Preclinical and Clinical Action of Mustard Oils as Basis of Antimicrobiotic Plant Drugs

Rainer Stange
Charité University Medicine Berlin and Immanuel Hospital, Germany

Biography

Dr. 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.

Comparative Chloroplast Genomics of Seven Coptis Species (Ranunculaceae)

Jie Yu
Southwest University, China

Abstract

Coptis is a perennial herb of the Ranunculaceae family. The underground rhizomes of Coptis are often used as traditional Chinese medicine, which are effective in clearing heat and dampness, removing heat and detoxifying toxins, with high economic value and good market prospects. In this study, we have assembled and annotated the following species of Coptis: Coptis chinensis var. brevisepala (MT773634), Coptis deltoidea (MT576696), Coptis omeiensis (MT773636), Coptis japonica (MT 773635), Coptis teeta (MT 773638), and Coptis quinquesecta (MT 773637). The six sequences were submitted to the NCBI website, and Coptis chinensis (MK569483.1) were downloaded from the NCBI. We analyzed using bioinformatics technology for comparative analysis, evaluation of sequence fragment identification ability and phylogenetic analysis of the chloroplast genomes of seven Coptis species. Finally, this study provides data support for the further research of Coptis chloroplast genome, provides new ideas for species identification, and also provides a research basis for the phylogeny of the Ranunculaceae family.

Biography

Dr. Jie Yu is a botany teacher from Southwest University in China. He has been engaged in the research of medicinal plants for many years, especially interested in the molecular identification and classification of plants. In 2018, under the guidance of Professor John Kress, he systematically studied DNA barcoding technology at Smithsonian National Museum of Natural History in USA. China has the richest medicinal plant resources in the world, which provides him with many good research objects. He looks forward to cooperating with foreign experts for the world’s medicinal plant cause.
Regulatory Effect of Maslinic Acid on Protein Kinase C Signalling Pathway and its Downstream Kinases

Yang Mooi Lim

Universiti Tunku Abdul Rahman, Malaysia

Abstract

Maslinic acid is a pentacyclic triterpene acid that has been widely reported to show strong anticancer properties and exert no toxic effect on mouse model. Maslinic acid was isolated from Coleus tuberosus Linn and demonstrated to regulate various cancer cell signalling pathways, particularly target on Protein Kinase C and its downstream kinases, which are mainly involved in inflammation, cytoprotection, apoptosis and cell cycle. This study reports the inflammation-suppressive and cytoprotective effects of maslinic acid in Raji cells, targeting COX-2, NF-kB, AP-1 and HO-1 and NQO1. Besides, the inhibitory effect of maslinic acid on cell cycle and apoptosis was demonstrated in HT-29 and HCT 116 cells. Maslinic acid inhibited the growth of HT-29 and HCT 116 in a dose- and time-dependent manner, induced apoptosis in HCT 116 cells and cell cycled arrest in HT-29 cells, as well as increased the unphosphorylated IKK- protein in both HT-29 and HCT 116 cells. These findings suggest that maslinic acid regulate various downstream kinases via Protein Kinase C signalling pathway.

Biography

Dr. Yang Mooi Lim is a Professor of Biochemistry in the Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman. Currently, she is the President for the Malaysian Society for Biochemistry and Molecular Biology (MSBMB), the delegate to the Federation of Asian and Oceanian of Biochemists and Molecular Biologists (FAOBMB) and the IUBMB ambassador to FAOBMB region. Her research interests are in the fields of phytochemistry, cancer chemoprevention, herbal medicine and syndrome differentiation study in Chinese Medicine and medicinal properties of edible bird’s nest.

Herb-Drug Interactions between Androgenic Chinese Herbal Medicines and Androgen Receptor Antagonist on Tumor Growth: Studies on Two Xenograft Prostate Cancer Animal Models

Yan-Fang XIAN

The Chinese University of Hong Kong, Hong Kong

Abstract

Some Chinese herbal medicines commonly prescribed for the treatment of male urological disorders were shown to contain phytoandrogens. Since phytoandrogens and androgen have many similar effects, especially in modulation of the androgen receptor. Therefore, in our precious study, we had screened 21 Chinese herbal medicines on the proliferation and tumor growth of prostate cancer (PCa). The results revealed that Epimedii Folium (EF) and Codonopsis Radix (CNR) significantly promoted tumor growth on a subcutaneous mouse model of PCa via enhancing the mRNA and protein expressions of androgen receptor (AR), while Astragali Radix (AGR) inhibited tumor growth via suppressing the protein expression of AR. In the present study, we aimed to investigate the potential interactions between EF, CNR or AGR and AR antagonist (abiraterone acetate (ABI)) on the tumor growth using subcutaneous and orthotopic PCa mouse models. EF, CNR, AGR and ABI were intragastrically given to mice once every two days for 4 weeks. The pharmacokinetics of ABI were evaluated in the plasma of rats when combined with EF, CNR or AGR. Our results demonstrated that EF or CNR could weaken the anti-tumor effects of ABI via increasing the AR expression involving activation of the PI3K/AKT and Rb/E2F pathways and decreasing the bioavailability of ABI, while AGR could enhance the anti-tumor effects of ABI through suppressing the AR expression via inhibiting the activations of PI3K/AKT and Rb/E2F pathways and increasing the bioavailability of ABI. These findings imply that cautions should be exercised when prescribing EF and CNR for PCa patients.
Biography
Dr. Yan-Fang Xian is the Research Assistant Professor at School of Chinese Medicine, The Chinese University of Hong Kong. Dr. Xian obtained her PhD degree in 2013 from The Chinese University of Hong Kong. She has rich experience in studying the Chinese medicines and neuroscience. Her research interests are focused on the neuroprotective effects of Chinese medicines and natural products for more than 10 years. She has published about 70 original research articles based on her experimental findings in various SCI-listed academic journals such as Brain, Behavior and Immunity, FASEB Journal, Phytomedicine.

Herbal Medicines as Tumor Microenvironment-Modulating Agents
Chan-Ran Park
University of Daejeon, Republic of Korea

Abstract
Background: The tumor microenvironment (TME) is a complex system that composed of various types of cells. TME interacts with cancer cells and participates in carcinogenesis by stimulating vascularization, suppressing immune system, and deformation of surrounded structure so it is considered as a promising target of cancer treatment. Herbal medicines are composed of multiple compounds and they have multi-target effects. In numerous researches, herbal medicines have been identified as prospective anticancer agents that affect the TME.

Method: In this study, we report the effects of 20 herbal medicines; herbal components, single herbs, and herbal formulas on the TME. We classified the TME into 4 categories: cancer-associated fibroblasts/tumor-associated fibroblasts (CAFs/TAFs), tumor-associated endothelial cells (TECs), myeloid-derived suppressor cells (MDSCs), and tumor-associated macrophages (TAMs). Then we investigated each herbal medicines can modulate which type of TME.

Result & Conclusion: EGCG, DHA, resveratrol, curcumin, etc., are associated with CAFs/TAFs. EGCG, resveratrol, and curcumin are associated with TECs. Curcumin, silibinin, Xihuang pill, Hochu-ekki-to and Keishi-bukuryo-Gan, and SL extract are related to MDSCs. EGCG, DHA, resveratrol, pAbM, Glycyrrhiza radix et rhizoma, etc., are related to TAMs. The 5 herbal components we reviewed, curcumin, DHA, EGCG, resveratrol, and silibinin have the ability to modulate two or more TME. We expect that this review would supports the potential of herbal medicines in TME-targeting anticancer therapy and it should be further explored to make clinical evidence.

Biography
Ms. Chan-Ran Park had graduated from Korean medicine college of Wonkwang University. She has completed her Master’s degree at graduated school of Daejeon University, Department of clinical oncology. She works as a Korean medicine Doctor in Korean medicine hospital of Daejeon University.

In situ Quantitative and Visual Investigation of the Retention of Benzo[a]Pyrene at the Surface Micro-Zone of Mangrove Leaf Cuticles
Shuai Guo
Xiamen University, China

Abstract
A novel approach for in situ simultaneous visualization and determination the retention of benzo[a]pyrene (BaP) at the surface micro-zone (0.096 mm²) of Avicennia marina (Am) and Aegiceras corniculatum (Ac) leaf cuticles was established using a confocal microscopic fluorescence spectral analysis (CMFSA) system with a spatial resolution of 200 nm. The detection limits of BaP were 0.07 ng spot⁻¹ for Am and 0.06 ng spot⁻¹ for Ac. Using the established CMFSA method, the retention of BaP at the Am and Ac leaf cuticle surface micro-zones were investigated in situ. BaP forms clusters instead of being evenly distributed at the Am and Ac leaf cuticle surface micro-zones, meanwhile,
B[a]P was mainly accumulated around the secretory cells around salt glands rather than along the irregular polygonal epidermis cell wall. In addition, the retained quantities of B[a]P showed significant differences, Ac > Am, which was related to the polarity index ((O+N)/C) of the leaf surfaces. The results of this work provided an in situ method for the investigation on the retention of PAHs at plant leaf surfaces at the microscopic scale, which will bring about knowledge of the PAHs fate in plants with a higher level of accuracy.

