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**Traditional Medicine,
Phytochemistry and
Medicinal Plants**

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October 15

MONDAY

Keynote Session

Importance of Phytotherapy in Different Traditional Medicines – Case Study of Antimicrobial Effects

Rainer Stange

Immanuel Hospital, Germany

Abstract

Traditional medicine, natural medicine, complementary medicine have come to different interpretations and practices all over the world. One of the few common feature seems to be the use of plants as the most important basis of remedies.

From the scientific point of view, pharmacognosy, phytochemistry and biological pharmaceuticals developed as fields of their own leading in the end to high quality end products with proven efficacy for medical use. Standards of modern phytotherapy are comparable to those for chemically defined drugs. With growing demands and consumptions of local phytodrugs and new developments from plants originally not found in Europe, there are new challenges to research on basic pharmacologic actions, clinical testing and large scale production of high quality products. Indications of rapidly growing importance are psychosomatic disorders and infectious diseases.

All over the world, the increasing use of antibiotics in humans and animals has been accepted as a major critical health issue. It is highly desirable to make use of phytotherapy in frequent clinical situations that require antimicrobial action.

As plants can only survive with strong shields against microbial attacks, it is evident, that an enormous variety of phytochemicals must have these properties, e.g. etheric oils for respiratory infections. Mustard oils with their most important active components isothiocyanates are other well-known candidates. In Asia and esp. Japan, Wasabi japonica is very popular with sufficient experimental data to investigate into clinical applications. European horseradish has experienced preclinical research and two RCT with a licensed drug.

Biography

Dr. med Rainer Stange is an internist and expert in natural healing and physical therapy. He is also a graduate physicist. He has been working as a doctor in the field of natural medicine since 1984, since 2001 he belongs to the Department of Natural Medicine of the Immanuel Hospital Berlin, from 2009 to 2017 as Chief Physician. He also worked at the University Outpatient Clinic Wannsee and is currently researching at the Immanuel Hospital Berlin as part of the endowed professorship for clinical naturopathy at the Institute for Social Medicine, Epidemiology and Health Economics of the Charité-Universitätsmedizin Berlin.



Malaria: The History and Promise of Natural Products as Antimalarial Agents

David G. I. Kingston

Department of Chemistry and the Virginia Tech Center for Drug Discovery, Virginia Tech, Blacksburg, Virginia 24061, USA



Abstract

Malaria continues to be one of the world's most devastating diseases, with over 3.2 billion people at risk for contracting the disease, and an estimated 214 million malaria cases and over 400,000 deaths in 2015. The potent antimalarial drugs quinine and artemisinin are natural products, and natural products continue to make key contributions of new antimalarial agents and leads for medicinal chemistry. Recent antimalarial work at Virginia Tech has included the discovery of the novel phloroglucinol mallotojaponin C, and of antimalarial 5,6-dihydro- α -pyrones from *Cryptocarya rigidifolia*.

Continuing studies have focused on the discovery of new antimalarial natural products from plants, including those from plants with an ethnomedical history of use as antimalarial medicines. This lecture will give a brief overview of the history of antimalarial drug discovery, and will then give some recent examples of the successful use of selective antimalarial assays coupled with bioassay-directed isolation and structure elucidation by NMR and MS to lead to the isolation and structure elucidation of different biosynthetic classes of compound as antimalarial agents, including polyketides, alkaloids, and terpenoids.

Biography

David Kingston received his B.A. and Ph.D. degrees from Cambridge University in 1960 and 1964, and is a University Distinguished Professor of Chemistry at Virginia Tech and Director of the Virginia Tech Center for Drug Discovery. He has worked extensively on drug discovery from natural products, with a recent emphasis on the discovery and mechanism of action of antimalarial agents from the former Merck collection of natural product extracts. He is a recipient of the Research Achievement Award of the American Society of Pharmacognosy and of the ACS Guenther Award for Natural Products.

Theories and Fundamentals of Traditional Medicine Acupuncture, Moxibustion and Cupping Therapy

Harnessing Cultural Capital and the Regulated Practice of Traditional Practitioners in Allopathic Arena

Jennie R. Joe

Department of Family & Community Medicine, University of Arizona, AZ, USA

Abstract

When modern or Western Medicine opens a space in clinical setting for indigenous medicine peoples or traditional practitioners, the invitation often comes with unanticipated governmental restrictions that affects the range of services to be provided by the practitioners. These restrictions are framed by national governmental healthcare system regulations as well as other related mandates, including regulations on providers' licenses, financial reimbursement for services provided as well as types of acceptable therapeutic interventions.

Despite these challenges, the team of traditional practitioners serving one region of the Navajo Indian Reservation are welcomed and valued by their patients. They provide diagnostic services—diagnosing the cultural causes of the health problems being treated by physicians. Although their services are restricted, their contributions add to the value placed on patient-centered care. The practitioners view their services complementary to the practice of biomedicine. This presentation discusses some of these challenges and how the new development has helped them and their communities reinstates an important part of their cultural capital.

Biography

Professor Joe is an American Indian, a member of the Navajo (Dine') Nation. She is currently professor emerita (a medical anthropologist) in the Department of Family and Community Medicine at the University of Arizona, Tucson, Arizona, USA. Her research, teaching, and advocacy have and continue to focus on indigenous cultures and its impact on health and health disparities. Her collaborative studies with communities have centered on various aspects of health problems prevalent to these native communities such as diabetes, cancer, disability, and related health risks behaviors.

The “Urheimische” Philosophy of Dr. Pandalis Refers in Particular to Humility and Respect for Creation

Peter W. Gundling

Dr. Pandalis Urheimische Medizin GmbH & Co. KG., Germany

Abstract

Dr. Pandalis coined the term “urheimisch” to describe the way of life that has been familiar to humans in their respective cultural areas for generations. Thus, in central Europe, food plants are considered “urheimisch” if have their origin in Europe (e.g. wild garlic) or have been experienced positively by central Europeans for several generations (e.g. potatoes, coffee, corn, pepper, bananas).

What is considered as “urheimisch” and thus tried and true also depends on the individual origin of the observer. In Asia, for example, algae are “urheimische” basic foodstuffs, in Europe it is grain, in South America manioc root and for the aborigines in Australia it is worms. In addition, there are respective healing methods. Thus, Traditional Chinese Medicine (TCM) is very familiar to Chinese. Europeans have long-standing “urheimische” medicines with roots in Hebrew, Greek, Celtic and Germanic botany.

“Urheimische” health is synonymous with functioning communication between our cells, tissues and control loops as well as between our cells and our individual microbiome (intestinal, oral and skin flora). From the point of view of “urheimische” philosophy, illness is always an expression of a disturbance of this communication.

“Urheimische” medicine is based on plants that are known to the organism and are of natural origin. Example: treatment of viral infections is successful with an extract made from a special variety of the cistus (*Cistus incanus* L. Pandalis). The lack of development of resistances and side effects also means cistus is useful as a prophylactic. For seasonal respiratory infections and influenza, the plant represents a viable alternative and contributes to natural immunization.

Chinese Yam Extract and Adenosine Attenuated LPS Induced Cardiac Dysfunction by Inhibiting of RAS and Apoptosis via ER Mediated Activator of SHC/Ras/Raf1 Pathway

Mengnan Zeng^{1,2}, Li Zhang^{1,2}, Meng Li^{1,2}, Yaping Sun^{1,2}, Yan Chen^{1,2}, Jingke Zhang^{1,2}, Weisheng Feng^{1,2} and Xiaoke Zheng^{1,2}

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²Collaborative Innovation Center for Respiratory Disease Diagnosis and Treatment & Chinese Medicine Development of Henan Province, China

Abstract

Sepsis is characterized by systematic inflammation and contributes to cardiac dysfunction. This study was designed to examine the effects of the Chinese yam extract and adenosine on lipopolysaccharide induced cardiac anomalies and the underlying mechanisms involved. Our results revealed that Chinese yam extract and adenosine improved heart function, down regulated pro-inflammatory cytokines, reversed mitogen activated protein kinases (MAPK) and renin-angiotensin system (RAS) following LPS challenge. In addition, they showed a better active in female LPS induced rats than male LPS induced rats, and this effect could be blocked by ICI182,780, a ER-unspecific antagonist. In later experiments, we found that Chinese yam extract and adenosine improved the expression of ER (ER α , ER β) and SHC/Ras/Raf1 and transformed the apoptosis markers following LPS challenge, in addition, this effect could be blocked by ICI182,780. In order to know the relationship between ER and SHC/Ras/Raf1, we observed the effect of ICI182,780 and FTS (selectively blocks the binding of long-lived Ras proteins) on the Chinese yam extract and adenosine interposed on LPS induced H9c2 cells. Results revealed that the Chinese yam extract and adenosine had protective effects on LPS induced H9c2 cells. In addition, ICI182,780 could block the expression of SHC/Ras/Raf1, but FTS could not block the expression of ER, demonstrating that ER might be the upstream signaling regulator of SHC/Ras/Raf1. Taken together, these data showed that the Chinese yam extract and adenosine ameliorated LPS induced cardiac contractile through inhibition of RAS and apoptosis, possibly involving an ER-SHC/Ras/Raf-dependent mechanism.

A Review on the Management of Migraine in the Avicenna's Canon of Medicine

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⁴Department of Pharmaceutics, School of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Migraine is a common type of headache which has a deep history dating back thousands of years. Avicenna (980–1032), a Persian scholar, made a great contribution to neurology including headache and migraine. The aim of this study is to consider Avicenna's description about migraine (*Shaghighhe* in Persian language) including definition, etiology and intervention. Also, his definition and treatment approaches were considered based on current concepts and findings. Although Avicenna believed in humoral theory and divided migraine into two categories, hot and cold, and suggested special treatments for them as well as general considerations, most of his definitions and explained pathologies are supported by current concepts of medicine. He believed that the migraine can result from bone of skull and also intraparenchymal; or from skull underneath membrane (*dura-mater*); or reaching substances from the painful side or from outer vein and arteries (extra cranial); or from brain and meninges (*pia-mater*). Furthermore, current findings show most medicinal plants mentioned by Avicenna for the treatment of migraine can have potentially significant effects such as remedies which stop central and peripheral sensitization [anti-neuroinflammatory agents, decreasing nitric oxide level, cyclooxygenase (COX)-2 inhibitors], as well as serotonergics, neuroprotective agents and analgesics.

Biography

Dr. Arman Zargaran was graduated in pharmacy (PharmD) and Traditional Pharmacy (PhD) both in Shiraz University of Medical Sciences. He is faculty member (Assistant Professor) in Department of Traditional Pharmacy, School of Persian Medicine, Tehran University of Medical Sciences now. He also is vice dean for international affairs in the school. He has about 120 published papers in the fields of phytopharmaceuticals, Persian medicine and history of medicine including historical papers, review articles, *in-vivo* and *in-vitro* studies and clinical trials. He is also the member of international academy of history of pharmacy.

The Role of Persian Bath in Traditional Persian Medicine

Zahra Hatami

Tehran University of Medical Sciences, Iran

Abstract

Baths in Iran has a long history and thousands years background. Bathing and cleanliness were as the main concerns among Iranian societies during history since ancient pre-Islamic times to Islamic era. Baths were as the main urban components and were built in the cities according to their populations. These baths, as one of the public buildings not only play the role of bathing, but also had other roles like Persian Massage (*Dalk & Ghamz*), medical activities like phlebotomy and cupping, the place for some

make up activities, the place for public and social meetings and also ceremonies, etc. Although, there were baths in some other civilizations like ancient Greek and Roman societies, their structures and functions were different and therefore Persian Baths has own historical and national identity. Persian Baths is mainly composed of four compartments: dressing room (*Bineh*), vestibule (*Mian dar*), hothouse (*Garmkhaneh*) and cold and hot water pools (*Khazineh*). The way of dividing these spaces and temperatures were based on the principles of Persian medicine (humoral medicine) on the keeping of health. Also, there are several therapeutic methods like *Abzan* (Traditional Persian sauna) which were mentioned by Medieval Persian physicians like Avicenna, Rhazes, Akhawayni, Jorjani, etc. to treat and manage diseases. Therefore, Persian bath is an ancient memorial to Iranian culture and civilization; many of its medical functions today can be revived and used.

Biography

Zahra Hatami was graduated in master of MBA and language and is research fellow in department of history of medicine, TUMS. She has 15 years of experience in the field of managing of sport clubs, Persian baths and swimming pools. She was awarded by 2017 health and beauty management conference (Tehran), Iran's Management & Organization Institute (for Customer Appreciation) and Tehran's Swimming Committee (for Talent Detection & Development).

Application of Dulyapabbumbud Technique of Acupuncture in Varieties of Diseases and Chronic Pain

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²*Institute of Dulyapabbumbud, Thailand*

Abstract

Dulyapabbumbud is the holistic approach as the whole body including external and internal factor. External factor including environment and eating. Furthermore, internal factors including linkage of anatomy and physiology analyzing by deviation of surface anatomy, muscle compensation, homeostasis of each body system. Dulyapabbumbud concepts are the interaction of following factors which can be divided into three interaction triangles. 1) Mind, body and social 2) structure, position and function 3) pain, spasm and ischemia. The concepts translate to application of 7 Es which are 1) Education: patients understand their disequilibrium of body structure and how to correct 2) Equilibrium: using Dulyapabbumbud technique acupuncture to correct disequilibrium depending on patient's disequilibrium leading to dissimilar and individual surface anatomy points of need insertion although they share the same symptoms or diseases. 3) Eating: advising proper nutrition to patient's condition. 4) Excretion: the secretion from the body is the clue of patient's pathology. 5) Exercise: Dulyapabbumbud has seven pose of basic breathing and mobilization exercise. However, the detail of Dulyapabbumbud -exercise adjust to individual patients. 6) Emotion: positive emotion will bring out a good chemical out from the body. 7) Environment: patients need to adjust the environment to their condition e.g. pillow, work station, bags etc. In these concepts, we treat patients as a whole and always dynamic consequently, consequently, once for four processes (health prevention, treatment of diseases, rehabilitation and health promotion) in varieties of diseases and chronic pain.

Traditional Biogenic Medicine in Salzburg, Austria

Karin Buchart

University of Salzburg, Austria

Abstract

Background: This study investigates the traditional healing knowledge from the alps.

Methods: Therefore, the present study intended to develop a verified concept of the application of traditional biogenic pharmaceuticals from the area “Pinzgau” in the county of Salzburg, Austria. For this purpose, 33 individuals underwent a qualitative interview focusing on the regional and traditional medical plants and their traditional using. The indications and applications were compared with the data of the “**European Scientific Cooperative on Phytotherapy - ESCOP**”.

Results: This comparison revealed an accordance of the proposed application, as stated in the interviews, with the monographs for 55 medicinal plants. Based on these herbs, an application catalog was developed which lists indications, modes, doses and risks of applications. This catalog enables the use of traditional alpine medical plants for health promotion, prevention and therapy in agreement with the accepted knowledge from natural sciences and medicine. Furthermore the catalog is the basis for the development of an educational concept and a range of handcrafted products.

Conclusion: Summing up, the present study demonstrates that the inquiry of the application of traditional, regional medicinal plants and the comparison of the traditional use with the current state of science presents a useful approach. It makes traditional medicine available for a scientific evaluation and discussion of its efficacy and opens ways to further investigate the underlying mechanisms of action of traditional medicinal products.

Biography

Karin Buchart studied Nutritional Sciences at the University of Vienna in 1963. After graduating she worked in a rehabilitation clinic in Germany and published her Dissertation at the University of Salzburg about local medical plants. She founded the non-profit association TEH (Traditional European Healing) to revive old medical plants recipes. Today she is an Author of herbal books and she is giving lectures about nutrition, herbs and medical plants at the University of Salzburg and at the Academy of TEH.

Detoxification: Flushing the Human Body Toxins an Approach to Health and Well-being

M. Nadir Sidiqi

BioNatural Healing College California, CA, USA

Abstract

In the physical sense, the human body is like a self-regulating biochemical machine, maintaining the health of this essential self-regulating machine for proper functions is crucially important through the detoxification which a physiological process in the removal of toxic substances from human body. Without a doubt human cells, tissues, organs and systems, every day face many challenges and constantly are in the battle to get rid of the toxins that are consumed through food, water, and breathing in the air and various personal care cosmetic products we use on our skin. Indeed, toxins that are present in the human body can be obtained from exogenous sources such as food, water, air, pesticides, and medications; and the endogenous sources such as: the products produced by digestion, energy metabolism, tissue regeneration, and end products from the metabolism of hormones, bacterial by-products and other complex molecules. Therefore, it is important to understand that the detoxification is the process that involves the mobilization, biotransformation, and elimination of toxicants of exogenous and endogenous origin from the body. Interestingly, human cells expend large amounts of energy to ensure that detoxification pathways continue to do their work. However, the aim of this study is based on reviewing numerous literatures to focus on how important it is to understand the toxins and their impact on human's health, and how to prevent and eliminate these toxins from the body through the process of detoxification for the approaching health and wellbeing.

Biography

Dr. Nadir Sidiqi, Ph.D. is the President/Dean of Academics of the BioNatural Healing College (Online Learning) non-profit based in California, USA. He was the CEO/president of Organic Ecocare Inc., from July 2008 to December 2014. Since, 2005, Dr. Sidiqi is an instructor for the State of California Department of Pesticide Regulation, provide continuing education. Remained from September 2012 to May 2013 as a host on Iman TV. Dr. Sidiqi is an author, writer, speaker, and an invited speaker/Chair session at several International conferences, Afghanistan, France, Egypt, and India. Despite his physical limitation (wheelchair) and constant pain due to, unfortunately, a very serious accident happened to him on April 28th, 2000 while he was a graduate student (MS Plant Science Fresno Un-California) and remained hospitalized for two years. Afterward, his positive attitude and hope to pursue his desire of education prevailed and obtained M.S. degree in Plant Sciences California State Polytechnic University, second MS degree in Biology NMSU, his Ph.D., (Agriculture Science) from AIU and earned second Ph.D. (Natural Medicine) Kingdom College of Natural Health.

Danggui Buxue Tang Attenuates Tubulointerstitial Fibrosis via Suppressing NLRP3 Inflammasome in a Rat Model of Unilateral Ureteral Obstruction

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⁴Department of Radiology, Xiangya Hospital, Central South University, Changsha, Hunan, China

Abstract

Inflammation significantly contributes to the progression of chronic kidney disease (CKD). This study aimed to characterize Danggui Buxue Tang (DBT) renoprotection and relationship with NOD-like receptors family pyrin domain-containing 3 (NLRP3) inflammasome expression in rats with unilateral ureteral obstruction (UUO). Sprague-Dawley rats were subjected to UUO and randomly assigned to untreated UUO, enalapril-treated (10 mg/kg/day), and DBT-treated (9 g/kg/day) groups. Sham-operated rats served as controls, with 8 rats in each group. All rats were sacrificed for blood and renal specimen collection at 14 days after UUO. Untreated UUO rats exhibited azotemia, intense tubulointerstitial collagen deposition, upregulations of tubulointerstitial injury index, augmentation levels of collagen I (Col I), α -smooth muscle actin (α -SMA), NLRP3, apoptosis-associated speck-like protein containing a caspase recruitment domain (ASC), pro-caspase-1, caspase-1, IL-1 β , and pro-IL-1 β . DBT treatment significantly attenuated interstitial collagen deposition and tubulointerstitial injury, lowering Col I and α -SMA levels. Synchronous expressions of NLRP3, ASC, pro-caspase-1, caspase-1, pro-IL-1 β , and IL-1 β decreased in renal tissue. In comparison to enalapril, DBT significantly reduced tubulointerstitial injury, interstitial collagen deposition, and expressions of Col I and IL-1 β . Thus, DBT offers renoprotection in UUO rats, which was associated with suppressing NLRP3 inflammasome expression and following reduction of the secretion of cytokine IL-1 β . The mechanisms of multitargets of traditional Chinese medicine can be better used for antifibrotic treatment.

Biography

Wang Linna is a MD, postdoctoral, student of China's famous nephrology experts academician Xiangmei Chen. Preside over China national postdoctoral science foundation, and involved in two China national natural science fund, she had published more than ten papers, the current as a youth committee of Chinese Association of the Integration of Traditional and Western Medicine, Department of nephrology.

The Molecular Insights into the Multifunctional Effects of *Ganoderma lucidum* Extracts Against Cancer and Obesity-related Diseases

Xingya Wang*, Yujiewang, Haitao Pan, Ying Wang, Tingting Sang, Chenjie Guo and Dandan Guo
Zhejiang Chinese Medical University, College of Pharmaceutical Science, Zhejiang, China

Abstract

Ganoderma lucidum (*G. lucidum*) is the most popular medicinal mushroom used in Traditional Chinese Medicine (TCM) for over 2000 years due to its promotion of vitality and longevity. In the past few decades, many researchers studied the biological function and examined the responsible active components of *G. lucidum*. These studies reported that *G. lucidum* has numerous pharmacological effects, including immunomodulatory, antiallergenic, anti-oxidative, cardiovascular protective, antidiabetic, and antitumor effects. A diverse group of active compounds including polysaccharide, triterpenoids, alkaloids and others were identified and isolated from *G. lucidum*. However, more studies are needed to further explore the biological function and underlining mechanisms of *G. lucidum*. Our research group is interested in examining the multifunctional effects of *G. lucidum* polysaccharide (GLP) and triterpenoids that extracted from sporoderm-broken spores on cancer prevention, adipogenesis, gut microbiota regulation and anti-atherosclerosis in laboratory models. This talk would focus on our recent discoveries in four aspects: (1) Effects of GLP on human colorectal cancer through targeting fatty acids metabolism, energy metabolism, and inhibition of autophagy flux in HCT116 cancer cells and nude mice; (2) Role of Nonsteroidal anti-inflammatory drug-activated gene-1 (NAG-1) in GLP-induced apoptosis in human prostate cancer PC-3 cells; (3) Effects of GLP on preadipocyte 3T3-L1 cell differentiation and its potential mechanism; (4) Effects of GLP on high-fat diet induced obesity and glucose tolerance through regulation of gut microbiota and gut barrier function.

Biography

Xingya Wang, PhD, received her Master's and PhD's diploma from the Ohio State University (from 2001-2007). She then worked at NIHES as a Post-doc fellow from 2007 to 2014. In 2014, she joined Zhejiang Chinese Medical University as a "Qianjiang" Distinguished Professor in China. Dr. Wang's work has been focused on examining obesity and its related diseases, including cancer, type 2 diabetes, atherosclerosis and aging. In addition, Dr. Wang has been interested in studying the biological function and molecular mechanism of *Ganoderma lucidum* and its water or ethanol extracts.

Aldose Reductase Inhibitors of Plant Origin in the Treatment and Prevention of Fatty Liver Disease

Longxin Qiu

School of Life Sciences, Longyan University, Longyan City, China

Abstract

Fatty liver disease (FLD) is a growing public health problem worldwide. The requirement for alternative and natural medicine has been increasing rapidly and considerably. Recently aldose reductase (AR)/polyol pathway has been reported to be involved in the development of FLD, therefore it is of interest to study the effect of plant-derived AR inhibitors on FLD. By conducting some investigations and by reading through literatures regarding AR inhibitors and FLD, we propose that plant-derived AR inhibitors may block AR/polyol pathway and in turn reduce the fructose production and the subsequent fat accumulation in liver in diabetic or high glucose diet-fed mice. Moreover, we propose that in rodents with alcoholic liver disease or nonalcoholic fatty liver disease/nonalcoholic steatohepatitis, AR inhibitors

may improve PPAR α -mediated fatty acid oxidation and reduce hepatic steatosis, and may attenuate CYP2E1-mediated oxidative stress or AR/gut bacterial endotoxin-mediated cytokines overproduction to alleviate progression of FLD. We conclude that potent AR inhibitors of plant origin may be efficient drugs for the treatment and prevention of FLD.

Biography

Longxin Qiu has completed his PhD at the age of 38 years from Xiamen University. He is the dean of school of life sciences, Longyan University. He has published more than 20 papers in reputed journals and has been serving as an editorial board member of *World Journal of Hepatitis*, etc.

Influence of Traditional Medicine (Tandok and Tawak) on Marinduquenos' Knowledge, Attitudes and Practices on Handling Animal Bites

Benjamin O. Sosa III

University of the Philippines-Manila, Philippines

Abstract

Tandok (removal of venom, rabies and tetanus from a wound by using an animal horn) and Tawak (direct suction by the mouth of a traditional practitioner) are the most prevalent nonmedical alternatives in Marinduque that deal with wounds caused by animal bites. In every ten (10) people bitten, six (6) would opt for non-medical alternatives rather than consulting a medical facility for vaccines. The cultures of Tandok and Tawak greatly affect the knowledge, attitudes and practices (KAP) of the people on how to properly handle animal bites. Thus, this cross-sectional study aimed to determine the extent of influence these cultures have on the people's KAP. Also, this study aimed to correlate the people's theoretical awareness on handling animal bites to actual practice using a two-tailed t-test. Lastly, the study determined the main reasons why people still patronage these traditional healers. A total of 420 respondents (three persons per village) from 140 randomly selected villages were interviewed. The respondents were chosen through simple random sampling with replacement. Results showed that people in municipalities with well-known traditional practitioners (mananandok or mananawak) prefer their services than that of medical facilities. Further, theoretical knowledge of handling animal bites does not translate to actual practice. Finally, the main reasons why people still patronage Tandok or Tawak are (1) expensive cost of vaccines (2) belief of the people that tandok and tawak have the same efficacy and (3) the distance of the hospital.

