% kcal, fat from lard with 45% kcal); T-I and T-II group received 20 μ l and 40 μ l crude oil /100 g body weight / day by gavage along with HFD. To evaluate the antiobesity effects of FO, we investigated the effect of *P. paradiseus* oil on the WATs weight, lipid profile, blood glucose and adipokines expression level on OC group compare with treated groups.

Result: After applying the FO in treated obese mice group, it showed significant reduction of body weight, BMI, and serum lipid profiles compared to the HFD induced OC group. Simultaneously the levels of obesity and inflammatory related adipocytokines were moderately reduced in FO treated HFD-induced obese mice group.

Conclusion: In conclusion, the Topse FO was enriched with major amount of essential fatty acids and it could be used as an antiobese food supplement.

Keywords: Obesity, fish oil, GC-MS, high fat diet, lipid profiles, adipocytokines.

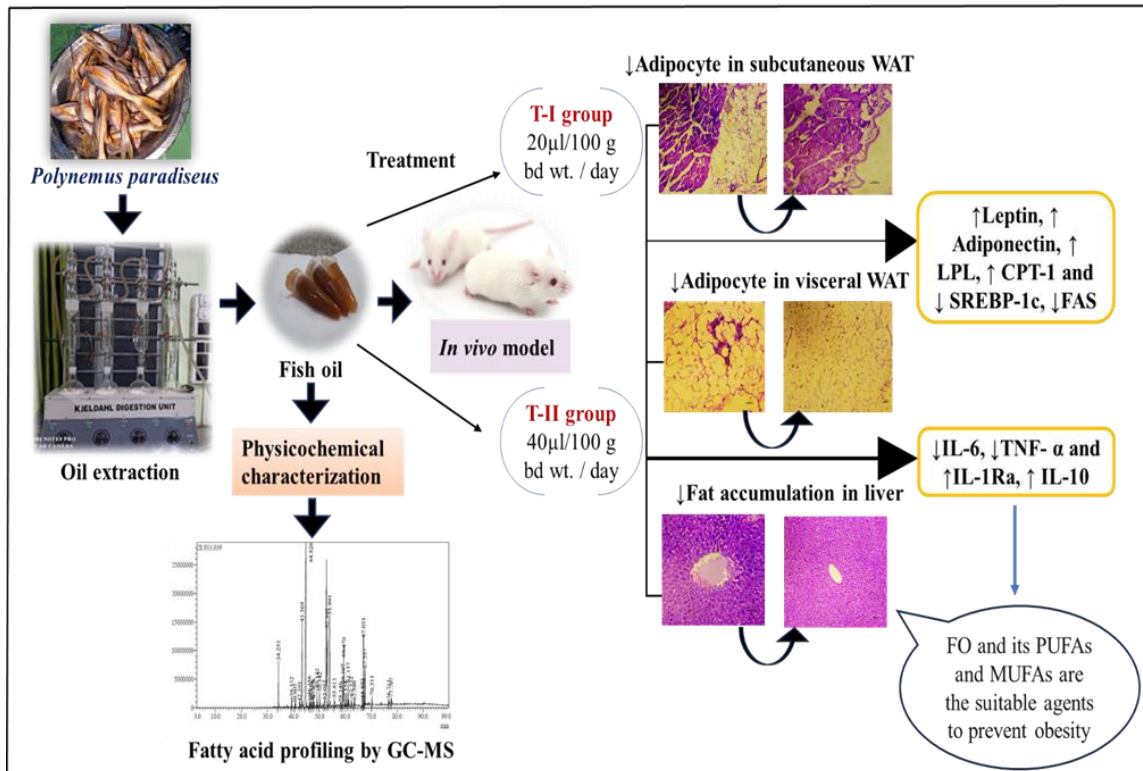


Figure: Diagrammatically representation of antiobesity potentiality of *P. paradiseus* fish oil.

***IN VITRO* EFFICACY OF DUAL DRUG LOADED LIPOSOME WITH EUGENOL OLEATE AND AMPHOTERICIN B AGAINST EXPERIMENTAL VISCERAL LEISHMANIASIS**

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Abstract

Visceral leishmaniasis (VL) is a systemic parasitic disease that leads to high rates of morbidity and mortality in humans worldwide. There is a continued need to develop effective, safe, and novel strategies to treat the VL. In this study, we examined the efficacy of liposomal entrapped Amphotericin B (AmpB) and Eugenol-oleate against Visceral leishmaniasis *in vitro*. We formulated dual drug loaded liposomes (DDL) with AmpB and Eugenol-oleate using the dry film hydration method and tested their efficacy on promastigotes and amastigotes of *Leishmania donovani* AG83 strain. DDL, at a dose of 2.5 µg/mL, showed less cytotoxicity to the host murine macrophages and potentiated enough to control the intracellular parasitic load compared with even higher doses of it. DDL induced host-protective immune responses by enhancing iNOS2 expression followed by NO generation. It up-regulated pro-inflammatory cytokines such as TNF-α and IL-12 in *L. donovani*-infected macrophages with concurrent inhibition of anti-inflammatory responses (TGF-β, IL-10). These findings strongly suggested the effectiveness of DDL as a potent novel approach for controlling the VL.

Keywords: Visceral Leishmaniasis; Liposomal dual drugs; Amphotericin B, Eugenol-Oleate; Immunomodulation.

LC-MS, NMR ANALYSIS AND MOLECULAR DOCKING STUDIES OF PHYTOESTROGEN FROM *Cassia occidentalis* Linn. PODS AGAINST PPAR- α PROTEIN

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Abstract

The pods of the *Cassia occidentalis* plant, harvested during both winter and prewinter seasons, were subjected to comprehensive phytochemical analysis using LC-MS and NMR. Additionally, molecular docking studies were employed to investigate the *in-silico* interactions between the identified phytochemicals and PPAR- α . The analysis of the extracts obtained from prewinter pods revealed the presence of several phytoconstituents, notably quercetin, p-coumaric acid, catechin, apigenin, syringic acid, kaempferol, caffeic acid, ferulic acid, ellagic acid, naringenin, protocatechuic acid, gallic acid, sinapic acid, myricetin, and vanillic acid. In contrast, the extract from winter pods contained quercetin, apigenin, p-coumaric acid, kaempferol, catechin, syringic acid, chlorogenic acid, gallic acid, ellagic acid, protocatechuic acid, ferulic acid, caffeic acid, p-hydroxy benzoic acid, sinapic acid, naringenin, and myricetin as the major compounds. The presence of naringenin in the prewinter *Cassia* pod extract was confirmed using both chromatography and spectroscopy methods. The results obtained from molecular docking simulations demonstrated that among the identified compounds, namely naringenin, kaempferol, myricetin, quercetin, and apigenin, naringenin exhibited the highest binding affinity with PPAR- α , with a binding energy of -8.5 kcal/mol. It was closely followed by kaempferol, myricetin, quercetin, and apigenin, with binding energies of -8.5 kcal/mol, -7.8 kcal/mol, -7.6 kcal/mol, and -7.3 kcal/mol, respectively. These findings suggest that these compounds have the potential to interact with PPAR- α and modulate its activity. The promising binding affinities of naringenin, kaempferol, myricetin, quercetin, and apigenin with PPAR- α suggest their potential utility in the development of anti-neuroinflammatory drugs and therapeutic interventions.

Keywords: Phytoestrogen; LC-MS; NMR; cassia; kaempferol; naringenin; neuroprotection; *in Silico*.

ANTI-OBESITY EFFECT OF ICOSA 11-14-17 TRIENOIC ACID FROM *Setipinna phasa* OIL ON HIGH FAT DIET INDUCED ADIPOSITY, ADIPOSE TISSUE INFLAMMATION AND STEATOHEPATITIS IN SWISS ALBINO MICE

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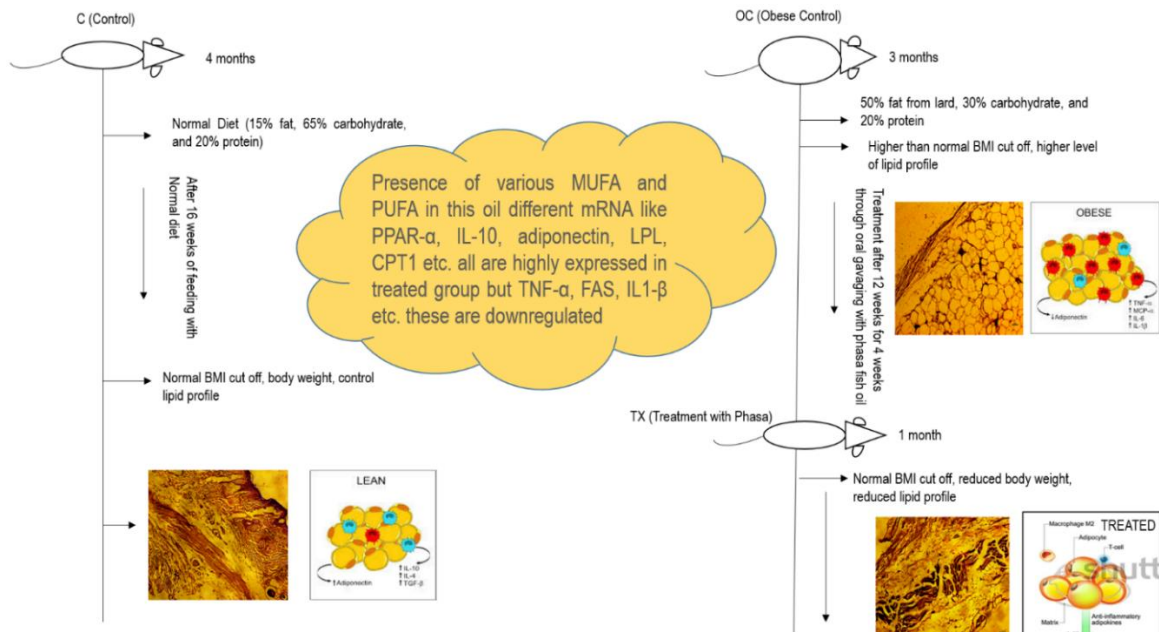
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Abstract

The prevalence of obesity, largely increasing by global changes in diets and lifestyles, reaches an epidemic level worldwide. Obesity is a complex disease involving accumulation an excessive amount of body fat. Due to ingestion of lot of fatty food plasma free fatty acids are elevated and contribute to lipotoxocity in various organ in obese condition. It is very difficult to treat with medication because the treatment cannot be short term. Anchovy, Gangetic Hairfin despite being a fresh water fish and going by the name “Phasa,” (*Setipinna phasa*), is thought to be able to tolerate some saline in the water. Considering this, it is aimed to characterize Phasa fish oil for the first time and evaluate its anti-obesity and anti-inflammatory potentialities in mice model. For the establishment of this research, mice were divided into six groups as control (C), Positive control (PC), Obese control group (OC), Icosa 11-14-17 Trienoic Acid from *Setipinna phasa* oil treated group with three doses TX1, TX2 and TX3. Icosa 11-14-17 Trienoic Acid is a conjugated fatty acid. Application of this acid on obese mice significantly reduced body weight, lipid profile, serum glucose and improve liver function compared to OC but it was revealed that TX3 group is more significant than TX1 and TX2 group. In this connection some obesity and obesity associated inflammatory cytokines expression were downregulated in treated group compared to obese group. Conjugated fatty acid treated group had elevated expression of PPAR- α , adiponectin, LPL gene and anti-inflammatory markers IL-10 and IL1Ra than obese group. After all the evaluation it is concluded that conjugated omega-3 fatty acid enriched *Setipinna phasa* might be used as an anti-obese and anti-inflammatory supplement.

Keywords: Icosa 11-14-17 trienoic acid, anti-obese, anti-inflammatory, body weight, medication.