Biography

Ms. Shuai Guo is a Doctor at Xiamen University. Her main research fields are Environmental Chemistry and the environmental behavior of environmental organic pollutants in mangrove ecosystems.

A Potential Novel Analysis Approach for In-situ Visual and Quantitative Investigation of Environmental Behavior of PAHs at the Micro-Zones and Micro-Interfaces of Mangrove Roots

Bingman Lei

Xiamen University, China

Abstract

Mangrove roots play an undeniably important role in the removing of PAHs (polycyclic aromatic hydrocarbons) from the mangrove ecosystem. Although numerous researches focused on the process of PAHs depuration by mangrove roots have been done, but the distribution and translocation of PAHs at micro-zones of root surface are still unclear due to the limitation of existed analytical methods, especially on the multicomponent PAHs. To address this issue, the deep UV multi-dimensional laser confocal microscopic fluorescence system was established for visual and quantitative investigation of environmental behavior of PAHs on mangrove roots. The positioning, qualitative, and quantitative analysis of PAHs at the micro-zones of mangrove root surface and inner tissues could be determined, so as to explore the retention behavior of PAHs on the root surface micro-zones (0.096 mm²) and the mechanism of transport to inner tissues of PAHs adsorbed on the root surface of mangroves. It will provide us a potential novel analysis method for the in-situ visual and quantitative investigation of PAHs behavior at the micro-zones and micro-interfaces of the mangrove ecosystem in the future, which will be contributed to improve our understanding of the process and mechanism on PAHs phytoremediation via mangrove roots.

Biography

Ms. Bingman Lei is a PhD Candidate at Xiamen University. Her main research fields are Environmental Chemistry and the environmental behavior of environmental organic pollutants in mangrove ecosystems.

Ayurvedic Herbal Decoctions as Immunity Enhancers

Krishna Misra

Indian Institute of Information Technology, India

Abstract

Ayurveda means science of long life, designed to promote good health and longevity rather than to fight disease. The balanced coordination of body, mind, and consciousness is the ayurvedic definition of health. All living organisms, plants, animals, and micro-organisms have self-defense system and are interdependent on each other. Immune system recognizes the attack of pathogens (harmful organisms) through receptors. According to Ayurveda as many as 85% of all diseases can be prevented by dietary changes. As suggested in Ayurveda daily use of herbs and spices in diet and detoxifiers and antioxidants can prevent many infections as well as act as synergistics for cure of several disorders. The ayurvedic regimen rejuvenates body tissues, tones up body systems and acts as a tonic. Ayurvedic approach to Synergism in drug application is the only remedy for multidrug resistance. There is relationship between the gut microbiota, the immune system and malnutrition.
Dr. Krishna Misra is Superannuated as Professor of Chemistry at University of Allahabad, at present honorary professor at IIIT-Allahabad, fellow of National Academy of Sciences India, chairperson of STEM program of DST. She has supervised 55 Ph.D.s, published 250 papers, four books, about 25 reviews, a dozen book chapters presented papers in about 100 national and international conferences. She has Indian and US patents, visited Japan (UNESCO fellow), U.K. (Sponsor British Council), USA (Invited papers/talks/chair) number of times. She has done many research projects including three international projects from USA. Her fields of research are Chemistry of naturally occurring herbal products, Oligonucleotide chemistry, tagging with fluorescent tags, Chemoinformatics, Systems Biology, Computer aided drug design, Molecular medicine, Biomedical Engineering, Targeted drug designing and Nano-Biotechnology.

Medicinal Uses, Phytochemistry, and Pharmacological Activities of Quercus Species

Yassine Rezzak
Hassan 1st University, Morocco

Abstract

Quercus species, also known as oak, represent an important genus of the Fagaceae family. It is widely distributed in temperate forests of the northern hemisphere and tropical climatic areas. Many of its members have been used in traditional medicine to treat and prevent various human disorders such as asthma, hemorrhoid, diarrhea, gastric ulcers, and wound healing. ‘e multiple biological activities including anti-inflammatory, antibacterial, hepatoprotective, antidiabetic, anticancer, gastroprotective, antioxidant, and cytotoxic activities have been ascribed to the presence of bioactive compounds such as triterpenoids, phenolic acids, and flavonoids. ‘is paper aimed to provide available information on the medicinal uses, phytochemicals, and pharmacology of species from Quercus. However, further investigation is needed to fully clarify the mode of action of its bioactive compounds and to evaluate in vivo chronic toxicity, before exploring their potential use as a supplement in functional foods and natural pharmaceutics.

Biography

Mr. Yassine Rezzak is PhD student in Applied Chemistry and Environment in Faculty of Science and Technology of Settat in Morocco. He graduated from the Faculty of Science and Technology of Mohammedia in Morocco as a Chemical Engineer in 2012 and he is working at Ministry of industry, Trade and Green and Digital Economy as a Head of the service of company environment improvement.

Ethnobotanical Survey of Medicinal Plants Used in the Traditional Treatment of Male Infertility in Jos North Local Government Area of Plateau State, Nigeria

Ohemu Temitayo Lucia
University of Jos, Nigeria

Abstract

An ethnobotanical survey was conducted in the Jos North Local Government Area of Plateau State Nigeria on plants used in the traditional treatment of Male Infertility with Focus on Erectile Dysfunction, Low Libido and Low Sperm Count. The study population was targeted at Traditional Medicine Practitioners, Herb Sellers, Herbalists and also indigenes who claim to have knowledge of medicinal plants used in the treatment of male infertility, using the referred chain of sampling technique method. A structured open and closed ended questionnaire was used to collect data. Data for the study were obtained from direct interviews using the communicable dialect within the area. Plant samples were collected and identified by taxonomists in the herbarium section of Federal College of Forestry Jos. Majority of the respondents were between the age ranges of 31-60.  A total of 21 Medicinal Plants Species from 18 Families were obtained from the survey. The major route of administration employed for drug delivery was oral. The plant parts mostly collected by the respondents for management of the conditions reported are roots, accounting for up 47.6%. Majority of the remedies involved the use of a single plant and water is the most common solvent. This information will
be beneficial in Public Health and researches providing lead to plants that can be useful in drug discovery.

**Biography**

Ms. Ohemu Temitayo Lucia is a Lecturer at the Department of Pharmacognosy and Traditional Medicine, Faculty of Pharmaceutical Sciences, University of Jos, Nigeria. A Pharmacist by profession, with MSc degree in Pharmacognosy. She is currently a PhD student; her area of specialization includes Traditional Medicine, Phytochemical study of Medicinal plants and Infectious diseases.

**Estimation of Compounds and Antimicrobial Studies of Different Solvent Extracts of *Garcinia Kola* Against Few Pathogens**

*Mansurat Bolanle Falana*

Al-Hikmah University, Nigeria

**Abstract**

This study is aimed at investigating the effect of organic (n-hexane and ethyl acetate) and traditional (Honey and Vinegar) solvents of seeds of *Garcinia kola* (Clusiacea) on the qualitative phytochemical components, and *in vitro* antimicrobial efficacies of the plant by Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC)/ Minimum Fungicidal Concentration (MFC), and disc diffusion assay against some pathogens (*Candida albicans*, *Escherichia coli* ATCC 25922, and *Staphylococcus aureus* ATCC 25923). High-Performance Liquid Chromatography (HPLC) of the n-hexane and ethyl acetate extracts were analysed. Saponin, tannin, phenolic, flavonoid, coumarin, anthocyanin, steroid, glycosides, triterpenes, phlobatanin, amino acids and alkaloids were randomly present in all the solvent extracts. The maximum MIC value (50 µg/mL) was obtained for n-Hexane against *E. coli* ATCC 25922, while the least MIC value (12.5 µg/mL) was obtained for ethylacetate and combination of solvent extract against *S. aureus* ATCC 25923 and *C. albicans*, respectively. The maximum MBC value (100 µg/mL) was obtained for n-Hexane extract against *E. coli* ATCC 25922, while the least MBC value (25 µg/mL) was obtained for ethylacetate and combination of solvent extract, respectively, against *S. aureus* ATCC 25923 and *C. albicans*, respectively. Maximum MFC (50 µg/mL) was obtained for n-Hexane and combination of solvent extract. The HPLC detector measured 13 compounds in the n-hexane extracts, 3 of which were identified at different concentrations as Luteolin (96.94 mg/mL), Apigenin (4.43 mg/mL) and quercetin (4.06 mg/mL). A total of 14 coumpounds were detected in the ethylacetate extracts, 6 of which were identified as Gallic acid (25.65 mg/mL), theobromine (17.31), caffeic acid (17.02), catechin (16.09), quercetin (8.99), epicatechin (11.08 mg/mL) and quercetin (4.06 mg/mL). This study provides information on the components of *G. kola* seeds and contribute towards the development of alternative therapeutic agent.

