

AASSA-PAS Regional Workshop on

**“Complementary Medicine as an Answer to Challenges
Faced in Achieving Sustainable Goals in Health”**

Islamabad, Pakistan

August 19-21, 2019
(Monday – Wednesday)

ABSTRACT BOOK

Organized Jointly by:

Association of Academies & Societies of Sciences in Asia (AASSA)
Pakistan Academy of Sciences (PAS)
&
The InterAcademy Partnership (IAP)

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Pakistan Academy of Sciences (PAS)

It is generally recognized that any progressive country, which aspires to occupy a befitting Place in the comity of nations, encourages the establishment of a supreme scientific organization, usually designated as the “Academy of Sciences” devoted to the promotion of science and its applications for the general welfare of humanity. While these organizations may not carry out actual researches, they do provide a forum for the advancement of scientific research, popularization of science, motivation of scientists and technologists, and encouraging and promoting studies in new areas of S&T.

As utmost importance is attached to the membership of such an academy, only scientists of the highest merit, who have made outstanding contributions to the advancement of scientific knowledge, are elected its Fellows. The Academy is regarded, by the public and the government, as a repository of the highest scientific talent available in the country, and is generally supported and consulted in all matters relating to scientific education, research and development.

The idea of establishing Pakistan Academy of Sciences was mooted in November 1947 at the 1st National Educational Conference held in Karachi. Subsequently, nine eminent scientists were elected as Founding Fellows of the proposed Academy. One of the Founding Fellows, Dr. M. Raziuddin Siddiqi, has drafted Charter of the Academy which was approved. The Pakistan Academy of Sciences was inaugurated by the then Prime Minister of Pakistan, Khwaja Nazimuddin, on 16th February 1953 during 5th Pakistan Science Conference in Lahore. On 19th February 1953, the Founding Fellows elected Prof. M. Afzal Hussain as President and Dr. M. Raziuddin Siddiqi as Secretary of the Academy.

The Academy is a non-governmental and non-political supreme scientific body of distinguished scientists in the country. The Government of Pakistan has given the consultative and advisory status to the Academy “on all problems relating to the development of scientific efforts in the country”, and “generally on such matters of national and international importance in the field of science as may be referred to the Academy”. The affairs of the Academy are regulated by its Charter and Bye-Laws approved by the Fellows.

The Academy is governed by a Council that includes its President, two Vice Presidents, Secretary General, Associate Secretary General and Treasurer. At present, there are 81 Fellows, 29 Foreign Fellows, and 19 Members, who have been elected by the General Body. The President of the Academy for the term 2018-2020 is Prof. Dr. M. Qasim Jan, ^{HI,SI,TI*}

Council of the Pakistan Academy of Sciences (2018-2020)

Prof. Dr. M. Qasim Jan	President
Prof. Dr. Kausar A. Malik	Vice President
Dr. Anwar Nasim	Former President (ex-officio)
Prof. Dr. M. Aslam Baig	Secretary General
Prof. Dr. G.A. Miana	Treasurer
Prof. Dr. A. R. Shakoori	Associate Secretary General
Prof. Dr. Khalid M. Khan	Secretary for Karachi Chapter
Prof. Dr. Iqrar A. Khan	Secretary for Lahore Chapter
Prof. Dr. Muhammad Asif Khan	Secretary for Peshawar Chapter
Prof. Dr. Masoom Yasinzai	Secretary for Quetta Chapter
Prof. Dr. Asghari Maqsood	Member
Prof. Dr. M. Waheed Akhtar	Member
Prof. Dr. Saqib Ali	Member
Dr. Muhammad Iqbal	Member (Nominee of MoST)
Prof. Dr. Zabta Khan Shinwari	Member (Nominee of MoE)
Prof. Dr. M. D. Shami	Member (Nominee of HEC)

Association of Academies and Societies of Sciences in Asia (AASSA)

The Association of Academies and Societies of Sciences in Asia (AASSA) launched on January 1, 2012, as a consequence of the merger of AASA (The Associations of Academies of Sciences in Asia) and FASAS (The Federation of Asian Scientific Academies and Societies) is a non-profit international organization with science and technology interests. It is made up of 34 scientific and technological academies and science societies in Asia and Australasia.

Through the merger, AASSA is expected to increase the visibility for science and increase efficiency, particularly in relation to resources (human and financial) with reduced overlap of activities and meetings, and provide a better platform for fundraising and interaction with other science organizations.

The inaugural general assembly of AASSA took place in Sri Lanka in October 2012. A new constitution for AASSA was formally sanctioned and election of new officers also took place.

The IAP announced that The Association of Academies and Societies of Sciences in Asia (AASSA), The European Academies Science Advisory Council (EASAC), Network of African Science Academies (NASAC), and InterAmerican Network of Academies of Sciences (IANAS) as the four regional affiliated networks of IAP. IAP Affiliated Network status will help AASSA for steady and long-term project development.

The principal objective of AASSA is to achieve a society in Asia and Australasia in which science and technology play a major role in the development of the region. AASSA is a forum for scientists and technologists to discuss and provide advice on issues related to science and technology, research and development, and the application of technology for socio-economic development.

Executive Board Members of AASSA

Yoo Hang Kim	President
Khairul Anuar Abdullah	President-Elect
Satryo Brodjonegoro	Vice President
Zabta Khan Shinwari	Treasurer
Cheryl E. Praeger	Member-at-Large
Quazi Abdul Fattah	Member-at-Large
Hiroshi Yoshino	Member-at-Large
Viktor Bogatov	Member-at-Large
Ahmet Nuri Yurdusev	Member-at-Large
Mooha Lee	Executive Director

The InterAcademy Partnership (IAP)

The InterAcademy Partnership (IAP) was formally launched in South Africa in March 2016, bringing together three established networks of academies of science, medicine and engineering, namely IAP, the global network of science academies, the InterAcademy Medical Panel (IAMP) and the InterAcademy Council (IAC). Under the new InterAcademy Partnership, more than 130 national and regional member academies work together to support the special role of science and its efforts to seek solutions to address the world's most challenging problems. In particular, IAP harnesses the expertise of the world's scientific, medical and engineering leaders to advance sound policies, improve public health, promote excellence in science education, and achieve other critical development goals.

The work of the world's academies of science, medicine and engineering has resulted in lives saved, better education, and more effective policy approaches to a range of issues. Academies are typically independent and highly committed institutions that recognize and promote excellence and achievement. By definition, they are merit-based, with members selected from among the leading scientific minds within a country or region. In addition to their honorific roles, academies are vital civil society institutions that have the credibility to inform the public and policy-makers about problems and potential solutions. Their credibility comes not only from the scientific excellence of their members, but also from the fact that they are free of vested political and commercial interests. Indeed, although many academies were established by national governments and tasked with serving their countries by, among other things, bringing scientific perspectives to bear on national and international issues, they were also constituted as independent bodies.

Just as each IAP member academy represents an authoritative voice nationally, this unified voice of academies under IAP aims to have great impact at the international level. Now, as international attention has turned to the 2015 Sustainable Development Goals, IAP provides a collective mechanism and voice for science academies to further strengthen their crucial roles as providers of evidence-based policy and advice. IAP will also continue to produce evidence-based statements and reports examining major priorities for sustainable development, and provide independent and authoritative advice to national governments and inter-governmental organizations, including the UN, on critical science-based issues.

FOREWORD

The concept of Science Academies is centuries old, starting with the Platonic Academy founded by Plato. Aristotle studied there for 20 years before founding his own school, the Lyceum. The Academy persisted throughout the Hellenistic period as a skeptical school, until coming to an end after the death of Philo of Larissa in 83 BC. Most countries of the world now have their own science academies, and some have played a highly significant role in the promotion of science and technology. InterAcademy Partnership (IAP), the Global Network of Science Academies, currently has a membership of 107 scientific academies from around the world; these include both national academies/institutions as well as regional/global groupings of scientists. The Association of Academies and Societies of Sciences in Asia (AASSA) is one of the four Regional Networks of IAP. As a national science academy, The Pakistan Academy of Sciences (PAS) has been serving as the most prestigious scientific body of the country, and has been offering science-based advice to Government on various matters in addition to popularization of science, and promotion of S&T and Human Resource Development. One of the objectives of the PAS has been to produce policy documents which address serious national issues. In recent years, the Academy has prepared documents on Energy and Biotechnology. These reports have been widely distributed among government officials. Another report, on Water Security, is in final stages.

PAS is grateful to IAP and AASSA for providing generous financial support for this Workshop, *Complementary Medicine as an Answer to Challenges Faced in Achieving Sustainable Goals in Health*. Recently, traditional medicine got global recognition when a Nobel Prize was awarded for the first time for work in Traditional Chinese Medicine for treatment of Malaria. Medicinal plants are a huge reservoir of therapeutic chemical entities, which can yield massive health care benefits. Plants are rich in such components that can be exploited for beneficial use.

I expect that interactions in the meetings would be productive and lead to tangible and concrete recommendations to be shared with national leaders and policy makers. Recommendations of conferences often end up in different offices or are not effectively implemented. I hope that this workshop will provide opportunity to develop futuristic plans for nurturing the herbal industries and their R & D towards achievement of the sustainable development goals (SDGs), and also increase awareness about the interface of herbal medicine and SDGs.

Prof. Dr. M. Qasim Jan,^{H.I., S.I., T.I.}
President, PAS

PROGRAM

AASSA-PAS Regional Workshop on

“Complementary Medicine as an Answer to Challenges Faced in Achieving Sustainable Goals in Health”

Islamabad, Pakistan

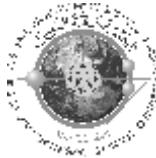
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NATIONAL COUNCIL
FOR TIBB



HIGHER EDUCATION
COMMISSION (HEC)

Venue: Pakistan Academy of Sciences,
3-Constitution Avenue, G-5/2, Islamabad

AUGUST 19, 2019 (MONDAY)

INAUGURAL SESSION

09:30	Guests to be seated
09:40	Arrival of the Chief Guest
09:45	Recitation from the Holy Qur'an
09:50	Welcome Address Prof. Dr. M. Aslam Baig Secretary General, Pakistan Academy of Sciences
10:00	Keynote Address Prof. Dr. Zabta Khan Shinwari Chief Organizer, AASSA-PAS Regional Workshop
10:25	Address by President AASSA Prof. Dr. Yoo Hang Kim
10:35	Address by President Elect AASSA Dato Dr. Khairul Anuar Bin Abdullah
10:40	Inaugural Address Prof. Dr. M. Qasim Jan President, Pakistan Academy of Sciences
10:50	Address by Chief Guest H.E. Zartaj Gul Minister of State The Ministry of Climate Change
11:00	Vote of Thanks Dr. Riffat Mahmood Qureshi
11:05-11:30	Tea & Coffee Break/Networking

COMPLEMENTARY MEDICINE AND SDGS

SESSION I

	Chair: Prof. Dr. Yoo Hang Kim Co-Chair: Prof. Dr. Mohammad Ali (VC-QAU)
(11:30 – 12:55)	
11:30 – 11:55	Title: Effective Pain Management Strategies by Integrating Traditional & Complementary Medicine (T & CM) with Allopathic Medicine: The Malaysian Strategy Speaker Name: Academician Prof. Dato' Dr. Khairul Anuar Bin Abdullah; <i>Malaysia</i>
11:55 – 12:10	Title: Extraction, Phytochemical Screening and Wound Healing Activity of Herbal Formulation of <i>Saussurea lappa</i> Speaker Name: Prof. Dr. Ghulam Abbass Miana; <i>Pakistan</i>
12:10 – 12:25	Title: Analgesics: Pain management through medicinal plants containing antioxidants Speaker Name: Prof. Dr. Huma Shareef; <i>Pakistan</i>
12:25 – 12:40	Title: Promoting Safe and Secure use of Herbal therapies for Primary health care in Pak-China Himalayas Speaker Name: Dr. Mushtaq Ahmad; <i>Pakistan</i>

- 12:40 – 12:55 | **Title:** Prenyl: an interesting functional group in aromatic compounds
Speaker Name: Prof. Zuopeng Li; *China*
- 12:55 – 14:00 | **Lunch & Prayer Break**

MODERN TECHNIQUES AND COMPLEMENTARY MEDICINE

- (14:00 – 15:50) | **Chair:** Dato Dr Khairul Anuar Bin Abdullah
Co-Chair: Maj. Gen. Aamer Ikram (ED-NIH)
- 14:00 – 14:20 | **Title:** Antidiabetic, antimicrobial and antioxidant properties of some high altitude medicinal plants found in Nepal
Speaker Name: Dr. Deegendra Khadka, *Nepal*
- 14:20 - 14:35 | **Title:** Therapeutic and adverse effects of commonly used medicinal plants: Standardization and quality assurance
Speaker Name: Dr. Rizwan Faisal; *Pakistan*
- 14:35 – 14:50 | **Title:** Bioinspired Synthesis of Nanoparticles and their Biomedical Potential: The Pakistan Experience
Speaker Name: Dr. Muhammad Ali; *Pakistan*
- 14:50 – 15:05 | **Title:** Antimicrobial Effect of Guava Leaf Extract in Correlation with Biofilm Formation and Metallo- β -Lactamase Production in Multidrug Resistant *Pseudomonas aeruginosa*
Speaker Name: Dr. Anjana Singh; *Nepal*
- 15:05 – 15:20 | **Title:** Floristic Diversity, Ethnobotany and Traditional Recipes' in Maruk Nallah, Haramosh Valley, and District Gilgit
Speaker Name: Dr. Qamar Abbas; *Pakistan*
- 15:20 – 15:35 | **Title:** DNA Barcoding of Herbal Medicinal Products: A Challenging Task
Speaker Name: Dr. Nadia Zahra; *Pakistan*
- 15:35 – 15:50 | **Title:** Hepatic Alterations in Albino Rats Induced by Ajinomoto (MSG) and Hepatoprotective Role of *Ginkgo biloba*
Speaker Name: Dr. Muhammad Ishaque, *Pakistan*
- 15:50 – 16:05 | **Title:** Honey is the Best Medicine in Ancient and Modern Era
Speaker Name: Dr. Samiyah Tasleem, *Pakistan*
- 16:05 – 16:30 | **Tea Break**
- 19:00 | **Dinner**

AUGUST 20, 2019 (TUESDAY)

ROLE OF PRACTITIONERS IN MAXIMIZING BENEFITS OF HERBAL MEDICINE

Chair: Prof. Dr. Masoom Yasinzai (Rector, IIUI)/Dr. S. M Junaid Zaidi (Founder Rector, CIIT)
(09:30 – 11:05) **Co-Chair:** Dr. Deegendra Khadka

- 09:30 – 09:50 | **Title:** Current Trends in Traditional Medicine in Sri Lanka
Speaker Name: Dr. Rathnayake M. Abeyrathne; *Sri Lanka*
- 09:50 – 10:05 | **Title:** Anticancer activity of *Ficus lyrata* L. Fruit against induced
Hepatic Carcinoma
Speaker Name: Dr. Farah Khan, *Pakistan*
- 10:05 – 10:20 | **Title:** Elicitation strategies of *in vitro* cultures for the sustainable
use of medicinal plants
Speaker Name: Dr. Tariq Khan, *Pakistan*
- 10:20 – 10:35 | **Title:** Aldose reductase inhibitory activity and free radical
scavenging of *Piper betle* extracts
Speaker Name: Dr. Sri Fatmawati, *Indonesia*
- 10:35 – 10:50 | **Title:** Unani Medicine for a Paradigm Change to Global Health
Speaker Name: Hakeem Irfan Shahid, *Pakistan*
- 10:50 – 11:05 | **Title:** Taxonomical and phytochemical characterization of two
highly traded medicinal species of genus *Berberis*
Speaker Name: Dr. Sidra Nisar Ahmed; *Pakistan*
- 11:05 – 11:30 | **Tea Break/Networking**

POSTER COMPETITION

- 11:30 – 13:00 | **PANEL OF REFEREES**
Prof. Dr. Yoo Hang Kim
Dato Dr Khairul Anuar Bin Abdullah
Prof. Dr. Masoom Yasinzai
- 13:00 – 14:00 | **Lunch & Prayer Break**

GROUP DISCUSSIONS

14:00 – 15:30

Topic
i) Complementary Medicine and SDGS
ii) Modern Techniques & Complementary Medicine
iii) Role of Practitioners in Maximizing Benefits of Herbal Medicine

15:30-16:00 | **Recommendations by each group (10 mints each), and finalizing
recommendations**

SESSION III

SESSION IV

SESSION V

- 16:00 – 17:00 | **Session Chair**
Chief Guest
H.E. Chaudhry Fawad Hussain
Federal Minister for Science and Technology
- i. Recitation from the Holy Qur'an
 - ii. Address by President, PAS
 - iii. Draft Recommendations by Prof. Dr. Tasleem Akhtar and Prof. Dr. Zabta Khan Shinwari "Strengthening the Role of Complementary Medicine to address Health Workforce Shortages in Primary Health Care in Asia"
 - iv. Address by the Chief Guest
 - v. Address by President AASSA, his future vision
 - vi. Vote of Thanks by Secretary General, PAS
 - vii. Distribution of Shields
- 17:00 – 17:30 | **Tea Break**
19:00 | **Dinner**

AUGUST 21, 2019 (WEDNESDAY)

POST WORKSHOP SPECIAL LECTURE

- 10:30 | Maj. Gen. Aamer Ikram (ED-NIH), Welcome address
Prof. Dr. Zabta Khan Shinwari (Coordinator)
Prof. Dr. Atta-ur-Rahman¹, *FRS, N.I., H.I., S.I., T.I., UNESCO Science Laureate*
Academician Prof. Dato' Dr. Khairul Anuar Bin Abdullah
(*President Elect AASSA*)

**Venue: National Institute of Health (NIH),
Islamabad, Pakistan**



Abstracts and Citations

Effective Pain Management Strategies by Integrating Traditional & Complementary Medicine (T&CM) with Allopathic Medicine: The Malaysian Strategy

Khairul Anuar Bin Abdullah
Vice-Chancellor, MAHSA University, Malaysia
President Elect, AASSA
Chairman Medical Sector and Member of the Council
Academy Sciences Malaysia
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Abstract

As per WHO documents, Traditional medicine has a long global history. It is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. Thus “complementary medicine” refer to a broad set of health care practices that are not part of that country's own tradition or conventional medicine and are not fully integrated into the dominant health-care system. They are used interchangeably with traditional medicine in some countries. Currently WHO encourages member states to develop national policies and implementing action plans in the WHO TM strategy 2014-2023 that will strengthen the role of traditional medicine to play broader role in promoting and providing better health for the population. Addressing the challenges of management of chronic pain, sophisticated instruments and new generation medicine are continuously introduced. It is undeniable that advances have been made in treatments for chronic pain, however, it remains inadequate. Furthermore adverse effects and complications due to extensive use of analgesic drugs, such as addiction, kidney failure, and gastrointestinal bleeding, also limit their use. Chronic pain is the leading indication for use of T&CM, and about 33% of adults and 12% of children worldwide have used it in this context. Integrating with Traditional & Complementary Medicine (T & CM) in addition to Modern Medicine approach encompasses both Western-style medicine and traditional & complementary health approaches as a new combined approach to treat a variety of clinical conditions. In Malaysia, T&CM division, Ministry of Health, have developed T &CM Practice Guidelines for treating chronic pain by integrating T & CM modalities such as Varmam Therapy from Siddha system of Medicine, Acupuncture from Tradional Chinese Medicine , Traditional Malay massage and external basti therapies from Ayurveda. All the above T&CM treatment modalities are currently practiced in 15 Public Hospitals in different states in Malaysia and progressing successfully giving the population an alternative health care. Therefore, it lends evidence that both Allopathic and T & CM will play an important role in the management of Chronic Pain.

