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Keynote Sessions

Tuina Massage for Chronic Pain

Sabine Zeitler

Societas Medicinae Sinensis (International Society for Chinese Medicine), Germany

Abstract

Western and Chinese medicine offer basic explanatory models for the development of chronic pain. In the field of Chinese Tuina massage, however, there are many overlaps and in the truest sense of the word “points of contact” of the two approaches. Speaking in the terminology of the TCM to find the cause of chronic pain one has, to have a close look on disturbances in the flow of Qi and Xue in the meridians. The Tuina massage offers many possibilities to release the blockages and to improve the flow of Qi and Xue in the channels. For this reason, manual therapy in Chinese medicine is so important in the treatment of chronic pain. Their effectiveness is also proven from the perspective of modern medicine with studies. Two case studies will explain how Tuina massage is applied to patients with chronic pain.

Biography

Sabine Zeitler is physiotherapist and practitioner of Traditional Chinese Medicine and Osteopathy. Since 2001 she is active in her own practice in Munich, Germany. Since 1996 she is member of the SMS – Societas Medicinae 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, Akupressure and Qigong within the framework of the education provided by the SMS - Societas Medicinae Sinensis.

Beyond Chemoprevention: A Novel Role of Cruciferous Vegetables-based Phytochemicals as Epigenetic Modulators in Malignant Melanoma

Michail Panagiotidis¹, Melina Mitsogianni¹, Theodora Mantso¹, and Aglaia Pappa²

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²Democritus University of Thrace, Department of Molecular Biology & Genetics, Alexandroupolis, 68100, Greece

Abstract

Epigenetic modifications are well established in leading to an altered gene expression state involved in various diverse cellular cascades including those of cell growth, proliferation, apoptosis, etc. On the other hand, a vast number of studies has documented that phytochemicals can exert a plurality of anti-cancer effects including restoration of the epigenetic landscape characteristic of a disease state. Given the reversible nature of these epigenetic alterations, there is a continuous growing interest from the pharmaceutical sector on the beneficiary effect of various small molecule compounds (including phytochemicals) as treatment options for various types of cancer. This is the case with isothiocyanates, the major biologically active products found in cruciferous vegetables, capable of mediating the epigenetic machinery in ways completely unexplored and beyond their well-known capacity to induce a chemopreventive response as their main anti-cancer property. Current evidence from our group and others strongly supports the role of isothiocyanates as potent epigenetic modulators capable of interacting with the epigenome in order to restore the normal epigenetic landscape in human malignant melanoma. Consequently, such ability raises the awareness on the concept of the epigenetic therapy as a therapeutic alternative in cancer treatment.

Biography

Mihalis is a Professor of Cellular & Molecular Sciences at Northumbria University, Newcastle Upon Tyne, UK. He has expertise relevant to carcinogenesis, experimental therapeutics and human nutrition evident by a number of peer review journal publications.

Moreover, he serves at the editorial board of a number of journals including *Medicine*, *Antioxidants*, *Pharmacology & Therapeutics*, etc. Finally, his group conducts research on the molecular mechanisms underlying disease pathology and the role of nutrition in disease prevention by investigating into the role of deregulated apoptosis and epigenetic pathways as key molecular targets underlining the pathological basis of human disease including cancer.

Phytomedicines – A Global Trend in Patients and Health Care Professionals

Rainer Stange

Charité – Universitätsmedizin Berlin and Immanuel Hospital Dept. Natural Medicine, Berlin, Germany

Abstract

We register global trends for increasing use of phytotherapy, but also on demands as quality and proven clinical benefit. A description of this scenario has to include very different regional developments, while astonishing new data from basic research and clinical trials, a strong idealistic, though not material support by WHO is available on the global scale. Finally, there is an increasing interest of up to now skeptical Western Medicine. The global market for herbal medicines currently stands at over US \$60 billion annually and is growing steadily. Regional differences in recognition and use of phytotherapy can be explained by predominant morbidities, position of Traditional Medicine, the standard of Western medicine, availability of high quality phytomedicine, public and private income. Case study diabetes: it is not diagnosed by most Traditional Medicines, therefore we might not know plants with long-term traditional use. However, increasing morbidities everywhere, also in still poor countries demand for new candidates. Case study malaria: it is the leading cause of death for children e.g. in Mali, where 60 plant species are used against it. Worldwide, 1200 plant species have been suggested against malaria, with very few of them undergoing clinical trials. There is an urge for a large variety of options due to availability and trust of local people in their plants, but also due to rapidly rising resistances.

Scientists can contribute by basic research to identify new plants as candidates, clinical trials to show efficacy, new ideas for inexpensive high quality local production of phytomedicines.

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.

Session 1: Quality Control and Marketing of Herbal Products | Ayurveda, Siddha and Yoga

Applying TCM under German Market Regulations

Hang Nga Mai-Dieterle

Wappen Apotheke München, Germany

Abstract

TCM plants and products are classified in Germany as medicaments. This implies a number of requirements to be fulfilled. Amongst others, in particular the processes of identification, pharmaceutical quality, safety and harmlessness. According to German regulations, TCM herbs can only be handled in pharmacies.

German regulations for pharmacies (Apothekenbetriebsordnung) require reconfirmation of the identity of the substances. The paper will cover methods, processes and systems and its limitations. Alternative ways of distribution like online services may not guarantee the efficacy and safety of such drugs. Beyond that, interactions with western medicaments require specific pharmaceutical qualifications in both, TCM and western academic medicine.

In Germany as in the EU, a harmonized regulatory framework for medicinal products in all Member States is relevant. The basic

rules are laid down in **Directive 2001/83/EC**, which can be seen as a European law on medicinal products, and which is implemented into the national frameworks of each Member State. In addition to the overall scope of sharing responsibility in an important field of public health, a harmonized legislation is created to facilitate access to the market and to establish defined procedures for work-sharing between national authorities.

Will it be possible to “western” the original Asian TCM? What would be required to broaden the acceptance of TCM in Germany and Europe?

Biography

Hang Nga Mai-Dieterle was born in Saigon, Vietnam. She grew up with both, traditional Chinese and western medicine. After the Vietnam War, she studied Pharmacy in Germany/ Munich. Being a member of the German TCM Apo AG and SMS (Societas Medicinæ Sinensis) she is running pharmacies for more than 25 years combining comprehensive experience in both lines of medicine.

Herbal Medicine in Health Care----Prospects and Challenges

Mohammed Mosihuzzaman

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Abstract

It is now generally accepted that the modern pharmaceuticals will remain out of reach of many people and the dream of ‘health for all’ may only be realized by modernizing the use of herbal medicine. Although herbal medicine is increasingly being used worldwide, there are genuine concerns about the safety, claimed efficacy and quality of much of the herbal medical products. These issues have been reviewed and the salient features are included in this presentation. The historical background and the philosophy of herbal medical practice and its status at the present time science have been outlined. Although the general perception is that herbal medicines are safe due to their age-old usage, serious adverse effects have been reported for many herbal medicines. These are primarily due to intentional adulteration or accidental contamination. Methods of identifying contaminants and assuring safety by proper toxicity tests have been outlined. As herbal medicine has a holistic approach, assessment of efficacy is difficult. Adapting the methodologies used for modern medicine, practical ways of assessing claimed efficacy are described. Pragmatic approaches of assuring reproducible standard of herbal medicine by using modern tools of fingerprinting the chemical profile of herbal medicine have been discussed. As much of the traditional herbal medical knowledge is scattered around the world at the family & community levels and in tribal areas, there is the obvious danger of losing the knowledge unless they are quickly documented. Difficulties in documenting herbal medical knowledge specially due to concerns of Intellectual Property Rights (IPR), have been highlighted. Based on the protocols developed, several local herbal medicines were evaluated at the laboratories of Bangladesh University of Health Sciences (BUHS) with mixed results.

Key words: Herbal medicine, safety, contamination, adulteration, adverse effects, efficacy, standardization, fingerprinting, documentation, intellectual property rights.

Yoga for Anxiety and Depression – A Review

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HELP University, Malaysia

Abstract

The number of people in the Malaysian community suffering from anxiety and depression is on the rise. While the common treatment for these two mental health disorders is medication and/or psychological counselling, research seems to show that mind-body therapies such as yoga not only reduces but also manages the psychological effects of anxiety and depression. The purpose of this paper is to investigate the function of classical yoga not only as a complementary therapy but also in the management of anxiety and depression.

Methodology: Based on the search done, articles were retrieved using a combination of databases including PubMed/MEDLINE and PsycINFO. Only peer reviewed articles written in English language were included in this review. The intervention of yoga

comprised asanas (postures), pranayama (expansion of life force), prathyahara (sense withdrawal), dharana (concentration) and dhyana (meditation).

Results: The findings revealed that the practice of yoga as complementary therapy is effective in managing and reducing anxiety and depression.

Conclusion: Despite the methodological limitations in most if not all of the studies examined, in terms of types of yoga practices, duration of practice, teaching methods and sample size, the practice of yoga appears to be effective in helping victims of anxiety and depression cope with these disorders. While it is imperative for researchers to streamline the types of yoga and teaching methods for future research, both the Malaysian community and readers of this paper should consider incorporating yoga as part of their daily routine to experience and reap its benefits.

Biography

Chandra, a certified yoga instructor/yoga therapist, received her Classical Yoga training at the Malaysian Association of Yoga Instructors. She holds Master's degrees in the fields of Analytical Chemistry and in Education specializing in English Language Teaching. Her doctorate is in the field of Natural Health Sciences specializing in Yoga Therapy. Her recent participation as speaker was at the Integrative Medicine Meeting Congress in Germany (2016) and at the Annual Congress on Mental Health in France (2018). Being an advocate of natural healing methodology, she conducts Hatha Yoga classes, therapy and workshops regularly to help the community cope with various ailments.

Session 2: Toxicology Studies of Plant Products | Alternative Medicine, Integrative and Complementary Medicine | Cultivation, Conservation and Propagation of Medicinal Plants

Mistletoe Therapy: Ordinary and Unconventional Treatment Approaches

Wiebelitz

Kreiskrankenhaus Prignitz, Academic teaching hospital of the Brandenburg Medical School Theodor Fontane, Germany

Abstract

The development of mistletoe to a medical plant is outlined. Different aspects of phytotherapeutical and anthroposophical mistletoe treatment are described. Scientific knowledge about mistletoe and its effects as a medical drug is briefly delineated.

The conventional subcutaneous mistletoe treatment is outlined as well as unconventional application of mistletoe (intratumoral, intrapleural and intraperitoneal application, high dose intravenous mistletoe treatment) on the basis of interesting clinical cases and a case series. Some examples of unusual indications for mistletoe treatment (laryngeal papillomatosis, hepatitis B) are also presented

Biography

Dr. K. R. Wiebelitz, born in 1960, married and father of four children, is a senior pediatrician specialized in Neonatology and Hematology/Oncology. He studied at Cologne University, Leeds University/Great Britain and Kasturba Medical College/India and worked at Cologne (Anaesthesia, Surgery), University of Tübingen (Neonatology, Hematology/Oncology, Pediatric Radiology), Gemeinschaftskrankenhaus Herdecke (Pediatrics), Kreiskrankenhaus Gummersbach (Senior pediatrician), Düren (Pediatrics, chief of the department), Ortenberg (Pediatric Hematology/Oncology, chief of the department), University Witten/Herdecke (Complementary Medicine), Klinik Blankenstein/Hattingen (Naturopathy) and Kreiskrankenhaus Prignitz/Perleberg (Pediatrics, chief of the department).

The Selection for High Quality Medicinal Lines of *Acer truncatum*

Zhen Feng*, Qian Qiao, and Hongjian Ren

Shandong Agricultural University, China

Abstract

Acer truncatum is considered a promising species as a raw material to produce nervonic acid (NA) which can repair brain nerve. The goal of this study was to explore the variation of oil content and nervonic acid content of 138 accessions native to 14 regions in China as well as provide guidance for establishing plantations and improving the production of nervonic acid. A large range of variation was found in oil content, nervonic acid per gram of oil, and nervonic acid per gram of seed (17.81%–36.56%, 3.90%–7.85%, and 0.84%–2.31%, respectively). Accessions YS-6, ABZ-6 and DQTL-8 were found as the most promising potential oil sources; PQ-2 was considered the optimal germplasm, and JY-6, NJ-8, LF-6, and CC-8 were found as promising potential sources for producing NA. A very significant difference ($P < 0.01$) among 14 regions was observed. DQTL and YS regions are considered the optimal farming regions for crops with high oil content, while the CC and PQ regions are regarded as the most suitable regions for nervonic acid production. A geographical trend from South to North was observed in which amount of seed oil increased but no such trend in nervonic acid content was observed. The data collected in the study on oil content and nervonic acid in accessions of *A. truncatum* in various regions can be utilized for establishing plantations of promising genotypes through clonal means.

Keywords: *Acer truncatum*; Seed oil content; Nervonic acid; Variation

Biography

Dr. Zhen Feng is a Professor of plant breeding in College of Forestry, Shandong Agricultural University, China. His seminal work has identified fluorene in *Acer truncatum* flowers, which can be used in making medicine such as antispasmodic, sedatives, analgesic, and antihypertensive drugs, Corilagin in *Acer truncatum* leaves, which is a promising natural product to treat cardiovascular diseases, and bred 15 cultivars of *Acer*. The medical compositions of several *Acer truncatum* cultivars are much higher than usual.

The History and Present State of Medical Cannabis

Ambros Uchtenhagen^{1*} and Ute Sehmsdorf²

¹Zurich University, Switzerland

²Swiss Research Institute for Public Health and Addiction, Switzerland

Abstract

Cannabis is one of the oldest plants cultivated for many purposes (used for constructions, textiles, warfare, food). Medical use is documented since over four millenia, from China, then India, but probably has been in use since neolithic times. Over 100 indications can be identified from documents dating from the pre-scientific period. Clinical and pharmacological research started mainly in the 19th century and industrial production of medical *cannabis* products emerged.

Repressive *cannabis* policy is known from medieval times and became dominant in the 20ties century, finally resulting in the UN single convention of 1961 when *cannabis* was scheduled as a dangerous substance and became prohibited.

The historical part is followed by an overview of the present state in research and available evidence for medicinal *cannabis* products, the international diversity of regulations and ongoing controversies. Links to recent representative publications summing up the state of knowledge lead to a conclusion on lessons learned

Biography

Ambros Uchtenhagen, M.D., Ph.D., em. Professor of Social Psychiatry, now President of the Swiss Research Institute for Public Health and Addiction, a WHO Collaborating Centre affiliated with Zurich University. Member of the WHO Expert Panel on Drugs. Member of the Scientific Council, European Society of Social Psychiatry. Co-founder of the European Association on Substance Abuse Research and of the journal European Addiction Research.

Comparison of the Effectiveness of Modeling Massage for Localized Fat Reduction Applied with Neutral Cream or Cream with *Equisetum arvense* extract

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Abstract

Man has used massage techniques as a form of therapy, associated with plants, from the beginnings of civilization. The actions, of the massage in the tissue alteration are: aid in the penetration of products with specific active decrease of the resistance of the skin to the chains and increase of the tissue malleability. Perfection begins with a smooth functioning of the body healthy habits and practices have a tremendous weight in the consequences of bodily and emotional balance. Therefore, for the complete functioning of aesthetics, it is fundamental to integrate sensorial modalities and psychic processes that are in constant interchange with the body¹. The techniques used in modeling massage can promote increased blood and lymphatic circulation, increased tissue nutrition, removal of catabolites stimulate visceral functions, aid in active penetration, mobilization and fluidification of fat, and local cutaneous hyperemia. The study was conducted in a sample of 10 individuals, female, with an average age of 25 years. Approved by the Human Ethics Committee: No. 2,464,970. Participants were randomly divided into two groups of 5 individuals. Thus, 5 participants were part of group I (control), submitted to modeling massage with cream without dermatological assets and group II, submitted to modeling massage with cream containing *Equisetum arvense* extract incorporated. After performing the massages, there was an average reduction of 4cm of the body measurements of the volunteers, which was superior to that found in the control group, which is satisfactory for the research, since the chosen asset is known for its systemic properties.

Biography

Veronica Soares, holds a bachelor's degree in Pharmacy Biochemistry from University Estadual Paulista Júlio de Mesquita Filho (2002), a Masters in Biotechnology from the Institute of Chemistry - UNESP Araraquara (2005). PhD by the Institute of Biology - Postgraduate Program in Functional and Molecular Biology, Biochemistry area, with medicinal plants activity. Fellow of the Carolina Foundation, Madrid (2010). Lecturer in Nursing, Nutrition, Physical Therapy, Pharmacy and Coordinator of Cosmetic Aesthetics Course at Universidade Paulista UNIP, Campus - Jundiaí-SP.

Mistletoe Therapy Controls Papilloma Growth in Laryngeal Papillomatosis

Wiebelitz

Kreiskrankenhaus Prignitz, Academic teaching hospital of the Brandenburg Medical School Theodor Fontane, Germany

Abstract

The development of mistletoe to a medical plant is outlined. Different aspects of phytotherapeutical and anthroposophical mistletoe treatment are described. Scientific knowledge about mistletoe and its effects as a medical drug is briefly delineated. The clinical challenge in treatment of larynx papillomatosis is presented on the basis of a clinical case. The rationale to try therapy this disease with mistletoe is analyzed and the clinical development of this case described.

Biography

Dr. K. R. Wiebelitz, born in 1960, married and father of four children, is a senior pediatrician specialized in Neonatology and Hematology/Oncology. He studies at Cologne University, Leeds University/Great Britain and Kasturba Medical College/India and worked at Cologne (Anaesthesia, Surgery), University of Tübingen (Neonatalogie, Hemtology/Oncology, Pediatric Radiology), Gemeinschaftskrankenhaus Herdecke (Pediatrics), Kreiskrankenhaus Gummersbach (Senior pediatrician), Düren (Pediatrics, chief of the department), Ortenberg (Pediatric Hematology/Oncology, chief of the department), University Witten/Herdecke (Complementary Medicine), Klinik Blankenstein/Hattingen (Naturopathy) and Kreiskrankenhaus Prignitz/Perleberg (Pediatrics, chief of the department).

Effect of Harvesting Time on Essential Oil Content and Composition of *Artemisia afra* Found in Different Agro-Climatic Zones of the Eastern Cape, South Africa

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²Department of Agronomy, Faculty of Science and Agriculture, University of Fort Hare, Private Bag X1314, Alice, 5700.

Abstract

Artemisia afra is widely distributed in the mountainous regions of several African countries, including South Africa. Essential oils from *Artemisia* spp. have high demand in international markets. Collections from wild populations vary in oil yield and composition. To determine the effect of harvesting time on yield and essential oil composition of *A. afra*, sampling was done in selected localities in the Eastern Cape. Fresh shoot samples were collected in four seasons (autumn, winter, spring and summer) over a two-year period. Essential oils were extracted using steam distillation and oil content determined. GC-MS was used for the identification of chemical components. For quantification, GC, using a flame ionization detector (FID) was used. The GC temperature program had an initial temperature of 60°C and with ramp of 3°C/minute increased to 245°C. Oil components were identified using the NIST mass spectra library and confirmed by retention index with the extensive essential oil identification dictionary. Essential oil content tended to be higher in summer compared to the other seasons. Samples from Indwe gave the highest oil content (0.61%). 1.8-Cineole was significantly higher in Autumn (Ngqeleni), while Artemisia ketone tended to be higher in in the samples from Adelaide. The highest cis-Thujone was recorded for the samples from Sterkspruit (65.14%) regardless of the season while lower than 0.24% was obtained from Barkley East samples. cis-Chrysanthenyl acetate (61.12%) was a major oil component in Barkley East only. Essential oil content and composition of *A. afra* were highly affected by locality, seasons and/or season x locality interaction.

Prophetic Medicine and Some of its Application

Khaled Saeed Aseri

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Abstract

Prophetic medicine which is well known among Muslims as a medical advices which has been mentioned in holy references of Islam It covers preventive medicine, curative medicine, mental well-being, spiritual cures, medical and surgical treatments And ethics. It integrates mind & body, matter and spirit.