**Biography**

Dr. Mansurat Bolanle Falana is a Lecturer of Microbiology and Public Health at Al-Hikmah University, Ilorin, Nigeria. She received her PhD and MSc degrees from Federal University of Agriculture, Abeokuta, Nigeria where she studied Medical Microbiology and Public Health. More than her profession as a tutor, she focuses her research on medicinal plants, having realized the impact of adulteration, cost, poor cultural acceptability, and side effects associated with drugs. She has explored series of research on medicinal plants and hopes to further collaborate with researchers across the globe in giving such study a wider scope.

**Antioxidant and Antiplasmodial Activities of Methanol Leaf Extract of *Paullinia pinnata* Linn.**

*Oluwatoyin Adenike Adeyemo-Salami*

University of Ibadan, Nigeria

**Abstract**

*Paullinia pinnata* leaves have been reported to be used in the folkloric treatment of malaria. However, our previous study has shown that at a dose of 200 mg/kg body weight, the methanol leaf extract possess weak curative property against *Plasmodium berghei*. This study is therefore designed to investigate the antiplasmodial effect of *P. pinnata*
leaves, and observe the outcome on oxidative stress and inflammation in the liver. Wistar mice of both sexes were used for the curative, prophylaxis, and suppressive tests by adopting standard procedures. In the curative test, the liver was processed for liver function, antioxidant and anti-inflammatory assays and histology. Significant changes in percentage parasitaemia were observed. The antioxidant and anti-inflammatory parameters were not affected. *P. pinnata* methanol leaf extract had low suppressive activity, mildly moderate prophylactic potential and curative property which were also reflected in the antioxidant and liver function test at a high dose while at a lower dose it showed weak curative activity with prophylactic and suppressive capacities.

Biography

Ms. Oluwatoyin Adenike Adeyemo-Salami is a junior faculty at the Department of Biochemistry, Faculty of Basic Medical Sciences, College of Medicine, University of Ibadan, Nigeria. Her research focus on Medicinal plants and Nutritional Biochemistry. She also has a keen interest in the emerging field of Nutrigenetics and Nutrigenomics. She has published papers in peer-reviewed International journals, and she has been a recipient of several grants and awards.

Ethnophytochemical Maps: A New Instrument for the Expression of Traditional Indigenous Knowledge About Medicinal Plants

Patricia Chaves de Oliveira

Federal University of Western Para-UFOPA, Brazil

Abstract

Phytochemistry as pure science *is per se*, an important means of prospecting medicinal plants; however, when it applies to ethnoknowledge and more specifically to ethnobotany, then it is capable of being an efficient instrument (EthnoPhytochemistry) for the socioeconomic empowerment of traditional populations in the Amazon. This research aimed to create models for expression of traditional Munduruku indigenous knowledge on medicinal plants, such models would be the Ethnophytochemical Maps, where the trinomial *Traditional knowledge + Ethnobotany + EthnoPhytochemistry* would be embedded in this order in the new concept. The methodology consisted of analyzing the ethnobotanical survey carried out with indigenous families of the Munduruku Ethnic Group in the Ipaupixuna Village (Oliveira & Souza 2020) from which the first twelve (12) species of highest Use Value were selected, and the Ethnophytochemical Maps were then constructed. The results were 3 Maps; 1st Ethnophytochemical Map: interaction between medicinal plant species/classes of secondary metabolites/main chemical compounds; 2nd Ethnophytochemical Map: interaction between medicinal plants/treated diseases and 3rd Ethnophytochemical Map: medicinal plant species/forms of preparation. The 15 main metabolic classes produced by the 12 plant species were involved, as well as 40 relevant chemical compounds, in addition to 29 treated diseases and 13 forms of preparation. This set of information represented in the Ethnophytochemical Maps is a *portrait* of the traditional knowledge of a given Munduruku indigenous population in the Amazon expressed more systemically than traditional tables. These maps should also be an instrument of technical-scientific dissemination to companies and industries interested in medicines from Amazon.

Biography

Dr. Patricia Chaves de Oliveira is Agronomic Engineer, Master in Agronomy and PhD in Agrarian Sciences. She is Associate Professor IV of the Federal University of Western Pará (UFOPA) - Institute of Biodiversity and Forests, where she develops research in Ethnobotany and Plant Ecophysiology of Amazonia, as well as agrotechnological extension activities aimed at strengthening traditional communities in the Tapajós River Basin. It has coordinated projects for the local, regional and international development of traditional populations in the Legal Amazon in the last two decades under the funding of national and international organizations like Global Environment Facilities (GEF), UNEP and ACTO.
Safety Evaluation in Healthy Colombian Volunteers of P2Et Extract Obtained from *Caesalpinia spinosa*: Design 3+3 Phase I Clinical Trial

Maria Isabel Duran Sanchez

Pontificia Universidad Javeriana, Colombia

Abstract

**Background**: The P2Et extract derived from *Caesalpinia spinosa* had antitumor and immunomodulatory activity reported in breast cancer, leukemia, and melanoma. In healthy mice it was observed that P2Et modulates immune response. Protective effects have been reported in healthy humans, but they could have risk of toxicity.

**Aim**: To evaluate the safety and maximum tolerated dose (MDT) of P2Et extract in Colombian healthy volunteers.

**Methodology**: Phase 1 clinical trial, open labelled, single arm, dose-escalation design 3 +3 study. It was conducted in clinical research center from Hospital Universitario San Ignacio (Bogota, Colombia), inform consent form was approved by independent ethics committee. Healthy volunteers were included and P2Et extract was administrated orally 600 mg daily for 28 days according to dosage level. Adverse events (AEs) were evaluated based on the National Institute of Health Common Terminology Criteria for Adverse Events (CTCAE) and general measurements of health status were performed.

**Statistical analysis**: Analysis by intention to treat was performed, data were expressed as mean (± SE) and median (ranges) with percentage of change between baseline and final visit.

**Results**: 7 healthy volunteer subjects were enrolled. MDT for P2Et extract was 600 mg dose, AEs most frequency were gastrointestinal without significant changes in clinical parameters assessed. Other AE less frequent than 5% like adynamic, asthenia, constipation, odynophagia, reflux and viral rhinopharyngitis.

**Conclusions**: Oral administration of P2Et extract was safe in healthy humans with a maximum tolerated dose of 600 mg. There was no severe toxicity without significant changes in the safety parameters evaluated.

**Biography**

Dr. Maria Isabel Duran Sanchez is a Medical Doctor degree from with an epidemiology post grade from Rosario University, Colombia and recently master in a biologic science. She is part of research group of immunobiology and cellular biology in Javeriana University, Colombia who are working in a phytomedicine focus on oncology. She has more than 5 year of experience in clinical research in different phases of product development.
Orobanchaceae Plants of Israel and Palestine. Chemical and Medicinal Treasures

Abdullatif Azab
Eastern Plants Company, Israel

Abstract

Orobanchaceae plant family is one of the most interesting plant families in our region: it is represented by small number of plants, that some of them attracted major interest, while others were almost completely neglected. Even the ethnobotanical uses of these plants in the west of the Middle East are very limited. The present situation of knowledge about these plants indicates contradicting research tendencies: interesting natural products that were isolated from some of these plants, along with massive lack of information about the chemical and medicinal properties of others. The knowledge about this family lacks some essential information or includes ambiguities. This presentation will introduce the known information in a helpful manner that include many figures but will mainly emphasize the areas where intensive research efforts are needed. The parasitic nature of these plants will be extensively elaborated, and some synthetic paths will be introduced.