Academician Prof. Dato' Dr. Khairul Anuar b. Abdullah

Vice Chancellor

MAHSA University & Academy of Sciences Malaysia

Jalan SP2. Bandar Saujana Putra. 42610 Jenjarom. Kuala Langat, Selangor

He obtained a Degree of Drs from the Faculty of Medicine, in the year 1974. In 1982 he graduated from the Tulane School of Medicine, USA with *PhD in Immunology*. To date he has published more than 200 publications in learned Medical Journals. In recognition of his research output he was awarded the *MSPTM Silver medal* in the year 1988. In the year 1998 he was awarded the Toray Science Award for distinguished researcher of the year 2001. Again in the year 2002 the *Sandosam Gold Medal* was conferred on him for achievements and contribution in Tropical disease research. He has outstanding contribution to Science and Technology, Malaysian Scientific Association (MSA) 2011 and Academician, Academy of Sciences Malaysia (ASM) in 2013. In 2007 he was appointed as the Foundation Dean of the Faculty of Medicine. In 2012 he was appointed as the Vice Chancellor & CEO of MAHSA University. Other positions held currently are: Chairman of The *Brain Gain Malaysia* for MOSTI, Vice President of The *Malaysian Science Association*, Board Member of TORAY Science Foundation, and Member of the *Medical Advisory Panel* (FOMEMA). He is a Member of the Awards committee Academy Science Malaysia and member of the Science, Technology and Innovation Policy Advisory Committee (STIPAC). He is Chairman of Medical and Health Sector, and council member Academy Science Malaysia. Recently Elected as President elect of The Association of Academies and Societies of Sciences in Asia (AASSA). He has now been elected as Chairman, Vice Chancellors' Council for Private Universities in Malaysia. Effective in 1st January 2019, he was appointed as the Pro Chancellor, MAHSA University.

Extraction, Phytochemical Screening and Wound Healing Activity of Herbal Formulation of *Saussurea lappa*

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Abstract

The aim of present research work was to develop emulgel and in-situ gels of methanolic extract of *Saussurea lappa* with the purpose to determine their wound healing and anti-bacterial properties. Phyto-chemical analysis of extract was also performed. Emulgel was prepared by using carbopol 940, Span 80, tween 80, polyethylene glycol (PEG 4000) and methyl paraben while in-situ gel was prepared by using polaxomer (P407) as thermo sensitive and carbopol (934P) as pH sensitive polymers. All formulations were maintained at pH 6-7 and stored at 4 °C. Lyophilized extract was added in solution form to enhanced the solubility as well as the stability. In-vitro release profile was done by using Franz diffusion method and data was plotted in different pharmacokinetic models like first order, Higuchi and Hixon Crowell models. All formulations followed first order release mechanism. *In vitro* anti-inflammatory activity of extract was performed at concentration of 100µg/ml through heat induced hemolysis of erythrocyte membrane model system while anti-bacterial activity was determined by using agar well diffusion method. Acute toxicity assay of crude extract showed that 1000mg/kg was safe dose with no toxic symptoms. Excision wounds were induced and wound healing potential of all formulations was determined. Results were compared and expressed as mean ± SEM, and data was analyzed by one way analysis of variance (ANOVA) with $p < 0.05$.

Ghulam Abbas Miana

Professor

Faculty of Pharmaceutical Sciences

Riphah International University, Islamabad

Presently Prof. Dr. Ghulam Abbas Miana is working as Rector, Advisor to Vice-Chancellor, as well as Director Research of Riphah Institute of Pharmaceutical Sciences at Riphah International University, Islamabad. Prof. Dr. G.A. Miana has served Gomal University as Chairman, Department of Pharmacy (1975-1980), Chairman, Department of Chemistry (1980-81, 1990, 1994) and twice as Vice-Chancellor from November 1986 - September 1989 and October 1990 – February 1993. Prof. Dr. G.A. Miana has served as Ex-Executive Director / Member (whole-Time), erstwhile University Grants Commissions (1996-99), which was apex body of Higher Education in Pakistan. Prof. Dr. Ghulam Abbas Miana, has exceptionally bright academic career securing throughout first class from Matriculation to Master's Degree. He was awarded Merit scholarship for highest marks in B.Sc examination of the University of Peshawar in 1959 and a Gold Medal in 1961 from the said University on account of obtaining first class first position in M.Sc Chemistry. He did his Doctorate from University of Calgary, Alberta, Canada and was awarded Research Studentship in 1965-67 by National Research Council of Canada. Dr. Miana has published 56 Foreign, Local: 55, and his Citation Index is : 600 Prof. Dr. Ghulam Abbas Miana's Research Work has been fully recognized both at National and International level. In this respect he availed many times "Post Doctorate" Fellowships in Canada, Great Britain, United State of America and Germany. He is member of various National and International Organization such as council of Association of Common Wealth Universities, American Society of Pharmacognosy, Technical Committee Pakistan Science Foundation, Syllabi Revision Committee (Chemistry and Pharmacy), HEC, Phytochemical Society of Europe, Pharmaceutical Society of Japan and American Chemical Society. He is also a Fellow of Chemical Society London and Alexander Von Humboldt Foundation Germany. He was General Secretary and fellow of the Pakistan Academy of Sciences, Fellow Institute of Chemistry and Chemical Engineers. Professor Miana's work on medicinal plants of Pakistan is of great national interest. During his work on the plants of family Rhamnaceae, Buxusaceae, Ranunculaceae, Berberdiaceae, Fumariaceae, commonly available in different parts of Pakistan, he has been able to isolate and establish the structure of a large number of interesting and new compounds especially the alkaloids namely Pakistannine, Pakistanmine Baluchistanamine, Baluchistanine, Quettamines, Numularine A,B,C,D,E, & F, Srilankine, Sapinine, Tescheschamine and caparinine. These compounds discovered by Professor Miana, are a valuable addition to both the literature and the knowledge of Natural Product Chemistry. Professor Miana has, to his credit, more than 100 research papers of International repute. His research publication impact factor is 110. He is author of a number of books, one of which has already been published. The National Book Council of Pakistan has awarded a prize of Rupees 25,000/- for his book on Organic Chemistry. He has been awarded research grant of more than Rs. 10.0 Million from National and International / Organization. In recognition of his academic and research achievements Professors Miana has been awarded Presidential award "Sitara-e-Imtiaz" in 1987.



Analgesics: Pain management through medicinal plants containing antioxidants

Huma Shareef^{1*}, Sadaf Naeem² and Erum Zaheer³

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Abstract

Pain is a natural self-protective system which is always unpleasant both mentally and physically with probable tissue harm. Analgesics are the medicinal agents which relieve the pain without losing consciousness. Medicinal plants are being widely used all over the world for human healthy life form. Plant's constituents are and play an important role in the prevention and management of acute and chronic diseases including pain. These compounds are comprised of large number of chemical groups like phenolic and polyphenolic, terpenoids, flavanoids, nitrogen-containing alkaloids, sulphur containing compounds, acetylenes and psoralens etc. Since these compounds have been used from long time as food and nutrients, but during the last three decades, medicinal plants have been studied for their key role as an analgesics. The intake of these phytochemicals are considered to be responsible for pain management because they may possess strong antioxidant and free radical scavenging abilities which are also the basis of other bioactivities such as anti-inflammatory action, anticancer, anti-aging, and protective action for cardiovascular diseases, diabetes mellitus, obesity and neurodegenerative diseases. In our research, medicinal plants containing antioxidants are summarized as a health benefit in view of their potential resources in the prevention and management of pain.

Huma Shareef

Professor

Chairperson, Department of Pharmacognosy
Institute of Pharmaceutical Sciences
Jinnah Sindh Medical University
Karachi, Pakistan

Prof. Dr. Huma Shareef has been working as an H.O.D at Department of Pharmacognosy, Institute of Pharmaceutical Sciences, Jinnah Sind Medical University. She is a member of the various committees including IRB, Academic Council and Board of faculty and Studies of various Universities. She is an editorial board member of the Journal of ANNALS and advisory board member of HJPS. She is also reviewer of international and national impact factor Journals. She completed her Post Doc. and Ph.D. in Pharmacognosy from the Department of Pharmacognosy, Faculty of Pharmacy and Pharmaceutical Sciences, University of Karachi, Pakistan and her M.Phil. was completed in the same discipline. She had done her Pharm- D (condensed course) and B. Pharm respectively. Additionally she has completed her post graduate diploma in Statistics. She has been supervised 2 Ph. D and 7 M. Phil students in collaboration with different Universities. More than 60 International and National research publications have on her account in impact factor Journals. She had communicated her research work in several National and International conferences by oral and poster appearance. The Pakistan society of Pharmacognosy and natural therapy has awarded her Gold medal twice in year 2010 and 2014 respectively on her research achievements. She has almost 17 years professional, teaching and research experiences including under graduates and post graduates students.

Promoting Safe and Secure Use of Herbal Therapies for Primary Health Care in Pak-China Himalayas

Mushtaq Ahmad^{1*}, Zabta Khan Shinwari², Shazia Sultana¹, Muhammad Zafar¹
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Abstract

Ethnopharmacology leads to new drugs discovery development using the phytochemical and nutra-pharmaceutical techniques for safe and secure health needs. The present study aimed to screen the Himalyan medicinal plants wealth by applying classical to advance techniques of ethnopharmacological (Quantitative) phytochemical (Extraction, GC-MS, NMR, FT-IR etc.), biological activities (*In vitro* and *In vivo*) and pharmacological assays. In total of 350 medicinal plant species have been recorded with ethno-pharmacological information Based on their detailed reviewed about 25 plants species were selected for detailed phytochemical and pharmacological screening. The prominent species includes *Paeonia emodii*, *Berginia ciliata*, *Rubus idaeus*, *Capparis spinosa*, *Zizyphus mauritima*, *Myrsine africana*, *Dodoneae viscosa*, *Rumex hastatus* *Debregeasia salicifolia*. Based on our results, future studies on such assertions will offer scientific base for the use of medicinal plants for which in turn will be valuable to improve the well-being of people and also help in new drug discovery. The study recommend the development of national parks, wild life sanctuaries, botanical gardens and herbaria based on in-situ and ex-situ conservation strategies in Northern areas of Pakistan to protect regional biodiversity for global acceptance. Indeed, conservation of biodiversity is fundamental to achieving sustainable development in this area particularly and world generally. Maintaining biodiversity is not only crucial for the sustainability in agriculture, forestry, fisheries, wildlife, tourism, health, irrigation and power sectors but is also life line for the downstream people in other parts of the Himalayas.

Mushtaq Ahmed

Director QAU Botanic Garden & Herbarium
Associate Professor
Department of Plant Sciences
Quaid-i-Azam University, Islamabad

Dr. Mushtaq Ahmad is young scientist in the field of Plant Biodiversity & conservation. 463 research publications (to date) in top international journals, more than 5500 citations, with high Impact factor (650), H & I indices. 21 international books published and circulated internationally. He is selected as young associate of botany by Pakistan Academy of Sciences (2016). He has selected for top 10 PCST Award (2017-18) and won GBIF-USA Project (2017). He is awarded Gold Medal by PAS in 2015. He has awarded with PIFI Fellowship in 2017. He has received Excellent Reviewer Recognition Award by Elsevier (2018). Awarded TTS Performance based award by QAU in 2018. Best Presentation award by Chenshan botanical garden Shinghai China in 2017. He got Travel grant award by UTP Malaysia in 2017. He has received highly productive award by QAU in 2018 for producing 7 PhDs. He is also the Editorial Board Member of many well reputed ISI journals and book series. Dr. Ahmad successfully supervised 17 PhD and 70 M.Phil. scholars, currently he is supervising 10 Ph. D and 12 M. Phil research scholars in applied disciplines of Plant Systematics & biodiversity, Ethnobotany, Natural plants products, Medicinal plants, Energy & Environment and Biofuel technology.

Prenyl: an interesting functional group in aromatic compounds

Zuopeng Li¹ and Haji Akber Aisa^{1*}

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Abstract

Prenyl group exist in many aromatic natural products, such as phenylpropanoids, flavonoids, coumarins, phloroglucinols, and xanthenes. This biosynthetic reaction represents the crucial coupling process of the shikimate or polyketide pathway providing an aromatic moiety and the isoprenoid pathway derived from the mevalonate or PEP pathway, which assemble the prenyl (isoprenoid) chain. Through oxidation, reduction, dehydration, cyclization, and hydroxylation, prenyl chain (5C) was convert into isoprenoid substituents (5C, 10C, and 15C). Many prenylated compounds have been identified as active components in medicinal plant with biological activities, such as anti-cancer, anti-androgen, anti-leishmania, and anti-nitric oxide production. Due to their beneficial effects on human health, prenylated flavonoids are of particular interest as lead compounds for producing drugs and functional foods. For the above reasons, we select three traditional herb medicines that include *Cratoxylum cochinchinense*, *Hypericum ascyron*, and *Humulus lupulus*. In the last five years study, we attempted to isolate more prenylated compounds in the target plant. Through silica gel, octadecyl-functionalized silica gel and Sephadex LH-20 CC, we isolated more than 80 prenylated structures including 20 new structures. The structures were elucidated on the basis of extensive spectroscopic data including 2D NMR and HREIMS

Zuopeng Li

Assistant Professor

Department of Science and Technology Development

Xinjiang Technical Institute of Physics and Chemistry

Chinese Academy of Sciences

Zuopeng Li was born in Heilongjiang, China, in 1988. He studied natural product chemistry at Gyeongsang national University of South Korea, where he received his Doctor degree in 2019. After Ph.D he joined the Xinjiang technical institute of physics and chemistry. Now he is working with Prof Haji Akber Aisa in the field of natural product chemistry. My current research interests are isolation of prenylated compound from arid zone of Center Asia.

Antidiabetic, antimicrobial and antioxidant properties of some high altitude medicinal plants found in Nepal

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Abstract

Regarding the severe side effects caused by synthetic compounds, studies were carried out taking high altitude medicinal plants to evaluate antidiabetic, antimicrobial and antioxidant activities. Antidiabetic property was observed by the inhibition PTP1B (protein tyrosine phosphatase 1B) enzyme with pNPP (para-nitrophenyl phosphate) assay. For antimicrobial activity, plant extracts and silver nanoparticles synthesized from the extracts were tested against four pathogenic bacteria; *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. DPPH assay was performed to evaluate antioxidant property. *Berberies asiatica* appeared to be more effective for the inhibition PTP1B enzyme (95-100%) at different concentrations. *Betulautilis* showed the highest zone of inhibition of 16 mm on three microbial in *S. aureus*, *E. coli*, and *K. pneumoniae* at 100 mg/mL. Nanoparticle of *Cassia* spp. has highest zone of inhibition over tested organisms with 13 mm in *S. aureus*, 12 mm in *E. coli*, 12 mm in *K. pneumoniae* and 10 mm in *P. aeruginosa* at 25 mg/mL. *Cassia fistula* showed the significant antioxidant property having IC50 = 67.74 ± 0.043 µg/mL.

Deegendra Khadka

Senior Scientific Officer
Nepal Academy of Science and Technology (NAST)
Khumaltar, Lalitpur, Nepal

Dr. Khadka has earned his doctorate degree in Molecular Biology from Inha University, Incheon, South Korea in 2012. After graduation, he returned back to his country and commenced working as a senior officer at NAST. Meanwhile, he started teaching biochemistry and chemistry, a visiting faculty, to the graduate students at Central Department of Chemistry, Tribhuvan University, Kirtipur, Nepal. He has been doing research enthusiastically related to type 2 diabetes and obesity since 2014. Dr. Khadka has supervised graduate students' thesis and has published research articles in the field of diabetes and obesity. Dr. Khadka had completed master's degree majoring in Organic Chemistry and Natural Product from Central Department of Chemistry, Tribhuvan University, Nepal in 2004.

Therapeutic and Adverse Effects of Commonly used Medicinal Plants: Standardization and Quality Assurance

Rizwan Faisal^{1*}, Laiyla Shinwari², Iram Aziz³ and Ali Talha Khalil⁴

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²Government Maternity Hospital, Peshawar

³CMH, Rawalpindi

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Abstract

The use of medicinal plants has witnessed an upsurge because of a general perception of being economical, effective and safe relative to allopathic medications. However, converging evidence suggest unwanted allergic reactions of herbal preparations and also toxic fatal reactions in the body signifying need for the extensive toxicity assessments. Moreover, some adverse reactions can stem from the contamination of herbal drugs which is attributed to the lack of standardization and quality control of herbal drugs. Contamination of metals, microorganisms and false identification can also end up in causing toxicity and allergic reactions which demand the dire need for pharmacovigilance to promote safe use of herbal preparations. In this paper, we have presented a review of literature on the toxicity profiles of most commonly used medicinal plants and presented valuable recommendations to allow safe use of the herbal medicines.