Biography

Benjamin O. Sosa III is currently a fourth-year medical student in the University of the Philippines-College of Medicine. At present, the researcher has already published two researches in the Philippine Journal of Science entitled (1) An Updated Survey and Biodiversity Assessment of the Terrestrial Snail (Mollusca: Gastropoda) Species in Marinduque, Philippines and (2) Influence of Traditional Medicine (Tandok and Tawak) on Marinduquenos' Knowledge, Attitudes and Practices on Handling Animal Bites. The researcher also has two other unpublished works about pediatric hypertension and various coping mechanisms of multi-drug resistant tuberculosis patients. After medicine, the researcher aims to become a neurosurgeon.

Anti-amyloidogenic Effect of Ethanol Extract from the Aerial Parts of *Mallotus japonicus* on β -amyloid Induced Memory Impairment in Alzheimer's Disease Mouse Model

Abinash Chandra Shrestha

Woosuk University, South Korea

Abstract

Alzheimer's disease is associated with extensive loss of neurons via accumulation of amyloid-beta ($A\beta$) as senile plaques and activation of astrocytes and microglial cells in the brain. Neurodegenerative diseases occur as a result of the breakdown and deterioration of the neurons of the central nervous system (CNS). Therefore, the need arises to search for new compounds from natural products with therapeutic potential to treat AD. *Mallotus japonicus* belonging to Euphorbiaceae family has been used for drugs and folk medicines. *Mallotus japonicus* extract has been reported to exhibit tannins and phenolic compounds with antioxidant and anti-melanogenesis property. The main aim of the present study was to evaluate the potential effect of ethanol extract from the aerial parts of *Mallotus japonicus* (MJE) on *in-vitro* anti-amyloidogenic and *in-vivo* beta-amyloid ($A\beta$) induced animal model of Alzheimer's disease. MJE treatment not only reduced the beta-amyloid secretion but also significantly inhibited the acetylcholinesterase activity. Furthermore, MJE prevented the formation of oligomer via inhibition of $A\beta_{42}$ aggregation. Additionally, MJE exhibited high anti-oxidant activities which were confirmed further via Total antioxidant status (TAS) assay. *In-vivo* experiment showed that MJE (500 mg/kg) treated mice improved the learning and memory impairment on beta-amyloid induced Alzheimer's model as measured by Passive avoidance, Y-maze and Morris water maze task examination. Overall, our findings suggest that MJE might be useful as a natural therapeutics and beneficial in neuro-inflammation-related neurodegenerative disorders.

Biography

Abinash Chandra Shrestha is a young and enthusiastic pharmacist from Nepal. Currently studying Master in Pharmacy from Woosuk University, South Korea. He completed his Bachelor in Pharmaceutical Sciences from Crimson College of Technology affiliated to Pokhara University, Nepal in 2014. He is currently involved in conducting the research on natural herbs in order to develop potent therapeutic agent as well as to rationalize the direct use of medicinal herbs to cure the Alzheimer's disease. He believes that his knowledge, skills and dedication towards excellence are essential to become a competent researcher.

Effect of EtOH Extract of *Chaenomeles sinensis* Fruit on the Metabolism of APP from APP^{swE} Overexpressing Neuro2a Cell Line and Animal Model of Alzheimer's Disease

KIM Ju Eun¹, JO Youn Jeong, Shrestha Abinash Chandra, Ham Ha Neul, Kim Hyo Shin and Leem Jae Yoon

¹College of pharmacy, Woosuk University, Korea

Abstract

Alzheimer's disease (AD), one of the most common forms of dementia, is a progressive neurodegenerative disorder symptomatically characterized by a decline in memory and cognitive abilities. Pathologically, AD is characterized by the presence of intracellular neurofibrillary tangles and the deposition of β -amyloid ($A\beta$) peptides of 40-42 residues, which are generated by amyloid precursor protein

(APP) cleavage. In addition, the amount of the neurotransmitter acetylcholine (ACh) decreased by 50% in patients with dementia. This is due to the abnormal concentration of ACh degrading enzyme acetylcholinesterase (AChE). In this study, we have assessed the effect of *Chaenomeles sinensis* (CS) on the metabolism of APP in APP_{swe} overexpressing Neuro2a cells. In addition, we evaluated the effect of inhibition A β production and subsequent improvement in memory and cognitive ability of AD model mice. CS reduced the secretion of A β 40 and A β 42 in APP_{swe} overexpressing cell line. In addition, CS showed inhibitory of AChE and BACE. CS showed inhibition of A β aggregation in TEM (Transmission electron microscopy) and ThT (Thioflavin T) assay. *In vivo* experiment using A β induced AD model mice. As result, mice treated with CS showed improvement in memory, which short-term memory and spatial cognitive ability. Taken together, we suggested that CS may be useful as therapeutic agent of as a functional food for AD treatment.

Biography

Kim Ju Eun is currently a PhD student at the University of Woosuk. The major is neuro-pharmacology. Interested research areas is development of memory and cognitive ability improving food utilizing photochemistry and medicinal plants. In addition, interested in treatment with essential oils and aromatic plants. A recently study was to evaluate the effects of using of medicinal plants or the combinations of plants to improve memory and cognitive abilities.

Quantification of Medicinal Plants used by Vhavenda, Limpopo Province, South Africa

Khathutshelo Magwede^{1,2*} and Ben-Erik Van Wyk²

¹School of Mathematics and Natural Science, University of Venda, South Africa

²Department of Botany and Plant Biotechnology, University of Johannesburg, South Africa

Abstract

Medicinal plants traditionally used by Vhavenda people of the Limpopo Province of South Africa have been comprehensively documented but their relative importance have remained poorly recorded. A rapid ethnobotanical appraisal was conducted to enrich the research findings already in the public domain. This was followed by formal interviews, using a flip file photo album showing images of 266 species of medicinally useful plants from 92 families and 212 genera. Interview results were analysed and quantified using the Matrix Method developed by De Beer and Van Wyk (2011). Species Popularity Index of each plant, as well as the Ethnobotanical Knowledge Index of each research participant, was determined.

Plants with the highest Species Popularity Indices were *Citrus limon* L. (0.86), *Aloe chabaudii* Schönland (0.8), *Solanum aculeastrum* Dunal (0.73), *Lippia javanica* (Burm.f.) Spreng (0.73), *Carica papaya* L. (0.72), *Bidens pilosa* L. (0.72), *Solanum campylacanthum* Hochst. ex A.Rich. (0.67) and *Sclerocarya birrea* (A.Rich.) Hochst. (0.65).

Ethnobotanical Knowledge Index was highest in senior citizens above 59 years of age (0.39), followed by adults between the age of 36 and 59 years (0.37) and lastly the youth below 36 years of age (0.22).

The highest diversity of plants was used to treat venereal diseases, respiratory ailments, stomach disorders, wounds, headache, infertility and toothache. Some enigmatic Venda medicinal plants such as *Mutavhatsindi* (*Brackenridgea zanguibarica* Oliv.) and *Muangaila* (*Millettia stublmannii* Taub.) are facing local extinction in the Limpopo Province because the traditional system of myths and taboos is no longer effective as conservation measures to ensure their sustainable use.

Homeopathy: Pharmacodynamics and Pharmacokinetics Meta-bolomics Approach in Phytochemistry and Medicinal Plants Research

The Significance, for Community, of Group Bathing Rituals: Comparing Native American *Inipi* (sweat lodge) with Japanese Bathing Traditions, *Sento* or *Onsen*

Tass Holmes

The University of Melbourne, Australia

Abstract

The author's recent ethnographic research in Victoria Australia included substantial fieldwork exposure to various 'alternative' healing methods, enjoyed by local people in a rural community. These included practices from Native American healing traditions, such as 'Hokokah', the sacred talking circle, calling up of energies of the 'four sacred directions' as a means of promoting healing, and 'Inipi', more commonly known as the 'sweat lodge'.

Inipi participation entailed an immersive communal sweat-bathing experience, and several sacred rituals of distinct character, including 'smoke bathing', the use of herbal plants, oils and pure water to direct phases of the lodge, group chanting and singing of traditional prayers, songs and playing of traditional instruments, the invoking of specific types of smoke and herb spirits to protect and convey spiritual energies, and welcoming in of 'The Old Ones', being the ancient, much-revered spirits of the stones. All rituals were coordinated and led by a Native American healer, singer/musician and shaman. The author also participated in a concluding ritual, known as 'burning the prayer ties'.

This paper invites audience members to enjoy a narration about this experiential healing journey and its welcome rejuvenating and social-bonding effects, and attempts to draw a parallel to Japanese traditions of communal bathing, known as *Sento* or *Onsen*. The significance of group bathing rituals is explored, as a means of promoting individual wellbeing, a heightened contemplative spirituality derived from a communing experience incorporating elements of nature, and the benefit of such rituals for bonding and social cohesion in communities.

Biography

Tass Holmes holds a PhD in Anthropology (focused on complementary medicine, and the nexus between rural poverty and health, in Australia), from the University of Melbourne (graduated 2015). She teaches in Anthropology and Multidisciplinary studies at The University of Melbourne, and in Indigenous Cultural, Political and Health Studies at Charles Sturt University. Tass has written widely in recent years about complementary medicine, and contemporary issues, including epidemic illness and traditional medicine in Africa, and endangered species.

Ethnobotanical Profiling of some of the Medicinal Plants used in Treatment of Inflammation

Milingoni Peter Tshisikhawe* and Takalani Matshiba

University of Venda, South Africa

Abstract

The use of medicinal plants in traditional medicine is an important aspect of healthcare provisioning in many rural communities around South Africa. Traditional medicines have therefore been reported to be used in treatment of a number of diseases including inflammations. The objective of this study was to document medicinal plants used in treatment of inflammation by the Vhavenda of Gundani village in Vhembe District Municipality of Limpopo Province, South Africa. Data was collected from participants through semi-structured interviews with an aid of a questionnaire. Twenty-three medicinal plant species were reported to be used in treatment of different types of wounds. The majority of the species used belonged to Fabaceae family. However, species that was frequently reported was *Zanthoxylum davyi* which belongs to the Rutaceae family. The plant parts mostly preferred in treatment of inflammation were barks and leaves. Roots, fruits, seeds, latex and in some cases the whole plant were also preferred in preparation of traditional medicine. Mouth sores were the main inflammatory conditions reported to be treated by traditional medicines followed by open wounds. The study clearly demonstrated the high use prevalent of traditional medicine in treatment of inflammations by a rural community.

Biography

Prof Milingoni Peter Tshisikhawe is an Associate Professor and Head of Department in the Department of Botany at the University of Venda in South Africa. Dr. Tshisikhawe lectures Ethnobotany as well as Plant Ecology to undergraduate and postgraduate students. Dr. Tshisikhawe have published extensively in the area of Plant Ecology and Ethnobotany in peer reviewed scientific journals and also written two book chapters. Dr. Tshisikhawe have also supervised a number of postgraduate students at Honours, Masters and PhD levels and the current research area focuses on population ecology as influenced by utilization options of plant resources.

Elevation of Triterpenoid Contents in Transgenic *Artemisia annua* L. Plants Resulted by Co-expression of Farnesyl Pyrophosphate Synthase (FPS) and Amorpha-4-11- diene Synthase (ADS) Genes

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¹Department of Biotechnology, Faculty of Science, Mahidol University, Bangkok, Thailand

²Faculty of Agriculture, Niigata University, Ikarashi, Niigata, Japan

Abstract

Overexpression of genes involved in terpenoid biosynthesis was manipulated in *Artemisia annua* L. prior to examine its effect on artemisinin content and terpenoid variations. The recombinant plasmid harboring amorpha-4-11-diene synthase (*ADS*) gene with or without the co-expression of farnesyl pyrophosphate synthase (*FPS*) gene were cloned into Ti-plasmid vector and transferred into *A. annua* using *Agrobacterium*. The PCR positive was confirmed after gradually selected the putative transformants in media containing bialaphos. These bialaphos-resistant plantlets showed a positive Southern blot analysis. Transgenic lines of both *ADS* and *FPS-ADS* co-expression exhibited higher transcriptomic expression of *FPS* gene more than wild type. Nonetheless, expression level of *ADS* gene in transgenic lines with *FPS-ADS* co-expressing was lower than those of transgenic with *ADS* solely. SEM analysis revealed

that the numbers and density of glandular secretory trichomes (GSTs) were detected in transgenic plants, however they were decreasing in size. Among transgenic plants, transgenic *ADS* showed the highest artemisinin content more than those of *FPS-ADS*. Surprisingly, low amounts of an artemisinin derivative (i.e. qinghaosu C) was detected in *ADS* overexpressing line, indicating that the metabolic flux of artemisinin biosynthesis might be interfered with inserted *ADS* gene. It was noted that transgenic *A. annua* with *ADS* overexpression had increasing contents of total sesquiterpene (C15), whereas those of *FPS-ADS* co-expression showed increasing of triterpene (C30). The information gain from this study will allow us to understand the roles of metabolic flux and chemotypic variations, which will be useful to apply for production of novel compounds or high-producing lines.

Biography

Ms. Darunmas Sankhuan is a doctoral candidate under the double degree program between Mahidol University, Thailand (Biotechnology) and Niigata University, Japan (Agriculture and Bioresources). Darunmas got a scholarship from RGJ (Royal Golden Jubilee) of Thailand Research Fund (TRF), as well as co-support from Niigata University under Global Circus program. Her special interest in metabolic bioengineering and transcriptomic analysis and plant metabolome.

Effect of Nutrient Deficiency on Biochemical Components of *Peperomia pellucida* L. Kunth

Netiya Karaket^{1*} and Kanyaratt Supaibulwatana²

¹School of Interdisciplinary Studies, Mahidol University, Kanchanaburi Campus, Thailand

²Department of Biotechnology, Faculty of Science, Mahidol University, Thailand

Abstract

Peperomia pellucida or 'Shiny leave' belongs to family PIPERACEAE has been reported as herbal medicine with anticancer and antibacterial properties. In this research studies, *P. pellucida* grew under soilless-cultured system supplemented with Yoshida's solution prior to treat with nutrient deficiency. One-fourth reduction of nitrogen (1/4N), phosphorus (1/4P), potassium (1/4K) or calcium (1/4Ca) were applied. Leaves of *P. pellucida* were extracted with ETOH and analyzed by gas chromatography mass spectrophotometer (GC-MS). It was shown that nutrient deficiency affected on the biochemical constituents detected in *P. pellucida*. Four main compounds were found in leaves of *P. pellucida* grown in full strength Yoshida's solution (control); these are apiol, 10,11-Benzo[3.2] paracyclophane-4',5'-dicarboxylic acid, dimethyl ester, caryophyllene, stigmasterol. The relative contents of main compounds detected in plants grown under nutrient deficiency were examined. It was interesting to note that 1/4N treatment caused decreasing of these target compounds when compared to control, whereas others treatments of P, K, Ca deficiency showed increasing biochemical contents up to 24.5%. Decreasing of N, P, K, Ca could stimulate sesquiterpenoid production up to 83%. These nutrient deficiency conditions could elevate the production of β -elemene up to 3-5 times over than control, where the accumulation ratio of β -elemene and caryophyllene was changed from 1:5 to 1:1.5. Two new compounds as Naphthalene, 1,2,3,5,6,7,8,8a-octahydro-1,8a-dimethyl-7-(1-methyl ethenyl)-, [1S-(1.alpha.,7.alpha., 8a.alpha.)]- or valencene were detected in treatment of 1/4P deficiency, which was not found in control. It might be suggested that nutrient deficiency condition could interfere the function of enzymes in sesquiterpenoids biosynthesis.

Biography

Ms. Netiya Karaket, Ph.D. is an academic staff in the school of interdisciplinary studies of Mahidol University since 2014. She performs her research activities mainly in metabolomics aspect of medicinal plant, the responds of plant in stress condition, as well as bioactive compounds in useful mushroom. Her works have been supported by Mahidol University and Agricultural Research Development Agency (ARDA).



October 16

TUESDAY

Therapeutic Efficacy of a Combined Sage and Bitter Apple Extract in Chronic DSS-induced Colitis

Maximilian Hoffmann, Ulla Schwertassek, Aleksandra Seydel, Klaus Weber, Sunna Hauschildt and Jörg Lehmann*

Fraunhofer Institute for Cell Therapy and Immunology, Leipzig, Germany

Abstract

Inflammatory bowel diseases are multifactorial disorders of the gastrointestinal tract with rising incidence worldwide. Current standard therapies are only partially effective and often show severe adverse effects. Thus, novel more efficient and well-tolerated therapeutic options are urgently needed. We have studied the therapeutic potential of a phytopharmaceutical combining sage and bitter apple (SBA) in the mouse model of chronic dextran sulfate sodium (DSS) colitis. SBA represents a traditional medicine against diarrhea and was shown to exhibit anti-inflammatory effects *in vitro*.

In the chronic DSS colitis model SBA treatment significantly reduced clinical symptoms in a dose-dependent manner. The positive therapeutic effect of SBA was characterized by a decreased histopathological score indicating tissue healing. Moreover, the number of neutrophils as well as the expression of the neutrophil-recruiting chemokine CXCL-1/KC in the colon tissue was significantly reduced, whereas the recruitment of macrophages was induced. Also, the expression of inflammatory markers was significantly suppressed, while the expression of the anti-inflammatory cytokine interleukin-10 was induced in colon tissue following treatment with SBA. Hence, based on the results from this study, phytopharmaceutical drugs containing SBA are considered as an alternative or supplementary option for IBD therapy.

The Genus *Huperzia* and its Lycopodium Alkaloids with Focus on *Huperzia Selago*

Elin S. Olafsdottir*, Natalia M. Kowal, Sebastian Oddsson and Maonian Xu

University of Iceland, Faculty of Pharmaceutical Sciences, Iceland

Abstract

The club moss genus *Huperzia* belongs to the family of Lycopodiaceae and has been further grouped into the subfamily of Huperzioidae. The generic and species classification of Lycopodiaceae family is still under debate and mapping of the phylogeny and alkaloid production of the huperzioid Lycopodiaceae species is important for this global task. The vulnerable and slow-growing *Huperzia* species have been used in traditional medicine for various conditions including neurological disorder such as schizophrenia and neurodegenerative diseases such as Alzheimer's. They produce bioactive alkaloids including the strong acetylcholinesterase inhibitor huperzine A, together with an array of various less explored lycopodium alkaloids. The aim of the study is to review the present knowledge of the phylogenetic relationship and distribution of lycopodium alkaloids in the *Huperzia* genus with a special focus on the species *Huperzia selago*. *H. selago* grows in the northern hemisphere including Arctic areas and is the only *Huperzia* species found in Iceland. A study of *H. selago* sampled various places in Iceland revealed three genotypes which showed distinct differences in the amount of huperzine A produced. The results show that identification of plant material down to genotypes is important with respect to the content of the valuable, bioactive

alkaloid huperzine A and could be relevant for other lycopodium alkaloids and *Huperzia* species as well.

Biography

Elin studied Pharmacy at the University of Iceland in Reykjavik followed by M.Sc. studies at the University of Copenhagen, Denmark. In 1991 she completed her Ph.D. studies in the field of natural products chemistry. She worked as a researcher at the Faculty of Medicine, Research Laboratory on Pharmacology and Toxicology, University of Iceland, and in 1994 she got a full time Faculty position at the Faculty of Pharmaceutical Sciences. Elin is currently a Professor of Natural Products Chemistry and her main research interests are in the field of bioactive natural products from Icelandic lower plants and lichens.

The Chemotherapeutic Value of *Astragalus membranaceus*: From its Total Saponins to Individual Isoflavonoids

Joshua Ko

Center for Cancer and Inflammation Research, School of Chinese Medicine, Hong Kong Baptist University, Hong Kong SAR, China

Abstract

In the past decade, we have investigated the contemporary anti-inflammatory and anti-carcinogenic potential of different components of the Chinese medicinal herb *Astragalus membranaceus*. We have first exhibited that crude aqueous extract of *Astragalus* could protect against experimental colitis through modulation of colonic cytokines and adhesion molecules. We then discovered that the total *Astragalus* saponins (AST) could cause significant growth inhibition in human colon cancer cells as well as tumor xenograft, which synergistically worked with the chemotherapeutic drug 5-FU while alleviating the drug-induced toxicity (Carcinogenesis 28:1347-55, 2007). AST has demonstrated anti-cancer activities in a wide range of human cancer cell lines, suggesting its universal chemotherapeutic property (Int. J. Cancer 125:1082-1091, 2009). AST undergoes a large variety of action mechanisms, including promotion of apoptosis, induction of phase-specific cell cycle arrest leading to inhibition of cell proliferation, ER stress-induced modulation of GRP78 and calpain deactivation through mediation of calcium homeostasis, reduction of oxidative stress, downregulation of pro-angiogenic and pro-invasive that results in inhibition of cell migratory and cell invasive actions. The signaling pathways and transduction molecules being identified as AST targets include NSAID-activated gene (NAG-1), PI3K-AST-mTOR pathway, ERK and NF- κ B signaling. The anticancer effectiveness of AST was shown in both primary solid tumor as well as liver metastasis as demonstrated in different animal models. Besides, differential anti-carcinogenic actions of the isoflavonoids formononetin and calycosin were also explored in colon cancer, with unique modes of action of the latter compound such as modulation of NADPH oxidase and the tumor microenvironment.

Biography

Dr. Ko had published over 100 journal papers and conference proceedings. His research focuses on the signaling pathways of anti-carcinogenic agents, with special interest in the pharmacological actions of herbal terpenoids and flavonoids when treating gastrointestinal cancers, particular that of the colon, pancreas and the liver, as well as to identify the key molecular drug targets. Current new ventures include the use of microRNA technology and tumor-targeting peptide, and to study modulation of the autophagy mechanism as well as the tumor microenvironment.

Therapeutic Effects of Phytochemicals Regulating the Activity of the Aryl Hydrocarbon Receptor in DSS-induced Colitis

Maximilian Hoffmann, Sina Riemschneider, Ulla Schwertassek, Klaus Weber, Sunna Hauschildt and Jörg Lehmann*

Fraunhofer Institute for Cell Therapy and Immunology, Leipzig, Germany

Abstract

Inflammatory bowel diseases such as Crohn's disease and ulcerative colitis are multifactorial inflammatory disorders of the intestine characterized by abdominal cramps, bloody diarrhea and anemia. Standard treatments including corticosteroids and biologicals (e.g. Tumor necrosis factor (TNF)- α inhibitors) induce severe side effects. Moreover, patients often develop resistance to those therapies. Thus, novel therapeutic options that are well tolerated are urgently needed. The aim of this study was to prove the therapeutic efficacy of the phytochemicals quercetin (Q) and indol-3-carbinol (I3C) in a translationally relevant mouse model of chronic dextran sulfate sodium (DSS) colitis. Both substances were shown to regulate the aryl hydrocarbon receptor (AhR). In order to evaluate the role of AhR in colitis therapy, the efficacy of these phytochemicals was tested in both wild-type and AhR-deficient (AhR^{-/-}) C57BL/6 mice. Oral administration of both Q and I3C induced amelioration of clinical symptoms in wild-type mice which was in coincidence with a significantly reduced histopathological score. The treatment prevented in part the DSS-induced loss of epithelial integrity and reduced significantly the inflammatory response in the colon as observed by colonoscopy. In contrast, neither Q nor I3C were therapeutically effective in AhR^{-/-} mice. Hence, based on the results from this study, AhR-activating phytopharmaceuticals are considered as an alternative or supplementary option for IBD therapy.

Effects of Active Constituents of Ginger Inhibit Docetaxel Resistant Prostate Cancer through Modulating Drug Resistance Factors

Chi-Ming Liu

School of Medicine, Yichun University, China

Abstract

Ginger has many bioactive compounds with pharmacological activities. These compounds have many pharmacological actions with anticancer, anti-inflammatory and antioxidant activities. Prostate cancer is the most prevalent cancer in the western countries. Drug resistance is a critical issue for the cancer therapy. Multidrug resistance (MDR) mechanisms are associated with increased expression of the P-gp (P-glycoprotein) or increased cellular metabolism of drug detoxifying proteins, such as glutathione-S-transferase (GST). The aim of our previous study was to investigate the anticancer properties of ginger phytochemicals including 6-gingerol, 10-gingerol, 4-shogaol, 6-shogaol, 10-shogaol, and 6-dehydrogingerdione in docetaxel-resistant (PC3R) and docetaxel-sensitive (PC3) human prostate cancer cells. The results showed that 6-gingerol, 10-gingerol, 6-shogaol, and 10-shogaol inhibit the proliferation of PC3R cells through the downregulation of MRP1 and GST π protein expression. Taken the results together, these phytochemicals might be applied for sensitizing the chemotherapy drug activity in chemoresistant cancers cells in the future.