Biography

Dr. Abdullatif Azab, completed his PhD in Medicinal Chemistry, School of Pharmacy, Hebrew University, Israel, in 2012. He completed Post-Doctoral Research, MRI Department from School of Medicine, Hebrew University, Israel, in 2013. He received Neuroscience Excellence Award, in 2013. He was Chemistry High School Teacher, from 1980-2020. Director of Environmental Services Company from 1993-1999. He is Medicinal Plants Researcher, from 2015-Current.
A Network Pharmacology Study to Uncover the Multiple Molecular Mechanism of the Chinese Patent Medicine Toujiequwen Granules in the Treatment of Corona Virus Disease (COVID-19)

Baoyu Yang
Liaoning University, China

Abstract
Since the outbreak of the novel Corona Virus Disease 2019 (COVID-19) at the end of 2019, specific antiviral drugs have been lacking. A Chinese patent medicine called ‘Toujiequwen Granules’ has been promoted in the treatment of COVID-19. The present study was designed to reveal the molecular mechanism of Toujiequwen Granules against COVID-19. A network pharmacological method was applied to screen the main active ingredients of Toujiequwen Granules. Network analysis of 149 active ingredients and 330 drug targets showed the most active ingredient interacting with many drug targets is quercetin. Drug targets most affected by the active ingredients are PTGS2, PTGS1, and DPP4. Drug target disease enrichment analysis showed drug targets are significantly enriched in cardiovascular diseases and digestive tract diseases. An ‘active ingredient-target-disease’ network showed that 57 active ingredients from Toujiequwen Granules interact with 15 key targets of coronary pneumonia. There were 53 ingredients that can act on DPP4, suggesting that DPP4 may become a potential new key target for the treatment of COVID-19. GO analysis results showed that key targets were mainly enriched in the cellular response to lipopolysaccharide, cytokine activity and other functions. KEGG analysis showed they were mainly concentrated in viral protein interaction with cytokine and cytokine receptors and endocrine resistance pathway. These evidences suggest that Toujiequwen Granules might play an effective role by improving the symptoms of underlying diseases in patients with COVID-19 and multi-target interventions against multiple signaling pathways related to the pathogenesis of SARS-CoV-2.

Biography
Dr. Baoyu Yang is working at Department of Biochemistry and Molecular Biology of Liaoning University, China.

Bronchodilatory Effect of Tetrahydrofurans from Artemisia judaica L. via K+ Channels
Abdullah Fahad Aldosari
Prince Sattam Bin Abdulaziz University, Saudi Arabia

Abstract
Artemisia judaica L. is used in some parts of Saudi Arabia as remedy for respiratory problems. The total extract was tested for the bronchodilator effect using isolated guinea-pig trachea as an experimental ex-vivo model. Complete inhibition of carbachol (CCh)-induced bronchospasm was observed at 3 mg/mL. The total extract was fractionated, and the activity was trapped to the petroleum ether fraction with EC50 value of 0.09 mg/mL. Bioassay-guided chromatographic purification of petroleum ether fraction resulted in the identification of five tetrahydrofuran sesquiterpene derivatives as the active compounds. The bronchodilator effect of this class is reported for the first time. Compounds 2 (davanone) and 5 (hydroxydavanone) were more active than 1 (1,2-dehydro-3-hydroxyisodavanone), 3 (arteincultone) and 4 (davana acid). Failure to reverse high K+ (80 mM)-induced contractions completely indicated that calcium channel blocking effect is not the dominant mechanism involved. The bronchodilator effect of these compounds was not effected by pre-incubation with atropine, propranolol and verapamil, excluding the involvement of antimauscrinic, β2 receptor activation and voltage-gated Ca++ channels inhibition. The effect was antagonized by pre-incubation with different Ca++ activated K+ channel blockers including the non-selective quinine (30 µM), apamine (100 nM)(small conductance Ca++ activated) and the large conductance iberiotoxin (180 nM). However; 2 was selectively resistant to apamine and 3 found to be partially sensitive to the pre-incubated tissues with quinine. Glibenclamide, tetraethylammonium (TEA) and 4-aminopyridine (4-AP) partially antagonized the inhibitory effect of...
these compounds. These results indicate that multiple Ca++ activated K+ channels activations are responsible for the observed bronchodilatory effects.

Biography

Mr. Abdullah Fahad Aldosari is recently graduated from the college of Pharmacy, Prince Sattam bin Abdulaziz University. He is very interested in natural product research. He was involved in joined projects between the Department of Pharmacognosy and Pharmacology. He participated in three conferences during his undergraduate study in Saudi Arabia and Egypt. He is looking forward to complete his graduate studies in the field of Phytopharmacology and Pharmacognosy.

Repurposing Artemisia for Covid

Andrei Felicia

University of Medicine and Pharmacy Victor Babes, Romania

Abstract

First isolated years ago from Artemisia annua L., widely applied since centuries in the Chinese Traditional Medicine, Artemisinin can be recycled nowadays for healing SARS COV-19. Applying the well-known principle of using a plant typical of the region where this pandemic seems to have emerged and adding the obtaining of this substance through traditional methods, we have the start of a new path. It may be the answer to a fierce search for a remedy under the pressure of time, in this surprising age. If the drug treatment initially proposed at the international level was of the antimalarial type, the hypothesis of choosing a substance of natural origin arose. And when clinical practice has shown that the symptoms, especially the medium and light ones, have responded fairly quickly and effectively, the mechanism of action may remain indifferent. So, reactivating the administration of this molecule and possibly its derivatives for a severe pathology such as in some cases produced by the COVID 19 virus can be life-saving with a satisfactory price and accessibility.

Biography

Dr. Felicia Andrei completed PhD in Medicine and a Pharmacist specialized in Clinical Pharmacy and Homeopathy with two Masters degrees: one in Pharmacy -Formulation and evaluation of the dermatocosmetic product and the other in Polytehnic 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 College of Pharmacists (Romania) and of the European Federation for Pharmaceutical Sciences as well as in the Union for Diplomate homeopathic physicians.

Rockrose (Cistus ladanifer) Essential Oil Incorporated in Pullulan Films: Characterization and Bioactivities

Angelo Filipe Santos Luis

Universidade da Beira Interior, Portugal

Abstract

Active packaging is designed to control the development of decay- and disease-causing microorganisms and is emerging as a promising technology for extending shelf-life, maintaining food safety, reducing waste, and minimizing the risks for foodborne diseases. The goal of this work was to develop and characterize bioactive pullulan-based films, containing rockrose (Cistus ladanifer) essential oil. Among other abundant compounds (camphene, bornyl acetate and trans-pinocarveol), α-pinene was identified as the major compound of rockrose essential oil (39.25%). The essential oil presented stronger antibacterial activity against Gram-positive than against Gram-negative bacteria. The antioxidant results indicate the potential of the developed films to be used to package foods susceptible to oxidation and rancification, thus improving their shelf-life. Also, this study reflects the potential of rockrose essential
oil, free or incorporated in pullulan, as a promising quorum sensing inhibitor, since it was able to interrupt intercellular communication, inhibiting violacein production. Electronic microscopy images showed the antibiofilm activity of the films with rockrose essential oil that were able to influence bacterial adhesion, which may be explained by the differences in the surface free energy of the films, as also determined.

**Biography**

Dr. Ângelo Luís obtained his PhD in Biochemistry in 2014 by the University of Beira Interior. Then, he was a Post-Doc researcher in Food Chemistry and Mathematical Modelling at Health Sciences Research Centre. His main research areas are focused on phytochemistry, bioactive compounds, health benefits of polyphenols and functional/edible films.

**Evaluation of Antioxidant, Anti-inflammatory and Antimicrobial Properties, and Phytochemical Characterization of Ayahuasca Beverages**

**Joana Domingos Goncalves**

Universidade da Beira Interior, Portugal

**Abstract**

Ayahuasca is an indigenous psychoactive beverage, traditionally consumed by tribes in South America. In recent years, recreational consumption of this beverage has expanded worldwide. Thus, this work focuses on the study of antimicrobial, antioxidant and anti-inflammatory properties, as well as the phytochemical profile of decoctions of a commercial mixture, four individual plants and four mixtures of the same plants, used in the Ayahuasca beverages. For that, the presence of phenolic compounds was determined by ultrahigh performance liquid chromatography-quadrupole time-of-flight mass spectrometry (UHPLC-Q/TOFMS). Additionally, the phenolic profile was analyzed, having determined the content of flavonoids and total phenolic compounds. The anti-inflammatory activity was evaluated by a protein denaturation method, and the antioxidant activity was determined by DPPH free radical scavenging assay and β-carotene bleaching test. Lastly, the disc diffusion assay, resazurin microtiter method, anti-quorum sensing and anti-biofilm activity assays, were performed, in order to evaluate the antimicrobial properties. The obtained results demonstrated that the samples presented a high content of phenolic compounds, reflecting in a significant anti-inflammatory and antioxidant activity. Important antimicrobial properties were also demonstrated, with emphasis on the effect of *P. harmala* and *B. caapi* on strain of *A. baumannii*, inhibiting the production of violacein pigment and the biofilm formation.