ANTI-GASTRIC ULCER POTENTIALITIES OF PROBIOTIC *Lactiplantibacillus plantarum* E2_MCCKT PREVIOUSLY ISOLATED FROM TRADITIONAL FERMENTED FOODS

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Abstract

Gastric ulcer is a chronic gastrointestinal illness, characterized by a major disruption in the mucosal barrier. Prolonged, regular uses of non-steroidal anti-inflammatory drugs are the risk factors for the development of stomach ulcers. This work aimed to investigate the gastroprotective effects of pre-treatment *Lactiplantibacillus plantarum* E2_MCCKT strain (isolated from traditional fermented foods) by a cold-induced ulcer mice model. The adult male mice (28.4 ± 1.62g) were randomly divided into three groups (n=5). The oral supplementation of the *Lp. plantarum* E2_MCCKT strain (10⁹ cells/ml/day) with a standard diet led to a significant reduction of cold-induced gastric erosion in stomach mucosa after 30 days. Moreover, *Lp. plantarum* E2_MCCKT strain effects on relative mRNA expressions related to gastric inflammation such as up-regulation of IL-10 (1.17±0.012-fold), PPAR- α (1.13±0.019-fold) and down-regulation of IFN- γ (1.12±0.03-fold), IFN- λ (1.14±0.025-fold), IL-12 (1.13±0.021-fold), and PPAR- γ (1.11± 0.054-fold) that supported the study to have an anti-inflammatory activity of the strain. Alongside, the histopathological study clearly showed that probiotic *Lp. plantarum* E2_MCCKT strain could protect the stomach epithelial cells from cold injury. Hence, the isolated *Lp. plantarum* E2_MCCKT strain might be an alternative therapeutic agent for gastric ulcer treatment.

Keywords: Probiotic, anti-inflammatory, gastro protective, PPAR- α .

MOLECULAR SYMPHONY: SYRINGIC ACID ORCHESTRATION OF HIPPOCAMPAL PLASTICITY FOR IMPROVED LEARNING

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Abstract

This work emphasizes the role of the polyphenol component syringic acid in improving the learning abilities of mice that were previously not strong learners. It was observed that syringic acid increased spine density in cultured hippocampal neurons, stimulated calcium influx that was sensitive to AMPA and NMDA, and upregulated molecules linked to plasticity. Plasticity-related molecules were upregulated in hippocampal neurons as a result of syringic acid-induced CREB activation via protein kinase A (PKA) and protein kinase C (PKC). Lastly, CREB activation generated by spatial memory consolidation and the expression of several molecules related to plasticity were shown to be lower in the hippocampal regions of mice with poor learning than in mice with good learning. Oral administration of syringic acid, enhanced the activation of CREB induced by spatial memory consolidation and the expression of molecules related to plasticity in the hippocampus of mice with poor learning abilities, thereby transforming them into good learners. These findings highlight a unique ability of syringic acid to enhance hippocampus plasticity, hence transforming poor learner into proficient ones.

Keywords: Syringic acid; Poor learners; CREB; Memory and learning.

ANTI-DIABETIC PROPERTIES OF SOME FISH MASSES

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is a metabolic syndrome associated with hyperglycemia, β -cell dysfunction, impaired secretion of insulin, or developing insulin resistance that results in high blood sugar. No satisfactory effective treatment is available yet to cure diabetes mellitus. Though, synthetic drugs are used to control this disease but there are numerous life-threatening side effects. Fish are important nutrient rich foods that have shown to possess positive effects in the management of T2DM. **Methods:** Thirty Wister strain albino rats were divided into 6 groups, each group having five rats. All rats were provided high lipid diet (HLD) for 45 days to promote quick weight gain. After 45 days, T2DM was achieved by a single intraperitoneal injection (i.p.) of streptozotocin (STZ) 4 mg/100 g b.w. dissolved in 0.5 ml buffer (0.1 M sodium citrate, pH 4.5). Three sea fishes, ‘volavetki’ (*Panna microdon*, Bleeker 1849), ‘ruli’ (*Coilia dussumieri*, Valenciennes 1848), and ‘tapra’ (*Opisthopterus tardoore*, Cuvier 1829) and fresh-water fish ‘mourala’ (*Amblypharyngodon mola*, Hamilton 1822) were dried in a mechanical dryer in separate trays to prepare fish mass i.e., VFM, TFM, RFM and MFM respectively. Experimental procedure on animal was permitted by IAEC, Raja Narendra Lal Khan Women’s College (Autonomous). Group I (control) and group II (T2DM) rats were fed HLD, group III, IV, V and VI fed HLD with VFM, RFM, TFM and MFM respectively. Fish mass was added in HLD by replacing casein 15% and fed for 28 days. Fasting blood glucose (FBG) and glycosylated hemoglobin (HbA1c) was measured at the times 0, 7, 14, 21 and 28 days. At the end of study, insulin, c-peptide, glucagon-like peptide-1 (GLP-1), total cholesterol (TC), low density lipoprotein (LDL), triglycerides (Tg), high density lipoprotein (HDL) level in plasma and dipeptidyl peptidase-IV (DPP-IV), glucokinase (Gk), superoxide dismutase (SOD),

glutathione peroxidase (GPx), catalase (Ct) activity and histopathologies of pancreatic tissue were also evaluated and Glucose 6 phosphate activity also evaluated from liver tissue.

Results: FBG, HbA1c, insulin, c-peptide, GLP-1, HDL in T2DM rats had risen excessively above normal level and significantly increased than group I rats. Interestingly, FBG, HbA1c, insulin, c-peptide, GLP-1, HDL significantly decreased in group III VFM treated rats than others groups of rats except group I. TC, LDL, Tg and DPP-IV were significantly decreased in VFM treated group than others groups. **Conclusion:** VFM treated rats resulted highly anti-hyperglycemic activity.

Keywords: Type 2 Diabetes mellitus; Sea fish mass; glucagon like peptide-1; Dipeptidyl-peptidase-4; High lipid diet.

***Sida cordifolia* FRACTION AMELIORATES CISPLATIN INDUCED NEPHROTOXICITY BY MITIGATING KIM-1/BCL2 MEDIATED INFLAMMATION**

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Abstract

Kidney injury refer to the abrupt and permanent loss of kidney function, which is based on elevated serum creatinine levels and decreased urinary output, which is a seven-day period that serves as a quantitative indicator of urine production. Cisplatin (CP) is used to treat a variety of malignant tumors, such as ovarian, lung, lymphoma, and germ cell tumors. Severe renal dysfunction affects 20% of patients who receive high-dose or long-term therapy of CP. *Sida cordifolia* (SC) reportedly has various pharmacological actions including laxative, anti-inflammatory, antipyretic, analgesic, antiviral, antifungal, antimicrobial and antioxidant activities. This study designed to investigate the diminishing effect of chloroform fraction of SC (CFSC) on CP induced nephrotoxicity and improving antioxidant defence system. CFSC (100mg, 200mg and 300/kg/day) was administered daily for 3 weeks and nephrotoxicity was induced in rats by intraperitoneal injection of CP at a dose of 10 mg/kg body weight on 16th day of experimentation. Biochemical studies were performed to evaluate renal function including GSH, SOD, sCr and others. Western blotting and gene expression were performed to measure the protein and gene levels of KIM-1, IL-18, NGAL, Bcl2, clusterin and nephrin in the kidney of CP treated rats. Histopathological analysis was done using hemotoxylin eosin-stained renal sections to investigate the structural abnormalities and fibrosis. CP treated rats suffered from nephrotoxicity as evidenced by worsened renal function, increased blood urea nitrogen, serum creatinine levels in renal tissues and histopathological abnormalities. Treatment with CFSC at 200mg and 300mg/kg/day mitigated these changes and restore the normal level of these biomarkers. Furthermore, CFSC at 200mg and 300mg up regulated Bcl2 and down regulated KIM-1, IL-18, NGAL, clusterin and nephrin. In these studies result suggested that CFSC 200mg and 300mg has an ability to improve renal function and attenuates KIM-1/Bcl2 signalling pathway in CP induced nephrotoxicity in rats.

Keywords: Cisplatin, KIM-1, Bcl2, nephrotoxicity, anti-inflammatory

CHARACTERIZATION OF *Aeromonas*-INFECTING BACTERIOPHAGE AHPMCC11, A NEW SPECIES OF GENUS *Ahphunavirus*

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Abstract

Aeromonas hydrophila is a major aquatic habitat pathogen responsible for huge economic losses in the aquaculture and food industry sectors. To combat *A. hydrophila* infection many antibiotics are used but antibiotic resistance is a great threat to this world. In this study, we used bacteriophage to control *A. hydrophila* infection instead of antibiotic therapy. A lytic bacteriophage AHPMCC11 was isolated using from a sewage sample by using *A. hydrophila* MTCC1739. Bacteriophage AHPMCC11 showed a short latent period of 10 min and burst size was 22 PFU. Bacteriophage AHPMCC11 had potent bacteriolytic activity within 2 hours in liquid culture inhibition assay and biofilm scavenging activity against *A. hydrophila* MTCC1739. It also had a wide range of pH (3-12), temperature (4-37 °C), and salinity (0-40 ppt) stability. Whole genome sequence analysis of bacteriophage showed that the AHPMCC11 genome was 42,439 bp with 58.9% G + C content. A total of 51 CDS and no tRNA were predicted in its genome. Comparative genome analysis showed that AHPMCC11 might be a new species under the *Ahphunavirus* genus in *Autographiviridae* family. In conclusion, AHPMCC11 might be used as a biocontrol agent in aquaculture and food sectors.

Keywords: antibiotic resistance, biofilm, bacteriophage, new species, *Ahphunavirus*.

***IN-SILICO* VACCINE DESIGNING AGAINST *Aeromonas hydrophila* CAUSING DROPSY DISEASE IN FISHES USING IMMUNOINFORMATIC TECHNIQUE**

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Abstract

Aeromonas hydrophila is the major causative agent responsible for the fin rot, gill rot and ulcers, collectively known as dropsy in fishes which can be zoonotic to young children and immunocompromised people. It causes major losses to fishery yield and fish export. This led to a major threat to food security. As this disease is zoonotic in nature it can bring significant challenges to food safety. Outer membrane protein (OMP) is crucial for designing of epitopic vaccine, limiting the robust outbreak of diseases. Present work equips immunoinformatics techniques to identify and validate the suitable epitopes for vaccine designing. The selected epitopes VGFDGSQYG and LAGKTTNES are identified by several HLA-DRB alleles of both MHC class (MHC-I and II) molecules. Simultaneously these epitopes also accessible to B-cell, confirmed through BCPEDS server. Antigenicity manifestation also been validated by the Vaxijen antigenic prediction portal. Appropriate 3D structural identity of the outer membrane protein (OMP) of *A. hydrophila* is generated through SWISS MODEL server and validated simultaneously through ProSA and PROCHECK server. The structure of the epitopes also modelled using DISTILL server. Molecular docking between the epitopes and both human and fish immune receptor authenticate the proper interaction between epitope and receptor with significantly low binding energy. Briefly the work provides a conspicuous impel towards development of epitopic vaccine as a remedy of fin rot, gill rot and ulcer and zoonotic infection in human body.

Keywords: Dropsy, OMP, Epitope, Molecular docking, Vaccine, Immunoinformatics.

***Bellamy* IS A HIDDEN WEAPON AGAINST HUMAN SICKNESS**

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Abstract

Bellamy bengalensis, a freshwater snail, has potential nutritional value. People eat *B. bengalensis* regularly since it is not only inexpensive and delicious, but it also has high therapeutic potential. People with heart disease are taking this snail in hopes of restoring their health. *B. bengalensis*, rich in MUFAs and PUFAs, is edible and high in flesh value. Its crude extract, mucus, and slime contain compounds like glycans, polypeptides, and proteins, which can be used to treat viral lesions, warts, and skin issues. Snails can be used to treat post-traumatic stress disorder. Snail bioactive substances like ω -MVIIA, μ -SIIIA, μ O-MrVIB, Xen2174, δ -EVIA, α -Vc1.1, σ -GVIIA, Conantokin-G, and ContulakinG, along with conopeptides, have potential for anti-cancer therapeutic development. Snail shells are an excellent source of calcium and magnesium. Calcium is a crucial element that the body needs to operate and can only be obtained from dietary sources. Calcium and magnesium are both essential for skeletal mineralization and have a variety of roles, including anti-cancer action. CaCO₃ crystals found in snail shells are used in cancer imaging systems and drug delivery and are also crucial for the production of hydroxyapatite nanoparticles for cancer therapy. It is essential to know the value of snails and try to protect them in the environment.

Keywords: *Bellamy bengalensis*, cardiac problems, cancer treatment, environment.