Biography

Chi-Ming Liu has completed PhD from Kaohsiung Medical University in 2009. He is currently an assistant professor, pharmacist and principal secretary in Tzu Hui Institute of Technology. His research interests focus on evaluating and developing pharmacological actions of natural products and clinical

drugs in cancers and benign prostatic hyperplasia for clinical applications. He has published more than 20 papers in journals and has been served as an Editor Board member of repute.

Evaluation of the Effect of Papaya Leaf Extract on Platelets and Unraveling its Mechanism of Action Using Preclinical and Clinical Models

Deepak Kumar Semwal

Uttarakhand Ayurved University, Uttarakhand, India

Abstract

Carica papaya leaves have been used in traditional medicine in Asian countries mainly in treating dengue. Various earlier studies proved its role in increasing platelet count in dengue patients, a precise mechanism of its action remains unknown. The present study aimed to evaluate the effect of *C. papaya* leaf extract on platelets and unravelling its possible mode of action. The methanol (MEA) and acetone (ACA) extracts were studied for antiplatelet activity and bleeding time in rats whereas the decoction of leaves powder was clinically used on patients with low platelet count. The results showed that MEA, ACA and positive control (heparin) attenuated the platelets aggregation by 68%, 56% and 72%, respectively. On the other hand, MEA and ACA at 400 mg/kg significantly increased the bleeding time in rats by 3 and 4 seconds, respectively while the standard (aspirin) at 100 mg/kg increased the bleeding time by 7 seconds in comparison to the control. The clinical studies revealed that decoction of the leaf (1 g thrice a day) significantly increased the platelet count in the patients. The study concludes that the papaya leaf has potential to increase platelet count via attenuating their aggregation.

Biography

Dr. Semwal is presently served as a faculty member at Uttarakhand Ayurved University, India. Prior to joining this position, Dr. Semwal was working as TUT/NRF Postdoctoral Research Fellow at Tshwane University of Technology, Pretoria, South Africa. He received his Master in Organic Chemistry and PhD in Phytochemistry from HNB Garhwal University, India. In 2005, he started his career as a Lecturer in Chemistry at HNB Garhwal University, India. In 2010, he received prestigious Dr DS Kothari Postdoctoral Fellowship from UGC, India and did his postdoctoral work at Panjab University, Chandigarh. He published his quality research in various journals of international repute and also presented his work at many national and international conferences. He received many prestigious awards including young scientist for his research and academic performance. His current research interests are phytochemistry, phytomedicine, Ayurveda, drug discovery, drug delivery, and semi-synthesis.

In vitro Cultures of *Viola odorata* as Production Platforms of Known and Novel Cyclotides

Narayani M, Anju Chadha and Smita Srivastava*

Department of Biotechnology, Bhupat & Jyoti Mehta School of Biosciences Building, Indian Institute of Technology Madras, Chennai, India

Abstract

Cyclotides are a class of cyclic plant proteins with a unique topology which is responsible for their exceptional chemical, thermal, and enzymatic stability. This makes them a potential candidate for diverse commercial applications like agrochemicals, pharmaceutical scaffolds for drug delivery, and therapeutic

agents. In this study, known and novel cyclotides were identified in the Indian variety of the medicinal plant *Viola odorata* using liquid chromatography and fourier transform mass spectrometry. Confirmation was based on their mass (2.5-4 kDa), hydrophobic nature, disulfide bonds, circular structure and amino acid sequence. A total of 71 known and 98 putative new cyclotides were identified. The study revealed that the production of cyclotides in plants varies with geographical locations and the type of the tissue and hence cannot serve as a reliable source for the production of cyclotides. Thus, to establish an alternative and sustainable production platform for cyclotides, callus, cell suspension and somatic embryos of *V. odorata* were developed to investigate the production of known and new cyclotides. Out of the 43 new cyclotides identified in the *in vitro* cultures, 10 were exclusively produced in the *in vitro* cultures but not in the natural plants. Furthermore, the somatic embryos (rich in cyclotides) also demonstrated superior biological activities (cytotoxic, hemolytic and antimicrobial) than the natural plant indicating that it could be an alternative source for several therapeutic applications. Hence, apart from germplasm conservation of the plant, the *in vitro* cultures can serve as an alternative source for production of natural and new cyclotides.

Biography

Dr. Smita Srivastava is an Assistant Professor in the Dept. of Biotechnology at IIT Madras, Chennai, India. She did her B. Tech in Chemical Engineering from HBTI, Kanpur followed by M.S (Research) and PhD in Biochemical Engineering from IIT Delhi in 2009. She started her independent career from 2010 as faculty at IIT Madras with a research interest in bioprocess development and optimization for *in vitro* production of high value plant metabolites. Her research achievements to date include 19 peer reviewed international journal publications, 2 book chapters, 4 applied patents and more than 20 international and national conference presentations. Her academic achievements to date include awards of different nature like best research paper, best poster, fellowships, travel awards, sponsored research grants, etc. from various govt. funding agencies and international conference organizations.

Comparative Phytochemical Analysis of the Different Plant Parts as a Contribution to Sustainable use of Medicinal Plants: The Case of *Barleria dinteri*

Sechene Stanley Gololo*, Chepape Semenya and Rejoice Maseko

Sefako Makgatho Health Sciences University, South Africa

Abstract

The importance and preservation of medicinal plants for continuous usage require sustainable harvesting approaches that could be in the form of substituting the roots with the aerial parts. Such approach would only be beneficial if the phytochemical composition profiles of the aerial parts is more similar or less different to those of the roots. In this study, it is shown that the phytochemical compounds that are possessed by the roots of *Barleria dinteri*, a medicinal plant against many ailments in South Africa are also present in the aerial parts through qualitative phytochemical analysis using phytochemical screening tests as well as thin layer chromatography (TLC), UV-Visible spectrophotometric and GC-MS analysis. The results suggest that the usage of the aerial parts of *B. dinteri* in traditional medicine could be encouraged as a contribution to the sustainable use of the plant species.

Biography

Dr S.S Gololo is a Ph.D graduate in Biochemistry with specialty in Phytomedicine with research interest in the sustainable usage of medicinal plants extracts that is supported by knowledge on phytochemical compositions of different plant parts.

Phytochemical Variations Affected by Genetic Interferences and Modified Environments

Kanyaratt Supaibulwatana

Department of Biotechnology, Mahidol University, Thailand

Abstract

Plants contain many valuable secondary metabolites that are useful as sources of high-value phytochemical such as pharmaceutical, natural agrochemicals, food flavorings, coloring agents, and natural fragrances. The medicinal use of natural phytochemical compound precedes recorded human history by thousands of years. Although in the past decades, the advent of molecular biology and combinatorial chemistry made possible the rational design of chemical compounds to target specific molecules. In recent years, incorporation of biotechnology with the advance technologies of analytical biochemistry and high-throughput omics led to more increasing numbers of complete plant genome sequences and better understanding in functional genomic study and more importantly, their role as a basis for drug development. Besides the genetic interferences by metabolic bioengineering, induced mutation are also useful to establish new mutants that may be implemented for production of high-yielding of high-value phytochemical. In this presentation, genetic interferences incorporated with modified environmental controlled environments with artificial lights that had effects on morphological growth and phytochemical changes will be demonstrated using a medicinal herb, *Artemisia annua* L. as a model plant. The alteration of plant metabolites and its bioactivity will be discussed in a presentation.

Biography

Associate Professor Dr. Kanyaratt Supaibulwatana is based at the Faculty of Science, Mahidol University, Bangkok, Thailand. She graduated PhD (Plant Biotechnology) from Chiba University, Japan with the support of Monbusho scholarship. Her recent research focuses mostly on agricultural biotechnology, plant physiology under artificial environments & stress conditions, mutation breeding and metabolic bioengineering of plant secondary metabolites for pharmaceutical implementation.

Synthetic Cytokinin Regulated as Elicitor to Enhance Plant Secondary Metabolites in *Andrographis paniculata*

Phapawee Worakan¹, Netiya Karaket², Nuchada Maneejantra¹ and Kanyaratt Supaibulwatana¹

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²School of Interdisciplinary Studies, Mahidol University, Kanchanaburi Campus, Thailand

Abstract

The demands of herbal medicines for wellness awareness and health aspect have been increasing worldwide. The production of medicinal plants as sources of valuable therapeutic compounds and novel bioactive substances is in need. Genetic variability, climate and geographical conditions mainly play significant roles on variations of biochemical production. Environmental factors can trigger as signal elicitors to alter both quality and quantity of plant metabolites, which are regulated with the expressions of related biosynthetic key enzyme genes. However, the abiotic elicitor-caused modulations of plant mechanisms associated with pharmaceutically desirable metabolites in medicinal plants have been studied only a small number of known gene families. This recent study demonstrated the evidence of synthetic cytokinin that affected on biochemical changes and terpenoids production of *Andrographis paniculata* plant. Application of synthetic cytokinin, CPPU (Cytokinin-1-(2=chloro=4= pyridyl)-3-phenylurea)

showed its influence to interfere the terpenoid biosynthetic compounds produced in leaves of *A. paniculata*. CPPU treated sample showed increasing contents of a target active diterpenoid, andrographolide and seem to alter the proportion of others terpenoid compounds in treated plants when compared to control. On the other hand, appropriate CPPU concentration could stimulate branching and more leaf numbers of *A. paniculata*. Hence, it was suggested that CPPU can be used as representative of cytokinin-like action *ex vitro* to elicit production of plant secondary metabolites in *A. paniculata*, which has potential to apply for commercial production of useful phytomedicines.

Biography

Ms. Phapawee Worakan obtained her master's degree from Department of Biotechnology, Faculty of Science, Mahidol University, Thailand in 2016. She is currently a doctoral candidate under the supervision of Assoc. Prof. Kanyaratt Supaibulwatana. She has special interest in molecular mechanisms and signal transduction of plant in responses to environmental signals, which is mainly focusing on monitoring of transcriptomic and metabolomic analyses.

Study on Functionality of Aquatic Plants “Water Chestnut” and its Application to Health Foods and Cosmetics

Midori Yasuda^{1*} and Masaki Ikeoka²

¹Nishikyushu University, Japan

²Refine Holdings Co., Ltd., Japan

Abstract

Water chestnut is an annual aquatic plant with thorns that grows naturally in lake and marsh of Asia. In Japan, Japanese water chestnut (*Trapa japonica*) in Kanzaki, Saga Prefecture and devil water chestnut (*Trapa natans*) in Inbanuma of Chiba Prefecture are well known. In this study, we investigated the functionalities of polyphenols in the water chestnut husk. We isolated and purified polyphenols from the husk of water chestnut and revealed that eugenin, 1,2,3,6-tetra-*O*-galloyl-D-glucopyranose (TGG), and trapain were the main components. These showed the inhibitory activities of amylase and α -glucosidase, and an inhibitory effect on postprandial blood glucose elevation in mice. From the result of a cooked rice load test in humans, the elevation in blood glucose level was significantly suppressed on 20 and 30 minutes after the meal. This was speculated to be due to the inhibitions of carbohydrase activity and glucose uptake into the small intestine by the polyphenols. Thus, the polyphenols show the preventive effects from lifestyle-related diseases. In addition, the polyphenols showed the inhibitory activity of tyrosinase and melanin production inhibitory activity of melanoma cells, and the inhibitory activities of collagenase and elastase were also observed. From these results, it turned out that the polyphenols have the whitening and the anti-aging effects. Furthermore, we are commercializing the sweets “Hishiboro” and are developing the cosmetics for effective use of the functionalities. Thus, the water chestnut is a high additive value material expected to be used in a wide range of fields such as health foods and cosmetics.

Biography

Midori Yasuda was born in Saga Prefecture, Japan. She graduated from the Department of Chemistry, Saga University, and Department of Chemistry, Graduate School of Science and Engineering, Saga University, Japan. She received a Ph.D. (Science degree) from Saga University in 2001. After graduate school, she joined as an assistant the Department of Food and Nutrition, Nishikyushu University, Japan. She became a Professor of the Department of Health and Nutrition Sciences, Nishikyushu University in 2008. Her research interests are an analysis of functional ingredients in food and an evaluation of functionality.

Biological Evaluation of the Rhizome Secondary Metabolites of *Cyperus articulatus* L. as a Potential Source of Ingredients for Drug Formulation

Ayusman Swain* and Hariprasad P

Indian Institute of Technology - Delhi, New Delhi, India

Abstract

Cyperus articulatus L. (Cyperaceae family) is a tropical perennial plant which was mostly studied for its essential oil which is rich in sesquiterpenoids and shows significant antimicrobial properties. The present work is focused on evaluating *in vitro* biological activities of the secondary metabolites extracted from the rhizome of *C. articulatus*. Among different solvent extracts the Acetone extract recorded most potent antioxidant and enzyme inhibitory activity. The IC₅₀ values against DPPH, ABTS⁺ and O₂⁻ radical were reported as 12.115 µg/ml, 16.33 µg/ml and 83.23 µg/ml, respectively. The total phenolic and flavonoid content of the extracts were correlated with the reducing property (FRAP and CUPRAC) and DNA protection assay. The HR-LCMS/MS of Acetone extract reveals the presence of several polyphenols, flavonoids, terpenoids and several natural drug molecules that support the experimental results. Major compounds are Quercetrin, Dihydroquercetin, C16-Sphinganine, Phytosphingosine, Meptazinol Deoxyelephantopin, Colforsin and Venpocentine. The crude acetone extract also showed the highest inhibiting potential against the enzymes α-Glucosidase (IC₅₀ 9.05 µg/ml) and Acetylcholinesterase (IC₅₀ 52.22 µg/ml). Kinetic studies were done with the metabolites from active fractions of chromatographic (TLC) revealing their competitive as well as mixed-type inhibition. Molecular docking studies suggest that Quercetin and Sphinganine class of compounds were pointed as the markers for enzyme inhibition. Results of the present investigation envisaged the secondary metabolites of the rhizome as a potential source of antioxidants and drug ingredients for Diabetes and Alzheimer's diseases.

Biography

Ayusman Swain, a research scholar in Centre for Rural Development and Technology, Indian Institute of Technology Delhi under the supervision of Dr. Hariprasad P., has been working on secondary metabolites from various neglected plants and weeds to validate those as source of functional food and drug ingredients since last three years, and suggested their medicinal/pharmacological importance. He has expertise in chemical analysis of different natural products and evaluation of their bioactivity and food properties analysis.

Creation of a Medicinal Plant Based Natural Product Library in South Africa

Vinesh Maharaj

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Abstract

Historically, natural products and their derivatives played a significant part in the pharmaceutical industry producing many of the early drugs and nearly half of all approved medicines. As the third richest centre of biodiversity in the world, South Africa has well over 20 000 indigenous plant species, providing a rich resource for drug discovery. The country also has a long tradition of medicinal use of plants with more than 200 000 Traditional Health Practitioners. Scientific research on this rich biodiversity informed by indigenous knowledge provides South African scientists competitive advantage in trying to identify new pharmaceutical products, typically herbal medicines and new chemical entities. We undertook to create a repository of natural products and involved a systematic collection of 11 000 plants species with the production of approximately 32 000 plant extracts and a database for the cataloguing and management of the collection and plants associated with traditional knowledge. Several screening campaigns targeting various diseases such as HIV, cancer, malaria, Alzheimer's disease were undertaken using the extracts which resulted in several "hits" requiring further isolation and identification of the biologically active compounds. However this proved to be difficult and challenging as the exceedingly complex mixtures of different classes of chemicals in the extracts and their isolation and purification remained as one of the main bottlenecks. Ideally pre-fractionated extracts in a format suitable for screening would have yielded better success. As a result of this, we are now fractionating the library of samples into semi pure fractions and compounds ready for high through put screening formats. The experiences, successes and challenges in creating a natural product library as well as future plans are discussed.

Biography

Prof Maharaj worked for the CSIR for 25 years before joining the University of Pretoria in November 2013 as Head of Department where he was involved in the discovery of new drug leads based on biodiversity samples. His research expertise includes natural products chemistry, isolation and structure elucidation of natural compounds and their development as pharmaceuticals and nutraceuticals. He is one of the main inventors on the patent based on the discovery of a novel appetite suppressant for the Hoodia plant for which he has over 80 international patents. He collaborated with Pfizer and Unilever on the commercialization of this discoveries. Prof Maharaj was instrumental in developing benefits sharing models with indigenous knowledge holders. He also led the systematic collection and extraction of indigenous plants from SA which led to the collection of 11 000 plant species and their corresponding 32 000 extracts managed to an electronic sample management system.

Phytochemical and Pharmacological Studies of the Stem Bark and Fruits of *Celtis australis*

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²Department of Phytochemistry, Faculty of Biomedical Sciences, Uttarakhand Ayurved University, Harrawala, Dehradun, India

Abstract

Celtis australis L., belongs to the family Cannabaceae, is a deciduous tree distributed to montane and submontane Himalayas. The paste obtained from its bark is used as a remedy for bone fracture and also applied on pimples, contusions, sprains and joint pains in the Indian traditional medicinal system. Five triterpenoids named 9 β ,25-cyclo 30-propyl hopane-31 β -ol; 3 β -hydroxy 30-propyl-hopane-31-one; 3 β -hydroxyoleanane; 9 β ,25-cyclo olean-12(13)-ene 3-O- β -D-glucufuranoside and 3 β -hydroxy-35-(cyclohexyl-5'-prop-7'-one)-33-ethyl-34-methyl-bactereohopane, a steroid named 9 β ,19-cyclo 3 β ,14 β -dihydroxycholane 3-O- β -D-glucopyranoside, a phenolic glycoside named 3-[8'-hydroxy-prop-6'-ene-6'-yl]-5-hydroxymethyl-4-methoxy-2-[penta-1',4'-diene-1'-yl-5'-sulphonic acid]-5,6-dihydrobenzofuran and an anthraquinone named 6-acetoxy 2-hydroxy 1,3,4-trimethoxyanthraquinone along with fatty acids have been isolated from the stem bark and fruits of *Celtis australis* for the first time. Their structures were characterized by means of chemical and spectral methods including advanced 2D NMR studies. The crude extract and fatty acid from *C. australis* fruits were evaluated for their antimicrobial, analgesic and anti-inflammatory activities. When tested by the disc diffusion method, the extract of *C. australis* was found active against *Bacillus subtilis* and *Pseudomonas aeruginosa* with a minimum inhibitory concentration of 250 and 125 μ g/mL, respectively. The bark extract, fruit extract and fatty acids obtained from the plant at the doses of 500 mg/kg/oral each exhibited the analgesic activity with protection percentage of 59.28%, 63.22% and 45.79%, respectively. The treatment with different doses of the crude extracts and fatty acids showed a dose-dependent inhibition of carrageenan-induced inflammation in mice by up to 50.00% after 3h of treatment, whereas phenylbutazone, a positive control at a dose of 100 mg/kg showed inhibition by 49.18%.

Biography

Dr. Ruchi Semwal is presently working as Assistant Professor at Pt. Lalit Mohan Sharma, Govt. PG College, Rishikesh, Uttarakhand, India. She has been working as NRF-Postdoctoral Fellow at the Department of Pharmaceutical Sciences, Tshwane University of Technology, Pretoria, and UGC-DSK-Postdoctoral Fellow at the Department of Chemistry, Panjab University, Chandigarh. She obtained her PhD in Natural Products Chemistry from HNB Garhwal University, India. She has been an author of many research papers and books and also presented her work at many conferences. She is currently engaged in the research on Phytomedicine, natural products, traditional medicine and natural dyes.

Bioactivity Guided Isolation and Characterization of Iso-Pimarene from the Stem Bark of *Tecomella undulate* Seem

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Abstract

Tecomella undulate (TU) Seem (Bignoniaceae), is used as an hepatoprotective drug in various Ayurvedic formulations such as Rohitakarishtha, Rohitakaadya and Rohitakaghrita, as an active pharmaceutical ingredient. Present study aims at bioactivity guided isolation of hepatoprotective compounds from the stem bark of TU. Decoction of the crude drug was prepared and dhataki pushp (*Woodfordia fruticosa*) along with jaggary was used to ferment the decoction as per Ayurvedic Pharmacopoeia of India. Successive fractionation of fermented decoction was performed and fractions were subjected to hepatoprotective activity using CCl₄ stressed HepG2 cell lines to determine potent fraction against Betulinic acid as standard. Potent fraction was subjected to column chromatography for the isolation of compounds. *In-vitro* Hepatoprotective activity of all isolated compounds was performed using CCl₄ stressed HepG2 cells. Chloroform fraction was found to be potent hepatoprotective fraction (percentage viability ranged between 39.33% and 63.0% at 150-450 µg/ml concentration) comparable as produced by standard Betulinic acid at 150 µg/ml. Iso-pimarene, white colour semi-solid mass (m.p. 159-160 °C) was obtained after column chromatography with hexane: ethyl acetate (75: 25 v/v) and characterized by Nuclear Mass Resonance, UV, Mass and Infra-Red spectra. Iso-pimarene was found to be a more potent hepatoprotective compound at the concentration of 50 µg/ml (72.33% hepatoprotection) than 25 µg/ml (59.0% hepatoprotection), comparable to Betulinic acid 50 µg/ml (77.67% hepatoprotection). Results are expressed as mean ± standard error mean (SEM).

Biography

Dr. Vidhu Aeri is a professor of Pharmacognosy & Phytochemistry, actively involved with teaching of UG, PG and PhD students and research on natural products with reference to traditional medicinal plants since last 27 years.

Her current focus is on research in hepatoprotective and antidiabetic medicinal plants in particular to their extraction, isolation and analysis of secondary metabolites *in vivo* and *in vitro* cultures. She is currently focusing on pharmacophores in aristas, asvas and bhasmas with bioactivity guided fractionation of extracts and microbial biotransformation of secondary metabolites under the projects sanctioned by DST and NMPB. She has authored two books: Pharmaceutical Biotechnology- Basics and Applications and Practical Pharmacognosy published by Capital Publishers and Frank Brothers. She has 6 book chapters and more than 100 research papers in National and International Journals to her credit.

Identification of Secondary Metabolite (phyllanthin) in Callus Cultures of *Phyllanthus virgatus* G. Forst

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Abstract

Phyllanthus virgatus is a valuable medicinal plant belonging to the family Euphorbiaceae. The plant

is used widely in traditional medicine for the treatment of flu, diabetes, jaundice, gall bladder calculus, liver disease, anti-inflammatory, Antimicrobial and anticancer activity. Callus cultures were established from leaf and nodal explants. Leaf explants showed better callus initiation than nodal explants. Explants inoculated on MS medium supplemented with individual concentration of 2, 4-D, NAA and BA. Leaf explants inoculated on MS medium containing 452 μ M 2,4-D was noticed to be significantly higher than nodal explants. Further screening of callus culture was carried out on Murashige and Skoog (MS) medium with different concentration and combinations of 2, 4 D, NAA, IAA, IBA, BA and KN individually and in combinations. Remarkable callus biomass to the tune of 17.9 \pm 0.30 g/L dry weight (182.7 \pm 0.20g/L fresh weight) was observed in MS media containing 2, 4-D, NAA and BA. The callus biomass was found to change when they were transferred to varying concentration of Sucrose, pH and macronutrients. A modified MS medium fortified with 2, 4-D, NAA and BA, 2.5% sucrose, 9g agar per liter, adjusted to pH 5.5 and maintained at 26 °C with 16-h photoperiod was found most effective in inducing significantly higher callus biomass 24.6 \pm 0.42 g/L dry weight (383.43 \pm 0.20g/L fresh weight). The harvested callus biomass was subjected to extraction and purification of phyllanthin compound. In this study, cell biomass extracts were compared with extracts from leaves of mother plants of *Phyllanthus virgatus*. HPLC analysis of these extracts showed that the main components of the active principles namely phyllanthin were present in sufficiently large amounts in the undifferentiated cultured cells.

Crystallization and X-ray Diffraction of Trilobolide-6-O-isobutyrate from Crude Extracts of *Wedelia trilobata* (L.) Flower

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Abstract

Wedelia trilobata is a creeping, succulent mat-forming perennial herb in the family of Asteraceae. Flowers were obtained from *Wedelia trilobata* grown as ground covering plants in Mahidol University, Kanchanaburi Campus. Flowers were dried at 50°C in a hot air oven. Crude extracts were obtained by gradient extraction using 3 different polarity organic solvents, i.e., hexane, ethyl acetate and methanol (12.8 g, 14.2 g, and 29.7 g, respectively). Crude ethyl acetate extract was further separated by a quick column chromatography using varied ratio of hexane and ethyl acetate mixtures as a mobile phase. Crystallized pure compound was obtained in the 3:2 hexane: ethyl acetate fraction. Chemical structure of the pure compound was elucidated by a spectroscopy data and reported to be trilobolide A and B, which has been revealed for its usage in fever, hepatitis, diabetes and cancer treatments. Identification of trilobolide-6-O-isobutyrate was confirmed by using a single crystal X-ray diffraction. The crystal was observed under light microscope and reported to be a hexagonal twinned, hexagonal pyramid crystal structure.