Rizwan Faisal

Associate Professor
Rehman Medical College
Hayatabad Peshawar

Academic Profile

- MBBS 2005 Kabir Medical College, Peshawar.
- M.Phil. Pharmacology University of Health Sciences, Lahore, Pakistan.
- Ph.D. Scholar Pharmacology Khyber Medical University, Peshawar.

Professional Experience

1. House Officer: Govt. Lady reading Hospital – Peshawar. February, 2006 to February 2013.
2. M.Phil. – University of Health Sciences, Lahore. October, 2010 to October, 2012.
3. Ph.D. Scholar – Khyber Medical University, Peshawar. September, 2015 to date
4. Senior Lecturer – Rehman Medical Institute, Peshawar. December, 2012 to December 2013.
5. Assistant Professor – Rehman Medical Institute, Peshawar. January, 2014 to February, 2018.
6. Associate Professor – Rehman Medical Institute, Peshawar. March, 2018 to date.

Fields of Specialization

Pharmacology, Public health (Preventive)

Publications

Articles published in international journals/ impact factor: 06

Articles published in national journals: 17

Total: 23

Citation (Research Gate) 85

Special Awards

- Best Teacher Award, 2018 (Rehman College of Dentistry)

Laiyla Shinwari M.B.B.S, FCPS

Fellow of College of Physicians & Surgeons Pakistan
Consultant Obstetrics and Gynecology, Women & Child hospital Charsadda, KP

Academic Profile

- MBBS 2011 KMU Institute of Medical Sciences, Kohat
- FCPS II (Obs. & Gyn) College of Physicians & surgeons, Pakistan

Professional Experience

1. House Officer: Polyclinic Hospital – Islamabad. March, 2012 to March 2013.
2. Post Graduate Resident – Govt. Lady Reading Hospital Peshawar. January, 2014 to January, 2018.
3. Consultant Obstetrics & Gynecology: Women & Child hospital – Charsadda. March, 2018 to date.

Fields of Specialization

Maternal & Child Health, Radiology

Publications

Articles published in international journals/ impact factor: 04

Articles published in national journals: 03

Total: 07

Special Awards

- Got 8 Gold medals in M.B.B.S.

Bioinspired Synthesis of Nanoparticles and their Biomedical Potential: the Pakistan Experience

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and Zabta Khan Shinwari^{1,2,3}

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Abstract

Nanotechnology is an emerging field that play pivotal role in a wide range of scientific fields. Applications of nanotechnology have been successfully applied in healthcare, drug delivery, gene delivery, diagnostics and energy sciences. Nanoparticle synthesis involves different methods like physical, chemical approaches and biological methods. The physical and chemical methods are associated with pitfalls as they pose potential threat to the environment; and hence ecofriendly routes of bioinspired nanoparticle synthesis are preferred. The biogenic synthesis of nanoparticles has attracted numerous researchers because of their potential advantages such as simplicity, safety, easy production, biocompatibility and low production costs. Green synthesis of nanoparticles involves the mixing and processing of a metal salt with a plant/bacterial/fungal extracts. Secondary metabolites from biological sources have potentials for reducing the metal salt(s); herby synthesize respective nanoparticles. The current review is aimed to discuss reports and studies conducted in Pakistan that have used biological approach for nanoparticle synthesis, as well as their potential biological and pharmacological application. Future directions should involve market oriented approaches for the commercialization of nanoparticles-based products that can help in up-left of national economy.

Muhammad Ali

Assistant professor, Department of Biotechnology
Quaid-i-Azam University Islamabad

Dr. Ali is currently working as assistant professor at the Department of Biotechnology, Quaid-i-Azam University Islamabad. He has been working as incharge of Molecular Systematics and Applied Ethnobotany Laboratory (Group leader: Professor Zabta Khan Shinwari). He is biotechnologist interested in developing deeper understanding of molecular biology, infectious diseases, phytomedicine and molecular pathology. Dr. Muhammad Ali Obtained his PhD in 2015 from University Roma Tre, Rome, Italy; funded by the Italian competitive international PhD fellowship program. Previously, he obtained his M. Phil degree from University of the Punjab. Dr. Ali has published 50 articles in peer reviewed journals with cumulative impact factor of 100 and citations of more than 900. In addition, He has published one book chapter as well. He is associate editor at Anti-Infective Agents – journal. In addition, he has been principal investigator of two projects funded by The World Academy of Sciences (TWAS) and Higher Education Commission (HEC).

Antimicrobial Effect of Guava Leaf Extract in Correlation with Biofilm Formation and Metallo- β -Lactamase Production in Multidrug Resistant *Pseudomonas aeruginosa*

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² KIST Medical College and Teaching Hospital, Imadol, Lalitpur, Nepal

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Abstract

Pseudomonas aeruginosa is an important pathogen causing various kinds of infections in humans. Infection by multidrug resistant *P. aeruginosa* is a public health issue. Production of metallo- β -lactamase (MBL) enzyme and ability to form biofilm are important factors for drug resistance in these organisms. This study was aimed to determine antibacterial effect of different guava leaves extracts and correlation of MBL production and biofilm formation with MDR *P. aeruginosa* isolated from different clinical samples. The study was carried out in the KIST medical college and teaching hospital and Central Department of Microbiology, Tribhuvan University, Kathmandu, Nepal. A total of 45 isolates of *P. aeruginosa*, isolated from different clinical samples were identified by standard microbiological techniques and antimicrobial susceptibility of the isolates was tested by Kirby-Bauer disk diffusion method on Muller Hinton agar as per CLSI guidelines. The ability to form biofilm was detected using the microtiter plate assay. MBL production was screened by Imipenem disk diffusion method and confirmed by Imipenem-EDTA combined disk method. Guava leaves extracts were prepared using absolute methanol and hydroethanol solvent at different ratios. The antimicrobial activity of guava leaves extract against the pseudomonal isolates was determined by agar well diffusion method. In the present study, out of 45 isolates of *P. aeruginosa*, 30 (67%) were MDR isolates, 30 (67%) were biofilm producers and 6 (13%) were MBL producers respectively. The methanol extract of fresh guava leaves (13mm) showed higher activity and least activity by 7:3 hydroethanol extract of dried guava leaves (6mm) toward the *P. aeruginosa* isolates. Guava leaves extract may be an alternative source for Pseudomonal infection treatment as antimicrobial resistance to available drugs is increasing day by day. However, it should be standardized and tested in animal models before its application.

Anjana Singh

Professor

Central Department of Microbiology, Tribhuvan University
Kirtipur, Kathmandu, Nepal

- 2004 Ph.D., Microbiology, School of Life Sciences, Jawaharlal Nehru University, New-Delhi, India
- 2008-2009 Post-Doctoral, University of Virginia, USA

Work Experience

1. Professor, Department of Microbiology, Tribhuvan University, 8 May, Nepal, 2009
2. Associate Professor, Central Department of Microbiology, Tribhuvan University, 28 March, Nepal, 2005- 7 May, 2009
3. Lecturer, Central Department of Microbiology, Tribhuvan University, Kirtipur, 25 June, 1997 - 27 March, Nepal, 2005
4. Assistant Lecturer, Central Department of Microbiology, Tribhuvan University, Kirtipur, 17 Nov. 1994 to 24 Jun. 1997 Nepal
5. Part Time Lecturer, Tri-Chandra Multiple Campus, Tribhuvan University, Nepal, 1994

Professional Experience

- 2004-2008; 2012-2016 Head, Central Department of Microbiology, Tribhuvan University, Kathmandu, Nepal
- 2016-2018 Executive Member of Board of Studies, South Asian University, New Delhi, India
- 2005-2008 Executive member of Nepalese Society of Microbiology (NESOM)
- 2009-2013 President, Filters for Families Nepal (FFF Nepal)
- 2010-2015 Associate Academician of Nepal Academy of Science & Technology
- 2010-till date Executive Member of Fulbright Alumni Association Nepal (FAAN)
- Life member Women in Science and Technology, Nepal
- Executive Member Health and Environmental Welfare Association, Nepal
- 2017 Life member of Nepal Biotechnology Society

Special Awards

- 2008-2009 Fulbright Scholarship-United States Government
- 2008 Education Award (Shikshya Puraskar), Nepal
- 2007 International Foundation for Science Grant, Sweden
- 2005 Crown Prince Young Scientist Award, NAST, Khumaltar, Nepal
- 2005 Mahendra Vidya Bhushan Award, 'Ka', for Ph.D., Nepal
- 2000 University Grant Commission, Mini Research Grant, Nepal

Publications

Total national and international publications-100; Peer reviewed journals-47, Books-3, Book chapters-23, General and Proceedings Publications -27, Abstract Published -9, Accepted articles on pipeline-5.

Floristic Diversity, Ethnobotany and Traditional Recipes of Medicinal Plants of Maruk Nallah, Haramosh Valley, District Gilgit, Gilgit Baltistan

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Azhar Hussain³, Asad ullah⁴, Muhammad Zafar⁵ and Karamat Ali⁶

¹Biological Sciences Department, Karakoram International University Gilgit-Baltistan,
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²Biological Sciences Department, University of Baltistan, Skardu Gilgit-Baltistan, Pakistan

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Abstract

Haramosh valley is one of the beautiful valleys located at 35°53'04" N latitude and 074°41'11" E longitude at elevation of 2500 meter to 5000 meters in district Gilgit. For the assessment of floristic diversity total 114 plant species were recorded at Maruk nallah, out of which, 85 were herbs belonging to 34 families; 13 were shrubs belonging to 9 families; while 16 were trees belonging to 10 families. Results showed that, family Asteraceae was the most dominant family with 12 genera and 21 species while the genus *Artemisia* was the most dominant genera, with six species. The inhabitants of the study area are habitual to use 65 plant species as a traditional medication for 45 different ailments. The use of plant parts for medication leaves (26%) were the most commonly used by people followed by fruits (19.2%), while parts are in less use. The inhabitants have a lot of cultural and mythical beliefs regarding to some of local plant species. Some very important medicinal plants include *Juniperus excelsa* M. Bieb, *Betula utilis* D. Don, *Delphinium brononianum* Royle., *Saussurea simpsoniana* Field & Garden, *Primula macrophyla* D. Don, *Pegnum harmala* L., *Geranium Pretense* L *Saussurea simpsoniana* Field & Garden; *Chenopodium foliasum* L. have much common use value reported especially for recipes. The natural resources are under pressure due to much grazing pressure, deforestation and over-exploitation need to conserve them for future generations.

Qamar Abbas

Assistant Professor
Biological Science Department
Karakoram International University, Gilgit

Dr. Qamar Abbas born in a village Nagral Kulchinote tehsil and district Gilgit. Initial education started in public school and college Jutial Gilgit, and passed matriculation from High School Skardu in 2004. After completion of intermediate education from Degree college Skardu, joined Forman Christian College Lahore for graduation. After successful completion of BSc from Punjab University Lahore completed Masters from Karachi University. I have honored to be a first MPhil graduate from Karakoram International University, (KIU) Gilgit and completed PhD. Degree from KIU during 2018. During my PhD studies I availed opportunity to six-month work experience at Hamburg University Germany, under HEC International Research Support program (IRSIP) during 8th August 2015 to 13th January 2016. I also experience of one-month training course, at Chenshan Botanical garden Shanghai under supervision “International Association of Botanic Garden Asian Division during 8th Sep. to 7th October 2016 in Shanghai China. I started my professional career as a lecturer Botany in Federal Government Degree College Danyore Gilgit, and joined Karakoram international University as a lecturer at 2006. Now I am serving as an Assistant Professor in Karakoram International University.

DNA Barcoding of Herbal Medicinal Products: A Challenging Task

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Abstract

There is a global resurgence of traditional and complementary medicine, specifically the herbal products have been booming for the last few decades. However, the events of substitution and adulteration of herbal drugs/medicinal products is an increasing concern for consumer safety. The prevailing situation of adulteration highlights the dire need of an effective scientific method for improved precision while carrying out the correct identity of the medicinal flora and their herbal products. DNA barcoding has come out as a solution for correct identification of herbs and to find the adulterants in herbal products. There are challenges involved in the barcoding method for medicinal plants in terms of developing barcodes and the analysis of data to measure the distinguishing power. Though, the solution to these problems is available and DNA barcoding can help to formulate a system to ensure the quality of herbal drugs which will help the pharma industry of herbs to regain the lost confidence of consumers.

Nadia Batool Zahra

Assistant Professor
Qarshi University, Lahore

Nadia Batool Zahra, holds a PhD in Biotechnology from Quaid-i-Azam University Islamabad and serving as an Assistant Professor Bioinformatics and Manager ORIC Qarshi University, Lahore. Her research interests are DNA Barcoding, Molecular Systematics, Bioinformatics, Plant Molecular Biology, Plant Taxonomy & Phylogenetics, Biosafety & Biosecurity, Bioethics, Responsible Conduct of Life Sciences and Biodiversity Conservation. She received a foreign training on “DNA Barcoding of Plants” at Ohio University, US in 2012 under a joint Pak-US project by HEC & State Department US. She remained a Visiting Researcher at University of Florida, US in 2015. She is also attached with PBSA as their Master Trainer. There are several projects in collaboration with International Organizations including The InterAcademy Partnership (IAP), The European Union Chemical Biological Radiological and Nuclear Risk Mitigation Centres of Excellence Initiative (EU CBRN CoE), Landau Network Centro Volta -Italy (LNCV) where she worked as a volunteer.

Hepatic Alterations in Albino Rats Induced by *Ajinomoto* (MSG) and Hepatoprotective Role of *Ginkgo biloba*

Muhammad Ishaque M.R^{1*}, Piriha Abbasi², and Raima Kalhoro³

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Abstract

The study aimed to evaluate the histological Hepatic alteration in albino rats induced by *Ajinomoto* (monosodium glutamate) and Hepato-protective role of *Ginkgo biloba*. 21 Albino Wistar rats average weight (150-200g) were taken for this study and divided into 3 parallel groups (n=7 in each group). Group 1 was control group which served as normal control feed with distilled water. Group II (experimental group) served *Ajinomoto* (MSG) 0.08mg/gm/po for the 45 days; Group III (experimental group) served *Ajinomoto* (MSG) 0.08mg/gm/po with GBE 0.05mg/gm/po for 45days. All the healthy adult Wistar rats with normal and without any gross abnormality were selected for this experimental study. All effected disease or any moribund rats were excluded. On 46th day, after the completion of experiment all rats were scarified and the Liver of Wistar rats was rapidly collected and fixed in formaldehyde. The group of rats that received MSG for 45 days showed changes of congestion of central vein in 7 out of seven, also changes in infiltration of leukocyte was observed in 6 rats, centrilobular hemorrhagic necrosis was seen in all 7 rats, and only one animal was observed with changes of hepatic fibrosis. It is concluded that *Ajinomoto* (MSG) has significant effects on liver histology than the group that received EGB.

Muhammad Ishaque Mujeeb Rehman

Lecturer of Eastern Medicine at Faculty of Pharmacy and Health Sciences
Univeristy of Balochistan

Muhammad Ishaque Mujeeb Rehman holds MPhil degree in the discipline of Eastern Medicine from the Hamdard University Karachi. My professional experience extended collectively to duration of almost 12 years. I worked as Residential Medical Officer (RMO) at Shifa-ul-Mulk Memorial Hospital (for Eastern Medicine) Hamdard University Karachi (June 2006 to August 2007). He worked as Herbal Physician and Lecturer at Qasmi Matab and Tibbiya College Karachi (September 2007 to December 2009) and also as research and development officer at A. R. Laboratories (PVT). Limited Hyderabad, Sindh (May 2010 to April 2015). He is currently working as Lecturer at Department of Eastern Medicine, Faculty of Pharmacy and Health Science, University of Balochistan, Quetta (May 2015 to Up-to-date).

Honey is the Best Remedy in Prehistoric and Current Era

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²Department of Pharmaceutics, Hamdard University, Karachi, Pakistan

³Foundation University Medical College Rawalpindi, Rawalpindi, Pakistan

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Abstract

Antimicrobial specialists are on a very basic level fundamental in reducing the general load of intense afflictions. Regardless, as secured pathogens make and spread, the sensibility of the counter defilement administrators is reduced. This sort of bacterial imperiousness to the antimicrobial overseers addresses an outrageous peril to general thriving, and for a broad assortment of antimicrobial, including the significant final retreat quiets, the frequencies of opposition are developing far and wide. Honey possesses been known since old energy for its healing and therapeutic use. Honey has cell fortification and antibacterial substance that control the advancement of a broad assortment of minute creatures and developments which cause various abscesses and particular sullyng. Honey has a mix of a wide scope of phytochemical and mineral. It is an incredible wellspring of different sorts of destructive, nutrient and mix. Numerous audits exhibit that nectar demonstrates hemostatic, calming properties. The Experimental (Non-comparative) study was conducted at the outpatient department of Dermatology, Fauji Foundation Hospital, and Rawalpindi from November 2011 to May 2019. Ointment containing 20% active antimicrobial honey was formulated as a sovereign remedy. A total number 7000 of wounds on different parts of the body were studied. A thin layer of honey ointment on gauze was applied to the wounds two to three times a day up to the complete healing. Clinical trials demonstrated that the topical application of honey ointment have significant control of infections arising from pathogenic bacteria and up to 100% healing results were observed in all wound cases within mean healing time for the duration of 8.15 (3–18) days' time period. Innovative ointment containing 20% active antimicrobial honey is more effective and low-cost alternative preparation for the treatment of wound infections.