ANTI-OBESITY POTENTIALITY OF *Opisthopterus tardoore* OIL ON HIGH FAT DIET INDUCED MOUSE OBESITY VIA REGULATION OF LIPID METABOLISM AND INFLAMMATION

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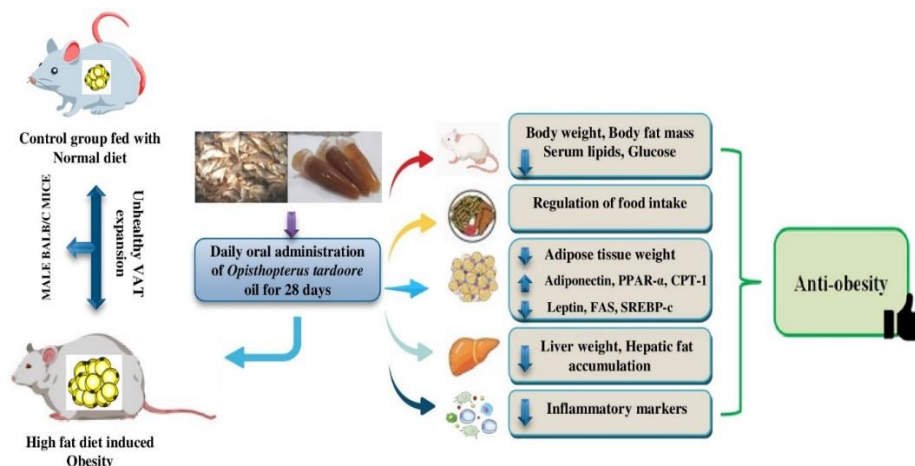
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Abstract

Obesity is a condition caused by surplus adipose tissue and is a risk factor for several diet-related diseases. Tapra fish is a marine fish available in Bay of Bengal. The present study sought to elucidate the role of oil extracted from Tapra fish (*Opisthopterus tardoore*) in high fat diet induced mouse obesity and investigated the primary molecular mechanism underlying these effects. BALB/c mice were fed a lard-based high-fat diet for 8 weeks to develop obesity and then three doses of oil extracted from *O. tardoore* were administered orally. Changes in body weight, and biochemical parameters were recorded and the mechanism was explored by quantitative PCR and western blotting. Body weight, blood lipids, blood glucose, organ weight and visceral adipose tissue weight were reduced by *O. Tardoore* oil. *O. Tardoore* oil significantly enhanced expression of genes such as adiponectin, PPAR- α , CPT-1, LPL. Fish oil also reduced the expression levels of pro-inflammatory factors such as TNF- α , IL-6, iNOS and lipid metabolism genes such as FAS, SREBP-1. The results therefore suggested that *O. Tardoore* oil exhibited lipid-lowering and anti-inflammatory effects by alleviating hepatic lipid metabolism and improving obesity in mice via activation of the β -oxidation pathway.

Keywords: Marine fish, *Opisthopterus tardoore*, PUFA, anti-obesity, anti-inflammation.



ISOLATION AND CHARACTERISATION OF PROBIOTIC YEASTS

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Abstract

Probiotics are non-pathogenic live microbes which, when administered in adequate amounts, confer positive health benefits. Mainly, probiotic bacteria are used as an alternative to medication, but the problem occurs due to the tendency of the resistance gene of the bacterial genome to carry forward. Considering this, there is a demand for the isolation and probiotic characterisation of yeast. In this study, we isolated 23 strains from different fermented foods, such as jalebi batter, haria, and idli batter, and checked their *in vitro* probiotic activity. Four isolates (Y2, Y3, Y5, and Y6) out of 23 showed high survivability in acidic pH (96.46-97.89%), high bile salt (2%) concentration (93.95-99.29%). Among 23 isolates, ten strains showed moderate auto-aggregation (50-70%) properties, and the rest of them showed strong auto-aggregation (>70%) capability. Similarly, seven isolates showed average hydrophobicity (50-70%) activity, and others had high auto-aggregation capability (>70%), which indicates the isolates' ability to survive in the gastrointestinal tract. Moreover, these isolates are sensitive to all antibiotics tested, indicating the absence of antibiotic-resistant genes in the isolates' genome. All the isolates exhibited intense antibacterial activity against *Escherichia coli* ATCC 25922 and *Aeromonas hydrophila* MTCC1739. In conclusion, the isolated yeast showed *in vitro* probiotic activity. A detailed analysis is needed to establish this yeast as a probiotic.

Keywords: Fermented foods, probiotics, non-pathogenic, yeast, antibiotics.

THERAPEUTIC EFFECTS OF FUNCTIONAL FOODS AND THEIR BIO- ACTIVE COMPONENTS IN HUMAN HEALTH FOR DISEASE PREVENTION AND MANAGEMENT

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Abstract

Functional food (FF) refers to natural, whole, fortified, processed, enriched or enhanced foods or ingredients that aid to specific body functions, may provide health benefits beyond that of the traditional nutrients it contains. FF also called super foods being contain various potentially beneficial bioactive components for promoting human health and disease prevention. Physiologically active substances derived from plant (whole grains, fruits and vegetables), animal (dairy, fish, meat), microbial (probiotics, prebiotics, symbiotics, synbiotics), miscellaneous (algae, mushrooms) sources. FF naturally include abundant bioactive compounds including carbohydrates (dietary fiber), proteins, omega-3 fatty acids, antioxidant, flavonoids, isothiocyanates, carotenoids, anthocyanidins, phenolic acids, sterols, polyols, phytoestrogens, phytosterols, soy protein, vitamins (A, C, E), minerals (selenium, zinc), play a crucial role in reducing or minimizing the risk of certain lifestyle diseases and other health conditions, when consumed at efficacious levels as part of a varied diet on regular basis. Various bioactive components in different FF have pharmacological properties like hypolipidemic, anti-inflammatory, antimicrobial, antiviral, anti-fungal, anticarcinogenic, antibacterial, antiproliferative, antiallergic, antihypertensive, cardioprotective, immunomodulatory and neuroprotective actions etc. which are responsible for the improvement of human health and can significantly reduce the probability of diseases as well as it helps to treat, control, prevent and manage certain chronic conditions and metabolic disturbances such as diabetes, dyslipidemia, hypertension, obesity, CVD, constipation, cancer, immune dysfunction, gastrointestinal disorder, aging, allergies, infection diseases and stress management. This review will highlight the effective therapeutic role of functional food in an individual's daily life.

Keywords: Functional Food, Bioactive Compound, Pharmacological Properties, Phytoestrogen, Antihypertensive, Antiproliferative.

ROLE OF FUNCTIONAL FOODS TO MINIMISE CHRONIC DISEASES IN TRIBAL COMMUNITIES

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Abstract

The use of functional foods for maintaining health and preventing or treating illnesses in recent years has been dramatically increased in the literature. There are available valuable examples of functional foods in ethno medicine from different tribes. Ethnic functional foods can be valuable resources for developing functional foods science, e.g., introducing memorial functional foods as an interdisciplinary ethno pharmacological concept. Ethno medicine contains knowledge, skills, and activities which are based on behaviour, culture, and experience of natives. Such knowledge is used to treat various physical and mental ailments. Due to the close relation of traditional and ethnic phytopharmaceuticals, they have long been valuable guides for modern research and development of pharmaceuticals. Today, globalization and mixing of cultures has gradually faded differentiated ethnic groups features, such as languages and traditions; as a result, rules and ethnic medical knowledge of natives barely have remained alive. Moreover, due to changes in the awareness of indigenous people, and increasing impact of globalization, indigenous knowledge is constantly declining. In many parts of the world, especially in isolated places and areas where physicians and pharmacists are not available, people commonly use their ancestors' home remedies and ethno medicine. In fact, what is transmitted from generation to generation is not only information but also indigenous memories and beliefs. Family is the most important source of knowledge in the community. As a result, local medications and functional food procedures have been transmitted from parents to children during the centuries, and in the present age, as a result of gap between generations, there is no guarantee for continuation of this transition.

Keywords: Functional foods, chronic diseases, Ethno medicine, Local medications.

FUNCTIONAL FOOD AS DIETARY INTERVENTION FOR CHRONIC DISEASE- NOBLE PERSPECTIVES FOR HEALTH PROMOTION AND DISEASE PREVENTION

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Abstract

While disease is inevitable in humankind the correct century has been burden with many chronic diseases, most of which our lifestyle immediate and which is part can be controlled by consuming functional foods through epigenetic modulation. The concept of functional foods was first introduced in Japan in the mid-1980s. The term functional foods is used to describe food ingredients that provide health benefits beyond meeting basic nutritional needs due to there are physiologically active food components. The health effects referred to by functional foods are typically due to the bioactive compounds they contain. Functional food describes the importance of foods in promoting health and preventing disease aside. Their primary role of providing the body while they required among of essential nutrients such as and it's protein, carbohydrates, vitamin, fats and oils needed for its healthy survival. This explains the interactions of functional food bioactive compound including polyphenones, carotenoids, alkaloids, omega-3 and polyunsaturated fatty acid among other with critical enzymes linked to some degenerative disease. Different functional food bioactive compounds (antioxidant, anticancer, anti-arthritis, antimicrobial, anti-diabetic, neuroprotective, and immunomodulatory). These degenerative disease (diabetes, cardiovascular disease, cancer, sexual dysfunctions, obesity, respiratory disease, and thrombosis) by modulating the active of these critical enzyme by psychological importance. Functional food should not be used as a substitute for medical treatment in their approach but shoot only be a complementary alternative. Functional foods when combined to with helpful eating patterns and lifestyle choices may significantly reduce the risk of chronic disease.

Keywords: Functional foods, chronic disease, epigenetic modulation, antioxidant, omega-3.

PREVALANCE OF CHRONIC ENERGY DEFICIENCY AND OCCUPATIONAL HEALTH HAZARDS AMONG THE DOKRA ARTISANS OF BANKURA, WEST BENGAL, INDIA

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Abstract

Malnutrition emerges as a critical global public health issue, particularly impacting vulnerable communities. This study delves into the repercussions of malnutrition among Dokra artisans in the Bankura district of West Bengal, India. The data collection process rigorously covers demographic and socioeconomic aspects, with anthropometric parameters calculated using established formulas. The analysis, carried out through the SPSS 25.0 statistical package for Microsoft, involves the application of Student's t-test or ANOVA for continuous variables and the chi-square test for categorical variables. The significance level ($p < 0.05$) prompts the utilization of Dunnet's post hoc test for specific mean comparisons. The participation of 122 artisans spanning diverse age groups reveals noteworthy disparities in nutritional status ($\chi^2=42.096$; $p < 0.01$). A discernible correlation between education levels and socioeconomic status is identified ($\chi^2=18.509$; $p < 0.05$). Standard questionnaires are employed to recognize a spectrum of occupational health challenges. The artisans are suffering from severe occupational health hazards such as vision disorder (35.22%), respiratory problem (27.77%), musculoskeletal pain (20.45%) and burn injuries (17.04%). This study underscores the severity of malnutrition among Dokra artisans, emphasizing the necessity for targeted health education initiatives within this demographic to address this formidable public health concern in India. The scope of public health interventions should extend beyond nutritional improvement, encompassing marginalized and vulnerable populations throughout India.

Keywords: Chronic energy deficiency, Occupational health hazards, Pearson's correlation, Dokra.