**Biography**

Ms. Joana Gonçalves completed her degree in Biochemistry from the University of Beira Interior and obtained a master's degree in Bromatology and Toxicology areas from the same university. She is currently a PhD student in Biomedicine, devoting herself to research in the areas of toxicology, phytochemistry, bioactive compounds and molecular biology.

**Antisickling Activity-guided Fractionation of Some Plants Used for the Management of Sickle Cell Disease in Southwest Nigeria**

**Joseph Morounfolu Agbedahunsi**

Obafemi Awolowo University, Nigeria

**Abstract**

The study evaluated the antisickling activities of some plants used in Southwestern part of Nigeria for the management of sickle cell disease (SCD), with a view to determining the most active plant extract and fraction. A semi-structured questionnaire was administered to two hundred and ten (210) respondents, comprising traditional medical practitioners, herb sellers and community elders. Aqueous extracts of the plants with high fidelity levels alongside the positive controls (Vanillic acid and p-hydroxybenzoic acid) were tested *in vitro* against the sickled erythrocytes.
using inhibitory and reversal methods. The active extracts were solvent partitioned into petroleum spirit, ethyl acetate and aqueous fractions, and subsequently bio-assayed. A total 166 plants were mentioned as being used for the management of SCD within the zone, among which 27 plants were selected. Among the candidate plants, the extracts of: Moringa oleifera leaf (MOL); Alchornea laxiflora leaf (ALL); Kigelia africana fruit (KAF); Olax subschorioidea leaf (OSL); Pyrenacantha staudtii leaf (PSL) and Parquentina nigrescense leaf (PNL) demonstrated 88.0%, 86.2%, 76.2%, 75.8%, 54.40% and 52.2% inhibitory activities respectively, while the reversal activities were 76.9%, 65.3%, 75.5%, 66.6%, 52.4% and 66.0% respectively. The ethyl acetate fraction of MOL and KAF (4 mg/mL) demonstrated 94.6% and 87.2% inhibitory activities, and 94.7% and 81.4% reversal activities respectively. The mode of activity of KAF was by membrane stabilization. Silica gel column purification and preparative thin-layer chromatography of the ethyl acetate fraction afforded 5 bands M1-M5, with M2 as the most active 78.9 and 70.8%, which had free radical scavenging property. The findings validated the ethnomedicinal use of M. oleifera leaves and K. africana fruits in the management of SCD, and identified the ethyl acetate fraction of both plants as possessing the putative components.

Biography

Dr. Joseph Morounfolu Agbedahunsi is Research Professor in Phytomedicines at Obafemi Awolowo University, Nigeria. He completed his M.Phil. from Department of Pharmacognosy of University of Ife and PhD. from Department of Pharmacognosy of Obafemi Awolowo University, Nigeria. He is National Coordinator-Nigeria, Western Africa Network of Natural Products Research Scientists (WANNPRES). He is Fellow of the Royal Society of Chemistry (FRSC), United Kingdom. He is Editor-in-Chief, Nigerian Journal of Natural Products and Medicine (NJNPM). He is member of Nigerian Society of Pharmacognosy (NSP)

Black pepper (Piper nigrum L.) Fruit Extract as a Source of Bioactive Compounds

Aleksandra Milenkovic

University of Niš, Serbia

Abstract

Black pepper (Piper nigrum L.) from the Piperaceae family has culinary and medicinal uses due to the bioactive compounds (essential oil, phenolics, flavonoids, lignans, terpenes, chalcones, alkaloids, amides, and steroids) present therein. This study aimed to determine the antioxidant and antimicrobial activity as well as the mineral composition of black pepper ethanolic extract. The total phenols and total flavonoids contents of the extract obtained were determined by Folin-Ciocalteu and AlCl3 method, respectively. Its antioxidant activity was determined by using the DPPH assay while the mineral content was determined by the ICP-OES method. The antimicrobial activity of the black pepper ethanolic extract against the bacteria (Bacillus cereus, Salmonella enterica ssp. enterica) and the fungus (Candida albicans) was determined by the microdilution method.

The contents of total phenols and total flavonoids were 89.82 ± 1.19 mgGAE/g dry extract and 17.14 ± 0.24 mgRE/g dry extract, respectively. The EC50 values after 20 min incubation and immediately after adding DPPH radical solution were 0.104 mg/cm3 and 0.551 mg/cm3, respectively. Among the macromolecules, sodium (123 μg/cm3 of extract) was detected in the highest amount and zinc (4.55 μg/cm3 of extract) among the microelements. The best inhibitory effect of the extract was noticed on B. cereus reference strain (MIC value: 0.78 mg/cm3) and the best microbicidal effect against S. enterica reference strain (MMC value: 25 mg/cm3). The obtained results indicate the possible application of black pepper ethanolic extract in the food and pharmaceutical industry as the safer alternative to synthetic additives.

Biography

Ms. Aleksandra Milenković is a PhD student at the Faculty of Technology in Leskovac. She completed bachelor and master studies at the same faculty. She defended master's thesis entitled “Chemical composition and biological activity of extracts and essential oils of black pepper (Piper nigrum L.), cubeb pepper (Piper cubeba L.) and allspice (Pimenta dioica (L.) Merr))”. After completing the master’s academic studies, she enrolled in a PhD studies at the same faculty at Department of Technological Engineering. Now she works on the isolation and characterization of bioactive compounds from plant materials by various extraction processes and their application in different industries.
Determination of Phenolic and Flavonoid from Some Useful Medicinal Plants Extract

Muhammad Salihu Abdallah
Yobe State University, Nigeria

Abstract

Gallic acid and Catechin happened to be most abundant phenolics and Flavonoids contents mostly found in all the plants extracts. The main aim was to determine both phenolic and flavonoid contents and detect their correlations among some useful medicinal plants extracts. Folin-Ciocalteu’s reagent procedure, absorbance recorded at 760nm spectrophotometrically, followed by flavonoid content determination using aluminium chloride solution as well as the absorbance of the mixture was measured at 510 nm, spectrophotometrically. Moreover, Gallic acid increased tremendously especially in Vachellia nilotica pods extracts with a curve \( R^2 = 0.9958 \). While a large Catechin increase was noticed in Sclerocarya birrea stem (bark) extracts and followed closely by V. nilotica pods extracts with a curve \( R^2 = 0.9993 \), all were significantly different at P-value < 0.0001 across the remaining extracts which revealed to have low contents more especially Leptadenia hastata leaf extracts as compared. Their respective correlations were also clearly showed phenolic contents with a curve of \( R^2 = 0.5025 \) as well as flavonoid contents \( R = 0.7089 \). Moreover, reasonable amount of phenolics and flavonoids contents determined the actions of individual plants, notably towards development of many valuable pharmaceutical products. Present findings do recommend further screening to know the valuable unknown compounds, mechanism of actions, which could be relieved and serve as bases of some synthesized antibiotics to control many infectious diseases or ailments.

Biography

Mr. Muhammad Salihu Abdallah is working at the Department of Microbiology, Yobe State University, Nigeria. His research areas include Medical microbiology, Phytomedicine, Medicinal plants, Antimicrobial chemotherapy. He has published many articles and attended various conferences. Currently, he is undergoing a PhD program at a University Putra Malaysia.

Antimalarial activity of Avicennia africana leaf (Avicenniaceae) in Plasmodium Berghei-infected Mice

Christian Kweku Adokoh
University of Cape Coast, Ghana

Abstract

Background: The emergence of widespread drug-resistance strains of the malaria parasites militates against strives for more potent antimalarial drugs.

Aim: The present study evaluated the antimalarial activity of Avicennia africana ethanolic crude extract (AAE) \textit{in vitro} and \textit{in vivo} against Plasmodium berghei-infected mice in anticipation of enquiring scientific evidence for it used by mangrove dwellers to treat malaria in Ghana.

Methodology: The pulverized dried leaves were extracted with 70% ethanol (v/v) and screened for phytochemicals using standard protocols. The \textit{in vitro} antimalarial activity was investigated against chloroquine-sensitive 3D7 \textit{P. falciparum} clones, using the SYBR® Green I fluorescent assay method using positive control Artesunate (50 to 1.56ng/ml). In the \textit{In vivo} studies, dose (200 to 1500mg/kg) of AAE were used in the 4-day suppressive and curative tests, using \textit{P. berghei}-infected mice. Artemether/lumefantrine (1.14mg/kg) and normal saline were used as positive and negative control respectively.

Results: The phytochemical analysis revealed the presence of alkaloids, saponins, flavonoids, glycosides, tannins, terpenoids and phytosterols. The extract showed an IC50 of 49.30±4.40µg/mL \textit{in vitro} and demonstrated 0.00±0.00 mean parasitaemia at dose 1500mg/kg \textit{in vivo} with a suppressive activity of 100% (p<0.0001) in the 4-day suppressive test. The extract confirmed high curative activity (p<0.0001) at 1500mg/kg with 100% parasite inhibition and the oral LD50 estimated to be greater than 5000mg/kg in rats.
Conclusion: The results of this study have demonstrated that *A. africana* crude extract has antimalarial activity both *in vitro* and *in vivo* confirming the traditional use of the plant to treat malaria by mangrove dwellers.