Some of prophetic medicine application:

Preventive application:

- 1- Quarantine in an epidemic of infectious diseases
- 2-nutritional advices
- 3- Breast feeding
- 4- Environmental health
- 5- Personal hygiene
- 6- Sexual transmitted diseases

Some of curative application

- 1- Cupping
- 2-nigella sativa
- 3- Camel milk and urine
- 4- Honey
- 5- quetering
- 6-many medicinal plants

Through that prophetic medicine, we can promote health anywhere without discrimination to colour languages and religions To utilize what have been mentioned in prophetic medicine I did my research which titled as nigella sativa and its application in malaria treatments the abstract of my research as follow:

Objectives: To compare the efficacy of Nigella Sativa as prophetic medicine in comparison with chloroquine to treat malaria cases.

Methods: It has been achieved through - Randomized clinical trial phase II. (34 non sever cases of Malaria for each therapy)

Results: Result show that Nigella Sativa is better than chloroquine in malaria treatment (95%, 72 % respectively) and the difference was significant. However, of all that result we cannot generalized our result to all endemic area except if we apply clinical trial 3rd phase.

Conclusion: It is hopefully for human well-being to integrate Traditional and modern medicine. Especially if its benefit has been tested scientifically. So our recommendation to promote integrative medicine.

Chemical Approaches to Drug-discovery

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⁴*Division of Instrumental Analysis, Life Science Research Center, Gifu University, Yanagase, Gifu 259-1293, Japan*

Abstract

Many natural products with extraordinary chemical structures and powerful biological activities have been obtained from marine organisms. We have investigated such fascinating bioactive molecules, exemplified by the potent marine toxin palytoxin and the antitumor molecule halichondrin B, which has been developed as the anticancer drug Halaven[®], to explore novel frontiers in organic chemistry and bioscience. We introduce here our major work along with up-to-date topics. Yoshinone A is a novel polyketide that we isolated from a marine cyanobacterium. We completed a gram-scale synthesis and showed that it inhibits the differentiation of 3T3-L1 cells into adipocytes without significant cytotoxicity. The detailed mechanisms of action will be elucidated by further experiments *in vitro* and *in vivo*. In this study, we explored the true producers of okadaic acid and halichondrin B by immunostaining of *Halichondria okadaei* with an antibody that was prepared using these natural products as antigens. We will analyze the isolated symbionts and reveal the relevant biosynthetic pathways.

Corilagin Sensitizes Epithelial Ovarian Cancer to Chemotherapy by Inhibiting CD44-Snail-Glycolysis Pathways

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²*Xiamen Overseas Chinese Subtropical Plant Introduction Garden, China.*

Abstract

We have identified that Corilagin is a major anti-tumor active component extracted from a well-known hepatoprotective and antiviral medicinal herb, *Phyllanthus niruri* L. Our previous work found that Corilagin inhibited the growth of ovarian cancer cells via TGF- β /AKT/ERK signaling pathways. Recently, we have defined Corilagin could enhance the sensitivity of chemotherapy in ovarian cancer cells. Different concentrations of Corilagin were applied in combination with Paclitaxel and Carboplatin in ovarian cancer cell lines SKOV3ip, Hey and HO8910PM-Snail. Corilagin distinctly enhanced inhibition effects of Paclitaxel and Carboplatin. To understand the mechanisms of sensitization by Corilagin, we performed reverse phase protein array analysis to determine the signaling networks induced by Corilagin. We observed that both Paclitaxel and Carboplatin upregulated the expression levels of several apoptotic and death proteins, such as: Caspase 3, Caspase 7, and PDCD4, which were further enhanced when combined with Corilagin. Meanwhile, Corilagin induced distinct pathways to Paclitaxel and Carboplatin treatment. We also performed isobaric Tags for Relative and Absolute Quantitation proteomics analysis in Corilagin treated ovarian cancer cells. This analysis suggested that Corilagin mainly involved in glycolysis pathway. Seahorse XF96 extracellular acidification rate analysis confirmed that Corilagin did inhibit glycolysis by down regulation of CD44, STAT3. In summary, our observations indicate that Corilagin sensitizes Paclitaxel and Carboplatin by primarily inhibiting CD44-Snail-glycolysis pathways in epithelial ovarian cancer cells. Corilagin is an herb medicine with lower toxic effects to normal cells, especially hepatoprotective, which could be an ideal complimentary medicine when combining with highly toxic chemo-drugs.

Biography

Dr. Yinhua Yu, Professor of Medicine, graduated from Peking Union Medical College in 1970 and worked in PUMC hospital as an Ob/Gyn doctor from 1978-1989. She went to U.S.A. in 1989 and joined the faculty of University of Texas, M.D. Anderson Cancer Center and promoted as an Associate Professor in 2006. She joined Shanghai Ob/Gyn Hospital of Fudan University in 2007 as the Consultant of Molecular Pathology Laboratory. Her major interest has been in the research of breast and ovarian cancers. She also collaborated with Xiamen University and investigated a Chinese medicine-Corilagin for treatment of ovarian cancer.

Analytical Approaches for Extraction, Separation, Structural Elucidation and Quantification of Polyphenols in Medicinal Plants

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Abstract

As is well-known the antioxidant and anticancer therapeutic effects of medicinal plants generally are related to their polyphenol content. The polyphenol complex comprises mainly from representatives of the three groups of compounds: phenolic acids, flavonoid glycosides and aglycones. Analytical approaches including ultrasound-assisted extraction, developing HPLC-PDA fingerprint chromatographic profiles, Orbitrap UHPLC-mass spectrometry structural elucidation and utilization of surrogate and internal standards for quantification of polyphenols are proposed and discussed. The polyphenol complex of plants from families Asteraceae (*Vernonia amygdalina* Del. and *Achillea millefolium*) and Lamiaceae (*Clinopodium vulgare* L. and *Mentha citrata* Ehrh.) was investigated. The dependence of extraction yield of main components from solvent composition and sample: solvent ratio is reveal. Optimization of chromatographic conditions was performed in order to develop fingerprint profile of polyphenol complex for each species. Identification of compounds was made by summarizing the data for retention times, UV spectra of standards and the peaks in the samples, mass spectrometric fragmentation and by comparing the chromatographic profile and spectral data with those of surrogate standards. The complexity of polyphenol composition demands application of an analytical strategy covering different techniques for components identification and quantification in order to ensure the trueness of results. The advantages of using surrogate standard especially if multiple high-cost commercial standards are required are highlighted.

Biography

Soleya Dagnon has her expertise in evaluation and chromatography profiling of polyphenols in plants. Her analytical and chromatography evaluation model based on deep cognition of chemical and spectral properties of compounds and their chromatographic behavior creates confidence in the information needed for improving the knowledge. She has built this model after many years of experience in chromatography, method evaluation and teaching both in research and education institutions. At the Plovdiv University Soleya Dagnon is teaching Modern Chromatographic Methods and Chromatographic Methods in Pharmaceutical Analysis.

Anti-inflammatory, Anti-acetylcholine Esterase and Anti-oxidant Potential of Betulinic acid and 3 β -Acetoxybetulinic acid from *Melaleuca bracteata* (Myrtaceae) Muell 'Revolution Gold'

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¹University of Zululand, South Africa

²University of Johannesburg, South Africa

³Durban University of Technology, South Africa

Abstract

To evaluate the anti-inflammatory, anti-acetylcholine esterase and anti-oxidant activities 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* and BAA synthesized by acetylation of BA. The structural elucidation of the compounds was established by spectroscopic methods. Anti-inflammatory activity was determined with cotton pellet-induced granuloma rats model. Cyclooxygenase (COX) activity determined by COX kits and acetylcholine kit was used for anti-acetylcholinesterase (ACHE) study. Antioxidant potential was determined using superoxide dismutase (SOD) kits, catalase assay kits and iron chelation activity with ferrozine. The compounds significantly ($p < 0.05$) dose-dependently inhibited inflammatory and ACHE activity. BAA also inhibited more COX-2 than COX-1. The compounds significantly decreased the inhibition of SOD and catalase activity. They also increased iron chelation activities in dose dependent manner. However, BAA (IC₅₀ 0.88 mg/mL) showed better iron chelation potential than citric acid (0.96 \pm 0.04) and EDTA (1.04 \pm 0.03), the positive control. In conclusion, BA and BAA possessed anti-ACHE, anti-inflammatory, antioxidant and anti-COX activity. BAA better activities than BA could be linked to its structural modification. Therefore, BAA could serve as scaffold in synthesizing potent neuro degeneration drugs.

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 nineteen 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.

Antioxidant and Anti-inflammatory of Natural Products in Medicinally Active Plants in Palestinian Traditional Medicine

Abdullatif Azab

Eastern Plants Company, Israel

Abstract

Palestinian traditional medicine (PTM) is part of West Asian tradition and it heavily relies on medicinal plants. It includes well known, successful treatments for various health disorders. These treatments were studied by modern science, and in most cases, the research findings supported the traditional knowledge.

Some of the plants used in PTM have high antioxidant capacity and/or high anti-inflammatory activity. We have studied the anti-inflammatory activity of *Notobasis syriaca* and the antioxidant and total phenolic content of some plants that were never studied before. Our findings match the traditional knowledge of the medicinal properties of these plants, especially as nutritional plants, anti-inflammatory and antioxidant.

The chemical compositions of most of these plants are known, and the natural products responsible for these activities were identified. After a brief introduction about PTM, we will present these natural products, highlighting the major functional group in each class of compounds. For some natural products, we will present the mechanism of action.

The second part of our presentation will be introducing the knowledge of PTM about some plants that were partially or never studied before. For example, the chemical composition of *Malva sylvestris* is well known, and it was extensively studied. On the contrary, the chemical and medicinal properties of *Malva nicaeensis* are very limitedly studied and they are hardly known, despite the fact that it is a widespread plant, and its traditional medicinal activities are well known in PTM.

We will present our recent finding and propose some future research and collaboration opportunities.

Overview on Alternative Marine Pharmacology for Some Human Diseases

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Abstract

The molecular mechanism of action of several marine natural products, which were shown in preclinical pharmacological studies to target neutrophils and macrophages both *in vitro* and *in vivo*, was reported in several publications. In addition, there was a remarkable increase in marine anti-inflammatory pharmacology research nowadays. However, production of antimicrobial compounds seems to be a general phenomenon for most bacteria. An admirable array of microbial defense systems are produced, including broad-spectrum classical antibiotics, metabolic by-products such as organic acid, and lytic agents, several types of protein exo-toxins and bacteriocins. Today, marine bacteria and actinomycetes are being recognized as important resources for microbial products that display antibacterial, antifungal and antitumor properties. Where they are regularly observed in unique microhabitats on surfaces and internal spaces of marine invertebrates. On the other hand, it was observed inflammation is part of the complex biological response of vascular tissues to harmful stimuli, such as pathogens, damaged cells, or irritants. However, if the response is exaggerated, misdirected, or long term the inflammation can adversely affect health and give rise to many conditions such as inflammatory bowel disease, rheumatoid arthritis, atherosclerosis, Alzheimer's, asthma, psoriasis, and multiple sclerosis; many of these inflammatory diseases are becoming common throughout the world. So, this overview aimed to highlight the production of different marine by-products able to defend pneumonia, fungal infection, and cancer diseases.

Keywords: alternative - marine - products - antifungal – antitumor – anti-inflammatory – anti-pneumonia

Ethnobotanical Study and Antioxydant Biological Activity Evaluations of Plant Extracts from New Caledonia Cosmetopia

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Abstract

The development of natural cosmetics as alternatives to petrochemicals products is on the rise. New Caledonia is a territory where the cultural values are strongly present in daily life, and in particular by the uses of plants for body care. Within this study we listed traditional uses of the plants with cosmetic vocation thanks to a bibliographical census and an ethnobotanical study carried out with the collaboration of the native authorities of New Caledonia. The aim of this project is to develop new products for natural cosmetic. Several selection criteria (botanical originality, IUCN ranking, availability...) allowed us to define a final list of 21 plants of interest. We prepared 200 extracts according to several methods of extraction (traditional method *versus* chemical extraction with solvent and hydrodistillation). The evaluation of their potential activity was conducted by biological assays in relation with skin structure (antioxidant (DPPH, TEAC), antimicrobial, inhibition of enzymes involved in the cellular matrix of the skin structure, *in vitro* cellular tests). Sixty extracts showed a strong potential of antioxidant activity (between 90 to 100%). In order to identify the biological active molecules, two phytoanalytical approaches were considered; on the one hand dereplication (HPLC-MS/GC-MS) to identify known molecules and on the other hand bioassay guided fractionation to isolate new molecules. Several valorizations of this research are possible; description of new active ingredients and recommendations for a sustainable management of these plants as natural resources.

Biography

Subama MAPOU is a PhD Student in Ethnopharmacology, Phytochemistry at the University of New-Caledonia. Her work combines social and botanical and phytochemistry sciences. She is in the third year of her PhD. She is also the General Secretary of the Kanak Institute of Plants for Handicrafts and Indigenous Languages (KIPHIL). She is the founder of Cosmetic Gardenia a start-up based on an eco-extraction of biomolecules of interest in New -Caledonia for cosmetics and food supplements.

Antimicrobial and Anti-inflammatory Activities of Selected Medicinal Plants Against Sexual Transmitted Infections (STIs)

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²Department of plant and Soil Sciences, University of Pretoria, Private Bag X20, Hatfield 0028

Abstract

More than one million sexual transmitted infections are acquired daily worldwide. The diversity and frequency of sexual infections caused by pathogenic microorganisms has increased thus becoming a major cause of illness and mortality amongst children and young adult worldwide. Medicinal plants are good remedies for the treatment of STIs since ancient times. In this study, we evaluate antimicrobial and anti-inflammatory activities of five selected medicinal plants against STI. We assessed the determination of antimicrobial susceptibility of plant extract against STI. Then, we evaluated the anti-inflammatory activities by measuring the inhibitory effect of the pro-inflammatory enzyme, 15-lipoxygenase. We further investigated anti-HIV activities against recombinant HIV-1 enzyme. Methanol extract of *Terminalia sericea* and Dichloromethane extract of *Bidens pilosa* exhibited good activity against *Nisseria gonorrhoea* and exhibited good activity against *Gardenerella vaginalis*. Ethyl acetate, DCM and methanol of *Bidens pilosa* exhibited good activity against *Candida albicans*. Ethyl acetate extract of *K. africana* and methanol extract of *B. pilosa* indicated good inhibitory activities against anti-inflammatory. Ethyl acetate, DCM and methanol of *T. sericea* exhibited promising anti-HIV-1 RT and Methanol of *T. dregeana* showed low inhibitory activity. These plants had shown a promising activity against the propagation of inflammation. Therefore, the observed positive activities of evaluated medicinal plants might lead to new drug target of STI.

Isolation, Structural Determination and Biological Activity Studies on *Galium aspragifolium*

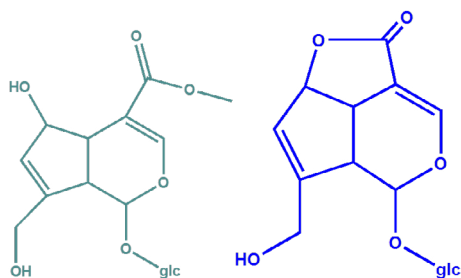
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Abstract

Galium species are the members of Rubiaceae family which is represented in 10 sections 101 species in Turkey. These species are called “Yoğurt otu (Yoghurt herb)” in Turkish because it contains an enzyme that can be used in yoghurt fermentation. It is known that many *Galium* species are rich in iridoid glycosides and anthraquinones, as well as flavonoids, naphthalenes, lignans, saponins and phenolic acids. Beside that many investigations of these species revealed that, this genus has important biological activities such as antioxidant, anti-inflammatory, cytotoxic activity. In this context, we decided to investigate the natural product content of *Galium aspragifolium* Boiss. & Heldr. and their biological activities. In our study, the *n*-butanol extract was examined by suitable chemical and chromatographic methods (CC, TLC, VLC, MPLC, HPLC) for obtain the pure compounds. Totally twelve compounds were isolated from the aerial parts of *Galium aspragifolium*. According to our literature findings, one of them is new and other eleven compounds are known which have iridoid and flavonoid glycosides. The structures of the compounds were identified by further spectroscopic and chemical studies (1D-, 2D-NMR; HR-MS). Eight of known compounds are structurally determined as deacetylasperuloside, scandoside methylester, daphylloside, acetylscandoside, scandoside, aucubin, a glucose derivative and rutoside. We have still ongoing structural determination studies on other isolated compounds. The all isolated compounds will be evaluated for their potential cytotoxic, antimicrobial and antioxidant activities. This is the first detailed phytochemical and biological study on *Galium aspragifolium*.



Some known isolated compounds from *G. aspragifolium*.

Improvement of the Extraction Procedure for the Analysis of Phenolic Compounds in Artichoke Leaves

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Abstract

Artichoke (*Cynara cardunculus* L) is an important medicinal plant, whose leaves are utilized for the treatment of dyspeptic disorders. The quality of artichoke leaves is often analyzed by the standard protocol of the European Pharmacopoeia. According to this protocol, samples are extracted with hot methanol for one hour, solid and liquid phase are separated, and the solid phase is extracted once again by the same procedure. This protocol has some drawbacks: It is time-consuming, it is carried out at high temperature, and it requires comparatively huge amounts of organic solvents. To reduce analysis time as well as the amount of pollutive waste while protecting phenolic compounds from degrading, we applied an ultrasound assisted extraction method. Samples were extracted with methanol in a cooled ultrasound bath for 30 min. Comparing both methods, our protocol proved to be very efficient in terms of analysis time, handling, and reproducibility. In addition, several ways of milling the raw material were compared. The reproducibility of the analysis could be significantly improved by using a ball mill. In conclusion, we recommend to reconsider the standard protocol of the European Pharmacopoeia, and to change it in the long term to a more environmental and operator friendly yet reliable method.

Biography

Beate Stumpf is a research assistant at the University of Giessen, Germany. She earned her master's degree in nutritional science in 2013, and is currently in the final steps of her PhD. Her research is mainly focused on antioxidant secondary metabolites in medicinal plants and staple foods.

Session 4: Traditional Medicine: Clinical and Research Studies

Greek Mountain Tea (*Sideritis scardica*) - A Modern Nootropic Food Supplement**Wilfried Dimpfel^{1*} and Björn Feistel²**¹Justus-Liebig-University Giessen c/o NeuroCode AG, 35578 Wetzlar, Germany²Finzelberg GmbH & Co KG, 56626 Andernach, Germany.**Abstract**

Greek mountain tea (*Sideritis scardica* Griseb., Lamiaceae) is a medical plant traditionally used to aid digestion, strengthen the immune system and suppress common cold. However, recent studies have shown an activity on the central nervous system. Preclinically, an influence on the reuptake of monoamine neurotransmitters, an increase of long-term potentiation in the hippocampus by an AMPA-mediated mechanism, a stimulating effect on EEG patterns in rats similar to the effect of Ginkgo and a cognition enhancing activity in Alzheimer's mice have already been reported. In order to further investigate effects of the plant on human brains a consistent extract quality was produced from cultivated plant material under GMP conditions (Extr. *Sideritis scardica* e herb. spir. sicc., ethanol 20% V/V; DER native 6:1). Clinically, an open study with 64 healthy participants (330 mg twice daily) showed positive influences on the executive functions involved in real-life planning and decision-making situations (cognitive flexibility). Quantitative EEG data in subjects suffering from mild cognitive impairment (crossover design, n=10, 500 mg) recorded during performance of the d2-concentration test showed increases of spectral power in the temporal lobe (involved in mental processing) concomitant with significant better psychometric performance. This was finally confirmed by a randomized, double-blind, placebo-controlled, parallel groups study of 140 healthy participants, which got 475 mg and 950 mg over a 4 week period. In summary, preclinical and clinical data suggest, that the new proprietary extract produced from *Sideritis scardica* can be regarded as a highly effective nootropic food supplement leading to improvement of cognitive function.

