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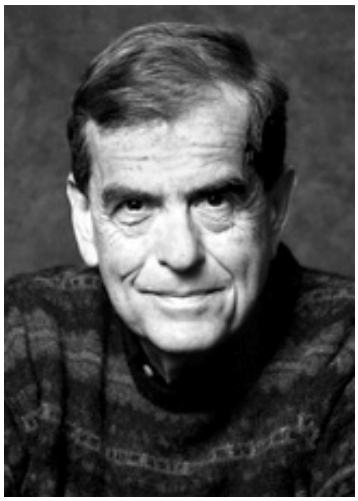
PLENARY LECTURES

INTRACELLULAR PROTEIN DEGRADATION: FROM A VAGUE IDEA THRU THE LYSOSOME AND THE UBIQUITIN-PROTEASOME SYSTEM AND ONTOHUMAN DISEASES AND DRUG TARGETING

Aaron Ciechanover, Nobel Laureate in Chemistry, Israel



Between the 1950s and 1980s, scientists were focusing mostly on how the genetic code is transcribed to RNA and translated to proteins, but how proteins are degraded has remained a neglected research area. With the discovery of the lysosome by Christian de Duve it was assumed that cellular proteins are degraded within this organelle. Yet, several independent lines of experimental evidence strongly suggested that intracellular proteolysis is largely non-lysosomal, but the mechanisms involved had remained obscure. The discovery of the ubiquitin-proteasome system resolved this enigma. We now recognize that ubiquitin- and proteasome-mediated degradation of intracellular proteins is involved in regulation of a broad array of cellular processes, such as cell cycle and division, regulation of transcription factors, and assurance of the celular quality control. Not surprisingly, aberrations in the system have been implicated in the pathogenesis of many human diseases, malignancies and neurodegenerative disorders among them, which led subsequently to an increasing effort to develop mechanism-based drugs, one is already in use.

Graduated from the Hadassah Medical School, Hebrew University of Jerusalem (1972). PhD from the Technion Institute of Israel (1981) and postdoctoral studies at the Massachusets Institute of Technology (1984). Full Professor at the Dept. Biochemistry, Faculty of Medicine, Tecnion Institute of Israel since 1992. Nobel Laurate in Chemistry (2004) for his pioneer work on extracelular protein degradation and the role of the ubiquitin-proteasome system. He his Visitng Professor at recognizd Universitis all over the world.

PRIMARY HEALTH CARE: INTEGRATIVE MEDICINE AND REGULATORY FRAMEWORK

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One of the main objectives of the alternative medicines is related to its implementation in Primary Health Care (PHC) programs. To allow that to happen, it is essential that each country has a legislation that provides for and approve the practices of each of the disciplines that make up. At the time, few countries have legislated on these aspects, highlighting the cases of Brazil, Chile, Peru and Argentina. One of the first difficulties lies in establishing which disciplines must be approved and which are not. In this regard, the World Health Organization has published a series of valuable documents, which have been placed at the consideration of the different countries.
These documents have also revealed aspects of teaching, that should be established for the training of health professionals in these areas. While there is consensus in disciplines of very long tradition, such as the Ayurvedic Medicine, Traditional Chinese Medicine, Phytomedicine, Balneotherapy and the Naturopathy, still others are the subject of debate, as is the case for example with Homeopathy, Indigenous Medicine and certain body therapies. In the same manner, is also necessary to rethink the concepts of “traditional medicine” and “evidence-based medicine”. This conference attempts to do an update on legislation, education and practice in PHC, of the different disciplines in Latin America that make up the integrative medicine. I hope that in the future, we will not speak more of different medicines, because “medicine is only one: that prevents and cures”. Or in any case, we will talk about “effective and not effective medicines”.

1. WHO (2015). WHO Traditional Medicine Strategy (2014-2023).
2. WHO (2010) General Guidelines for Methodologies on Research and Evaluation of Traditional Medicine. Geneve.

Graduated in Medicine from the University of Buenos Aires (UBA). Director of Postgraduate Courses, Faculty of Medicine UBA. Director of courses in the Pharmaceutical College of Buenos Aires. He has published more than thirty papers. Author of the textbooks “Tratado de Fitomedicina”, and “Medicinal Plants from Argentina to Primary Health Care”. Guest Professor of Universities from Chile and Argentina. He was Director of the Official Program “Harvesting the Health” in Primary Health Care in Argentina (2003-2006).

FOODOMICS: NATURAL INGREDIENTS AND FOOD IN THE POSTGENOMIC ERA

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In this work, we will present some of the latest Foodomics results obtained in our laboratory 1-8 to investigate the possibilities of Foodomics in Alzheimer's disease studies and to determine the anti-proliferative effect of natural polyphenols against different human cancer cell lines. Whole-transcriptome microarray, proteomics and MS-based non-targeted whole-metabolome approaches were employed to carry out the mentioned studies. These Foodomics strategies enabled: i) the identification of biomarkers for early detection of Alzheimer's disease which should allow to investigate the effect of natural compounds on this illness, and ii) the identification of several differentially expressed genes alone and/or linked to changed metabolic pathways that were modulated by natural polyphenols in cancer cells, providing new evidences at molecular level on the antiproliferative effect of natural compounds that are part of our diet.

1. Cifuentes A et al. Rosemary polyphenols induce unfolded protein response and changes in cholesterol metabolism in colon cancer cells. J. Funct. Foods 2015, 15: 429-439
2. Cifuentes A et al. Comprehensive Foodomics study on the mechanisms operating at various molecular levels in cancer cells in response to individual rosemary polyphenols. Anal Chem 2014, 86:9807-9815
3. Cifuentes A (Ed): Foodomics: Advanced Mass Spectrometry in Modern Food Science and Nutrition. John Wiley & Sons; 2013. ISBN: 9781118169452
4. Cifuentes A et al. Present and Future Challenges in Food Analysis. Foodomics. Anal Chem 2012, 84:10150–10159
5. Cifuentes A et al. Foodomics: MS-based strategies in modern food science and nutrition. Mass Spec Rev 2012, 31:49–69.
6. Cifuentes A et al. Towards a Predictive Model of Alzheimer's Disease Progression Using Capillary Electrophoresis-Mass Spectrometry Metabolomics. Anal Chem 2012, 84:8532−8540
7. Cifuentes A et al. A new metabolomic workflow for early detection of Alzheimer's disease. J Chromatogr A 2013, 1302:65-71
8. Cifuentes A et al. Global Foodomics Strategy to Investigate the Health Benefits of Dietary Constituents. J Chromatogr A 2012, 1248:139-153

PhD from the University of Valladolid, Spain (1992). Head of Foodomics Laboratory. Institute of Food Science Research (CIAL). Research Council of Spain (CSIC), Madrid. He has published more than 200 scinetific papers, 20 books and book chapters and 6 patents. He holds several awards and is member of the Editorial Board of several international journals. He has defined for the first time in a SCI journal the new discipline of Foodomics. His research interests includes advanced analytical methods development for Foodomics, food quality and safety, as well as isolation and characterization of natural bioactive compounds.

A NEW FLUORINE BIOCHEMICAL SPACE IN TARGETED CANCER THERAPY

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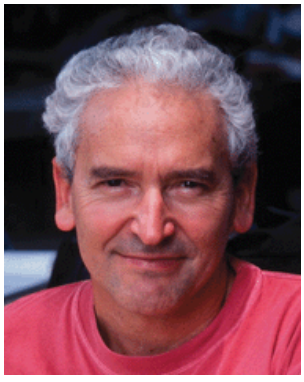
In the majority of fluorine-containing therapeutic drugs, it is the metabolic stability of the C-F bond what motivates the pursuit of fluorine replacement strategies. And in the vast majority of these cases, it is the aromatic C-F bond or the aromatic CF3 group what matters most to medicinal chemists. Therefore, with few exceptions, the biochemical space of fluorine has been limited to mostly aromatic or heteroaromatic substitutions, especially in the fight against cancer. Despite advances in our understanding of the molecular mechanisms that drive cancer, translating this progress into safe and effective therapies is still a challenge--an estimated 80% of oncology drugs entering Phase I clinical trials will not make it to market. Our efforts to study the anticancer properties of non-aromatic fluorinated compounds led to the recent discovery of a difluoropropargyl-containing small molecule (XB05), with potent antiproliferative and cytotoxic activity in vitro. Evaluations of BX11, an optimized analog of XB05, indicate that this agent not only showed GI50 values that were <100 nM against prostate and other cancer cell lines, but it also had in vivo antitumor efficacy with no evidence of toxicity. Moreover, we have identified that BX11's inhibition of DNA methylation might be what may be contributing to its effects. Whereas DNA methylation is already an established target for intervention in cancer, BX11 is completely different from existing agents. Very recently, our work has led us to hypothesize that cellular response to BX11 depends on levels of SOX9 expression. Our presentation will provide an update on the chemical and biological studies.

Bibliography: G. B. Hammond, B. Xu, P. J. Bates. "*Substituted alkyne derivatives as anticancer agents*" U.S. Patent 8,207,381.



Graduated from the Pontificia Universidad Católica del Perú. Ph.D from the University of Birmingham, England. Professor of Chemistry, University of Louisville, USA. He has authored 150 publications and 6 patents. His research interests include novel synthetic methodologies involving gold catalysis and organofluorine chemistry, natural products isolation and drug discovery. Recently he was awarded as Distinguished Fulbright Chair (2013).

INHIBITING THE HIV INTEGRATION PROCESS: PAST, PRESENT, AND THE FUTURE

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HIV integrase (IN) catalyzes the insertion into the genome of the infected human cell of viral DNA produced by the retrotranscription process. The discovery of raltegravir validated the existence of the IN, which is a new target in the field of anti-HIV drug research. The mechanism of catalysis of IN is depicted, and the characteristics of the inhibitors of the catalytic site of this viral enzyme are reported. The role played by the resistance is elucidated, as well as the possibility of bypassing this problem. New approaches to block the integration process are depicted as future perspectives, such as development of allosteric IN inhibitors, dual inhibitors targeting both IN and other enzymes, inhibitors of enzymes that activate IN, activators of IN activity, as well as a gene therapy approach.

Bibliography. R. Di Santo. *J Med. Chem* 57: 539-566, 2014.

Graduated in Chemistry, University of Rome (1986), PhD in Medicinal Chemistry, University of Rome (1990). Full Professor in Medicinal Chemistry, University of Rome. He has published more than115 papers and patents. His present research interests are focused on chemotherapeutic agents: in particular antivirals, antitumorals, compounds active in the CNS, and nitrogen and sulphur heterocycles. He has an extensive collaboration with Pharma Companies

VITAMIN A DEFICIENCY SYNDROME- WAY BEYOND VISION

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Vitamin A is critical throughout life. Together with its derivatives, it regulates diverse processes including reproduction, embryogenesis, vision, growth, cellular differentiation and proliferation, maintenance of epithelial cellular integrity and immune function Vitamin A deficiency is a major public health problem worldwide that contributes significantly to the global burden of disease. It is the leading cause of preventable blindness in young children, as well as the promoting factor for disease and death from severe infections. An estimated 250 million preschool children are Vitamin A deficient in endemic areas. Often the prevalence of VAD is determined by economic constraints, sociocultural limitations, insufficient dietary intake, and poor absorption, leading to depleted vitamin A stores in the body. The cycle of VAD begins with reduced taste ability which leads to decrease in food intake. Reduced intake along with impairment in absorption and digestion may lead to malnutrition and may increase the risk for inflammation. As the VAD deepens, disturbed bone development and vision can be witnessed. This can damage growth in early age and reproduction later on. VAD can reduce immune system's ability to protect the body through direct interaction or through the microbiome, an entity which also affects vitamin A metabolism in a different manner. Recent work has shown that vitamin A acts not only through genetic but also through epigenetic mechanisms among other ones. In this talk I shall also present a series of studies from our lab involving humans as well as in animal and cell line models on vitamin A deficiency syndrome.