Biography

Dr. Watcharra Chintakovid is an assistant professor working at Division of Agricultural Science, School of Interdisciplinary Study, Mahidol University, Kanchanaburi Campus. Studies on extraction and chemical elucidation of herbal plants and microorganisms had been taught in the subject of “Natural products and their applications” as a collaboration between Division of Agricultural Science and Dr. Thaworn Jaipetch from the Center of Excellence for Innovation in Chemistry (PERCH CIC), Mahidol University, Kanchanaburi Campus. We established a course with lecture and laboratory periods that students in Agricultural Science Program can experience in this field.

Bioactive Properties of a Desert Truffle and a Cultivated Mushroom Proteins Hydrolyzed by Gastrointestinal Proteases

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Abstract

Recently, bacterial resistance to common synthetic antibiotic compounds, as well as oxidation and the production of free radicals in food and in the body, combined with the side effects of synthetic antioxidants and antibiotics are crucial problems in the world's food and medicinal industry. Therefore, finding new natural bioactive compounds can help to resolve these problems. Recent research has come to consider proteins and peptides as bioactive compounds with multifunctional properties such as antioxidant and antimicrobial activities. In this field, the source of proteins, types of proteases, degree of hydrolysis, process conditions all affect the bioactivity of produced peptides. Gastrointestinal enzymes are of widely used proteases in this regard. They produce new digest resistant bioactive peptides. *Terfezia clavaryi*, a desert truffle, and *Agaricus bisporus*, as cultivated mushroom, are medicinally important edible fungus with large amount of proteins. These mushroom proteins were hydrolyzed by both individual and mixed gastrointestinal enzymes in our research work. Our research indicated that the types of gastrointestinal enzymes and endogenous proteases effect the degree of hydrolysis. Moreover, the degree of hydrolysis, the strain of the mushrooms, and whether or not blanching is utilized as a common process, all influence the generation of bioactive peptides with different antioxidant and antimicrobial properties. Furthermore, some of the hydrolysates have more bioactive properties than their parent proteins. Therefore, the proteins of these mushrooms and their enzymatic hydrolysates, which possess new bioactive properties, can be beneficial to human health, both as medicine and in the food industry as preservative compounds.

Biography

The presenter, Parisa Farzaneh, is a PhD student major in Food Science and Technology, at the Science and Research Branch of Islamic Azad University in Tehran, Iran. The research being presented was completed in the Institute of Agriculture Biotechnology Research, in its branch in the city of Isfahan, Iran. Parisa's research area of interest focuses on two edible mushrooms: *A. bisporus* and *T. clavaryi*, the first of which is widely cultivated, and the second is harvested from its natural habitats of some countries like Iran. This is a report based on our article in LWT-Food Science and Technology.

Supercritical Carbon Dioxide Extraction and GC/MS Analysis of Medical Plants in the South Pacific Islands

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²School of Biological and Chemical Sciences, Faculty of Science, Technology and Environment, The University of the South Pacific, Suva, Fiji

Abstract

In the South Pacific Islands, a variety of traditional medical plants have been widely used together with the western medicine under the instruction of the local specialists who have been called traditional healer. Their bioactive components, however, have not been fully clarified yet, so scientific instrumental

analysis has been expected for effective and safe use of these medical plants. The authors have been involved in analytical chemistry using the supercritical carbon dioxide extraction and have shown the following advantages: (1) The extraction requires less than 1 g of sample. (2) The extraction can be done at temperatures as low as 313 K. (3) The ingredients do not react with the solvent -- carbon dioxide. (4) The extraction can be completed in one hour. This presentation will begin with an introduction of supercritical carbon dioxide extraction, which is the most effective and reliable extraction methods for hydrophobic compounds in the plants. Then we will discuss the results of GC/MS analyses of the extracts from several kinds of medical plants traditionally used in Fiji islands which are located in the center of the South Pacific islands. These scientific approaches are expected to contribute to the effective and safe use of the traditional medical plants and then the development of medical plant industry in the South Pacific islands.

Gamma Sitosterol and Palmitic Acid Isolated from *Tournefortia hirsutissima* L. to Accelerate the Healing Process

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¹Instituto Tecnológico y de Estudios Superiores de Monterrey, México

²Universidad Nacional de Quilmes, Argentina

Abstract

An investigation of *Tournefortia hirsutissima* L., endemic plant of Mexico and Central America, was made in order to identify the active compounds that take part in the acceleration of healing. Different extraction methods were evaluated to improve the yield and quality of the procedure. Microbiological tests were made to confirm the inhibition growth of the main microorganisms responsible of injury infections. A purification process, was designed to obtain the g-sitosterol and palmitic acid. Cell cultures of Keratinocytes of the line HaCat were treated with different concentrations of this compounds to measure the levels of proliferation and cytotoxicity. The Trolox proof was applied in order to know the antioxidant capacity of g-sitosterol. Finally, a topic formulation, made with the extract of the plant and complemented with other active compounds, is proposed like an auxiliary in the treatment of people with healing problems.

Biography

Engineer Gabriela Rivera Hernández obtained the Biotechnology degree with the Bioprocess specialization in 2018 by the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM). In 2017 she made an internship in Plastic Omnium Auto Inergy in the division of Health and Environment. In the same year, her project "Omnicell, topic formulation to accelerate the healing process" won the Engineer Competition in ITESM. She was selected to participate in the International Program of Food Science and Product Development in L'institut Supérieur Des Biotechnologies de Paris in 2017. She published the research article "Healing cream, *Tournefortia hirsutissima*" in the Journal "Medicinal and Aromatic Plants."

Anti-Inflammatory, Antioxidant and Phytochemical Studies of South African Medicinal Plants Traditionally Used in the Treatment of Sexually Transmitted Infections

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Abstract

Inflammatory sexually transmitted infections (STIs) such as gonorrhoea, chlamydia, and trichomoniasis have been implicated in the development of acute and chronic inflammatory disorders when left untreated. The inflammatory response triggered by these STIs also increases the risk of HIV acquisition. This study aims to harness the anti-inflammatory potential of twelve understudied South African medicinal plants used in the treatment of STIs. Acetone extracts from root or stem bark of the plants were tested for their inhibitory activity against Inducible nitric oxide production (iNOS) in liposaccharide (LPS) stimulated RAW 264.7 macrophages, 15-lipoxygenase (15-LOX) and xanthine oxidase (XO). Radical scavenging potential of the extracts was also assessed. Preliminary phytochemical analysis was conducted using NMR spectroscopy and the determination of total phenolic and flavonoid content. The tested extracts showed significant suppression of iNOS production in RAW macrophages. The best activities was observed in stem bark extracts of *Ficus abutilifolia*, *Faurea saligna* and *Zanthoxylum capense* ($IC_{50} < 30.0 \mu\text{g/mL}$). In the 15-LOX inhibitory assay, root bark extract of *Lannea schweinfurthii* showed noteworthy activity ($IC_{50} = 40 \pm 3 \mu\text{g/mL}$), while extracts from *Cassia abbreviata* best inhibited xanthine oxidase activity in the *in-vitro* assay ($IC_{50} = 46.8 \pm 1.5 \mu\text{g/mL}$). Nine of the tested plant extracts possessed good radical scavenging properties and showed little or no toxicity when tested against RAW macrophages and Vero cells. The observed biological activities could be due to the presence of polyphenolic compounds among other diverse chemical constituents as indicated by the preliminary NMR spectroscopy studies.

Biography

Fatimah Lawal is a final year PhD student at the University of Pretoria South Africa. Her current research is focused on the bio-guided isolation, purification and identification of anti-inflammatory compounds from plants used traditionally in the management of sexually transmitted infections. She explores NMR based metabolomics to de-replicate and bio-prospect for active constituents in these understudied plants.

Synthesis and Characterization of Copper Nanoparticles Stabilized with *Quisqualis indica* Extract: Evaluation of its Cytotoxic and Apoptotic Potential in B16F10 Melanoma Cells

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Abstract

Green synthesis of metallic nanoparticles is a cost effective environment friendly technique and ranoon creeper has ethnomedicinal values. With this background in this study, the floral extract of *Quisqualis indica* was used to fabricate copper nanoparticles (QCuNPs) from copper acetate. The QCuNPs were characterized by UV-vis spectroscopy, SEM, AFM, FTIR and XRD. Biophysical analysis revealed the formation of spherical, monodisperse, crystalline QCuNPs. Cytotoxic potentials of the nano-formulation were determined by MTT and LDH assay on B16F10 melanoma cells. Estimation of GSH and ROS was done to evaluate the role of oxidative stress. The nanoparticles induced melanoma cell death by induction of oxidative stress. Semiquantitative RT-PCR and proteomic studies were done to decipher the mechanism of apoptosis. RT-PCR analysis showed elevated levels of Bax expression while antiapoptotic Bcl-2 was down regulated. A significant increase of caspase-3 and caspase-9 was observed whereas upregulation of caspase independent death factor (AIF) was also noticed. Proteomics analysis showed the abundance of apoptotic and cell cycle arrest proteins in treated samples. The *in vivo* therapeutic efficacy was studied in mice bearing B16F10 melanoma tumor where significant decrease in tumor growth was observed in nanoparticles treated animal model. Thus, QCuNPs caused cytotoxicity and apoptosis in melanoma cells and its mechanism was established from gene expression and proteomic studies.

As per our information, this is the first study exploring the potential of *Q. indica* for the formulation of eco-friendly copper nanoparticle which will have great future application in the medicinal field.

Biography

Ria Mukhopadhyay is currently pursuing the PhD from CSIR-Indian Institute of Chemical Biology (IICB), Kolkata, West Bengal, India under the guidance of Dr. Mita Chatterjee Debnath. Ria did my graduation in Agricultural Sciences and allied subjects and post-graduation with specialisation in Plant Pathology from Visva-bharati and Bidhan Chandra Krishi Viswavidyalaya respectively. Presently as a Senior Research Fellow (SRF) in IICB Ria's work is mainly focused on targeted drug delivery system to reduce malignant tumors. Nanoparticles being very minute in size (nanoscale) and uniform can penetrate cancerous cells, be toxic to them and arrest their growth.

Rosemary – An Herb to Remember

Mark Moss¹, Jemma McCready, Lauren Bussey, Victoria Earl, Kamila Irvine and Lorraine Oliver

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Abstract

The application of aromas as therapeutic treatments, and for improving psychological or physical well-being in healthy individuals are widely recognised and practised. The possibility of their use as cognitive enhancers is perhaps less well known or researched. Arguably, the received wisdom of ages assumed that our cognitive functioning was optimal for the environment in which we have evolved. However, recent research has demonstrated that natural interventions can augment cognition, and that we are not perhaps at the peak of our performance. The research presented in this paper suggests that natural aromatic compounds present in the essential oil of Rosemary, and absorbed through inhalation or ingestion, might exert beneficial effects on principle mental operations. Seven studies are summarized that demonstrate improvements in cognition by extracts of Rosemary, with possible mechanisms being identified and evaluated. Enhancements in verbal memory in healthy adults are mirrored by effects on prospective memory in both healthy young and aged participants. Importantly, correlations between serum levels of active constituents and performance levels suggest a pharmacological mechanism. This contention is further supported by data from a study assessing complex working memory tasks where serum analyses were also performed. Data from a study of School children suggest the potential for a positive impact on academic performance and that benefits are not restricted to the adult population. The final two studies employed brain imaging techniques and suggest changes in brain metabolism and electrical connectivity may play significant roles in the production of the benefits observed.

Biography

Mark gained his Psychology degree with first class honours in 1995, winning the British Psychological Society undergraduate project prize. He was awarded a PhD in 1999 based his work investigating the impact of breathing pure oxygen on human cognition. Moving into herbs and essential oils in 2003 Mark has published studies investigating Lavender, Sage and Peppermint among others. His focus however, has always returned to Rosemary. Mark is the Head of the Department of Psychology at Northumbria University in the UK, where he leads a team of 45 academic staff delivering high quality research and education to over 1000 students.

Periodontal Therapy via Subgingival Instrumentation with Adjunctive use of Essential Oils

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³Institute of Microecology, Herborn, Germany

Abstract

Subgingival instrumentation (scaling and root planing) is the key therapy and the gold standard to treat periodontal disease. High quality scaling and root planing (SRP) results in reduction of probing pocket depth (PD), clinical attachment gain (AL) and reduced bleeding on probing (BOP).

The adjunctive use of essential oils (*Cymbopogon flexuosus* oil, *Thymus zygis* oil, *Rosmarinus officinalis* leaf oil, Parodolium® mouthwash, SymbioVaccin, Herborn, Germany) resulted in significantly better AL after three and six months ($p < 0.001$) and had a tendency to better PD after three months ($p = 0.10$). BOP was significantly lower in the group using essential oils after three months ($p = 0.027$). This improvement of BOP was also better in the test group after three months in the tendency ($p = 0.065$). No adverse effects were observed. Analyzing the subgingival biofilm microbiologically by semiquantitative PCR-methods (ParoCheck® kit, Greiner Bio-One, Frickenhausen, Germany) it could be demonstrated that *T. denticola* and *F. nucleatum* were significantly more reduced by the adjunctive use of essential oils ($p = 0.044$, $p = 0.029$) after three months. After six months *T. forsythia* was still reduced in the test group, but not in the control group, with significant intergroup comparison ($p = 0.039$). These results will be compared to results obtained by SRP with adjunctive use of hyaluronic acid or systemic antibiotic therapy.

Within the limits of existing own randomized clinical trials one may say that the adjunctive use of a mouthrinse containing essential oils following SRP has a positive effect on clinical variables and the composition of the subgingival biofilm in the periodontal pocket.

Microbial Molecular Targets for Components of Essential Oils

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Abstract

Aromatic and medicinal plants have been used as anti-microbial agents since time immemorial, though there has been a stark decline in the total quantitative use in recent times. Nonetheless they have been used, albeit with little or no precision in the knowledge of their modes of actions. Recent studies have indicated that different components of essential oils cause distinct types of injuries to microbial cells, each type of damage characteristic to one or more components of a particular essential oil. The damages to the microbial cells result due to oxidative stress, protein dysfunction or membrane impairment. The modern inter disciplinary research has been successful in furthering our comprehension of the various different chemo-types of essential oils as well as improving our insight on designing active compounds for use as antimicrobial agents and as alternatives to antibiotics. Here, we have briefly reviewed the chemical principles that underlie the antimicrobial activity of some promising essential oils. We have also discussed the pros and cons of preferring Phenolic compounds for specific microbial targeting. Additionally, results of *in-silico* docking predicts made between active constituents of some essential oil with homologically

modelled protein targets of microbial cell were discussed. The discussion pertains the excellent correlation of *in-silico* results with experimental *in-vitro* data. Further, we have emphasised on the possible steps to catalogue and leverage this uncharted fraction of the study of anti-microbial properties of essential oils.

Biography

Dr. Smaranika Pattnaik currently serves as a faculty in Department of Biotechnology and Bioinformatics, Sambalpur University, India. Previously she had held a position as a faculty member in a Pharmaceutical Science College, right after completing her Post-doctorate (CSIR) at Jawaharlal Nehru (JNU) University and Assam University, India. She is on the verge of completing research projects on natural products as source of anti-microbial agents. Her work interests include Screening for drug resistance phenomenon among clinically relevant microbes and Evaluation of medicinal aromatic plants as antimicrobial agents.

Ayurvedic Concept of Shatkriyakala in Cancer Diagnosis and its Correlation with Modern Science

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Abstract

The term 'Kriyakala' refers to the stage recognition of the process of disease and resort the appropriate measure to correct the imbalanced *dosha*. It is a combined expression for 'Kriya', the choice to measure medicine, food and daily-routine in order to improve or reduce the disturbance in *dosha* and 'Kala', the stage for the process of disease. Sushruta, an ancient Indian surgeon has described the concept of *Kriyakala* in *Vranaprashnadhyaya*, which seeks to explain the incidence of *varnas*, in terms of *doshic* disturbances. *Varana* in modern parlance may be described as an inflammatory process, which may lead ulceration and chronic inflammation actively which promotes all stages of carcinogenesis. Cancer results when abnormal interactions between *Prakriti* (genotype) and environmental factors vitiate the *Doshas* and impair immunity. Abnormalities in the cells besides aberrant cell growth and cell death cause cancer. Epigenetic regulation, diet, environmental factors, and immunity affect phenotypes. The interaction between vitiated *Doshas* and weak tissues (*Dhatus*) manifests as cancers of specific organs. *Shatkriyakala* gives the chance to assess cancer and its pathogenesis at a different stage. Therapies indirectly target cancer tissue by eliminating vitiated *Doshas*, rejuvenating *Dhatus*, and restoring immunity. One the major reasons for pathogenesis in cancer are due to an imbalance in the ratio of antioxidant and oxidant molecules. Imbalance in *Tridosha* may be correlated with an imbalance in the ratio of oxidant and antioxidant molecules/radicals in the cells. *Sanchaya* (accumulation) stage may represent the level of oxidative stress, which damages the cell structure and its functions. Such phenomena may induce somatic mutations and neoplastic transformation in the cells. However, *Prakopa* (vitiating) stage has unusual cell proliferation due to oxidative stress, which may have increased DNA mutations or induced DNA damage and genome instability. The stage of *Prasara* (dissemination) can be correlated with the cell migration, as oxidative stress can augment tumour growth and metastasis by causing profound alterations in the morphology and adhesive properties of the cells. On the other hand, *Sthanasamskraya* (localization) in cancer may be called as homing of cancer cells. This process takes place through multi-steps, which includes malignant progression, invasion, and settling of cancer into a distant organ. In the stage of *Vyakti* (manifestation), cancers cause symptoms as they enter

into advanced stages because of changes in the normal function of the affected organ. However, the stage of *Bedha* (complication) is the final stage, which confirms the type of cancer and its treatment options. Hence, the traditional knowledge of *Satkriyakala* can be utilized with modern technologies to detect predisposition, diagnosis, prognosis, and treatment of cancer patients.

Biography

Dr. Semwal is presently served as a faculty member at Uttarakhand Ayurved University, India. Prior to joining this position, Dr. Semwal was working as TUT/NRF Postdoctoral Research Fellow at Tshwane University of Technology, Pretoria, South Africa. He received his Master in Organic Chemistry and PhD in Phytochemistry from HNB Garhwal University, India. In 2005, he started his career as a Lecturer in Chemistry at HNB Garhwal University, India. In 2010, he received prestigious Dr DS Kothari Postdoctoral Fellowship from UGC, India and did his postdoctoral work at Panjab University, Chandigarh. He published his quality research in various journals of international repute and also presented his work at many national and international conferences. He received many prestigious awards including young scientist for his research and academic performance. His current research interests are phytochemistry, phytomedicine, Ayurveda, drug discovery, drug delivery, and semi-synthesis.

Sustainable Management of Medicinal Plants through Application of Michel Porter's Value Chain Analysis: A study on the Gandamardan Mountain in Odisha

Arka Kumar Das Mohapatra

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Abstract

The loss of world's biological diversity is a major concern today. Its conservation and preservation through sustainable management is equally a challenge, although not impossible. This paper focuses on the issues that can be best addressed by applying Michel Porter's Value Chain Analysis to ensure a sustainable management of the medicinal plants. A microlevel analysis of the Gandamardan Mountain which is located in the Western part of the Odisha province in India that is considered to be the store house of over 500 species of medicinal plants, giving medical facilities to over 50,000 tribal people through a whopping 100 and above known traditional healthcare practitioners has indicated that the stakeholders are in favour of use of every effective methods that help create and conserve the medicinal plants. The formulated hypothesis *H₀1: There is no significant difference in the perception of different e* of traditional health care practitioners, beneficiaries of the traditional health care services and the inhabitants in and around the Gandhamardan mountain base has led to the acceptance of the hypothesis thereby indicating towards adoption of effective methods for sustainable use of the medicinal plants. The Value chain analysis holds immense potential to this extent.

Keywords: *Sustainable management, competitive strategy, value chain analysis, inbound logistics, outbound logistics, intrinsic value, economic value*

A large, bold, yellow number '3' is the central focus of the image. It is set against a dark teal background. The number has a thick stroke and a rounded, decorative top. A horizontal band with a white dotted pattern crosses the lower part of the number.

October 17

WEDNESDAY

Provitamin A Carotenoids should be Considered as Food Fortificants to Mitigate Hypervitaminosis A

Sherry Tanumihardjo

University of Wisconsin-Madison, USA

Abstract

Vitamin A (VA) deficiency is a public health problem in many parts of the world. In order to combat this condition, current strategies include food fortification, supplementation, and increased provitamin A consumption through biofortification or dietary diversification. However, some of these strategies are occurring in the same groups. High liver stores were diagnosed in Zambian children who were exposed to high-dose VA supplementation for five years of their lives, sugar fortified with preformed VA for all of their lives, and provitamin A carotenoids through fruit and vegetables consumption. In order to simulate the condition of exposure to multiple VA interventions, two studies were orchestrated in Mongolian gerbils ($n = 151$). The effects of provitamin A consumption from biofortified orange maize and carrots and preformed VA consumption from graded levels of fortificant on VA status were investigated. Both studies included controls, fed treatments for 9-weeks, and determined VA status with liver stores. In both studies, VA status was adequate from the provitamin A carotenoids in the orange carrot and maize groups, preventing VA deficiency as single interventions. However, on the background of adequate dietary intake from provitamin A carotenoids, VA fortification caused excessive and hypervitaminotic liver stores in this model. This is the current situation in some parts of Zambia. Reformulating fortificants with provitamin A carotenoids will require time and expense, but will provide for a healthier alternative than the potential excess that can occur with preformed VA.

Biography

Dr. Tanumihardjo studies vitamin A and carotenoid metabolism in animals and humans. She serves as director of the Undergraduate Certificate in Global Health and is on the Executive Board for the University of Wisconsin-Madison Global Health Institute. Tanumihardjo has >170 publications and has presented at >310 domestic and international venues. She has served on editorial boards and as reviewer for many journals. Awards: WHO's Expert Advisory Panel, G. Malcolm Trout visiting scholar at Michigan State University, Ruth Pike Lectureship at Pennsylvania State University, Alex Malaspina ILSI Future Leader, Dannon Creative Leadership Institute, Endowed Chair and Vilas Associate at University of Wisconsin-Madison, WI.

Potential of Pomegranate Rind Extract in Wound Healing

Charles M Heard

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Abstract

The fruit of *Punica granatum* L. (pomegranate) has long been known to possess antimicrobial properties - this is largely attributable to punicalagin, the large hydrolysable tannin which constitutes 80-85%w/w of pomegranate rind extract (PRE) tannins. We have recently established that the co-administration of PRE with zinc(II) results in potent and broad spectrum microbicidal action against *Herpes simplex* virus. The mechanism of action is yet to be elucidated, although the activity is long lasting and non-cytotoxic. Our current work focuses on exploiting this in novel therapeutic systems aimed at decreasing the microbial load associated with open and chronic wounds, which is further supported by the demonstrable anti-inflammatory activity of PRE against COX-2 [2], and accelerating wound healing. The objective was to determine the bactericidal activity of co-administered PRE and Zn(II) and assess it in wound healing tests.

Addition of ZnSO₄ to PRE resulted in potentiated bactericidal activity against a panel of gram positive and gram-negative bacteria, including *E.coli*, *Staphylococcus epidermidis*, MRSA and *Pseudomonas aeruginosa*, by an as yet unknown mechanism. The combination in a mucoadhesive spray formulation of 0.25M ZnSO₄ and PRE 1mg/ml showed greater bactericidal activity than each alone. Wound dressings impregnated with PRE and Zn(II) provided comparable Zone of Inhibition data to similar gauzes containing Manuka honey for *E.coli* and MRSA. MTT testing showed the combination enhanced cell proliferation of HaCaT keratinocytes, and accelerated wound closure was suggested via scratch test analysis. Overall, PRE and Zn(II) shows promise as a novel wound-healing system.

Traditional Vietnamese Medicine Toxicity

UyenVy Doan

Cho Ray Hospital, Ho Chi Minh City, Vietnam

Abstract

A Traditional Vietnamese Medicine has been affected by Traditional Chinese Medicine for a long time, and many people believe that using herbal medicine is natural, effective, safe and cheap. These herbal medicines have been used on a daily long-term basis for treating chronic diseases without mentioning dosage. There are lot of sources of traditional Vietnamese medicine that includes botanies, invertebrates, vertebrates and minerals. A few of these traditional medicines are especially based on minerals composed of heavy metals. Concentrations of individual mixture products can vary greatly and dosage can also change based on whether the formulation is an extract, a tablet, a capsule or powder etc. Hence, clinical manifestations will differ from patient to patient in spite of using the same types of products. In fact, exposure to chronic traditional medicine may cause acute or chronic poisoning. Clinical manifestations may show up as some internal or chronic diseases. They even cause multi-organ toxicity and mortality. Diagnoses of such cases of poisoning are based on the knowledge of traditional medicine ingredients and experiences of physicians when signs and symptoms do not improve after treatment. If the patients had used traditional Vietnamese medicine, laboratory tests will reveal presence of heavy metal poisoning such as mercury, arsenic and lead. Treatment of herbal toxicity is supportive but there are several kinds of such drugs that the patients need to be treated with specific therapies such as chelation.