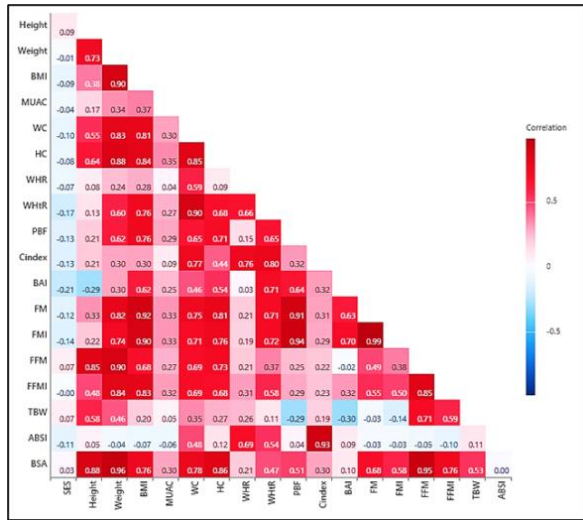


Figure 1: Pearson’s correlation matrix of different studied parameters

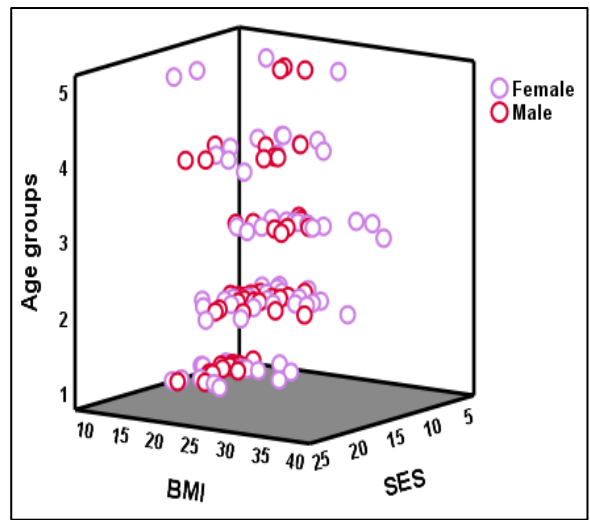


Figure 2: Scattered plot of BMI & SES in different age groups of Dokra artisans

ASSESSMENT OF NUTRITIONAL STATUS, SOCIOECONOMIC STATUS AND CARDIOVASCULAR RISK AMONG ADULT TERRACOTTA ARTISANS OF BANKURA, WEST BENGAL, INDIA

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Abstract

Cardiovascular risk among adults was a pressing global public health concern, particularly affecting vulnerable communities. This study delved into the repercussions of nutritional status, socioeconomic status (SES), and cardiovascular risk factors among adult Terracotta artisans in the Bankura district of West Bengal, India. The data collection process rigorously covered demographic and socioeconomic aspects, with anthropometric parameters calculated using established formulas. Blood pressure was measured following standard methods, and blood pressure indices were calculated using established formulas. Statistical analysis, carried out through the SPSS 25.0 statistical package for Microsoft, involved the application of Student's t-test or ANOVA for continuous variables and the chi-square test for categorical variables. The significance level ($p < 0.05$) prompted the utilization of Dunnet's post hoc test for specific mean comparisons. The participation of 193 artisans revealed gender-specific noteworthy disparities in nutritional status ($\chi^2=11.515$; $p < 0.01$). Binary logistic regression of forward stepwise (Wald) showed that mid upper arm circumference (MUAC) was significantly associated with chronic energy deficiency (Wald = 31.815; $p < 0.01$), and the model was significant at $\chi^2 = 38.370$; $p < 0.01$. Gender-specific significant differences ($F=46.944$, $p < 0.001$) in mean arterial pressure (MAP) and age-specific significant differences ($F=19.599$; $p < 0.001$) in systolic blood pressure were disclosed. An elevated MAP (>90 mmHg) was found in 29.01% of the participants, posing a threat of cardiovascular risks. This study underscored the severity of nutritional status and cardiovascular risk among Terracotta artisans, emphasizing the necessity for targeted health education initiatives within this demographic to address this formidable past public health concern in India.

Keywords: Cardiovascular risk, Nutritional status, Mean arterial pressure, Terracotta, Bankura

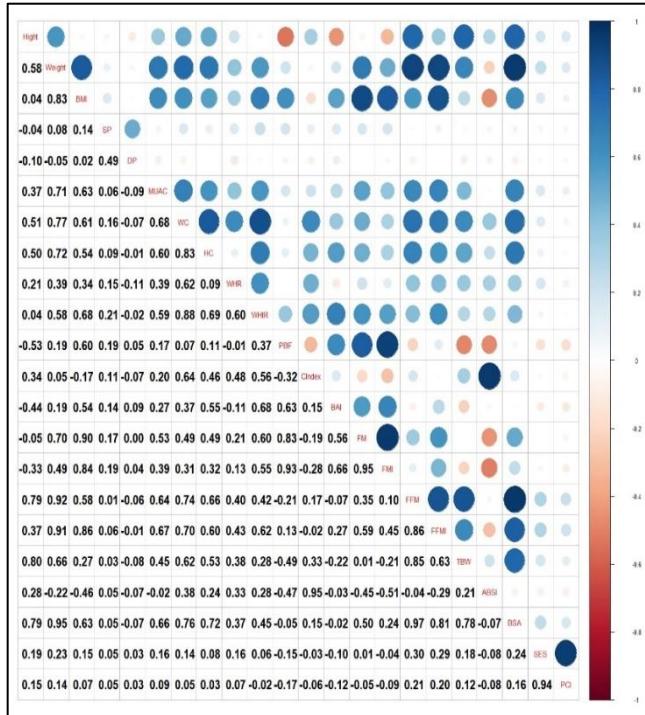


Figure 1: Correlation matrix of different studied parameters

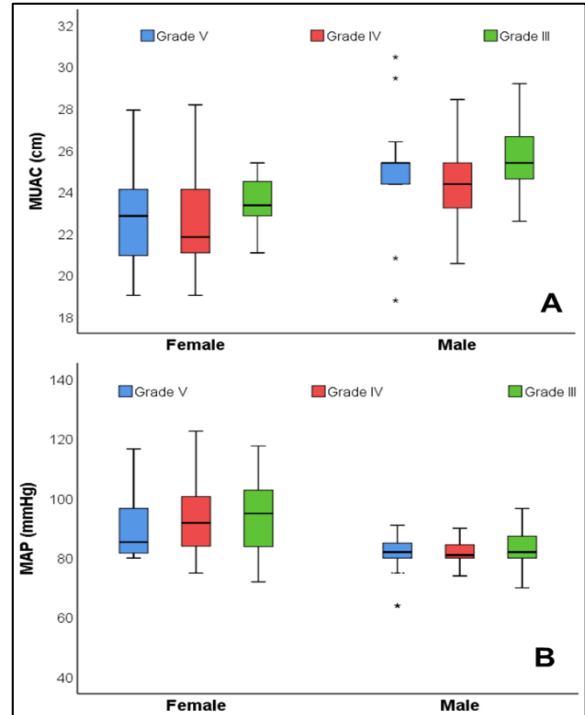


Figure 2: Gender-specific distribution of MUAC (A) and MAP (B) in different SES groups of the Terracotta Artisans

IMPACT OF RED BLOOM IN SHALLOW WATERBODIES OF BANKURA DISTRICT OF WEST BENGAL: HARNESSING NUTRIENT DYNAMICS

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Abstract

Water bodies play a vital role in society, influencing diverse aspects of our lives, especially for the aquaculture. Plankton diversity in aquatic ecosystems governs water body productivity, with distribution closely tied to unique physicochemical characteristics. This present study based on Bankura district explores the intricate relationship between physicochemical parameters and plankton distribution, aiming to determine correlations using standard methodologies and ultimately the changes in productivity. Artificial Neural Networks (ANNs) was also employed to understand intricate relationships among physicochemical parameters, zooplankton diversity, and water body status. Spectral data of the water samples were developed through NMR spectrometer to study the differences of metabolites. Categorizing sites into normal and bloom-forming water bodies reveals significant differences ($p < 0.05$) in physicochemical parameters and zooplankton through one-way ANOVA. Pearson's correlation ($p < 0.05$) underscores connections between various physicochemical parameters and zooplankton groups. Canonical correspondence analysis elucidates the relation between environmental and biological parameters. Nutrients ($\text{PO}_4^{3-}\text{-P}$, $\text{NO}^2\text{-N}$) enrichment is playing a major role in formation of toxic red algal blooms potentially triggered by *Euglena* sp. Various diversity indices assess abundance and species richness, revealing a significant correlation between plankton diversity and water body physicochemical characteristics. The NMR spectra reveals a significant change in the metabolites among bloom forming waterbodies. The ANN model aims to establish a model system for water quality and ecosystem health based on integrated data, contributing to effective management strategies. The overall improvement may further help in improving the fish production of Bankura district of West Bengal.

Keywords: Physicochemical Parameters, Zooplankton, Correlation, NMR, ANN

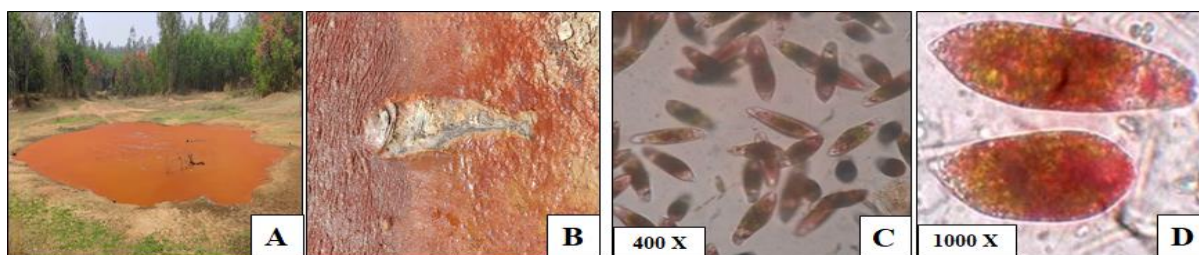


Figure 1: Bloom forming waterbody (A), Fatal condition of fish (B), *Euglena sanguinea* under 400X (C) and *Euglena sanguinea* under 1000X.

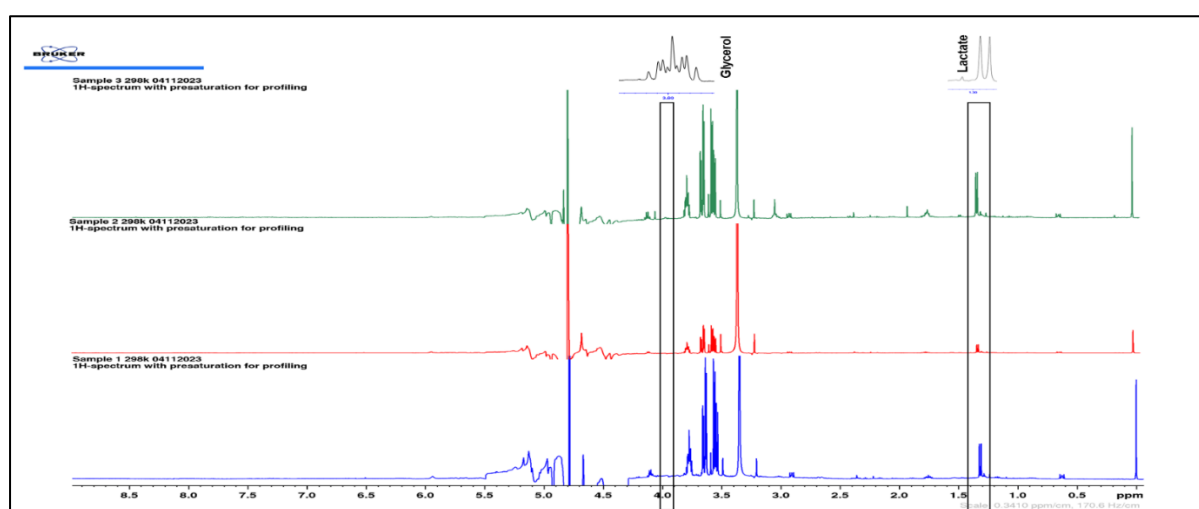


Figure 2: NMR spectrum of the water samples of different waterbodies. Peak of Glycerol and Lactate depicts the presence of these metabolites in the water samples.

EFFECT OF ANTIOXIDANTS FROM *Moringa oleifera* ON NON-ALCOHOLIC FATTY LIVER DISEASE

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Abstract

Moringa oleifera is a tree with antioxidant and anti-inflammatory properties which is also known as a Drumstick Tree. It is native to the Indian subcontinent and used extensively in South and Southeast Asia. Moringa is particularly suitable for dry regions as it can be grown using rainwater without expensive irrigation techniques. The different parts of the Moringa tree's like (flower, seeds, leaves, seeds oil, roots) used as a food. As well as In ancient period it is used as a traditional medicine for hypertension but they have also some role in diabetes mellitus, edema, cancer (breast, liver), sickle cell anemia, cardiovascular disease etc. The foods that are rich in antioxidants, among which polyphenols and carotenoids play a predominate role in liver disease. *Moringa oleifera* is one which have the antioxidant and anti-inflammatory properties which are help to reduce the liver disease. Non-alcoholic fatty liver disease is characterized by a variety of liver conditions ranging from hepatic steatosis, to non-alcoholic steatohepatitis which, if untreated, can lead to further complications such as hepatic fibrosis, cirrhosis or cancer, and even death. Moringa reduced the numbers of smooth muscle α -actin positive cells and the accumulation of collagens I and III in liver. Moringa seed extract showed significant inhibitory effect on 1,1-diphenyl-2-picrylhydrazyl free radical, as well as strong reducing antioxidant power. The activity of superoxide dismutase as well as the content of both malondialdehyde and protein carbonyl, which are oxidative stress markers, were reversed after treatment with Moringa. Moringa seed extract can act against CCl₄-induced liver injury and fibrosis by his antioxidant and anti-inflammatory effect and its ability to attenuate the hepatic stellate cells activation.