Graduated from the Hadassa Medical School, did his residency in Pediatrics in Jerusalem, and a dual fellowship in Pediatric Gastroenterology and Nutrition in Sick Kids Toronto, Canada. Head of the School of Nutritional Sciences, Hebrew University is currently the Research Director of the Research Center for Nutrigenomics and Functional Foods. He has published more than 110 peer-reviewed papers and 60 students graduated from his lab. He is a member of international and national committees in nutrition and health related subjects, and is a senior consultant to the food industry and to governmental authorities. His vision is to carry out research that translates to helping alleviate malnutrition and contributes to better nutrition and health of mothers and children

CHEMICAL AND BIOLOGICAL STUDIES OF PLANTS BELONGING TO ECUADORIAN FLORA

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In Ecuador, medicinal plants are largely used by local people, although for the most part of species, there is not enough scientific information or an ecological profile that could help to find the best conditions to produce sufficient raw material and to satisfy the existing demand1. Most of the time the collection of the species is carried out directly by consumers, as in the case of indigenous people for daily consumption. The whole plant could be used or commercialize as raw material, or in parts, pulverized, as extracts or as semi-synthetic substances. People use medicinal plants for infusions, to treat different sickness as headache, back pain, skin illness, or among others as antibiotics or antifungal remedies. This is why it becomes indispensable to improve the research of Ecuadorian medicinal plants, to conserve the species and their habitats, use and trade, in order to benefit the population's health. It's also important to study the chemical content of these species, to better understand their properties and encourage an appropriate consumption and use of herbal drugs and their products2. To discover biologically active secondary metabolites from Ecuadorian plants some unstudied species belonging to different families were collected: Bidens humilis (Kunth) (Asteraceae), Andromachia igniaria (Humb.& Bonpl.) (Asteraceae), Euphorbia laurifolia (Juss. Ex Lam.) (Euphorbiaceae), and Clinopodium tomentosum (Kunth) Harley (Lamiaceae), all growing in the zone of Cordillera de los Andes, where species are the most requested by local inhabitants. Plants were selected for their chemotaxonomic, phylogenetic and traditional medicine features. Then, the dried materials were extracted with solvent of increasing polarity, and fractionated to isolate and characterize secondary metabolites. Compounds belonging to different classes of secondary metabolites such as phenolics, diterpenes and flavonoids, including some new derivatives, were identified with the aim of NMR spectroscopy and mass spectrometry. Biological assays were also carried out for some new flavonoids isolated from B. humilis3 and A. igniaria, and diterpenes from E. laurifolia4.

1- Buitrón C X. *TRAFFIC international,* 1999.
2- Rosén J, et al. *J. Med. Chem*. 52, 1953-1962, 2009.
3- Vera Saltos M B,et al. A. *Planta Med*. 2015, in press (DOI: 10.1055/s-0035-1545928).
4- Braca A, et al. *Planta Med*. 2014, 80, P1L73 (DOI: 10.1055/s-0034-1394730).

She has a PhD at Pisa University. Associate Professor in Pharmaceutical Biology at the Department of Pharmacy, University of Pisa, and Director of the Degree Course in Herbal Sciences. She has published more than 125 papers on international journals. Her main field of research is natural products chemistry, phytochemistry, and medicinal/food plants used in folk medicine of European, Latin American, African and Asian countries. She won the Egon Stahl Award in Silver 2007 of the Society for Medicinal Plant Research (GA).

A NEW STRATEGY FOR THE PREVENTION OF CLOSTRIDIUM DIFFICILE INFECTIONS

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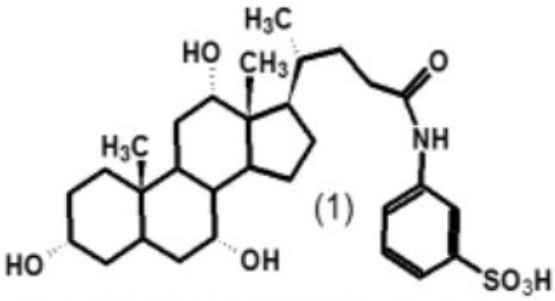
Clostridium difficile infection (CDI) is a leading cause of antibiotic-associated diarrhea,a major nosocomial complication. In the U.S., there are over 500,000 cases of CDI annually, with a mortality rate of up to 2.5% and costs up to $3.2 billion. Spores, the infectious form of C. difficile, do not cause disease but germinate into toxin-producing cells in the microbiota-depleted gut of patients. Because C. difficile spore germination is required for symptomatic infection, anti-germination approaches could lead to the prevention of CDI. To understand the signals necessary to trigger spore germination we used a combination of kinetic models and molecular probes. Within our molecular probes library we identified bile salt analogs that inhibit C. difficile spore germination in vitro and in vivo. We found that a single 50 mg/kg dose of CamSA (1), was sufficient to prevent CDI in mice without any observable toxicity. We further characterized CamSa's in vitro stability, distribution, and cytotoxicity. Our data also suggests that CamSA will not be systemically available, but instead will be localized to the GI tract. Several experiments support a mechanism whereby the anti-germination effect of CamSA is responsible for preventing CDI signs in mice. We estimated that C. difficile spores germinated and established infection less than 10 hours after ingestion. Ingested C. difficile spores rapidly transited through the GI tract and accumulated in the colon and cecum of CamSA-treated mice. We further tested CamSA as a CDI prophylactic in the hamster model of CDI. CamSA treatment alone doubled the time to death of infected animals. This is the first report of using molecular probes to both prevent CDI and obtain disease progression information for C. difficile infection. This approach represents a new paradigm in CDI treatment.



CamSA (1) is a synthetic cholic acid analog with an *m*-aminobenzenesulfonic acid side chain

Graduated from the Universidad Autónoma de Santo Domingo (1992), PhD from the University of Washington (1997) and postdoctoral studies at the Pennsylvania State University (2001). Full Professor at the University of Nevada, USA. He has authored more than 40 scientific articles and 2 patents. His research interest include techniques for evaluating spore germination and chemical probes for test binding sites of Ger receptors in spores. CamSA (1) is a synthetic cholic acid analog with an maminobenzenesulfonic acid side chain

INTEGRATING PLANT PRODUCTS INTO CONVENTIONAL ANTITHROMBOTIC TREATMENTS: A CURRENT CHALLENGE

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Atherosclerosis is a silent and chronic inflammatory process at the artery wall. A procoagulant state may occur after atherosclerotic plaque rupture and provoke acute atherothrombotic events, which are among the first causes of death in many countries. Antiplatelet agents are prescribed to prevent these diseases. However, the efficacy of currently available drugs is limited. Furthermore, inter-individual differences of the responses to these drugs are well demonstrated. Therefore, other effective, safe and lowcost therapeutic options are needed. Platelet inhibiting activity of the extracts manufactured from botanical species like Citrus aurantifolia Ch., Citrus sinensis L. Morinda citrifolia L. and Sacharum officinarum L. suggests that antithrombotic drugs could emerge from plants used in traditional medicine and be integrated into conventional medical practices. The analysis of the effects of Policosanol (a sugar cane wax derivative) on platelet reactivity of atherosclerotic patients provides an example and suggests that its medical prescription may be a useful approach. People´s interest on the utility of natural products for managing different illnesses is growing worldwide. However, doctors' involvement in this phenomenon is low thus, limiting the rational integration of pharmacologically validated herbal preparations into conventional treatments and the generation of the necessary clinical evidences. Consequently, changing this contradictory situation is a current challenge. Adding these topics to the programs for medical studies could contribute to this purpose.

1- Hall R , Mazer CD. *Anesth Anal*g. 2011; 112: 292–318, 2011.
2- Garcia Mesa M, et al. *Rev Bras Farmacog*. 2011; 21: 884-88, 2011.
3- Rodeiro I, et al. *Drug Metabol Drug Interact.* 27(1):57-60, 2012.
4- García-Lazo G, et al.*Rev Cub Plantas Med*. 20 (2), 2015 (In Press)
5- Ramírez-Beltrán R, et al. *Rev Cub Plantas Med*. 20 (1), 2015. (In Press)

PhD with postdoctoral studies at Boujon Hospital (Paris) and the School of Medicine, University of Vermont (USA). She is a Professor of Clinical Biochemistry and Pharmacology, University of Havana, and Senior Researcher, University of Medical Sciences of Havana. The pharmacological evaluation of natural products is her main research field. Reviewer of several reputed journals. She has published more than 60 articles.

SESSION LECTURES

ADVANCES IN CHEMICAL CHARACTERIZATION OF ANTIPROLIFERATIVE CONSTITUENTS FROM SONORA PROPOLIS

C. Velázquez

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Propolis is a resin and cereous substance produced by honeybees from the collection of exudates present in different plant structures [1-3]. Propolis possesses broad pharmacological activities, including antioxidant, antibacterial, antiparasitic, antifungal, anti-inflammatory, and antiproliferative activity on cancer cell growth [1-5]. Previously, we found that the chemical composition of Sonoran propolis (SP) is mainly comprised by flavonoids, being pinocembrin, chrysin and pinobanksin-3-O-acetate the most abundant constituents in SP [3]. More recently, we found in SP two different families of esterified derivatives of pinobanksin and pinobanksin-5-methylether. Herein, we reported the chemical isolation and structural determination by 1H, 13C and 2D NMR techniques of four new compounds in SP: 5,7-dihydroxyisoflavanone, kaempferol-4'-methylether, galangin-3-methylether and quercetin-3',4'-dimethylether. Additionally, we evaluated the antiproliferative activity of those compounds by MTT assay on M12.C3.F6, HeLa and A549 cancer cell lines, using ARPE-19 as a normal control cell line. Kaempferol-4'-methylether and quercetin-3',4'-dimethylether showed a significant inhibitory effect on M12.C3.F6 (15.7 ± 2.2 and 31.3 ± 2.4 μM, respectively) and HeLa (15.3 ± 0.4 and 17.4 ± 6.7 μM, respectively) cells. Those compounds did not induce a significant effect on A549 (159.6 ± 13.0 and 253.0 ± 16.1 μM, respectively). Kaempferol-4'-methylether induced in treated cells morphological changes similar to those induced by SP. Galangin-3-methylether and 5,7-dihydroxyisoflavanone did not induce any inhibitory effect on cell lines tested. Only quercetin-3',4'-dimethylether exhibited activity against ARPE-19 normal cells (55.0 ± 7.2 μM). These results increased our knowledge about the chemical composition of SP and its antiproliferative effect. At present, 32 chemical compounds have been identified in this natural product.

Bibliography

1. A.L. Piccinelli et al. J. Agric. Food Chem. 61 (2013) 5080-5088..
2. J.M. Sforcin, V. Bankova. J. Ethnopharmacol. 133 (2011) 253-260.
3. D. Valencia et al. Food Chem. 131 (2012) 645-651.
4. S. Alday-Provencio et al. Planta Med. (2015) DOI: 10.1055/s-0035-1545982.
5. D. Sawicka et al. Folia Histochem. Cytobiol. 50 (2012) 25-37.

Biography

PhD in Cell biology/Immunology, CINVESTAV/IPN. Researcher and Professor, Dept. Chemistry-Biology, University of Sonora. He has published 35 papers in peer review journals. His present field of research is immunology/parasitology, cell biology, natural products and cancer.

CHEMICAL COMPOSITION AND IN VITRO BIOLOGICAL ACTIVITIES OF THE ESSENTIAL OIL FROM LEAVES OF PEPEROMIA INAEQUALIFOLIA RUIZ & PAV

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The Peperomia inaequalifolia Ruiz & Pav is a medicinal aromatic plant from Ecuador, known commonly as “congona”, widely appreciated for its pharmacological attributes. The chemical study revealed the presence of 16 components, 15 of which were identified, such as safrole (28,795%), isopropyl palmitate (21,451%), 11-αH-himachal-4-en-1-β-ol (19,594%) and myristicin (15,621%). The antiradicalar (DPPH and ABTS test) and antioxidant (PCL) activity studies showed that the oil possesses an interesting activity, lightly lower to the natural reference, the T. vulgaris essential oil. The bioautographic activity showed that the oil’s major components were responsible for such activity. The MIC results showed that the oil has very interesting antimicrobial and antifungal properties, particularly against Gram+ bacteria (Staphylococcus aureus subsp. aureus ATCC 6538 and Streptococcus mutans ATCC 25175) and two yeasts (Candida tropicalis ATCC 13803 and Candida albicans ATCC 10231).