Biography

Wilfried Dimpfel is Honorary Professor at the Institute for Pharmacology at Justus-Liebig-University Giessen since 1983. For many years he acted as chief editor of the "European Journal of Medical Research". As "Max Kade scholar, New York" he joined the National Institute of Health in Bethesda. He developed a combination of quantitative EEG with Eye Tracking called "Enkephalovision".

Björn Feistel, PhD, is Head of Scientific Affairs in the company Finzelberg, the leading German plant extract manufacturer. He has >20 years industrial experience in developing of herbal extracts, focusing on pre-clinical and clinical results as well as up scaling in the production process.

Protective Action of Saharian *Anvillea radiata* Extracts Against Diabetic Neuropathy Progression, Inflammatory Processes and Oxidative Stress in High-fat-fed Mice. An Electrophysiological, Biochemical and EPR Investigation**Anne Mercier*, Chouaib Kandouli, Marcel Culcasi and Sylvia Pietri**

Aix Marseille-University, CNRS, ICR, France

Abstract

We have recently investigated the antioxidant, anti-inflammatory and antidiabetic properties of polyphenol-enriched extracts of the Saharian traditional medicine *Anvillea radiata* Coss & Dur (Kandouli et al., 2017). Diabetic neuropathies (DN) are of the major and earliest complications in diabetic patients, taking complex and multiple forms and are associated with reactive oxygen species (ROS) production, mitochondrial dysfunction and inflammatory-mediated damage in neurons and glial cells. In our search of natural medicines against diabetic-induced complications, we then investigated the protective effect of *Anvillea radiata* (AR) extracts against neural damages. Experiments were first conducted *in vitro* in human neuroblastoma cells exposed to high glucose medium.

In the presence of selected aqueous or organic extracts at doses as low as 5 µg/mL, caspase and NADPH oxidase activities and ROS production were significantly reduced. Then, two selected extracts were given orally for 12 weeks at the dose of 150 mg/kg in High-Fat-Diet (HFD)-C57BL/6J diabetic mice. A significant hypoglycemic action, a reduced oxidative stress in blood and muscles and improved hyperlipidemic and inflammatory status were demonstrated. Interestingly, oral treatment with both AR extracts were found protective against DN damage including i) apoptosis in sciatic nerves, ii) conduction velocity and motor nerve conduction impairment, iii) infiltration of T cells, iv) inflammation and oxidative stress. Taken together, the use of AR extracts may prove to be of therapeutic value in the management of diabetes complications.

Biography

Dr Anne Mercier is a researcher at the Institute of Radical Chemistry in Marseille, France. After a degree in chemical engineering, and a Ph.D. in Physical and Organic Chemistry (CEA), she joined the CNRS in 1988, working on stable free radicals for biological investigations and dynamic nuclear polarization. She then developed an expertise in the study of spin-trapping agents for biological applications. She is currently involved in the valorization of natural substances against oxidative stress in pathologies such as diabetes. She mentored more than 20 Ph.D. and post-doctoral students, published more than 50 research works, and leads several projects.

Development of Herbal Drug from *Andrographis paniculata* for Liver and Bile Duct Cancer Treatment

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Abstract

Andrographis paniculata is an important herbal medicine widely used in Scandinavian and Asian countries for the treatments of various diseases such as common cold, and diarrhea. *A. paniculata* has a broad range of pharmacological beneficial properties for example immunostimulatory, and anti-cancer activities. We investigated the pharmacokinetic studies of four major diterpenoids and clinical parameter modulation after multiple oral dose administration of a standardized *A. paniculata* capsule in healthy subjects. The relative systemic exposures, represented by the dose normalized C_{max} and AUC, were highly different among different diterpenoids. There were no serious adverse events but modulations of some clinical parameters were evidenced such as a rapid and transient reduction in blood pressure, and inductions of white blood cells and absolute neutrophil count in the blood. *In vitro* studies on the potential uses of *A. paniculata* for intrahepatic cholangiocarcinoma (iCCA) indicated that *A. paniculata* extracts and its major diterpenoids, andrographolide (AP1), inhibited growth of iCCA by inducing cell cycle arrest and apoptosis. AP1 could also mitigate the immune escape mechanism of iCCA cells by suppressing the programmed receptor-ligand 1 (PD-L1) protein expression. To study the herb-drug interactions, interactive effects of *A. paniculata* and a cancer chemotherapeutic, 5-Fluorouracil (5-FU), on drug metabolizing cytochrome P450s enzymes were determined. *A. paniculata* extracts or AP1 could sensitize liver cancer cells to 5-FU but inductions on CYP1A2 and CYP3A4 proteins were observed. *A. paniculata* or AP1 could be the promising candidates for the alternative treatment of iCCA but the potentiality of herb-drug interactions should be carefully considered.

Biography

Dr Tawit Suriyo is a senior research scientist at laboratory of pharmacology, Chulabhorn Research Institute, Bangkok, Thailand. He obtained a PhD degree in Environmental Toxicology from the Inter-university program between Asian Institute of Technology, Chulabhorn Research Institute, and Mahidol University, Thailand. One of his research focuses is the molecular pharmacology and toxicology of Thai medicinal plants. He is involved in the development of Thai herbal drugs for treatment of non-communicable diseases such as cancer and diabetes mellitus. Currently, Dr. Suriyo has over 23 refereed publications.

An Overview of GuaSha and Its Use at Cellulite: A Case Study

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²Comprehensive Health Research Centre (CHRC), University of Évora, Portugal

Abstract

The objective of this study was to analyze the performance of Gua Sha in cellulitis through a clinical case. The method included the story of a 34-year-old patient, affected by cellulitis in the thighs and buttocks, submitted to a manual scraping program through Gua Sha and specific Chinese oil. The patient was subjected to the treatment program, which consisted of a 60-minute session each week (with an interval of 7 days between sessions) for 3 months. The results showed improvements in the amount and depth of cellulite, mainly, where there was a higher incidence. Gua Sha helps to expel toxins that cannot be eliminated physiologically, improving blood circulation, restoring the normal metabolic process. There was also improvement in the texture of the skin and in small strokes. It was demonstrated that the Gua Sha was able to reduce cellulite and improve the texture of the skin, providing, consequently, aesthetic benefits and greater self-esteem.

Key words: Gua Sha, Traditional Chinese Medicine, Acupuncture, Cellulite.

Biography

I'm physiotherapist specialized in Acupuncture, Moxibustion and Chinese Phyto therapy (Hospital of the Jiangxi Traditional Chinese Medicine University, China); I am certified in the Order of Physical Therapy in Brazil and in the Association of Physiotherapists in Portugal; Specialist in Respiratory Physiotherapy; I'm a master's student in education; I teach classes in acupuncture, Tui Na massage, cupping therapy, auriculotherapy and Gua Sha; I've also written articles like "The Pain and Effects of Acupuncture: Incidence in Rheumatic Pathologies"; "The Clinical Practice in Acupuncture: Biosafety and its Hygiene"; "Acupuncture in Asthma Physiological Dysfunction" and "An overview of Gua Sha and its use at Cellulite: a case study".

Clinical Trial of Guava and Pitanga Tree Leaves in Skin Healing Processes

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Abstract

Phytotherapies are barely used in Brazil, besides the existence of politics that incentivizes their use in the Public Health System. The objective was to evaluate the use of decoction, tincture and gel-cream of guava (*Psidium guajava* L.) and pitanga (*Eugenia uniflora* L.) tree leaves, in skin healing processes in the Neuropathic and Vascular Injury Specialized Service (SELVEN) in Valinhos-SP-Brazil.

The project was approved by the In Humans Ethics Committee (CAAE: 60579916.7.0000.5512) and was performed at SELVEN. Decoction, tincture and gel-cream of both plants were formed. Microbiological control, protein quantification and phenols were executed.

Results

The average time of treatment with the decoction was reduced in 40% when compared to the control. The leaves tincture showed an improvement of 27% in the healing process in 28 days, however, a more prominent skin drying and burning was present, because there are solvents in the tincture composition. The gel-cream applied directly in the wound reduced in 65% the total area of the latter in 28 days. The tincture did not present microbiological growth and the gel-cream presented a total bacterial growth of 4 CFU/g being within the parameters allowed by the Brazilian laws. Protein of tincture were 20,35 mg/mL *protein* and phenol 6,25 mg/mL *phenol*

The adhesion of patients to the treatment was because Valinhos has commercial agricultural production of guava, and pitanga grows naturally in the city. Conclusion: The guava and pitanga tree leaves, both as decoction, tincture and gel-cream are effective in the process of healing of skin wounds.



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

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²Virology, Immunity and Infection Unit, SELADIS institute, Biochemistry and Pharmacy Faculty, Universidad Mayor de San Andres, La Paz, Bolivia.

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. A huge number of natural products, mainly from plants, have been used by traditional populations in the Bolivian Amazonas to cure diseases. Recent evidence suggest that the use of nano-structures can potentiate the antimicrobial effect of plants extracts for example. In this report, mixtures of plant extracts of different botanical specimens and NPs 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 *Copaifera reticulata* D, *Erytroxilum coca*, *Leg. papilionoideae* and *Mangifera indica* with or without NPs efficiently blocked HSV-2 infection of cell cultures at low concentrations, without exhibiting cell cytotoxic effects. Extracts from *Erytroxilum coca* and *Leg. papilionoideae* with or without NPs could also prevent disease development when administered together with virus in a mouse model of genital HSV-2 infection (ongoing study). *In vitro* analyses revealed that plant extracts with or without NPs exerted their anti-HSV-2 effects by inhibiting viral cell attachment. These studies show that plant extracts used as antiseptic treatment have potent antiviral activity alone, but the activity increases 2 times more when they are conjugated with nanoparticles and could be explored further for the development of novel antiviral microbicides.

Biography

Marianela Patzi-Churqui is a PhD student at the University of Gothenburg, Sweden. She got a degree in Biochemistry and did a residence in Immunology at Universidad Mayor de San Andres in Bolivia. She got a scholarship from the Swedish International Development Cooperation Agency (SIDA), which is run between the Sweden and Bolivia. Her interest and aim is to study the prevalence and prevention of sexually transmitted viral infections in women from the Bolivian Amazonas. Her recent study showed the anti-viral activity of plant extracts used by Bolivian natives and she continues studying the anti-inflammatory activity of them.

Wound Healing Potential of Pomegranate Rind Extract and Zn(Ii)

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¹School of Pharmacy and Pharmaceutical Sciences, Cardiff University

²School of Dentistry, Cardiff University

Abstract

Inflammation is one of the main phases in wound healing. While it is a natural immune response, prolonged inflammation causes discomfort, pain and chronic wounds. Pomegranates have been used since ancient times to treat a range of conditions including microbial infection and inflammation, and this has since been supported in many laboratory studies. Pomegranate rind extract (PRE) has been shown to possess antioxidant and anti-inflammatory properties [1]; and innate virucidal [1], bactericidal (unpublished), anti-inflammatory [2] activities are significantly enhanced PRE is when co-administered with Zn(II) ions. These activities are principally

attributable to the polyphenolic constituents, in particular the tannin punicalagin. To date, no work has been carried out to determine the effects of PRE and zinc combinations in wound healing, and the aim of this study was to carry out a preliminary assessment of PRE ± Zn(II) in cell proliferation and migration assays.

Methods: Proliferative effects on HaCaTs of PRE and punicalagin, ZnSO₄·7H₂O, and PRE combination with ZnSO₄·7H₂O 0.1 μM in phthalate buffer pH 4.5 (0.1-100 μg/ml), were assessed by MTT assay and compared against an untreated control. An *in-vitro* scratch assay was used to investigate the wound repopulation of HaCaTs. Wound repopulation was assessed through time-lapse microscopy over 48h, with ImageJ analysis performed to calculate percentage wound closure at 24h and 48h.

Results: No proliferative response was evident for pomegranate extracts, except PRE 1 μg/ml at 72 h. Moreover, PRE 100 and 50 μg/ml, punicalagin 10 μg/ml showed the anti-proliferative effect by starting at 72h. The combination of PRE (0.1 - 1 μg/ml) and with ZnSO₄·7H₂O (0.1μM) exhibited significantly greater proliferation of HaCaTs at 72, 120 and 168h, while PRE alone did not show any significant proliferation on HaCaTs. Different concentrations of PRE did not significantly affect the migration of HaCaT cells compared to untreated controls.

Conclusion: PRE and punicalagin do not have significant proliferative and migratory effect on HaCaTs when they used alone. However, PRE showed proliferative effects on HaCaTs when used in combination with Zn(II). In summary, PRE with Zn(II) may have beneficial effects in an infected wound bed and, moreover, the lack of deleterious effects supports the development of a novel topically applied antimicrobial and anti-inflammation product.

Session 5: Phytochemical Studies of Medicinal Plants

The Potential of Pomegranate Rind Extract in Wound Healing and Disinfectant Products

Charles Heard

Cardiff University, United Kingdom

Abstract

The fruit of *Punica granatum* (pomegranate) has a long history relating to its health benefits including fighting infection. The main active phytochemicals are the polyphenols, most notably punicalagin, which is a large hydrolysable ellagitannin and is found in high concentration in the exocarp, or rind. We recently found that pomegranate rind extract (PRE) elicits an anti-inflammatory response when applied topically and that when coadministered with zinc ions gives rise to potent synergised virucidal and bactericidal activity, against Herpes simplex virus, HIV, *Staphylococcus aureus*, MRSA and *E. coli*. The mechanism for this activity is currently under investigation. Such broad-spectrum properties indicate potential in a range of products for wound healing and other disinfection applications. This poster describes some of the work we have been carrying out in the development of novel formulations for example, topical application to chronic wounds and wound biofilms.

Biography

Dr Charles Heard has been researching natural products and topical drug delivery at the School of Pharmacy and Pharmaceutical Sciences, Cardiff University for 30 years, and has published 95 research articles and received significant grant funding. He has particular expertise in formulation development, and chemical analysis.

Anti-hyperglycemic Effects of Multiflorin a Contained in Peach Leaf

Tomoyuki Koyama

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Abstract

The crude extract of peach leaf dose-dependently suppressed the postprandial elevation in the blood glucose level after the oral administration of soluble starch in mice. An oral carbohydrate-loading test showed that peach leaf extract suppressed the glucose-

induced increase in the levels of plasma glucose, without affecting plasma insulin levels in mice. Moreover, an enteral soluble starch and glucose loading test in mice showed that the crude extract (1,000 mg/kg) significantly suppressed the postprandial elevation of the blood glucose level and increased in amount of glucose that remained in the intestine to within the same range as those with phloridzin (500 mg/kg), a natural SGLT- specific inhibitor.

To elucidate the active principle in peach leaf, purification of the active compound and a structure determination were performed. With the use of bioassay-guided fractionation using glucose-loaded mice, the acetylated kaempferol glycoside multiflorin A (MFA), a potent inhibitor of glucose absorption from the intestine, was isolated from the MeOH extract of leaf of the edible peach *Prunus persica*. The structure was identified by HPLC using thiazolizine derivatives and by an analysis of its spectral data. The inhibitory effect of MFA against glucose absorption was demonstrated in the dose dependent manner in mice. However, as the deacetylated analog of MFA, multiflorin B did not show the activity at the in vivo, the activity of MFA was suggested to depend on the acetyl group on the sugar moiety. MFA may be useful in functional foods or medicines for preventing the postprandial absorption of glucose in hyperglycemia.

An Evaluation of the Antioxidant and Antibacterial Activities, Total Phenolic and Flavonoid Content of the Methanol Extracts of the Leaves and Stems of Milkweed, *Gomphocarpus physocarpus* (E.Mey)

Yogasphree Naidoo* and Ashlin Munsamy

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Abstract

The antioxidant activity of the methanol extracts of the stems and leaves of *Gomphocarpus physocarpus* (E.Mey.) (Apocynaceae) were assessed to determine the medicinal potential of this South African milkweed. The possible phytochemical sources, of the antioxidant activity were also evaluated by measuring the total phenolic (Folin-Ciocalteu method) and flavonoid contents (Aluminium chloride method). Histochemical tests were conducted to confirm the location of these compounds. The EC₅₀ based on the DPPH radical scavenging activity was similar for the leaf (9.93±0.11 µg/ml) and stem (11.37±0.46 µg/ml) extracts which was significantly lower than the standard antioxidant, ascorbic acid (13.52±0.41 µg/ml). The total phenolic (8.7±0.41 mg GAE/g DW) and flavonoid contents (2.91±0.21 mg QE/g DW) of the stem extracts are possibly responsible for the strong antioxidant activity. Additionally, preliminary antibacterial screening of both the leaf and stem extracts revealed favorable activity against *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae* and *Salmonella typhimurium*. Histochemical analyses and fluorescence microscopy revealed the location of phenol accumulation to be in the laticiferous and parenchymatic tissues of the stem cortex and pith. It is possible that the plant accumulates phenolic compounds as part of its chemical defense strategy against insect herbivory. This defense strategy may in fact be a major source of novel antioxidant and antibacterial compounds. Further investigations are needed to quantitatively determine the extent of the antibacterial activity displayed by *Gomphocarpus physocarpus*.

Biography

Professor Yougasphree Naidoo is a researcher at the University of KwaZulu-Natal in South Africa. Her research interests include the specialised salt glands of marsh grasses and mangroves, secretory structures (trichomes, oil cells, mucilage cells, laticifers) in medicinal plant species and the phytochemistry and ethnopharmacology of selected southern African medicinal plants.

Disparities Between the Biosynthetic and Bio-accumulative Responses of Phytochemicals in Selected Medicinal Plants Collected under Varied Environmental Conditions

Sechene Stanley Gololo

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Abstract

Environmental conditions may influence the types, the contents and proportions of phytochemical constituents in plant species. Some constituents are only synthesized or their accumulation is increased or decreased under certain environmental conditions. Therefore, the comparison of the phytochemical compositions in plants under the influence of different environmental factors may be either qualitative, quantitative or both. In this regard, a study was undertaken to determine the presence and amounts of specific phytochemicals in several plant species under different growing conditions and locations. In most cases, variations in environmental conditions showed moderate or less effect on the quality of phytochemicals and substantive effect on the quantity of phytochemicals.

Therefore the findings of the study, suggest some disparities between the biosynthetic and the bio-accumulative responses of phytochemicals in selected medicinal plants under varied environmental influences.

Biography

Dr S.S Gololo is a Ph.D graduate in Biochemistry with specialty in Phytomedicine with research interest in the effects of environmental factors and variations in handling procedures on the qualitative and quantitative phytochemical compositions of medicinal plants. His research interest also entails the contribution to sustainable use of medicinal plants through evidence-based plant parts substitution.

Ethnopharmacology Study of Plants as a Traditional Medicine on Respiratory System Disease in Banyumas, Indonesia

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Abstract

Indonesia is the world's biodiversity center, and ranks second in the world where 30.000 species exist in Indonesia, but the basic data of medicinal plants in Indonesia are still lacking. This study was directed to explore information about the case of medicinal plants used on respiratory system disease and how to treat it in Cilongok District, Banyumas Regency, Indonesia. This study is descriptive survey research with semi-structured interviews of 68 informants, conducted in November 2018 to January 2019. Data were qualitatively analyzed by interpreting the interview transcript and quantitatively to calculate species use value (SUV) of those medicinal plants. The result showed that in Cilongok District, there were 40 medicinal plant species from 25 families used as medicine in respiratory system disease, and pounded as the most utilized methods of preparation. *Citrus aurantiifolia* (lime) is the most used medicinal plants with SUVs were 0.235, *Amomum compactum* Sol. ex Maton (cardamom) (SUVs 0.206), *Zingiber officinale* Roscoe (ginger) (SUV 0.176), *Kaempferia galanga* (SUV 0.176), and *Zingiber officinale* var Rubrum (red ginger) (SUV 0.147).