Biography

Dr. Christian K. Adokoh is a Senior Lecturer in the Department of Forensic Science, University of Cape Coast, Ghana. Dr. Adokoh’s research examines inorganic biomaterials, nano medicine and regenerative medicine, with an emphasis on developing new biomaterials especially carbohydrate moiety complexes and their nanomaterials for drug and targeted delivery applications. His laboratory research work mainly focuses on the use of carbohydrate moiety for the synthesis of ligand systems as stabilizers of nano composite, inorganic medicinal units as well as well-defined polymers as drug delivery agent. Currently, he has also been working on Natural Product Medicinal plant to isolate active molecules. He has published over 40 articles in peer-reviewed and high impact journals and reviewer to so many reputable journals.

Hepatoprotective and Antioxidant Activities of *Hibiscus sabdariffa* Petal Extracts in Wistar rats

Abba P. Obouayeba

Félix Houphouët Boigny University of Abidjan, Côte d’Ivoire

Abstract

*Hibiscus sabdariffa* is a medicinal plant rich in phytochemical compounds, which is the source of its biological properties. This study on the aqueous extract of *H. sabdariffa* (AEHS) was conducted to assess its hepatoprotective and antioxidant properties. It was carried out with 25 Wistar rats divided into five groups. Two groups were treated with a solution of NaCl 0.9 %. One group was treated with silymarin at a dose of 25 mg/kg body weight (BW). Two other groups were treated with the AEHS at different doses (100 and 200 mg/kg BW). The treatments were carried out via oral route and at single dose for 7 days. After injection of 2,4-dinitrophenylhydrazine (DNPH), blood samples were collected for the carrying out of biochemical analyses of oxidative stress markers (thiobarbituric acid reactive substances, ferric reduction antioxidant parameter, and 2,2-diphenyl-1-picrylhydrazyl) and hepatotoxicity (albumin, total and direct bilirubin, alanine transaminase, aspartate aminotransferase, and lactate dehydrogenase).

Three major results were obtained. The hepatotoxicity of DNPH expressed by the rats of Group 1 was significantly different (p<0.05) from those of the other groups (control, 2-4) for both hepatotoxicity and oxidative stress markers. The hepatoprotective and antioxidant properties of the AEHS and confirmation of those of silymarin through the rats of Groups 2-4 were statistically identical (p<0.05) to the control group for markers of hepatotoxicity and oxidative stress. These results confirm and reinforce certain therapeutic virtues of *Hibiscus sabdariffa*.

Biography

Dr. Abba P. Obouayeba is Assistant Professor of Biochemistry-Pharmacology at the Agrovalorisation Laboratory of Jean Lorougnon Guédé University of Daloa (Côte d’Ivoire). His research work falls within the general framework of medicinal plants for the health of populations. These works have been the subject of 20 scientific publications. He is a member of the editorial board of four (4) international journals and a reviewer of 20 international science journals. In addition, he is a member of the prestigious learned society: Society for Medicinal Plant and Natural Product Research.

Hepatoprotective Effect of Aqueous Extract of *Lippia multiflora* Leaves against Ethanol-induced Toxicity in Wistar Rat

Bouagnon Julie Jose Rita

Félix Houphouët Boigny University of Abidjan, Côte d’Ivoire

Abstract

Usually called Tea of Gambia, *Lippia multiflora* is traditionally used for its sedative, relaxing, febrifuge, anti-flu-
like, antispasmodic, hypotensive, anti-inflammatory, anti-catarrhal, mucolytic, anti-infective and hepatoprotective properties. The present study was carried out to evaluate the hepatoprotective effect of aqueous extract of *Lippia multiflora* leaves against ethanol induced toxicity in rat livers. Thirty Wistar albino rats (100-162 g) were divided into six groups of five animals. Group 1 served as control and received *per os* only distilled water. Group 2 received only 15% ethanol *per os* (3 mL/100 g body weight/day). Group 3 served as standard group and received silymarin *per os* (70 mg/kg b.w.). Groups 4, 5 and 6 served as extract treatment groups and received *per os* respectively 100, 300 and 900 mg/kg of *L. multiflora* aqueous extract. 15% ethanol (3 mL/100 g b.w./day) was administered 1h after treatment in groups 3, 4, 5 and 6. All treatment protocols followed 28 days. At days 7, 14, 21 and 28 of experimental period, blood samples were collected from retro- orbital venous plexus in non-heparinized tubes and the serum levels of liver marker enzymes, biochemical metabolites parameters were monitored. *L. multiflora* extract (300 and 900 mg/kg b.w.) provides significant protection (P<0.05) against ethanol induced toxicity in rat livers showed by reduction of enzymatic parameters activities (ALT, AST and GGT). Histopathological study shows a normal hepatic architecture in *L. multiflora* extract (300 and 900 mg/kg b.w.) groups compared to 15% ethanol group. Our results prove that *L. multiflora* extract has protective effects against ethanol- induced toxicity.

**Biography**

Dr. Bouagnon Julie José-Rita holds a PhD in Biotechnology-Biosafety-Bioresources option Pharmacology of natural substances obtained in 2016 at the University Félix Houphouët-Boigny Abidjan, Ivory Coast. Since February 2017, she has been a Research Associate at the Centre de Ressources Biologiques/Biobanque of the Institut Pasteur de Côte d’Ivoire with the mission of:

- Collect, prepare, make available and distribute biological resources,
- Elaborate strategies for the conservation and cultivation of the genetic material of medicinal species on small areas and define the needs for the acquisition of this genetic material,
- Train interested parties (students, health professionals) in biobanking techniques.

**Medicinal Plants and Liver Pathologies: Hepatoprotective Activity of Olax subscorpioidea and Distemonanthus benthamianus**

Konan Kouassi

Félix Houphouët Boigny University of Abidjan, Côte d’Ivoire

**Abstract**

Liver diseases are a serious public health problem. *Olax subscorpioidea* and *Distemonanthus benthamianus* are two plants used in traditional medicine in the treatment of many diseases including jaundice and hepatitis. The present study was carried out to assess the hepatoprotective potential of the hydro-ethanolic leaf extracts of these plants in carbon tetrachloride (CCl4)-induced hepatotoxicity in Wistar rats. To get there, plant extracts at doses of 25 and 100 mg/kg bw, and silymarin (25 mg/kg bw) were intraperitoneally (*i.p.*) injected once daily for 7 days to different groups of rats. Hepatotoxicity was induced on the 7th day in all the group animals except control. Rats were sacrificed on the 8th day and blood was collected. Serum biochemical parameters were measured using standard procedures. Histopathological examinations of liver rats were also performed. Hepatotoxicity induced with CCl4 was well manifested by significant increase in serum activities of ALT, AST, ALP and GGT, and enhancement of total bilirubin. On the other hand, the level of total protein, albumin and α1-globulin significantly decreased. Pretreatment with plant extracts prevent the toxic effects of CCl4 by decreasing serum enzyme activities and total bilirubin level. In addition, extracts of *O. subscorpioidea* and *D. benthamianus* raised the level of total protein and albumin in intoxicated rats, indicating a resumption of normal hepatocyte function in the latter. Histopathological observations showed almost normal hepatic cells with a mild degree of inflammation, lesser fatty infiltration and absence of necrosis among the rats treated at 100 mg/kg of extracts of both the plants.
Biography

Dr. KOUASSI Konan has PhD in Biotechnology-Biosafety-Bioresources, specialty Pharmacology of Natural Substances and is Assistant Professor at Félix HOUPHOÛET-BOIGNY University of Abidjan. He is a Research Associate at the Laboratory of Biology and Health, Unity of Biochemical Pharmacodynamics. The research activities carried out within this Unity are part of a vast program to promote medicinal plants through the evaluation of their pharmacological activities, their biotolerance, and the identification and isolation of their active ingredients. In this unity, Dr. KOUASSI Konan is responsible for studying the toxicity of plants from traditional medicine and evaluating their therapeutic and antioxidant properties.

Development of a Nanoemulsion of *Himatanthus sucuuba* Roots

**Maira Martins Haddad de Almeida**

Oswaldo Cruz Foundation (FIOCRUZ), Brazil

**Abstract**

*Himatanthus sucuuba* (Spruce) Woodson (Apocynaceae) is a tree indigenous to the Amazon region whose latex is used as an anti-anemic, anti-inflammatory, and anti-cancer. This work aims to develop a nanoemulsion with the extract from the roots of this tree.