Efficiency of Medicinal Plant Extracts in Controlling Rice Weevil, *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae)

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Abstract

Rice weevil, *Sitophilus oryzae* is one of the major pest of stored product which attacked by feeding inside rice kernels, qualities of the grain during storage is reduced. Therefore, the objectives were to analyze active constituents of medicinal plant extracts and test efficiency of medicinal plant extracts to control the weevil. The active constituents were analyzed in the plant extracts followed as long pepper fruits, tobacco leaves and neem seeds by GC-MS. In addition, using medicinal plant extracts control the weevil in adult stage at different concentration were 0.1%, 0.5%, 1%, 5% and 10% (v/v), compared with distilled water and dichlorvos (insecticide). The mortality rate of the weevil was recorded for 1, 3, 5, 7 and 9 days after testing, respectively. The results showed that the major active constituent of long pepper fruits were piperine (99%), active constituent of tobacco leaves were pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)- or nicotine (9%). Unless the major active constituent did not found in neem seeds by GC-MS method. Furthermore, the efficiency of 3 medicinal plant extracts can control the weevil population. The long pepper extract was the most efficiency of concentration at 5% for 3 days after testing, that controlled the weevil at 100% mortality rate that was not significantly difference from 0.1% dichlorvos (positive control). Therefore, the long pepper extract was concentration at 5% can be used to control the rice weevil.

Dietary Intake of Chywanprash Induces Intrinsic Apoptosis in Cancer Cells and Tumor Regression in Mice

Sathees Raghavan

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Abstract

Chywanprash (Chy) is a herbal formulation used in Ayurveda in India as dietary supplement for maintaining homeostasis. In the present study, we evaluate the chemotherapeutic potential of Chywanprash using different trades against cancer by *ex vivo* and *in vivo* studies. We observed that oral administration of Chy inhibited tumor initiation and progression in mice bearing breast adenocarcinoma. Interestingly, survival rate of Chy treated animals were ~7 fold higher than that of untreated tumor bearing animals. Importantly, histopathological study of tumor and liver tissues following Chy administration showed reduced pathological features. Consistent to that, our *ex vivo* studies in leukemia and adenocarcinoma cell lines showed that Chy inhibited the growth of CEM and EAC cells in a time- and dose-dependent manner. Remarkably, accumulation of subG1 peak, loss of mitochondrial transmembrane potential, annexin V-FITC staining, DNA fragmentation, upregulation of pro-apoptotic proteins (BAD, BIX, BID), down regulation of anti-apoptotic proteins (BCL2, BCLxl), activation of caspase 3 and caspase 9, and PARP cleavage revealed Chy triggered intrinsic pathway of apoptosis in cancer cells. Collectively, our study suggest that Chy possess appreciable potential of treating cancer. Chy can be unequivocally an excellent source in the human diet and its regular consumption would thus be beneficial to human population.

Biography

Dr. Sathees Raghavan obtained his PhD from Banaras Hindu University, India and then went on to do his postdoctoral research from the University of Southern California, USA. He is currently a Professor at Indian Institute of Science (IISc), Bangalore. His research group at IISc focuses on deciphering mechanism of genomic instability in leukemia and lymphoma. Besides, his group also explores the role of immune system in the genesis of chromosomal abnormalities, DNA repair and cancer therapeutics. He has published over 125 research articles in internationally peer-reviewed journals, and has obtained several patents. Dr. Raghavan is the recipient of several awards including Shanti Swarup Bhatnagar prize (2013), Leukemia Research Foundation (USA), Kobayashi Foundation Award (KFA), 2016, NASI-Reliance Industries Platinum Jubilee Award (2015), Department of Atomic Energy (DAE) SRC outstanding researcher award (2014), Lady Tata Memorial Trust (UK) and National Bioscience award from DBT (India). He is also a “Fellow” of National Academy of Sciences, Allahabad and Indian Academy of Sciences, Bangalore. He is currently an Editor of FEBS Journal, UK and many other international journals.

Unintentional Ingestion of Cordyceps Fungus-infected Cicada Nymphs Causing Ibotenic Acid Poisoning in Southern Vietnam

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Abstract

Background: Cordyceps fungus found in infected cicada nymphs (“cicada flowers”) is utilized in traditional Chinese medicine. Cordyceps fungus toxicity in humans has not been previously reported. We report 60 cases of apparent Cordyceps poisoning in Southern Vietnam.

Methods: We retrospectively collected demographic and clinical data from the medical records (21 cases) and by telephone interview (39 cases) of patients admitted to seven hospitals in Southern Vietnam following ingestion of cicada flowers between 2008 and 2015. We also determined the species of Cordyceps present in the cicada flowers and performed a partial chemical analysis of the fungus.

Results: Sixty cases of toxic effects following ingestion of cicada flowers were documented. Symptom onset occurred within 60 minutes following ingestion. Symptoms included dizziness, vomiting, salivation, mydriasis, jaw stiffness, urinary retention, seizures, agitated delirium, hallucinations, somnolence and coma. None of the patients suffered liver or kidney injury. There was one fatality. The Cordyceps fungus involved in these poisoning was identified as *Ophiocordyceps heteropoda*. The presence of ibotenic acid was confirmed, but musimol and muscarine were absent.

Conclusion: Cicada infected with *Ophiocordyceps heteropoda* in Vietnam contain ibotenic acid and are associated with a clinical syndrome consistent with its effects.

Activity Evaluation of Natural Active Compounds Targeting on Cancer Tyrosine Kinase Receptors of Eph

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School of Pharmacy, Health Science Center, Xi'an Jiaotong University, PR China

Abstract

The Eph receptor tyrosine kinases and their plasma-membrane-anchored Ephrin ligands play a pivotal role in angiogenesis, cell proliferation and migration in many different cell types and tissues. EphrinB2 ligand expressed in various tumor cells is related to its high vascularity. EphrinB2 is a transmembrane subclass ligand and its reverse signaling is mediated by the EphrinB2 cytoplasmic domain, which contains a PDZ binding motif that can interact with signaling molecules. So, regulation of EphrinB2 signaling might be useful to simultaneously interfere with the function of VEGFR2 and VEGFR3 which act together during angiogenesis. 50 kinds of traditional Chinese medicine and natural products targeting on EphrinB2 and EphB4 were screened by the cell membrane chromatography (CMC) and protein column of EphrinB2 and EphB4. The cells of overexpressed and knockdown EphrinB2 and EphB4 with other cancer cell lines including A549, NCI-H1299 and NCI-H460, SMMC-7721, HepG2, MCF-7, MDA-MB-231, et al. were used to target confirming and cell proliferation inhibition of screened active compounds. The biological activities of screened active compounds were evaluated, EphrinB2 expression and signaling players were also investigated. The results indicated more than 6 compounds were found including berberine and sanguinarine. Berberine and sanguinarine can bind EphrinB2 and EphB4, inhibit cancer cells lines growth, and downregulate EphrinB2 expression and PDZ protein PICK1, as well as EphB4. Accordingly, the inhibition was associated with the down-regulation of PI3K/AKT/mTOR and MAPK signal pathway molecules, such as Akt, mTOR, Erk1/2, PLC γ , etc.

Acknowledgements: This work was supported by the National Natural Science Foundation of China (Grant no. 81773772).

Biography

Dr. Yanmin Zhang is a professor of School of Pharmacy, Health Science Center, Xi'an Jiaotong University of China, member of Chinese Pharmaceutical Association. Dr. Zhang received his B.S. in chemistry and Ph.D. in pharmaceutical analysis. He began his independent career in 1999. He is currently the director of molecular pharmacology program and a full professor at school of Pharmacy of Xi'an Jiaotong University, and assistant research scientist in the Biodesign Institute of Arizona State University, USA. Research interests in the Yanmin Zhang Group are at the interface of pharmacy and biology focused on screening and activity evaluation of small molecular drug for antitumor, studies of molecular mechanism of natural bioactive products and drug process analysis *in vivo*. He has published more than 100 papers including *Pharmacol Therapeut*, *Advanced Science*, *Semin Cancer Bio*, *JACS*, *CDDs*, *Org Lett*, *Chem Commun*, *Can let*, *JCMM*, et al. and holden 27 patents.

Anticoagulant, Antithrombotic, and Antiplatelet Activity of Betulinic Acid and 3 β -Acetoxybetulinic Acid from *Melaleuca bracteata* ‘Revolution Gold’

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²University of Johannesburg, South Africa

³Durban University of Technology, South Africa

Abstract

This study investigated the anticoagulant, antithrombotic, and antiplatelet activity of betulinic acid (BA) and 3 β -acetoxybetulinic acid (BAA) from *Melaleuca bracteata* ‘Revolution Gold’: Betulinic acid was isolated from ethyl acetate extract of *M. bracteata* leaves by column chromatography and BAA was subsequently synthesized by acetylation. The structures of the compounds were determined by nuclear magnetic resonance spectroscopy, mass spectrometry and infra-red spectroscopy. Anticoagulation activity studies were carried using bleeding tail time assay in rats’ model. Antithrombotic potential of the compounds was screened using chromogenic substrate. Plasma rich platelets from rats were used for platelets aggregation studies using light microscope. The compounds exhibited anticoagulation activity with shorter bleeding time in comparison to aspirin. The compounds also significantly ($P < 0.05$) inhibited thrombotic activities in dose dependent manner. BAA showed highest significant IC_{50} value of 1.10 ± 0.03 mg/ml than BA (2.36 ± 0.09 mg/ml) and aspirin (2.65 ± 0.01 mg/ml), the positive control. Addition to this, all the compounds attenuated platelets aggregation induced by thrombin. In conclusion: BAA displayed better antithrombotic, antiplatelet, and anticoagulant activity. Therefore, it could serve as promising remedy in the management of cardiovascular events. For future study, mechanism of actions need to be ascertained.

Biography

Dr. Foluso O Osunsanmi is currently a Researcher at the Department of Agricultural Science, University of Zululand, South Africa. He is a biochemist with eighteen years work experiences both in academic and industrial sectors. He had notable publications in reputable journals and had presented both in local and international conferences. He regularly performs peer review for twenty-two difference reputable journals. He is an Academic Editor of many International journals. He is also member of South Africa Association Council for Natural Scientific Professions, South Africa Association of Clinical Biochemistry, South Africa Association of Botanist and National Association of Safety professional.

Utilising Grape Marc for the Cultivation of *Ganoderma* Strains of Medicinal Mushrooms in Australia

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²School of Agriculture and Food Science, The University of Queensland, Australia

Abstract

Waste products from various industries (whey permeate, wine rice, soybean and coffee lees) are increasingly being examined in studies involving the cultivation of medicinal mushrooms such as *Ganoderma*,

in an attempt to efficiently decrease the environmental impacts associated with organic industrial waste. Using a novel substrate (grape marc), a by-product from the wine industry, the cultivation of six local *Ganoderma* isolates (*Ganoderma cupreum* 007, *Ganoderma weberianum* 041, *Ganoderma sp120*, *Ganoderma steyaertanum* 150, *Ganoderma sp184*, *Ganoderma sp187*) on different levels of grape marc constituents in plastic growth bags (solid-state substrates) was evaluated. Initially, mycelium invasion on malt peptone agar (MPA) revealed significant growth differences between isolates. The isolate with the highest mycelial growth on MPA (*Ganoderma sp187*) was inoculated into three types of growth bags: control (C = 100 % conventional wood chips, pH 6.5), substrate 1 (S1 = 100 % grape marc, pH 4.3), and substrate 2 (S2 = 50 % wood chips, 50% grape marc, pH 5.5). Under the same growth conditions (28-30 °C, 80-90 % relative humidity), the mycelium invaded through the growth bags successfully on the different substrates, completely whitening the entire growth bags after inoculation within 17 days for C but requiring 32 days for the other substrates (S1 and S2). The growth rates of mycelium were notable as a function of the substrates' constituents but the study showed that grape marc is a promising novel substrate applied in the artificial cultivation of medicinal mushrooms in Australia and in other wine exporting countries around the world.

Biography

Anh Nguyen is a PhD. candidate at the University of Adelaide. Her MSc. was in Food Chemistry at the University of KULeuven, Belgium. Her Master thesis was on the isomerization of lycopene extracted from tomatoes (2009). Anh worked as a lecturer at CTEC College, Viet Nam for three years before commencing her PhD. candidature in 2015. Anh is interested in generating a novel Australian Shiraz wine product with *Ganoderma lucidum* extracts added pre- or post-fermentation. She has also been working on the application of a novel substrate (grape marc) in the cultivation of Australian *Ganoderma* strains.

Tuina Treatment of Craniomandibular Dysfunction

Sabine Zeitler

SMS – Societas Medicinæ Sinesis, Germany

Abstract

Craniomandibular Dysfunction (CMD) is characterized by clinical symptoms of the chewing muscles and/or the jaw joint and the related structures in the head and mouth. From the point of view of Chinese Medicine, CMD can be the result of a number of different pathogenic mechanisms: bi-blockages (occlusiones), yin energy deficiency in the kidney and liver functional systems (depletio yin renale et hepatici, shen gan yin) or energy deficiency (depletio, xu) in the spleen and stomach functional systems (oo. lienalis et stomachi, pi wei). In all these cases Tuina treatment, often in combination with other methods offered by Chinese Medicine, can contribute to an improvement or a complete remedy for the patient.

The author first of all describes suitable pain-alleviating and muscle-relaxing techniques for the area affected. The author then describes the procedure with regard to the three pathogenic mechanisms mentioned and indicates appropriate Tuina components. She concludes by explaining the therapy to be administered with the help of a case study.

Biography

Sabine Zeitler is physiotherapist and natural healer. Since 2001, she is active in her own practice in Munich, Germany. Centre point of her therapeutic work is the Traditional Chinese Medicine and the treatment with osteopathic techniques. Since 1996 she is member of the SMS – Societas Medicinæ

Sinensis (International Society for Chinese Medicine). Her education in Tuina, the manual therapy of the Chinese Medicine, was provided by Dr. John Zhou, Bad Pyrmont, Germany, and Dr. Han Chaling, Rome, Italy. Since several years she gives courses in Tuina, Acupressure and Qigong within the framework of the education provided by the SMS.

The Effect of Acupuncture Treatment of Acupoint San Yin Jiao on the Pulse Diagnoses in Patients While Dysmenorrhea is Attacking

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³Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan

⁴Department of Computer Science and Information Engineering, National Taiwan University, Taipei, Taiwan

Abstract

Background: Pulse diagnosis of the dysmenorrhea patients before and after acupuncture treatment on the acupoint San Yin Jiao (SP6) were performed so that the mechanism led to the pain can be understood more clearly and one may have a better idea to treat the disease in the future.

Methods: Fifteen women participated in the study voluntarily. They have first to fill in the form of Visual Analogue Scale (VAS) for pain. Then the pulse of the subjects were measured by ANSWatch before and after acupuncture. All meridians can be assessed by analyzing the pulse spectra through Fast Fourier Transform (FFT) of the original pulse data. The significant change of amplitude in certain harmonics which corresponds to a specific meridian after acupuncture treatment can be selected out.

Results: It is discovered that only one harmonic, that is, the 7th harmonic representing the bladder meridian shows a significant change in amplitude ($p = 0.027$) after acupuncture treatment. The pain value dropped from 4.8 to 2.1 on the average after acupuncture ($p = 0.001$). Five subjects whose VAS for pain values were over or equal to 3.0 were treated by original point therapy of the sacrum. After original point therapy of the sacrum, the average pain value dropped from 4.1 to 0.6 ($p = 0.039$).

Conclusion: It is concluded that the subjects in the trial experienced dramatic pain relief after acupuncture treatment and the changes in the 7th harmonic of the pulse data corresponding to bladder meridian is significant.

Biography

Chen-Kai Liao is the Ph.D. candidate in the Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University. He is a clinician of Traditional Chinese Medicine.

What Makes Vietnamese Medicine Original?: The Modern History of Traditional Medicine in North/South Vietnam

Nara Oda

Kyoto University, Japan

Abstract

This presentation aims to consider on a complexed history of traditional Vietnamese medicine in relation to Chinese medicine. It examines to what extent and how the government of South and North Vietnam during the time of cold war institutionalized 'Eastern medicine', that is, traditional medicine, into its medical system. It also analyzes the social background of large influence by the Chinese and Chinese medicine, which prevented South Vietnam from institutionalizing Vietnamese traditional medicine as was the case of the North.

Today, Vietnamese traditional medicine, which consists of *Thuoc Nam* (medicine of the south) and *Thuoc Bac* (medicine of the north, that is, China), is institutionalized in the medical system. It has been explained that this is because of the policy by North Vietnam to improve Vietnamese medicine, whereas it is said that South Vietnam did not take initiative to make the most of Vietnamese traditional medicine. However, this presentation reveals that South Vietnam did try to promote traditional medicine and to integrate it into the public health care system by following lawmaking process.

On the other hand, due to large population and influence of the Chinese, Eastern medicine in South Vietnam did not represent traditional Vietnameseness but rather Chinese medicine. In order to acquire more Vietnameseness, the government had to restrict Eastern medicine practices only to the Vietnamese. To summarize, South Vietnam also attempted to institutionalize traditional medicine. However, it was premised on more complex principle than the North's.

Biography

Nara Oda is a Ph.D. Candidate at Graduate School of Asian and African Area Studies at Kyoto University. She has been working on history of traditional medicine in Vietnam in the 20th century, combining historical material research and interviews in Vietnam.

Poster Presentations

Antimicrobial Activities of Some of the Alien Invasive Plants used in Treatment of HIV/AIDS Related Symptoms by the Traditional Healers of Vhembe District Municipality

Sipho Glen

University of Venda, South Africa

Abstract

The antimicrobial activity of restorative plant extracts justifies their use in sustenance industry and drug store. There are an expanding numbers of illnesses, including bacterial diseases which are displaying different levels of drug resistance. The aim of this study was to investigate the antimicrobial activity of alien invasive plants that had been frequently used by the traditional healers of Vhembe District Municipality in the treatment of HIV/AIDS related symptoms. In this study, 6 alien invasive plants namely; *Solunum mauritanium*, *Argemone chroleuca*, *Eucalyptus paniculata*, *Melia azedarach*, *Ricinus communis*, and *Agave sisalana* were selected based on their frequency of use and the little literature reported on their antimicrobial activities. The minimum inhibitory concentration (MIC) of both the acetone and aqueous extracts against the different test organisms ranged from 3-50 mg/ml. The concentration of plant extracts were conducted at 1 mg/ml, 5mg/ml, 10 mg/ml, 20 mg/ml and 50 mg/ml. The positive results were slightly shown at the concentration of 50 mg/ml. This clearly meant that the plant extracts are not effective for MIC. The investigation of plant extracts may be a first step towards finding new therapeutic agents against resistant human pathogens of bacterial origin. Pathogenic bacterial strains which may be etiologic agents of sexually transmitted infections include *E. coli*, *K. pneumoniae*, and *S. aureus*. The positive results demonstrate that plants utilized by Vhembe traditionally healers have an impact in the treatment of some HIV/AIDS related symptoms.

Biography

Mr Sipho Glen Mbambala is currently doing his Doctoral degree at the University of Venda and the research project is focusing on "An assessment of the impact of alien invasive plants

on biodiversity within road verges in the Mutale Local Municipality within the Vhembe Biosphere Reserve". Mr. Glen was a Laboratory Assistant from 2011 to 2013, and a tutor from 2014 to 2017 at the department of Botany, University of Venda and have one publication in the area of Ethnobotany in a peer reviewed scientific journal.

In vitro Antiproliferative Activity of *Centaurea iberica* Trev. Ex Sprengel (Asteraceae) on MCF-7 Breast Cancer Cell Line

Ciler Kartal¹, Fulya Dilek Gokalp¹, Şebnem Selen İsbilir¹ and Gulsah Gedik²

¹Trakya University, Faculty of Sciences, Turkey

²Trakya University, Faculty of Pharmacy, Turkey

Abstract

Asteraceae family is one of the largest angiosperm families, with more than 1,620 genera and 23,600 species of herbaceous plants, shrubs, and trees distributed throughout the world. *Centaurea iberica* (Asteraceae) is one of the 205 taxon of the genus *Centaurea* growing wild in Turkey. It is reported that *Centaurea* species are rich in flavonoids and sesquiterpene lactones in the previous studies. In this study, it was aimed to determine the antiproliferative activity of *C. iberica* against breast cancer cell line. Plants were collected in the flowering period from natural habitat on July 2014. The antiproliferative activity of aerial parts aqueous extract of *C. iberica* was tested on MCF-7 (breast epithelial adenocarcinoma) cells by using iCELLigence Real-Time Cellular Analysis (RTCA) system (Roche, Germany). *C. iberica* water extract have an antiproliferative effect on the MCF-7 cell line. IC₅₀ value was found as 625.915 µg/ml after 24 hour treatment. These findings confirm other reports relating to antiproliferative activities of different *Centaurea* species. Furthermore, active extracts would be tested on different tumor cell lines. Detection of the antiproliferative activities of *Centaurea* species will provide a viewpoint for the crops, which will increase the economic value of these plants.

Biography

Dr. Ciler Kartal is working as a Botany Professor at the Trakya University, Faculty of Science, Department of Biology, Edirne, Turkey. Her research area includes plant anatomy, plant embryology, phytochemistry and ethnobotany.

Antiproliferative Activity of *Centaurea diffusa* Lam. (Asteraceae) on MCF7 Breast Cancer Cell Line

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²Trakya University, Faculty of Pharmacy, Turkey

Abstract

Asteraceae family is one of the largest angiosperm families, with more than 1,620 genera and 23,600 species of herbaceous plants, shrubs, and trees distributed throughout the world. *Centaurea diffusa* (Asteraceae) is one of the 205 taxon of the genus *Centaurea* growing wild in Turkey. In traditional medicine, *Centaurea* species are used for fever, menstrual disorders, vaginal candidiasis, the treatment of liver, kidney and ulcer diseases, as antidiarrheal, stomachic, tonic, appetitive, antidiabetic, antipyretic, also as a diuretic and expectorant. In the present study, it was aimed to investigate the antiproliferative activity of aqueous extract obtained from *C. diffusa* human tumor cell line. The antiproliferative activity of aerial parts aqueous extract of *C. diffusa* was measured on MCF-7 (breast epithelial adenocarcinoma) cell line by using the iCELLigence Real-Time Cellular Analysis (RTCA) system (Roche, Germany). In the iCelligence real-time cell viability test, *C. diffusa*'s water extract showed high antiproliferative activity on the MCF-7 cell line (24 h IC₅₀ value=156.586 µg/ml). It is important to investigate antiproliferative effect of different plant extracts on different cancer cell lines. Detection of the antiproliferative activities of *Centaurea* species will provide a viewpoint for the crops, which will increase the economic value of these plants.

Keywords: *Centaurea diffusa*, MCF-7, antiproliferative

Biography

Dr. Fulya Dilek Gokalp is working as a Assoc. Professor at Biology department, Faculty of Science, Trakya University, Edirne, Turkey. Research areas are ecogenotoxicology, cytogenetics, apoptosis, cytotoxicity.

Effect of Light Quality on Growth and Plumbagin Production of *in vitro* Plantlet of Selected *Drosera* spp.

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Abstract

In vitro plantlets of *Drosera adela*, *D. capensis* and *D. spatulata* were cultured on ½MS medium under white, blue or red LED-light for 12 hrs/day. The colors of Light do not significantly affect the survival of all tested *Drosera* species. However, growth and plumbagin production were greatly influenced by light colors. The highest rosette heights were observed in the plant grown under blue light. The widest rosette width in *D. adela* and *D. spatulata* were gained from the white light treatment. On the other hand, the rosette width of *D. capensis* did not affected by light colors. Interestingly, the differences of new shoot formation among light treatments of *Drosera* species were observed. For *D. adela*, the white light promoted the highest new shoot formation (84.1%), whereas no new shoot was found in red light treatment. Alternatively, red and white lights induced the highest new shoot formation (≈50%) in *D. capensis* which was about 2 folds over blue light. In contrast, new shoot formation in *D. spatulata* did not affected by light color, nearly 100% of *D. spatulata* plants produced new shoot in all tested light. The highest fresh and dry weights of all 3 species were obtained from the white light treatment. The highest plumbagin production in

D. capensis (0.38 mg/gDW) and *D. spatulata* (0.87 mg/gDW) were derived from white light, whereas in *D. adelaie* (2.15 mg/gDW) was acquired from blue light. The results suggested that plant species respond differently to light color.

Biography

Dr. Phithak Inthima is a lecturer at Department of Biology, Faculty of Science, Naresuan University, Thailand. He received double Ph.D. degrees from Mahidol University, Thailand and Niigata University, Japan. He does research in plant biotechnology with emphasis on plant secondary metabolite production and plant mutation.