Keywords: *Moringa oleifera*, antioxidant, anti-inflammatory, hepatic steatosis, α -actin, Nonalcoholic fatty liver.

POTENTIAL HEALTH BENEFIT OF THANKUNI (*Centella asiatica*)

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Abstract

Centella asiatica is an herbaceous perineal plant which propagate by producing stolons. *Centella asiatica* (L.) urban is a member of the plant family apiaceae (formerly Umbelliferae), and subfamily mackinlayoideae (USDA 2016). It is found on most tropical and sub-tropical countries, growing in swampy area, including parts of India, Pakistan, Sri Lanka, Madagascar, South Africa, Eastern Europe. Around 21 species of the plant are found in India, Particularly in Rajasthan, Kullu valley and Shimla. The plant can be traditionally grown in nitrogen rich soil using the hydroponic method. The soil required for the growth of the plant should be moderately fertile; A PH of 4.5 to 8.3 is tolerable and low temperature 0 to 5 degree centigrade. It is a tasteless odourless plant that thrives in and around water. It has small fan-shade Greenleaf with white or light purple-to-pink or white flowers and it bears small oval fruit. The whole plant (Leaf, seeds, fruits, Stem) can be used. The plant is rich in carbohydrate, dietary fibre, protein and fat, other phytochemicals such as alkaloids, alkanoids, Saponins, terpenoids, carotenoids and phenolic compounds. *Centella asiatica* is found to have numerous health benefits such as anti-cancer, antidiabetic, antihyperglycaemic, anti-inflammatory, anti-microbial and anti-oxidant activity, and hepatoprotective.

Keywords: *Centella asiatica*, phytochemicals, anticancer, anti-diabetic, anti-inflammatory, nitrogen-rich soil.

FISH OIL ENRICHMENT WITH POLYUNSATURATED FATTY ACID AND ITS CARDIOVASCULAR HEALTH BENEFITS

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Abstract

Introduction- Worldwide 17.9 million out of these 17 million pre-mature fatalities people died as a result of cardiovascular disease, which is accounting to 32% of total death. Circulating level of triglyceride is a most recognized risk factor for developing CVD, the leading cause of death. Long chain polyunsaturated fatty acids omega-3 are one of the best dietary products to reduce triglyceride in serum and fish oil remains the main source of it.

Objective- Consumption of PUFA, especially eicosapentanoic acid and docosahexaenoic acid to reduce serum triglyceride in hyperlipidemic individual. **Mechanism** – PUFA can reduce serum triglyceride by the mechanism of fatty acid oxidation. Where, triglyceride brake down into fatty acid (fat metabolism) and fatty acid brake down into acetyl- CoA (protein metabolism)and Acetyl -CoA comes to krebs cycle and produces energy to cell. **Conclusion-** Previous study observed that the pharmaceutical dose, 3.4 gm/day fish oil (PUFA) reduce in serum triglyceride by about 25-50% after one month of consumption of fish oil (PUFA).Evidence showed that consumption of fish oil (PUFA) may reduce the risk of CVD and in specific, it may potential benefits in improving the prognosis of patients with hypertension, coronary heart disease.

Keywords: Cardiovascular disease, Fish oil, Polyunsaturated Fatty Acid Omega-3, Triglyceride, Eicosapentanoic Acid, Docosahexaenoic Acid.

BENEFICIAL EFFECT OF FUNCTIONAL FOOD ON WOMEN’S HEALTH

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Abstract

Functional foods (yogurt, pomegranate, beetroot, nuts & green vegetable etc.) are claimed to have an additional function, these foods may enhance health and prevent disease as a result of their content of phytochemicals. Women’s are identified as one of the most important consumer groups for functional foods because they have specific health leads than men, such as during pregnancy, postpartum period etc. The objective of the study is to investigate the impact of few functional foods on women’s health. From previous study, we were recognizing that functional foods have a major role in health enhancement. Yogurt not only to improve the nutritional properties, but also possess phytochemicals such as vit C, carotenoids & antioxidant component. It reduce the risk of infertility in women. Pomegranates contain folic acid, antioxidants and vit C, which help to increase blood flow. A high-calcium diet may reduce osteoporosis in women. Iron rich veggies promotes healthy pregnancy & increased energy. Functional foods are beneficial for women’s health due to their rich content of physiologically active substances derived from both plant and animal sources. The consumption of these foods can collectively alleviate the strain on health care system.

Keywords: functional foods, yogurt, diet, women’s health, phytochemicals.

AN EXCELLENT HEALTH IMPACT OF *Amaranthus viridis*

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Abstract

Amaranthus viridis, commonly known as the spiny amaranth, spiny pigweed, and prickly amaranth is a plant that is native to the tropical Americas but is present on most continents as an introduced species and sometimes a noxious weed. It can be a serious weed of rice cultivation in Asia. *Amaranthus viridis* is used as traditional medicine in the treatment of fever, pain, asthma, diabetes, dysentery, urinary disorders, liver disorders, eye disorders and venereal diseases. The plant also possesses anti-microbial properties. *Amaranthus* is an annual herb with an upright light green stem that grows to about 60-80 cm in height. Numerous branches emerge from the base and the leaves are ovate 3-6 cm long, 2-4 cm wide with long petioles of about 5 cm. In the North-eastern Indian state of Manipur, it is known as cheng-kruk, it is also eaten as a vegetable in South India, it is a common vegetable in Bengali cuisine, where it is called “Note shak”. Green Amaranth can contain up to 38% protein by dry weight. The leaves and seeds contain lysine an essential amino acid. *Amaranthus viridis* is used as a medicinal herb in traditional Ayurvedic medicine under the Sanskrit name Taduliya. *Amaranthus viridis* however has higher medicinal values, a decoction of the entire plant is used to Stop dysentery and inflammation. It is also taken to treat constipation.

Keywords: *Amaranthus viridis*, Antioxident, Beta-Carotene, Vitamin-c, Inflammation.

AN EXCELLENT HEALTH IMPACT OF FENUGREEK SEEDS

(Trigonella foenum graecum)

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Abstract

Fenugreek is an annual herb that belongs to the family Leguminosea. It has a long history as both a culinary and medicinal herb. Scientific name of fenugreek is *Trigonella Foenum-graecum*. Fenugreek seeds contain a substantial amount of fiber, phospholipid, phosphorus, phospho proteins, glycolipids, nucleic acid, oleic acid, vitonetic acid, choline, vitamins A, B1, B2, C, nicotinic acid and many other functional elements. Fenugreek seeds were useful for the Treatment and prevention of various ailments. Fenugreek (*Trigonella foenum-graecum*) are primarily known for its anti-diabetic and hypocholesterolemic activities. Research in the past two decades has shown that Fenugreek seeds help to lower blood glucose in patients with Diabetes. It acts as an antidiabetic by reducing fasting blood glucose levels and improved glucose tolerance in human subject. The germinated Fenugreek seeds were used in the treatment of E. coli infection in Germany and France. The important phyto constituents responsible for such medical applications are saponins, Polyunsaturated fatty acids. Galactomannans, trigonelline, and γ -hydroxyisoleucine. Flavonoids, apigenin 6,8-di-e-glucoside, apigenin - 6-c-glucosyl - 8-c-galactoside, 6-e-galactosyl-8-c - arabinoside are the chief ingredients of fenugreek seeds. The other major bioactive components in fenugreek seeds are polyphenols like rhaponticin and isovitexin. Fenugreek is a rich source of vitamins A, C, and K folic acid, calcium, iron, potassium and protein. Fenugreek is an excellent functional food having disease preventive properties.

Keywords: Fenugreek, anti-Diabetic activity, hyper cholesterolemia, flavonoids choline.

THE CLINICAL EFFICACY AND SAFETY OF TULSI (*Ocimum sanctum*) IN HUMANS

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Abstract

Ocimum sanctum also known as Tulsi or Holy Basil. It is widely used as medicine to cure various ailments. It is an aromatic shrub in the basil family Lamiaceae (tribe Ocimeae) that is thought to have originated in North Central India and now grows native throughout the Eastern world tropics. Within Ayurveda, tulsi is known as 'The Incomparable One Mother Medicine of Nature' and 'The Queen of Herbs' and revered as an 'Elixir of Life' that is without equal for both its medicinal and spiritual properties. From different studies, it was revealed that various secondary metabolites such as carbohydrate, tannin, flavonoids, saponins, glycoside, terpenoid, fatty acid and phenol are present in tulsi leaf. Major constituents are viz., Eugenol, Benzene, 1,2-dimethoxy-4-(2-propenyl), alpha-Farnesene and cyclohexane, 1,2,4-triethenyl. These phytochemicals are known to possess antiseptic, analgesic, anti-inflammatory, antimicrobial, antistress, immunomodulatory, hypoglycemic, hypotensive and antioxidant properties. Hence, it is more beneficial to use Tulsi as an herbal medicine as compared to chemically synthesized drug. Within India, tulsi has been adopted into spiritual rituals. This emerging science on Tulsi, which reinforces ancient Ayurvedic wisdom, suggests that Tulsi is a tonic for the body, mind and spirit that offers solutions to many modern day health problems.

Keywords: *Ocimum sanctum*, phytochemical, medicine, ayurveda, holi basil, stress.

CHIA SEEDS: A RENEWABLE SOURCE OF FUNCTIONAL FOODS

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Abstract

Chia seeds are edible seeds from the flowering plant *Salvia hispanica*, which belongs to the mint family (Lamiaceae). Chia seeds are oval, grey, with black and white dots, and have a diameter of around 2 mm. The seeds are hygroscopic, absorbing up to 12 times their weight in liquid when soaked and forming a mucilaginous coating that gives chia-based meals and beverages their unique gel texture. Dried chia seeds have 6% water, 42% carbohydrates (including a high concentration of dietary fibre), 16% protein, and 31% fat. In a 100-gram (3.5 oz) reference quantity, chia seeds are a rich source (20% or more of the daily value, DV) of the B vitamins thiamine and niacin (54% and 59% DV, respectively), as well as a moderate source of riboflavin (14% DV) and folate (12%). The seeds are high in calcium, iron, magnesium, manganese, phosphorus, and zinc (all more than 20% DV). Chia oil is extremely nutritious and healthful, with a high proportion of essential fatty acids (59.9-63.2%) and a low concentration of saturated fatty acids. Chia seed oil's fat is mostly unsaturated, with the primary fatty acids being linoleic acid (17-26% of total fat) and alpha-linoleic acid (50-57% of total fat).

Keywords: Chia seeds, carbohydrates, vitamins.

AN EXCELLENT HEALTH IMPACT OF TURMERIC (*Curcuma longa*)

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Abstract

Turmeric is a flowering plant in the ginger family zingiberaceae. It is a perennial, rhizomatous, herbaceous plant native to the Indian subcontinent and the Southeast Asia that requires temperatures between 20° and 30°C and high annual rainfall to thrive. Although long used in Ayurvedic medicine, where it is also known as haridra, there is no high quality clinical evidence that consuming turmeric is effective for treating any disease. The greatest diversity of curcuma species by member alone number in India, at around 40 to 45 species. Thailand has a comparable 30 to 40 species. Various species currently utilized and sold as "Turmeric in other parts of Asia have been shown to belong to several physically similar taxa, with overlapping local names. Turmeric is a perennial herbaceous plant that reaches up to 1m tall. It has highly branched, yellow to orange cylindrical, aromatic rhizomes. The petiole is 50 to 115 cm long. The simple leaf blades usually 76 to 115 cm long and rarely up to 230 cm. They have a width of 38 to 45 cm and are oblong to elliptical narrowing at the tip. Turmeric is one of the key ingredients in many Asia dishes, imparting a mustard like, earthy aroma and pungent, slightly bitter flavour to foods. Turmeric is also rich in vitamin-C, Vitamin-B6 and other antioxidants that reduce the risk of serious health conditions like heart disease and diabetes. Turmeric may block blood clotting. However it advises caution when combining turmeric with blood-thinning drugs. Turmeric help brighten skin and the appearance of uneven tone, leaving with clearer skin. It also aids bile production, which support the liver detoxification process and prevents fat build up in the body while restoring liver function. Turmeric is very beneficial for health as it helps to fight inflammation and controls high levels of uric acid. High dose turmeric supplements might reduce some symptoms of non-alcoholic fatty liver disease. Turmeric is one of the spices known to inhibit iron absorption by 20-30% humans.