COMPOSITION-ANTIFUNGAL ACTIVITY RELATIONSHIPS OF UNFRACTIONATED EXTRACTS OF SEVERAL PIPER SPECIES EVALUATED THROUGH METABOLIC PROFILING.

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Some plant pathogens such as Fusarium oxysporum generate considerable losses in economically important crops such as the Cape Gooseberry (Physalis peruviana), since this pathogen produces vascular wilt, requiring regularly control alternatives [1]. Member organisms of the Piper genus are widely distributed in tropical regions and they are also known to produce metabolites with
biological activity against infectious agents as well as antitumor and antioxidant properties. Its phytochemistry has been extensively studied determining that species of this genus are rich in bioactive compounds such as alkaloids, flavonoids, and benzoic acid derivatives [2]. As part of our research on antifungals, several organs of eight species of the Piper genus (leaves, roots, stems and inflorescences) in central Colombia were collected, dried and subjected to maceration in ethanol. The resulting extracts were evaluated on total phenols (between 0.8 and 4.0 mg GAE/gDE) and total flavonoid (0.6 to 2.0 mg QE/gDE) contents, and the in vitro antifungal activity against the growth of F. oxysporum. The unfractionated extracts exhibited reasonable mycelial inhibition at different levels (IC50 < 10 ppm). Each extract was further characterized by LC-DAD-ESI-MS. The correlation by multivariate discriminant analysis (OPLS and PLS-DA) allowed identifying a
composition-antifungal activity relationship characterized by extracts with interesting components (mainly chromenes). These results based on statistically-discriminated bioactivity will be useful in future isolation processes of the Piper-derived antifungals.

Acknowledgement: The present work was funded by Vicerrectoría de Investigaciones at UMNG through project INV-CIAS-1788- Validity 2015.

Bibliography

1. Enciso-Rodríguez FE et al., PLoS One. 2013, 8(7):e68500; [2] Johann S et al., Mycoses. 2009, 52:499-506.

Biography

Prof. Dr. E. Coy-Barrera works at MU Nueva Granada, Colombia. Head and Senior Researcher, Bioorganic Chemistry Laboratory. He has published more than 45 papers in reputed journals. His current research is focused on natural product chemistry, organic synthesis, medicinal chemistry, molecular modeling, chemoinformatics, and plant metabolomics.

ETHNOPHARMACOLOGICAL STUDY OF JATROPHA CURCASSEEDS: TRADITIONAL DETOXIFICATION AND ANTIMYCOBACTERIAL ACTIVITY

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Associação de Comunidades Remanescentes de Quilombos do Município de Oriximiná, Oriximiná-PA, Brasil.

Jatropha curcasseeds are known for their toxicity, especially by the presence of phorbol esters(PEs),which are able to promotetumorseven at very lowconcentrations. Inthe Quilombola Communities from the Brazilian Amazon, it was verified the wide medicinal use of these seeds against pneumonia and tuberculosis (Oliveira et al., 2011), afterperforming atraditional process ofdetoxification. This traditional usemotivated us to investigate the antimycobacterial activity, PEs content and in vitrotoxicity of different parts of J. curcas seeds and of the traditional preparation called “peão-branco milk”.According with the quilombola method to reduce toxicity, seeds were separated into testa, inner “peel”, endosperm and embryo, and subjected separately tomethanolicextraction in Soxhlet, followed by evaporationof the solvent under reducedpressure. To obtain the “peão-branco milk”, endospermswere triturated withwater, filteredand lyophilized. The filtered residue was also subjected to a methanolic extraction.PEscontents were analyzed by HPLC/DAD whereas thein vitrotoxicity was observed through the viability of isolated macrophages and
splenocytes, maintained in different samples concentrations for 72h. Antimycobaterial activity was evaluated against M. tuberculosis. As a result, the higher PE content was found in theinner peel (12.33 mg/g), which wascircathree times that one found in the endosperm (3.94 mg/g). Testa (0.15 mg/g) and cotyledon (0.33 mg/g) showed low PEs content when compared to other parts and to the whole seed (3.18 mg/g). The lowest concentration was found for the“milk”(0.01mg/g) andits extractionresidue(0.10 mg/g). Furthermore, the “milk” showed no cell toxicity, resulting in 100% cellviability at allconcentrations (0.1-200ug/ml) in the cytotoxicity assay. Endosperm and inner peel of seeds presented antimycobacterial activity at 200 µg/ml. Thus, we can conclude that the traditional quilombola detoxification process was effective in reducing the PEs and toxicity in seeds, and still has antimycobacterial activity, consistent with the traditional indication of use.

Bibliography

Oliveira D. et al. *Braz. J. Pharmacogn*. 2011, 21:793 -806.

Biography

PhD from the Federal University of Rio de Janeiro. Junior researcher, Pharmacy College, UFRJ. He has published 20 papers in reputed journals. His present field of research is ethnopharmacology, ethnobotany, herbal medicines legislation, public policies applied to herbal medicines, access to genetic heritage, traditional knowledge associated and benefit sharing.

FEASIBILITY STUDY ON THE PASSITO WINES DISCRIMINATION BY AN E-TONGUE

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The passito wines are a cultural and territorial heritage of Calabria (South of Italy). Here, three passito wine are produced from dried grapes of autochthonous vine: Greco di Bianco PDO, Mantonico IGT and Moscato di Saracena. Wine sensory attributes, closely tied not only to aromatic volatile compounds but also to the chemical composition (pH, total and volatile acidity, polyphenolic compounds), are crucial to determine consumer approval. The acidity in wine is an important component in the quality and taste. The amount of total acidity, refers to all acids, in wine tasting, refers to the fresh and sour attributes which are evaluated in relation to the sweetness and bitter components of the wine (i.e. phenolics). The electronic tongue is based on similar principles to the human tongue. It is able to discriminate the five different tastes - sweet, salty, bitter, acidic and umami (savoury) - and it is sensitive to multiple substances that determine taste and flavour of wine. The final aim of this research line was the optimization of the device to detect passito wine fraud. In this work was tested potentiality of the e-tongue for passito wine quality classification. The analyses were performed with the α-Astree electronic tongue (Alpha MOS company), that consisted of seven different liquid cross-selective potentiometric sensors and an Ag/AgCl reference electrode. The sensor responses were evaluated using discriminant function analysis (DFA). The e-tongue data were validated by means of conventional chemical methods for the determination of the main wine chemical parameters. The electronic tongue was able of distinguishing the passito wines from different geographical areas as well as the passito wines produced at different vintage. Thus, the instrument can be used for fast identification of passito wines.

Acknowledgement: Italian Government, European Commission and Calabria Region (Project Enotria Tellus – Agenda Strategica). Ccontributions of bers of the research team at Technological Laboratory “Quality, Food Safety and New Technologies” Quasicatec, Ministry of Research and University (MIUR).

Bibliography

1. Rudnitskaya, S.M. et al. *Anal Chim Acta* 662 (2010) 82–89
2. Gutiérrez J.M. et al.*Microchim Acta* 169 (2010) 261-268

SECUROLIDA: FROM AN IMPROBABLE MEDICINE TO A POSSIBLE ANTINEOPLASTIC. PHARMACEUTICAL DEVELOPMENT OF A NEW NATURAL MEDICINE

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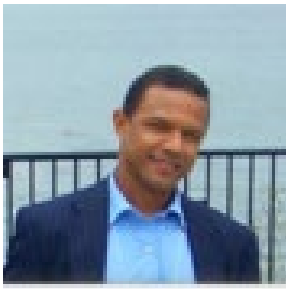
The pharmaceutical industry, in a sustained manner, for decades has been representing one of greater thrust business activities globally and the Dominican Republic is no exception. Although the growth of the Dominican pharmaceutical industry has been based in the development of drugs with active substances released from the intellectual property protection. The present work shows the path you need to explore in the development of a drug, whose active ingredient is under own patent. Shows also the exercise of years of laboratory Magnachem, a visionary company that has managed to achieve an important number of the stages to develop BIOSEC, a new drug whose active ingredient is SECUROLIDA, a novel molecule that this laboratory has developed into the world of the antineoplastics.



PhD in Organic Chemistry, at the University of La Laguna, Spain (1994). Post-doctoral studies at the High Scientific Research Council (CSIC), Spain, and the Canary Islands Institute of Agrobiology. He is currently researcher at the National Evangelic University, Dominican Republic. Member of the Academy of Sciences of the Dominican Republic. He holds 3 US patents and has published 8 articles and 1 book, with more than 20 presentations at scientific meetings in several countries.

EVALUATION OF THE HYPOCHOLESTEROLEMIC EFFECT IN WISTAR RATS OF AGAVE ATROVIRENS SAP.

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Aguamiel is the sap from agave, rich in carbohydrates, amino acids, vitamins and minerals. Since pre-hispanic age, it has been used in the production of an alcoholic beverage called pulque. An alternative use of aguamiel is using its beneficial effects on diseases such as gastritis and its suggested properties to decrease cholesterol and glucose in blood. Therefore, in this study the hypocholesterolemic effect of the aguamiel of A. atrovirens in a murine model were evaluated. The physico-chemical properties of sterilized aguamiel, such as moisture content, pH, °Brix, and total proteins, aminoacids, minerals, vitamins, carbohydrates as glucose, sucrose and fructooligosaccharides (FOS) were determined. The hypocholesterolemic effect was evaluated by determining the lipid profile (total cholesterol, triglycerides, HDL and LDL), glucose leptin and insulin in Wistar rat administered with aguamiel (FOS 100 and 200 mg/Kg) and feed with a hypercholesterolemic diet. The animals feed with the hypercholesterolemic diet added with 200 mg/Kg of FOS showed values similar to control group. Insulin and leptin serum levels were similar to control group due to its effect in reducing lipids and glucose. Similarly minor damage in the livers of rats administered with aguamiel respect to hypercholesterolemic control was obtained. These results confirm the beneficial effects of the components present in Aguamiel of A. atrovirens and elucidate part of hypocholesterolemic mechanism in vivo models, and suggest the use of this agave sap as a drink or functional ingredient.

Bibliography

Alvarado, C. et al. Revista Mexicana de Ingeniería Bioquímica 2014. 2: 417-427.
García, H. E. et al El Respyn Revista Española de Salud Pública y Nutrición, 2010. 5: 109-129.
Gómez, E.et al. A. Journal of Applied Microbiology, 2010.108: 2114-2121
Martyrosian, D. et al. Science and Practice, 2012. 10: 21-23.
Tovar, R. C. et al. Italian Journal of Animal Science, 2011.10: 10-21.

Biography

PhD, University of Querétaro, Mexico. Postdoctoral training,University of Reading, UK. She has been working for the National Polytechnic Institute,National School of Biological Sciences. Professor of Food Biochemistry, Food Technology and Biochemical Nutrition. She has conducted research in the area of nutrition and nutraceutical properties of foods. Authored and co-authored 60 peer reviewed journal publications.

POTENTIAL ANTIFUNGAL BIOPESTICIDE FROM QUINOA (CHENOPODIUM QUINOA) RESIDUES

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Bolivia is the first world exporter of quinoa (Chenopodium quinoa Willd) producing around 25.000 tons of raw quinoa per year, of which around 11.000 tons are exported. In its natural state quinoa has a coating of bitter-tasting (saponins), making it essentially unpalatable. For export, the Bolivian industries remove the seed coat producing a residue called “mojuelo” rich in saponins, in a percentage of 4,5% (more than 1000 TM per year). This residue is the raw material of our investigations, it has about 20% of saponins, and we standardized an extract process to concentrate the saponins, obtaining an extract with 65% of saponins (controlled by HPLC). This process was scaled to pilot scale, arriving to the implementation of a pilot plant in a processing quinoa Community.