Samiyah Tasleem

Researcher

Department of Microbiology

University of Karachi

Her thesis covers the Antimicrobial activity of Synthetic and natural compounds, Phytochemical identification via HPLC, Formulation of an ointment and human clinical trials. She has experience in infectious diseases control and nosocomial infections. She has published 30 HEC approved and internationally recognized articles. She authored 4 international books. She attended more than 204 national and international conferences/workshops/seminars within Pakistan and abroad. In January-2007, she signed a contract to work as an assistant professor during 2007-2008 in the Department Of Pathology (Microbiology), Hamdard College of Medicine and Dentistry, Hamdard University; Karachi. She was selected by the HEC under IPFP program and appointed as an Assistant Professor in the Department of Microbiology, Federal Urdu University of Arts Science and Technology (FUUAST), Karachi. She has experience with the quality control department of different pharmaceutical companies and different Pathology Laboratories. She formulated an ointment which is registered as Patient in Pakistan. And her product won the 1st prize from DICE, HEALTH, PAKISTAN, and the product is under process on the DICE platform. She selected tope 500 Microbiologist in the world in 2017. She is also working 45 international journals as editorial board member and reviewer. She has a lifetime memberships of AFASSA, Pakistan Society of Microbiology, Infectious Disease Society, Pakistan Biological Safety Association, American Society of Microbiology, Pakistan Botany Society, Economic Geologists, and Mineral Technologists, Pakistan Chemical Society, Pakistan Eastern Medicine Association, International Eastern Medicine Association, Bio-cognizance, Alumni of the University of Karachi. She is CEO of one startup PEHC (Pakistan Educational and Health Consultant Group).

Current Trends in Traditional Medicine in Sri Lanka

Rathnayake M. Abeyrathne
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abeyrathnayake87@gmail.com

Abstract

It is well known fact that Sri Lanka was able to produce a unique tradition of knowledge in the field of traditional medicine over the last two thousand five hundred years of its history. The country is place where its inhabitants were able to develop a traditional medicine-based medical pluralism, comprising Desheeya Chikithsa, Ayurveda, Unani, Siddha, Homeopathy and various other informal traditions to as remedies cure various illnesses. In this deliberation, I focus on discussing major developments and trends in traditional medicine in Sri Lanka at present. It is based on three themes ranging from research and education, popular health practice, and to private sector involvement in promoting traditional medicine. As far as research is concerned, both state and private sectors conduct research on various aspects of traditional medicine at universities and private institutes and some of them tends to organize collaborative conferences to publish their results. At present, traditional medicine-related items have become common consumable items among Sri Lanka public as a deterrent to control non-communicable diseases and traditional herbal products are more popular as beatification therapies. Finally, the private sector involves more than ever before in promoting traditional medicine in the country and its activities include provision of clinical services, production of traditional medicine-based drugs and promoting traditional medicine-based tourism in the country.

Rathnayake M. Abeyrathne

Senior Lecturer and Medical Anthropologist
Department of Sociology
University of Peradeiya, Sri Lanka

Dr. Abey Rathnayake entered the University of Peradeniya in 1985, specialized in Sociology but due to university upheavals in the 1980s, under an ISLE scholarship, he went to USA and completed BA at Bowdoin College, specialising in Anthropology. After graduation, he went on to pursue his postgraduate study to the University of Washington, Seattle, USA and completed his MA specialising in South Asian Studies. Following his return to Sri Lanka in 1993, he joined the Department of Sociology, University of Peradeniya and worked there as a lecturer. In 1999, he went to Thailand under a Ford Foundation Scholarship to pursue an MA degree in the field of Health Social Sciences. Again in 2005, he went on to the University of London to complete his doctoral study and completed his thesis on the History Traditional in Sri Lanka. He currently teaches Medial Sociology and Medical Anthropology at the Department of Sociology and he was the Head of the Department from 2016-2019. In addition, he has supervised traditional medicine-based doctoral and master of philosophy dissertations on the preservation of traditional medicine-based herbal plants, traditional medicine in the Tamil plantation community and factors affecting people to seek traditional medicine in Sri Lanka. He is currently teaching a traditional medicine course to an American group of students who come to the University Peradeniya under the Inter-Collegiate Sri Lanka Education Programme to study Sri Lanka Society.

Anticancer activity of *Ficus lyrata* L. Fruit against induced Hepatic Carcinoma

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Abstract

Hepatocellular Carcinoma is the 6th most predominantly existing cancer and the second largest contributor to human mortality the world over. The present study provides therapeutic as well as prophylactic method for the treating induced Hepatocellular carcinoma (HCC) by administrating a plant ethanolic extract and compared with standard drug Sorafenib (in medical use for the treatment of Hepatocellular Carcinoma). Hepatocellular carcinoma (HCC) was induced in *Oryctolagus cuniculus* (Rabbits) by the administration of Carbon tetrachloride. The induced animals were treated with fruit extract afterwards. Curative and protective effects of plant extract were effectively analysed by monitoring physiological changes (pH of saliva, temperature, blood glucose, body weight) in induced Hepatic Carcinomic *O. cuniculus*. Furthermore, Hematological investigations (Hb, RBC, TLC, MCV, MCH, MCHC and Platelets), changes in Liver Biochemical Enzymes (Alkaline phosphatase, Aspartate amino Transferase and Alanine aminotransferase) and Hepatic Carcinoma Marker (Alpha Fetoprotein) efficiently marked therapeutic as well as prophylactic outcomes followed by histo-pathological studies of carcinomic and healthy livers following hematoxylin and eosin staining.

Farah Khan

Professor

Molecular genetics & Biotechnology lab, Botany Department
Lahore College for Women University, Lahore, Pakistan

Qualifications

Post-Doc in "Molecular **Genetics**" (OSU, USA)

Ph.D. in "**Botany** with specialization in **Biotechnology**" (PU, PK)

Professor / Chairperson, Department of Botany, LCWU, Lahore

Department of Botany, Lahore College Women University 92 Jail Road, Lahore 54000
Pakistan

Professional Experience -

Thirty two years' experience of **Post** Graduate, Graduate and Undergraduate, teaching &
Research supervision

Currently working as the **Chairperson of Botany Dept.** LCWU, Lahore

Research Supervised - So far, **65 Research theses including 05 Ph.Ds.** have been supervised
where as currently, **02MS & 04Ph.D.**

Teaching Specializations

- Molecular Genetics
- Plant and Environmental Biotechnology
- Diversity, Anatomy, Morphology and Evolution of Vascular Plants

Fields of Research

- Molecular Genetics specially, Viroid's genomes & their Site directed mutagenesis.
- Plant Biotechnology especially Recalcitrant Plant Tissue Culture and related Biochemistry.
- Metabolomics.
- Varietal identification of plants using molecular markers.
- Phytoremediation & Stressed Cell Lines
- Plant Anatomy and Plant Taxonomy.

Awards and Distinctions

- **Two times short listed for the interview of Vice Chancellor Ship** of public Sector Universities of Punjab (Feb, 2015 & Jan, 2016).
- **Gold Medal Award** by Idara Faroge Taleem, PK, 2015.
- **PI** of LCWU-Lahore Zoo project of **Botanical naming** of Lahore Zoo Trees, 2014.
- **First and the only** Pakistani scientist working on Viroidal Genomics since 2011.
- **Post-doctoral Fellowship** award 2010-2011, for Department of Molecular Genetics, Ohio State University, Columbus, USA, by HEC, PK.
- **HEC approved Ph.D.** Supervisor since 2010.

Elicitation strategies of *in vitro* cultures for the sustainable use of medicinal plants

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Abstract

Medicinal plants are highly traded for its promising potential against different types of diseases including cancers. Development of elicitation strategies for increased production of important anticancer compounds from *in vitro* cultures of medicinal plants has proved very productive. For this purpose, different stresses are applied to *in vitro* cultures to produce increased amounts of the compounds. For instance, cell cultures are produced via stem explants in the Murashige & Skoog basal medium supplemented with different concentrations of plant growth regulators (PGRs). The extracts from samples are then subject to flavonoid and phenolic content assessment, antioxidant quantification and Chromatographic analysis. In our experiments, among the many PGRs, Thidiazuron (TDZ) triggered higher quantities of biomass and total flavonoid & phenolic content (191.03 µg quercetin/mg and 202.8 µg gallic acid equivalent/mg, respectively) through cell cultures of the anticancer *F. indica*. Similarly, sucrose induced the maximum biomass among the different carbon sources (fructose, glucose, maltose, and sucrose) given in different concentrations to cell cultures of *F. indica* while glucose produced the maximum phenolic content followed by fructose when harvested after 42 days. Manipulation in the supply of light to the cultures with a combined effect from other chemicals, a significant effect was seen on growth and secondary metabolism such that dark-grown cell cultures treated with Methyl Jasmonate (Me-J) gave the highest TPC. A chromatographic method such as the high-performance liquid chromatography analysis revealed an increased quantity of secondary metabolites. In conclusion, cell cultures of *F. indica* treated with Thidiazuron and grown in dark in the presence of glucose as a sugar source and Me-J as elicitor gives enhanced quantities of important anticancer secondary metabolites.

Tariq Khan

Lecturer

Department of Biotechnology

University of Malakand Chakdara Dir Lower

Dr. Tariq Khan has recently completed his Ph.D. in *in vitro* plant biotechnology specially focused on the cell cultures. He has performed his work on establishing callus culture of *Fagonia indica*. During his PhD, he visited the University of Florida for 6 months to perform a part of his research work. He has published his Ph.D. research work in internationally reputed journals. During Ph.D., he has participated in writing grants and managing the laboratory of his supervisor guiding new coming students in the lab. He had a very fruitful experience during Ph.D. at the top ranked institution of the country. He is currently pursuing to explore the different dimensions of *in vitro* cultures related to *Fagonia indica*, a very important anticancer plant. He has worked on the enhancement of important phenolic compounds in cell cultures of *Fagonia indica*. However, He is now pursuing the establishment of *in vitro* cultures of the plant for enhanced production of important terpenoids at the institutions where he works.

Aldose reductase inhibitory activity and free radical scavenging of *Piper betle* extracts

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Abstract

Piper betle is one of *jamu* ingredients which could consume freshly by Indonesian people from the natural product resources. *P. betle* leaf, as known as “daunsirih” is the popular ingredients for most of traditional medicines in Indonesia. The present study is the primary article on human aldose reductase inhibition of *P. betle* leaves extracts. We revealed that the ethanol extract exhibited the utmost inhibitory activity of the enzyme among extracts. It was discovered to present an IC₅₀ value of 18.8µg/mL for an *invitro* human aldose reductase and show antioxidant activity by ORAC assay with value of 3861.2 ± 451.0µmol Trolox Equivalent/g extract. Further investigation, the chemical components of the ethanol extract showed a total of 14 compounds by GC-MS analysis. The major compounds were bisphenol A (**13**) (34.4%) isoxylic acid (**3**) (13.8%), *trans*-phytol (**11**) (6.6%) and octadecyl aldehyde (**14**) (6.4%).

Sri Fatmawati

Assistant Professor

Laboratory of Natural Products and Chemical Synthesis, Department of Chemistry

Faculty of Sciences

Institut Teknologi Sepuluh Nopember (ITS)

Surabaya – Indonesia

President of Organization for Women in Science for the Developing World (OWSD) –
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Dr. Sri Fatmawati has completed PhD Natural Product Chemistry from Kyushu University, Fukuoka, Japan. Her research work is based on the interface of natural occurring compounds, medicinal properties, and biotechnology. To date, she has published 30 research articles with cumulative impact factor > 50. She is member of Indonesian Young Academy of Sciences (ALMI) since 2017, as vice coordinator of Frontiers of Science working group. She received awards such as Elsevier Foundation for Women in Science 2016, The Most Inspiring Woman 2015, The People of the Year 2014 for Indonesian Young Leader Category and L'Oréal UNESCO for Women in Science 2013, etc. At present, Dr. Fatmawati is serving Institut Teknologi Sepuluh Nopember (ITS) - Surabaya as Lecturer, where she is teaching courses as well as striving for building productive industry academia linkages. Recently, she has been appointed as the Chair of Organization of Women in Science for The Developing World (OWSD) - Indonesia National Chapter. Through the chair, she is actively involved in strengthening the collaboration for the promotion of Women in Science.

Unani Medicine for a Paradigm Change to Global Health

Hakeem Irfan Shahid
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Abstract

Unani System of Medicine (USM) originated from Greece and has been introduced in India by Arab and Persian settlers. USM has been accepted worldwide because of its easy availability, cheaper and relatively safer than other conventional medicine. World Health Organization (WHO) is the predominant agency that has direct impact on global health care. USM has gained recognition from WHO since 1976. Global health is about understanding to provide solutions to the challenges and disparities in the health status of people worldwide. An insight of current health scenario in Pakistan and available research can help achieving a paradigm change to National and Global Health.

Hakeem Irfan Shahid

Ex-Chairman,
CEO Awami Laboratories

Mr. Irfan Shahid did his Master's in Business Administration and after completing his first few years in Pharmaceutical and Telecommunication sector he joined a family owned small entity which mainly produce herbal medicines. That small organization which became its journey in 1991 as Awami Laboratories is today's one of the first five companies in Tibbi sector which were acknowledged by GOP issuing Enlistment in May 2017 as GMP compliant Herbal/Unani medicines producer in Pakistan. The company also owned national famed brand 'SlimSmart'. He is also serving as CEO of Aeon Technologies (a PTA licensed Application Development House) which primarily deals with application development for telecommunication sector. Another establishment is an online health portal www.healthshop.pk which aims to provide an easy access to people of Pakistan specially youth to Tibbi medicines offered by the sector. With these entrepreneurial successes, Mr Irfan Shahid also worked on philanthropy to give back to society and help those in need. He has founded an organization Search Quran www.searchquran.com with an ambition to provide an easy access to Muslims around the world regarding Quran and Hadith through an easy to use searchable online application. With a perspective of sharing knowledge various lectures/courses are delivered at forums like Pakistan Academy of Sciences, Government College Lahore, Lahore University for Women, National College of Arts, Home Economics College etc on topics like Human Economy, Information Technology and Health Sciences. Mr Irfan Shahid also served as Chairman PTPMA (Pakistan Tibbi Pharmaceutical Manufacturers Association) a registered trade body to represent the manufacturers of Herbal medicines in Pakistan.

For more on Awami Laboratories, please visit its website: <http://www.awami.com/>

Taxonomical and phytochemical characterization of two highly traded medicinal species of genus *Berberis*

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and Shazia sultana²

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Abstract

The medicinal plants serve as an important natural source and potentially safe medicinal drugs that can play a significant role in moderating human health by contributing towards herbal medicines. The genus *Berberis* exhibits evergreen and deciduous shrubs like *Berberis aristata* DC and *Berberis lyceum* Royal. These medicinal plants are used as a remedy for swollen and sore eyes, skin diseases, healing of broken bones, curative piles, jaundice and diarrhea. This study attempts to fill the need by developing semi-permanent slides of leaf and pollen grain using safranin staining. The detailed foliar anatomical studies showed polygonal epidermal cells having anticlinal walls. However, anomocytic stomatal type is observed in *Berberis aristata* while paracytic stomatal type is found in *Berberis lyceum*. The pollen of studied species appeared as a single spiroaperturate showing lobes in equatorial view. Furthermore, HPLC finger printing and quantitative analysis of phenols and flavonoids for comparative study are described. The screening showed higher quercetin peak in *Berberis aristata* (1.89 mg/g) as compared to *Berberis lyceum* (1.71mg/g). The results achieved provide us with valuable information for botanical quality control and species identification and assist us to detect adulterations in commercial as well as in laboratory samples.

Sidra Nisar Ahmed

Assistant Professor

Department of Botany, Faculty of Life Sciences

The Women University Multan

Dr. Sidra Nisar Ahmed has completed her PhD degree in the supervision of Dr. Mushtaq Ahmad from Quaid-i-Azam University, Islamabad in April 2016 and her field of specialization is Plant systematics and biodiversity. She has joined The Women University Multan, Pakistan as Assistant Professor under IPFP in November 2018. Her field of interests is Authentication of Herbal drugs, Phytochemistry, Antioxidant activities, High profile liquid chromatography (HPLC), Medicinal Plants, Ethnobotany and Electron microscopy etc. Dr. Sidra is an active researcher having expertise in applications of modern trends of systematics in authentication of traded medicinal plants in Pakistan. She has planned many research projects to solve adulteration related problems in medicinal plants at local, regional and global level.

Trans-cultural Uses of Ethnomedicinal Plants and its Comparative Study in Pakistan (Jatlan) and United Kingdom (Bradford)

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Abstract

Despite the increasing relevance of trans-cultural healthcare issues in public health policies, knowledge is still very restricted about migrant communities' perceptions and use of traditional medicines (TMs) within multicultural societies in Western countries like UK. In this field study, an in-depth study was carried out of the herbal drugs still in use among Pakistani migrants from Mirpur (Jatlan) living in Bradford (UK), in the north of England. It was demonstrated by open-ended and closed-ended interviews that many inhabitants hitherto utilize the herbal therapies in UK for curing of different diseases. Analytical micro statistical tools such as fidelity level (FL), Informant consensus factor (ICF) and data matrix ranking (DMR) were employed for meta-analysis. These analysis factors produced good indicators to depict the popularity of herbal medicines in developed country like UK. It was known that people gather and utilize the herbs collected from their native town and sometime bought from the botanic market. The availability of these botanic drugs is calculated by indigenous people for future conservation perspectives. This proves that MPs plants had earned very high value in local people communities of Jatlan and Bradford. These MPs are being used as complementary alternative medicines (CAMs) ubiquitously.

Dr. Muhammad Ishtiaq

Associate Professor (Tenure)

Department of Botany, Mirpur University of Science and Technology (MUST) Bhimber
Campus, Bhimber, Azad Jammu and Kashmir

I am working as Associate Professor (Tenure). I am working on Ethnomedicines, Ethnopharmacology of Medicinal Plants; Plant Biodiversity Conservation, Climate Change Impact and Sustainability, Commercialization of wild forest fruits of Pine forest of Samahni area of AJK. I have supervised 01 Ph.D., 30 M.Phil. and 75 MSc./BS students. Currently 4 PhD, 10 MPhil, students are working in my research group. I have won HEC Best University Teacher Award (BUTA) for year 2015. I am Lifetime member of Pakistan Botanical Society and Herbarium Curator Society. Currently, working as Chairperson of Department of Botany, MUST, Bhimber Campus, AJK.