Keywords: Ethnopharmacology, traditional medicine, respiratory, Indonesia

Antiplasmodial Activity of *Pappea capensis* Eckl. & Zeyh. (Sapindaceae)

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Abstract

Although *Pappea capensis* (Sapindaceae) is commonly used by the Venda community in the Limpopo Province of South Africa to treat malaria and other malaria-related symptoms, there are no identified compounds that could be attributed to the observed ethnomedicinal use. The main aim of the study was to isolate and identify antiplasmodial compounds in *P. capensis*. Ground twigs of *P. capensis* were extracted in dichloromethane: 50% methanol (1:1) solvent system. The non-polar fraction (I) was subjected to liquid-liquid extraction yielding two fractions (II and III). The antiplasmodial activities of fractions I, II and III were evaluated against the chloroquine sensitive strain of *Plasmodium falciparum* (NF54). Fraction II, which was more non-polar compared to fraction I and III, demonstrated a relatively good antiplasmodial activity (>70% inhibition at 5 µg/ml, > 50% inhibition at 1 µg/ml and the IC₅₀ < 1 µg/ml). It was then chromatographed on silica gel eluting with hexane: ethyl acetate, ethyl acetate: methanol, methanol: water with increasing polarity yielding 21 sub-fractions. All the acquired sub-fractions were also tested for antiplasmodial activity and 9 sub-fractions exhibited good antiplasmodial activity. Further chromatographic separations led to 4 pure compounds (A = 34.4 mg, B = 213.0 mg, C = 5.7 mg and D = 12.6 mg). The isolated compounds will be subjected to further spectroscopic analyses. The study has in part validated the ethnomedicinal use of *P. capensis* for malaria and has also demonstrated the potential of discovering novel antiplasmodial products with good antimalarial activity from medicinal plants.

Biography

Dr Johanna Bapela is a lecturer and researcher in the field of Medicinal Plant Sciences, Department of Plant and Soil Sciences, University of Pretoria, South Africa. Her research focus area is on bioprospecting indigenous South African plant species for

antiprotozoal chemotherapeutic agents, with a specific interest in antimalarial plant products. Dr. Bapela has established networks with leading researchers all and is close co-operation with the French, Swiss Tropical and Public Health Institute and South African collaborators. She has presented papers at national and international conferences. She has co-authored research articles in peer reviewed journals.

Screening of Cytotoxic, Anti-Inflammatory and Neuroprotective Activities of *Crinum latifolium* L.

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Abstract

Crinum latifolium L. is widely used in traditional medicine because their pharmacological properties as antiviral, antitumoral, anti-inflammatory and antioxidant [1,2]. The aim objective of this study was contributed in the biological study of the methanolic extract (ME) from bulbs of *C. latifolium*. ME was evaluated for their cytotoxicity against SH-SY5Y Human Neuroblastoma (HN), RAW 264.7 murine macrophage (MM), and HepG2 hepatocarcinoma cells. Anti-inflammatory and Neuroprotection activities were assessed in MM and HN cells by using a model with H₂O₂ and lipopolysaccharide (LPS), respectively. Genotoxicity on HN was assessed by the comet and micronucleus (MNA) assays. Cell viability on the three cell lines was higher than 70% in concentrations below 25 µg.ml⁻¹. The extract decrease the oxidative damage in MM stimulated with 1 µg/ml LPS, reducing nitric oxide release in the medium culture in 26%, 44% and 63% at 25, 12.5 and 6.25 µg/mL, respectively. Furthermore, ME did not protect HN cells of the oxidative damage caused by 0.125 µM H₂O₂, reducing the cell viability below 30% in all the treatments. There was not DNA strand breakages when evaluating parameters as tale's length, moment and intensity in the comet assay. In the MNA was observed a decrease in the nuclear division index of 10% and 4% in HN cells treated with 25 and 12.5 µg/mL ME respectively. The frequency of micronucleated binucleated cells, nucleoplasmic bridges and nuclear buds increase in a dose dependent manner, and it's suggest that highest concentration of the extract causes chromosomal mis – segregation in HN cells.

Phytochemical Profiles of Marine Phytoplankton and Evaluation of Their Antioxidant Activities

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Abstract

Marine phytoplankton are a rich resource of bioactive components that can act as novel functional food ingredients. Out of more than 5000 known marine phytoplanktons, currently only a small fraction has been studied and it is important that more studies are required in order for them to be fully utilized as important microbial resources in the functional food and pharmaceutical industries. In this study, the phytochemical profiles including the carotenoids, total mycosporine-like amino acids (MAAs) and total phenolic contents (TPCs) in solvent extracts including 90% acetone and methanol from five marine phytoplankton including *Nitzschia closterium* (Bacillariophyta), *Isochrysis zhangjiangensis* (Haptophyta), *Platymonas subcordiformis* (Chlorophyta), *Porphyridium cruentum* (Rhodophyta) and *Synechocystis pevalekii* (Cyanobacteria) were analyzed. The amounts of total carotenoids in all the 90% acetone extracts from the five phytoplankton were found to be strongly correlated with their in vitro antioxidant activities evaluated by the DPPH, TEAC and FRAP assays. It was found that the prokaryotic phytoplankton had a relatively higher carotenoid levels which corresponded to its higher biological activities. Eukaryotic phytoplankton with higher levels of individual carotenoids such as fucoxanthin and diadinoxanthin in *N. closterium* as well as prasinoxanthin in *I. zhangjiangensis* are targets for further investigation. Hence, these phytoplankton have the potential as the novel sources of natural food antioxidants to be used as the active ingredients in functional food products.

Biography

Professor Peter C.K. Cheung obtained his PhD from the University of New South Wales in Australia and is the current Associate Director of the Food and Nutritional Sciences Programme of the School of Life Sciences at the Chinese University of Hong Kong. Professor Cheung's primary research interest is on the extraction, structural elucidation and bioassays of bioactive components derived from plant foods and their applications in functional foods. He is the author or coauthor of over 130 SCI publications.

Clinical Evaluation of Guava and Pitanga Tree Leaves for Prevention of Dental Bacterial Plaque and Skin Healing Process

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Abstract

Decoction and extract of guava tree leaves were used in a wound skin healing assay (In Humans Ethics Committee CAAE 60579916.7.0000.5512) and prevention of dental bacterial plaque (CAAE 81079919.9.0000.5512), both being performed in Valinhos, Sao Paulo, Brazil. The objectives of the assays were to increase the quality of service and reduction of costs. The skin healing assay was executed in the public health system (Specialized Service in Vascular and Neuropathic Lesions), and consisted of 30 minute baths using guava and pitanga tree leaves decoction, followed with dressings of wounds using the original prescription of each patient. The group was divided by graveness of wounds (epidermal, hypodermal, muscular). The assay of dental bacterial plaque control was performed with elementary students enrolled in public schools, and consisted of daily mouth washing with diluted guava tree leaves tincture, only solvent, and pure water. The retrospective evaluation of wound treatment led to a reduction in skin healing time of 37%, and a decrease of 52% in supplies costs. The group of children that performed the daily mouth washing presented the following proportions of bacterial plaque reduction after 60 days: with tincture, 23%; solvent, 17%; pure water 15%. The prepared phytotherapies used are of ease obtainment, and did not constitute an incremental cost in this study.

Conclusion: the adoption of the described treatments is of easy incorporation in the health system, and presents a great potential in costs decrease.

Acute Toxicology Assay of the Lichen *Cryptothecia rubrocincta* Extract

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Abstract

Security evaluation is an extremely important assay when evaluating new compounds. The lichen *Cryptothecia rubrocincta* was removed from *Schinus terebinthifolius* Raddi, of a humid region on the city of Ibiuna-SP, Brazil, and produces a reddish substance when cultivated in potato agar, and possesses many pharmacological actions such as antioxidants and skin healing effects. The objective of the present work was to evaluate the acute toxicology of extract from the reddish compound in mice, using water and 70% ethanol as control, after approval of In Animals Ethics Committee (Ethics Committee AN 37/2014). Was applied doses of 1mL/kg of samples and the same amount of water and ethanol 70% for the control group, in single dose, and evaluated total mass of animals, as well as water and feed consumption, with a total of 5 animals/group. At the end of the 14 days trial, the animals were euthanized, and pathological analysis was performed. The results indicated that the reddish compound and water led to similar results in total water and feed consumption, as well as total mass of animals, and no pathological lesion was appreciated. The ethanol 70% group also did not present variation in total water and feed consumption, as well as total mass of animals, however, in the liver of the animals treated with ethanol 70%, were observed focal acute necrosis, as well as light to moderate periportal hepatitis. These results indicate that the reddish compound does not lead to acute intoxication, therefore being used safely.

Aqueous Extract from *Cryptothecia rubrocincta*: Antioxidant and Healing Activity

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²UNIP (University Paulista), Health Sciences Institute, SP-Brazil

Abstract

In Brazil, *Cryptothecia rubrocincta* is a lichen commonly found in humid and shaded places, being considered a bioindicator for non-polluted environments. The body of the lichen forms continuous, circular crust-like patches on dead wood, easily recognizable by the prominent red pigment. The aged lichen has its central region covered with red, spherical to cylindrical granules. The objective of the present work was to develop a methodology for “in vitro” growth of the lichen, extraction of a red compound, and evaluation of skin healing activity using rats as experimental models. Lichen samples were collected from *Schinus terebinthifolius* trees, located in Ibiúna, SP, Brazil, and later transported to Uninove, being kept in a humid chamber. After one week under this conditions, the reproduction of the fungal partner could be seen with small cups named apothecia. This fungal material was inoculated in tubes containing potato-dextrose-agar (PDA) medium, kept in a dark environment, and after 4 days, the red color could be seen. Water was added in the tube with 15 days of growth, e after 15 minutes, the red color was extracted from the medium. Total proteins and phenols quantification was performed. The antioxidant capability evaluation was executed by ABTS (2,2-azino-bis(3-ethylbenzotiazolin)-6-sulphonic) acid method, using Trolox as standard, and results expressed in mM Trolox. For the evaluation of wounds skin healing in rats (Ethics Committee AN 37/2014), was used 20 adults male Wistar rats (UNINOVE Animal Facility), divided in three groups: Group 1 consisted of animals treated with 1mL of gel at 10% of lichen extract; Group 2 with 1mL of distilled aqueous gel; Group 3 with fibrinase. Daily applications over the wounds were performed. The initial size of the wound in located in the dorsal area was 4cm², with evaluations being made macroscopically in days 0, 3, 5, 7 and 14. All measures of skin healing retraction, and wound progress, were performed by digital planimetry. The total amount of red compound from *Cryptothecia rubrocincta* extracted was 1.15mg of protein and 2.43mg of phenols. As antioxidant, red compound presented IC₅₀ = 92.91µM of Trolox. The skin healing trail showed that after 14 days, the wounds in animals treated with red compound showed a wound of 0.4344 cm, an 89.14% reduction when compared to the control group, while animals with fibrinase had a wound of total size 1.4432 cm² an 63.92% reduction when compared to the control group. Demonstrating that red compound was more efficient then fibrinase as a skin healing agent. It is possible to conclude that the gel with red compound is effective for skin healing in rats, being used as a skin healing agent, besides possessing potential antioxidant activities.

Biography

Erna E. Bach have Bachelor's degree in Chemistry and a PhD in Agronomy (Phytopathology) from the University of São Paulo

(2007). Specialist in Biochemistry by Germany (DSE). Researcher Retired by the Secretariat of Agriculture of São Paulo - Biological Institute working in Plant Biochemistry and Immunology. From the moment of retirement act as Professor of UNINOVE (University Nove de Julho) - discipline Biochemistry, general chemistry and organic chemistry. Course involved Biomedicine. Responsible for laboratory with students involving biochemistry, microbiology and technological innovation.

Anti-hyperglycemic and Anti-hyperlipidemic Potential of Yacon (*Smallanthus sonchifolius*) Extract in STZ-induced Diabetes Mellitus.

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²UNIP (University Paulista), Health Sciences Institute, SP-Brazil

Abstract

The Yacon (*Smallanthus sonchifolius*) is a plant from the *Asteraceae* family, rich in Oligofruitsaccharides and fibers which retract many antidiabetogenics biological effects. The objective of present work was to evaluate the Yacon anti-hyperglycemic and anti-hyperlipidemic activity in type 1 diabetes induced Wistar rats by intraperitoneal streptozotocin inoculation. Extract: 650g of *in natura* Yacon and 650 mL of hot water (95° C), boiled for 10 minutes, with posterior in vacuum filtration. Casuistry: 20 male Wistar rats separated in four groups: 1- Healthy Control, 2- Yacon Control, 3- DM Control, and 4- DM Yacon. Groups 3 and 4 animals were initially inoculated by intraperitoneal streptozotocin 60mg/kg. The treatment started posteriorly. The groups were evaluated for 30 days, the animals were euthanized, and blood was collected for measurement of glucose, total cholesterol, triglycerides (TAG), urea, and creatinine. Blood serum was precipitated with ammonium sulfate, followed by dialysis and submitted to HPLC for amino acids analysis: tryptophan (Try), methionine (Met), valin (Val), arginine (Arg), and Kynurenin (Kyn). Pancreas was collected for histological analysis. The variance analysis was performed by the One Way ANOVA test, following T Student Test ($p < 0.05$). In the glycemic analysis was observed a statistical difference between the groups DM Control and DM Yacon. After 30 days of streptozotocin inoculation the DM Control showed glycemic levels of 473 ± 37 mg/dL, while the DM Yacon group showed 358 ± 28 mg/dL. Evaluating creatinine, urea and lipids, total DM Control animals manifested high rates when compared to Healthy Control and DM Yacon group. For creatinine analysis DM Control group presented concentration of $0,83 \pm 0,09$ mg/dL, while the DM Yacon group presented $0,45 \pm 0,19$ mg/dL, a concentration with a significant statistical difference ($p < 0,05$). The urea analysis did not show statistical difference, where the DM Control group presented concentration of 57 ± 2 mg/dL, while the DM Yacon showed 58 ± 6 mg/dL. In the lipids analysis, there was a statistical difference in the results of total cholesterol and triglycerides (TAG). The DM Control presented a concentration of 101 ± 3 mg/dL of total cholesterol and 98 ± 4 mg/dL of TAG, while the DM Yacon group showed 69 ± 6 mg/dL of total cholesterol and 62 ± 11 mg/dL of TAG. Histological analysis evidenced preservation from the pancreatic islets architecture in group DM Yacon ($111,49 \text{ um}^2$), when compared to group DM Control ($3,4 \text{ um}^2$), result that corroborates with the anti-hyperglycemic effect. Plasma from DM Control rats presented Kynurenin that came from tryptophan catabolism and 3.11mM of Trp. Rats treated with Yacon (Yacon Control) presented Trp (9.95mM) and Arg (8.9mM), but when submitted to streptozotocin and Yacon (DM Yacon), rats presented 4.11mM of Trp, Arg (14.32mM) and Met (11.43mM). Control rats (Healthy Control) presented trp (4.99mM), Met (12.11mM) and Val (10.12mM). The mechanisms that promotes the effect need more studies but it's important that the control of diabetes needs equilibrated the catabolism of Trp and maintained others amino acids.

Conclusion: The Yacon root aqueous extract promotes an anti-hyperglycemic and anti-hyperlipidemic, which can be associated with the pancreatic islets preservation, and control of catabolism from Trp.

Biography

Erna E. Bach have Bachelor's degree in Chemistry and a PhD in Agronomy (Phytopathology) from the University of São Paulo (2007). Specialist in Biochemistry by Germany (DSE). Researcher Retired by the Secretariat of Agriculture of São Paulo - Biological Institute working in Plant Biochemistry and Immunology. From the moment of retirement act as Professor of UNINOVE (University Nove de Julho) - discipline Biochemistry, general chemistry and organic chemistry. Course involved Biomedicine. Responsible for laboratory with students involving biochemistry, microbiology and technological innovation.

Phytochemical Study of Alkaloid Extracts of *Anacyclus pyrethrum* Link. (Asteraceae)

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Abstract

This study offers to assess the potentialities of *Anacyclus pyrethrum* L. (Asteraceae) as botanical insecticide for the protection of the harvest during the stocking. The alkaloids constitute the most important chemical family in the roots of *Anacyclus pyrethrum*. They are extracted by three methods (in acid and alkaline medium), the extracts obtained are A₁, A₂, A₃ and A₄. Their average yields were expressed in grams compared to 100g of dry vegetable matter, they are in the order of 3,7 ; 3,1 ; 3,1 ; 2,9% respectively. The different samples of alkaloids were analyzed by high performance liquid chromatography (HPLC) coupled with mass spectrometry, LC/UV/SM, to prove the presence of a major alkaloid N-isobutylamide, the pellitorine, accompanied with a mixture of other alkylamides (Ancycline, N-isobutyl-2,4-heptadiene-6-monoynamide, N-isobutyl-2,4-octadiene-6-monoynamide, (2,4)-Dodecadiene-Ntyamide, N-isobutyl-2,4-hexadiynamide, Acétanilide, N-methyl-isobutyl-2,4-decadienamamide, etc). These alkaloids could be used as an alternative method to synthetic insecticides, natural substances that are biodegradable and not harmful to the environment, compatible with integrated pest management, particularly in organic farming.

Keywords: *Anacyclus pyrethrum* L., HPLC, Mass spectrometry, Alkaloid, Alkylamid.

Regeneration of Insulin-Producing Pancreatic Islet Cells Provoked by Selected *Citrullus colocynthis* Seed Extracts in Streptozotocin-Induced Diabetic Rats

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Abstract

Streptozotocin-induced diabetic rats received one week after administration of streptozotocin and for the ensuing 3 weeks daily intraperitoneal injection of either saline, glibenclamide or five different extracts prepared from *Citrullus colocynthis* seeds. The percent area occupied by islets in sections of the pancreatic gland stained for insulin averaged 3.5 ± 0.6 in the STZ rats injected either with saline or a defatted aqueous extract, 10.7 ± 1.1 in the rats injected with glibenclamide or either an ethyl acetate or n-butanol seed extract and 44.9 ± 12.0 in rats injected with either an untreated aqueous or H₂O-methanol extract, these three mean values being significantly different from one another. In the seven groups of rats under consideration, there was a highly significant negative correlation between the logarithmic values for the mean percent islet area and corresponding glycemia measured after overnight starvation at the end of the experiments. It is proposed that the regeneration of insulin-producing cells provoked by selected *Citrullus colocynthis* extracts is attributable, to a large extent, to an improvement of glucose homeostasis and justifies further investigation on the possible use of these extracts in a therapeutic perspective.

Antioxidant Activity and Phenolic Compounds Identification of *Micromeria inodora* (Desf.) Benth. from Western Algeria

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Abstract

Micromeria inodora (Desf.) Benth. is an odorless plant in the west-Mediterranean region especially localized in few area of littoral of western Algeria. The aims of the present study was to analyse the phenolic composition of *M. inodora* extracts aqueous and organic extracts of *M. inodora*, aqueous extract (Aq), hydromethanolic (EM), hydroacetic (EA) extracts and ethyl acetate (Acet) and n-butanol (n-but) fractions, and to investigate their antioxidant activities using DPPH radical scavenging method, β -Carotene Bleaching assay (BCB), ferric reducing antioxidant power (FRAP) and Total antioxidant capacity (TAC). The polyphenol and total flavonoid content varied between 84.72 to 626.13 mg gallic acid equivalent/g extract and 653.93 to 872.26 mg catechin equivalent/g extract. The results of antioxidant activity have shown that all extracts reported an important scavenging effect in DPPH assay with the IC_{50} values ranged from 1.5 to 18.9 μ g/mL, whereas IC_{50} values in β -carotene bleaching assay ranging from 28.1 to 128.3 μ g/mL. The results of FRAP and total antioxidant capacity assay (TAC) reveal that the ethyl acetate extract fraction was the most important extract (102.83 μ g GAE/mg extract). An antioxidant activity higher than some standards was observed for ethyl acetate fraction. RP-HPLC-PDA analysis of phenolic acids and flavonoids as gallic acid, quercetin, rutin, quercetin vanillin and naringenin. The antioxidant activity of this plant has not been reported before and this study has revealed that *M. inodora* constitute a considerable source of natural antioxidants especially the ethyl acetate extract which its effect is related to its polyphenols content mainly on flavonoids.