The Effect of Palm Pollen on the Result of Fertility Rate in Infertile Men

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Abstract

Introduction: There are many ancient records of herbal medical plants. The phoenix dactylifera date palm pollen is used in the traditional medicine for male infertility. The aim if this study is to determine the effects of palm pollen on sperm parameters of infertile men and fertility rate.

Methods: This clinical trial was performed on 30 nonsmoker infertile men. 7 gram of palm pollen prescribed in gelatinous capsules daily for two months. Semen analysis was done before and after the treatment and the results were compared. Their wives were healthy.

Results: The mean sperm count was $12.33 \pm 5.61 \times 10^6$ /mL at baseline and $22.03 \pm 12.17 \times 10^6$ /mL after treatment period ($P < .05$). The mean percentage of sperm progressive motility was $14.69 \pm 6.8\%$ before the treatment which increased to $24.01 \pm 11.11\%$ thereafter ($P < .05$). No significant

effect was detected on morphology. Pregnancy rates were 53.3% in their wives after treatment.

Conclusion: palm pollen seems to improving the sperm count and motility in infertile men which leads to increased fertility. We believe further studies on larger sample sizes are needed to elucidate the potential role and mechanism of action of palm Pollen in the treatment of male infertility.

Keywords: palm pollen, sperm, male, infertility, fertility

Comparing the Effects of Nigella Sativa + Black Pepper with Letrozole + Tamoxifen in Infertile Woman with Polycystic Ovary Syndrome”

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³Shiraz Azad University, Shiraz, Iran

Abstract

Introduction: polycystic ovary syndrome (PCOS), one of the most common causes of infertility due to anovulation, affects 4–7% of reproductive women. The purpose of this study is to compare the effect of nigella sativa + black pepper with letrozole + tamoxifen as a treatment of infertile polycystic ovary syndrome women.

Methods: This comparative clinical trial was done on 90 infertile PCOS women referred to Dr.rasekh clinic with aged 18-42 years. patients were randomly allocated to either case or control group. The control group prescribed letrozole + tamoxifen and Case group nigella sativa plus black pepper from third to eighth day of menstrual cycle. Transvaginal ultrasound parameters including Ovarian follicular size, numbers and endometrial thickness were measured during treatment and based of this parameters continue these regimens and prescribed trigger drug.

Results: Pregnancy rate was higher in the group using nigella sativa plus black pepper and there was a significant relationship between two groups ($p < .05$). Also, there was a significant relationship in endometrial thickness and dominant follicle size between the two groups ($p < .05$). No significant correlation was found between two groups in the incidence of OHSS ($p > .05$).

Conclusion: because of significant effects of nigella sativa plus black pepper regimen on increase of endometrial thickness and size of dominant follicle, and eventually increase of pregnancy rates. Therefore, we recommend, this low costs, low side effect regimen in treatment of PCOS patients.

Keywords: PCOS, letrozole, tamoxifen, black pepper, nigella sativa

Some Medicinal Plants Used as Folk Medicine for Endocrine System Diseases around European Turkey

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Abstract

Most of the medicinal plants have been used for endocrine system diseases such as diabetes, obesity and goiter as folk medicine. In according to this, this paper includes some traditional medicinal plants which are used for endocrine system diseases around European Turkey. In this presentation the photographs of some of the plants, locations of them around European Turkey and information about how they could be used for endocrine system diseases as folk medicines, plant parts which were used for treatment, preparations, therapeutic effects, using dosages were given. The evaluation of relevant data in literature revealed that, *Mentha x piperita* L., *Rosmarinus officinalis* L., *Thymbra spicata* L. var. *spicata*, *Thymus* sp. were used for obesity while *Thymus* sp., *Salix* sp., *Urtica dioica* L., *Tribulus terrestris* L., were used for diabetes. In addition to this, it was seen that some plants *Malva neglecta* Wallr., *Plantago major* L. subsp. *intermedia* were used for goiter. In spite of the well-developed medicinal facilities, the local people still use folk medicines for the treatment

of diabetes, obesity and goiter diseases. It is important to document the valuable information because the transmission of knowledge from the old to the new generation.

Keywords: endocrine system, European Turkey, traditional medicinal plants

Biography

Gulden Yilmaz is working in Trakya University, Faculty of Science, Department of Biology in Edirne in Turkey. Gulden studied about morphology, anatomy, palynology and karyology of some *Verbascum* L. species for the Master's degree and studied about toxic effects of pesticides on the morphology, anatomy and biochemistry of *Triticum aestivum* L. for Doctorate's degree. Gulden is now working as Assoc. Prof. since 2014 for the branch plant morphology and anatomy. In addition to this Gulden research areas are plant systematics, cytology, palynology and ecotoxicology.

Antioxidative Capacity of *Ephedra nebrodensis* Herb Extracts

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Abstract

Ephedra species have a long history of medicinal usage that dates back to the Chinese traditional medicine, distinctly for treatment of asthma and bronchitis. Secondary metabolites originating from *Ephedra* species comprise alkaloids, amino acids and derivatives, volatiles and phenolic compounds. Phenolics, particularly flavonoids, are reported to exhibit various biological activities, including antioxidative and free radical scavenging activities. Free radicals cause oxidative stress that is involved in the development and progression of numerous diseases. The aim of this work was to measure the antioxidative capacity (AC) of aqueous herb extracts of *E. nebrodensis*, a rare *Ephedra* species moderately rich in phenolics. The AC was determined by manual spectrofluorimetric methods using the oxygen radical absorbance

capacity assay (ORAC_{FL}) and a modified hydroxyl radical averting capacity (HORAC_{FL}) assay. In both assays Trolox was used as a standard. The quantitation of the AC was based on the calculation of the area under curve. The obtained ORAC value was 392 mM TE/100 g_{dry weight}, whereas the HORAC value was 34 mM TE/100 g_{dry weight}. The results indicate a strong antioxidant activity against ROO[•] and OH[•] which is associated with the total phenolic and total flavonoid content of *E. nebrodensis*. The high AC found in *E. nebrodensis* herb extracts should be confirmed by automatized methods and encourage further studies regarding the characterization, purification and concentration of their phenolic compounds.

Biography

Saida Ibragic, PhD, is an Assistant Professor at the Department of Organic Chemistry and Biochemistry, Faculty of Science, University of Sarajevo. She graduated at the University of Sarajevo, Faculty of Pharmacy and completed her masters and doctoral studies at the Faculty of Science, Division for Chemistry. She is currently teaching Free Radicals Chemistry and Biochemistry of Xenobiotics. Her specific interest areas include biochemistry, bioanalytical chemistry, phytochemistry, free radicals chemistry and neurochemistry.

Rosemary Water: A Turbo Charger for the Brain

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Abstract

The Rosemary plant, *Rosmarinus officinalis*, is an aromatic evergreen shrub that is traditionally associated with remembrance. Previous studies have reported positive effects on cognition as a result of inhaling the aroma of the essential oil of Rosemary in young and elderly participants.

80 young adults were randomly allocated to drink either 250ml Rosemary Water (containing a hydrolat extract of Rosemary) or 250ml of water. Following a 20-minute absorption period, a number of computerised cognitive tasks were completed whilst either Near Infra-Red Spectroscopy (NIRS; a brain-imaging technique that detects the absorption of oxygenated and deoxygenated haemoglobin in the frontal regions of the brain) or Electroencephalography (EEG; a brain-imaging technique that detects electrical activity) was recorded. Mood was assessed before and after the tasks on the dimensions of 'Alert', 'Content', 'Calm' and 'Fatigue'.

Results from the NIRS demonstrated that Rosemary water produced significant changes in oxygenated and deoxygenated haemoglobin levels, suggesting increased oxygen extraction in the brain during task completion. This was mirrored by positive benefits in terms of serial subtraction processing and memory retrieval speed. EEG analysis revealed significantly enhanced activity in the parietal and occipital lobes, and increased event-related waveform responses to novel stimuli. In addition, the working memory attentional resource component suggested faster updating of memory during task completion. Measures of mood were not affected.

This is the first demonstration that acute consumption of Rosemary Water can enhance aspects of cognition. Together, these findings

suggest a great potential for Rosemary Water as a dietary supplement to enhance mental performance.

Biography

Jemma McCready recently graduated from Northumbria University with an MSc in Health Psychology. Since completing the thesis in September, Jemma have been working as a Research Assistant on the Rosemary Water project outlined above. Prior to this, Jemma won a competitive funded research internship where Jemma investigated the impact of the aroma of Rosemary essential oil on prospective memory, and the detection of absorbed components in the blood serum of adults. Jemma career trajectory is focused on obtaining PhD funding in order to explore the potential of Rosemary Water as a dietary supplement for the enhancement of human mental performance.

Effects of *Ganoderma lucidum* Polysaccharides on Adipocyte Differentiation of Mouse 3T3-L1 Preadipocytes

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Abstract

Ganoderma lucidum polysaccharide (GLP) has been proposed to have beneficial effects against obesity. However, how GLP affects adipocyte differentiation has not been elucidated. Our results revealed that GLP significantly inhibited adipogenesis and lipid accumulation in a dose-dependent manner in 3T3-L1 preadipocytes by Oil Red O stain and Triglyceride content determination. In order to explore the mechanism, we conducted a dynamic transcriptome study during 3T3-L1 preadipocytes differentiation (0h, 9h, 18h, 48h, 120h) with or without GLP treatment. Transcriptome showed that GLP significantly causes cellular hypoxia by damaging mitochondria and inhibiting oxidative phosphorylation with the activation of the MAPK signaling pathway, and then delayed the mitotic

clonal expansion(MCE), eventually lead to down-regulation of the expression of genes involved in the adipogenesis pathway, including peroxisomal lipid metabolism, fatty acid and triacylglycerol metabolism, lipids and lipoproteins metabolism, Fatty Acyl-CoA and triacylglycerol Biosynthesis. Flow cytometry data revealed that GLP caused an increase of cells in G0/G1 phase and a decrease of cells in G2/M phase from 9 to 18 h. These data suggest that GLP arrests the cell cycle at G0/G1 phase in 9h. In addition, GLP decreased the expression of adipogenic and lipogenic genes including PPAR γ , C/EBP α , and FASN at both mRNA and protein levels. Furthermore, GLP induced the phosphorylation of JNK, p38 and ERK. Pretreatment with PD98059, a specific ERK inhibitor, significantly rescued GLP-induced inhibition of adipogenesis. Taken together, these findings demonstrate that GLP inhibits 3T3-L1 preadipocytes adipogenesis through inducing cell hypoxia, delaying cell cycle, and which may be regulated via ERK activation.

Biography

Ying Wang, M.S, received her Master's diploma from the Nanjing Forestry University (from 2010-2013). She then worked at Research Institute of Subtropical Forestry, Chinese Academy of Forestry as a research assistant from 2014 to 2015. In 2015, she joined Prof. XingYa Wang's research group as a volunteer research assistant in Zhejiang Chinese Medical University in China. Under the guidance of Professor Wang, Ying mainly studies the effects of *Ganoderma lucidum* extracts on obesity and energy metabolism.

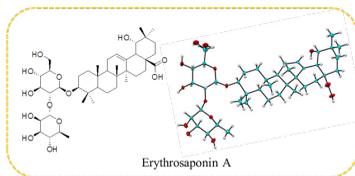
Erythrosaponins A–J, Triterpene Saponins from the Roots and Stem Bark of *Gardenia erythroclada*

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Center of Excellence in Natural Products Chemistry, Department of Chemistry, Faculty of Science, Chulalongkorn University, Thailand

Abstract

Ten undescribed triterpene saponins, named erythrosaponins A–J, along with one known analogue were isolated from the roots and stem bark of *Gardenia erythroclada*. Their structures were determined on the basis of extensive 1D and 2D NMR analyses. Absolute structure of erythrosaponin A was unequivocally affirmed by single-crystal X-ray crystallography. All isolated compounds were evaluated for their cytotoxicity against cancer cell lines (KB and HeLa S-3) and their anti-inflammatory activity based on the inhibition of NO production in RAW264.7 cells. Erythrosaponin D showed moderate cytotoxicity against KB and HeLa S-3 cells with IC₅₀ values of 25.8 and 29.5 μM, respectively. Erythrosaponins D, F, G, I and J showed moderate anti-inflammatory with IC₅₀ values in the range of 63.0–81.4 μM.



Biography

Sutin Kaennakam has completed his PhD from Chulalongkorn University Thailand and postdoctoral studies from Center of Excellence in Natural Products Chemistry, Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok, Thailand. He has published more than 10 papers in reputed journals.

Antibacterial Activities of *Arundo donax* Rhizomes Extracts

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Abstract

Arundo donax L., or giant cane in Poaceae family, is an annual plant with 6–10 metres height. Currently, this plant is one of the most efficient sources of natural renewable energy because of its rapid-growth characteristic, producing high biomass, and high heating value. Moreover, this plant resists to drought environment and requires low fertilizer or pesticide. The aerial part is frequently used as a material source for energetical generation, however, the subterranean, such as rhizomes and roots, is thrown out of the energy production system. Like that, the bioactivities of *A. donax* L. rhizomes were investigated to find other medical utilizations. In this study, rhizomes were extracted with difference solvents; hexane, dichloromethane, ethyl acetate, and methanol. Consequently, antibacterial activities of all extracts were tested against Gram positive bacteria; *Bacillus subtilis* and *Bacillus cereus*, and Gram negative bacterium; *Escherichia coli*, by disc diffusion method. The results revealed that the *A. donax* L. extracts had antibacterial activities against Gram positive tested bacteria but no inhibition against Gram negative tested strain. Among four extracts, dichloromethane extract provided the highest inhibition zone (17–18 mm), whereas, 7–8 mm inhibition zones were observed when co-incubated *Bacillus* sp. with ethyl acetate extract. As for others, hexane and methanolic extracts did not clearly suppress the growth of tested strains. From this study, the results clearly exposed that *A. donax* L. is another source of antibiotic agents which could be worthwhile for further study and application. Hereafter, phytochemical compounds of *A. donax* L. rhizomes will be further clarified.

Understandings about Homeopathy: How Much are We Willing to Relinquish?

Tass Holmes

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Abstract

Recent ethnographic research in a rural community in Victoria, Australia, highlights an acceptable level of knowledge about the healing practice of homeopathy among complementary and alternative medicine (CAM) practitioners, and community members more generally.

This knowledge, and the history of safe use of homeopathy, as well as its relative affordability, sees it often used for ‘first-aid’, as well as for both ‘professional care’ and ‘home prescribing’.

During the period of the latter part of the research project, the Australian government funded a review of studies of homeopathy, which was used – despite some reasonably robust evidence in its favour – to refute the efficacy of homeopathy, and so to exclude it for consideration as a type of healing suited to subsidisation among a wide range of free and part-funded healthcare (Medicare-funded) services that are made available to the Australian public.

This paper seeks to bring into focus the views and understandings of practitioners and consumers regarding homeopathy, and to highlight political issues that arise in context of biomedical responses to the ‘different’ philosophical stance of this ‘energetic’ style of medicine, and which contrast starkly with consumer and prescriber perspectives.

The paper endeavours to engage with some of the difficult terminology and rebuttals of homeopathy that are used in the review, in order to provide a more positive response, that serves to reiterate the effectiveness, safety, and wide applicability of homeopathy, which enjoys an important role as the world’s second-most frequently used type of medicine (after traditional Chinese medicine).

Biography

Tass Holmes holds a PhD in Anthropology (focused on complementary medicine, and the nexus between rural poverty and health, in Australia), from the University of Melbourne (graduated 2015). She teaches in anthropology and multidisciplinary studies at the University of Melbourne, and in Indigenous Cultural, Political and Health Studies at Charles Sturt University. Tass has written widely in recent years about complementary medicine, and contemporary issues, including epidemic illness and traditional medicine in Africa, and endangered species.

Artemisia roxburghiana – An Indian Medicinal Plant with Ethnobotanical and Pharmacological Importance

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Abstract

Traditional medicine has been considered as an extremely important area of research in medical sciences due to adverse effects of the presently existing medication mainly against the chronic disease like cancer and diabetes. A majority of world’s population, particularly in rural areas, are totally depending on the traditional medicine. Various medicinal plants used in the traditional medicine worldwide either in the form of crude extract or in the form of a purified molecule isolated from these plants. *Artemisia roxburghiana* Wall. ex Besser, also known as Roxburgh’s Wormwood, is a perennial aromatic herb distributed in China, India, Afghanistan, Pakistan, Thailand, and Vietnam. It is widely used in traditional medicine to treat various ailments like diabetes, rheumatism, malaria, dysentery, intestinal worms, hepatitis, skin allergy and helminths. In

the present study, the relevant literature collected from various offline and online sources including from the scientific database like Scopus, Web of Science and PubMed, was thoroughly studied for Phytochemistry, Ethnobotany and Pharmacology of the plant *A. roxburghiana*. The literature survey revealed that *A. roxburghiana* contains a wide range of secondary metabolites like flavonoids, terpenoids, coumarins, steroids and fatty acids. The plant has been reported to be an important source of many bioactive compounds such as artemisinin, scopoletin, taraxeryl acetate, roxburghianin A and B. It has been found to show anti-protozoal, anthelmintic, anti-inflammatory and antidiabetic activities in various experimental models. The study concludes that *A. roxburghiana* can be used to treat many human ailments. However, it needs further research to develop it as a medicine.

Biography

Mr Ankit Kumar is presently working as Junior Research Fellow at Uttarakhand Ayurved University, India. He did his master in Pharmacognosy at Uttarakhand Technical University, India. Previously, he worked as an Assistant professor at IEC University, India, and as an Assistant Scientist at Patanjali Herbal Research Institute, India. He has successfully completed a project titled "Standardization of *Mallotus philippensis* Muell. Arg. & evaluation of its Anti-urolithatic Potential" during his master degree. His current research interests are plant taxonomy, pharmacognostic characterization, phytochemical studies, and standardization of medicinal plants. He has qualified the Graduate Pharmacy Aptitude Test and has experience in handling various laboratory equipment like UV spectrophotometer, HPLC, IR, dissolution apparatus, microscope, microtome, colourimeter, autoclave and incubator.

Phytochemical and Therapeutical Significance of *Drimia indica* – an Ayurvedic Herb

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Abstract

Nowadays, more focus is being given to the use of medicinal plants and finding out how they prove to be beneficial in curing various diseases. The plant extract has proven to be the best in terms of their quality, safety, and cost treatments, therefore half of the world population rely on various products obtained from these plants. *Drimia indica* (Roxb) Jessop is an interesting perennial Ayurvedic herb mainly grows as wild in South Asia to South Africa. The extract obtained from the bulbs of *Drimia indica* is used in Ayurveda as cardiac, deobstruent, diuretic, emmenagogue, expectorant and stimulant. The aim of this work is to find out the significance of *Drimia indica* and to explore its hidden characteristics by applying new methodologies. Most relevant research articles of *Drimia indica* from various online scientific tools like Scopus, PubMed and Google Scholar, were surveyed minutely for the Phytochemistry, Ethnobotany and Pharmacology of the plant. The available literature revealed that *Drimia indica* has diverse biological application including antiulcer, antitumor, anthelmintic and anti-arthritic activities. Various parts of this plant contain phenolics, terpenoids and other bioactive secondary metabolites. This work concludes that *Drimia indica* has potential to cure a variety of human ailments which require further research to develop it as a drug.

Biography

Ms. Sonali Aswal is presently engaged in a NMPB-funded project as a Project Assistant at Research and Development Centre, Uttarakhand Ayurved University, India. Ms Aswal hold a Master degree in Microbiology from D.B.S (PG) College (H.N.B.G.U) Dehradun. She completed a dissertation entitled “Screening microbial antagonists and chemical fungicides against fungal species associated with foliage of *Rhododendron* sp.” in Forest Pathology Division, Forest Research Institute, Dehradun. Her technical proficiency in lab includes-media preparation, serial dilution, sub culturing of microbes, screening of microbial antagonists, collection and screening of medicinal plants.

Medicinal Plants of Panama 2: Ethnobotany of the La Tronosa Forest Reserve, Province of Los Santos

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Abstract

The Tronosa Forest Reserve is located in the province of Los Santos, Tonosí district with an area of 20.579 ha. The aim of the research was to determine the use of medicinal plants. The methodology includes surveys ethnobotanical walks and implementation in communities: La Bijagual, Culebra, Corotúa and La Bonita. Species were identified 108 and 1855 data source and used portion of the plants, the preparation form and processed healing properties. La Bonita was the community that uses the medicinal plants by 38%. The part of the plant used was the leaf (69%) and are prepared in wash (65%) and tea (57%). The plants most commonly used are aloe, mastranto and sage. The most common diseases are respiratory (19,7%), body pain (19%) and stomach problems (18%).

Antibacterial, Anticancer and Antioxidant Potential of Silver Nanoparticles Engineered using *Trigonella foenum-graecum* Seed Extract

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Abstract

Synthesis of silver nanoparticles (AgNPs) using physical and chemical methods have been exploited by researchers for several years. Cost and environmental toxicity associated with the chemical synthesis calls for the need for more environment friendly and less expensive method. The present study incorporates green synthesis of silver nanoparticles using seed extract of *Trigonella foenum graecum* (TFG). Different parameters such as time, temperature, concentration of AgNO₃ and amount of the extract were taken into account while synthesizing TFG-AgNPs. These Nanoparticles were characterized using UV-vis spectroscopy, DLS, FESEM, EDS, XRD and FT-IR. The absorbance peak of TFG-AgNPs was found in the range of 400-450nm. Antibacterial activity was studied against both gram positive and gram-negative bacteria. TFG-AgNPs exhibited antioxidant activity against DPPH radical and its anticancer potential was visible on the skin cancer cell line, A431.

Keywords: nanoparticles, *Trigonella foenum graecum*, anticancer, antibacterial, antioxidant

Phytochemical Study and Biological Activities of Essential Oils, Hydrosols and Extracts of *M. suaveolens* Ehrh. From Moroccan Middle-Atlas

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Abstract

The aim of this work was to valorize one of the most used species in traditional medicine by Moroccan population through its different extracts: essential oils (EOs), hydrosols (HYD) and extracts. The *M. suaveolens* (Ehrh.) leaves and flowers collected from three regions in the Middle Atlas. The EOs and HYD were analyzed by GC-MS. The crude extracts were subjected to the phytochemical tests. The chemical profiles showed that the composition varied according to the location then the main compounds of *M. suaveolens* EOs were oxide piperitenone and/or piperitenone. However, the HYD chemical compositions were different than EOs whose the hydrophilic and oxygenated compounds were very abundant. The phytochemical screening has detected the main secondary metabolites as flavonoids, tannins, alkaloids and saponins that justify its therapeutic properties. The phenolics and flavonoids were extracted by maceration and soxhlet with increasing polarity solvents and its contents were determined. Moreover, these extracts, with diverse phenolic and flavonoids contents, and the EOs were tested for its antioxidant activity by DPPH*scavenging test. Thus, the EOs and HYD were evaluated for its antibacterial activity against 6 bacteria including Gram-positive and Gram-negative. The EOs and HYD insecticidal effect respectively against *S. oryzae* (L.) and *T. aurantii* were also studied. Consequently, the extracts and EOs of *M. suaveolens* showed a higher antioxidant activity, a moderate antimicrobial activity while the HYD was active towards some bacteria and a strong toxic effect against tested pests. These investigations confirmed the therapeutic, antioxidant, antibacterial and insecticidal potential of this mint.

Keywords: *Mentha*, Essential oil, Hydrosol, phytochemicals, biological activity

Black Cohosh (*Actaea racemosa* L.) Extracts or Pure Compounds Act as HDAC1 Agonists/antagonists in Ovarian Granulosa, Colon Cancer and Breast Cancer Cells

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Abstract

Black cohosh (*Actaea racemosa* L., Ranunculaceae) extracts (BCEs) are used by women for the management of menopausal symptoms. One of the primary stumbling blocks to the progression of the clinical science has been the lack of a plausible mechanisms of action. In this study, a 40% isopropanol extract (BC40) and a 75% ethanol extract of black cohosh (BC75) rhizomes, along with the pure compounds actein (AC), 23-epi-26-deoxyactein (DOAc), were screened in ovarian granulosa, colon and breast cancer cells. At very low concentrations (50 ng/ml) the extracts enhance the growth of GCs, but at concentrations >5 µg/ml they inhibit the growth of GCs and induce apoptosis. Interestingly, in colon cancer SW480, CaCo2, and breast cancer MCF-7 cells, BCEs reduced cell proliferation at 0.5-20 µg/ml, with no biphasic effects observed. At low concentrations, BCEs also reversed GC cell apoptosis induced by serum starvation, with 500 ng/ml restoring cell growth almost as effectively as 10% FBS. Since AC and DOAc are the major triterpenes present in BCEs, we tested the effects of these compounds on the viability cultured GCs. Both AC and DOAc have biphasic effects on cultured GCs with very low concentrations (10.0 ng/ml) enhancing the growth of GCs by 35-80%, but at higher concentrations reduced cell viability by 40-55%. Gene expression analysis, BC40 (50 ng/ml) and DOAc (10 ng/ml) significantly reduced the BAX/BCL-2 ratio and increased HDAC1 expression up to 7 fold, while at

concentrations above 500 ng/ml DOAc acts as an HDAC1 inhibitor. Our data suggest both BC40 and DOAc modulates apoptosis of GCs by acting via as HDAC1 activators or inhibitors depending on concentration.