Keyword: *Curcuma Longa*, Vitamin B6, Vitamin C, Antioxidants.

EFFECTS OF AMLA (*Emblica officinalis*) IN PREVENTING HYPERLIPIDEMIA AND OXIDATIVE STRESS IN AGEING PROCESS

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Abstract

The ayurvedic herb *Emblica officinalis* is a gift to mankind to acquire a healthy lifestyle. It has great therapeutic and nutritional importance. *Emblica officinalis*, also known as Indian gooseberry or Amla, is a member of the Euphorbiaceae family. Amla is widely used in Indian medicine for the treatment of various diseases like as a restorative, diuretic, liver tonic, refrigerant, stomachic, laxative, antipyretic, hair tonic, ulcer preventive, and for the common cold and fever. Hyperlipidemia is also known as high cholesterol or an increase in one or more lipid-containing blood proteins the effects of amla on the lipid metabolism and protein expression involved in oxidative stress during the ageing process. The antioxidant properties of amla extracts and their effects on the oxidative stress aging process. Amla extracts showed strong free radical scavenging activity. Amla also showed strong inhibition of the production of advanced glycosylated end products. The lipid levels, such as cholesterol and TAG, in serum and liver were markedly elevated in aged control while they were significantly decreased by the administration of amla. Amla helps to increase the level of PPAR- alpha (a protein involved in lipid and cholesterol metabolism), thereby reducing the level of total cholesterol and prevention of atherosclerosis. The expressions of hepatic NF-kB, inducible NO synthase (iNOS), and cyclo-oxygenase-2 (COX-2) protein levels were also increased with ageing. However, amla extract reduced the iNOS and COX-2 expression levels by inhibiting NF-kB activation in aged. Amla may prevent age-related hyperlipidaemia through attenuating oxidative stress in the ageing process.

Keyword: *Emblica officinalis*, Hyperlipidemia, oxidative stress, ageing, NF-kB.

HACCP IN SHRIMP PROCESSING INDUSTRY

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Abstract

Shrimp continues to represent one of the safest forms of muscle protein consumed in the world, yet as for all seafoods, they will be subject to additional regulatory scrutiny through increasing use of Hazard Analysis and Critical Control Point (HACCP) programs for ensure the products safety. This example of a HACCP plan for cultured penaeid shrimp is recommended for consideration by producers, processors and importers of raw, fresh and frozen, shell-on or peeled shrimp tails on/off. For this product form the primary critical control point(CCPs) is product receiving with a distinct critical limit for sulfite residuals. This plan is complimented by reference to appropriate Quality Assurance (QA) programs to guide production practices and a sanitation control plan for in plant operations. Completion and implementation of these plans remains a company responsibility with additional and new record keeping requirements. The anticipated benefits are compliance for international commerce, less regulatory scrutiny per firm, consumer/buyer confidence and market access.

Keywords: HACCP, Quality Assurance, Peeled shrimp, Sulfite residue, Critical Control Points (CCPs).

HEALTH BENEFITS AND MEDICINAL USES OF *Hygrophila spinosa*

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Abstract

Hygrophila spinosa T Ander, belonging to the family Acanthaceae, is a promising medicinal plant with great economic potential. The medicinal value of *H. spinosa* has been appreciated in the ancient medical literature. The plant contains various groups of phytoconstituents, namely, phytosterols, fatty acids, minerals, polyphenols, proanthocyanins, mucilage, alkaloids, enzymes, amino acids, carbohydrates, hydrocarbons, flavonoids, terpenoids, vitamins, and glycosides. The parts of this plant are widely used in traditional medicine for the treatment of various disorders, which include anasaraca, diseases of the urinogenital tract, dropsy from chronic Bright's disease, hyperdipsia, vesical calculi, flatulence, diarrhea, dysentery, leukorrhea, gonorrhoea, asthma, blood diseases, gastric diseases, inflammation, cancer, rheumatism, painful micturition, menorrhagea. It is also scientifically proved to have a variety of pharmacologic functions, which indicate its usefulness in the treatment of different types of diseases and disorders.

Keywords: Antioxidant, jaundice, kulekhara, phytochemistry.

HEALTH BENEFITS OF BLUEBERRIES AND THEIR ANTHOCYANINS

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Abstract

Awareness of the human health benefits of blueberries is underpinned by a growing body of positive scientific evidence from human observational and clinical research, plus mechanistic research using animal and in vitro models. Blueberries contain a large number of phytochemicals, including abundant anthocyanin pigments. Of their various phytochemicals, anthocyanins probably make the greatest impact on blueberry health functionality. Epidemiological studies associate regular, moderate intake of blueberries and/or anthocyanins with reduced risk of cardiovascular disease, and type 2 diabetes, and with improved weight maintenance and neuroprotection. These findings are supported by biomarker based evidence from human clinical studies. Among the more important healthful aspects of blueberries are their anti-inflammatory and antioxidant actions and their beneficial effects on vascular and glucoregulatory function. Blueberry phytochemicals may affect gastrointestinal microflora and contribute to host health. These aspects have implications in degenerative diseases and conditions as well as the aging process. More evidence, and particularly human clinical evidence, is needed to better understand the potential for anthocyanin-rich blueberries to benefit public health. However, it is widely agreed that the regular consumption of tasty, ripe blueberries can be unconditionally recommended.

Keywords: anthocyanin, cardiovascular disease, cognition, diabetes, obesity, neuroprotection.

HEALTH BENEFITS OF GARLIC (*Allium sativum*)

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Abstract

Garlic (*Allium sativum*) is a popular spice, a remedy for a variety of ailments and is also known for its medicinal uses as an antibiotic, anti-thrombotic and antineoplastic agent. It has been used for thousands of years for culinary, medicinal and spiritual purposes. Garlic contains at least thirty-three sulfur compounds, several enzymes and seventeen amino acids. Additional constituents of intact garlic include steroidal glycosides and lectins. The sulfur compounds are responsible both for garlic's pungent odour and many of its medicinal effects. Garlic and its secondary metabolites have shown excellent health-promoting and disease-preventing effects on many human common diseases, such as cancer, cardiovascular and metabolic disorders, blood pressure, and diabetes, through its antioxidant, anti-inflammatory, and lipid-lowering properties, as demonstrated in several in vitro, in vivo, and clinical studies. Consumption of garlic, garlic preparation, garlic extract, and garlic extract-derived bioactive constituents are beneficial for preventing oxidative stress, inflammation, cancer, cardiovascular and metabolic disorders, skin, bone, and other common diseases. Garlic has attracted particular attention of modern medicine because of widespread belief about its effects in maintaining good health. In some Western countries, the sale of garlic preparations ranks with those of leading prescription drugs. There is appreciable epidemiologic evidence that demonstrates therapeutic and preventive roles for garlic. Several experimental and clinical investigations suggest many favorable effects of garlic and its preparations.

Keywords: Allium sativum, Allicin, Antineoplastic action, Cancer.

ROLE OF BITTER MELON (*Momordica charantia*) IN DIABETES TREATMENT- USE OF BITTERNESS TO REDUCE SWEETNESS

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Abstract

Globally diabetes mellitus is one of the most common disorders and is the leading cause of death especially in developed and developing countries and the number of cases is rising significantly. It is a metabolic disorder syndrome caused due to a combination of environmental and hereditary factors leading to abnormally high blood sugar levels a condition called hyperglycemia. Bitter melon, *Momordica charantia*, also referred to as bitter gourd or *karela* has received much attention for its anti-diabetic properties and is traditionally used in the management of diabetes in and related disorders in Asia, South America, India and East Africa. Numerous pre-clinical studies on animals have recorded the anti-diabetic and hypoglycemic effect of the vegetable but data with human subjects and the standardized information on the use of this vegetable as an antidiabetic drug is still very limited. Plant based medicines has been used cost effectively worldwide for diabetes treatment. Bitter melon is a nutrient dense plant and the fruit is composed of numerous beneficial components including vitamins C, A, E and B-complex, minerals like potassium, calcium, zinc, magnesium, iron, phosphorus and antioxidants like phenols, flavonoids terpenes etc. Bitter melon can enhance insulin sensitivity, repair damaged pancreas islet β -cells, stimulate insulin secretion, reduce hyperglycaemia by regulating intestinal flora, inhibiting glucosidase and amylase, scavenging free radicals, enhancing the activity of AMP-activated protein kinase (AMPK) and increasing expression of peroxisome proliferator-activated receptors (PPARs). Thus bitter melon can be used as a dietary and medicinal intervention for the prevention of diabetes mellitus and it is a daily life plant product much within the reach of common people.

Keywords: *Momordica charantia*, diabetes mellitus, hyperglycemia, insulin, antioxidants, β -cells.

NUTRITIONAL AND NUTRACEUTICAL PROPERTIES OF MILLETS AND THEIR EFFECTS ON CHRONIC DISEASES

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Abstract

Millets are used as animal and bird feed but have limited consumption by people in rural areas at household level due to lack of knowledge. Millets are one of the underutilized groups of cereal grains. In spite of the presence of high nutritional and nutraceuticals components, these are still considered as food of poor people. Millets are considered as rich source of energy, carbohydrate, and protein and are comparable to other cereals have more fat, calcium, iron, dietary fiber, and Vitamin E (tocopherols and tocotrienols) content. These are found to be rich sources of phytochemicals such as phenolic acids, flavonoids, catechins, phytic acid, and phytosterols. The application of Millets as alternative of cereals potentially healthy to elaborate therapeutic food products such as gluten free diet, protein and energy rich diet, diet for diabetes, CVD, etc. Millet foods are also characterized to be potential Prebiotic and can enhance the viability of probiotics that prevents diabetes mellitus. Millet contains tannins, phytates, polyphenols, trypsin inhibitors and dietary fiber which considered as “anti-nutrients. It’s have some health friendly properties like anti-oestrogenic, anti-mutagenic, anti-carcinogenic, antiviral effects, anti-inflammatory, platelet aggregation Inhibitory activity that might be potential benefit in minimizing and preventing the incidence of diseases. Millet’s food can contribute to anti-oxidant activity, which play important role in health, aging and metabolic diseases. The millets are used as “food medicine”.

Keywords: Nutraceuticals, Anti-nutrient, Diabetes Mellitus, Anti-oxidant, Anti-inflammatory.

MOLLUSCS: AN ALTERNATIVE PROTEIN SOURCE FOR ECONOMICALLY BACKWARD GROUP

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Abstract

Freshwater molluscs are often gathered for food and medicine across the world. In India, tribal and economically poor communities consume freshwater molluscs. These molluscs are in high demand since they are a low-cost protein source that also contributes to food security, livelihood, and medicine. Those are easily available in ponds, other water bodies as well as in agriculture fields. Those play an important role in the ecological food chain. Those are small but have many nutritional values. Those have ethno-medicinal values. Those are protein-rich as well as also have good resources of fat, calcium, phosphorus, copper, etc. It has higher protein values than many fishes. Previous reports suggested that molluscs have anti-microbial, anti-oxidative, anti-hypersensitive, and immuno-booster properties. The edible foot part of the molluscs has many amino acids which are hydrolysed by three proteases namely Papin, pepsin, and alcalase. Factors exerting this activity probably are the oleic acid and cyclopropane fatty acid-rich lipid, isolated after the ethnomedicinal clue from the foot of the molluscs. Mollusc meat has high levels of vitamin A, vitamin B12, vitamin C, and vitamin D. It is a healthy and important food for patients, who are suffering from diarrhoea, night blindness, conjunctivitis, etc. This healthy food is more interesting with the addition of onion, ginger, garlic, vegetables, salt, turmeric, etc.

Keywords: Freshwater molluscs, ethno medicine, nutritional values.

FUNCTIONAL FOODS IN DIABETES MANAGEMENT: SUPERFOODS

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Abstract

The escalating prevalence of diabetes has intensified the quest for effective management strategies, with a burgeoning interest in functional foods as a pivotal aspect. This presentation explores the increasing demand for innovative approaches to diabetes management, emphasizing the role of functional foods in meeting the nutritional requirements and maintaining the stability of the blood sugar level of a diabetic individual. As individuals with diabetes navigate complex dietary considerations, functional foods emerge as a promising avenue due to their inherent health-promoting properties. These foods, enriched with bioactive compounds, have demonstrated potential in modulating blood glucose levels as well as improving insulin sensitivity.