Endothelium-Dependent and -Independent Vasodilator Effects of Rose Petal Extracts in Rat Aorta

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Abstract

Background: It is known that rose portals have very strong antioxidant action more than lemon, and anti-obesity and anti-hyperglycemic effects.

Objective: This study examined the mechanism of vasorelaxation induced by rose petal extract (ROSE) in endothelium-intact and -denuded rat aorta.

Methods: *Ex vivo* organ bath methods.

Results: ROSE inhibited phenylephrine (PE, 1 μ M)-induced contraction in a dose-dependent manner. However, this relaxation was lower in the absence of the endothelium. In endothelium-intact rat aorta, ROSE-induced relaxation was attenuated by pretreatment in L-NAME (100 μ M), but not indomethacin (10 μ M). ROSE contains high concentrations of quercetin, gallic acid, rutin and protocatechuic acid. In endothelium-intact rat aorta, quercetin and rutin significantly inhibited PE-induced contraction, however, gallic acid enhanced PE-induced contraction at low concentrations, and protocatechuic acid-induced relaxation was slightly. On the other hand, in endothelium-denuded rat aorta, quercetin and gallic acid significantly inhibited PE-induced contraction, while rutin- and protocatechuic acid-induced relaxations were slightly. ROSE-induced relaxation of PE-precontracted endothelium-denuded rat aorta was significantly attenuated by pretreatment with SQ22536 (100 μ M), but not ODQ (30 μ M). Pretreatment with 4-aminopyridine significantly attenuated ROSE-induced relaxation of PE-precontracted endothelium-denuded rat aorta, whereas iberiotoxin and glibenclamide did not affect ROSE-induced relaxation.

Conclusion: These results suggest that ROSE-induced relaxation is explained by the following three modes: 1) release of nitric oxides from endothelial cells, 2) increasing cAMP levels via activation of adenylate cyclase in vascular smooth muscle, 3) activating of voltage-activated K⁺ channel. In conclusion, the ROSE-induced relaxation is involved with some polyphenols included in ROSE.

A Dynamic Duo: Pharmacists and Music as Ambassadors for Homeopathy

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Abstract

Homeopathy is a special type of medicine that has been used across the world for more than 200 years. Because it is controversial and clouded by diverse beliefs and opinions. Pharmacists, pharmacy technicians, and other health care personnel might be asked to counsel patients and other care providers about this branch of integrative or complementary and alternative medicine.

A pharmacist does not need to endorse homeopathy in order to learn about it. All pharmacy professionals should know enough about homeopathy to communicate effectively and appropriately with patients. The goal of this presentation is not to champion homeopathy or its practice, but, rather, to provide facts and information that can help pharmacists and other health care professionals assist patients with making informed treatment decisions. One of the best ways to explain to patients the principles of homeopathy, its mode of action, pharmacology, pharmacodynamics, and the posology of these special remedies is through music.

The whole manual or industrial manufacturing process is accompanied by sounds, many remedy pictures contain key notes about sounds and music and we have managed to translate them even on the portable with notes, in musical compositions typical for some of the main homeopathic remedies.

True understanding of homeopathy requires both consideration of the homeopathic principles on their own and practical experience in using them with patients, why not with an innovative .

Biography

Felicia Andrei is a PhD in Medicine (Anatomy and Embryology) and a pharmacist specialised in Clinical Pharmacy and Homeopathy with two Masters degrees: one in Pharmacy - Formulation and evaluation of the dermatocosmetic product and the other in Polytechnic Computer Automation - Information Systems in Health Care, now Assistant Professor of the Faculty of Pharmacy in Timisoara with expertise in dermatopharmacy and cosmethology. Active member in the Romanian College of Pharmacists and of the European Federation for Pharmaceutical Sciences as well as in the Union for Diplomate homeopathic physicians.

Mixtures of Fruit Seed Oils from Rosaceae Family Species for Topical Use

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²University of Agricultural Sciences of Banat, Timisoara, Romania

Abstract

There are several good sources of volatile vegetal oils, important for the dermo-cosmetic industry that can be used successfully in the aromatherapy. Some fruit seeds are waste in the food industry, so they have an insignificant cost. To be noted that fruit species are part of the normal flora of Romania and their active principles (unsaturated fatty acids, nutrients, minerals) are comparable with the most precious oils. At least in theory, they can be beneficial and deserve to be investigated more closely.

The aim of this study was to determine the physical and chemical quality indices of two oils from *Prunus domestica* (plum) and *Prunus armenica* (apricot), both related species of Rosaceae family. The seeds oils were obtained through collaboration with the University for Agricultural Sciences of Banat. The content of unsaturated fatty acids as determined by chromatographic method is then compared to the high concentration of unsaturated fatty acids of other valuable oils, already known, proposing new indications for topical applications.

The study showed the superiority of *Prunus domestica* oil compared with different oils obtained from seeds of species in the Rosaceae and other families, with a percentage of 35% for the fraction of fatty acids of C18 and recommends further studies of this oil on the field of nutrition and beauty industry. Its relevance was demonstrated by the active components in significant amount.

These seeds rich in essential volatile oils, representing for the food industry a waste, could be harnessed for pharmaceutical, aromatherapeutic and cosmetic products.

Biography

Felicia Andrei is a PhD in Medicine (Anatomy and Embryology) and a pharmacist specialised in Clinical Pharmacy and Homeopathy with two Masters degrees: one in Pharmacy - Formulation and evaluation of the dermatocosmetic product and the other in Polytechnic Computer Automation - Information Systems in Health Care, now Assistant Professor of the Faculty of Pharmacy in

Timisoara with expertise in dermatopharmacy and cosmethology. Active member in the Romanian College of Pharmacists and of the European Federation for Pharmaceutical Sciences as well as in the Union for Diplomate homeopathic physicians

Phytochemical Screening, Anti-microbial and Anti-oxidant Activities of *Diospyros villosa* Leaves and Stem

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Abstract

Active compounds from natural sources are sources of useful drugs for treating infectious diseases. *Diospyros villosa* (*D. villosa*) is a traditional shrub in South Africa and no information is known about the medicinal use of its leaves and stem. The aim of this study was to assess the anti-oxidant and anti-microbial activities of different solvent extracts of *D. villosa* leaves and stem.

Methods: Fresh leaves of the stem-bark and mature leaves of *D. villosa* were collected from KwaZulu-Natal, Durban, South Africa (29° 84' 33.6" S, 31° 4' 12") and bioactive ingredients were extracted by Soxhlet apparatus using methanol, chloroform and hexane respectively. Qualitative phytochemical analyses were carried out on the extract. The anti-oxidant property was assessed using DPPH and FRAP while the anti-microbial activity was determined against American type collection culture: *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Methicillin-resistant Staphylococcus aureus*, *Klebsiella pneumonia* and *Salmonella typhimurium* using the agar well diffusion method.

Findings: The Phytochemical screening of the leaves and stem of *D. villosa* showed a considerable amount of tannins, saponin, glycosides and steroids were found in all the extracts. Also, the DPPH scavenging and metal chelating activity of non-polar extract of the plants was quite greater in comparison to gallic acid. The results further showed that methanolic leaf and stem extract was active against five bacteria strains whereas the chloroformic and hexanolic stem extract was active against only one.

Conclusion: This study suggested *D. villosa* leaves and stem as a potential natural free radical scavenger which could find a role as an anti-oxidant and perhaps, therapeutic use in the treatment of infection.

Biography

Oluwatosin is a graduate of Olabisi Onabanjo University, Nigeria where she had her first degree in Plant Science. She proceeded to Obafemi Awolowo University, Nigeria and obtained her Master's degree in Environmental Control and Management. At the moment, she is a PhD candidate at the University of KwaZulu-Natal, South Africa where she is running experiments on an identified medicinal plant. She should complete all the experiments at soonest.

Therapeutic Effects of Bee Venom and its Major Component, Melittin, on Atopic Dermatitis Model

Kwan-Kyu Park¹, Hyun-Jin An¹, Jung-Yeon Kim¹, Mi-Gyeong Gwon¹, HyeMin Gu¹, Hyun-Ju Kim¹, and Sang Mi Han²

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Abstract

Atopic dermatitis (AD) is a multifactorial skin disease with complex interactions of innate and adaptive immune responses based on a genetic, pharmacological, and psychological predisposition. There are several treatment approaches for AD, including topical glucocorticosteroids, emollients, phototherapies, calcineurin inhibitors, and immunosuppressants. These therapies reduce inflammation, but they also cause various side effects. Therefore, it is necessary to develop new therapeutic approaches for AD treatment without side effects. There are several studies on natural materials or toxins, such as herbs, ginseng extract, and snake venom, for AD treatment. However, bee venom (BV) and melittin (Mel)-mediated AD treatment has rarely been studied. The present study was designed to determine the effect of BV and Mel in an AD-like model. This study investigated the potential pharmacological effects of BV and its major component, Mel, on 1-Chloro-2,4-dinitrobenzene (DNCEB)-induced *in vivo* and TNF- α /IFN- γ -induced *in vitro* AD-like skin disease models. We found that BV and Mel possess potent anti-atopic activities, as evidenced by decreased DNCEB-induced AD-like skin lesions in an animal model. *In vitro* studies using TNF- α /IFN- γ -stimulated human keratinocytes

revealed that BV and Mel inhibited the exaggerated expression of chemokines, such as TARC/CCL17 and MDC/CCL22, and pro-inflammatory cytokines, including IL-1 β , IL-6, and IFN- γ , through the blockade of the NF- κ B and STAT signaling pathways. In conclusion, these results suggest that BV and Mel would be suitable for epicutaneous application, as topical administration is often appropriate for the treatment of AD.

Biography

Dr Kwan-Kyu Park, M.D., Ph.D., now is a professor of pathology, a chief of the pathology in college of medicine, Catholic University of Daegu, Republic of Korea. Prof. Park has published over 300 papers about inflammatory disease and pathology. He is an expert in kidney and liver pathology and his main research interest is inflammatory diseases. He is interested in therapeutic effects of bee venom on various diseases. Further, he has been studied about gene therapy using oligodeoxynucleotide decoy. Currently, Dr. Park Kwan-Kyu leads 8 members of the pathology laboratory, and works a specialist for Daegu Catholic University Medical Center.

Therapeutic Effects of Bee Venom on Periodontitis *in vivo* and *in vitro*

Kwan-Kyu Park*, Hyun-Jin An, Mi-Gyeong Gwon, Hyemin Gu and Hyun-Ju Kim

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Abstract

Porphyromonas gingivalis (*P. gingivalis*) is one of the major periodontal pathogens leading to inflammation and alveolar bone resorption. Bone resorption is induced by osteoclasts. Osteoclastic bone resorption is mediated by enhanced receptor activator of nuclear factor-kappa B ligand (RANKL) signaling. Therefore, the down-regulation of RANKL downstream signals is regarded as an effective therapeutic target in the treatment of bone loss-associated disorders. The aim of this study was to evaluate whether purified bee venom (BV) could attenuate *P. gingivalis*-induced inflammatory periodontitis and RANKL-induced osteoclast differentiation. Inflammatory periodontitis increased alveolar bone resorption and increased expression of pro-inflammatory cytokine, while BV treatment resulted in decreased bone loss and pro-inflammatory cytokines. We show that BV reduces *P. gingivalis*-induced inflammatory bone loss-related periodontitis *in vivo* and RANKL-induced osteoclast differentiation, activation, and function *in vitro*. These results suggest that BV exerts positive effects on inflammatory periodontitis.

Biography

Dr Kwan-Kyu Park, M.D., Ph.D., now is a professor of pathology, a chief of the pathology in college of medicine, Catholic University of Daegu, Republic of Korea. Prof. Park has published over 300 papers about inflammatory disease and pathology. He is an expert in kidney and liver pathology and his main research interest is inflammatory diseases. He is interested in therapeutic effects of bee venom on various diseases. Further, he has been studied about gene therapy using oligodeoxynucleotide decoy. Currently, Dr. Park Kwan-Kyu leads 8 members of the pathology laboratory, and works a specialist for Daegu Catholic University Medical Center.

¹H NMR-based Metabolomics of Selected South African Medicinal Plants Used in the Treatment of Sexually Transmitted Infections and Associated Inflammation

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Abstract

Proton nuclear magnetic resonance (¹H NMR) spectroscopy was conducted on crude extracts from twelve South African medicinal plants used in the treatment of sexually transmitted infections (STIs) to determine the presence of anti-inflammatory constituents. Extracts were tested against a pro-inflammatory mediator (15-lipoxygenase) and multivariate data analysis was applied to the acquired ¹H NMR spectra. An orthogonal partial least square discriminant analysis (OPLS-DA) was used to correlate the 15-lipoxygenase activity of the plant extracts to their chemical constituents. A clear separation between active and inactive plant extracts was observed from the score plot generated. From the contribution plot, spectral signals which were correlated to 15-LOX inhibition were tentatively identified to be a wide stretch of phenolic compounds with the data pointing to the presence of proanthocyanidins. This study highlights the application and usefulness of ¹H NMR spectroscopy combined with chemometric techniques in facilitating

drug discovery by providing information on class of bioactive constituents which is needed for targeted isolation of compounds from crude plant extract.

Keywords: Metabolomics, ¹H NMR, South Africa Medicinal plants, Crude extracts, 15-LOX activity

Biography

Dr Tshikalange is a senior Lecturer in the Department of Plant and Soil Sciences of the University of Pretoria, South Africa. His research focus areas include ethno-botanical medicinal plants used traditionally in the treatment of sexually transmitted diseases, oral pathogens and antimicrobial activities. He has published articles in peer reviewed national and international journals, such as the Journal of Ethnopharmacology and has been serving as an editorial board member of *BMC Complementary and Alternative Medicine*. He co-authored chapters in the book *Medicinal plant research in Africa: pharmacology and chemistry*. Several postgraduate students have completed their studies under his supervision.

Exploring the Effective Herbal Prescription for Cognitive Disorder Treatment among Licensed Herbal Medicine in Korea

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³*New Drug Development Center, Daegu-Gyeongbuk Medical Innovation Foundation*

Abstract

Objectives: The purpose of this study is to select candidates among licensed herbal medicines that are expected to be effective in the treatment of cognitive disorders.

Methods: From laboratory experiments, we first found individual single herbal drugs that could be effective for cognitive disorder, and then through expert's recommendation, selected priorities of single herbal drug and got information of the best herb as a combination drug for each. To derive the final herbal prescriptions, we searched the KFDA drug information system for licensed herbal medicines containing each drug and its combination.

Results: As a result of cell experiments and experts recommendation, we found that the five effective single herbal drugs for cognitive disorders. They are Ginseng Radix, Acori Graminei Rhizoma, Cyperi Rhizoma, Coptidis Rhizoma, Hoelen cum Pini Radix, Rehmanniae Radix Preparata, and Pinelliae Rhizoma (Hoelen cum Pini Radix, Rehmanniae Radix Preparata, and Pinelliae Rhizoma were tied for 5th). And licensed herbal medicines derived from the planned search are Palbohoichoon-tang, Bosim-hwan, Jaemyoungsin-tang and so on. Among these, in consideration of the feasibility of research and possibility of success in development, Yukgunja-tang, Samhwangjichul-hwan can be selected as future study subjects.

Conclusions: Through experimental studies and expert advice, we have derived herbal prescriptions that can be effective in treating cognitive disorders from licensed herbal medicines in Korea.

Acknowledgement: This study was supported by a grant of the Traditional Korean Medicine R&D Project, Ministry of Health & Welfare, Republic of Korea (HI15C0006), and by grants from the Korean Institute of Oriental Medicine (KSN1812160).

Biography

In Chul Jung is a professor of College of Korean Medicine in Daejeon University, South Korea. He has performed many clinical trials with herbal medicine, acupuncture, and moxibustion in the field of psychiatry, especially cognitive disorder and depression, and has published papers as results of his research.

EPR and UV-Vis Examination of Free Radical Scavenging Activity of Different Water Extracts from *Pericarpium phaseoli*

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¹*Department of Biophysics, School of Pharmacy and Division of Laboratory Medicine in Sosnowiec, Medical University of Silesia in Katowice, Poland*

Abstract

The two water extracts of *Pericarpium phaseoli*: the brew and the decoction, which are used in disorder of urination, kidney disorder, and swelling, were examined. The interactions with free radicals for the brew and the decoction of the nonirradiated and UVA irradiated plant material were tested. As the model free radicals the paramagnetic molecules of DPPH (2,2-diphenyl-1-picrylhydrazyl) in the ethyl alcohol solution were prepared. Free radicals in the reference solutions of DPPH and the solution of DPPH with the tested extracts of *Pericarpium phaseoli* were examined. The first derivative EPR spectra of DPPH free radicals were measured by electron paramagnetic resonance spectrometer with microwaves in the range of X-band (the frequency of 9.3 GHz). The numerical data acquisition system to fast detection of the signals worked together with the EPR spectrometer. The EPR spectra of DPPH free radicals in contact with the water extracts were lower than the EPR spectrum of DPPH in the reference solution. This result pointed out that both the brew and the decoction of *Pericarpium phaseoli* scavenge free radicals and they quenched the EPR lines of DPPH free radicals. The magnitude and the kinetics of the antioxidant interactions of these two water extracts with DPPH free radicals were different. The kinetic correlations revealed that the amplitudes of the EPR signals of DPPH in contact with the brew and the decoction decreased and after reaching the minimal values they were constant. The scavenging activity of the brew and decoction differed. The effect of UVA irradiation of the plant material, before preparing the extracts, on their scavenging activity was observed. The UV-Vis measurements confirmed the EPR results about the antioxidant properties of the extracts from *Pericarpium phaseoli*.

Biography

Mr Adrian Matysek is the student of laboratory medicine at School of Pharmacy with Division of Laboratory Medicine in Sosnowiec. Mr Matysek is interested in application of EPR spectroscopy and UV-Vis spectrophotometry in medicine and biology. Paweł Ramos has the post-doctoral degree in pharmacy and the doctoral degree in the medicine. He specializes in spectroscopic examination of free radicals in drugs. He is the author of over 80 full papers in medicine and pharmaceutical sciences. Prof. dr hab. Barbara Pilawa is the professor of physics, the specialist of biophysics and electron paramagnetic resonance spectroscopy. She is the author of over 200 full papers about free radicals and paramagnetic centers. All the authors perform their studies in Department of Biophysics in Sosnowiec, in Medical University of Silesia in Katowice (Poland).

Comparative EPR and UV-Vis Spectroscopic Studies of Antioxidant Properties of the Urban Honey and the Traditional Lime Honey

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²Society for Free Radical Research Europe

Abstract

The antioxidant properties of the urban honey and the traditional lime honey, were compared. Interactions of the honey samples with the model DPPH (2,2-diphenyl-1-picrylhydrazyl) free radicals were examined. The effect of UVA irradiation on interactions of the urban honey and the traditional lime honey with free radicals were determined. The honey samples were exposed to UVA in the range of linewidth 315-400 nm, produced by Medisun 250 lamp (Schultze & Böhm GmbH). In this work the following two experimental methods: electron paramagnetic resonance (EPR) spectroscopy and UV-Vis spectrophotometry, were used to examination of the antioxidant interactions of the honey samples. EPR spectra of DPPH free radicals were measured by the X-band (9.3 GHz) spectrometer of Radiopan Firm (Poznań, Poland) with magnetic modulation of 100 kHz, and by the numerical data acquisition system - Rapid Scan Unit of Jagmar Firm (Krakow, Poland). UV-Vis absorbance spectra were recorded by Thermo GENESYS 10S spectrophotometer of Thermo Scientific Firm (USA). The EPR spectra of DPPH free radicals in the reference solution and the EPR spectra of DPPH free radicals in contact with the tested honey samples, were measured. The scavenging activity of the both tested honey samples was observed. The urban honey and the traditional lime honey quenched the EPR lines of DPPH free radicals. Additionally the formation of free radicals during UVA irradiation was detected by the EPR method. The free radical concentrations in the irradiated honey samples were determined. The antioxidative interactions of the tested honey samples were confirmed by the UV-Vis measurements. The changes of the antioxidative properties after UVA irradiation was obtained for both the urban honey and the examined lime honey. EPR and UV-Vis examination indicated that the honey samples should not be storage under UVA irradiation.