Traditional Chinese Medicine Going Global: Opportunities for Belt and Road Countries

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Ikram Ullah⁵ and Zabta Khan Shinwari⁶

¹Chinese Academy of Sciences (CAS), China

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Abstract

Due to Belt and Road Initiative (BRI), Traditional Chinese Medicine (TCM) a 2,000-year-old Chinese national treasure is experiencing a fresh thrive. By 2020, China aims to issue 20 TCM international standards, register 100 TCM products and build 30 overseas TCM centers in BRI countries. Distinctive theories and practices, such as herbal medicine, acupuncture, massage and dietetics are all integral part of TCM. Interestingly, due to intergovernmental cooperation a cooperative framework will be designed, which will help in the removal of legal barrier in TCM qualification, TCM education accreditation, drug access and medical insurance. Worldwide trade in TCM services, including clinic treatment, education and training, and health tourism is estimated to be at about \$50 billion. TCM has become a vital area of health and trade cooperation between China and the ASEAN, EU, Africa, and Central and Eastern Europe. In the present scenario, BRI countries (~70) also have the opportunity to promote their own traditional and complementary/alternative medicine systems globally such as Ayurveda, homeopathy, and unani systems of medicine along with yoga, naturopathy etc. A flagship project of BRI, China–Pakistan Economic Corridor (CPEC) Pakistan is intended to rapidly modernize Pakistani infrastructure and strengthen its economy by the construction of modern transportation networks, numerous energy projects, and special economic zones, the value of which is worth \$62 billion as of 2017. In this scenario, it's vital for the herbal practitioner's, scientists, industry and policy makers in Pakistan to exploit the opportunity given by BRI and CPEC to both promote their own herbal values globally and learn the practices of TCM to enhance their overall skills. This will result in a massive move towards the achievement of Sustainable Development Goals (SDGs) globally and will nurture herbal industries to develop on solid scientific and legal grounds.

Ali Talha Khalil

Lecturer

Department of Eastern Medicine and Surgery
Qarshi University, Lahore

Dr. Ali Talha Khalil has completed PhD Biotechnology from Quaid-i-Azam University, Islamabad, Pakistan. His research work is based on the interface of nanotechnology, material sciences and biotechnology. To date, he has published 52 research articles with cumulative impact factor > 110. He is also selected as fellow/ambassador of the UNESCO Chair in Nanosciences and Nanotechnology. Through the Chair, he is actively involved in strengthening the South-South collaboration for the promotion of Nanotechnology. He is also member/ambassador of International Society of Science, Engineering and Technology-UK. At present, Dr. Khalil is serving Qarshi University as Lecturer and Manager ORIC, where he is teaching courses as well as striving for building productive industry academia linkages.

Muhammad Ovais

PhD Candidate

National Center for Nanoscience and Technology (NCNST), Beijing, China
Chinese Academy of Sciences

Muhammad Ovais is a PhD candidate at Chinese Academy of Sciences (CAS) Center for Excellence in Nanoscience, National Center for Nanoscience and Technology (NCNST), Beijing. His research interest lies in the development of novel immuno-nanomedicines for cancer theranostics via utilizing cutting-edge technologies. He is a Web Writer for Biomaterials Science (Royal Society of Chemistry, UK) and has published over 35 scientific articles in prestigious journals with cumulative impact factor of >120. He also visits Peking University, Guanghua School of Management, to elucidate core developments underlying Belt and Road Initiative and emerging business opportunities for Healthcare Industry.

Phenolics profiling, amygdalin content, *in vitro* antioxidant and HepG2 cancer cells' antiproliferation potential in apricot kernels

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Abstract

Phenolic acids, quercetin, catechin, epigallocatechin gallate, amygdalin contents and antiproliferative activity against HepG2 cells were studied for the first time in the kernels of apricot cultivars grown in Pakistan. Standard analytical procedures were adopted. The contents of total phenolics, total flavonoids, chlorogenic acid and syringic acid were found highest in Habbi kernel, which also depicted significant capability to scavenge the DPPH and ABTS+ free radicals as well as oxygen radical absorbance capacity. The average concentration of quercetin varied from 0.072 to 1.34 mg/100 g, and that of epigallocatechin gallate (EGCG) from 0.71 to 6.52 mg/100 g. Amygdalin content was highest in the kernel of Balaani (1145 mg/100 g), whereas maximum inhibition of HepG2 cells was exhibited by the kernel of Wafu Chuli. The PCA showed significant contributions of polyphenols and flavonoids towards biochemical assays. Overall, Habbi, Wafu Chuli, Thukdeena and Balaani kernels were rich in phytochemicals along with significant antioxidant/anticancer activity and may contribute considerably in the prevention and treatment of chronic health disorders.

Arshad Mehmood Abbasi

Assistant Professor

Department of Environmental Sciences, COMSATS University Islamabad,
Abbottabad Campus-Pakistan

Arshad Mehmood Abbasi (PhD-Post Doc.) is working as Assistant Professor of Environmental Sciences at COMSATS University, Islamabad, Abbottabad Campus- Pakistan. Dr. Abbasi received his PhD in Ethnobotanical and Nutraceuticals aspects of plant species of Lesser Himalayas, Pakistan from Quaid-i-Azam University Islamabad Pakistan in 2013. Dr. Abbasi research is mainly focused on: ethnobotany, nutraceuticals, medicinal and food plant resources and phytochemistry. To date Dr. Abbasi has authored 80 research articles and 3 Book Chapters. Dr. Abbasi has also two international books in his credit: “*Medicinal Plant Biodiversity of Lesser Himalayas-Pakistan*” and *Wild Edible Vegetables of Lesser Himalayas: Ethnobotanical and Nutraceutical Aspects* published by Springer, USA in 2012 and 2015, respectively. So far, Dr. Abbasi has been awarded three outstanding research awards by Higher Education Commission (HEC) of Pakistan, Best researcher award by host University and foreign expert certificate by Chinese Government along with many other certificates. Dr. Abbasi is also serving as volunteer editor and reviewer of several journals of international repute including *Journal of Ethnobiology and Ethnomedicines*, *Journal of Ethnopharmacology*, *Journal of Herbal Medicine*, *Food Chemistry*, *Pharmaceutical Biology*, *European Journal of Medicinal Plants*, *Pakistan Journal of Pharmaceutical Sciences*, *Asian Pacific Journal of Tropical Biomedicine* and *Pakistan Journal of Botany* among several others. Dr. Abbasi is also member of International Society of Ethnobiology; Society of Ethnobiology, University of North Texas, USA; American Chemical Society (ASC) and Institutional APIFP Champion: Asia Pacific Institute of Food Professionals

Green synthesis and characterization of biologically active silver nanoparticles against *in vitro* cultured MCF-7 cells

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Abstract

Green synthesis of nanoparticles is an ecofriendly one step biosynthetic technique that extends the interest of scientist for fabricating bio-medically active metallic nanoparticles. In the current study, silver nanoparticles (AgNPs) were synthesized using an aqueous extract of *Fagonia indica* L., and evaluated for anticancer activity. The AgNPs were characterized using UV–Visible absorption spectroscopy, X-rays diffraction (XRD), scanning electron microscopy (SEM), Dynamic Light Scattering (DLS) and Fourier transformed Infrared (FTIR) spectroscopy. The synthesized AgNPs were highly stable (Zeta potential, -16.3 mV), spherical, monodispersed with a crystal size ranges from 10-60 nm. MTT cell viability assay shows concentration-dependent inhibition of the growth of MCF-7 cells at an IC₅₀, 12.35 µg/ml. The fluorescent microscopy confirms morphological changes (AO/EB assay) in the cell membrane and cause nuclear condensation (DAPI assay). The flow cytometry analysis confirms the apoptotic cell death (Annexin-V/PI assay) and activation of caspase 3 & 9 activities. The intracellular ROS was also found at an elevated level. Taking all these data together, it is suggested that *Fagonia indica* modulated AgNPs may be a potential agent for the inhibition of breast cancer cells. This is the first study using *Fagonia indica* leaves extract for the synthesis of bioactive silver nanoparticles against breast cancer cells.

Ikram Ullah

Deputy Manager
Qarshi Herb Research Center
Qarshi Industries Pvt. Ltd. Hattar Haripur

Ikram Ullah [Ph.D.], is a biotechnologist. He did his Ph.D degree from Quaid-i-Azam University (QAU) Islamabad-Pakistan in 2018 under the supervision of Prof. Dr. Zabta Khan Shinwari. During Ph.D study, he won TUBITAK 2216-research fellowship and worked as an international researcher in Yildiz Technical University Istanbul Turkey under the supervision of Prof. Dr. Adil M. Allahverdiyev for one year. His Master degree is also in Biotechnology from QAU in 2011 and bachelor degree in Biotechnology from University of Malakand, Pakistan in 2008 with distinction. He is a young growing research scientist with many diverse research experiences. His research interest includes development and discovery of therapeutic Nanomedicine against infectious organisms and cancer, cytotoxicity and bioassays development. He is author and co-author of more than 27 research and review papers and a book chapter. He published in Elsevier, Scientific Report, Nanomedicine and PubMed publishing organization with an impact factor more than 50 and citation score more than 370. He is also reviewer of many reputed journals like Human and experimental Toxicology, Toxicology and Industrial Health, Herbal medicine, applied organometallic chemistry, Journal of advance bioscience & bioengineering and 3 Biotech. He has more than 3.5 years Industrial experience and one year teaching experience at university level. Currently, he is working as Deputy Manager, in Qarshi Herb research center, Qarshi Industries Pvt. Ltd. Hattar.

Endophytic Bacteria from Medicinally Important Plant *Fagonia indica* as a Source of Sustainable Alternative Medicine

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Abstract

Endophytes, microbes residing within plants, are a potential source of important chemical compounds with varied applications including therapeutics. Ethnobotanical importance of medicinal plants has been known for centuries in complimentary medicine and thus represents a valuable resource for bioprospecting endophytes. Biosynthesis of various metabolites by endophytes associated with *F. indica* is of crucial importance in this regard. The present study aims at successful isolation, identification of endophytic bacteria and their screening for bioactive metabolites quantification as well as *in vitro* pharmacological activities. 16S rRNA gene sequencing was used for the identification of bacteria. Their crude extracts were evaluated for total phenolic contents (TPC), total flavonoids contents (TFC), DPPH free radical scavenging activity, reducing power (TRP) and total anti-oxidant (TAC). Further screening was done for antimicrobial activity, antileishmanial activity and protein kinase inhibition. Results show that the isolated bacterial strains belonged to various genera such as *Bacillus*, *Enterobacter*, *Pantoea*, *Erwinia* and *Stenotrophomonas*. Among all, *B. subtilis* and *S. maltophilia* showed highest phenolic and flavonoids contents i.e. 243 µg and 15.9 µg/ mg of extracts respectively. Significant TAC (37.6 µg / mg of extracts), TRP (206 µg /mg extracts) and DPPH free radical scavenging activity with IC₅₀ value of 98.7 µg /mL were estimated for *S. maltophilia*. Significant antibacterial activity was observed against *Klebsiella pneumonia* and *Bacillus subtilis* by *S. maltophilia*. An extract derived from *E. cloaca* was active against *Leishmania tropica* with IC₅₀ value of 1.4 µg /mg of extract. *B. subtilis* and *B. tequilensis* correspondingly exhibited significant protein kinase inhibition of 47 ± 0.72 and 42 ± 1.21 mm bald zones, indicating anti-infective and antitumor potential. Our findings revealed endophytic bacteria from medicinal plants may serve as treasure trove for searching sustainable alternative to medicinally important compounds.

Lubna Rahman

PhD Scholar

Department of Biotechnology

Quaid-i-Azam University, Islamabad, Pakistan

Ms. Lubna Rahman, PhD student of Biotechnology, Quaid-i-Azam University, Islamabad, Pakistan. She is working on (Bioprospecting therapeutic potential of secondary metabolites of endophytic fungi isolated from medicinally important plant *Fagonia indica*). During MPhil, she did her work on endophytic bacterial secondary metabolites isolated from *Fagonia indica*. She studied different biological activities of extracted bacterial metabolites and got positive results and hence can be used in many areas including medicine, agriculture and industry. She also evaluated the cytotoxic activities of these extracts that proved to have good potential in the field of drug development. She has also been awarded “Best student of the year award “being the most devoted and hardworking researcher by her lab during her MPhil research. To date, she has published 3 articles and 2 review papers. In future, she has commitment with combination of different bioassays and chemical analysis techniques to improve screening efficiency for the isolation of novel bioactive compounds to be used as complementary medicines.



Endophytes of Medicinally Important Plant *Ajuga bracteosa* as Emerging Bionanofactories

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Abstract

Biosynthesis has emerged as a frontier technology for fabrication of functionally diverse nanoparticles that possess tremendous therapeutic implications. Various biological resources have already demonstrated their potential to produce nanoparticles with interesting features. Endophytic microbes live in a symbiotic relationship with plants possessing a unique and versatile reservoir of potentially therapeutic secondary metabolites having the tendency to reduce metallic ions in to nanoparticles. Endophytes associated with medicinal plants may produce different secondary metabolites which we think is from plant but actually they are from endophytes. Therefore, endophytes should be considered in researches on compounds medicines or secondary metabolites. The research work is focused on isolation of endophytic bacteria from medicinal plant *Ajuga bracteosa* and utilization of these endophytic bacteria for the synthesis of nanoparticles. *Ajuga bracteosa* have medicinal importance due to its use in traditional medicine and as well as used in Ayurveda to treat certain diseases. Moreover, it has antimicrobial, anthelmintic, anti-inflammatory properties etc. Endophytic bacteria mediated nanoparticles also showed different therapeutic effects like antibacterial, antifungal, antioxidant etc. Further studies are needed to understand the mechanism of biopharmaceutical effects of these endophyte-mediated Nps.

Sidra Rahman

M. Phil Scholar

Department of Biotechnology

Quaid-i-Azam University, Islamabad, Pakistan

Sidra Rahman is a young research scholar in the field of Biotechnology and exclusively Nanotechnology, believes in efforts and hard work. Currently, she is a research student of M. Phil 4th and currently enrolled under the supervision of Professor Zabta Khan Shinwari. Her research work includes the research on medicinal plant associated endophytic bacteria mediated synthesis of nanoparticles. She is interested in utilization of these nanoparticles for the well fare of mankind in terms of medical applications. She strongly believes that research never ends and that's why she is trying to know more and more about Nanotechnology. To achieve her career goals, she needs to learn much more about current international scenario, developments, skills and techniques in understanding the aspects of life sciences, its implementation and extension. The proposed workshop will provide her with the theoretical and practical understanding, and in depth ideas of practical approaches in aiding managerial decision-making and research skills to enable me to develop and expertise in the core areas of scientific fields.

Green-synthesized zinc nanoparticles as a novel virucidal agent against prophylaxis of vaccine-derived poliovirus infection

Tanzeel Zohra^{1,5,6*}, Ali Talha Khalil^{2,3,4}, Safia Ahmed¹, Muhammad Masroor Alam^{5,6}, Ribqa Akhtar⁶, Muhammad Salman⁵, Aamer Ikram⁵, Zabta Khan Shinwari^{1,2}, and Malik Maaza^{3,4}

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Abstract

Immunodeficient persons (iVDPV) encounter chronic prolonged excretion of vaccine derived poliovirus and presents a personal risk of poliomyelitis to other individuals as well as offers deliberate risk of delayed global polio eradication. Prospective use of antiviral drugs can help in the mitigation and management of accidental ongoing outbreaks. Efforts to discover antivirals against poliovirus are ongoing. The interface of nanotechnology and biology has revolutionized research for providing innovative nanomedicinal solutions for different health issues. This study was aimed to investigate the cytotoxicity of *Momordica charantia* synthesized ZnONPs against enteroviruses derived RD cell line, specifically Poliovirus derived Hep-2C and L20 cell lines as well as to evaluate the antiviral activity against Sabin poliovirus PV3 and PV1 strains. The synthesized ZnONPs of the average size 53 nm with nanorod like morphology were further characterized using diverse techniques like Ultraviolet-Visible spectroscopy, X-ray diffraction, HR-SEM, HR-TEM, Selected Area Electron Diffraction, Energy Dispersive Spectroscopy and Fourier transformed infrared spectroscopy. *In vitro* cytotoxicity and anti-poliovirus activity were daily evaluated for cytopathic effect (CPE) with the help of inverted light microscopy. CPE was determined in tested cells by comparing them with negative and positive control wells; viability was assessed with MTT assay and by staining method with crystal violet. No CPE of RD, L20 and Hep-2C cells was seen with ZnO NPs at concentration of 250ug/ml to 25 ug/ml in well in days post-incubation. The antipoliovirus activity of ZnO NPs was determined corresponding to the viral concentration of 1TCID₅₀, 10TCID₅₀ and 100TCID₅₀ (Tissue Culture Infective Dose) and incubated for 2 days which resulted in strong cytopathic effect, cell viability was only found up at concentration of 1TCID₅₀. To our best knowledge, there are very few articles of theranostic application of biosynthesized nanoparticles against non-enveloped viruses. The present study would be useful for further application in the field of nano biomedicine for polioviruses and other enteroviruses, as well as can be further assessed for other viral pathogens.