Initially, the powered roots were extracted with hot distilled water for 10 hours, followed by filtration and lyophilization. For the preparation of the nanoemulsion, Milli-Q water and a mixture of surfactants (Tween 80 and Span 80) were heated until 75°C. After that, the surfactants were added into the water with magnetic stirring at 400 rpm and heating at 75°C for 30min. The mixture returned to room temperature and the sample was diluted in dimethylsulfoxide until the concentration of 1.1 mg/mL. Finally, the sample was added to the nanoemulsion solution through a Turrax homogenizer for 5 minutes.

The analysis was performed using Zetasizer apparatus; the sample was diluted in water, placed in a cuvette and read in triplicate. The three readings showed the following particle diameters: 278.6, 279.5, and 279.3 nm, with polydispersity values of 0.248, 0.261, and 0.285, respectively. These results showed that there was a formation of the nanoemulsion with good particle sizes on a nanometric scale and good homogeneity. The obtained nanoemulsion was used in *in vitro* tests against *Leishmania amazonensis* and showed an important inhibition value of LC50. More analyzes will be carried out to establish the activity and properties of this nanoemulsion.

Biography

Ms. Maíra Almeida holds a bachelor’s degree in Chemistry, and currently is a Master’s Student in Translational Research in Drugs and Medicines Program in the Institute of Drug Technology/ Oswaldo Cruz Foundation (FIOCRUZ), Brazil. Since 2018, her research involves medicinal plants and their derivatives, with a focus on finding new therapeutic alternatives for neglected diseases. The authors thank PROEP/CNPq nº 407856-0/2017.

Antiviral Effect of Essential Oils from Colombian Plants: *In Vitro* and Molecular Docking Analysis Revealed Potential as Primary Sources of Dengue Virus Inhibitors

**Lina Marcela Silva Trujillo**

Universidad Industrial de Santander, Colombia

**Abstract**

Essential oils (EOs) are used to prevent and treat viral infections, although not much have been explored on their potential to treat dengue (1). We analysed EOs from 11 medicinal plants grown in Colombia, which were obtained by microwave-assisted hydrodistillation method. The EOs chemical composition was analysed by gas chromatography coupled to mass spectrometry (GC/MS) (2). We used a cytopathic effect inhibition assay for determining the in-vitro
susceptibility of dengue virus (DENV) to antiviral action of EOs. We also performed a molecular docking simulations as protein-phytochemicals interactions play a vital role in drug design (3). The 3D structures of seven DENV proteins were obtained from the protein data bank and docked with 124 3D PubChem structures of EOs compounds by using Autodock Vina 1.5.6 software. The cell-based assays confirm that treatment of DENV with EOs reduces virus-induced cell death. Docking analysis revealed that sesquiterpenoids have potential interactions with DENV proteins, and ADME (Absorption, Distribution, Metabolism and Excretion) analysis indicated considerable medicinal properties with acceptable Lipinski’s rule of five for the compounds. Three sesquiterpenoids (trans-β-caryophyllene, bicyclogermacrene and dehydrofukinone) showed the best docking score for two (NS1 and NS5) DENV proteins and could be able to inhibit the viral replication. It can be concluded from this study that the presence of sesquiterpenoids could explain the antiviral effect of EOs, and they could serve as starting point for developing antiviral drugs for the treatment of dengue. Further in-vitro analyses are required to confirm efficacy and potency of anti-DENV effect of EOs and sesquiterpenoids.

Biography

Dr. Lina Marcela Silva Trujillo is currently working at Centro de Cromatografía y Espectrometría de Masas (CROMMASS) at Universidad Industrial de Santander, Colombia.

Inhibitory Effects Induced by *Vicia faba*, *Uncaria rhyncophylla*, and *Glycyrrhiza glabra* Water Extracts on Oxidative Stress Biomarkers and Dopamine Turnover in HypoE22 cells and Isolated Rat Striatum Challenged with 6-hydroxydopamine

Giustino Orlando

G. d’Annunzio University of Chieti Pescara, Italy

Abstract

Parkinson’s disease (PD) is the most common and progressive neurodegenerative and oxidative stress-related disorder, characterized by a dramatic loss of dopamine (DA) neurons in the nigrostriatal tissue. The first-line drug for PD treatment is represented by L-dopa, although clinical and preclinical studies pointed out the potential efficacy of medicinal plant- and food-derived antioxidants as brain protective agents. In this regard, the potential application of *Vicia faba*, *Uncaria rhyncophylla*, and *Glycyrrhiza glabra* extracts is of noteworthy interest, despite a lack of information in the scientific literature regarding their effect on striatal DA level.

The protective effects of *V. faba*, *U. rhyncophylla*, and *G. glabra* water extracts were investigated on HypoE22 cells and isolated rat striatum specimens challenged with 6-hydroxydopamine (6-OH-DA). The extract effects against lactate dehydrogenase (LDH), nitrites, and 8-iso-prostaglandin (PG)F2α were evaluated using either single-extract treatments or a treatment with a pharmacological association. Additionally, the turnover of DA was measured.

The pharmacological association of the extracts was the most effective in contrasting the upregulated LDH and nitrite levels and in reducing striatal DA turnover.

The present findings corroborate the rationale for the traditional use of *V. faba*, *G. glabra*, and *U. rhyncophylla* extracts, supporting their pharmacological association in order to improve their protective effects.

Biography

The pharmacological research activity of Dr. Giustino Orlando is focused on the following main research fields: Role of endogenous peptides on food intake and energy expenditure control; Protective effects of medicinal plants and extracts, with particular regards to inflammatory and neurodegenerative diseases; Pharmacology of central monoaminergic system; Optimization of preclinical pharmacological models for the study of the mechanism of action of drugs.
Prof. Giustino Orlando is co-author of 110 publications in peer-reviewed international journals. Currently, Prof. Orlando is also scientific responsible of several projects focusing on the study of the pharmacognostic and pharmacological properties of Cannabis sativa (industrial hemp) extracts and phytochemicals.

**Phenolic Content and Antimicrobial and Anti-inflammatory Effects of Solidago virga-aurea, Phyllanthus niruri, Epilobium angustifolium, Peumus boldus and Ononis spinosa Extracts**

Claudio Ferrante

G. d’Annunzio University of Chieti Pescara, Italy

**Abstract**

Prostatitis is an inflammatory condition that is related to multiple infectious agents, including bacteria and fungi. Traditional herbal extracts proved efficacious in controlling clinical symptoms associated with prostatitis. In this context, the aim of the present study was to explore the efficacy of extracts from S. virga-aurea, O. spinosa, P. boldus, E. angustifolium and P. niruri against bacterial (Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus cereus) and fungi strains (Candida albicans; C. tropicalis), involved in prostatitis. Additionally, anti-mycotic activities were tested against multiple species of dermatophytes (Tricholosporum rubrum, T. tonsurans, T. erinacei, Aspergillus crocatum, A. quadrifidum, A. gypseum, A. currey, A. insingulare), as well. Antioxidant effects were also evaluated in isolated rat prostate challenged with lipopolysaccharide (LPS), whereas phytochemical analyses were conducted to identify and quantify selected phenolic compounds, in the extracts. Finally, a bioinformatic analysis was conducted to predict putative human and microbial enzymes targeted by extracts’ phytocompounds and underlying the observed bio-pharmacological effects. The phytochemical analysis highlighted that rutin level could be crucial for explaining the highest antibacterial activity of P. boldus extract, especially against E. coli and B. cereus. On the other hand, in the E. angustifolium extract, catechin concentration could partially explain the highest efficacy of this extract in reducing lipid peroxidation, in isolated rat prostate stimulated with LPS.

Concluding, the results of the present study showed moderate antimicrobial and anti-inflammatory effects induced by water extracts of S. virga-aurea, P. boldus, E. angustifolium, P. niruri and O. spinosa, that could be related, at least partially, to the phenolic composition of the phytocomplex.

**Biography**

The pharmacological research activity of Dr. Claudio Ferrante is focused on the following main research fields: Role of endogenous peptides on food intake and energy expenditure control; Protective effects of medicinal plants and extracts, with particular regards to inflammatory and neurodegenerative diseases; Pharmacology of central monoaminergic system; Optimization of preclinical pharmacological models for the study of the mechanism of action of drugs.

Dr. C. Ferrante is co-author of more than 90 Scopus-indexed publications in peer-reviewed international journals. Currently, Dr. Ferrante is also scientific responsible of several projects focusing on the study of the pharmacognostic and pharmacological properties of Cannabis sativa (industrial hemp) extracts and phytochemicals.