This presentation also lights on understanding the mechanisms by which functional foods operate, revealing their multifaceted impact on metabolic pathways and inflammation- the key components in diabetes progression. Integrating such foods into daily dietary patterns becomes crucial for optimizing their benefits. This presentation also includes practical implementation involves examples of diet plans to include functional foods rich in antioxidants, fiber, and specific nutrients known for their positive effects on blood sugar regulation.

Keywords: Diabetes, Global statistics, Functional foods, Bioactive compounds, Insulin sensitivity, Metabolic pathways.

EFFECTS OF INTERMITTENT FASTING ON WEIGHT LOSS AND HUMAN METABOLIC HEALTH

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Abstract

Obesity remains a major public health concern and intermittent fasting is a popular strategy for weight loss, which may present independent health benefits. However, the number of diet books advising how fasting can be incorporated into our daily lives is several orders of magnitude greater than the number of trials examining whether fasting should be encouraged at all. One approach to improving weight and metabolic outcomes is intermittent fasting, which consists of multiple different timing schedules for temporary food avoidance, including alternate-day fasting, other similar full-day fasting patterns, and time-restricted feeding (where the day’s food is consumed over a 6-h period, allowing for 18 h of fasting). These feeding schedules have favorable metabolic effects by intermittently inducing the metabolism of fatty acids to ketones. The regimens overall lead to a decrease in weight and have been linked to improvements in dyslipidemia and blood pressure. While more research is needed on longer-term outcomes and this approach should be avoided in particular health conditions, intermittent fasting should be considered as an option for individuals who have a pattern of unhealthy weight gain using standard eating patterns.

Keywords: Intermittent fasting; weight loss; eating pattern; time-restricted feeding.

THANKUNI (*Centella asiatica*) ACTION POTENT ANTI-DIABETIC AGENT

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Abstract

Thankuni, scientifically known as *Centella asiatica* (CA) is a ground creeper and whole plant is used for medicinal purpose. *Centella asiatica* is an important medicinal herb that is widely used in the orient and is becoming popular in the west. Thankuni is a nutritionally rich and traditionally revered medicinal herb. It contains many bioactive phytochemicals, namely Asiatic acid Asiaticoside, Madecassic acid, Madecassoside etc. The herb possesses anti-oxidant, anti-inflammatory, antihyperglycemic and anti-ulcer properties. Such effects may be useful for the treatment of diabetes mellitus and its complications. Wound healing may also be promoted by such properties. CA may stimulate insulin secretion, inhibit carbohydrate digestion, absorption and regulate the major metabolic pathways of carbohydrate in the body leading to normoglycemia. Additionally it has the ability to promote wound healing and inhibit scar tissue formation. The study for find out the effect an action of the *Centella asiatica* in different systems of human.

Keywords: *Centella asiatica*, Medicinal herb, Ant-diabetic, Antioxidant, Chemical composition, Anti-inflammatory.

ROLE OF FUNCTIONAL FOOD IN MANAGEMENT OF OBESITY

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Abstract

Obesity is a disorder where excess or abnormal amount of fat accumulates in the body that risks many health problem and diseases for example cardiovascular diseases like high cholesterol level, chronic liver diseases like diabetes, hypertension, arthritis and certain type of cancers especially breast cancers and colorectal cancers. Body mass index (BMI) of 30 and above suggests obesity. Functional foods and food components are super foods that have been formulated to contain substances or live microorganisms that have a possible health enhancing disease preventing value. Functional foods helps in obesity management by the inducing satiety, reducing appetite, modulating lipid metabolism, affecting adipocyte life cycle. Fiber induces satiety by increasing gastric loads and emptying time, which may increase cholecystokinin and reduce ghrelin. Phenols, tannins and anthrocyanins present in teas and berries and peas exhibit in in-vitro lipase inhibition activity. Legumes are rich in proteins also contain phenolic compounds such as flavonoids, isoflavones, phenolic acids and lignans. They play a critical role in metabolism. Peas, lentils, faba beans are in rich in glutamines increased energy expenditure by 49% in humans. Effects of black soy peptides in reducing body weight and fats were tested in 12 weeks, there was a significant reduction in body fats, weights gains. Blueberry powder reduced 2% body fat, liver weight, body weight, triglycerides. Blueberry polyphenols suppressed adipocyte differentiation, adipogenesis and cell proliferations. Black tea is fermented and contains mostly theoflavins and polyphenols. Black tea polyphenols are reported to inhibit pancreatic lipase and thereby effect lipid metabolism. Caffeine present in tea showed thermogenic effects and stimulate fat oxidation.

Keywords: Functional Foods, Obesity, Anthrocyanin, Flavonoids, Isoflavones, Theoflavins.

TURMERIC: THE ANCIENT REMEDY FOR MODERN AILMENTS

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Abstract

Turmeric or *Curcuma longa*, is a flowering plant in the ginger family Zingiberaceae. It is a perennial, rhizomatous, herbaceous plant native to the Indian subcontinent and Southeast Asia. Turmeric has been used for centuries in traditional medicine systems for various health conditions. The use of turmeric as a culinary spice and in religious ceremonies dates back nearly 4000 years to the Vedic culture in India. According to Sanskrit medical treatises and Ayurvedic and Unani systems, turmeric has a long history of medicinal use in South Asia. Sushruta’s Ayurvedic Compendium, dating back to 250 bc. Turmeric contains curcumin, a bioactive compound that exhibits anti-inflammatory, antioxidant, antibacterial and anticancer properties. Curcumin may modulate various molecular pathways that are implicated in chronic diseases such as Heart diseases, Diabetes, Arthritis, Alzheimer's disease, Cancer. Many studies showed that curcumin exhibited antibacterial activities against Gram-negative and Gram-positive bacteria. The antibacterial action of curcumin involves the disruption of the bacterial membrane.

Keywords: Ayurvedic, Herb, Anti-inflammatory, Antioxidant, Antibacterial, Anticancer.

HEALTH BENEFICIAL EFFECT OF GREEN TEA

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Abstract

One of the most popular drinks in the world, green tea comes in a variety of varieties and is higher in antioxidants than other types of tea. It also contains minerals, polyphenols, and caffeine, trace amounts of vitamins, amino acids, and carbs. Green tea's polyphenols are recognized to support human health generally and stimulate the central nervous system. Senescence and extrinsic damage from prolonged exposure to UV light are two of the external factors that contribute to skin aging, also referred to as photo aging. These factors can cause erythema, edema, sunburns, hyperplasia, premature aging, and the development of non-melanoma and melanoma skin cancers. UV radiation can damage skin in two ways: directly, by causing biomolecules to absorb energy, or indirectly, by increasing the creation of reactive oxygen and nitrogen species. Strong exogenous antioxidant candidates, such as green tea polyphenols, have the potential to counteract the body's excess endogenous ROS and RNS, reducing the effects of photo aging. Green tea intake may have an anti-wrinkle impact by increasing the concentration of collagen and elastin fibers and suppressing the synthesis of the collagen-degrading enzyme MMP-3 in the skin, according to a number of *in vivo* and *in vitro* studies. Green tea's ability to prevent photo aging has not yet been thoroughly studied. It is well known that the polyphenols in tea can prevent oxidative damage to DNA by promoting the production of several antioxidant enzymes. Additionally, green tea has the ability to act as a mediator in neurodegenerative illnesses like Alzheimer's disease. The anti-photo aging, stress-resistance, neuroprotective, and autophagy quality of green tea is one of the most well-known properties.

Keywords: Green tea, polyphenols, Alzheimer's disease, antioxidant.

DIFFERENT HEALTH PERSPECTIVE OF SOYABEAN: A LOW-COST NUTRITIOUS FOOD

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Abstract

Soyabean is a basic food ingredient of traditional Asian cuisine used for thousands of years. In Western countries, soybeans have been introduced about a hundred years ago and recently they are mainly used for surrogate foods production. Soy and soy foods are common nutritional solutions for vegetarians, due to their high protein content and versatility in the production of meat analogues and milk substitutes. Soyabean is recognized as an oil seed containing several useful nutrients including protein, carbohydrate, vitamins, and minerals. Dry soybean contain 36% protein, 19% oil, 35% carbohydrate (17% of which dietary fiber), 5% minerals and several other components including vitamins Soybean protein is one of the least expensive sources of dietary protein. Soybean protein is considered to be a good substituent for animal protein, and their nutritional profile except sulfur amino acids (methionine and cysteine) is almost similar to that of animal protein because soybean proteins contain most of the essential amino acids required for animal and human nutrition. Researches on rats indicated that the biological value of soy protein is similar to many animal proteins such as casein if enriched with the sulfur-containing amino acid methionine. Soybean is viewed as equivalent to creature nourishments in protein quality yet it is believed that plant proteins are prepared diversely to creature proteins. Soyabeans and its bioactive compounds are used for various adverse health conditions such as, cardiovascular disease, osteoporosis, cancer, diabetes etc.

Keywords: Soyabean, methionine, biological value, cardiovascular disease.

AVOCADO: AN EXCELLENT SOURCE OF NUTRIENTS

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Abstract

Avocado is considered one of the main tropical fruits, as it contains fat-soluble vitamins which are less common in other fruits, besides high levels of protein, potassium and unsaturated fatty acids. Avocado pulp contains variable oil content, and is widely used in the pharmaceutical and cosmetics industry, and in the production of commercial oils similar to olive oil. This fruit has been recognized for its health benefits, especially due to the compounds present in the lipidic fraction, such as omega fatty acids, phytosterols, tocopherols and squalene. Studies have shown the benefits of avocado associated to a balanced diet, especially in reducing cholesterol and preventing cardiovascular diseases. The fruit contains large quantities of the desirable unsaturated and monounsaturated fatty acids and is rich in fiber, protein, vitamins, antioxidants, and minerals. The processed avocado pulp is an alternative to utilize fruits, which can be used in various value-added food products. Fluid extract of the avocado leaves is widely used in pharmaceutical products, mainly due to the diuretic characteristic of the present compounds in plant leaves. With the increasing research supporting the nutritional characteristics and benefits of avocado, the tendency is to increase the production and exploitation of this raw material in Brazil, as also observed in other countries.

Key words: Avocado, phytosterols, tocopherols, antioxidants.

SHANKHPUSHPI: UNVEILING ITS NOOTROPIC EFFECTS ON THE HUMAN BRAIN AND FUTURE POSSIBILITIES

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Abstract

Shankhpushpi (*Convolvulus pluricaulis*) Chaisy Family Convolvulaceae) is an indigenous and most significant herbal plant in Ayurveda, which is considered as a gift of nature to human. It very commonly found in north temperate regions such as India, Shrilanka, Mayanmar, Nepal, and Malaysia. The most likely appearance of the flower is like a 'shankh (a marine shell). Hence, the name is given to this plant is shankhapuspi. It is a perenneal herb. The *Convolvulus pluricaulis* (CP) is known as a Medhya (brain tonic) Rasayana in the Indian traditional system. The composition of the CP, which includes phytonutrients such as Scopline beta-sitosterol, Convulvidine, Subhirsine, Convulvine, Convuline, and Confoline, makes it one of the most effective and notable natural remedies for enhancing memory. CP is primarily utilized as a cognitive enhancer and brain booster. Recent research has sparked fascination in the extraordinary pharmacological and therapeutic potential of CP. It encompasses cognitive-enhancing effects, mood-boosting properties, stress-relieving abilities, anxiety-reducing qualities, antioxidant properties, blood sugar-regulating effects, heart-healthy attributes, memory-enhancing capabilities, neuroprotective properties, cholesterol-lowering effects, pain-relieving properties, calming effects, antifungal and antibacterial properties, ulcer-preventing effects, catatonia-fighting abilities, and immune system-modulating effects. The present study aims to explore Shankhpushpi as a promising candidate for cognitive development. Additionally, it seeks to assess the underlying mechanism responsible for this cognitive effect.

Key word: Shankhpushpi, natural remedies, cognitive enhancer.