Tanzeel Zohra

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Tanzeel Zohra attended Quaid-i-Azam University, Islamabad and earned her M.Phil degree in Biotechnology under the supervision of UNESCO laureate Prof. Dr. Zabta K. Shinwari. She has been an active researcher throughout her academics period. During her studies, she voluntarily worked with Pakistan Academy of Sciences and successfully organized more than a dozen scientific conferences/workshops. She also joined Pakistan Biological and Safety Association (PBSA) as a Life Time Member and has participated in numerous workshops on biosafety and biosecurity. Currently, she is working as a research trainee in WHO Regional Reference Laboratory for Polio Eradication Initiative, National Institute of Health, Islamabad. In parallel to this she is also working as a trainee in CDC National Influenza Lab Based Surveillance project. She is amongst the few students from Pakistan who were selected to participate in an international workshop on Biosecurity and Tissue Collection Integrity, Amsterdam, Netherlands. Her research work has been published in different international journals. Now she is planning to pursue her PHD degree. Her professional profile exhibits that she is very ambitious, passionate and eager to contribute towards science.

Biocompatibility and toxicity of gold nanoparticles biosynthesized using *Monotheca buxifolia* leaf extract

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Abstract

In this contribution a complete green route was adopted for biosynthesis of gold nanoparticles using *Monotheca buxifolia*. The synthesized nanoparticles were characterized using diverse techniques and their biological potential was investigated using diverse bioassays. Green method was used for nanoparticles syntheses which were then characterized by UV, FTIR, XRD, ERD, SEM, TEM and TG/DTA. Biological activities were performed including antioxidant, antibacterial, antifungal, hemagglutination, cytotoxic, thrombolytic, hemolytic and Ames assay. The crystallite of gold nanoparticles (AuNPs) had different shapes. FTIR spectra indicated several functional groups primarily phenols as potential reducing and amide as stabilizing agents. AuNPs revealed highest free radical potential as compared to *M. buxifolia* extracts. *M. morganii* was found to be the most susceptible strain to AuNPs. Growth of Vancomycin Resistant *Staphylococcus aureus* was also inhibited. Furthermore, no mutagenic properties were shown by the biogenic AuNPs. Significant insecticidal activities were revealed for AuNPs and plant extract against all test insects. In addition, the biogenic gold nanoparticles manifested significant cytotoxicity. AuNPs possessed no mutagenic potential against human DNA and revealed moderate thrombolytic activity. Aqueous extract was hemolytic at high concentration while AuNPs were slightly hemolytic. AuNPs showed cent percent mortality against insects. Results suggest broad applications of biogenically derived gold nanoparticles.

Asma Shah

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Dr. Asma Shah has completed PhD Biotechnology from Center of Biotechnology and Microbiology, University of Peshawar, Peshawar, Pakistan. During PhD, she worked on eco-friendly synthesis of nanoparticles. She has also worked in the field of medicinal plants and ethno-pharmacology. She has a single peer reviewed publication. She has working plan on the biosynthesis of nanoparticles/ nanocomposites and their applications and toxicity. Dr. Asma Shah is further committed to applied research in nanoscience and aims to start a bioinspired materials-graphene research group. She further welcomes any potential collaborators.

Chemical Constituents from Medicinally Important *Ferula oopoda* (Boiss. & Buhse) Boiss

Sheikh Zain Ul Abidin^{1,2,4}, Raees Khan⁴, Mushtaq Ahmad⁴, Muhammad Zafar⁴, Shazia Sultana⁴, Ebru erol², Zulfikar Ali², Asma Saeed¹, and Ikhlas A. Khan^{2,3}

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Abstract

Ferula oopoda (Boiss. & Buhse) Boiss. (Apiaceae) is a common native species in Northern Baluchistan, Pakistan. The phytogeography of this species is mainly Mediterranean area and Central Asia¹. Medicinally, *F. oopoda* is traditionally used to cure and control many ailments such as intestinal worms, hemorrhoids, aphrodisiac, sedative and digestive. This study aims the isolation and characterization of secondary metabolites of *F. oopoda*. Eleven compounds including three monoterpene-phenyl esters (1-3), a monoterpene glucoside (4), five sesquiterpenoids/sesquiterpene-phenyl esters (5-9), a phenolic acid glucoside (10), and uridine (11) were isolated from the aerial parts of *Ferula oopoda* (Boiss. & Buhse) Boiss. Structures of the isolated compounds were elucidated by 1D and 2D NMR spectroscopic methods and comparison with previously reported data. Compound 1 was found to be new compound. NMR data of compounds 5 and 6 are reported here for the first time. Moreover, these compounds were reported for the first time from this species. This paper deals with the isolation and structure elucidation of the metabolites from *F. oopoda* and their chemotaxonomic significance.

Sheikh Zain Ul Abidin

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Mr. Sheikh Zain Ul Abidin is a one of the young researcher in the field of Botany with specialization in Plant systematics and Biodiversity. Currently, he has completed Ph.D. in the department of Plant Sciences, Quaid-i-Azam University Islamabad. Mr. Zain has published more than 08 research articles in various journals of good repute. Currently, he is working as Research Associate in International project on Digitization of Flora of Pakistan with special reference to Data mobilization and Georeferencing of Plant occurrence from Pakistan funded by GBIF. He has presented many research papers in National as well as International conferences. His fields of interest are Plant Biodiversity surveys, Natural Product Research, Antioxidants, Phytochemicals, Extraction of Natural Products, Wild Food Plants, their traditional knowledge and food composition. He has good expertise in management and digitization of Herbarium and has capacity to develop and establish botanical garden.

Precursor effects on the physical, biological and catalytic properties of *Fagonia indica* (Burm.) mediated ZnO NPs

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Abstract

We report a facile, green and precursor based comparative study on the biosynthesis of ZnO nanoparticles using anti-cancerous *Fagonia indica* as effective chelating agent. Biosynthesis of ZnO nanoparticles (ZnONPs) was carried out using zinc sulfate and zinc acetate as precursor salts under similar experimental conditions. The synthesized ZnO nanoparticles were characterized extensively for physical and biological properties. Scherer equation deduced a mean crystallite size of ~ 23.4 nm (ZnOA) and ~ 41 nm (ZnOS) for ZnO nanoparticles. The nature of the nanoparticles was compared using UV, DRS, FTIR, TGA-DTG, SAED, EDS, Zeta potential, HR-SEM and HR-TEM. Detailed *in vitro* pharmacognostic activities revealed a significant therapeutic potential for ZnOA and ZnOS. Potential antimicrobial activities for the nanoparticles and their nanoscsmaceutical formulations are reported. Dose dependent cytotoxicity was revealed against leishmanial promastigotes while ZnOA being more effective than ZnOS. Significant antioxidant and protein kinase inhibition was revealed. The hemolytic assay indicated a hemocompatible nature of the nanoparticles. Catalytic degradation of crystal violet dye (CVD) by nanoparticles was investigated under different parameters (Light, Dark and UV). In addition, Sonophotocatalytic degradation of CVD was also studied. Our results indicate that the precursor(s) can have a significant effect on the physical, biological and catalytic properties of the biosynthesized nanoparticles.

Safia Hameed

Research Scholar

Department of Biotechnology

Quaid-i-Azam University, Islamabad, Pakistan

Safia Hameed is a young research scholar in the field of Biotechnology and exclusively Nanotechnology, she believes on efforts and hard work. She has done her M.Phil by securing 4.1/5.0 CGPA under the supervision of Prof. Zabta Khan Shinwari. She have expertise in the field of Nanotechnology, like Nanoparticles formation their Characterizations and biological activities and recently published her paper in journal of Nanomedicine, she have made Nano Composite by green Nanotechnology procedure, she is interested in Nano-Antibiotic formation and its Delivery pathways and she have strong believe that research never ended and that's why she is trying to know more and more about Nanotechnology. She got her BS degree in biotechnology from Bacha Khan University Charsadda in 2016 with good grades and received Gold medal. She did plenty of research work in different research institutions in Pakistan like NIFA and NCP. She is the 2018 fellow of HSP health security partner Washington DC for a year from Pakistan and have attend international conference on infectious diseases in Baku, Azerbaijan

Salvia moorcroftiana mediated green synthesis of Zinc Oxide nanoparticles and evaluation of their biomedical applications

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Abstract

Salvia moorcroftiana also known as *Kallijari* (Urdu name) is an important medicinal plant mostly found in the regions of Himalayas in Pakistan. It is traditionally used in curing various ailments like fever, inflammation, cough, dysentery, itchy skin, colic, healing of wounds and hemorrhoids. In our study, potential metabolites of *S. moorcroftiana* were utilized for the synthesis of zinc oxide nanoparticles (ZnO Nps). We performed *in vivo* and *in vitro* experiments to test *S. moorcroftiana*-mediated ZnO NPs for their therapeutic as well as toxic effects. ZnO NPs (dose: 50 mg kg⁻¹ and 5 mg kg⁻¹ body weight) were administered in healthy female albino rats through oral route for 14 days. Solvent-based toxicity of biosynthesized Zn ONPs was checked by taking different parameters like blood glucose levels, physical changes, histopathological analysis of liver i.e. estimation of antioxidants enzyme content including sulfur oxide dismutase (SOD), peroxidase (POD), catalase (CAT), reactive oxygen species (ROS), and thiobarbituric acid reactive species (TBARS) of liver etc. Results of the study showed elevated levels of liver antioxidant enzymes and slight gains in the body and organ weights of some rats including substantial reduction in glucose levels as compared to control group on dose-dependent manner. From histological and biochemical results; it is concluded that toxicity of biosynthesized ZnO NPs is comparatively much lower than the chemically and physically synthesized Zinc Oxide nanoparticles.

Nasir Ali

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Mr. Nasir Ali is M. Phil scholar in Molecular systematic and Applied Ethnobotany Laboratory (MoSAEL), Quaid-i-Azam University Islamabad, Pakistan. Currently he has biosynthesized Zinc Oxide nanoparticles from medicinally important plant *Salvia moorcroftiana*. He conducted study to test biosynthesized zinc oxide nanoparticles for *in vitro* biological applications. Furthermore, he also checked nanoparticles for *in vivo* toxicity using rats as animal model. He has received his B.S (Hons) degree in Biotechnology from the Gomal University Dera Ismail Khan in 2013 with A grade. During his study in Gomal University, he joined the biotechnology department of Gomal Centre of Biochemistry and Biotechnology (GCBB) and conducted research on “Prevalence of genetic eye disorders in Tehsil Kabal District Swat” under supervision of Dr. Muzammil Ahmad Khan (Assistant Professor; Ph.D., Post Doc). In 2017, he joined the Department of Biotechnology, Quaid-i-Azam University Islamabad and joined research in Molecular systematic and Applied Ethnobotany Laboratory (MoSAEL), under the supervision of Tenured Professor. Dr. Zabta Khan Shinwari (Tenured Professor, UNESCO laureate, QAU Islamabad). His current research interests include Biotechnology, Nanotechnology, Nanotoxicology, *in vitro* and *in vivo* applications of nanoparticles, and Green synthesis of nanoparticles. Currently he has three publications while most papers are under process for publications.

Parveen Nisar

M. Phil Scholar

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Ms. Parveen Nisar is M. Phil scholar in Molecular systematic and Applied Ethnobotany Laboratory (MoSAEL), Quaid-i-Azam University Islamabad, Pakistan. Currently she has conducted research entitled “Isolation, molecular characterization and biological activities of endophytes from *Punica granatum*”. During her research work; she worked to evaluate secondary metabolites isolated from endophytic bacteria for *in vitro* biological applications. Furthermore, she also assessed secondary metabolites for *in vivo* toxicity using Brine shrimp lethality assay. She received her B.S (Hons) degree in Biotechnology from the University of Malakand in 2016 with A grade. During her study in University of Malakand, she conducted research entitled “Effects of high temperature frying of Spinach leaves in sunflower oil on carotenoids, chlorophylls, and tocopherol composition.” under supervision of Dr. Alam Zeb (Associate Professor; Ph.D.). In 2017, she joined the Department of Biotechnology, Quaid-i-Azam University Islamabad and joined research in Molecular systematic and Applied Ethnobotany Laboratory (MoSAEL), under the supervision of Tenured Professor. Dr. Zabta Khan Shinwari (Tenured Professor, UNESCO laureate, QAU Islamabad). Her current research interests include Biotechnology, Plant Biotechnology, Microbial Biotechnology, Nanotechnology and *in vitro* and *in vivo* applications of secondary metabolites. Currently she has one publication while most papers are under process for publications.

Medicinal Plant Biodiversity used among the Rural Communities of Arid Regions of Punjab, Pakistan

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Abstract

The aim of this survey was to document the medicinal uses of plants in arid regions of the Punjab province, Pakistan. The people hold their different ways of life, interpretations and traditions and have been using local plants for different designs for generations. The ethno botanical results show the quantitative information on documented medicinal plant diversity in the region. The data was gathered through semi-structured interviews, rapid assessment approach, open ended questionnaire and personal reflections. Outcomes were examined using quantitative indices of information consent factor (ICF), fidelity level (FL), use value (UV), frequent citation (FC) and relative frequency citation (RFC). In total, 84 plants species belonging to 35 families were reported for the medicinal purposes. Fabaceae was found to be a predominant family in terms of species in the area with 9 species. The leaves were noted as most frequently used parts (38%). Decoction (25%) was the most commonly used preparation method. The highest ICF was reported for Glandular diseases. Fidelity level varies from 59 % to 100%. The high usage value of medicinal plant in this study should be screened for the pharmacological research for bio active phytochemical compounds that are necessary for the synthesis of new drug for various diseases.

Shomaila Ashfaq

PhD Scholar

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Ms. Shomaila Ashfaq is enrolled Ph.D Scholar in Department of Plant Sciences (Plant systematics and Biodiversity lab) under the supervision of Dr. Mushtaq Ahmad and Dr. Muhammad zafar from Quaid-i-Azam University Islamabad. Her field of interests is Medicinal Plants, Ethnobotany and Systematics. Shomaila is an active researcher having expertise in Medicinal Plant biodiversity and Eco taxonomy of Arid regions. She has planned many research projects in Ethnopharmacology, Ethnobotany and Plant Systematics at local, regional and global level.

Current Status of Medicinally Important Plants for Treatment of Diabetes in Sindh-Pakistan

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Abstract

The use of anti-diabetic plants is well anchored in the traditional health care system of Pakistan. The study aims to document indigenous knowledge about medicinal plants used against diabetes among local community people, herbal seller, Traditional Health Practitioners (THPs) and diabetic patients. Further it is aimed to authenticate data by comparing with previous published literature about diabetes. The data was collected during field surveys from 147 local people, 43 herbal sellers, 87 THPs and 63 diabetic patients using open ended and semi-structured questionnaires. In results, life forms, families, plant part used and modes of preparation were analyzed. In quantitative analysis, Relative Frequency of Citation percentage (RFC %) and Disease Consensus Index (DCI) were calculated. While for authentication and highlighting important anti-diabetic plants, we compared current data with previous ethno-botanical and pharmacological studies. In total, 91 plant species were reported. In life forms, herbs with 36 reports are the most dominant form. The leaves having 45% reports are the most frequently plant part used followed by the fruits (40 %). In modes of preparations, the most preferred method was decoction (24%) followed by juice (23%) and Powder (21%). In quantitative analysis, the RFC% ranges from 15 to 32 while DCI varies from 0.18 to 0.78. The present study revealed that use of anti-diabetic plants shows the common heritage of THPs in the various cultures of Pakistan. A good knowledge of the traditional use of anti-diabetic plants based on Ethno-botanical studies is very important in designing pharmacological and clinical trials for Diabetes Miletus management. It is recommended that pharmacological and phytochemical studies should be conducted on plants lacking previous records, especially on those having highest Frequency of Citation (FC), Disease Consensus Index (DCI) and Relative Frequency of Citation percentage (RFC %) values.

Ghulam Yaseen

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Dr. Ghulam Yaseen is a one of the young researchers in the field of Botany with specialization in Plant systematics and Biodiversity. Currently, he has completed Ph.D. in the department of Plant Sciences, Quaid-i-Azam University Islamabad. Dr. Yaseen has published more than 25 research articles in various journals good repute and has published a book. He has also contributed various book chapters in international books. Currently, he is working as Research Associate in International project on Digitization of Flora of Pakistan with special reference to Data mobilization and Georeferencing of Plant occurrence from Pakistan funded by GBIF. He has presented many research papers in National as well as International conferences. Further, he has published book chapters in the field of medicinal plants used as food and medicine. His fields of interest are plant biodiversity surveys, wild edible plants, their traditional knowledge and food composition. He has good expertise in management and digitization of Herbarium and has capacity to develop and establish botanical garden.

Role of Unani Medicine in Improving Quality of Life of Thalassemia Patients

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Abstract

Thalassemia is a major health problem, placing an immeasurable emotional, psychological and economic burden on millions of people around the World. It is more prevalent in Mediterranean region but now it is found all over the world. The estimated prevalence is 16% in people from Cyprus, 1% in Thailand, and 3-8% in populations from Bangladesh, China, India, Malaysia and Pakistan. As current therapeutic strategies are constrained and adherence is suboptimal; so that patients still suffer disease complications and significant burden from chronic treatment with transfusions and chelation. In this scenario the main treatment option for most patients is nurturing them by improving their quality of life. A cross-sectional study was conducted in Faculty of Eastern Medicine, Hamdard University among children and adolescents with thalassemia who received treatment in Hussaini Blood Bank. Already diagnosed 131 subjects, male (n=77) and females (n=54) between 12-22 years of age were interviewed and examined using a validated questionnaire which included complete history, general physical and systemic examination, body mass index calculation and temperamental assessment. Quality of life (QoL) assessment was performed using the four temperamental characteristics based questionnaire. The clinical information about the disease history and lab findings pertaining to blood transfusion, blood indexes and medications were also recorded. The vital signs of the patients such as temperature (?F), pulse (beats/min) and blood pressure (mm Hg), were measured following standard procedures. Out of 131 patients enlisted, 63 percent patients exhibited better QoL after changing their lifestyle and dietary habits and choices. The Physical, Psychological, Mental status were improved after following guidelines based on Unani Medicine perspective. This study revealed Unani Medicine concept of the role of six essential factors is much more than just the mere avoidance of disease.