The saponins have different chemical and biological properties that can be used in the generation of various products. The aim of this study was the evaluation of fungicidal activity, against fungal phytopathogens, of extracts rich in saponins for its potential use as biopesticide. The results show a good inhibition of mycelial growth Cercospora beticola, phytopathogen of spinachs, Cercospora coffeicola, phytopatogen of coffee trees and Moniliophthora roreri, phytopathogen of cacao; the highest inhibition was observed against C. beticola (80% of inhibition at 0.1 mg / mL versus 55% at the same concentration of control), but the most interesting results are against Moniliophthora roreri, because this fungus is causing significant losses for producers of organic cocoa in Bolivia and in several Latin American countries. The assays were done in vitro and in experimental plots, giving promising results.

Bibliography

Lozano M. et al. *Rev Boliv Quím*, 30/2: 115-121,2013.
Lozano M. at al. *Rev Boliv Quím*, 29/2: 128-135, 2012.
Flores Y. et al. *Rev Boliv Quím*, 22/1: 71-77, 2005
Kuljanabhagavad, T.; Wink, M. *Phytochem Rev* 8: 473-490, 2008.
Rauf, S.; A. Javaid. *Int. J. Agric. Biol*., 15: 367 –371, 2013.

Biography

She has completed her PhD studies at the University of Barcelona, Spain (1996). She is full time Lecturer-Researcher at Chemical Research Institute of UMSA. Lecturer in the Organic Chemistry Area and researcher of Bio-organic Laboratory, focused in isolation and structure elucidation of secondary metabolites from Bolivian plant species, techniques of quality control for plant extracts, and semi-synthesis of natural products. She has published more than 40 papers in reputed journals.

METABOLIC SYNDROME: CHARACTERIZATION AND TREATMENT

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Metabolic syndrome is a disease diagnosed by a co-occurrence of several medical conditions: abdominal (central) obesity, elevated blood pressure, elevated fasting plasma glucose, insulin intolerance, high serum triglycerides, low high-density cholesterol levels and fatty liver. Associated conditions include: hyperuricemia, polycystic ovarian syndrome, erectile dysfunction and acanthosis nigricans. Metabolic syndrome increases the risk of developing cardiovascular disease and diabetes. The prevalence in developed countries was estimated in 30-34% of the adult population, and the prevalence increases with age. The physiopatology is very complex and has been only partially elucidated. There was also a genetic cause, but other important factors are involved: dietary (particularly sugar-sweetened beverage and fatty foods consumption), sedentary behavior, psychotropic medication use, sleeplessness and alcohol abuse.
High-sensitivity C-reactive protein has been developed and used as a marker to predict coronary vascular diseases in metabolic syndrome, and it was recently used as a predictor for nonalcoholic fatty liver disease in correlation with serum markers that indicated lipid and glucose metabolism. Fatty liver disease is indicative of abnormal energy storage as fat in ectopic distribution. The first line treatment is change of lifestyle; however, in most cases drug treatment is frequently required. Precisely, one of the problems of this syndrome is related to the pharmacological treatment, because involved a several drugs with adverse effects and interactions inwardly (statins, fibrates, live protector, hypoglycemic, antihypertensive and psychotropic drugs). Anyway, this conference will be an updated referring to research on phytochemicals from plants and foods, as an alternative to the polypharmacy.

Bibliography

Kaur J. *Cardiology Res Pract* 2014: 943162. doi:10.1155/2014/943162.
Alonso J. *Tratado de Fitofármacos y Nutracéuticos*. 3ª. Ed. Buenos. Aires, 2015.

Jorge Alonso (MD) has completed his dregree from the University of Buenos Aires. He is director of postgraduate courses in Medicine Faculty of Buenos Aires, Argentine (Phytomedicine, Phytodermatology & Phytocosmetics, Nutraceuticals & Functional Foods), and professor in the following Universities: Finisterrae (Chile), Maimónides (Argentine) and El Salvador (Argentine). Director of courses in Pharmaceutical College of Buenos Aires. Was Director of the official program “Harvesting the Health” in Primary Health Care in Argentina (2003-2006). He has published more than thirty papers in various journals. Author of the textbook “Tratado de Phytomedicine”, and “Medicinal Plants from Argentina to Primary Health Care”.

INTEGRATIVE-ORTHOMOLECULAR MANAGEMENT OF THE PATIENT WITH GENERAL DEVELOPMENT DISORDERS

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For centuries men have observed that life styles and nutrition play an important role in the health-disease binomial. The thinking process is formed by a countless number of methabolic reactions and structural changes of the brain that are in great degree a result of how macro and micro nutrients interact within our neuronal circuits. The General Development Disorders (GDD), do not escape these biochemical events, where Orthomolecular medicine discovers and evidences alterations of methabolic pathways that are incomplete. These can be as a a consequence to heavy metal intoxication, deficiency or excess of oligoelements and vitamins, opportunistic mychotic and parasitic infections, organic acid buildup and methabolites that did not complete an excretion cycle. In effect, a series of events that we must take into consideration as we approach these patients.

Graduated from Medicine (1992), University of Medical Sciences of Havana, Cuba. Certified Physcian in Chelation Therapy (1996), Advanced Medicin Academy, USA; Physiologist applied to sports (2005), Iberoamerican University, Dominican Republic. Director, Innovative Medicine Institute since 1994. Associate Professor in Integrative Medicine, National Evangelic University, Dominican Republic

OZONETHERAPY SUCCESS IN TREATMENT OF CERVICITIS DUE TO HP STRAIN 16 & 18

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Ozone therapy has been used since 1874 by the Germans in dentistry and since World War II at the medical level for its great germicidal effect without generating resistance. We present the results obtained using ozonetherapy on 73 patients in the clinical practice at the Institute of Integrative Medicine, Dominican Republic, with positive clinical and laboratory exams for HPV infection (DNA / HPV strains 16 & 18). Of the total affected by both strains, 75 % became negative after 20 cycles of ozone treatment and 25 % required an additional 10 cycles. We have been able to assess the effectiveness of ozone to fight such a serious disease as cervicitis due to HPV strains 16 & 18 infection, which have been proven to be the most agressive and cause 99.7 % of cervical cancer. It is important to state that medical ozone also improves tissue oxygenation, stimulates the immune system, and has anti-inflammatory, analgesic and antioxidant effects.

Biography

Dr. Maria P. Salazar Posada, graduated in Medicine from the Military University of Nueva Granada. She uses complementary practices such as homeopathy, acupuncture, floral therapy, phytotherapy, neural therapy, ozone therapy, magnetic therapy and polyhedral therapy. Over 20 years practicing in these areas in Colombia in several health centers as DODES Medical Center, Aluna Holistic Medical Center, “Union y Vida” Foundation; and 7 years in Dominican Republic as integrative doctor in the Institute of Integrative Medicine (IMI) of the National Evangelic University (UNEV).

METABOLITE DETERMINATION OF TYPICAL FOODS IN MEDITERRANEAN DIET BY HR-MAS NMR

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NMR spectroscopy has become an experimental technique widely used in food science [1]. The experimental procedures that allow precise and quantitative analysis on different foods are relatively simple. For a better sensitivity and resolution, NMR spectroscopy is usually applied to liquid sample by means of extraction procedures that can be addressed to the observation of particular compounds. For the study of semisolid systems such as intact tissues, High-Resolution Magic Angle Spinning (HR-MAS) has received great attention within the biomedical area and beyond [2, 3]. Metabolic profiling and metabolism changes can be investigated both in animal organs and in foods. In this work we present a proton HR-MAS NMR study on the typical vegetable foods of Mediterranean diet such as the Protected Geographical Indication (PGI) cherry tomato of Pachino, the PGI Interdonato lemon of Messina, several Protected Designation of Origin (PDO) extra virgin olive oils from Sicily, and the Traditional Italian Food Product (PAT) red garlic of Nubia. We were able to identify and quantify the main metabolites within the studied systems that can be used for their characterization and authentication [2].

Bibliography

1. A. Spyros and P. Dais, *NMR Spectroscopy in Food Analysis*, RSC, Cambridge, UK, 2013.
2. N. Cicero et al., *Nat Prod Res*, 2015.
3. D. Mallamace, C. et al. *Physica A: Stat Mechan Appl*, 401: 112–117, 2014.

Degree in “Technician of Prevention in the Environment and Workplace” Faculty of Medicine, University of Messina. Assistant Professor in Food Chemistry, Department of Environment, Security, Territory, Food and Health Sciences (SASTAS), University of Messina, Italy. Professor of Food Chemistry, and Chemical and Food Technology.

ANALYTICAL AND PREPARATIVE METHODS FOR THE ISOLATION AND STRUCTURAL ELUCIDATION OF PLANT POLYPHENOLS

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Phenolic secondary metabolites are widely spread in plant kingdom, mainly derived by shikimic and polyketide biosynthetic pathways. They are also classified as phenolics and polyphenolics or vegetable tannins. These comprises hidrolyzable tannis [1], condensed tannins or proanthocyanidins [2], from terrestrial plants, and phlorotannins [3] from marine algae.
The extraction and purification methods of polyphenols include ultrasound-assisted extraction of polyphenols [4], separation and isolation by combination of preparative chromatography on Diaion HP-20, Toyopearl HW-40, Sephadex LH-20, MCI-Gel CHP20 or RP-18 stationary phases and high-speed counter-current chromatography [5, 6]. Analytical techniques to follow the isolation process are mainly HPLC or UHPLC in normal Phase and reverse phase, with UV detection at 270-280 nm and coupling with electrospray mass spectrometry in positive and negative mode. The structure elucidation of these natural products have been achieved by extensive spectral analyses, including ESI-MS, 1H-, 13C-NMR spectra and 2D experiments, COSY, TOCSY, J-resolved, NOESY, HMQC, DEPT and HMBC as well as chemical and enzymatic degradations. Since cristalization is not the rule but the exemption, the stereochemical issues are approached by circular dicroism (CD).

Bibliography

1.Isaza J.H. et al. *Phytochem*, 2004. 65(3): 359-367.
2.Ito C. et al. *Food Chem,* 2013. 141(3): p. 2507-12.
3.Isaza J.H., Torres Castañeda G.H. *J Chromatogr Sci,* 2013. 51(8): . 825-838.
4.Wong Paz J.E. et al., *Ultrason Sonochem*, 2015. 22: 474-81.
5.Savitri Kumar N. et al. *J Chromatogr A*, 2009. 1216(19): 4295-4302.
6.Zhang S. et al. *Food Chem*, 2015. 188(0): 422-429.

PhD from the Okayama University, Japan (2001), and postdoctoral studies at the University of Pretoria, South Africa (2003). Full profesor at “Universidad Tecnológica de Pereira”, Colombia (1994-2009), “Universidad del Valle”, Cali, Colombia (2009-present) in Organic Chemistry, natural products and instrumental analytical chemistry. Research interest is focused on natural products analysis, mainly phenols and polyphenols.