PROXIMATE ANALYSIS OF RICE CULTIVATED IN THE REGION OF PASCHIM MEDINIPUR DISTRICT

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Abstract

Rice (*Oryza sativa*, a member of the Poaceae family) is a staple food in our country as well as whole world. At present, about 40,000 varieties of rice are existing, only a few varieties are cultivated extensively, milled and polished. Many variety of rice like Khanika, Jawahar, Saraswathi, Jalprabha, Neeraja, Bhagirathi, Patnai, IR-36, IR-50, Pankaj, IR-8, Sona, Kunti and others are cultivated in West Bengal in every year. Beside this Nethiya, Khitis, Bumpy gold, Manjeera, Gourav and others are popularly cultivated in our Paschim Medinipur district. We were collected Nethiya, Khitis, Bumpy gold, Manjeera and Gourav for proximate nutritional analysis as well as household measurement to know about the weight of parboiled rice converted to weight of cooked rice. One standard cup contains mean 85 g parboiled rice which amount was converted to average 318 g after boiling with water to prepare cooked rice. These rices contain protein average 6 g % and fat about 0.63 g %. We consume cooked rice but not parboiled rice, so, accurate amount of parboiled rice consumption is important aspect for health promotion and diseases prevention.

Key words: Rice, Nethiya, Khitis, Bumpy gold, Manjeera and Gourav.

LEMONGRASS: AN AROMATIC MEDICINAL HERB

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Abstract

Lemongrass is a native high-flowering aromatic plant of a family: Poaceae, grown in many tropical and subsoil regions of south-eastern Asia and Africa. Lemongrass is the source of lemongrass oil, a good source of natural citral, which is used as a basic raw material for synthesis of β -ionone used for synthesis of a number of useful aromatic compounds and Vitamin- A. The aromatic or essential oils are highly concentrated secondary metabolites of diverse functions in plant system. In addition to essential oils, there are several bioactive compounds in lemongrass, grouped into terpenoids, tannins, saponins, flavonoids, phenols. It's leaves and oil are used for the treatment of bowel spasms, chest pain, higher blood pressure, epilepsy, dysentery, cough, rheumatism), flu, common cold, and tiredness. Lemon grass oil is widely used in perfume industry directly and indirectly. It is used extensively in soaps, detergents, house-hold cleaner, mosquito cream, agarbatti, teablending etc. Oil also serves as starting material for certain important isolates such as Geraniol, Citronellol, these can be converted into some of most widely used aromatics. Oil contains α -ionone, which is precursor of Vitamin B12, it is also anti-biotic, anti-flatulent. Citronella oil is used in cough syrup to remove muscle fatigue, it is also used for wound healing. Lemongrass oil is used in culinary flavouring. It is used in most of the major categories of food including alcoholic and non alcoholic beverages, frozen dairy desserts, candy baked foods, gelatins and puddings, meat and meat products and fat and oils.

Keywords: Lemongrass, essential oils, terpenoids, flavonoids.

MEDICINAL, NUTRITIONAL AND BIOCHEMICAL VALUES OF FISHES

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Abstract

The nutritional value of fish meat is comparable and even higher than that of the other animal meat. Fish is not only the stuff to eat and relish. It has huge medicinal values and they can be used as a medicine for various diseases. The nutritive and medicinal value of fish has been recognized from time immemorial. The principle biochemical contents of fish flesh are: protein, vitamin, fat and water. Fish proteins comprise all the ten essential amino acids in desirable strength for human consumption, namely- lysine (high concentration), arginine, histidine, leucine, isoleucine, valine, theonine, methionine, phenylalamine and tryptophan. The principle minerals present calcium, magnesium, potassium, sodium, phosphorus, iron, chlorine, copper, manganese, iodine, bromine. Besides traces of Sr, Zn, Ba, Al, Pb, Mo, Co, Ni, Hg, Cd. Fish provides vitamins A, B and D all essential vitamins for human diet, particularly rich in vitamin B12 and B complex, vitamins A and D. Vitamin B complex includes thiamine, riboflavin and nicotinic acid. Omega-3 fatty acids are considered a boon to human beings. The fish oil consumption is linked to reduced risk of diabetes in children as well as adults and the autoimmune diseases. Fish, above all, is rich in linoleic acid [w-3 (omega3) polyunsaturated fatty acids] a factor known for its role in prevention of coronary heart diseases, and other cardiovascular diseases.

Keywords: Autoimmune diseases, Omega-3 fatty acids, essential amino acids, cardiovascular diseases.

JACKFRUIT SEED: AN UNDERUTILIZED FUNCTIONAL FOOD

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Abstract

The Jackfruit (*Artocarpus heterophyllus*) is a well-known fruit in many Asian countries. Although people don't use or recognize jackfruit seeds as often, they have significant nutritional value and may be used as a functional food ingredient. Since jackfruit seeds make up 8–15% of the fruit weight and mostly contain 60–80% dry matter, they are thought to be an inexpensive source of carbohydrates. Starch from jackfruit has great potential for various applications due to its unique structure and functional features. The anti-nutrients present in jackfruit seeds, such as trypsin inhibitor, phytate, and tannin, can negatively affect nutrient absorption, but can be reduced through roasting and germination. Jackfruit seeds are also rich in iron, which helps in preventing anemia and ensuring proper blood circulation. The lectins present in the seeds support the immune system, while prebiotic activity can promote probiotic bacterial growth. The seeds have strong antioxidant activity and can be utilized as a source of pectin or in ice cream recipes. Because of their high fiber content, the seeds help reduce the risk of heart disease, avoid constipation, and aid in weight loss. They are also rich in dietary fiber and B-complex vitamins. Additionally, resistant starch found in jackfruit seeds regulates blood sugar and maintains gut health. Jackfruit seeds possess anti-microbial activity, which prevents foodborne diseases. The seeds contain an abundance of magnesium which plays a vital role in lowering the blood pressure and maintaining bone health since it aids in calcium absorption and hence helps to strengthen the bones. Furthermore, the seeds are rich in highly soluble protein resulting in the prevention and treatment of mental stress and anxiety. The seeds have low water and fat-absorption capacities, which helps in prevention of obesity.

Keywords: Jackfruit seeds, functional food, antioxidant, lectins, prebiotic

COMBAT ANAEMIA WITH NUTRITIONAL AWARENESS

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Abstract

Menopause is a natural phase signifying the conclusion of the reproductive span in women. In India, the typical age range for menopause is between 40 and 50 years. However, certain women experience an early onset of menopause, occurring before the age of 40, a condition termed premature menopause. This phenomenon is notably prevalent among female cultivators, particularly those engaged in field labor or moderate physical activity, as opposed to housewives with sedentary work. Through my research, it has become apparent that a higher proportion of female cultivators undergo early menopause compared to their counterparts in sedentary roles.

.Respondents: There were 30 female cultivators (moderate worker) and 31 house wives (sedentary worker) whose age is 52-54. All the respondents' BMI of two groups is in normal range 18.50-24.99 kg/m².

Experimental Diet: We refrained from recommending any specific dietary changes to the participants. They continued to adhere to their regular meals, which offered sufficient energy and carbohydrates but presented an excess of protein. The interviews with the study population took place between February 2023 and August 2023.

Parameters Measured: Age of menopause (Year) and Hemoglobin level (gm/dl).

Result and Discussion: This study indicates significant ($P < 0.001$) age difference of onset of menopause were noticed between mean of age of sedentary working house wives with the field working (moderate work) women. This study also indicates that the age of onset of menopause is significantly ($P < 0.001$) related with the hemoglobin level.

Summary and Conclusion: Incorporating nutritional education into formal educational curricula stands out as a widely employed and advocated strategy. It is essential for nutritional education programs to encompass the entire community to ensure the sustainability of the implemented changes.

Key words: Menopause, Hemoglobin level, Nutrition education

A KAP STUDY OF UNDIAGNOSED DIABETES, UNDIAGNOSED PRE-DIABETES AND NON-DIABETES PATIENTS IN EAST MEDINIPUR, WEST BENGAL, INDIA

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Introduction

India ranks among the top ten nations globally with 77 million reported cases of diabetes, including 43.9 million instances of undiagnosed diabetes and 25.2 million cases of impaired glucose tolerance, as per the 2019 International Diabetes Federation Diabetes Atlas. According to the World Health Organization, India leads in the global count of diabetic patients with 32 million currently, and this number is projected to reach 79.4 million by 2030. The worldwide prevalence of diabetes is estimated at over 382 million (8.35%), with expectations of surpassing 592 million by 2035. The prevalence of pre-diabetes is also on the rise globally, with an estimated 552 million individuals expected to be affected by 2030. While lifestyle modifications are key to preventing diabetes, there is limited information on the challenges associated with managing pre-diabetes and effective strategies to overcome them.

Aim

- i. To focus on the Knowledge, Attitudes and Practice towards an individual’s diet and physical activity.
- ii. To determine the prevalence of Undiagnosed Diabetes, Pre-Diabetes and Non-Diabetes subjects.

Materials and methods:

Participants were randomly selected through door-to-door visits as part of a cross-sectional survey. For this current study conducted in the rural and semi-urban areas of Medinipur, West Bengal, India, a sample of 898 families comprising 1013 participants was taken. The interviews with the study population took place from November 2022 to May 2023.

Data collection was performed through face-to-face interviews using structured interviewer-rated questionnaires. Specifically, structured interviewer-rated questionnaires were employed to gather information from both undiagnosed pre-diabetic individuals and those without diabetes.

Statistical Analysis: The analysis included the creation of qualitative frequency distributions and percentage assessments. Logistic regression analysis was employed to identify potential risks associated with three distinct groups: 432 individuals with undiagnosed diabetes, 242 individuals with undiagnosed pre-diabetes, and 349 individuals without diabetes.

Results: The study reveals that 42% of the population had Undiagnosed Diabetes Mellitus. When examining gender differences, 74% of males exhibited Undiagnosed Pre-Diabetes, while 41% of females had Undiagnosed Diabetes. In the age group of 18 to 40 years, 42% were found to have Undiagnosed Diabetes. However, a concerning finding emerged in the 40-60 years age group, where 74% exhibited Undiagnosed Pre-Diabetes. Although no significant differences were observed among subjects with varying educational backgrounds, it is noteworthy that both rural and semi-urban populations exhibited a significant lack of Knowledge and Attitude. This finding contrasts with previous research, emphasizing the need for heightened awareness and educational interventions across diverse demographics.

Conclusion: Extensive knowledge, proper attitude and good practice could be the means to control and prevent diabetes related consequences. Our study reveals the poor level of overall knowledge, attitude and practice (KAP) among pre-diabetic patients. Public health Programs involving educational interventions and behavioural change is the need of the hour for better control and management of the disease in rural areas. Given the disease is now highly visible across all sections of society within India, there is now the demand for urgent research and intervention - at regional and national levels - to try to mitigate the potentially catastrophic increase in diabetes that is predicted for the upcoming years.

Keywords: Knowledge, Attitude, Practice, Pre-diabetes, Diabetes, Undiagnosed Diabetes.

UNLOCKING NATURE’S GOLDEN SECRET: TURMERIC & CURCUMIN FOR PAIN RELIEF & ARTHRITIS COMFORT

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Turmeric is a plant in ginger family that used in Ayurveda, main active component **curcumin** which gives yellow colour in turmeric. Curcumin has anti-inflammatory properties, making it a potential treatment for a number of health conditions, including reduce pain & increased assay of movement in people with arthritis. Research suggests that, curcumin can help in the management of oxidative & inflammatory conditions, metabolic syndrome, anxiety. The aim of the study is to evaluate the effectiveness & safety of curcumin in arthritic patients. In 2016 meta-analysis, studies have shown that, curcumin treated 1600 arthritis patients supplemented with 1500-2000 mg/day over 8-12 weeks. Demographic information & blood samples were taken at the start & the end of the study to determine serum malondialdehyde (MDA) concentration, high sensitivity C-reactive protein. In vitro studies, demonstrated that curcumin prevent apoptosis of chondrocytes, suppress the release of proteoglycans, cyclooxygenase & inflammatory cytokines. It down-regulated downstream pathways by down regulating TNF- α through the suppression of NF- $\kappa\beta$, reduce of inflammation. It also inhibits expression of pro-inflammatory cytokines CXCL1 via the NF- $\kappa\beta$ signalling pathway & reduce tumour metastasis. Curcumin vs NSAIDs similar effect on joint pain, stiffens but less side effect. Curcumin extract may improve symptoms & inflammation levels in people with arthritis.

Keywords: Curcumin, Arthritis, Anti-inflammatory, Immunomodulatory effect, Therapeutic outcome.



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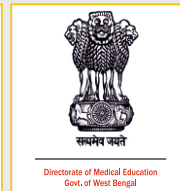
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