Biography

Dr. Mahady is an Associate Professor and the Director of the Clinical Pharmacognosy Laboratory in the College of Pharmacy at the University of Illinois at Chicago, and a research faculty member within the PAHO/WHO Collaborating Centre for Traditional Medicine since. She has >20 years of experience in natural products and herbal medicines and most of this work has been funded by grants from NCCIH (formerly NCCAM). She is an expert in the field of botanical dietary supplements, pharmacognosy, phytomedicine, medicinal plant research, small animal imaging, women's reproductive health including menopause, osteoporosis and cancer.

Root Extracts of *Nymphaea odorata* Inhibit the Growth of *Helicobacter pylori* and Induce Apoptosis in Gastric Cancer Cell Lines AGS and NCI-N87

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Abstract

Nymphaea odorata Aiton (Nymphaeaceae; American white water-lily) is an aquatic perennial plant used in First Nation, Ayurvedic and Chinese traditional medicine for the treatment of gastrointestinal ailments. In this work we investigated the effects of *N. odorata* extracts on the growth of *Helicobacter pylori* (HP), the etiologic agent for gastritis, peptic ulcer, gastric MALT

lymphoma and gastric cancer, as well as the effects of the extract on gastric cancer cells *in vitro*. In 17 clinical strains of HP and the ATCC strain 43504, a methanol extract of *N. odorata* inhibited the growth of all HP strains at a concentration of 12.5 µg/ml, with an MIC of 9.25 µg/ml. In addition, the effects of the methanol extract of *N. odorata* was investigated in two gastric cell lines namely, AGS and NCI-N87 at concentrations up to 100 µg/mL. Control cells were treated with vehicle solvent (DMSO 0.02%). Cytotoxicity and cell viability was determined using the CellTiter-Glo® 2.0 assay. The IC₅₀ concentration of the methanol extract of *N. odorata* root was 26.79 µg/mL in AGS and 35.44 µg/mL in NCI-N87. The purified active compound, methyl gallate induced apoptosis in the gastric cancer cell lines by altering the expression of BAX and Bcl-2 to favor apoptosis, as well as by increasing caspase 3/7 activity.

Acknowledgements: This work was funded in part by a Raman Post-Doctoral Fellowship by University Grants Commission, Govt. of India to NAR; a Schlumberger Foundation Postdoctoral Fellowship to TOL and a grant from the First Analysis Foundation to GBM.

Methyl Gallate Isolated from *Nymphaea odorata* Aiton (Nymphaeaceae) Induces Apoptosis in MCF-7 Cell Lines by Increasing the Bax/Bcl-2 Ratio and Inducing Caspase 3/7

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Abstract

Nymphaea odorata (Nymphaeaceae), the American water-lily is a perennial aquatic plant native to the USA and Canada. Preparations of the roots and leaves of *N. odorata* have been used orally in traditional medicine for the management of cancer, chronic diarrhea, as well as topically for burns and open wounds. In this work, we assessed the effect of methanol extracts of the roots of *N. odorata* in the estrogen receptor positive human breast adenocarcinoma cell line MCF-7. Coarsely powdered roots of *N. odorata* were extracted with methanol and the extract was air dried. Cytotoxicity and cell viability assay was performed using CellTiter-Glo[®] 2.0 assay in MCF-7 and IC₅₀ concentration was determined. The mechanism of cell death was determined by employing Alexa Fluor[®] 488 Annexin V/Dead Cell Apoptosis Kit with Alexa[®] Fluor 488 Annexin V and PI for Flow Cytometry. The methanol extract of *N. odorata* exhibited cyto-toxicity activity on MCF-7 with IC₅₀ of 20.6 µg/ml. Flow cytometry revealed that the extract induces apoptosis in MCF-7. Methyl gallate was identified as the active constituent by X-ray crystallography. This compound induced apoptosis in MCF-7 cells by increasing caspase activity and by alter the BAX/Bcl-2 ratio to favor apoptosis.

Acknowledgements: This work was funded in part by a Raman Post-Doctoral Fellowship by University Grants Commission, Govt. of India to NAR; a Schlumberger Foundation Postdoctoral

Fellowship to TOL and a grant from the First Analysis Foundation to GBM.

Extracts of *Dillenia indica* L. and *Anogeissus leiocarpus* (DC.) Guill. & Perr. Induce Apoptosis Via the Caspase 3/7 Pathway

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Abstract

The use of traditional medicinal plants for the treatment of breast cancer is common practice in rural populations in the developing countries including Nigeria. The mixed juices of bark, leaf and fruits of *Dillenia indica* L. (Elephant apple, Dilleniaceae), are used for the treatment of cancer, as well as aqueous preparations of *Anogeissus leiocarpus* (DC.) Guill. & Perr. (African birch, Combretaceae). *D. indica* samples (stem bark, leaves and fresh matured fruits) and *A. leiocarpus* (stem bark and root) were collected in Ibadan Nigeria, air dried and extracted with methanol and the dried extracts were then tested for their anti-cancer effects in MCF-7 breast cancer cells. Cell viability and cytotoxicity was determined using the CellTiter-Glo[®] 2.0 assay in MCF-7. Induction of apoptosis by caspase activation was investigated using Caspase-Glo[®] 3/7, Caspase-Glo[®] 8, ApoTox-Glo[™] Triplex Assay Reagents and confirmed by flow cytometry. Aqueous and ethyl acetate extracts of *D. indica* stem bark were cytotoxic in MCF-7 with IC₅₀ of 65.3 and 60.6 µg/mL, respectively. Extracts of the leaf and fruits were not active at concentrations up to 100 µg/mL. Extracts of *A. leiocarpus* were active with IC₅₀ between 12.8 and 64.8 µg/mL. The aqueous extracts of root and stem bark were the most active at 15.2 and 20.7 µg/mL respectively and

explain the activity of the plants in MCF-7 cell. Flow cytometry indicated apoptosis, which was confirmed using a caspase 3/7 assay. These findings support the use of these plants for the management of breast cancer in traditional medicine.

Tandok and Tawak: Marinduque's Culture of Non-Medical Alternative of Curing Animal Bites

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Abstract

Marinduque was recently declared as one of the 14 provinces in the Philippines deemed to be rabies-free. Despite the declaration, animal bites remain to be a recurring problem in the province. Six (6) in ten (10) Marinduquenos bitten by animals availed of *Tandok* or *Tawak* as means of attending to their wounds. *Tandok* is characterized by the removal of venom, rabies or tetanus using a suction apparatus. On the other hand, *pagtatawak* is the act of removing the venom, rabies or tetanus through direct sucking of the blood from the wound by a *mananawak*. Aside from these, little is known about the culture of *Tandok* and *Tawak* in Marinduque. Thus, this study aimed to comprehensively document the culture of *pagtatandok* and *pagtatawak* in Marinduque. Data from this study were obtained mainly through interviews with local *mananandok* and *mananawak*. Observation-participation method was also utilized to illicit other details about *pagtatandok* and *pagtatawak*.

Biography

The researcher is currently a fourth year medical student in the University of the Philippines-College of Medicine. At present, the researcher has already published two researches in the Philippine Journal of Science entitled (1) An Updated Survey and Biodiversity Assessment of the Terrestrial Snail (Mollusca: Gastropoda) Species in Marinduque, Philippines and (2) Influence of Traditional Medicine (Tandok and Tawak) on Marinduquenos' Knowledge, Attitudes and Practices on Handling Animal Bites. The researcher also has two other unpublished works

about pediatric hypertension and various coping mechanisms of multi-drug resistant tuberculosis patients. After medicine, the researcher aims to become a neurosurgeon.

Reduction of Asthmatic Parameters by Fresh Raw Garlic Extracts in Experimental Allergic Asthma

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Abstract

Garlic has a variety of biologic activities. From comparison of antioxidant and anti-inflammatory effects between fresh raw garlic and aged black garlic extracts (FRGE and ABGE), we found that FRGE have high anti-inflammatory activity and ABGE, a type of aged garlic, show strong antioxidant activity. Asthma is a chronic inflammatory disease of the respiratory tract of unknown etiology. Inflammation is often associated with an increased generation of reactive oxygen species. Here we investigated the effect of FRGE and ABGE on ovalbumin (OVA)-induced mouse model of allergic asthma. The asthma model was sensitized and challenged with OVA, and FRGE, ABGE, or organosulfur compounds (OSCs) were orally administered. FRGE significantly reduced OVA-induced asthmatic parameters, but not ABGE, such as the number of inflammatory cells, levels of total and OVA-specific IgE in serum, levels of Th2 cytokines (IL-4, -5, and -13), leukotrienes (D4 and E4), and histamine concentration in bronchoalveolar lavage fluid, mucus production by goblet cells in lung tissue, and histamine-induced contraction of asthmatic bronchial smooth muscle cells. Garlic-derived OSCs, except S-allyl cysteine which is abundant in ABG, inhibited asthmatic parameters, like FRGE did. These OVA-induced asthmatic parameters were down-regulated by FRGE and OSCs-induced inhibition of mitogen-activated protein kinase signaling. Moreover, FRGE did not affect the weights of the spleen nor

thymus, whereas dexamethasone, a steroidal anti-inflammatory drug, reduced them. Taken together, these results show that FRGE and garlic-derived OSCs have anti-asthmatic effects, and suggest that FRG could be a potential therapeutic agent and a functional food for treatment of asthma.

Fungicidal Mechanisms of Action of Apigenin Isolated from Traditional Medicine *Aster Yomena*

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Abstract

The anticarcinogenic properties of the flavone compound apigenin have been well characterized; nevertheless, its bioactive properties against pathogenic fungi have not yet been widely investigated. In this study, we examined the antifungal activity of apigenin, as well as its mode of action. Three-dimensional flow cytometric analysis demonstrated that apigenin induced morphological changes such as cell shrinkage in *Candida albicans*. We investigated the cause of cell shrinkage using the cyanine dye 3,3'-dipropylthiadicarbocyanine iodide, which revealed that apigenin altered the cell membrane potential. Apigenin also induced membrane dysfunction and increased cell permeability towards compounds such as propidium iodide and 1,6-diphenyl-1,3,5-hexatriene. We observed the influx and efflux of fluorescent dyes of varying molecular weights and radii across the membranes of FITC dextran-encapsulated large unilamellar vesicles and live cells that had been treated with apigenin; the damage allowed the flow of molecules with a radius of up to 2.3 nm through cell membranes. Membrane damage enabled the release of small intracellular contents such as ions and sugars, but not proteins, and affected the maintenance of the biofilm mass. In conclusion, this study suggests that apigenin exerts its antifungal activity through the leakage of intracellular components, leading to membrane disturbance and cell shrinkage.

Modulation of Macrophage Polarization by Sea Hare Hydrolysates Through P38 MAPK/NF- κ B Signaling

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Abstract

Our previous studies have demonstrated that sea hare-derived glycosaminoglycans induce macrophage activation, and sea hare hydrolysates (SHH) reduce asthmatic parameters in a mouse model of allergic asthma, without discussing macrophage polarization pattern. These results led us to study the effect of SHH on macrophage polarization. Here, we identified the effects of SHH on macrophage polarization in RAW264.7 cells and mouse peritoneal macrophages. M1

or M2 macrophage polarization was induced by exposure to lipopolysaccharide (LPS, 1 µg/mL) or interleukin (IL)-4 (10 ng/mL), respectively. SHH effect was compared to LPS and IL-4 effects. In RAW264.7 cells, SHH induced macrophage activation showing vacuolization and spreading, like LPS did. SHH treatment enhanced phagocytic ability of macrophage. The iNOS and TNF-α (M1 markers) were up-regulated by SHH treatment, whereas arginase (Arg)-1, a representative marker for M2 polarization, was not detected in RAW264.7 cells. However, the Arg-1 transcript was detected in mouse peritoneal macrophage treated with IL-4, but not with SHH. In addition, iNOS and TNF-α were not detected in IL-4-treated peritoneal macrophage. Furthermore, SHH treatment down-regulated IL-4-induced increase in Arg-1 and Ym1 expressions. The expression pattern of M1 and M2 markers by SHH was modulated through NF-κB and P38 MAPK activation, respectively. Taken together, our results demonstrate that SHH could be a novel immunomodulatory agent that induces M1 polarization, and reduces M2 polarization, suggesting that SHH may be offered as a potential remedy for cancer.

Biography

Marie Merci NYIRAMANA is master student in department of Convergence Medical Sciences at College of Medicine, Gyeongsang National University, South Korea. She have undergone several trainings in research methodology in various molecular physiology science projects and research experiments. Currently, her research interest is to study two-pore domain potassium channel, especially THIK-1 channel in relation to inflammatory pain model.

Hepatoprotective Effects of Oyster-Derived Tyr-Ala Peptide on Fulminant Hepatitis Through Down-Regulation of MAPK/NF-κB Signaling Pathways

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Abstract

In our previous study, oyster hydrolysate (OH) showed hepatoprotective effect on lipopolysaccharide (LPS)/D-galactosamine (D-GalN)-induced fulminant hepatitis with its antioxidant and anti-inflammatory activities. However, molecules and mechanisms in the hepatoprotective effect of OH have not been fully elucidated. Tyrosine-Alanine (YA) was highly and easily detected in the OH by high-performance liquid chromatography. The experimental acute liver injury model was induced with LPS (1 µg/kg) and D-GalN (400 mg/kg). YA peptide showed high DPPH and ABTS radical scavenging activities in a dose-dependent manner. YA significantly reduced LPS/D-GalN-induced increases in the concentrations of alanine transaminase and aspartate aminotransferase in serum. In the LPS/

D-GalN group, liver tissues exhibited apoptosis of hepatocytes with hemorrhages. These pathological alterations were ameliorated by YA treatment. YA markedly reduced the LPS/D-GalN-induced increase in the expression and concentration of pro-inflammatory cytokines TNF- α , IL-1 β , and IL-6 mRNA in liver tissue. These YA effects were blocked by incubation of MAPK activators and NF- κ B activators. In mouse liver tissue and hepatocytes, LPS increased phosphorylated MAPK expression, but the LPS-activated MAPK expression levels were decreased by YA treatment. YA also reduced the protein level of AMPK, which is known as a detrimental factor in fulminant hepatitis, phosphorylated by LPS/D-GalN. Taken together, these results show that YA has hepatoprotective effects on LPS/D-GalN-induced fulminant hepatitis through inhibition of MAPK/NF- κ B signaling pathways. We suggest that YA could be used as a functional peptide for treatment of acute liver injury.

Biography

Adrian Syawaluddin Siregar is a PhD student at Department of Convergence Medical Science, Gyeongsang National University. He received master degree in pharmacy at Gyeongsang National University. After graduation, he spent his time as laboratory assistant to work in cancer and stem cell at the same department. Recently, His research interest is to study the molecular mechanism in drug-induced liver injury and its potential treatment. He also works in some experiment related to two pore domain (K_{2P}) potassium channel.

Medical Plant Extracts as Inhibitors of Viral Attachment and Entry in an Experimental Model of HSV-2 Infection

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Abstract

Genital herpes is the most common cause of genital ulcers worldwide. There exist no vaccine against the causative agent, herpes simplex virus type 2 (HSV-2), nor any eradicating cure. As genital herpes is a major risk factor for later HIV infection, there is a pronounced need to develop novel treatments that can prevent and/or cure the infection. In rural areas of South America, particularly in the Amazonas, a huge number of natural products, mainly from plants, have been used by traditional populations to cure diseases. In this report, extracts of five different botanical specimens from the Amazon region of La Paz, Bolivia, were screened for anti-viral activity against herpes simplex virus type 2 (HSV-2) using both *in vitro* and *in vivo* models of infection. Hydroethanol plant extracts of *Equisetum giganteum*, *Croton lechleri*, *Uncaria tomentosa* and *Copaifera reticulate* efficiently blocked HSV-2 infection of cell cultures at low concentrations, without exhibiting any cell cytotoxic effects. All four plant extracts could also prevent disease development when administered together with virus in a mouse model of genital HSV-2 infection. *In vitro* analyses revealed that the extracts exerted their anti-HSV-2 effects by interfering with viral cell attachment and entry. In summary, these studies show that plant extracts used by the native population in Bolivia as antiseptic treatment have potent antiviral activity and could potentially be explored further for the development of novel topical antiviral microbicides.

***Asteris radix* Attenuates Testosterone-induced Benign Prostatic Hyperplasia in Rats**

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Abstract

Benign prostatic hyperplasia (BPH) is a non-malignant enlargement of the prostate gland, resulted from hyperplastic changes of prostate epithelial and stromal cells. *Asteris Radix* (AR) is traditional prescriptions for use as cough medicines, expectorants and diuretics. Here, we investigated the therapeutic effect of AR on BPH in a testosterone-induced BPH animal model. BPH in rats was generated via daily subcutaneous injections of testosterone propionate (TP; 3 mg/kg) dissolved in corn oil, for 4 weeks. Finasteride (10 mg/kg) or AR (150 mg/kg) was administered daily for 4 weeks by oral gavage concurrently with the TP. All rats were sacrificed and the prostates were dissected, weighed, and subjected to histological, immunohistochemical, and biochemical examinations. The prostate weight, testosterone in serum and dihydrotestosterone (DHT) concentration in prostate tissue were significantly reduced following the treatment with finasteride or AR. TP-induced prostatic hyperplasia and the expression of proliferating cell nuclear antigen (PCNA) were significantly attenuated in finasteride or AR-treated rats. The expression of anti-apoptotic protein, B-cell lymphoma 2 (Bcl-2) was decreased whereas pro-apoptotic Bcl-2-associated X protein (Bax) was increased in finasteride or AR-treated rats. Furthermore, finasteride or AR inhibited the expressions of cyclooxygenase 2 (COX-2) and inducible nitric oxide synthase (iNOS). However,

finasteride or AR-treated rats showed significant reduction in the expressions of these cytokines. Therefore, our findings suggest that AR effectively represses the development of BPH and might be a useful treatment agent for BPH.

Biography

Mrs. Jeong completed her master's degree at Kyungpook National University. She had previously worked in Keimyung University and Korea Institute of Oriental Medicine. She is the researcher of Research Institute of Veterinary Medicine in Chungnam National University.

***Stauntonia hexaphylla* and *Cornus officinalis* on Benign Prostatic Hyperplasia in LNCaP Cell Line**

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Abstract

Stauntonia hexaphylla (Thunb.) Decne. is native plants which are grown in the southern districts and Jeju island in Korea. It has been used in oriental medicine of as an analgesic, anthelmintic, sedative and diuretic. Also Corni Fructus is a known fruit of the perennial woody plant, *Cornus officinalis* Siebold et Zuccarini, which exhibits several biological activities, including hypoglycemic, antineoplastic and antimicrobial effects. Corni Fructus has been used in order to improve liver and kidney functions in Traditional Korean Medicine. The study was designed to investigate the combination effect of *Stauntonia hexaphylla* (SH) and *Cornus officinalis* (CO) on benign prostatic hyperplasia (BPH) in LNCaP cell line. The cell viability was evaluated by MTT method using LNCaP cell line, pretreated with various concentrations of SH+CO. The expression of prostatic specific antigen (PSA) and androgen receptor (AR) protein were evaluated by western blot using LNCaP cell and compared various ratio of SH+CO with 10 μ M finasteride. The cytotoxicity of SH+CO to the LNCaP cell

line was shown at above 50µg/ml of SH+CO. SH+CO suppressed expression of PSA and AR in LNCaP cell line. In conclusion, the experimental results showing synergism between SH and CO in BPH propose a scientific basis for the usage of combinations in Korean Medicine, and also suggest SH+CO as a useful therapeutic drug for BPH, a common disease among elderly men.

The Effect of Acetone and Aqueous Crude Leaf Extracts from *T. alliacea*, *T. simmleri*, and *T. Violacea* on the Viability of RAW 264.7 Macrophage Cell Line

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Abstract

The genus *Tulbaghia* has been used in traditional medicine to treat diseases such as tuberculosis, oesophageal cancer and stomach ailments. Plants used in traditional medicine are assumed to be safe due to their long usage in the treatment of diseases. However, recent scientific research has shown that these plants may be potentially toxic. Currently, there is contradicting evidence with regards to the toxicity of the species in the genus *Tulbaghia*. The aim of this study was to evaluate the effect of acetone and aqueous crude leaf extracts from *T. alliacea*, *T. simmleri*, and *T. violacea* on the viability of RAW 264.7 macrophage cell line. The effect of the extracts on the metabolic activity and cell membrane integrity against the macrophages was assessed using the MTT and LDH assays, respectively. For the MTT assay, significant inhibitory effect was observed after 48h treatment with *T. alliacea*, *T. simmleri* and *T. violacea* acetone extracts with IC₅₀ values of 0.48 mg/ml, 0.72 mg/ml and 0.1 mg/ml, respectively. Water extracts on the other hand showed less toxic effect indicated by higher IC₅₀ values of 0.95 mg/ml, 2.49 mg/ml and 0.3 mg/ml for *T. alliacea*, *T. simmleri* and *T. violacea*, respectively. The LDH release by macrophages after 24h treatment with

acetone extracts was observed to be concentration dependent while treatment with water extracts did not induce LDH release. In conclusion, all the plant extracts used showed minimal toxicity on the macrophages which was observed to be concentration, extract and time dependent. The low toxicity of these plant extracts indicate that they could serve as sources for natural therapeutic agents.

Keywords: LDH, Macrophages, Medicinal plants, Toxicity, MTT, *Tulbaghia*

Evaluation of the Activity of Traditional Medicine Extracts in Inducing Killing of *Mycobacterium tuberculosis* by Human Macrophages

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Abstract

Mycobacterium tuberculosis, the causative agent of TB, has developed resistance to all available drugs for TB treatment. This suggests the urgent need to find effective ways to combat this infection. Targeting the host instead of the pathogen appears to be the best alternative as it reduces the chances of pathogen developing drug resistance.

Recent studies have reported that exogenous ATP stimulated human macrophages to kill intracellular virulent *Mycobacterium tuberculosis*. In this study, we will use *in vitro* antibacterial activity testing of various solvent- and water- derived plant extracts as well as RNAseq analyses to investigate the effect of traditional medicines on the ability of human macrophages to fight TB infection.

Macrophages will be infected with the closely related *Mycobacterium bovis* bacille Calmette-

Guérin (BCG), then treated with aqueous plant extracts, mimicking the traditional way of decoction preparation. Intracellular survival of BCG will then be monitored using available protocols. RNAseq will be performed on macrophages treated with extracts that show activity in order to identify pathways that might be differentially regulated to enable killing of the pathogen. Gas chromatography-mass spectrometry will also be used to identify and characterize the chemical compounds present in the active plant extracts.

We expect that some of the medicinal plant extracts will stimulate macrophages to kill TB and at the conclusion of these experiments, we expect to have new anti-TB drugs that are host directed and have a detailed mechanism of action of each active compound by employing RNA-seq technology.

Cosmeceutical Activities of Active Composite JCL1 Containing the EtOH Extracts of *Daphne odora*, *Pseudocyonia sinensis* and *Rosa rugosa*

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Abstract

Elastase is an enzyme that degrades the elastin layer which reduce the elasticity of the skin causing wrinkles. Collagen is a protein that forms the binding layer of skin together with elastin by breaking down the collagen fiber to reduce the elasticity of the skin. In this study, we accessed the *in vitro* anti-collagenase, anti-elastase and anti-oxidant activities of natural products to develop functional cosmetics. The EtOH extract of *Daphne odora* showed anti-elastase and anti-inflammatory activity whereas *Pseudocyonia sinensis* showed protective effect against UVB irradiated CCD-986sk cell. On the other hand, EtOH extract of *Rosa rugosa* also showed effective anti-oxidant activity against oxidant stress. We could prepare an active composite JCL1 which is composed of *Daphne odora*, *Pseudocyonia sinensis* and *Rosa rugosa*. JCL1 inhibits the activity of elastase to reduce the degree of damage to the elastin binding

layer of the skin. The active complex having antioxidant effect protects skin from skin damage caused by active oxygen derived from harmful substances. In conclusion, our study suggests that the active composite JCL1 can be effective in anti-aging properties as well as in development of cosmeceutical care management.

Biography

Ham Ha-Neul is currently studying Master in Pharmacy in Woosuk University, South Korea. The major is neuro-pharmacology and immunology. He is mainly focused on the development of memory and cognitive ability improving food utilizing photochemistry and medicinal plants. In addition, interested in treatment with essential oils and aromatic plants with application in cosmeceutical areas. His recent study was to evaluate the effects of using of medicinal plants or the combinations of plants to improve memory and cognitive abilities.