COMPARATIVE STUDY OF THE EFFICIENCY OF A MIXTURE OF ANTIBACTERIAL PARABENS FROM ROSEMARY OIL (ROSMARINUS OFFICINALIS L.) USED AS A PRESERVATIVE IN A COSMETIC FORMULATION

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All items of cosmetic use require an a preservative, or substance that will inhibit bacterial growth in its lifetime. The selected option for the current project, is the essential oil of Rosemary, which presents preservative qualities and is a natural ingredient, and as such it can be considered as a main ingredient in cosmetic formulations. The study compares the antimicrobial abilities of two ingredients in cosmetic formulations. The first one is a mixture of parabens (Phenoxyethanol, Methylparaben, Ethylparaben , Propylparaben , Butylparaben , Isobutylparaben) , widely used in the cosmetics industry despite the questioning that exists in regards to their safety. The compounds in the naturally occurring essential oil of rosemary (Rosmarinus officinalis L.). Five formulations of shampoos have been prepared, in which the only variation was the compound used as a preservative and it's action. A formula containing a commercial preservative, corresponding to 0.7% concentration of parabens (which is accepted by international regulations and
regulatory bodies such as COLIPA; three combinations using essential oil of rosemary (Rosmarinus officinalis) 1, 1.5 and 2.5 %, and the fifth with none of the antibacterial ingredients. Method ISO 11930:2012 Preservative Efficiency of EC Regulation 1223/2009 (Challenge Test) applies. The essential oil, incorporated to the cosmetic formulations from the lowest concentration of 1% generates a similar preservative efficacy as the commercially available preservatives that comprise a mixture of parabens incorporated in the formulation .
The essential oil can be considered an acceptable preservative system

Bibliography

1.Kalemba. *Curr Med Chem*, (2010), 813-829.
2.Kline & Co. (2012). *Natural and Organic Beauty Maintains Strong Demand, Expected to Grow 10% Through 2016.* United States: GCI Natural & Organic.
3.Miñana, M., & Goncalves, E. (2011). *Aplicaciones cosméticas y farmaceúticas de los surfactantes.* Laboratorio FIRP - Escuela de Ingeniería Química - Universidad de los Andes
4.Nadinic. (2009). *Scientia et Technic*a, (2009), 263 -269
6.International Organization for Standardization. (2012). ISO 11930:2012

Biography

Master in Science and Technology Cosmetics; Director, Center for Research and Assessment of Biodiversity, Polytechnic Salesian University. She teachs Engineering in Biotechnology. Author of the book "Research in Natural Cosmetics". She has 3 publications in peer review journals.

EVALUATION AND COMPARISON OF THE FLOCULANT CAPACITY OF MODIFIED TANNINS (RED QUEBRACHO, ACACIA, CHESTNUT) AND THE APPLICATION IN WASTEWATER TREATMENT

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Several water sources are affected by different pollutants, generating a high impact on ecosystems and society. For several years have been used inorganic salts such as Al2(SO4)3 and FeCl3 for wastewater treatment. Numerous scientific studies have demonstrated the impact on health like neural disorders in humans. The aim of this work is modified chemically tannins by Mannich reaction to obtain natural coagulants. For modifications were used three types of amines (ethanolamine, diethanolamine and ammonium chloride) and three types of tannins extracts obtained from Acacia mearnsii (Acacia), Schinopsis balansae (red Quebracho) and Castanea Sativa (Chestnut). The coagulant action of modified tannins were evaluated in wastewater samples considering several physicochemical variables such as pH, conductivity, turbidity, color (UPC), nitrates, nitrites, COD, bioassays and solids, quantified before and after the treatments. With the better treatment results achieved was designed a completely randomized factorial arrangement to select the best modifications. As a result was obtained a method to obtaining natural coagulants from tannins. was achieved good results in reducing the physicochemical parameters analyzed in the different types of wastewater (between 50 and 90%) but shows significant statistical relevancies of those flocculants made with chloride ammonium ($p=0,0000$ $\alpha= 0,01$). Additionally they are not statistical interactions between the flocculants, but at experimental level that relations are showed. Treatment of wastewater by modified tannins is efficient specially with ammonium salts, because this modifications not alter color units (PCU) than other treatments, which makes them a good alternative for the treatment of domestic wastewater.

Bibliography

1. J. Beltrán-Heredia, J. Sánchez-Martín. *Chem Eng J*; 162 (2010) 1019–1025.
2. J. Beltrán-Heredia, J. Sánchez-Martín. *J Hazard Mat* 186 (2011) 1704–1712.
3. Flaten, T.P *Brain Res Bull* 2001;55:187–96.
4. FAO, 2013. Accessed on 05-11-2013. http://www.fao.org/statistics/es/
5. Subramaniapillai, S*. J. Chem. Sci.* Vol. 125, No. 3, May 2013, pp. 467–482.

Biography

William A. Espinosa Arismendi is a specialist in instrumental chemical analysis , Pontificia Universidad Javeriana, Colombia. Currently he is a student of the Phytochemical Research Group (GIFUJ), Faculty of Sciences, Pontificia Universidad Javeriana.

PHYTOCHEMICAL STUDY OF LEAVES OF SENNA RETICULATA (FABACEAE) AND EVALUATION OF THEIR ANTIOXIDANT ACTIVITY

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Senna reticulata is a species belonging to the family Fabaceae; distributed in Colombia found its highest concentration in the departments of Tolima and Cundinamarca; it has traditionally been used as a laxative, diuretic, laxative and also for the treatment of constipation and fever. In terms of chemical composition studies they have reported the presence of flavonoids, alkaloids, tannins, saponins and anthraquinone. The main objective of this study was to contribute to the phytochemical study of the leaves of this species and assess their antioxidant activity. To this end, from plant material collected in the municipality of Honda (Tolima) and identified in the Colombian National Herbarium collection under number COL573012 ethanol extract (131.18 g) was obtained; which separations by column chromatography, and preparative thin layer formed by a mixture erythritol, isoamyl acetate and L-pyroglutamic acid and isolation of quercetin, kaempferol and hyperoside, first reported for this species was obtained in our country. The structural elucidation of the isolated compounds was carried out using techniques GC-MS and 1H NMR, 13C. The antioxidant activity is evaluated by the method of DPPH, where it was established that the presence of flavonoids and phenolic compounds, were responsible for the antioxidant activity presented for the ethanol extract, fractions of dichloromethane and ethyl acetate and kaempferol, a inhibition rate above 40% with reference to the uptake of gallic acid antioxidant free radical DPPH.

Bibliography

1. Nerilson L.et al. (2013). *Invest Prod Nat*, 27, 4-5.
2. Ortiz,H. et al. (2009). *Rev Acad Colomb Ciencias*. Universidad del Tolima, 183-191.
3. Vargas, C. (2007). *Estudio de la actividad cicatrizante y antiinflamatoria del extracto alcohólico de las hojas de la Senna reticulata (Willd.)* H. Irwin y Barneby (Retama). Lima, Perú.
4. Nunes, S. (2007). *Estudio químico y farmacológico de la Senna reticulata Willd.* Thesis, Universidade Federal do Ceará, Fortaleza, Brazil.

Biography

Master in Biological Sciences, Chemistry of Natural Products Plant. Professor in Chemistry, Faculty of Sciences and Education of the University “Francisco Jose de Caldas”, Bogotá, Colombia. He has 7 publications on natural products analysis. His main area of research is the isolation, purification and structural elucidation of fixed and volatile metabolites of Colombian plants.

HONEY AUTHENTICATION BY MEANS OF A POTENTIOMETRIC ELECTRONIC TONGUE

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Be able to classify honeys according to their floral or geographical origin has become a priority issue as a results of the frauds observed. The European Community legislation on honey packaging recommends the use of labels indicating floral and geographical origin, as specific quality criteria. The identification of botanical source of honey responds to consumer demands and guarantees the quality of the products, avoiding frauds which have a significant economic impact and undeniable nutritional and organoleptic consequences. The work is part of a line of research very timely, aimed at the development of non-destructive techniques for botanical classification of honeys introducing, this one, the goal of authentication. For the purpose, it seems necessary to develop appropriate database. Given the lack of detailed studies on the honey of one of the most important regions of Italy for the production, this study was focused on honey of Calabria. A biomimetic system, α Astree e-tongue based on the different response of seven potentiometric sensors (ZZ, JE, BB, CA, GA, HA, JB) and chemometric data processing was used. The sensor array was applied to four honey groups of different botanical origin (Citrus, Citrus spp, Chestnut, Castanea Sativa Miller, Acacia, Robinia Pseudoacacia, and sulla, Hedysarum coronarium) being a representative sampling of an italian region (Calabria). The honey sensor signal patterns were treated by two different pattern recognition techniques: Principal Component Analysis (PCA) and Discriminant Function Analysis (DFA). The e-tongue was able to classify the honeys of different floral origins by PCA and DFA with a classification rates of 90 % and 93.75 %, respectively. The results showed the high potential of e-tongue as a tool for honey authentication.

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Italian Ministry of Research and University (MIUR) and European Commission (Project PON01_00636). Contributions of the research team of Technological Laboratory “Quality, Food Safety and New Technologies” Quasicatec –Accredited n. 28, DM 593/2000 - Ministry of Research and University (MIUR).

Bibliography
1. N. Major et al. *Talanta* (2011) 85: 569–574
2. Viuda-Martos M. et al. Internat *J Food Sci Technol.* (2010) 45: 1111-1118.

NUTRACEUTICALS AND ANTIOXIDANTS: THEIR IMPACT ON HUMAN HEALTH

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Nutraceuticals and antioxidants are demanded increasingly by World population in order to avoid diseases as part of a healthy life style together with a balanced diet and physical exercise. However, there is large difference and conception of uses between wealthy and non-developed countries in terms of health care more than prophylactic uses. This makes an essential point of discussion when considering the environmental impact of health care in the Third World, where more than 80 % of the population has in natural products the first option of medication. More efforts and funds must be directed to R&D on nutraceuticals and antioxidants of natural origin, where a more complex research methodology should be carry out as compared to synthetic drugs. The crucial point is to develop a standardized crude extract, which eliminates subsequently most of the drawbacks attributed to its use in formulations as compared to a pure active principles. Green raw material processing and extraction technologies, with adequate scale-up and engineering, under a multidisciplinary approach within a "product-oriented" Project, together with chemists and biologists, will be strictly necessary to succeed on this goal, where the right selection of Project leader will be crucial for success. Common work of producers, distributors, importers, mass media, regulatory agencies and the public is needed on higher levels in order to assure an effective, safe, and high quality of nutraceuticals and antixodants use, with a critical eye on the importance of ethics, where the most relevant is the health care of the individual.

Bibliography

•Núñez Sellés AJ et al. *Pharmacol Res*, 55:351-358, 2007.
•Colegate, SM, Molyneaux, RJ (eds) (2008). *Bioactive Natural Products. Detection, Isolation and Structural Determination.* 2nd Ed, CRC Press, Boca Raton.
•Núñez Sellés AJ et al. *Curr Pharmac Biotechnol*, 16: 272-280, 2015

PhD in Analytical Chemistry (1985, Tchekoslovaquie); Doctor in Sciences (2007, Cuba). Member of Academies of Sciences in Cuba, Puerto Rico and Spain, and the International Council of Science (ICSU). Author of 16 books or book chapters and 130 scientific articles in peer review journals. Guest Lecturer to scientific meetings in 25 countries. Biography included in 2000 Outstanding Scientists of the XX Century, and Profiles of Accomplished Leaders (American Biography Institute, USA).

DIETARY SUPPLEMENTS AND SUPERFOODS: MYTHS, PRESUMPTIONS OR FACTS?

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Dietary recommendations to promote good health are made by governments, international organizations and medical societies. Although the minimal nutritional requirements to prevent deficiencies are well established, there is no universal consensus as to which foods or supplements should be included in the diet in order to prevent chronic diseases and ensure wellness. Many recommendations have been made without sufficient scientific evidence (presumptions/expert opinions) and some persist despite contradicting evidence (myths). The endorsement of unsupported beliefs may lead to mistaken clinical and public health recommendations. Examination of antioxidant supplementation, once thought to be the key to prevention of many chronic diseases, has not been supported in clinical trials (1). Limiting consumption of saturated fats and cholesterol has been presumed to reduce heart disease for decades. Recent debate shows that these recommendations may be more myth than fact (2). However, foods and supplements like fish and fish oils along with other plant sources of omega-3 fatty acids may indeed be beneficial for maintaining good health (3). Does the epidemiological, laboratory and clinical work available sufficiently support dietary recommendations for consumption of omega-3 fatty acids and do the studies hold up under scrutiny? Are there other foods and supplements that are being marketed today that show promise of having therapeutic properties and should be a part of universal dietary recommendations? The overall lack of scientific evidence and the abundance of presumptions has led to the current approach of focusing on healthy eating patterns (ie. Mediterranean diet) rather than individual foods or nutrients (4).