Biography

Mr Adrian Matysek is the student of laboratory medicine at School of Pharmacy with Division of Laboratory Medicine in Sosnowiec. Mr Matysek is interested in application of EPR spectroscopy and UV-Vis spectrophotometry in medicine and biology. Paweł Ramos has the post-doctoral degree in pharmacy and the doctoral degree in the medicine. He specializes in spectroscopic examination of free radicals in drugs. He is the author of over 80 full papers in medicine and pharmaceutical sciences. Prof. dr hab. Barbara Pilawa is the professor of physics, the specialist of biophysics and electron paramagnetic resonance spectroscopy. She is the author of over 200 full papers about free radicals and paramagnetic centers. All the authors perform their studies in Department of Biophysics in Sosnowiec, in Medical University of Silesia in Katowice (Poland).

Is *Lachenalia* a Potential Source of Phenolic Compounds?

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Abstract

The genus *Lachenalia* J. Jacq. ex Murray is a bulbous ornamental plant belonging to Asparagaceae family. It includes 133 phenotypically and genotypically diversified species native to South Africa and Namibia. In recent years, agro technical guidelines of *Lachenalia* cultivation has been developed under northern hemisphere conditions (Kapczyńska 2013). The pharmacological properties of the genus has not been investigated previously but the content of endogenous phenolic compounds in *in vitro* cultures of *Lachenalia* bulbs and shoots exposed to diverse light conditions (white, blue, red light and darkness) was analyzed for the first time (Bach et al. 2015, 2018). The results indicated the higher total soluble phenolics content in shoots of *Lachenalia* (1.0-4.9 mg g⁻¹ DW, depending on genotype) than in bulbs (0.4-2.0 mg g⁻¹ DW, depending on genotype). The shoots exposed to white and blue light had the highest total soluble phenolics content, the lowest was noted for shoots formed in the dark. The most abundantly detected phenolic acid in *Lachenalia* shoots was caffeic acid. The total phenolic content in bulbs depended on the genotype and light conditions and it ranged from 0.5 to 2.0 mg g⁻¹ DW. Significant amounts of cinnamic and caffeic acids in bulbs were accompanied by low level or absence of p-coumaric, ferulic and sinapic acid. A negative correlation with the ability of *Lachenalia* cultures to form bulbs was exhibited with chlorogenic acid.

Our experiments showed that besides the ornamental value, *Lachenalia* has a potential in relations to the content of phenolic compounds, which requires further detailed investigations.

Effects of Glycyrrhizin Pre-treatment on Transient Middle Cerebral Artery Occlusion Induced Brain Injury in Mice

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²Department of Nursing, Far East University, Republic of Korea

³School of Korean Medicine, Pusan National University, Republic of Korea

Abstract

Ischemia induced brain damage is the leading cause of adult disability and the fifth leading cause of death, and thus, the development of anti-apoptotic neuro-protective therapeutic agents is viewed as an attractive developmental strategy. Glycyrrhizin is the main sweet component in licorice and has a number of pharmacological activities, which include neuro-protective, anti-fungal, and anti-cariogenic activities. This study was undertaken to investigate the effects of glycyrrhizin on ischemia-induced brain damage. In infarct volumes and the levels of several apoptosis-related proteins, caspase-3, -8, 9, Bcl-xL, Bcl-2, and their activities in the brains of middle cerebral artery occlusion (MCAO) treated mice were measured using western blotting methods. Single pre-treatment with glycyrrhizin (10-100 mg/kg) at 2 hours before MCAO significantly reduced infarct volumes at 24h after MCAO. In addition, glycyrrhizin effectively inhibited the activations of caspase-3 and -9 and the down-regulation of Bcl-xL protein caused by MCAO. The neuro-protective effect of glycyrrhizin was found to be due to its regulation of apoptosis-related proteins signals. The authors suggest glycyrrhizin be considered a potential candidate for the treatment of ischemia induced brain damage.

Biography

Suin Cho has completed his MD PhD at the age of 30 years from Dongeui University College of Korean Medicine located in Republic of Korea and postdoctoral studies from Harvard University School of Medicine. He is a faculty of the Pusan National University School of Korean Medicine. He has published more than 30 papers in reputed journals and has been serving as an editorial board member of Korean Journal of Herbology.

Phytochemical Characterization of Some Plant Species used by the Indigenous Gnöble Bugle Community of Bocas del Toro, Panama

Francisco Farnum

Universidad de Panama, Panama

Abstract

In Panama, as in other regions of the world, there is limited evidence documenting the use of medicinal plants in general and even more in indigenous areas; which has led to the loss of this knowledge. Therefore, an ethnobotanical study was proposed in the region of Gnöble Bugle, district of Changuinola, Province of Bocas del Toro, Panama, focused on the collection of knowledge of the species used by the community for traditional medicinal purposes. The data was obtained between 2015 and 2016 from interviews with residents and key informants of that ethnic group. As a result information was recorded for 165 plant species all with known ethnobotanical uses, the most named botanical families were *Arecaceae* with 11 species, *Fabaceae* with 9 species, *Malvaceae* with 6 species and *Moraceae* with 5 species, highlighting uses in housing, crafts, industrial, medicine, among others. 81 of the 165 species were mentioned that have medicinal uses; but only 4 species were found with confirmed relationship between the medicinal action mentioned and the active ingredient documented in the Panamanian pharmacopoeia (Caraña, *Protium asperum*, Guava, *Psidium guajava* L, lemon, *Citrus spp.*, and Guanábana, *Annona muricata*). It is relevant to carry out more phytochemical analysis to the rest of the plants that were mentioned with medicinal use, since this will allow to open research instances that facilitate the development of new drugs, vaccines, treatments, among others.

Biography

Dr. Farnum currently works at the Centro Regional Universitario de Colón, Universidad de Panamá. Dr Farnum does research in Ethnobotany, Ecology and Botany. His current project is “Socio-ecological bases for the sustainable management of parallel forest patches to via Boyd-Roosevelt, Panama”. Dr. Farnum lectures Ethnobotany as well as Plant Ecology to undergraduate and postgraduate students. Have published extensively in the area of Plant Ecology and Ethnobotany in peer reviewed scientific journals and also written two books.

Genotoxicity of Aqueous Extracts of *Tulbaghia violacea* as Determined Through an *Allium cepa* Assay

Lerato Nellvecia Madike*, Samkeliso Takaidza, Cornelius Ssemakalu and Michael Pillay

Vaal University of Technology, South Africa

Abstract

Tulbaghia violacea (wild garlic) is commonly used in traditional medicine for the treatment of various ailments including fungal infections, gastrointestinal ailments, asthma, fever, colds and pulmonary tuberculosis. We assessed the potential genotoxic effects of water extracts from the leaves, stems and roots of *T. violacea* using the *Allium cepa* assay. Extracts at concentrations of 100, 250, 500 and 1000 µg/mL were tested on root meristems of *A. cepa*. Ethidium bromide was used as a positive control whereas distilled water acted as a negative control. The results reveal that as the concentrations of the water extracts of *T. violacea* increased, the mitotic indices decreased. Similarly, the percentage of chromosomal aberrations was dependent on the concentration as well as on which part of the plant was used. The six most common chromosome aberrations included laggard chromosomes, chromosome bridges, c-mitosis, sticky chromosomes, formation of binuclei and formation of trinuclei. The presence of micronucleated cells at interphase also increased as the concentration of the water extracts increased. The results confirm that water extracts of *T. violacea* exert significant genotoxic effects at higher concentrations, with the stem extracts being more toxic than the leaf and root extracts at similar concentrations.

Moringa oleifera Causes LDH Release and Pre-G0 Cell Cycle Arrest in Caco2 Cells

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²Department of Biochemistry and Molecular Genetics, American University of Beirut, Faculty of Medicine, Beirut, Lebanon

Abstract

Moringa oleifera (MO) is a member of Moringaceae that grows in southeast-Asian countries. All parts of MO are edible being highly nutritive, rich in minerals, vitamins and biologically active phytochemicals. We demonstrated previously the anti-cancerous effect of MO on A549 cells. In this study, we examined the effects of water extract of MO leaves (MOE) on Caco2 cells. In addition, we have screened other Colon Cancer Cell lines (CCC): SW948, SW837, SKCO1.

Qualitative phytochemical analysis of MOE confirmed presence of: flavonoids, saponins, dipterene and phenols in the extract. Cells were treated with MOE (0.01-0.05%) and viability was assessed using Trypan-blue exclusion and MTT assays. In addition we the effect of MOE on oxidative stress, plasma membrane integrity consequently cell cycle analysis were performed. Results show a dose dependent decrease in viability using both trypan and MTT assays. Treatment of Caco2 cells with MOE (EC50) caused time dependent increase in ROS level of 45% /68% after 6 /24-hours treatment respectively. In addition LDH was significantly released (86%) as of 6-h MOE-treatment. Cell cycle analysis of treated cells showed an increase in preG0 from 51% to 95% at 6 and 24 hours of treatment. Preliminary screening of other CCC showed a similar dose dependent effect of MOE on all cancerous cells with an estimated EC50 of: 0.01%, 0.03%, and 0.04% for SW948, SW837, and SKCO1 respectively.

MOE is commonly used as tea-drink by people. Our findings suggest its potential anti-cancerous effect on CCC causing cell death induced by ROS and LDH release.

Potential Hypocholesterolemic Effect of Aqueous Moringa oleifera Leaves Extract

Haifa Hassanie*, Hala Sardouk, Farah Reda, and Julnar Usta*

Department of Biochemistry & Molecular Genetics, Faculty of Medicine, American University of Beirut, Lebanon, Beirut

Abstract

Interest in plant extract phytochemicals have increased in the recent years as potential alternative source of inexpensive, effective, and disease curing drugs. Most of the approved drugs are based on mimetic molecules of natural products. Compared to a single compound, plant extracts may have a superior therapeutic activity targeting different pathways.

Moringa oleifera (MO), the miracle tree, has been highlighted by NIH as highly valued medicinal plant. All parts are edible and have been used for many years in promoting health and treatment of ailments. Studies demonstrated cardioprotective, antipyretic, antidiabetic, antioxidant, antihypertensive effects using alcoholic MO-extracts.

In this study we opted to examine the effect of MO-leaves water extract (MOE) on cholesterol level mimicking daily consumption by people (tea-drink). Initially, direct testing of MOE on pure HMGCoA reductase (rate determining step enzyme of cholesterol-pathway) caused a significant decrease of 30% in enzyme activity. Consequently we are hereby investigating, the possible effect of MOE (0.05%-0.2%) treated-HepG2 cells on: viability (trypan /MTT), ROS, as well as levels of: cholesterol (MAK043), LDL receptor (immunohistochemistry), and HMGCOA reductase (q-PCR).

Our preliminary findings show: a) Morphological changes after 3 hrs, with no further significant change with time; b) dose dependent decrease in HepG2 viability (24 h, EC50: 0.2%) with no further decrease when treated for 48/72h; c) ROS level variations were also dose but not time dependent. Experiments quantifying cholesterol, LDL receptors' expression levels and HMGCoA transcript/activity in MOE treated cells are currently ongoing. MOE ability to lower cholesterol may have clinical implication in hypocholesterolemia

Biography

Haifa Hassanie is Lebanese in origin with Brazilian Nationality. She graduated with a Bachelor of Science in Chemical Engineer from University of Industrial Engineering (2013). She has a professional experience in Health, Safety and Environment (HSE) at the Multinational Petrochemical Industry in Brazil (2012-2013), where she acquired knowledge of methodologies for risk analysis

(Hazop and LOPA) and document management software (SAP, note GR and note GM). Currently she is working towards her Master of Science degree at the American University of Beirut, Faculty of Medicine, Department of Biochemistry and Molecular Genetics, working in the effect of natural products against non-communicative diseases.

Diversity and Uses of the Medicinal Plants in Panama

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Abstract

Panama has 10,444 species of plants (Correa, *et. al* 2004), some with medicinal properties, but there is no inventory to determine the totality of medicinal plants that are used. Our goal is to perform a review of publications and research with a view to presenting an estimated on the diversity of medicinal species and types of uses. Throughout the country are used medicinal plants, but its use is increasing more rural areas, and this is due to the scarcity of health services. The species most sold in pharmacies and public markets are: *Equisetum bogotense* (cola de caballo), *Lippia alba* (tilo), *Pluchea carolinensis* (salvia), *Cymbopogon citratus* (hierba de limón), *Neurolaena lobata* (contragavilana), *Costus spicatus* (caña agria) and *Momordica charantia* (balsamino). Among some species of medicinal plants that are exported we have: *Psychotria ipecacuana* (raicilla), *Smilax aspera* (zarzaparrilla) and *Ficus benjamina* (Robles Valley, G.R. et al 2007). We determined 916 species of medicinal plants according to the review of different research studies. The provinces with the most registered species in the studies of medicinal plants are Darién (25%) and Panama (24%), in Darien the interest in knowing the use of medicinal plants by indigenous groups increases. There are 33 species of medicinal plants, used against snake bites, and most are in Darien, which is a difficult-to-access province with a vulnerable population, due to the scarcity of health services. The species most commonly used against snakebites is *Piper darienense* C.DC. (kana or duermeboca, hierba de la montaña). Of the aboriginal cultures of the country, it is the Kunas who have the greatest knowledge regarding the use of medicinal plants.

Key words: Diversity, species, uses, medicinal plants.

Prebiotic Effect of a Fraction Rich in Fructooligosaccharides of *Psacalium decompositum*

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Abstract

Psacalium decompositum is a shrub that grows in northern Mexico and the southwestern United States. A decoction with water is used by Tarahumara, Yaquis and Pimas healers as a traditional remedy for the treatment of type 2 diabetes, gastrointestinal pain, etc.

Objective: To determine if a fraction rich in fructooligosaccharides (FOS) can improve the intestinal biota in healthy rats.

Methods: The experimental model consisted of 1) positive control group (Isotonic saline solution, ISS), 2) negative control group (chicory inulin) and 3) FOS experimental group (n=8). A subacute study (15 days) was performed, dosing intragastric route 4 mL/kg of ISS to group 1 and doses of 150 mg/kg to groups 2 and 3. The fecal samples were collected at times 0 and 15. DNA was extracted from the samples to sequence the V3-V4 region of the r16S gene (MiSeq Illumina; Seoul, KR). Finally, the data was processed using the Geneious 9.1.8 desktop software.

Results: The classification carried out through the 16S Biodiversity tool in Geneious showed that the predominant phyla are *Firmicutes*, *Bacteroidetes* and *Proteobacteria*. The latter groups microorganisms that produce LPS. In our study, the relative abundance of these phyla remained (2.0%), while the proportion of the biota producing of butyrate, as well as *Lactobacillus*, increased (16.5% VS 52.5% and 5.0% VS 10.0%, respectively) in comparison with the negative control. **Conclusions:** The FOS-rich fraction of *Psacalium decompositum* improved the relative abundance of microbial genera considered beneficial from intestinal biota in healthy rats.

Effect of Heat Treatment on the Hypoglycemic Capacity of Aqueous Extracts of *Cucurbita ficifolia* Fruits at Two Stages of Development

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Abstract

Cucurbita ficifolia (Cucurbitaceae) fruits, popularly known in Mexico as “chilacayote,” are widely used in Mexican cuisine and other places of the world¹. Also, it is used as a traditional remedy for type 2 diabetes, and several previous experimental and clinical studies have validated this use^{1,3}, with additional beneficial effects in diabetes, as antioxidant and anti-inflammatory activities⁴. However, if a thermic treatment to the fruit affects its hypoglycemic properties has not been yet explored.

Objective: Determine if the application of different thermal treatments to the *C. ficifolia* fruits modifies its functional properties.

Methods: *C. ficifolia* fruits were collected and submitted to physical and chemical tests. First, fruits were classified as immature and mature. Some fruits were subjected to water immersion cooking and steam for 20 min; juice from other fruits was extracted, filtered, and sterilized. All obtained extracts were freeze-dried. Hypoglycemic capacity was performed in normoglycemic male mice (n=4) arranged as follows: Tween 20 as control (4 mL/kg), glibenclamide (10 mg/kg) as positive control and aqueous extracts (200 and 400 mg/kg). Blood samples were taken at Time 0, 2, 4, and 6 hours.

Results: In healthy mice, the extract from cooked immature fruits showed similar effects to glibenclamide.

Conclusions: Thermal treatment affects the functional properties of *C. ficifolia* fruits. The hypoglycemic effect depends both on the state of maturity and the type of thermal process applied.

Cannabis Oil Containing Three of the Main Phytocannabinoid Compounds Exhibits Potential Hypoglycemic Properties

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Abstract

Cannabis sativa and phytocannabinoids have been attributed to medical uses: hypnotic, anxiolytic, antinociceptive, antiemetic, anti-inflammatory, etc. There are several preparations registered and standardized based on *Cannabis* (Sativex, Marinol, Nabilone)¹. Also, there are *Cannabis* non-registered products dissolved in oils (olive, sesame, coconut, etc.)². Despite the popularity of these empiric preparations, there are no studies about their metabolic effects, whereas its cannabinoid content is unknown.

We study *Cannabis* oil “Green Medicine” (GMCO) effects on glycemia in normal mice and inflammatory cytokine expression in adipocytes and examine phytocannabinoid content.

GMCO was acquired in a folklore store of craft products in Cali, Colombia. To determine the hypoglycemic effect, fasted normal mice were used. GMCO and glibenclamide were administered per os, and intraperitoneally (IP) and glycemic tests (6h) were performed. Antihyperglycemic effect was determined through oral glucose tolerance tests (OGTT) with the administration of GMCO or metformin; glycemia was measured during 90min. In expression studies, 3T3-L1 adipocytes were incubated with GMCO and rosiglitazone (24h), RNA extracted, and expression mRNA measured by RT-PCR. Chemical analysis was performed by GC-MS and X-ray diffraction.

GMCO IP exhibited hypoglycemic effect in normal mice, without effect per os; whereas In OGTT, it showed a tendency to glycemia reduction. GMCO also caused a significant decrease in IL-6 expression. Chemical analysis by GC-MS showed Δ^1 -THC presence, Cannabichromene; whereas by X-ray diffraction were detected Cannabidiol and Cannabinol.

In conclusion, GMCO exhibits potential as a hypoglycemic agent; however, its further evaluation in diabetes models is mandatory. Besides, GMCO contains phytocannabinoids, including Δ^1 -THC, which should be confirmed in further studies.

The Analysis of Phytochemical Compounds and Antibacterial Activity in Leaf and Stem Extracts of *Barleria albostellata*

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Abstract

Microbial infections are an important concern of human health. Several infectious microbes have displayed resistance to many accessible medicines. Africa is considered as the cradle of mankind comprising of a rich cultural and biological diversity and with healing practices varying in regions. Plants offer mankind with alternative medicines as they are widely accessible and highly effective against various infectious microorganisms. In recent years, there has been a rise in the study of organic compounds found within plants and their activity. *Barleria albostellata* (Acanthaceae) is a shrub that is indigenous to South Africa. This study aimed at characterising the phytochemical compounds and antibacterial efficacies of *B. albostellata*. Phytochemical analysis and gas-chromatography mass spectrometry (GC-MS) analysis were performed in order to determine the composition of compounds that may be of medicinal importance. Methanolic leaf and stem extracts were subjected to antibacterial analysis against several pathogenic microorganisms. The qualitative phytochemical screening of leaf and stem extracts revealed the presence of alkaloids, amino acids, carbohydrates, flavonoids, mucilage and gums, phenols, saponins, terpenoids and sterols. Some pharmacologically important compounds identified with GC-MS in methanolic extracts were alpha-amyrin, phytol, squalene and stigmasterol. Methanolic extracts positively inhibited Gram-positive, *Bacillus subtilis*, Methicillin-resistant *Staphylococcus aureus*, *Staphylococcus aureus* and Gram-negative, *Pseudomonas aeruginosa* and *Escherichia coli*. Majority of the activity was detected against Gram-positive bacteria. Future discoveries from this plant could advance the use of indigenous traditional medicine or lead to new drug discovery.