Tabiba Syma Ghayas

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Tabiba Syma Ghayas is a PhD fellow in Eastern Medicine from Hamdard University University, Karachi, Pakistan. Her M. Phil research work is based on the Philosophy of Four Humours in Health and Disease Applying Clinical and Conventional Laboratory Techniques. To date, she has published 5 research articles. She has participated in many national and international seminars, conferences and workshops. She is a lifetime member of Pakistan Association for Eastern Medicine (PAEM). At present, Tabiba Syma Ghayas is serving Department of Principles of Eastern Medicine, Faculty of Eastern Medicine, Hamdard University, Karachi, as Assistant Professor, where she is teaching Medical Physiology and Principles of Eastern Medicine courses since 15 years as well as she is a chairperson, Health and Education Awareness Committee, and an active member of many academic committees of Faculty of Eastern Medicine, Hamdard University.

Analysis of Unani coded formulation on the diagnostic parameters and hormonal imbalance in polycystic ovarian syndrome (*Takyees al Mabayedh*)

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Abstract

Polycystic ovarian syndrome (PCOS) is a common endocrine disorder in reproductive age women. Unfortunately the medications currently available for the treatment of PCOS have their own limitations. Unani system of medicine has a balanced and moderate approach for treating diseases such as PCOS based on the concept of *Nazriya Akhlaat* (Theory of humours). Treatment of PCOS is a major challenge therefore a research study was conducted to evaluate the efficacy of Unani coded formulation *Picolin* designed into two dosage forms capsule *Picolin* (Crude form) and tablet *Picolin-E* (Hydroalcoholic extract) both the test groups were compared with positive control metformin group. Acute toxicity, anti-oxidant and anti-inflammatory activities were performed to assess its safety and therapeutic potential the hydroalcoholic extract of Unani formulation in acute toxicity test showed no sign of undesirable effects, morbidity and mortality in female mice (n = 20) during 14 days observation period. The antioxidant activity was 56% and was measured by DPPH. The anti-inflammatory activity was carried out in rats by carrageenan induced rat paw edema and it demonstrated maximum activity after 3 hours and maintained its activity till the 4th hour, which was greater than the standard drug diclofenic sodium. Then the clinical studies were conducted patients (n = 90) fulfilled the inclusion criteria while (n = 73) continued and completed the 12 weeks treatment period. Our clinical trial validated the efficacy of the Unani formulation which exhibited improvement in menstrual cycle frequency and flow and in the endocrine parameters i.e. serum fasting insulin and prolactin. Before treatment the insulin level was 14.8 ± 1.8 , 16.7 ± 1.7 and 17.4 ± 1.6 in capsule *Picolin*, tablet *Picolin* and metformin group whereas after treatment, 28%, 44% and 6% reduction in insulin level was observed the best response was for tablet *Picolin-E*. The menstrual cycle flow after treatment was improved by 80%, 63% and 54% in capsule *Picolin*, tablet *Picolin-E* and metformin treated groups respectively. The polyherbal formulation demonstrated promising therapeutic effects which is a valuable contribution for the management of PCOS however, further research studies are required.

Tabiba Leena Hameed

Lecturer

Faculty of Eastern Medicine, Hamdard University, Karachi

Academic qualification

Hamdard University Karachi	M Phil (Eastern Medicine)	2014-2018
Hamdard University Karachi	Bachelor of Eastern Medicine and Surgery	2008-2013

Professional Experience

- Lecturer in Department of Basic Clinical Sciences
- (Pharmacology and Bioinformatics, Faculty of Eastern Medicine, Hamdard University) (2014- present)
- Training as a demonstrator (October, 2013- March 2014)
- OPD consultation in Shifa-ul-Mulk Memorial Hospital (Hamdard University)

Research Interest

- Polycystic ovarian syndrome
- Evidence based Unani medicine
- Gynecological and Endocrinal disorders

Honor and Awards

- Name being mentioned in the Book of Galaxies of WHO'S WHO 2012 for being best student in Hamdard University
- Achieved two gold medals in the year (2013) B.E.M.S for being the best graduate and position holder
- 1st Position in speech competition on No Tobacco Day 2013
- Shifa-ul-Mulk Memorial Hospital Certificate Award of House job in Annual function of FEM 2015

Memberships

- Pakistan Association of Eastern Medicine PAEM 2008-present
- Membership certificate of Institute of Research Promotion Innovator club

Native medicinal plant species as potential phytoaccumulators of heavy metals from the contaminated soils around Nashpa oil field; A step towards clean and cure the polluted environment

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Abstract

Medicinal plants are not only alternate to cure the diseases, these are alternatives to cure and clean the ecosystem and environment. The aim of the current study was to evaluate the level of heavy metals in studied area and the potential of medicinal native species, i.e., *Withania coagulans*, *Rhazya stricta* and *Calotropis procera* as phytoaccumulator using atomic absorption spectrometry. Heavy metals were monitored in soil as well as these plant species collected from four cardinal directions (North, South, East and West) at Nashpa-Mela oil and gas field situated in district Karak Pakistan. Proline estimation and chlorophyll contents were studied to assess the resistance and plants health. On comparing native plant species, the best heavy metals remediation potential to variety of heavy metals was observed in the *C. procera* followed by *W. coagulans*, *R. stricta*. *C. procera* is a sturdy xerophytic plant and was observed growing well at all the polluted sites. General tendency of heavy metals present in the region around field in plant parts and soil sample were in order of North > West > South > East. The highest heavy metals uptake was observed in *C. procera* from North sites and at the nearest points to Nashpa-Mela fields. The ratio of heavy metals remediated by the above mentioned plants was Zn followed by Mn, Fe, Ni, Pb, Cu, Cr and Cd. In Zn and Cd samples maximum co relation coefficient were examined. Significant correlation between degree of contamination and concentration of Zn and Cd in the plant samples recognizes *C. procera* as an operative heavy metal remedial of contaminated lands along the environmental stressed condition for plant around the studied oil and gas field. It thus advocated that medicinal plants not only cure the diseases it also cure the ecosystems.

Shujaul Mulk Khan

Assistant Professor
Department of Plant Sciences
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Dr. Shujaul Mulk Khan was born in a village of District Swat, Khyber Pakhtun Khwa Pakistan. He got various distinctions including Quaid-i-Azam award in BSc and 3rd position in his MSc Botany in the whole province of then NWFP. He went to UK for PhD studies in 2008 under HEC Scholarship and got PhD degree from University of Leicester, UK in 2012 with a best thesis award in the School of Biological Sciences followed by Post Doctorate Fellowship in 2013 from the Centre for Landscape and Climate Research, University of Leicester, UK. His research focuses on Ethno-ecology of the Himalayas with a broader aims of natural resources' conservation particularly endemic plants. He has published 71 research articles with a total impact factor of more than 80 and 10 books/chapters. He supervised 5 PhD and 41 MS and MPhil students. He delivered lectures in 115 international and national events. Currently he runs ALP - PARC project on Grape cultivation in FATA, Pakistan” worth Rs. 4.89 million.

Characterization and Determination of Adulteration in *Garcinia* and Ginseng Species, and Their Commercial Products by Chromatographic and Spectrometric Techniques

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Abstract

In today's markets, the commercial products of *Garcinia cambogia* and *Panax ginseng* are available with high price in the form of tablets, capsules, decoction, carbonated drinks and teas for the treatment of obesity, digestive problems, depression, asthma, type-2 diabetes, and cancer. Due to the high price and to get high income, it is therefore, assumed that the products might be contaminated with similar species such as *Garcinia atroviridis*, *Garcinia indica*, *Garcinia mangostana*, *Platycodon grandiflorum*, *Codonopsis lanceolata*, and *Pueraria lobata*. The current study aims to evaluate and quantify adulteration in *Garcinia cambogia*, *P. ginseng* and their commercial products by ultra-performance liquid chromatography–mass spectrometry (UPLC–MS). The applied method was validated by linearity, sensitivity, precision and accuracy. Among the four *Garcinia* species, anthocyanins were detected in *G. mangostana* (cyanidin-3-*O*-glucoside, 9.01 mg/kg) and *G. indica* (cyanidin-3-*O*-sambubioside and cyanidin-3-*O*-glucoside, 28.0 and 11.0 mg/kg), whereas commercial products did not contain any anthocyanins. In the analysis of *P. ginseng*, similar species and the commercial products, two marker compounds; lobetyolin was detected in *C. lanceolata* and *P. grandiflorum* (75.9, 65.0 mg/kg), and ononin in *P. lobata* (421.8 mg/kg). *P. ginseng* and the commercial products did not show these compounds. The results of this study assured the quality of the *Garcinia cambogia* and *P. ginseng* products by identifying any fraudulent activities and hence, it might be helpful in protecting consumers' health and national economy.

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Dr. Nargis Jamila is currently serving as Assistant Professor at the Department of Chemistry, Shaheed Benazir Bhutto Women University Peshawar, Khyber Pakhtunkhwa, Pakistan. She did PhD in “Natural Product Chemistry” from Universiti Sains Malaysia, Malaysia in 2014 and served as Post Doc fellow in “Food and Medicinal Chemistry” at the Department of Food and Nutrition, Chosun University, South Korea during September 2014-January 2017. She authored more than 40 research articles published in SCI International Journals with cumulative impact factor of 65.0. She is a reviewer in several International SCI Journals such as Food Chemistry, Natural Product Research, International Journal of Biological Macromolecules, Talanta, Meat Science, and Analytical Letters. She recently (November 2018) participated as a Keynote Speaker in the 2nd National Conference on Bioactivity of Phytochemicals organized by the University of Lahore.

Investigating the Anticancer activity of Bee Propolis from Kohat Khyber Pakhtunkhwa

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Abstract

Propolis a highly viscous, natural and gummy substance that the honey bees collect from plants, flowers and leaves of trees combines with enzymes secretions and pollens of bees. Human being used propolis for decades against disease causing microorganisms and cancer. There have been several reports on anticancer activity of propolis from different parts of the World. Anticancer potential of bee propolis has been determined on different cancer cells in Malaysia, Egypt and India. Till data no data is available on the anticancer activities of Pakistani bee propolis. These interesting reports encouraged us to investigate the anticancer potential of bee propolis collected from Khyber Pakhtunkhwa on different Cancer Cells. Propolis was collected from different apiaries of district Kohat. Chemical analysis of propolis was done through GC-MS. Different concentrations of the propolis were applied to colorectal cell lines grown in 96 wells plate for 48 hrs. Cytotoxicity/Antiproliferative activity of the propolis was determined through MTT assay and cell viability assay. Results obtained from MTT assays were analysis through SPSS. Some concentrations of the propolis showed very good cytotoxic effects on colorectal cancer cell lines.

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Academic Background

2008-2011 PhD Faculty of Medicine, Dept. of General, Visceral & Transplantation Surgery, University of Ulm, Germany
Field of Specialization: Cancer Biology
Title of PhD thesis: Characterization of the role of Casein Kinase 1 delta and epsilon in tumorigenesis and progression of colorectal tumors.

2006-2008 Master/M.Phil. Molecular Biology National Centre of Excellence in Molecular Biology (NCEMB)

Research Interests

Cancer Biology, Cell Culture, Virology, Medicinal Plants

Experience as an Organizer in HEC/non HEC-funded Workshop

S. No	Title	Role	Sponsor	Date
1	"Healing Locality Through Apiculture"	Organizer	KUST	March 21, 2017
2	"Wondrous Products of Honey Bee Hive"	Organizer	HEC	May 08-09, 2017
3	"Managing Honey Bees for Healthy Outcome"	Organizer	HEC	Nov 15-17, 2017
4	Parasites: a serious threat to human and livestock	Organizer	HEC approved	March 14-15, 2018

Nanoformulations of Curcumin: A promising approach for the Treatment of Cutaneous Leishmaniasis and Secondary Bacterial Infections

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Abstract

Cutaneous leishmaniasis being a neglected tropical disease (NTD) faces several challenges in chemotherapy. If infected with secondary bacterial infections, the treatment regime of cutaneous ulcers in cutaneous leishmaniasis is further complicated which usually require two or more than two chemotherapeutic agents for healing. Curcumin is bright yellow herbal product and is obtained from medicinal plant *Curcumin longa* which possesses both antibacterial and antileishmanial properties. Due to lipophilic nature the beneficial properties of curcumin are very restricted. The aim of the study was to prepare nanoformulations of curcumin (Cur-SEDDS) with the objectives of their evaluation for the treatment of cutaneous leishmaniasis and secondary bacterial infection. Different Nanoformulations of curcumin were prepared by mixing different excipients (oils, surfactants and co-solvents) through stirring (vortex) and sonication. The formulations were characterized regarding their droplet size, PDI and zeta potential. The Cur-SEDDS formulations (F1-F7) containing a blend of different excipients displayed different sizes ranging from 32.4nm up to 80.nm. The zeta potential of the formulations ranged from -1.56 up to - 4.8. The antileishmanial activities of the SEDDS formulations in terms IC₅₀ against *Leishmania tropica* ranged from 0.19µg/ml up to 0.37µg/ml. The minimum inhibitory concentrations (MICs) of these formulations against *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* were detected in the range of 48- 62µg/ml. The hemolysis caused by formulations was 1-2%. The spreading potential of the formulations (F1 and F5) over damaged skin model was remarkable. These results demonstrate that Cur-SEDDS further enhances the broad spectrum antileishmanial and antibacterial profile of curcumin and have the potential to provide a promising tool for the treatment of cutaneous leishmaniasis and its associated secondary infections.

Momin Khan

Assistant Professor

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Dr. Momin Khan recently completed his PhD in Biotechnology from Quaid-i-Azam University, Islamabad, Pakistan. His area of research and interest is infectious diseases, nanomedicines and Novel Drug Development. He has particularly focused on the development of Nanoformulations for the treatment of infectious diseases like Leishmaniasis. Dr. Momin has 24 research publications to his credit with cumulative impact factor of 80. Currently he is serving as assistant professor in the department of Microbiology IBMS, Khyber Medical University Peshawar. He is actively engaged in research and teaching and so far He has supervised/co-supervised 21 M.Phil students. Based on excellent performance in teaching he has been conferred Best Teacher Certificate for 6 times by Quality enhancement Cell (QEC) Khyber Medical University and 1 time by QEC, University of Peshawar. He has been member of various academic and statutory bodies of the university including, Graduate Studies Committee, syndicate and PT member of QEC.

Biological synthesis of Zinc Oxide Nanoparticle via Medicinally Important Plant *Buxus papillosa* and its Biomedical Activities

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Abstract

Medicinal plants based strategy for biosynthesis of ZnO nanoparticles is getting increasingly popular as it offers several advantages relative to physical and chemical methods. Biosynthesized ZnO NPs have been demonstrated using different extract (ethanol, water and methanol) of medicinal plant *Buxus papillosa*, while composing their physical, biological and catalytic properties. The broad peaks and the energy band gap were observed at 392 (3.2 eV), 377 (3.3 eV) and 391 (3.2 eV) nm for BPNP_E, BPNP_W and BPNP_M respectively. XRD analysis suggested highly crystalline nature of the nanoparticles of size 28.37nm (BPNP_E), 68.45nm (BPNP_W) and 26.10 nm (BPNP_M) using Scherer approximation. SEM shows interesting morphology of ZnO NPs like rod shape (BPNP_E) and dendrimers like (BPNP_W) and (BPNP_M). FTIR spectra suggest the role of phytochemicals in the reduction of metal salt to nanoparticles. Zeta potential indicates the stability as well as negative charge on ZnO nanoparticles. In case of antimicrobial activity all samples actively inhibited bacterial and fungal strains; however, BPNP_M significantly inhibited *S. Epidermis* and *A. niger*. Cytotoxicity of the nanoparticles was studied which indicated a dose dependent inhibition. Non-significant inhibition of protein kinase was reported while effective enzyme inhibition activity was determined through AChE and BChE inhibition.

Dania Zia

M. Phil Scholar

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Miss Dania Zia has completed M. Phil Biotechnology under the supervision of Prof. Dr. Zabta Khan Shinwari, from Quaid-i-Azam University, Islamabad, Pakistan. Her research work is based on the interface of nanotechnology, material sciences and biotechnology. To date, she has 7 published research articles with cumulative impact factor > 12. She has expertise in the field of Nanotechnology, like nanoparticles formation. She is interested in utilization of these nanoparticles for the well fare of mankind in terms of medical applications. She has a strong believe that research never end so for this she is trying to know more and more about Nanotechnology.

Attenuation of Diazepam withdrawal Symptoms by Traditional Medicinal Herb *Valeriana officinalis* in Comparison with Dietary Agmatine

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Abstract

Diazepam withdrawal syndrome may be even life threatening if not managed correctly. *Valeriana officinalis* is one of the most popular medicinal plants used to treat insomnia, mild anxiety and reduce muscle tension whereas, use of valerian preparations with conventional medications can lead to the potential herb-drug interactions. Agmatine has been evolving as reputed alternative therapeutic implements that could assist traditional pharmacotherapy. It is found in seeds of various leguminous and gramineous plants and fermented foods. 36 male Albino wistar rats were divided previously into water and diazepam groups for 21 days whereas, animals were allocated further into three groups: a. water b. agmatine and c. valerian root extract for 7 days. Behaviors were assessed in open field test, marble burying test, elevated plus maze test and withdrawal scoring scale. Animals treated with valerian root extract demonstrated improved activity in open field test and elevated plus maze test in comparison with agmatine. Valerian also decreased % of marbles buried and withdrawal symptoms more effectively than agmatine. Present study determines that valerian root extract and dietary agmatine are potential therapeutics and can be used complementary for diazepam withdrawal symptoms.

Hira Rafi

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In 2012, graduated in Biochemistry from University of Karachi and developed interest in biochemical principles and associated methods during bachelors that motivated to get Master's degree in 2014 from Department of Biochemistry, University of Karachi. Efforts and experience convinced to fortify interests in neuropharmacology and clinical biochemistry and in 2015 got enrolled in MPhil leading to PhD program in the same department and started research in neuropharmacology and behavioral sciences. Since then, working on a novel neurotransmitter agmatine and its therapeutic potentials on various clinical and behavioral aspects and have developed different neuroethological animal models including memory and cognitive impairment, addiction and withdrawal, oxidative stress and chronic mild stress using albino Wistar rats. Currently, seven published research papers in reputed national and international scientific journals and expected to submit PhD this autumn.