Bibliography:

1. Davì G1, Santilli F, Patrono C. *Cardiovasc Ther.* 2010;28:216-26, 2010.
2. DiNicolantonio JJ. *Open Heart.* 2014 Feb 8;1(1):e000032.
3. Stark AH, Reifen R, Crawford MA. C*rit Rev Food Sci Nutr.* 2015 Mar 16:0.
4. USDA. A series of systematic reviews on the relationship between dietary patterns and health outcomes. March 2014. Internet: www.nel.gov/vault/2440/web/files/DietaryPatterns/DPRptFullFinal.pdf

PhD in Nutritional Sciences, Hebrew University, Israel. She trained in both clinical nutrition and nutritional biochemistry. Post-doctoral Research Associate at the University of North Carolina, USA. Senior Faculty, Hebrew University. Academic Chair for graduate and post-graduate international programs in Nutrition. Over 50 articles and book chapters (nutrition surveys, basic research on functional foods and clinical studies). Her current work focuses on nutrition education and public health policy.

NUTRACEUTICALS AND THEIR CLINICAL APPLICATION IN PEDIATRICS

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Epithelial and other cells of the gastrointestinal mucosa rely on both luminal and bloodstream sources for their nutrition. The term nutraceutical or functional food is used to describe nutrients that have an effect on physiologic processes that is separate from their established nutritional function and some of these nutrients are proposed to promote gastrointestinal mucosal integrity. We reviewed the recent in vitro and in vivo clinical research that evaluated the role of several types of gastrointestinal functional foods in order to promote health or cure diseases related to the GI tract. Some includes the aminoacids, glutamine and arginine; the essential micronutrients, vitamin A and zinc; lipids like omega 3FA, and two classes of food additives; prebiotics and probiotics. Many of the data from multiple animal or human studies support a strong role for enteral nutrients in gastrointestinal health and disease.

Bibliography

1. CE Ulbricht, EM Basch. *Evidence-Based Clin Rev.* www.naturalstandardatabase.com
2. R. Kleinman and F.Greer. Editors: Pediatric Nutrition. 7th. Edition, American Academy of Pediatrics, 2014.

Biography

Graduated in Medicine, UNPHU (1981) and ECFMG (1985). Resident Medical-Internal, Spain (1989). Speciality studies at the University of Valencia, and the University of Madrid, Spain. (1985-1990). Research-Doctorate Sufficiency in Pediatrics, University of Valencia.Spain. (1990-1993). Scientific Director, National Institute of Integrative Research in Pediatric Gastroenterology Hepatology and Nutrition. Director of Pediatric Research, Medical School, UNPHU. He has more than 150 presentations and publications in Medical Journals and Congresses around the World.

GREEN TEA (CAMELLIA SINESIS L.) AS FUNCTIONAL BEVERAGE: A ROLE IN POST-STROKE DEPRESSION.

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Growing evidence suggests that tea consumption has beneficial effects on cardiovascular risk because of its flavonoid content. This activity has been ascribed to the flavonoidspresent in tea, which have been shown to improve oxidative stress. On the other hand, green teahas been associated with in vivodecreased depressive symptoms. Recent investigations has shown the role of oxidative stress in depression. In fact, a growing body of evidence demonstrates abnormalities in the levels of antioxidant enzyme activities and lipid peroxidation products (TBARS) in patients with depression. Based on the role of oxidative stress in the pathophysiologyof ischemic stroke as well as depression, we hypothesizedthat oxidative stress plays an important role in post-strokedepression.Thus, the aim of this study was to evaluate the in vivo protective activity against oxidative stress and post-stroke depression of green tea (GT) and GABA green tea (GGT). Moreover, the chemical composition of both tea extracts was determinedby RP-HPLC-UV-DAD-ESI-MSn.
GGT and GT were effective in vivo against oxidative stress, producing an increase of antioxidant enzymes activities and a decrease of TBARS in mice brains. Moreover,GGT was more effective than GT in the modulation of antidepressive-like symptoms in two common behavioural tests used to evaluate mood state. The metabolic profiling of teas and polyphenol, glutamine and theanine contentseems to justify the registered biological activities. In conclusion, this work represents the first attempt to demonstrate the positive effect of tea on post-stroke depression and to correlate the protective activity with phytochemical characterization.

Bibliography

1. Nabavi SF et al. *Curr Med Chem*. 2015; 22(3): 343-51.
2. Braicu C. et al. *Food Chem* 2013; 141: 3282-9.
3. Marchese A et al. *Food Res Int* 2014; 63: 182-91.

Biography

PhD in Chemical and Pharmaceutical Technologies. Specialization in Industrial Pharmacy (50/50). Associate Professor in Food Chemistry, University of Pavia, Italy. Her research activities are focused on the study of biological and functional properties of foods and the development of analytical methods useful in the determination of active compounds. She has published more than 80 scientific papers and by about 100 communications to national and international congresses.

CONTRIBUTION TO THE PHYTOCHEMICAL STUDY OF LEAVES OF PICRAMNIA GRACILIS TUL. (URU) (PICRAMNIACEAE)

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Picramnia gracilis Tul. (Uru) is widely used as a colorant by the Ika Indian community which lives on the western slope of the Sierra Nevada de Santa Marta, Colombia. Taking into account that there are not phytochemical studies of this species, the chemical study of the prevailing fixed metabolites in fractions of hexane and dichloromethane obtained from the ethanolic extract of fresh leaves of the species was carried out in this work. Through the preliminary phytochemical analysis the presence of flavonoids with the core α-benzopyran and anthraquinones was established. This is consistent with phytochemical studies on different species of the same genus. Separation and purification by Column Chromatography and Ultra Performance Flash Purification (UPFP), allowed to obtain from the n-hexane fraction a mixture of chrysophanol, benzyl benzoate and benzyl salicylate, which were identified by their mass spectra. Moreover, in the dichloromethane fraction the presence of aloe-emodin and some of its derivatives was established by HPLC-DAD analysis. These results are consistent with the anthraquinones found in species of the picramnia genus. Chemotaxonomic relation between species is thus established. This work constitutes the first report of a chemical study of a species of which little scientific information was available.

Bibliography

1. Balderrama, L. et al *Biochem System Ecol*, 2001, 29(3), 331–333.
2. Bellaistre, M.B.C. et al.. *J Chromatogr A*, 2011, 1218(6), 778–786.
3. Devia, B., et al. *Contribución al conocimiento de las fuentes de colorantes precolombinos a partir del estudio de las especies colorantes de uso tradicional por la comunidad indígena ika de Nabusímake, Sierra Nevada de Santa Marta, Colombia*. (2014). Research Report. Universidad Distrital Francisco José de Caldas. Bogotá.
4. Hernandez-Medel, M. R. et al *Rev Cub Quím,* 2007, 19(1), 68–70.
5. Jacobs, H. *Biochem System Ecol,* 2003, 31(7), 773–783.
6. Robledo, S. M.et al. *Adv Pharmacol Sci*, 2015, 1–8.

Biography

BS Chemistry. Member, Research Groups on Natural Dyes and Natural Vegetables Products, District University “Francisco José de Caldas”. His present research work is oriented to the isolation, purification and structural elucidation of metabolites fixed in tinctorial plants.

PERUVIAN ETHNOBOTANICAL SOURCES OF ANTICANCER NATURAL PRODUCTS

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Over a decade ago, we began a multidisciplinary collaborative ethnobotanical research program in the Peruvian upper Amazon basin and eastern Andes Mountain foothills, among the Aguaruna community. This ethnobotanical study amassed one of the largest tropical collections of systematically targeted ethnomedicinal plants. Over 80% of the plant species in this inventory were collected based on their medicinal use, toxicity or other physiological activity recognized and kept as part of the oral tradition of the Aguaruna community. A large number of these species provided higher frequencies of bioactive secondary metabolites than those found in the flora as a whole. Screening of targeted plant extracts using different cancer cell lines followed by bioassay-guided fractionation led to the isolation and identification of biologically active natural products with selective anticancer activity, some of which will be discussed in this talk. The long-term goal of our team is to strengthen this international and multidisciplinary bioprospecting program, with the aim of linking biological diversity with sustained economic management of medicinal plants needed for the discovery and development of pharmaceuticals.

ONCOLOGY, NUTRIENTS AND PHYTOMEDICINES: RECENTS ADVANCES

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Despite the progress made in the early diagnosis and the development of new drugs, the prevalence of cancer in the world continues to rise. .Medicinal plants and the orthomolecular nutrition continue to provide answers in the forward in the fight against cancer. According to the National Cancer Institute, for every 100 molecules that are investigated, only one can become a drug approved by the health authorities. Currently, of the 30 most used cancer drug, nearly 40% come from the plant kingdom or natural resources. On the other hand, of the 20 drugs that are in study (in phase II and III), 20 come from medicinal plants, especially plants that derive from South America and Asia. The purpose of this conference is to make a quick update on the investigations carried out with active principles of more promising medicinal plants, along with the demonstration of the benefits they are getting with specific nutrients of the food.

Bibliography

Alonso J. *Tratado de Fitofármacos y Nutracéuticos*. Electronic Version. (2015). Buenos Aires, Argentina.
Chandrakant Katiyar et al. *Ayu.* 2012, 33(1): 10–19.
Zulkipli I, et al. *Drug Target Insights.* 2015, 9:9-19.

Biography

Jorge Alonso (MD) has completed his dregree from the University of Buenos Aires. He is director of postgraduate courses in Medicine Faculty of Buenos Aires, Argentine (Phytomedicine, Phytodermatology & Phytocosmetics, Nutraceuticals & Functional Foods), and professor in the following Universities: Finisterrae (Chile), Maimónides (Argentine) and El Salvador (Argentine). Director of courses in Pharmaceutical College of Buenos Aires. Was Director of the official program “Harvesting the Health” in Primary Health Care in Argentina (2003-2006). He has published more than thirty papers in various journals. Author of the textbook “Tratado de Phytomedicine”, and “Medicinal Plants from Argentina to Primary Health Care”.

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SEDATIVE AND ANTINOCICEPTIVE EVALUATION OF BREU ESSENTIAL OILS ADMINISTERED BY INHALATION

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Species belonging to Burseraceae family produce oleoresins known in Brazil as breu. These oleoresins exhibit a complex composition rich in terpenes and are employed by traditional communities for the treatment of headaches by burning and subsequent inhalation. Essential oils from breu oleoresins collected in quilombola communities of Oriximina, Brazil, were grouped into five different groups (A-E) according to their chemical compositions and then included in solutions. Mice were subjected to inhalation in an inhalator chamber developed by us and subsequently evaluated for motor activity by rota-rod and antinociceptive activity by the hot plate and formalin tests. The protocol for animal use was approved by CEUA/UFRJ #DFBCICB015-04/16. None of the formulations demonstrated any influence on motor activity of the mice. This result suggests that any effect against pain or inflammation triggered by one of the solutions is not associated with a depressor effect in the CNS1. In the hot plate test none of the formulations showed central analgesic activity, like others examples in literature1. However, in the formalin test, formulation E, rich in α-pinene, limonene and β-phellandrene, showed activity in both phases, while formulations B, rich in p-cymene, and D, rich in α-terpineol, limonene and β-phellandrene were active only in the first and second stages, respectively. Therefore, a possible peripheral analgesic effect was demonstrated by formulations E and B, while a possible antiinflamatory effect was demonstrated by formulations E and D. This can be probably explained by the presence of high concentration of some monoterpenes which exert these activities2.

Bibliography

1Lima, G.M. et al. *Braz J Pharmacogn* 22/2: 443-450, 2005.
2Guimarães, A.G.; et al. *Phytother Res.* 27: 1-15, 2013.

Biography

Ph.D. in Organic Chemistry (1994), Federal University of Rio de Janeiro. Professor of Pharmacognosy at the UFRJ. She has published over 70 papers on plant secondary metabolites with medicinal importance. Her main research interests are in ethnopharmacology and the isolation, structure elucidation, and biological evaluation of chemotherapeutic agents from plant origin.