**Therapeutic Effects of Eugenol in a Rat Model of Traumatic Brain Injury: A Behavioral, Biochemical, and Histological Study**

Bhagawati Saxena

Nirma University, India

**Abstract**

**Background and Aim:** Traumatic brain injury (TBI) results in death or long-term functional disabilities. Eugenol is demonstrated to be beneficial in a range of experimental models of neurological disorders via its anti-inflammatory
and antioxidant properties. Thus, the present study was designed to investigate the neuroprotective effects of eugenol in a weight-drop induced rat model of TBI.

**Experimental procedure:** Rats were assigned into five groups; control and TBI groups pretreated with vehicle, and three TBI groups pretreated with different doses of eugenol (25, 50, and 100 mg/kg/day, p.o., seven consecutive days). Except for the control, all other groups were subjected to TBI using Marmarou's weight-drop method. 24 h after TBI, locomotor functions and short-term memory were evaluated. Lastly animals were scarified and the estimation of lipid peroxidation in brain tissue, blood-brain barrier (BBB) integrity, brain water content (brain edema) and histopathology of the brain tissue were performed.

**Results:** Weight-drop induced TBI caused functional disabilities in the rats as indicated by impairment in locomotor activities and short-term memory. The TBI also resulted in augmented neuronal cell death designated by chromatolysis. The results also showed disruption in the BBB integrity, increased edema, and lipid peroxidation in the brain of the rats exposed to trauma. Pretreatment with eugenol (100 mg/kg) ameliorated histopathological, neurochemical, and behavioral consequences of trauma.

**Conclusion:** For the first time this study revealed that eugenol can be considered as a potential candidate for managing the functional disabilities associated with TBI because of its antioxidant activities.

**Biography**

Dr. Bhagawati Saxena is working as an Assistant Professor in the Department of Pharmacology, Institute of Pharmacy, Nirma University. Her area of research interest is investigation of new therapeutic targets for the treatment of various neurological diseases, Phytopharmacological screening, Toxicity and Pharmacokinetic studies. She has around 20 international publications in journals like Journal of Molecular Neuroscience, Pharmacological Reports, Chemico-Biological Interaction, Stress, Fitoterapia etc to her credit. She has attended various seminars, workshops and presented papers at the various national and international level conferences including the one at AAPS Annual Meeting and Exposition, New Orleans, USA and Singapore Pharmacy Congress. She has received the InSc-Young Researcher Award-2020 for publication in Journal of Molecular Neuroscience and Best Poster award at the conference of Recent Advances in Pharmaceutical Sciences at IIT (BHU), 2010.

**Propagation, Cultivation, Traditional Uses and Essential Oil Composition of Artemisia afra: A Review of Current Trends in South Africa**

**Babalwa Mpambani**

Dohne Agricultural Development Institute, South Africa

**Abstract**

Medicinal plants play an important role in the traditional health care system of South Africa. It is estimated that between 12 and 15 million or 60 % of South Africans used traditional remedies from as many as 700 indigenous plant species. The majority of these plants, including Artemisia afra, are collected from the wild. Artemisia afra is traditionally used for treating a variety of ailments such as coughs, colds, headaches, dyspepsia, loss of appetite, colic, whooping-cough, gout, asthma, malaria, diabetes, heart inflammation, rheumatism etc. The plant material is collected from the wild, which results in variations in supply and quality due to shortage of labour at certain times of the month, stage at which the plants are harvested, veld fires, etc. The intensive harvesting of A. afra plant material for commercial trade in South Africa poses a threat of extinction. To sustainably meet the demand and to mitigate threat of extinction, cultivation can be an option. However, cultivation is hindered by several constraints such as difficulty to propagate and lack of experience with proper cultivation requirements. Previous research findings on essential oil composition have shown that volatile secondary metabolites identified in A. afra vary in plants collected from different geographic regions. For example, artemisyl acetate was found to be the major constituent in Ethiopian oil, while 1.8-cineole was found to be a major constituent in Kenyan oil. In Zimbabwe, α- and β-thujone was the major constituent while only α-thujone was found to be the major constituent of South African oil. Studying the environmental conditions and agronomic practices from propagation to harvesting that influence yield and quality of A. afra is essential for successful cultivation.
Biography

Dr. Babalwa Mpambani is currently working as a Scientific Manager, Horticulture at Dohne Agricultural Development Institute, Eastern Cape, South Africa. She is also a registered PhD student with the University of Fort Hare. She has presented in many scientific platforms nationally and internationally on various aspects of medicinal plants. She is the member of South African Society of Horticultural Science, Indigenous Plant Use Forum and Society for Medicinal Plants for Economic Development.

HPTLC Phytochemical Screening and Biological Activity of Plants Used in Burkina Faso in the Regulation of Blood Sugar in Diabetics: Cases of Apium graveolens L. (Apiaceae), Cleome gynandra L. (Brassicaceae) and Hibiscus sabdariffa L. (Malvaceae)

Alphonsine Ramde-Tiendrebeogo

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Abstract

Diabetes mellitus is a socially significant disease characterized by chronic hyperglycemia and metabolic disorders of proteins, carbohydrates, and lipids due to reduced function of insulin. Medicinal plants, rich in bioactive components that promote prevention and treatment, are inexpensive and no side effects. Apium graveolens, Cleome gynandra, and Hibiscus sabdariffa from Burkina Faso were investigated for their phytochemical profile and antioxidant activities. The high-performance thin-layer chromatography profile revealed flavonoids, tannins, and sterols in these herbaceous. The Hibiscus sabdariffa methanolic extract exhibited the highest total phenolic (138.4 ± 0.5 mg GAE/g DW) and flavonoid (52.8 ± 0.6 mg RuE/g DW) contents comparatively to Cleome gynandra and Apium graveolens. Hibiscus sabdariffa methanolic extract also presented the highest antioxidant activity (IC50 = 0.31 ± 0.002 mg/mL) using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity assay. A high correlation between flavonoid contents and hydrophilic antioxidant activities (r = 0.99) was observed, indicating that flavonoids contribute significatively to these herbaceous antioxidant properties.

Apium graveolens, Cleome gynandra, and Hibiscus sabdariffa constitute a natural source of phenolic compounds that could be exploited in diabetes mellitus management.

Biography

Dr. Alphonsine RAMDE/TIENDREBEOGO is a Biochemist in the field of Natural Substances at the Institute for Research in Health Sciences (IRSS), of the National Center for Scientific and Technological Research (CNRST). His research contributes to enhancing the traditional pharmacopoeia and medicine used in Burkina Faso in the treatment of infectious diseases, sickle cell disease, inflammatory diseases, and diabetes. She is author of scientific publications and participates in the supervision of students at University Joseph Ki-ZERBO. Mrs. RAMDE / TIENDREBEOGO Alphonsine has been distinguished Knight of the Order of Academic Palms since December 11, 2018.

Adaptogens in E-commerce: Poland compared to the World Market

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Abstract

Adaptogens are plants containing active substances with properties that increase the body's ability to adapt to unfavorable, stressful conditions. They have been used for centuries, mainly in Asia. Recently, there has been growing interest in this group of herbs worldwide. Adaptogens include about 50 species of medicinal plants and several species of fungi. The aim of the study was to identify the adaptogens that are most popular among internet users in the world, and the adaptogens most often purchased by Polish customers on the Allegro platform and in online herbal stores. Fourteen plant and two mushroom species were selected for the analyses carried out with the following tools:
(1) Google Trends, which allows tracking the interest of people using Google with data collected from search engines, (2) TradeWatch, illustrating financial movements on the Allegro platform, (3) review of Polish online stores. It has been shown that the following adaptogens are currently popular in the world: *Withania somnifera*, *Bacopa monnieri*, *Panax quinquefolium*, *Uncaria tomentosa*, *Lepidium meyenii*, *Centella asiatica*, *Rhodiola rosea*, *Astragalus propinquus* and two species of fungi *Ganoderma lucidum* and *Cordyceps sinensis*. In Poland, the most frequently purchased adaptogens are: *W. somnifera* and *L. meyenii* and *R. rosea*, followed by *B. monnieri*, *U. tomentosa*, *Scutellaria baicalensis*, *C. asiatica*, *G. lucidum* and *C. sinensis*. Of these, only *R. rosea* and *S. baicalensis* are grown in Poland. From January 2020, a systematic increase in sales of products based on raw materials from most of the analyzed species has been observed in Poland.

**Biography**

Dr. Jadwiga Andrzejewska is Professor of Crop Science at University of Science and Technology in Bydgoszcz, Poland. Her research interests are on cultivation and market of medicinal plants, characterization of their active properties and their use. She has published 23 papers and three books on medicinal plants and their properties. She developed and teaches a university course on medicinal plants and a short-course for the general public.