Aquaporin-4 Mediates β -Amyloid-Induced Apoptosis in Rat C6 Glioma Cells

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Abstract

It is well known that the $A\beta$ -astrocyte interaction results in astrocyte malfunction and apoptosis, which contribute to neurodegeneration in Alzheimer's disease (AD). The regulation of astrocyte apoptosis is pivotal in physiological and pathological processes in the central nervous system. Aquaporin-4 (AQP4), which is primarily expressed in astrocytes, is a water selective membrane transporter protein. Recent studies indicate that AQP4 plays a role in various astrocytes functions, and AQP4 deficiency alters the pathophysiological processes, such as

impairments of synaptic plasticity, spatial memory, and language-associated learning in neurological diseases. In addition, glutamate uptake from the extracellular space by astrocytic glutamate transporters (GLTs) is reduced after A β infusion, which results in glutamate-induced excitotoxicity. Although there are several studies on the induction of AQP4 expression in an astrocyte-like cell line, rat C6 glioma, little is known about the regulation of the pattern of AQP4/GLT-1 expression in A β -treated C6 cells. In the present study, the effects on cell death, AQP4 expressions, and glutamate uptake in C6 cells treated with A β 25-35, A β 1-40, and A β 1-42 at 1 – 25 μ M were investigated. We found that all A β species induced apoptosis, especially with A β 1-42 at 25 μ M. Therefore, the effects of A β treatment on the expressions of AQP4 gene and protein were measured using A β 1-42. Furthermore, the effects on GLTs expression and the regulation patterns of AQP4/GLTs were examined in A β 1-42-treated C6 cells using various inhibitors, which possibly provide a basis for developing novel *in vitro* assay system for A β -associated neurodegenerative disease.

Biography

Dr. Seun-Ah Yang is currently an associate professor at Department of Food Science and Technology, Keimyung University in Korea. In my laboratory, we are establishing an *in vitro* evaluation system for screening active molecules from natural resources and studying mechanisms underlying AQP4-mediated regulation of Alzheimer's disease.

Alpha-Glucosidase Inhibitory and Antioxidant Activities of Chemical Substances from the Wood of *Derris reticulata* Craib

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Abstract

Derris reticulata (Leguminosae-Papilionoideae) has been used for the treatment of diabetes in Thai folk remedies. The phytochemical investigation of the wood of *D. reticulata* revealed the isolation of two new prenylated flavanones, 4'-methoxydereticulin (1) and 2'''-hydroxy, 3'''-ethoxylupinifolin (2), along with five known ones namely genistein (3), lupinifolin (4), 2''',3'''-dihydroxylupinifolin (5), lupeol (6), and β -sitosterol (7). Compounds 1 (% inhibition = 41.70) and 3 (% inhibition = 34.27) showed moderate DPPH radical scavenging activity, while lupinifolin (4) (% inhibition = 14.38) exhibited weak activity at the tested concentration of 250 μ g/ml. Furthermore, among the tested compounds 1-5, compound 3 exhibited the best α -glucosidase inhibitory activity (IC₅₀ of 151.24 μ g/ml), while the others showed weak activity.

Hepatoprotective Effect of *Achyranthes aspera* Extract on Non-alcoholic Fatty Liver in Mice

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Abstract

Non-alcoholic fatty liver disease is a common disease with accumulation of liver fat, and it occurs without the history of alcohol consumption, which has the same characteristics as alcoholic fatty liver and histologic findings. The aim of this study was to determine whether administration of *Achyranthes aspera* extracts (AAE) prevents diet induced nonalcoholic fatty liver disease. Male C57BL/6 mice (7 weeks old; initial weight 22.3 g) were randomly assigned into two groups after a 1 week adaptation period: normal control diet (CTL group) and high fat diet (HF group). CTL group and HF group freely received normal control diet and high fat diet respectively. After 12 weeks adaptation period, the HF group were assigned randomly to two groups and further fed an HFD

(HF group) or an HFD supplemented with AAE (A500 group). After 4 weeks, we evaluated the body weight, serum metabolic parameters, and expression of mRNAs related to hepatic fatty acid uptake and de novo lipogenesis. The HF group exhibited higher weight gain throughout the body and liver than the CTL and A500 groups did. The HF group also showed greater expression of LXR α , LXR β , SREBP1c, SREBP2, and C/EBP α mRNAs in the liver than the CTL and/or A500 groups. In addition, expression of ACC1, FAS, and SCD-1 mRNA in the liver were reduced, while expression of PPAR γ mRNA was lower in the A500 group than in the HF group. Hepatic expression of p-AMPK/AMPK was higher in the A500 group than in the HF group. Accordingly, AAE prevents anti-inflammatory, anti-obesity and ameliorative liver fatty degeneration effects. This study provides novel information concerning the protective effect of AAE supplementation against obesity-induced nonalcoholic fatty liver disease.

Biography

T.W Oh has completed his PhD at the age of 32 years from Dongguk University, South Korea. He majored in traditional Korean medicine and medicinal plants for neuroscience and ophthalmology. He is the senior researcher of Korea Institute of Oriental Medicine (KIOM), a government-funded research institute in South Korea. He has over 30 publications that have been cited over 10 times, and he has more than 10 patent applications and registrations.

Effect of Stevia's Leave Extract, Stevioside, on Pro-inflammatory Cytokines Release in Human Monocytic Cells

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Abstract

Stevioside (SVS), a natural noncaloric sweetener isolated from *Stevia rebaudiana* Bertoni. This study aimed to investigate the immunomodulatory activity of stevioside in monocytic cells which isolated from peripheral blood mononuclear cell (PBMC). Human monocytic (CD14⁺) cells were incubated with different concentrations of stevioside in the absence or presence of lipopolysaccharide (LPS). The level of TNF- α , IL-1 β and IL-6 were determined by using human enzyme-linked immunosorbent assay (ELISA) kits. Stevioside in doses ranging from 0.001-1 mM had no cytotoxic effect on CD14⁺ cells. Interestingly, stevioside at 0.01 - 1 mM significantly suppressed LPS-induced the release of TNF- α while stevioside at 0.001-1 mM significantly inhibited the released of IL-1 β and IL-6. Moreover, stevioside itself at 0.001 mM has no effect on TNF- α , IL-1 β and IL-6 release, higher concentration of stevioside (0.01-1 mM) significantly stimulated TNF- α , IL-1 β and IL-6 release from CD14⁺ cell however, less than that of LPS stimulated. In conclusion, stevioside had an immunomodulatory activities, in the presence of LPS, stevioside inhibit the release of pro-inflammatory cytokine on the other hand, in the absence of LPS, stevioside stimulated the release of pro-inflammatory cytokines.

Keywords: Stevioside, TNF- α , IL-1 β , IL-6, CD14⁺ cell

Cytotoxic Effect of *Ophiocordyceps sinensis*'s Extract in Dog Peripheral Blood Mononuclear Cells

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Abstract

Ophiocordyceps sinensis, a famous and maybe the most expensive fungal species, is an entomopathogenic fungus in the family Ophiocordycipitaceae. It is a well-known medicinal mushroom in traditional Chinese and Tibetan medicine that increase energy, stimulates immune system and act as an overall tonic to the body. Peripheral blood mononuclear cells (PBMCs) are a mixed population of single nuclear white blood cells including monocytes, natural killer cells, T cells, and B cells. Therefore, PBMC is probably the best source for the assessment of differences or changes in immune responses to diseases or drugs. This study aim to investigate cytotoxic effect of *Ophiocordyceps sinensis* on dog PBMCs. PBMCs were isolated from healthy dogs, 2 x 10⁶ cells of PBMCs were incubated with varying concentrations of *Ophiocordyceps sinensis*'s extract from 0.1 µg/ml to 1 mg/ml. Cell viability was determined by trypan blue dye exclusion technique which serves as a useful procedure to study cell viability because the membrane integrity of dead cells is unable to exclude this vital dye. Results demonstrated that effect of *Ophiocordyceps sinensis*'s extract at concentration of 0.1, 1.0 µg/ml, 0.01, 0.1 and 1 mg/ml had no cytotoxic on dog PBMCs. In conclusion, *in vitro* study indicated that *Ophiocordyceps sinensis*'s extract in the given dosages is safe for dog PBMCs.

Keywords: *Ophiocordyceps sinensis*, dog, PBMC, cytotoxic

Effectiveness of SKT Meditation in Diabetes Mellitus Patients

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Abstract

SKT meditation is a non-invasive Thai traditional medicine conducting to heal chronic illnesses. This study aims to test the effectiveness of SKT meditation in diabetes mellitus (DM) patient. There are 30 DM patients who walked in to Non-communicating disease (NCD) clinic during 1stFebruary to 31th July, 2016 and willing to join this study for 6 months. They have learned and practiced SKT medication, in addition they've also learned food, exercise and mood model (FEM) assessment. All patients committed to regularly practice SKT at least 2 times a day. Moreover, they will join the peer group activities once a month to share their everyday life and effectiveness of SKT meditation. Data was collected including frequency of SKT meditation, assessment of FEM, blood sugar levels (fasting blood sugar) and HbA_{1c}. Results revealed that blood sugar levels of DM patients were decreased after healing by SKT meditation. Principles of SKT meditation is to calm down and to control the mind to power and authority which resulted in a normal function of the body. In conclusion, SKT meditation, a non-invasive traditional medicine, can heal DM patient in Thailand.

Keywords: SKT meditation, diabetes mellitus (DM)

In vitro Cytotoxic Effect of Purple Rice Husk Extract on Peripheral Blood Mononuclear Cells

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Abstract

Purple rice genotype Kum Doi Saket (*Oryza sativa* L. ssp. *indica*) is one of the purple glutinous rice grown widely in the northern area of Thailand. Purple rice is called "hematopoietic rice" and "medical rice" and has been used in medical herb cuisine. It contains gamma oryzanol, anthocyanins and tocotrienols, which have been claimed for several health benefits such as antioxidant, antidiabetic and lipid-lowering actions. Peripheral blood mononuclear cell (PBMC) is any peripheral blood cell having a round nucleus. These cells consist of lymphocytes, monocytes and granulocytes which is probably the best source for the assessment of immune responses to medicinal plants. This study aim to investigate *in vitro* cytotoxic effect of purple rice husk extract on dog PBMC. 2×10^6 peripheral blood mononuclear cells isolated from healthy dogs whole blood using ficoll were incubated with varying concentrations of purple rice husk extract from 0.1 $\mu\text{g}/\text{ml}$ to 1 mg/ml . Cell viability was examined by trypan blue dye exclusion technique which serves as a useful procedure to study cell viability base on the membrane integrity of dead cells which is unable to exclude this vital dye. Results shown that purple rice husk extract at concentration of 0.1, 1.0 $\mu\text{g}/\text{ml}$, 0.01, 0.1 and 1 mg/ml had no cytotoxic effect on dog PBMC. Thus, *in vitro* study indicated that purple rice husk extract is safe for dog PBMCs.

Keywords: purple rice husk extract, PBMC, cytotoxic

Effects of the Chinese Herbal Medicine Mixture 919 Syrup on the Isolation Stress Response in Postpartum Mice

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Abstract

Because 919 syrup (919 TJ) improved of appetite chronic liver disease patients, we examined whether it has an effect on appetite and isolation stress (IS) induced anorexia related gene expressions in postpartum mice.

Methods: Mice puerperas and offspring were separated for 3 h/day. Weight gain, ghrelin serum concentrations as well as hypothalamic and gastric ghrelin, growth hormone secretagogue receptor (GSHR), leptin, neuropeptide Y (NPY), agouti-related protein (AgRP), corticotrophin-releasing factor (CRF), proopiomelanocortin (POMC) and serotonin receptors 5-HT_{2c}R (hypothalamus) and 5HT_{2b}R (stomach) transcriptions were monitored in high and low 919 TJ dose treated IS exposed postpartum mice.

Results: Over the course of 21 days, IS inhibited feeding and weight gain, increased the serum levels of ghrelin, upregulated ghrelin and GHSR expression in the stomach and hypothalamus, downregulated leptin and 5-HT_{2b}R expression in the stomach, upregulated NPY and AgRP expression in the hypothalamus and downregulated CRF, POMC, and 5-HT_{2c}R expression in the hypothalamus. Although 919 TJ did not improve food intake or weight gain, it reduced the serum concentrations of active ghrelin; downregulated ghrelin and GHSR and upregulated leptin and 5-HT_{2b}R transcriptions in the stomach; downregulated ghrelin and GHSR and upregulated CRF, POMC, and 5-HT_{2c}R transcription in the hypothalamus of postpartum mice.

Conclusion: 919 TJ could reverse all IS induced anorexia genes related changes beside weight gain and food intake, indicating that ghrelin is not the principal driver of feeding behavior in postpartum mice. The IS induced ghrelin changes were not as expected for hypothalamic-pituitary-adrenal (HPA) axis stress response.

Biography

Pengfei Gao, as a TCM doctor, got the Ph.D of Keio university in 2011, now the dean of Department of Traditional Chinese Medicine of Jinshan Hospital of Fudan University, Shanghai, China. He did the research of 919 syrup for 20 years, also majored the clinical and basic study of the Kampo medicine.

Effects of 919 Syrup on the Ghrelin Signaling of the Maternal Stress Model

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Jinshan Hospital of Fudan University, China

Abstract

Previous studies have shown that immobilization stress (IS) promoted the secretion of ghrelin and downregulated 5-HT_{2c}R expression in the hypothalamus of postpartum mice, while 919 syrup can reverse the effects of IS. The present study aimed to investigate the effects of 919 syrup on the appetite regulation in postpartum IS mice.

Methods: On postpartum day 2, IS was applied to the animals for 3 hours every day for 3 weeks. 919 syrup (20 mg / kg daily) and 5-HT_{2c}R agonist (DOI, 3 mg / kg, intraperitoneal injection every other day) were given during postpartum IS. Weight gain and food intake were recorded. Ghrelin serum concentrations were detected by ELISA. Real-time PCR and western blot analyses were performed to determine the mRNA and protein levels of ghrelin signaling-related genes, respectively.

Results: IS inhibited the food intake and weight gain, which was not affected by 919 syrup or DOI. IS significantly increased the serum levels of ghrelin, upregulated ghrelin expression

in the stomach and hypothalamus, downregulated 5-HT_{2b}R expression in the stomach, upregulated NPY and AgRP expression in the hypothalamus and downregulated 5-HT_{2c}R expression in the hypothalamus. Both 919 syrup and DOI reduced the serum concentrations of ghrelin, downregulated ghrelin and upregulated 5-HT_{2b}R transcription in the stomach; downregulated ghrelin and upregulated 5-HT_{2c}R transcription in the hypothalamus of postpartum mice. Combination of 919 syrup and DOI can strengthen the effect.

Conclusion: 919 syrup and DOI could reverse the effects of IS on ghrelin signaling.

Biography

Yuemei Xu, as a TCM doctor, got the master's degree of TCM from Shanghai University of Traditional Chinese Medicine in 2009, now the attending doctor of Department of Traditional Chinese Medicine of Jinshan Hospital of Fudan University, Shanghai, China. She has been engaged in clinical and basic research in traditional Chinese medicine for nearly 10 years, and the research of 919 syrup for 5 years.

A Randomized, Double-Blind, Placebo-Controlled Study of Thai Herbal Recipe in Advanced Hepatocellular Carcinoma

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Abstract

Thai herbal remedy “Sam rak” is the famous

and well-known herbal remedy in the North Eastern part of Thailand used for treating liver cancer for several decades. This herbal remedy is composed of three roots, i.e., *Eurycoma longifolia*, *Dipterocarpus tuberculatus*, *Tamilnadia uliginosa*, in equal proportion. Thai patients used these three roots by grinding them and dissolving in water, then drinking this herbal remedy every day. Our research group had the question regarding the efficacy of this herbal recipe for treating liver cancer. Thus, we conducted the double blinded randomized control clinical research. Twenty patients diagnosed with hepatocellular carcinoma, advanced disease with no definitive therapy were enrolled in this study and divided into 2 groups, i.e., control and experimental groups. Each group had 10 patients by randomization. The control group took placebo and the other took the real herbal remedy. Both doctors and patients were double blinded. They continued the treatment until the progression of disease or death, but not over 1 year period of research.

Based on our research, the age, sex, history and physical examination are no statistical difference, including CBC, SGOT, SGPT, BUN, Cr. However, the experimental group has the tumor size much larger than the control. Alpha feto protein and alkaline phosphatase of the experimental group are significantly much higher than the control group, which means high tumor burden. Using Kaplan-Meier survival curve analysis, though the experimental group showed high tumor burden, the experimental group has no inferior survival than the control.

Biography

Professor Dr. Tanawan Kummalue, Department of Clinical Pathology, Faculty of Medicine Siriraj Hospital, Mahidol University, was graduated with M.D., Ph.D., and Thai Board of Hematology. Her works and research are in the field of herbal medicine and integrative medicine. She is now doing research for finding the anti-hyperglycemic, anti-hyperlipidemic, and also anticancer drugs from plant sources, both *in vitro* and *in vivo*.

Essential Oils as Ecofriendly Preservatives for Cultural Heritage

Eman Osman

Chemical Metrology Division, National Institute of Standards, Egypt

Abstract

Essential oils are well known since ancient times by their medicinal and cosmetic effects. Moreover, essential oils are widely used as components of drugs, biologically active additives and dietary supplements, as well as in aromatherapy, the food industry and cosmetics. Recently, numerous research studies reported a biological activity of essential oils: they exhibit antibacterial, fungicidal, antioxidant and antiradical properties. Since, researches in archeological artifacts conservation provide essential information to conservators on the causes of deterioration and proposing conservation solutions and the appropriate methods of treatment and on the assessment of treatment performance and they also help in understanding the composition of materials and the techniques used to create works of art. Consequently, studies on the biological activities of essential oils have become increasingly important in the search for natural and safe alternative preservatives in recent years. In this talk, I am going to present how we could offer alternative natural tender and subtle essential oils preservatives for ancient manuscripts that may replace the common chemical harsh preservatives.

Effects of Rhizome Extract of *Dioscorea batatas* and its Active Compound, Allantoin on Skeletal Muscle Dysfunction in High Fat Diet/Streptozotocin induced Diabetic Mice

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²College of Chinese Materia Medica, Shanxi University of Chinese Medicine

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Abstract

With aging process, a loss of skeletal muscle mass and dysfunction in older people are related to the metabolic syndrome. Yams are commonly use in functional foods and medications with various biological activities. In previous study, we found that rhizome extract of *Dioscorea batatas* (Dioscoreae Rhizoma, Chinese Yam) and its bioactive compound, allantoin, can help myoblast differentiate into myotubes and improve the mitochondrial biogenesis in C2C12 mouse skeletal muscle cells. The present study was conducted to investigate the effects of Yam extract and allantoin on skeletal muscle dysfunction in high fat diet (HFD)/streptozotocin (STZ)-induced diabetic mice. The treatment of yam extract and allantoin in diabetic mice decreased the fasting blood glucose levels and increased serum insulin levels. Yam extract and allantoin treatment reduced serum total cholesterol and triglyceride levels in the diabetic mice. In addition, yam extract and allantoin efficiently increased mitochondrial ATP production and reversed the decrease of mtDNA copy number in skeletal muscle tissue. Furthermore, yam extract and allantoin increased the expression of mitochondrial biogenetic factors (PGC1 α , Sirt-1, NRF-1, and TFAM), GLUP-4, and the phosphorylation of AMPK and ACC in skeletal muscle tissues. These results indicate that yam extract and allantoin can help prevent skeletal muscle dysfunction in HFD/STZ-induced diabetic condition.

Phenolic Contents, Antioxidant and Anti-Inflammatory Activities of *Asparagus cochinchinensis* (Loureiro) Merrill

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Abstract

Asparagus cochinchinensis (Loureiro) Merrill. (AC) is used as a traditional medicine for treating inflammation and oxidative stress-related diseases. In this study, aqueous extract of AC tuber was investigated to determine the antioxidant and anti-inflammatory activities. Free radical-scavenging activities as well as total phenolics and flavonoid contents of the extracts were measured. As primary screening of anti-inflammatory activity, cell viability and inhibition of nitric oxide (NO) production were determined using the lipopolysaccharide-treated RAW 264.7 macrophage cell line. The levels of phenolic and flavonoid compounds from AC mg were found to be 459 1 gallic acid equivalent/g (GAE/g) dry mass and mg 642 4 catechin equivalent/g (CE/g) dry mass, respectively. AC showed 2,2-diphenyl-1-picrylhydrazyl 1,1-diphenyl-2-picrylhydrazyl, nitrite scavenging and hydroxyl radical-scavenging activity in a dose-dependent manner. Significant NO production and cell viability were also found in the extracts. Results suggest that AC can be a source of natural antioxidants and anti-inflammatory substances.

Biography

Beong Ou Lim is a professor and dean at department of biomedical & health science in Konkuk University, South Korea. Professor Beong Ou Lim has more than 150 international papers on antioxidant, anti-cancer, and anti-inflammatory mechanisms using various natural products. He earned his Master of Science from Kyushu University in 1994 and achieved his PhD in Food Chemical Engineering from the same university in the year of 1997. During his PhD he did some

noticeable publication in international study. In 2007, he received an excellent paper in the field of medicinal crops and conducted research on antioxidant in the pharmacology classroom of the University of Toronto, Canada. His recent publications include “Preventive and therapeutic effects of blueberry extract against DSS-induced ulcerative colitis regulation of antioxidant and inflammatory mediators,” His current research interest includes the bio-medical compound. In addition, he is currently working on the BK-21 plus, a major research project in Korea, and the CK project, and is doing his best in bio-related research.

DNA Protection, Total Phenolics and Antioxidant Potential of the Bilberry (*Vaccinium myrtillus* L.)

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Abstract

Bilberry (*Vaccinium myrtillus* L.) has been known to play a protective role in human health due to its high anthocyanin content. The extracts were tested for antioxidant activity by using DPPH (1,1-diphenyl-2-picrylhydrazyl), and hydroxyl (OH•) radicals scavenging activity. The level of intracellular reactive oxygen species (ROS) was determined in H₂O₂ treated chang liver cells. Anti-inflammatory activity was evaluated by the inhibition of nitric oxide (NO), inducible nitric oxide synthase (iNOS), as well as tumor necrosis factor-alpha (TNF- α) protein expression in a lipopolysaccharide stimulated Raw 264.7 murine macrophages cell line. Bilberry extracts scavenged DPPH, OH• radicals and decreased the level ROS.

The extracts reduced NO reduction and inhibited the expression of iNOS and TNF- α proteins. The findings indicate that extracts of bilberry could be considered as natural antioxidants and anti-inflammatory agents for food and drug industries.

Acupoints Selection Characteristics of Acupuncture for Insulin Resistance by Data Mining

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²Shenzhen Hospital of Traditional Chinese Medicine, China

Abstract

The characteristics and rules of acupoint selection of acupuncture for insulin resistance were analyzed.

Methods: By searching CNKI, VIP, WF, literature regarding acupuncture for insulin resistance from 1991 to 2016 was collected to establish an acupuncture prescription database. The data mining technology was applied to analyze the characteristics and rules of acupoint selection.

Results: a total of 64 papers were include, involving 73 acupoints. It was found that the acupoints that had frequency of selection include Zusanli (ST 36), Sanyinjiao(SP 6), Fenglong(ST 40) and Taichong(LR 3). The acupoints selected were distributed in 13 meridians, in which yangming, taiyin meridian of foot and ren meridian had a frequency of 58.07%, the special acupoints including five-shu points, crossing points and back-shu point, accounting 56.71%.

Conclusion: This study discussed the regular of acupuncture in patients with IR, excavate the regular of the main acupoints selection for IR, which provides the approach for acupuncture on IR in clinical treatment.

Biography

Yi Wei, born in August 1966 is a M.D., Professor, Doctor Advisor in Acupuncture, Tuina and Moxibustion. She has participated in many projects, among which two are supported by National Natural Science Foundation of China while three are supported by Provincial Science Foundation of Guang Dong. She has published more than 30 papers and compiled 8 monographs. Professor Yi specializes in the research on metabolic diseases by acupuncture and moxibustion; the principles and mechanism of acupuncture treatment as well. She is known for using acupuncture to treat Metabolic diseases, gynecological diseases, obesity, stroke, facial paralysis, rhinitis and pain syndromes, etc.

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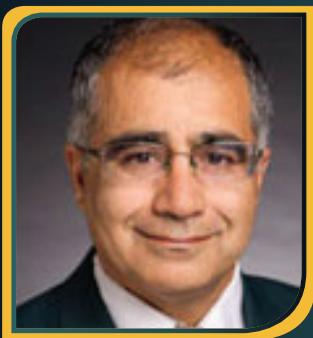
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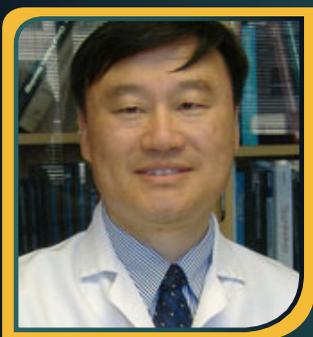
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