ANTIOXIDANT AND CYTOTOXIC ACTIVITY OF LEAVES AND INFLORESCENCES OF LOURTEIGIA HUMILIS

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Species of Lourteigia genus have been recognized by their biological activities (1, 2), however there are not reports about of the specie L. humilis. In this study it was evaluate the antioxidant activity of extracts and fractions in different concentrations by DPPH method. It was found that the ethanolic extract from inflorescences (IC50 = 38,90 mg/L ± 0.026) and the ethanolic fraction of leaves (IC50 = 40,24 mg/L ± 0.025) showed an antioxidant capacity significantly higher among extracts and fractions analyzed ($p < 0.01$; α: 0.05). No significant difference between the ethanolic extract from leaves and the ethanolic extract from inflorescences was evidenced (Tukey $p > 0.05$). The quercetin was taken as a positive control for antioxidant activity with a high percentage of inhibition of (IC50 = 7,08 mg/L ± 0.41) compared with the results obtained for extracts and fractions of L. humilis. The inhibition of cell viability induced by extracts and fractions was evaluated in breast MDAMB231 and colon HT29 cancer cell lines by MTT method. The highest cytotoxicity was shown on breast cancer cell line exposed to the polar extract of inflorescences with(IC50 = 24.60 mg/L ± 0.71); Tukey $p < 0.05$, but the activity of extracts and fractions was low on colon cancer cell line, being the best activity that obtained for the leaves non polar extract with (IC50 = 121,75 mg/L ± 3.49). The results suggest an important biological activity that needs to be explored to find active compounds responsible for that activity.

Bibliography

1. Rosas-Romero A. et al. *Planta Med* 2002, 68(9):843-5.
2. Mondolis E et al. *Rev Bras Farmacogn* 2013, 23(5):

Biography

Master in Sciences, member of the Natural Products Research Group from UDCA.
Her interest is focused in Phytochemistry related to the biological and chemical properties of the Colombian species of Asteraceae family.

HISTOCHEMISTRY OF EUPHORBIA TITHYMALOIDES L. AND JUSTICIA SECUNDA VAHL. MEDICINAL PLANTS USED TRADITIONALLY AT SINCELEJO SUCRE – COLOMBIA, FOR THE TREATMENT OF URINARY TRACT INFECTIONS

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Ethnopharmacological surveys conducted by the research group on natural products (Gipnus) of the Universidad de Sucre since 2002 until 2014 (Márquez. 2014) have registered the frequent use of plants for the treatment of urinary tract infections. Within them are the species commonly known as Ultimorreal (Euphorbia tithymaloides L),(Márquez. 2007-2005) and Singamochila (Justicia secunda Vahl). With the intention to contribute to the scientific knowledge of its morphologic and anatomyc characteristics, we conducted a study on histochemistry and fitochemistry of the parts used as drug (leave and stem). Experimental tests throw variability of presence of primary and secondary metabolites, substances which could be attributed to the derived pharmacological effect. This study allowed us to identify compounds that could be counter-productive or produce antagonistic effects due to its toxic nature , which might be determined with subsequent studies. The use of certain types of plants in tea, infusions and decoctions is evident in traditional herbal medicine. Essential oils, flavonoids, saponins and potassium salts could act to increase the glomerular level, causing an increase in the renal circulation and increasing the rate of glomerular filtration and the formation of primary urine (Lopez, 2001).

Bibliography

1. Márquez R.L., *169 Congr Colombiano Ciencias Biológicas,* Sincelejo, Oct. 7 - 9, 2014.
2. Fuentes K et al., *169 Congr Colombiano Ciencias Biológicas*, Sincelejo, Oct 7 - 9, 2014
3. Carpio C.M. et al. *XII Cong Colombiano Fitoquímica*, Universidad de Cartagena, May 21 – 23, 2014.
4. Meneses D.A et al. *XII Congr Colombiano Fitoquímica*, Universidad de Cartagena, May 21 – 23, 2014.
5. Márquez R.L. et al. *Scientia et Technica* 2007 ISSN: 0122-1701

Biography

Master in Biology; Researcher, University of Sucre (Ecuador). She has published 19 papers. Research interest focused on phytochemistry and biological evaluation of natural products.

AGLUCIDIC ENTERAL NUTRITIONAL THERAPY "AENT": IMPACT ON PSORIASIS, AN INSULIN-SENSITIVE SKIN DISEASE

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In adults affected by severe psoriasis a 28-day period of a specifically program almost carbohydrates-free was feasible and safe, and produced significant reduction in psoriatic severity disease, body metrics, mesenteric fat, and metabolic risk profile. With a prevalence about 3% psoriasis is a chronic inflammatory disease that affect mainly the skin. Psoriasis patients have increased odds of metabolic syndrome and there is a robust dose-response relationship between psoriasis severity and prevalence of metabolic syndrome[1]. The patients were prescribed a liquid, carbohydrate-free, low-fat nutritional formula performed continuously by means of a polyurethane nasogastric tube. It contained a fixed amount of branched-chain amino acids, glutamine and high-quality proteins; a complete multivitamin-multimineral supplement was also provided. In fact, the protocol has been enriched with linseed oil and cod liver oil containing vitamin D and omega 3; chiro- inositol was added to stabilize the improvement of insulin sensitivity.
AENT "Aglucidic Enteral Nutritional Therapy" has generated the improvement in psoriasis, decreased HOMA index, BMI and aortic-mesenteric-fat-thickness; the last was detected by a new ultrasound technique[2].

Bibliography

1. Armstrong AW, *J Acad Dermatol.* 68(4): 654-662, 2013.
2. Monaco L. *Am J Med Sci*. 347(1):8-13, 2014.

CHALLENGING EPIDEMIC: DUAL BURDEN OF OBESITY AND DIABETES

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Poor eating habits nested in our childhood and sedentary lifestyles promoted by an electronic and fast-forward society are fueling one of the most dramatic epidemics ever: Obesity and Diabetes. This dual burden of disease affects a significant portion of the population in middle and high income countries and is becoming a global challenge to health. In USA alone, 2/3 of its population are overweight with 34.9% obese adults and 16.9% obese children, while Diabetes continues at well over 10% of the population in most states. CDC estimates one in 3 adults will have diabetes by 2050, if current rates continue. WHO reports overweight in Chinese men increased from 34% in 2005 to 57% in 2015. Type II Diabetes prevalence rate in Dominican Republic increased from 5.5% in 1998 to 9.9% in 2015. The social and financial impact of this epidemic can overflow the health system's capacity. The American Diabetes Association estimated cost of diagnosed diabetes at $245 billion (2012). Innovative strategies to counteract this epidemic range from fad diets and exercise programs to complex drugs developed in research labs. While a "magic bullet" is found, a multi-prong approach is needed to tackle obesity and DM in humans: adults must lead by modeling healthier eating habits and lifestyles to younger generations; research should be funded adequately to understand better the individual, social and structural determinants that fuel these epidemics, and further develop new drugs that are proving to be effective in reversing obesity and its co-morbidities in experimental settings and need to be transferred safely to the public; define Public Policy to confront mislabeling or misleading labels for sugar, fat, sodium and caloric contents in food. Media campaigns and one on one BCC activities must be designed to engage the public and help modify the way our populations are feeding themselves, starting in pre-school.

Bibliography

1. Scheen, Andre J. *The Lancet,* 29 Jan. 2015.
2. Wang Y.; Beydoun MA. *Epidemiology Rev*. 29:5-28,2007
3. CDC/NCHS *National Health and Nutrition Examination Survey 2011-2012*

Biography

Doctor in Medicine and Masters in Human Sexuality ,Fulbright Fellow in Public Health, Tulane School of Public Health, New Orleans, LA. Consultant for United Nations and US Government agencies on t HIV/AIDS, Primary Health Care Programs and research. Technical Director of Fundación Génesis, Dominican Republic. Her research interests deal with emerging global challenges and engagement in raising awareness about obesity and diabetes.

INTESTINAL MICROBIOTA

V. Scarcella

At birth the newborn is sterile but immediately comes in contact with a variety of microorganisms that develop in the intestine and not only, said microbiota. In the intestinal tract, they are allocated over 1000 different species of microorganisms classified as follows: (useful, harmless and pathogens) are: Gram +, Gram -, Fungi, protozoa and viruses) that, in a healthy individual, living in perfect balance “Embiosi. “The Embiosi is important, in order to maintain the correct relationship between the microbiota and the immune system of the mucosa of the digestive tract. Microbiota in the different sections of the intestine varies according to:

1) internal conditions: pH, presence or absence of oxygen, stress;
2) external conditions: food, medicines, additives, GMO products, etc ..

Functions: digestive, defensive barrier, synthesis of vitamins, essential amino acid synthesis, synthesis of anti-inflammatory components, especially of filter or selective barrier “SELF” for the absorption of micro components of normal power “monosaccharides, and fatty acids and monopeptidi glycerol “. The microbiota useful is recognized by the innate immune system or “microbiome” genetic heritage, why not start an immune reaction. The gastro-intestinal tract is covered with terminations (cells) sensitive and other cells capable of secreting: neuropeptides, neurohormones, hormones, and cytokines in order to keep informed of the brain. Just think that 85% of serotonin is secreted by cells gastro-intestinal tract. Now it is clinically proven the close correlation between the brain and the gut. Just think how psychological stress can alter the qualitative and quantitative composition of the microbiota (dysbiosis) and the latter in turn can alter nerve function, and behavior over time

EFFECT OF PC6 ACUPOINT IN RESPONSE TO ORTHOSTATIC STRESS IN NORMAL SUBJECTS

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Background. Autonomic nervous tests and heart rate variability (HRV) have been used to assess cardiac autonomic function. This study was undertaken to determine whether the acupuncture in PC6 could change cardiac response to orthostatic stress in normal subjects.
Methods. Twenty two normal subjects (21.55 ± 5.2, mean ± SD years), treated with acupunture in PC6 and 34 control subjects (21.65 ± 3.8 mean ± SD years), underwent to the stand manoeuvre test. ECG recordings were taken for 15 min after standing to assess changes in RR interval lenght, the 30:15 ratio, and for HRV analysis.

Subjects treated with acupuncture showed a highest speed in the appearance of R-R interval decrease and with a smaller magnitude (s 2, y = -0.96) relative to controls (s 5, y = -1.5); similarly, the onset of R-R interval increase response appeared faster in the treated subjects (6.6 s) compared to controls (12.3 s). Similarly, the maximum speed of the response of R-R interval increase also presented earlier and with greater magnitude in treated subjects (15.5 s, y = 2.1) versus control subjects (18 s, y = 1.89). Acupuncture significantly increased the ratio 30:15 ($p < 0.03606$) in the treated group compared with controls. Regarding the heart rate variability between groups no differences were found.
Conclusion. These findings show that acupuncture in PC6 could elicit changes in the cardiac vagal and integrated baroreflex function in normal subjects underwent to orthostatic stress.

Bibliography

1. Rivas-Vilchis JF et al. *Am J Chinese Med*. 2007; 35(3): 427- 436.
2. Rivas-Vilchis JFet al. *J Acupunc Meridian Stud* 2008, 1: 58-61,.
3. Rivas-Vilchis JF, et al. *Proc West Pharmacol Soc* 2009, 52: 61-62

Biography

Doctor in Biological and Health Sciences. Full professor. Published articles: 10. Head of chronic degenerative diseases laboratory. Research fields: cardiovascular physiology, acupuncture, autonomic regulation.

NEW GREEN ALTERNATIVES FOR THE EXTRACTION OF BIOACTIVES FROM NATURAL SOURCES

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In the present work, examples of green extraction processes will be presented based on the intensification of processes by advanced technologies able to provide with fast, selective, efficient, sustainable and ecological processes to obtain bioactive compounds from natural sources such as algae (microalgae and seaweeds) and plants. The different technologies presented deal with the employment of pressure, temperature and/or microwaves as a way to improve the extractability of the raw material and the recovery/purification of secondary metabolites with bioactive properties (antioxidant, antiproliferative, etc.). Moreover, the development of green processing platforms able to fulfill the requirements for sustainability will be also presented.