Biography

Serisha Gangaram obtained a *Cum Laude* for her Masters dissertation in medicinal plant sciences. Miss Gangaram is a first-year Doctoral candidate at the University of KwaZulu-Natal, South Africa. Her field of expertise ranges from plant biotechnology to the properties of medicinal plants. Her doctoral research investigates the morphological characterisation, chemical composition and biological activity of *Barleria albostellata* (Acanthaceae). This research project will evaluate the medicinal properties of *Barleria albostellata* with the objective of providing a medicinal plant that will be highly beneficial to all South Africans.

Phytochemical Analysis and Preliminary Anti-bacterial Activity of *Tabernaemontana ventricosa* Hochst. ex A.DC. Leaf and Stem Crude Extracts

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Abstract

The novel discoveries of biologically active compounds extracted from medicinal plants have driven various fields of research towards the establishment of important sources of natural drug candidates. *Tabernaemontana ventricosa* (Apocynaceae) is a medicinal plant often used to palliate fever, treat wounds and reduce blood pressure. The present study aimed to analyze the chemical composition of the leaf and stem crude extracts of *T. ventricosa*, as well as to evaluate the preliminary anti-bacterial activity. Screening the phytochemical compound classes of the leaf and stem extracts detected the presence of alkaloids, flavonoids, saponins, sterols, steroids, phenols, fats and fixed oils, carbohydrates and amino acids. The chemical composition of the methanolic extracts determined by Gas chromatography-mass spectrometry (GC-MS) analysis showed the presence of alkaloids, terpenes, phytosterols and fatty alcohols. Major identified compounds (>1%) in both crude extracts were 3,5a-epoxynaphth[2,1-c] oxepin, 1,4-benzenedicarboxylic acid, alpha.-d-mannofuranoside methyl and 4-dodecanol. These compounds are reportedly biologically active and contain pharmacological effects such as anti-bacterial, anti-inflammatory and anti-cancer properties. Preliminary anti-bacterial activity was evaluated using methanolic extracts (1 mg.mL⁻¹) against gram-positive and -negative bacterial strains, which were most effective against *Staphylococcus aureus* and *Bacillus subtilis*. The results suggest that the methanolic leaf and stem extracts of *T. ventricosa* have a substantial anti-bacterial activity that supports the usage of this plant in traditional medicine. Further studies should be considered to establish the full pharmacological potential of this species.

Biography

Clarissa Naidoo is a member of the International Golden Key Society, she obtained a *Cum Laude* for her Masters research in medicinal plant sciences. Miss Naidoo is a first-year Doctoral candidate at the University of KwaZulu-Natal, South Africa. Her research field focuses on cellular biology and the chemical properties of medicinal plants. Her doctoral studies examines the micromorphological characterization, histo-phytochemical analysis and bioactivity of *Tabernaemontana ventricosa* Hochst. Ex A. DC. (Apocynaceae). This research could be used to establish their pharmacological properties and possibly produce novel drugs and herbal remedies for the treatment and prevention of diseases in South Africa.

Antioxidant Capacity of Micro Propagated *Hyssopus officinalis* Plants Grown on Different Carbohydrate Sources

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Abstract

An effective protocol for *in vitro* propagation of hyssop *Hyssopus officinalis* L. was established. The shoots were cultured on Murashige and Skoog (MS) medium containing fixed concentrations (1.0 mg/L) of plant growth regulators such as 6-benzyl aminopurine-BAP and 0.1 mg/L indole-3-butyric acid (IBA). The culture medium was supplied with different carbohydrate sources - sucrose, glucose maltose and with concentrations 1, 2, 3 and 4 %. Total phenols and flavonoid content is the highest in the plants grown on the culture medium supplied with 4% carbohydrates – sucrose, glucose and maltose, which is in correspondence with antioxidant potential measured by Ferric ion reducing power assay (FRAP method) and water soluble antioxidant activity. Free radical-scavenging activity in dry shoot samples, collected from 4 weeks micro-propagated plants, determined from the bleaching of the purple methanol solution (2,2-diphenylpicryl-hydrazyl, DPPH[•]) did not show any significant differences between the four applied concentrations of sucrose and glucose. Only in plants grown on the medium supplied with maltose the highest values of antioxidant potential measured by DPPH[•] method was observed at 4% maltose.

Acknowledgment: This study was conducted with financial support from National Science Fund at the Bulgarian Ministry of Education and Science, Project DN06/7 17.12.16.

Keywords: *Hyssopus officinalis*, antioxidants, carbohydrate sources, micropropagation

Biography

Prof. Dr. Ira Stancheva works at the Department of Plant – Soil Interactions of Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences. Her research is orientated to medicinal plants cultivation, biologically active compounds, plant – microorganisms' relation and quality of plant production. She is a member of Union of Bulgarian Scientists and Federation of European Societies of Plant Biology. Dr. Stancheva has an experience as project leader supported by the Bulgarian Ministry of Education and Science and some bilateral projects.

Screening of the Enzyme Antioxidant Potential of In vitro Propagated Hyssop (*Hyssopus officinalis* L.) Depending on Carbon Source in Culture Medium

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Abstract

Medicinal plants hyssop (*Hyssopus officinalis* L.) contain high levels of natural antioxidants and exhibited strong antioxidant activity. The impact of carbon sources (sucrose, glucose and maltose) added to the culture medium at different concentrations (1.0-4.0%) on enzyme antioxidant activity of *in vitro* micropropagated hyssop (*Hyssopus officinalis* L.) plantlets was investigated. The shoots were cultured on Murashige and Skoog (MS) medium containing fixed concentrations (1.0 mg/L) of plant growth regulators of 6-benzyl aminopurine and 0.1 mg/L indole-3-butyric acid. The type and concentration of carbohydrates had a significant effect on superoxide dismutase, catalase, guaiacol peroxidase and ascorbate oxidase activity. The highest enzyme activity was obtained in the highest carbohydrate concentration 4% added to the MS nutrient medium during hyssop micropropagation. Adding glucose in the

nutrient medium lead to the most significant increase of superoxide dismutase, catalase, guaiacol peroxidase and ascorbate oxidase activity, followed by maltose and sucrose adding.

Acknowledgement: This study was conducted with financial support from National Science Fund at the Bulgarian Ministry of Education and Science, Project DN06/7 17.12.16.

Key words: *Hyssopus officinalis*, carbon sources, sucrose, glucose, maltose, micropropagation, antioxidant activity.

Biography

Maria Geneva has been a Research Staff Member since 2000 at the Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences. She earned his PhD in Plant Physiology from Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences in 2003. She has been an Associate Professor since 2013. Her main research interests are: plant mineral nutrition, soil and foliar fertilization, phosphor, carbon and nitrogen metabolism, medicinal and aromatic plants cultivation, plant secondary metabolism, antioxidant activity – enzymatic and metabolic, phytoremediation.

Hypoglycemic Effect of *Cucurbita ficifolia* During its Growth and Development

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Abstract

There are more than 400 species used for the treatment of diabetes mellitus type 2, however not all have been evaluated scientifically [1]. *Cucurbita ficifolia* Bouché belongs to the group of pumpkins and has acquired a growing scientific interest due to its hypoglycemic effect. It has been confirmed that this effect is similar to that of the medicines used for this disease, such as glibenclamide [2]. Despite the accumulated scientific information, the influence of the stage of maturity of the fruit on the hypoglycemic effect and the compounds present in this fruit to which this effect can be attributed has not been explored. The aims of this investigation were to determine the hypoglycemic effect of harvested fruits during different stages of growth and development, in diabetic mice and to make a chemical characterization of the extracted fruits.

To realize these, seeds were sown and fruits were harvested at 10, 15, 25, 30, 40 and 45 days. To determine the hypoglycemic effect, an aqueous extract was obtained and administered to diabetic models induced by streptozotocin; glibenclamide was used as a positive control and isotonic saline as control. The chemical characterization was carried out by means of an HPLC with a diode array detector. Extracts from all stages of development showed a significant hypoglycemic effect similar to glibenclamide, being greater at 15 days. The compounds found in all the analyzed stages were; gallic acid, quercetin, myricetin and Kampferol. Its use can be recommended in all stages of development, mostly after 15 days.

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

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Abstract

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

Modification of SERCA Activity and Viability of Pancreatic INS-1E Beta Cells by Curcumin Derivatives

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Abstract

The transmembrane enzyme sarco/endoplasmic reticulum Ca^{2+} -ATPase (SERCA) plays a key role in calcium homeostasis. It maintains concentration of Ca^{2+} ions in cells by their active sequestering from cytosol to sarco/endoplasmic reticulum (SR/ER) resulting in high luminal Ca^{2+} concentration, necessary for triggering muscle contraction, cell signaling, gene expression and apoptosis. SERCA dysfunction is linked with several diseases like nephropathy, neuropathy, vascular and neurodegenerative disease, cancer and diabetes.

Curcumin, a natural compound of turmeric, isolated from root of the plant *Curcuma longa*, has many beneficial effects on diabetic complications. It is able to reduce cholesterol and blood glucose, to increase pancreatic islets viability and possess antioxidant and anti-inflammatory properties.

Moreover, curcumin is known as SERCA enzyme inhibitor. Our aim was to study the impact of novel curcumin derivatives on SERCA1 activity, SERCA1 conformation and viability of pancreatic INS-1E beta cells. We did not observe any changes in SERCA1 activity and conformation, however the results showed significant decrease of viability of all five hydrocurcuminoids tested.

Evaluation of the Cytotoxic and Genotoxic Effects of *Sedum praealtum* A. DC. (Balsam)

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Abstract

Sedum praealtum (balm) is a plant used by popular medicine with cicatrizant, gastroprotective and anti-inflammatory activity. This study evaluated the cytotoxic and genotoxic effects of the hydroethanolic extract of balsam leaf, stem and root. In vitro cytotoxicity was evaluated by culturing *Aedes albopictus* cells. The toxic and genotoxic effects of balsam leaves were analyzed by micronucleus assay in bone marrow of *Swiss albinus* mice. The animals were acclimatized to the conditions of the vivarium for 7 days, then treated with

a single dosage of NaCl (negative control), doxorubicin and cyclophosphamide (positive controls) and plant extract (0.5-2 g/kg). After 24-48 hours of treatment, these animals were euthanized, the femurs were surgically and aseptically removed, the contents of the spinal canal was removed and added in slides for further analysis. The number of PCEs, NCEs and the number and frequency of micronucleated PCEs were analyzed. The cytotoxicity (IC₅₀) of *S. praealtum* was of 4.22 and 5.96 mg/ml for leaves and stems, respectively, while their roots did not show cytotoxicity. MNPCE analyzes did not show differences between treatment doses (0.5-2 g/kg) and negative control (NaCl), but the PCE/NCE ratio showed significant differences between treatments. The results suggest that leaves and stem of the balsam show potential systemic cytotoxicity. In addition, *S. praealtum* leaves exhibit no clastogenic and/or aneugenic effects, but it has systemic toxicity dose-independent.

***Chrysophyllum albidum* Linn (family: Sapotaceae) Endosperm Seed Gum: A Potential Pharmaceutical Excipient**

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Abstract

There is an increasing global interest and use of natural polymers as excipients in pharmaceutical formulations. Extracted *Chrysophyllum albidum* seed gum (CasG) was characterized for its physicochemical, pharmacognostical, microbial and toxicological properties and profile using established methods and protocols. It was comparatively evaluated for its binder excipient potential with a standard binder, acacia gum (AcaG) in a paracetamol powder tablet system.

The outcome of characterization being: particle size ($110 \pm 0.18 \mu\text{m}$); moisture content ($11.73 \pm 0.11\%$); pH (6.0); swelling index (3.19 ± 0.19); water binding capacity (119 ± 0.1), viscosity ($23.2 \pm 0.30 \text{ cp}$); flow rate ($2.3 \pm 0.12 \text{ g/sec}$); bulk density ($0.61 \pm 0.01 \text{ g/cm}^3$); tapped density ($0.66 \pm 0.01 \text{ g/cm}^3$); angle of repose ($30.00 \pm 0.1^\circ$); compressibility index (7.6 %); Hausner's ratio (1.08) and total ash content ($0.5 \pm 0.07\%$). CasG was found to hydrate in water and at higher water temperatures, CasG hydration formed viscous gum dispersions, the viscosity being concentration dependent.

It showed presence of reducing sugars and carbohydrates and absence of other tested substances; absence of objectionable organisms and the microbial load conformed to the microbial limits specified by the United States Pharmacopoeia. CasG LD₅₀ value was greater than 5000 mg/kg and it had acceptable and safe toxicological profile.

These desirable properties suggest its excipient potential usefulness in pharmaceutical formulations as binders, disintegrants, matrix layer former (sustained release systems) and carriers in nanoencapsulation systems. CasG demonstrated comparable binder potential with an equivalent concentration of AcaG in the paracetamol tablet system when so evaluated.

Keywords: *Chrysophyllum albidum* seed gum: Characterizations: Binder Evaluation: Pharmaceutical Excipient.

Effectivity of Different Methods for the Extraction of Principle Actives and Phytochemicals Content in Medicinal Herbs

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Abstract

Ageratum conyzoides (AC), *Plantago major* (PM) and *Arctium lappa* L. (AL) are three medicinal plants of enormous phytotherapeutic importance. AC, for instance, is widely used in several cultures as a remedy for a wide range of diseases, possibly due to its excellent

anti-inflammatory and antinociceptive properties. AL, has been widely used as a diuretic and for the treatment of hypertension, gout, arteriosclerosis, hepatitis, and others inflammatory disorders. We investigated the influence of various extraction methods on the chemical and biological potential of phytochemicals extracted from three medicinal plants (AC, PM and AL). Several extraction methods were used to obtain the phytochemicals from the three species, including: maceration, sonication, infusion, decoction, and microwave. In order to compare various methods, the results were analyzed by variance analysis. Our results suggested that sonication is the most effective extraction method among the five methods tested herein, for the extraction of phytochemicals that have a high antioxidant potential and phenolic content. The three plants employed had a high concentration of flavonoids and phenolics, which were compatible with the chemosystematics data. All the samples possessed a sun protection factor (SPF) of less than six. Interestingly, a maximum reaction time of approximately 20 min was noted for the complexation of $AlCl_3$ with the flavonoids present in the phytochemical extract during analyses of the kinetic parameters. AC extract, prepared by sonication, possessed a significant pharmacological potential against hepatocarcinoma tumour cells, and therefore provides a biological basis for the therapeutic use of AC.

Bioactivity and Profile of Phenolic Compounds in Flowers Growing in Brazilian Cerrado

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Abstract

This work describes studies of chemical research by HPLC-DAD, CE-UV and biological activity of four flowers collected in the Cerrado in northeastern Brazil in order to obtain a metabolic profile that guides the discovery of new metabolites with chemical-pharmacological potential. The native flower species Cerrado biome *Fridericia platyphylla*, *Turnera ulmifolia* L., *Momordica charantia* L., *Handroanthus albus* (coded S1-S4 respectively) were collected in the city of São Raimundo das Mangabeiras-South of the State of Maranhão. Fresh flower samples (0.5 g) were extracted with 10 mL of methanol solvent, filtered, and then concentrated in a rotary evaporator. The obtained extracts were cleaned-up using reverse-phase Sep-Pak cartridges and subsequently subjected to HPLC-DAD and CE-UV analysis. The extracts were again evaluated for their antioxidant (DPPH) and antifungal activity against *C. albicans*, *C. tropicalis* and *C. parapsilosis*. The chromatographic profiles of flower extracts showed several peaks, including derivatives of phenolic compounds, especially flavonoids with two characteristic absorption bands (240-285 nm band I for ring A and band II 300-550 nm for ring B). The methanol extract of species 1 to 4 showed good antioxidant activity for DPPH radical when compared to positive and negative controls. Species S1 and S2 in 0.5 mg/mL reduced the growth of *C. tropicalis* by 47 and to 69%, and of 29 and to 71%, of *C. parapsilosis* respectively. This study contributes to the knowledge of the chemical and biological diversity of the medicinal resources available in the regional flora as well as the biological and pharmacological applications.

We thank PIBIC-IFMA for the scholarship granted

Treatment of Acute External Hemorrhoids by Topical Herbal Salve in Traditional Iranian Medicine

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Abstract

Symptomatic hemorrhoid disease is one of the most prevalent ailments associated with significant impact on quality of life. Management options for hemorrhoid disease are diverse, ranging from conservative measures to a variety of office and operating-room procedures. Near half of all patients with hemorrhoidal disease are asymptomatic; the most prevalent complaints are rectal bleeding, pain associated with thrombosed hemorrhoids, and perianal pruritus in symptomatic patients. Traditional Iranian medicine

[TIM] is an ancient and popular medical paradigm.

Methods: This salve has been experienced for a long time in folk medicine and TIM. Its components are *Allium ampeloprasum* seeds, *Carum carvi* seeds, *Rosa damascene* oil and *Althaea officinalis* flowers. Treatment of hemorrhoids in TIM is based on improving nutrition, eating laxative food and drugs and usage of topical salve.

Results and Conclusions: Persian leek seeds is the main part of this slave and it has these effects: resolvent, absorbent, preventing of anal bleeding and the healing of anal fissure in TIM. A significant decrease was observed in the grade of bleeding with fresh aqueous liquid obtained from cutting *Allium ampeloprasum* leaf in previous study. *Carum carvi* has also Antibacterial and antifungal activity and Analgesic effect in this slave formulation. *Rosa damascena* showed both Analgesic and anti-inflammatory activities which can be useful for the current complications. Clinical research has been done on this salve is very little but its indigenous and traditional usage for a long time has shown that is very effective and without side effects.

Effect of Roasting on Cox Value of Brown and Yellow Varieties of Flaxseed (*Linum usitatissimum* L)

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Abstract

Flaxseed has two cultivars with brown and yellow surface. Roasting of brown flaxseed has traditionally been used in Iran. Monitor changes in calculated oxidizability value (COX) of brown and yellow varieties of flaxseeds in the raw and roasted states using gas chromatography (GC).

Methods: Methyl- esterification of the samples was performed by methanolic boron trifluoride method according to American Oil Chemists' Society. The oxidative stability of the seeds at different roasting temperature based on unsaturated FA (USFAs) content was calculated using equation $COX = \{1(18:1\%) + 10.3(18:2\%) + 21.6(18:3\%)\} \times 100$

Where 18:1, 18:2 and 18:3% represent percent contents of oleic, linoleic, linolenic acids, respectively.

Results: The results show that there are significant differences in the level of each FA between different varieties and roasting conditions but the calculated ratio of FA did not show any changes under different roasting conditions. The COX value was found for the unroasted brown type (13.19 ± 0.01 %) whilst the lowest amount was observed for the roasted brown seed at 350 °C (12.79 ± 0.01 %). COX value for yellow type was 5.62 ± 0.01 %.

Conclusion: COX value is an index calculated based on USFA. The calculated COX value for flax seeds decreased at higher temperatures. Flaxseeds are commercially important in production. Consumption of flaxseeds is beneficial to human health. Flaxseeds are one of the richest sources of poly unsaturated fatty acid in human diet and further investigation is required in this regard.

Biography

Reza Moknatjou first studied pharmacy at the Esfahan University of Medical Sciences, Iran. He then studied Iranian traditional pharmacy at Tehran University of Medical Sciences, Iran, where he received a PhD degree and completed his doctorate on "Formulation and Evaluation of flaxseed (*Linum usitatissimum* L.) Lozenge for Treatment of Cough". He has been a lecturer at the Hamedan University of Medical Sciences, Iran since 2016.

His research interests and publication lie in the field of Health and Iranian traditional drug formulation and safety. She has contributed articles to Tropical Journal of Pharmaceutical Research and International Journal of Biosciences.