Antioxidant activity and mechanism of two xanthone isomers isolated from *Dryopteris ramosa* (Hope) C. Chr

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Abstract

Plants have been used as a source of novel bioactive substances. *Dryopteris ramosa* (Plant family: Dryopteridaceae) is one of an important medicinal plant species of Pakistan, being used in traditional medicine for the treatment of gastric ulcer and constipation. But beside its ethnomedicinal importance and reliable use, it is never been investigated for its phytochemical constituents. Present study is aimed to isolate bioactive phytoconstituents and to identify their free radical scavenging potential. We also aimed to correlate the structural activity correlation of isolated compounds to their antioxidant potential. Plant material was collected from galyat region and methanol extract is prepared by cold crude maceration technique. For the isolation of pure compounds HPLC and TLC chromatographic techniques were used. The isolated compounds were identified by using various techniques including UV-absorption spectrum analysis, Mass spectroscopy and NMR spectroscopy. The isolated compounds were tested for antioxidant activity by using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) standard free radical scavenging bioassay. Crude methanol extract and aqueous fraction of *D. ramosa* showed strong free radical scavenging potential. Two xanthonoids compounds mangiferin and Isomangiferin were isolated from aqueous fraction of *D. ramosa* by chromatographic techniques. Their structures were confirmed by spectroscopic analysis like MS, NMR (¹H, ¹³C, HSQC and HMBC). The antioxidant potential of mangiferin (60.34±0.14 µg/mL) and isomangiferin (55.98±0.39 µg/mL) as compared to ascorbic acid (57.97 ±0.93 µg/mL) a known antioxidant compound. Antioxidants like mangiferin and isomangiferin are promising agents for oxidative pathologies. The mechanism of free radical scavenging by mangiferin and isomangiferin showed that catechol moiety was involved in quenching of free radicals in a simpler and reliable way. This is the first report on isolation of mangiferin and isomangiferin from *Dryopteris* genus however reported in other fern genera e.g. *Cystopteris*, *Acystopteris*, *Gymnocarpium*, *Asplenium*. This study not only justified the traditional use of *D. ramosa* but also confirming the pharmacological properties of isolated compounds.

Yamin Bibi

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Dr. Yamin Bibi is currently working as Assistant Professor in Department of Botany PMAS Arid Agriculture University Rawalpindi. She has joined this department in 2011 soon after completion of her PhD Degree from Quaid-i-Azam University Islamabad. Her field of expertise is Medicinal plants bioactivities and phytochemicals. Currently she is involved in teaching as well as research. A number of M. Phil and PhD students are working under her supervision. She has completed two research projects and she is the author of about 42 publications in different national and internationally reputed journals. She has taught different courses like General Pharmacognosy, General Pharmacology, Research planning and report writing, Plant reproductive Biology and Conservation and Management of Plant resources at graduate and post graduate level. She has participated in different international conferences in Malaysia, Bosnia-Herzegovina, Turkey and Czech Republic to present her research papers. Her aim is to excel in the field of medicinal plants and pharmacology.



Isolation of two pentacyclic triterpenoids from *Quercus dilatata* L. and evaluation of their chemopreventive potential

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Abstract

Natural products especially from plants have fulfilled both the nutritive and curative requirements of earthlings. Present study was designed to explore the phytochemical riches of *Quercus dilatata* L. Two pentacyclic triterpenoids named as glutinol (**1**) and teraxerol (**2**) were isolated from *n*-hexane fraction of crude methanolic extract of *Quercus dilatata* aerial parts by bioassay guided separation techniques using normal phase silica gel column chromatography. The structures were elucidated by nuclear magnetic resonance and electron ionization mass spectrometry, after comparing with the data from literature. Afterwards, isolated compounds were subjected to different chemopreventive bioassays including nitric oxide (NO) production inhibition in lipopolysaccharide-activated murine macrophage raw 264.7 cells, tumor necrosis factor- α activated nuclear factor- κ B (TNF- α activated NF- κ B) inhibition and hyphae formation inhibition using *Streptomyces* 85 E. Among the isolated compounds, glutinol showed substantial inhibition of NO (78.0 ± 1.10 %). It also significantly inhibited NF- κ B in stable transfected human embryonic kidney cells 293 (65.4 ± 3.2 %, IC_{50} 16.1 ± 2.0 μ g/ml). Survival rates of cells in both assays were 89.2 ± 3.3 % and 88.5 ± 2.80 % respectively. Further it also showed moderate protein kinase inhibitory activity against (7.0 ± 0.5 bald zone of inhibition). The isolated leads could be a promising avenue for the discovery of novel cancer chemopreventive drug molecules. These compounds have been isolated for the first time from *Q. dilatata*.

Madiha Ahmed

Assistant Professor

Shifa College of Pharmaceutical Sciences
Shifa Tameer-e-Millat University, Islamabad

Academic Profile

- Ph.D. (Pharmacognosy) 2018 Quaid-i-Azam University (QAU), Islamabad, Research in University of Sydney, Australia
- M-Phil (Biochemistry) 2013 QAU, Islamabad
- Pharm D 2009 University of Karachi, Karachi

Professional Experience

1. Assistant Professor: Shifa College of Pharmaceutical Sciences (SCPS), Shifa Tameer-e-Millat University, Islamabad: Nov 2018 to date.
2. Lecturer: Riphah Institute of Pharmaceutical Sciences (RIPS), Riphah International University, Islamabad: Sep 2013 to Mar 2014.
3. Research Assistant: Bioresource Research Center (BRC), Islamabad: Jan 2013 to March 2013.
4. Production Officer: Paramount Pharmaceuticals, Kahuta Road, Islamabad: Jun 2009 to Jun 2011.

Fields of Specialization

Natural product isolation and drug discovery

Publications

17 in both national and international journals (**Impact factor 32**)

Investigation of Anti-diabetic Potential of *Cedrela serrata* Leaves Extract

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Abstract

Diabetes mellitus is one the major worldwide concerns which has attracted great attention of researchers, especially those who are working on natural herbal products. *Cedrela serrata* is important medicinal plant and has been used in folk medicines in the treatment of diabetes and allied complications. Current study was aimed to explore the hypoglycemic potential of *C. serrata* leaves extract and experimentally unveil its glucose lowering effects using *in-vivo* and *in-vitro* models. Leaves of *C. serrata* were extracted in methanol and concentrated under reduced pressure. The crude extract was processed for their anti-hyperglycemic properties against α -glucosidase enzyme as well as rats' model. The crude extract of *C. serrate* displayed potent inhibition against α -glucosidase enzyme with IC_{50} of 0.47 μ g/ml and inhibited the target enzyme in dose-dependent manner at different concentrations of the extract. Moreover, in the *in-vivo* study using streptozotocin induced rats, the extract showed significant anti-hyperglycemic effects by lowering blood glucose level of the treated groups in comparison with the negative control group. Similarly, the blood biochemical profile such as hemoglobin, cholesterol, triglycerides, LDL and HDL levels of the treated groups were greatly altered which also proved the anti-diabetic potential of *C. serrata* crude extract.

Zia Uddin

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Academics/Degrees

- Postdoc, Institute of Agriculture and Life Science, GNU, South Korea, 2018.
- Ph.D, Gyeongsang National University, South Korea, 2017.
- M.S, Gyeongsang National University, South Korea, 2014.
- Pharm.D, University of Malakand, KPK, Pakistan, 2010.

Specialization: Pharmacognosy/ Natural Products Chemistry

Profile/Bio

- July.2018 till now: Assistant Professor, Department of Pharmacy, COMSATS University Islamabad, Abbottabad Campus, Pakistan
- August.2017 to June. 2018: Postdoctoral Research Fellow, Institute of Agriculture and Life Science, GNU, South Korea.
- March. 2015 to July. 2017: Researcher, IALS, Gyeongsang National University, South Korea.

Dr. Zia is an active researcher in the area of Pharmacognosy and Phytochemistry, specifically he works on exploration of novel lead structures from diverse natural sources, which could play the role of potential therapeutic agents. His research group is working on elucidating the structures and functionalities of the isolated bio-active compounds and their evaluation against hydrolase enzymes. Moreover, he is also working on molecular farming, metabolites flow, quantitative and qualitative analysis of secondary metabolites.

Synthesis of 3,5-disubstituted-2-pyrazolines by microwave assisted technique: A green approach to generate potent antimicrobials and antioxidants

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Abstract

Heterocyclic compounds containing pyrazoline were reported to possess worthwhile bio-activity. Taking substituted chalcones and azachalcones as the starting material two novel series of pyrazolines were synthesized by conventional heating and microwave irradiation. Claisen Schmidt condensation between intended aryl methyl ketones (1a-b) and different substituted aromatic aldehydes (2a-c) resulted in the formation of corresponding chalcones (3a-c; 4a-c) which were cyclized using hydrazine hydrate to yield final pyrazolines (5a-c; 6a-c) in good yields (59-81%). Reaction time and %ag yield data ratified the superiority of microwave assisted technique over classical heating. The structures of all the synthesized compounds were confirmed on the basis of physical data, spectroscopic studies X-ray powder diffraction and micro analysis. The infrared spectral group frequencies of chalcones and pyrazolines have been found in good correlation that approved the synthetic routes. Further, the compounds of both series (5a-c; 6a-c) have been screened against 1,1-diphenyl-2-picrylhydrazyl free radical (DPPH) to assess their antioxidant potentials and all the compounds showed good free radical scavenging activity which is comparable to that of standard galic acid. Similarly the whole synthesized scaffold has also been tested for anti-bacterial and anti-fungal activities and results were compared with positive control that declared all products as good antimicrobial agents. Amongst all the tested compounds 5a and 5b were found to be more active. The highest antimicrobial and antioxidant potential of 5a-b owed to the presence of multi-chloro groups on the phenyl rings.

Nazia Saleem

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Ms. Nazia Saleem is M.Phil. Scholar from Govt. College women university Faisalabad; her research work is based on the synthesis of heterocyclic compounds and evaluation of their pharmacological potential. Recently, she is working in a project to investigate the anti-cancerous effects of heterocyclic compounds in collaboration with Institute of Pharmacy, Physiology & Pharmacology, University of Agriculture, Faisalabad, Pakistan. She has published her research work in Bio Resources; two papers are submitted in international journals. Recently, she presented her research work in 9th International Conference on Green & Sustainable Chemistry, Reston VA, organized by American Chemical Society & 11th International Conference on Medicinal Chemistry and Pharmaceutical Technology, Czech Republic. She is lifetime member of Pakistan Chemical Society.



Draft Workshop Recommendations

Strengthening the Role of Complementary Medicine to Address Health Workforce Shortages in Primary Health Care in Asia

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Background

According to the World Health Organization (WHO), “Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being¹”. Globally there is a resurgence of interest in traditional medicine and other non-conventional health care systems. Such systems include Chinese medicine, Ayurveda, Herbal medicine, Tibb Unani, Homeopathy, Acupuncture, Chiropractic, Osteopathy, bone-setting and many others. Variously named as Indigenous, folk, Traditional and Complementary Medicine (T&CM) and/or Complementary and Alternate Medicine (CAM), these systems of health care were until recently predominantly used by the poor and rural communities. They are however currently finding favor with the more educated and affluent communities of the developed world, and their use is rapidly expanding. The positive features of T&CM responsible for the rapid expansion of their use include diversity, flexibility, easy accessibility, relative low cost, low levels of technological input, relative low side effects and growing economic importance (WHO)⁵. Along with their affordability and accessibility these systems are firmly embedded in the belief systems of communities and are culturally compatible. Taking cognizance of the growing demand for and use of TCM WHO developed guidelines and strategies for T&CM integration into conventional health care systems by member countries for the period 2002-2005 and recently 2014-2023. The 2014-2023 strategy has two key goals: to support Member States in harnessing the potential contribution of T&CM to health, wellness and people centered health care and to promote the safe and effective use of T&CM through the regulation of products, practices and practitioners. These goals will be reached by implementing three strategic objectives: 1) building the knowledge base and formulating national policies; 2) strengthening safety, quality and effectiveness through regulation; and, 3) promoting universal health coverage by integrating T&CM services and self-health care into national health systems¹.

An immediate need for T&CM integration into national health systems is in the area of Human Resources for Health (HRH). The critical shortage of trained health workers in low and middle income countries was documented in 2004 and reported in the World Health Organization (WHO) 2006 World Health Report^{2,3}. The estimated shortage of 4.3 million in

¹WHO Traditional Medicine Strategy 2014-2023. https://apps.who.int/iris/bitstream/handle/10665/92455/9789241506090_eng.pdf

²Human Resources for Health-Overcoming the Crisis. Joint Learning Initiative. 2004

³WHO.The World Health report 2006 – working together for health. Geneva: World Health Organization; 2006

the two reports had increased to 7.2 million by 2013 and is predicted to reach 12.9 million by 2035⁴. This shortage has impeded the achievement of past national and international health goals and will be a serious barrier to achieving current and future goals⁵. Rapid strengthening of HRH therefore is considered a vital and urgent part of policies and strategies to achieve health in countries like Pakistan who have crisis level HRH, shortages. A task shifting approach for the deployment of Community Health Workers (CHWs) and traditional medicine practitioners is recommended to achieve rapid expansion of the health workforce. A study by Celluti et al found that where there is necessary support and certain conditions are observed, CHWS and TM workers can make significant contribution to health services delivery and achievement of universal health coverage⁶.

Conference Recommendations

The following recommendations are based on the presentations and discussion during the conference and are in line with the strategies recommended in the WHO 2014 – 2023 Strategic Frame Work.

1. Establish Higher Education and Research to enhance quality and expand the knowledge base of T&CM

In the developed countries Integrative Medicine has achieved recognition as a specialty field and Academic Centers/ Institutes and Universities have been established to provide higher education and undertake quality research in the field. In the United States, the American Board of Integrative Medicine (ABIM) awards Certification in the field like in all other medical specialties. Asian countries and more especially Pakistan need to establish such institutions. The institutions however, need to be established within the existing universities and academic centers in order to ensure that the field of integrative medicine doesn't develop in isolation from other such institutions in the domain of medical and health care field.

2. Integrate Traditional Medicine with Primary Health Care (PHC)

WHO's traditional medicine strategy 2014-2023's Strategic objective 3 aims to promote universal health coverage by integrating T&CM services into health care service delivery and self-health care. The following recommendations are given to achieve the objective 3 of the strategy:

- 2.1. Recognize HRH crisis as a health policy priority and consider T&CM integration in PHC as one of the strategic objectives for addressing the crisis;
- 2.2. Build TCM knowledge base to inform policies and strategies;
- 2.3. Review and revise existing regulations to strengthen safety, quality and

⁴A Universal Truth: No Health Without a Workforce. Third Global Forum on Human Resources for Health Report, November 2013. Global Health Workforce Alliance and World Health Organization. <http://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/>

⁵O'Brien P and Gostin LO. Health Worker Shortages and Global Justice. October 2011. Milbank Memorial Fund. http://www.milbank.org/uploads/documents/HealthWorkerShortages_Mech/HealthWorkerShortages_Mech.html

⁶Deployment of community health workers in response to health workforce shortages. AIDS 2010, 24 (suppl 1):S45–S57. http://hsrc.himmelfarb.gwu.edu/cgi/viewcontent.cgi?article=1357&context=sphhs_policy_facpubs

effectiveness of TCM therapies and practices;

2.4. Review and revise TCM training curricula to include some essentials of modern health care, such as the following:

2.4.1. Professionalism

Healing the sick is a profession and Healers are professionals. Professionals have a legal and ethical relationship of trust with those they serve. Health Professionalism is a three-part promise:

- a) To acquire and maintain value system which emphasizes that the interests of the patients and the public will supersede the self-interests of practitioners;
- b) Acquire and upgrade knowledge and technical skills necessary for providing good health care; and
- c) Develop interpersonal skills necessary to communicate and work together with patients.

2.4.2. Medical Ethics

The teaching of “medical ethics” must become a part of TCM practitioners pre-service and continuing education curricula. Health professionals are required to develop 'respect' for individuals, 'do no harm' to their patient, work for 'doing good' for their patients and exercise 'fairness' in the distribution of goods and benefits to their patients.

2.4.3. Avoidance of mixing single active ingredient modern medicines with herbal and traditional medicines

They must be made to understand that modern single ingredient drug's use requires a good understanding of their pharmacology. They should stick to their whole herb therapies and avoid mixing modern medicines like antibiotics, steroids and psycho-active drugs in their herbal medicines formulations.

2.4.4. Recognition of Drug interactions

The widespread belief that whole herbs formulations are harmless is not correct. Concurrent use of herbs with modern medicine may mimic, magnify, or oppose the effect of drugs. The apparently harmless garlic can interact with some modern drugs and cause serious interaction like bleeding when taken with low dose aspirin and Warfarin etc.

2.4.5. Timely referral of patients for appropriate therapy and management

As emphasized by Hippocrates 2400 years back, don't attempt to treat conditions for which you have no knowledge and skill- refer them. Timely referral is an essential function of PHC. T&CM practitioners need to be linked with modern medicine practitioner and health care facilities for the

purpose of timely referral of patients who need modern medical management.

2.4.6. Adoption and transmission of essential health promotion and disease prevention messages which are a function of PHC workers

These include Antenatal Care and Delivery by Trained Workers; Child vaccination; Mother and Child Nutrition; Drinking of Clean Water and Personal and Environmental Hygiene. Teaching of health promotion and disease prevention maybe made a compulsory part of TCM curricula.

3. Additional recommendations relevant to Pakistan and some other Asian countries:

These include the following;

- 3.1. Suppliers of medicines based on natural products must ensure that harvesting of the products from the animal/organisms species providing the source compounds is sustainable or the animals are domesticated in order to meet demands.
- 3.2. Many species are endangered because of their (real or perceived) health benefits. Efforts must be made to eliminate illegal trade in such endangered species. Such efforts should include an awareness campaign about the scientific basis for 'no medical effects' of such produces, e.g. donkeys, rhino horn, tigers, rhinoceroses, sea horses and pangolins.

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