Leech Therapy for Linear Incisional Skin-Wound Healing in Rats

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Abstract

The aim of this study was to investigate the effects of leech therapy (LT), in comparison with topical phenytoin (PHT), on incisional skin-wound healing in animal models.

Methods: This experimental study included 15 male rats (5 animals in 3 groups) with approximately equal body weights (350 ± 10 g). Skin wounds with lengths of 20 mm and depths of 0.5 mm were made on the dorsolateral region of rats 4 cm from the spine. The first group (PHT group) was treated daily with topical PHT (1%) while the second group (LT group) received LT at the beginning of the experiment. The control group received neither the drug nor the therapy. Wound healing was evaluated every day, and the study was continued until the wound had completely healed. Changes in the areas and the appearances of the skin wounds and histological differences (at the end of the experiment) were used to investigate the differences in wound healing among the groups.

Results: The process of wound healing was significantly faster in the group treated with LT

($p < 0.05$) than in the group treated with the PHT.

Conclusion: The study results showed that LT improved incisional skin-wound healing in rats.

Biography

Sayid Mahdi Mirghazanfari, born on July 31st 1977 in Tehran, Iran. He received his MD-PhD (physiology) from Tehran University of Medical Sciences with a high average and now he is a researcher and lecturer at AJA University of Medical Sciences as Assistant Professor. In addition, Dr. Mirghazanfari is well known in Iran as one of the most qualified and highly competent experts, lecturers, physicians and researchers in Iranian Traditional (Persian) Medicine.

Investigation Effect of Different Concentration of *Artemisia dracunculus* Ethanoic Extract on Immune System Response of Laying Hens in Late Phase of Production

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Abstract

Artemisia dracunculus from Astraceae is a bitter warming aromatic herb that stimulates the digestive system and uterus, lowers fevers and destroys intestinal worms. The plant is mildly sedative and has been taken to aid sleep. A poultice can be used to relieve rheumatism, gout, arthritis and toothache. The plant is harvested in the summer and can be dried for later use. Effects of *Artemisia dracunculus* hydroalcoholic extract concentrations on immune response of laying hens at the end of the production period were investigated. Forty eight laying hens of line strains (W36) were studied. The experiment was carried out in completely randomized design with 4 treatment four replicate treatments: 0, 0.75%, 1.5% and 2.25% of *Artemisia dracunculus* extract in drinking water. Addition of 0.75% of hydroalcoholic *Artemisia dracunculus* extract in drinking water of laying hens increased the percentage of herd production and lymphocytes compared to control treatment ($p \geq 0.05$). But a significant decreased of heterophils and the heterophile to lymphocytes ratio was observed compared to control treatment ($p \leq 0.05$). Although using of 0.75% *Artemisia dracunculus* extract significantly reduced the cholesterol LDL conc but it increased glucose and HDL conc. ($p \leq 0.05$). Also addition of 2.25% of *Artemisia dracunculus* extract in drinking water, significantly reduced cholesterol conc. compared with control treatment ($p \leq 0.05$). Finally the treatments did not effect on the number of eosinophils, monocytes, basophils, total white cells and triglyceride conc. ($p \leq 0.05$). The results showed that the level of 0.75% hydroalcoholic extract of *Artemisia dracunculus* can improve blood parameters and increase the immune response of birds.

Session 6: Alternative Medicine, Integrative and Complementary Medicine

Methanolic Extract of Poisonous Insect, *Paederus fuscipes* Causes Accumulation of Aneuploidy Cells Lead to Post Mitotic Apoptosis on Cervical CellsNunuk Aries Nurulita^{1,2*}, Wahyu Rhamadhan¹, and Dwi Hartanti¹¹Faculty of Pharmacy, Universitas Muhammadiyah Purwokerto, Indonesia²Cancer and Stem Cell Research Center (CSRC), University of Muhammadiyah Purwokerto, Indonesia**Abstract**

Tomcat (*Paederus fuscipes*), an insect contains compound named pederin, the group of amide compound with two tetrahydrophyran rings. Both of pederin and *P. fuscipes* extract has been known to inhibit protein and DNA synthesis in normal cells. This study aims to determine the cytotoxic activity, the anti-proliferation effect, cell death induction, and cell cycle modulation on cervical cancer due to methanolic extracts of *P. fuscipes* (EMPF) treatment. EMPF has cytotoxicity properties as high as doxorubicin shown by with IC50 of 2.5 and 3 µg/mL, respectively. This extract might induces cell death through of apoptosis mechanism shown by significant amount of phosphatidylserines-annexin V binding. Opposite with doxorubicin that already known causes cell death mostly through necrosis. EMPF 2.5 µg/ mL causes an accumulation of cells undergoing early apoptosis and late apoptosis amounted to 14.07% and 41.25%, whereas doxorubicin with the same concentration of 0.81% and 15.29%. EMPF treatment causes an accumulation of cells in sub-G1 phase and the amount of accumulation increases with dose dependent manner. The accumulation of subG1 after EMPF is higher than doxorubicin at the same concentration. EMPF treatment lead to a double peak in the G0-G1 phase indicates accumulation aneuploidy cells that further cause post-mitotic apoptosis mediated mostly by the protein P53. EMPF has a high potency as anticancer which can induce cell death through apoptosis post-mitotic mechanism.

Keywords: Methanolic extract of *P.fuscipes*, HeLa cells, doxorubicin, aneuploidy, apoptosis.**Biography**

Dr. Nunuk Aries Nurulita is an associate researcher at Universitas Muhammadiyah Purwokerto on affiliated with The Cancer and Stem Cell Research Center (CSCR). Her Primary fields of expertise complementary medicine of cancer using natural resources. She focus on elucidating extract and active compounds from natural resources activity as complementary medicine of cancer. She conducting several experimental systems, such as in vitro culture systems using cell lines and animal model systems using transgenic mice. She investigate molecular mechanisms controlling proliferation, the connection between cell cycle progression and oncogenesis on several cancer cell type. These findings can be applied to regenerative and cancer therapy.

An Appraisal of Documented Medicinal Plants Used for the Treatment of Cancer in Africa Over a Twenty-Year Period (1998-2018)Idris O Raimi^{1*}, Boikanyo G Kopaopa¹, Liziwe L Mugivhisa¹, Francis B Lewu², Stephen O Amoo³, and Joshua O Olowoyo¹¹Department of Biology, Sefako Makgatho Health Sciences University, P.O. Box 139, Medunsa 0204, South Africa.²Department of Agriculture, Cape Peninsula University of Technology, Wellington Campus, Wellington 7655, Western Cape, South Africa.³Agricultural Research Council, ARC-Roodeplaas Vegetable and Ornamental Plants, Private Bag X293, Pretoria, 001, South Africa.**Abstract**

Over the years, appreciable advancements have been made in the treatment and control of cancer incidence and progression globally. However, the conventional treatment method is often accompanied with serious and sometimes devastating side effects, besides the treatment cost, which is usually so high that it remains unaffordable to many cancer sufferers in the developing countries. A total of 212 articles containing information on medicinal plants used for cancer treatment in Africa were retrieved from scientific

databases such as Google scholar, PubMed, and Web of science. A total of 194 plant species from 69 different plant families were recorded in this review. Thirty-eight percent (38%) of the documented plant species were reported for cytotoxic activity against different cancer cell lines while the rest were traditionally applied but yet to be scientifically evaluated. The dominant plant families documented for use in cancer treatment included Asteraceae and Fabaceae. Plant species such as *Artemisia afra* Jacq., *Artemisia armeniaca* Lam., *Bidens pilosa* L., *Solanecio mannii* (Hook.f.) C. Jeffrey, and *Solanecio nandensis* (S. Moore) C. Jeffrey were reported for the treatment of different cancer types such as skin, breast, and colorectal cancer in southern Africa. Some of the identified 'potent' medicinal plant species from in vitro screening need to be evaluated in vivo as part of the drug design pipeline. The mechanism(s) of action, other pharmacological activities including cytotoxicity against non-targeted cells and potential in cancer therapy development of the identified 'potent' extracts and isolated plant compounds are other areas that require more research attention.

Sulfated Polysaccharides of Some Seaweeds Exhibit Neuroprotection via Modulation of Redox Imbalance, Cholinergic Function and Inhibition of Zn – Induced Neuronal Damage in HT-22 Cells

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²University of Kwazulu-Natal, South Africa

Abstract

Sulfated polysaccharides from marine algae are known to possess antioxidative activities, however their therapeutic role in metal – induced neurodegeneration have not been explored. In this study, the neuroprotective potentials of sulfated polysaccharides isolated from *Ecklonia maxima* (PKPM), *Gelidium pristoides* (PMNP), *Ulva lactuca* (PULV), *Ulva rigida* (PURL) and *Gracilaria gracilis* (PGCL) in Zn-induced neurotoxicity in hippocampal neuronal (HT-22) cells were assessed. Cells were cultured and maintained at 37°C. Control cells did not contain Zinc sulphate (ZnSO₄) while other experimental groups contain Zn (50 µM) alone or in combination with sulfated polysaccharides (0.4 or 0.8 mg/mL). Zn significantly reduced cell viability to 50%. However, sulfated polysaccharides improved cell viability to 95% and inhibited apoptosis after exposure to Zinc. Furthermore, decrease in catalase and superoxide dismutase activities as well as significantly low glutathione content were observed in Zn-treated cells compared to the control. Treatment with sulfated polysaccharides, antioxidant enzymes and glutathione content was significantly increased in Zn – treated cells. Sulfated polysaccharides also reduced acetylcholinesterase activity. Furthermore, beta-secretase (BACE-1) and amyloid precursor protein expression (APP) were also significantly reduced after treatment with Zn. These findings suggest that the neuroprotective effects of PKPM, PGCL, PURL, PULV and PMNP against Zn – induced neuronal damage may be attributed to their ability to inhibit apoptosis, oxidative damage and acetylcholinesterase activity as well as down regulation of BACE-1 and APP expression and could be good therapeutic agents to protect neuronal cells against Zn induced - pathological processes associated with Alzheimer's disease.

Biography

Mr Tosin Olasehinde is a Doctoral Research Fellow at the Department of Biochemistry and Microbiology, University of Fort Hare, South Africa with expertise in functional foods, nutraceuticals and phytomedicine. His research interests include exploration of bioactive constituents from plants for the management and/or treatment of Alzheimer's disease, diabetes, erectile dysfunction and hypertension. He has published 39 papers in reputable journals indexed in Scopus and ISI. He is a recipient of The World Academy of Science and National Research Foundation of South Africa PhD fellowship award and other travel grant awards to attend local and international conferences.

First Analysis of the Elementary Composition from the Medicinal Plant *Hymenaea martiana* Hayne (Jatobá)

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Abstract

Hymenaea martiana Hayne (Jatobá) belongs to the Fabaceae (Leguminosae) family and does not has studies about the micro and macroelements and toxicity yet. It is a medicinal plant used in the traditional medicine because demonstrates medicinal purposes as antioxidant, immunomodulatory (Bonniface, 2017), microbial, antiviral, hepatoprotective (Ganeshpurk, 2017), gastroprotective and antifungal (Almeida et al., 2012). In the present study, was studied Al, Ca, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, S and Zn in fresh barks and leaves and tea leaves and tea bark. Micro digestion in microwave oven was realised and after the reading was in ICP-OES. A comparison was made with DRI / AI according to the Food and Drug Administration (FDA) for children (1-8 years), adolescents (9-18 years), men and women (19-> 70 years) and according to the National Agency of Sanitary Surveillance (ANVISA) for children (1-10 years old) and adults. The results show that potassium (K) is the quantified element of higher concentration in the fresh leaf, bark tea and leaf tea and the Ni the lowest. Calcium (Ca) is the element of greatest quantification in the bark and copper (Cu) is the smallest element in the leaf. Aluminium, copper and iron were not detected in leaf tea and Al and Cu were not detected in bark tea and Cu in fresh bark. The quantification of the concentration of minerals in the *Hymenaea martiana* Hayne obtained is important to understand the efficacy and safety for the dosage in preparations for medicinal purposes.

Cytotoxic and antioxidative activities of endophytic fungus *Talaromyces purpureogenus* isolated from marine sea weed: physico-chemical optimization and mechanism

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Abstract

Marine-derived fungi are rich sources of pharmacologically active secondary metabolites. This study focussed on the biological activities in extracts of endophytic fungi '*Talaromyces purpureogenus*' from *Sargassum muticum*, a marine brown alga, which has been used as traditional medicine. Further, physico-chemical culture parameters of endophyte including growth curve, media, salinity and solvent system were optimized to enhance the cytotoxic and antioxidative activities. The total culture crude extract was able to inhibit the growth of human cancer lines viz. human cervical cancer (HeLa), human breast cancer (MCF- 7), human skin cancer (A-431), human lung cancer (A549), human liver cancer (HePG2) and glioblastoma (LN229) in a concentration-dependent manner, while no significant cytotoxicity to the normal human embryonic kidney cell line (HEK 293 T) was observed. The highest anticancer activity was observed in ethyl acetate extract of total culture grown in Potato Dextrose Broth media for 28 days in a dose dependent manner, while highest antioxidative activity was observed in hexane extract of fungal culture grown in Malt Extract Broth for 21 days. Further, Gas chromatography mass spectroscopy (GCMS) analysis of crude extract showed presence of bioactive compounds in the crude extracts including 3-nitropropanoic acid, 4H-Pyran-4-one 5-hydroxy-2-(hydroxymethyl), hexadecanoic acid. HeLa cells were the most vulnerable to the treatment with IC₅₀ value of 101±1.36µg/mL among different cancer cell lines tested. Apoptosis mediated cell death in HeLa cells was confirmed by membrane damage, mitochondrial depolarisation and AO/PI staining. The unexplored wealth of marine endophytes definitely bears the candidature for novel and potent drug discoveries.

Biography

Dr. Madhuree Kumari is currently post-doctoral fellow in Department of Biochemistry, Indian Institute of Science, Bengaluru, India. She has obtained her PhD from CSIR-National Botanical Research Institute, Lucknow, India. She has authored more than

10 international publications and book chapters in international journals. Her research topic is bioprospection of fungi for human welfare. Currently, she is involved in deciphering the mechanism of cytotoxic and antioxidative potential of endophytic fungi obtained from marine sea-weeds, which are used in traditional medicine.

Bioprospecting Marine Alga Derived Endophytic Fungus *Chaetomium globosum* for Anticancer, Antioxidative and Antimicrobial Activities

Siya Kamat*, Madhuree Kumari, and C Jayabaskaran

Indian Institute of Science, India

Abstract

This study investigated the chemical composition and assessed the cytotoxic, antioxidant and antibacterial properties of total culture extract of a fungal endophyte *Chaetomium globosum* associated with a marine green alga *Chaetomorpha media*. The algal sample was collected from the rocky shore of Palolem, Goa. The findings showed that the ethyl acetate extracts caused significant cytotoxicity on A549, MCF-7, A-431 and HeLa cancer cell lines with IC_{50} values $<10.07 \pm 0.03 \mu\text{g/mL}$ as evaluated by MTT and resazurin reduction assay. Out of the four solvents used for extraction of cytotoxic secondary metabolites, ethyl acetate gave the best results. The extract was also evaluated for its antibacterial activity by agar well diffusion method, against Gram positive and Gram negative pathogenic bacteria. Significant results obtained from this study established the extract to have a broad spectrum antibiotic potential. A moderate antioxidant effect was observed when the extract was evaluated for its DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity. The ethyl acetate extract was investigated by Gas Chromatography/Mass Spectroscopy (GC/MS) analysis for its volatile chemical constituents. Forty-six compounds were identified while many remained unidentified indicating scope for the presence of novel compounds. Trimethyl esters of carboxylic acids, Octadecanoic acid formed the major constituents of the fungal extract which are known to have antiproliferative and antibacterial effects. Loss in mitochondrial membrane potential, cell cycle arrest as well as ROS production was observed in response to the fungal extract treatment on MCF-7 cells. This establishes the endophytic fungus *C. globosum* as a potential source of novel natural bioactive leads.

Biography

Ms. Siya Kamat is a PhD student in the Biochemistry department of Indian Institute of Science, India. She received her Master's degree in Biotechnology from Pune University, India for which she was awarded the gold medal for standing first. Her PhD work deals with isolation and characterization of novel anti-cancer secondary metabolites derived from endophytic fungi associated with marine algae. She strongly believes that nature possess a treasury of compounds of therapeutic value which are yet to be fully explored. Her career objective is to be an academic researcher and focus on inter-disciplinary approaches to discover novel potent anti-cancer compounds.

Comparison of the Effectiveness of Modeling Massage for Localized Fat Reduction Applied with Neutral Cream or Cream with *Mentha piperita* Extract

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Abstract

The use of medicinal plants associated with modeling massage techniques has gained a lot of attention in the aesthetic universe. Massage has the purpose of increasing blood circulation in tissues, improve the appearance of the skin, and depending on the intensity or type of massage, reduce the concentration of localized fat. Therefore, for the complete functioning of aesthetics, it is fundamental to integrate sensorial modalities and psychic processes that are in constant interchange with the body¹. The techniques used in modeling massage can promote increased blood and lymphatic circulation, increased tissue nutrition, removal of catabolites stimulate visceral functions, aid in active penetration, mobilization and fluidification of fat, and local cutaneous hyperemia. The study was conducted in a sample of 10 individuals, female, with an average age of 25 years. Approved by the Human Ethics Committee: No.

2,464,970. Participants were randomly divided into two groups of 5 individuals. Thus, 5 participants were part of group I (control), submitted to modeling massage with cream without dermatological assets and group II, submitted to modeling massage with cream containing *Mentha piperita* extract incorporated. After performing the massages, there was an average reduction of 2cm of the body measurements of the volunteers, which was superior to that found in the control group, which is satisfactory for the research, since the chosen asset is known for its systemic properties.

Biography

Veronica Soares, holds a bachelor's degree in Pharmacy Biochemistry from University Estadual Paulista Júlio de Mesquita Filho (2002), a Masters in Biotechnology from the Institute of Chemistry - UNESP Araraquara (2005). PhD by the Institute of Biology - Postgraduate Program in Functional and Molecular Biology, Biochemistry area, with medicinal plants activity. Fellow of the Carolina Foundation, Madrid (2010). Lecturer in Nursing, Nutrition, Physical Therapy, Pharmacy and Coordinator of Cosmetic Aesthetics Course at Universidade Paulista UNIP, Campus - Jundiaí-SP.

Effect of Ischemia Preconditioning and Leech Therapy on Cutaneous Pedicle Flaps Subjected to Prolonged Ischemia in a Mouse Model

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Abstract

We sought to determine the effect of ischemic preconditioning (IPC) and hirudotherapy (leech therapy) on cutaneous pedicle flaps after they underwent prolonged ischemia (global ischemia) in a mouse model. Twenty cutaneous pedicle flaps were elevated in 20 mice, and the animals were randomized into four groups: sham, control, IPC and leech (5 flaps in each group). Except in the sham group, all flaps were subjected to global ischemia for 5 h via pedicle clamping. The control group did not receive any treatment before or after global ischemia. In the IPC group, global ischemia was preceded by three 10-min episodes of ischemia, each followed by 10 min of reperfusion. In the leech therapy group, after global ischemia, hirudotherapy was performed. Flap survival area and histopathological changes were evaluated on the 10th day after surgery. Flap survival areas were significantly higher in both the IPC and leech groups than in the control group and were significantly higher in the leech group than in the IPC group ($p < 0.05$). In conclusion IPC and hirudotherapy had definite effects on the survival area of cutaneous pedicle flaps that underwent prolonged ischemia in a mouse model.

Biography

Sayid Mahdi Mirghazanfari, born on July 31st 1977 in Tehran, Iran. He received his MD-PhD (physiology) from Tehran University of Medical Sciences with a high average and now he is a researcher and lecturer at AJA University of Medical Sciences as Assistant Professor. In addition, Dr. Mirghazanfari is well known in Iran as one of the most qualified and highly competent experts, lecturers, physicians and researchers in Iranian Traditional (Persian) Medicine.

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