Bibliography

1. E. Ibáñez et al. *J Supercrit Fluids* 100 (2015) 86-96
2. M. Herrero, E. Ibáñez. *J Supercrit Fluids* 96 (2015) 211-216
3. E. Ibáñez et al. *J. Funct. Foods* 11 (2014) 293-303
4. E. Ibáñez et al. *Int. J. Mol. Sci.* 15 (2014) 16270-16283
5. E. Ibáñez et al. *Trends Anal Chem* 52 (2013) 23-35

Biography

PhD in Analytical Chemistry, Autonomous University of Madrid, Spain. Full Research Professor, Institute of Food Science Research (CIAL), CSIC, Madrid, Spain. Postdoctoral studies at Brigham Young University, and University of California at Davis, USA. She has received several awards and authored 175 scientific publications, 21 book chapters and 10 patents. Her research interests includes the study and development of new extraction processes to isolate bioactive compounds from natural sources such as food and agricultural by-products, plants and algae.

CAT (COLONY ASSAY TOOLBOX): A COST-EFFECTIVE APPROACH TO HIGH-CONTENT DRUG SCREENING

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In 2006 the Food and Drug Administration (FDA) released the first guidance document highlighting the importance of the colony assay method for assessing the effect of some preclinical antiviral drugs [1]. Since its establishment in 1956, cell colony-forming unit (CFU) has been considered a “gold-standard” to evaluate the efficacy of novel potential anti-tumor drugs. However, typically such experiments involve manually performed (several days), subjective, low-throughput (few drugs per experiment) counts of cell colonies after drug administration [2]. We present an experimental and an automated multi-parametric image analysis workflow, named Colony assay Toolbox (CaT), that allows clonogenic assays to be performed in high-throughput format (hundreds of drugs can be evaluated simultaneously) [3]. The method yields highly reproducible results within a day of reaching the experimental end-point, significantly shortening the cycle time for initial drug screening. Moreover, CaT enhances cost-effectiveness in terms of materials (by using a single fluorescent dye), instrumentation (common wide-field microscopes are suitable) and software (exploiting an open-source image analysis environment), making this protocol widely accessible. We used CaT to test the effect of preclinical compounds on the growth of human cancer cells. This reveals its applicability as a high-throughput and high-content alternative to monitor colony growth in the context of both natural/synthetic drug treatments.

Bibliography

1. Food and Drug Administration, Center for Drug Evaluation and Research, *Guidance for Industry Antiviral Product Development-Conducting and Submitting Virology Studies to the Agency,* 2006.
2. Yadav, N.K., et al. *Drug Chem Toxicol,* 2015: 1-12.
3. Ricci, F., A. Subramanian, and M. Wade. *J Biomol Scr,* 2015. 20(3): p. 391-401.

Biography

PhD in Molecular Biophysics. Reseracher, National Enterprise for NanoScience and Nanotechnology (NEST), Laboratory of “Scuola Normale Superiore”, Pisa, She has published several papers in peer-review journals and authored two patents. Her current research interests focus on the development and setting of fluorescence methods for High-Throughput (HTS) and High-Content Screenings (HCS) of library compounds and gene silencing approaches in the oncology field. ”

CARDENOLIDES FROM ASCLEPIAS SUBULATA WITH ANTI-PROLIFERATIVE ACTIVITY

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Introduction: Asclepias subulata is a shrub that is distributed in the desert of Arizona-Sonora, Mexico. This species is used by the Sonoran ethnic groups, Seris and Pimas, for the treatment of eye diseases, gastrointestinal disorders and cancer, there are few reports on its biological activities.
Objective: To characterize the metabolites responsible for the antiproliferative activity of A. subulata and molecular mechanisms involved.
Methodology: We conducted a bioassay-guided fractionation of methanol extract of the aerial parts of the plant. MTT assay was used to measure the antiproliferative activity of fractions and compounds against three human cancer lines (A549, LS 180 and PC-3), a murine cancer cell line (RAW 264.7) and non-cancerous human cell line (ARPE -19). Chromatographic, spectroscopic and spectrometric techniques were used for the isolation and characterization of the compounds. The translocation of phosphatidylserine, depolarization of the mitochondrial membrane and the activation of caspases 3,8 and 9 were measured to establish the mechanism of action of the compounds.
Results and Discussion: A new cardenolide glycoside, 12,16-dihydroxycalotropin, and three known, calotropin, corotoxigenin 3-O-glucopyranoside and desglucouzarin, were isolated. All isolated compounds showed a strong antiproliferative activity in human cancer cells. Calotropin was the more active with IC50 values of 0.0013, 0.06 and 0.41 M on A549, LS180 and PC-3 cell lines, respectively; while 12,16-dihydroxycalotropin reached values of 2.48, 5.62 and 11.70 M, on the same cells; corotoxigenin 3-O-glucopyranoside had IC50 of 2.64, 3.15 and 6.62 M and desglucouzarin showed values of 0.90, 6.57 and 6.62 M, respectively. Isolated compounds showed little effect on murine cancer lines and human noncancerous line, exhibiting selectivity for human cancer cells. The isolated compounds activate apoptosis events preferably using the extrinsic pathway of caspases. Thus, A. subulata isolated glycosides are postulated as potential molecules for further research in cancer treatment.

HEMOLYTIC ACTIVITY OF PASSIFLORA EDULIS

T.V. Braga, C.S. Souza, M.G. Santiago, F.C.G. Evangelista, R.G. Rodrigues-das-Dores, F.P. Varotti, M.G. Carvalho, and A.P. Sabino

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Passiflora edulis (Passifloraceae), native to tropical America, is popularly known as passion fruit. The leaves when prepared in the form of infusion are used against nervous restlessness, insomnia and anxiolytic action1. The objective was to evaluate the hemolytic activity of Passiflora edulis leaves. P. edulis leaves were collected in Ouro Preto, Minas Gerais, Brazil. Voucher specimen is deposited in the Herbarium of EPAMIG identified as PAMG57074. The ethanol extract of leaves was obtained by maceration in ethanol PA and evaporated in a water bath at 42 °C to obtain a dry residue. In assessing the hemolytic activity, citrated blood were washed with sterile saline solution. 0.5 mL of the cell suspension was mixed with 0.5 mL(1000, 500, 250, 125, 62.5 µg/mL) of extract. The mixtures were incubated for 30 min at 37 ◦C and centrifuged at 1500 rpm for 10 min. The free hemoglobin in the supernatants was measured by spectrophotometry at 540 nm. Saline and distilled water were included as minimal and maximal hemolytic controls. The tests were performed in triplicate2. Results of hemolytic activity have shown that extract of P. edulis exhibited the activity of the 47.03 ± 0.40 % at 1000 µg/mL. Hemolytic activity of 50 %, in concentrations lower than 200 µg/mL, was considered toxic3. The hemolytic activity of the extract was performed to rule out the possible cytotoxic mechanism. Performing hemolytic assay is important to determine whether a drug can be used in pharmacological applications.
The ethanolic extract of P. edulis leaves was not cytotoxic.

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Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

Bibliography
1. Paris F et al. *Acta Farm. Bonaerense* 2002, 21: 5-8.
2. Kannan RRR et al. *Food Chem* 2013, 136: 1484–1489.
3. Kalaivani T et al. *Evid-Based Complem Altern Med* 2011: 1-8.

ANTIULCER AND ANTIMICROBIAL PROPERTIES FROM ANNONA CORIACEA MART.

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Peptic ulcers (PU) are a common disorder of the entire gastrointestinal tract, often affecting the stomach and the duodenum (Araújo et al., 2014). The PU occurs due to an imbalance between aggressive and protective factors and the treatment of PU includes eradication of H. pylori infection and anti-secretory therapy. However, this treatment is followed by severe side effects (Najm, 2011). There is currently a search for anti-ulcer drugs with less side effects. Due to the large presence of metabolites with biological activity, various species have been used for treating a number of diseases (Hosseini et al., 2014). The aim of this study was to assess the effects of the ethanolic extract of the leaves of Annona coriacea Mart. (ACEt) in the absolute ethanol-induced gastric ulcer, as well as to evaluate its antimicrobial activity. Anti-ulcerogenic studies were performed on male Wistar rats (n=7). Animals receiving 0,9 % Saline (10 mL/kg) and ACEt (50; 100; 200 and 300 mg/kg, p.o.) after a 12-h fast were used and the experimental protocols were approved by the Animals Ethics Committee from Federal University of Goiás (no. 001-14). The chromatography analysis showed the presence of liriodenine, an aporphine alkaloid. ACEt, all doses tested, significantly inhibited the mucosal injury induced by ethanol (66.7; 52.5; 48.5; 67.3 %, respectively). When the ACEt was investigated in antimicrobial assay, it demonstrated MIC 256 µg/mL for S. aureus. These results suggested gastroprotective activity, probably involving cytoprotective factors of gastric mucosal. Additionally, ACEt presented an antimicrobial activity which was more effective against gram-positive bacterial strain.

Bibliography

1. Araújo, M.B., Borini, P., Guimarães, R.C., *Arq Gastroenterol* 2014, 51: 155–161.
2. Hosseini, S. et al. *J Ethnopharmacol* 2014, 152: 451–6.
3. Najm, W.I.,. *Prim Care Clin Off Pract* 2011, 38: 383–394.

Ph.D. in Molecular and Functional Biology from Campinas University, Brazil (2009). Adjunct Professor, Dept Biological Sciences, Federal University of Goiás, Brazil. His current research interest is focused on the study of action mechanisms of medicinal plants in the pathophysiology of the diseases that affect the gastrointestinal tract (peptic ulcers and inflammatory bowel disease). He has published 30 papers in reputed journals.

MEDICINAL PLANTS USED IN THE DOMINICAN REPUBLIC

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In the Dominican Republic two medical systems can be distinguished: the formal medical system and the informal medical system. The formal medical system has its basis in the Western conventional medical system. The second, the informal system can also be called Traditional Dominican Health System (TDHS). This system is based on the ancient concepts and practices in the Dominican culture, which in turn is based on three separate cultures, the Taino (the original inhabitants), Spanish (the colonizer) and African culture (the enslaved African workforce).
To integrate medicinal plants in the official health system and to develop a national policy on alternative and complementary health practices, it will be necessary to have a broad knowledge of the uses of the medicinal plants within the TDHS. The WHO stated, that a country, with an active traditional health system, wants to formulate a national health care policy, it should have a broad knowledge of the traditional health practices. In the Dominican Republic there has been no extensive, systematic research on the use of medicinal plants. To fill this gap we formulated a project : National Study of the Medicinal Plants of the Dominican Republic. In 2000, together with the Pan-American Health Organization (PAHO), a questionnaire was developed. Mostly students from the Health Faculty of the Universidad Nacional Pedro Henriquez Ureña (UNPHU), have thus far conducted more than 4000 interviews with about 800 persons in each of the provinces of the Dominican Republic.
Preliminary results of this national Study will be presented and discussed.

Bibliography

- De Medeiros, et al. *Evid-Based Complem Altern Med,* 2012, 1-11 (807452).
- Flores, K.E., Quinlan, M., B. *J Ethnopharmacol* 2014, 153 (3): 624-634.
- Gómez, P.F. *Soc Hist Med*, 2013, 26 (3): 383-402.
- Roersch, C. *J Ethnopharmacol* 2010, 131: 522-537.
- Vandebroek, I. et al. *J Ethnopharmacol 2010*, 128: 20-41

PhD in Pharmacognosy, Radboud University of Nijmegen, The Netherlands. His doctoral thesis was about the use of medicinal plants in the South Andina, Peru, and included more than 400 monographs of medicinal plants. Member, Academy of Sciences of the Dominican Republic. He works at UNPHU as a research professor and Director of the Herbarium. His present field of research is the use of medicinal plants by the Dominican people.

BIORESONANCE: APPROACH TO AN ALTERNATIVE THERAPY

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The therapy is based on the principle of neutralizing altered electromagnetic vibrations of the patient harmonizing them while making the energetic information that causes disease disappear. In other words, there is no disease without altered electromagnetic vibrations. From Biophysics we know that the electromagnetic field involves the whole body and includes pathologic and physiologic frequencies. The therapy will modify and harmonize those altered vibrant frequencies of sick organs and systems, however, those that are physiologic will not be modified in any way. Every organ, whether healthy or sick, has a vibration spectrum that varies from person to person, therefore therapy has to be individualized. There is a wide range of indications for Bioresonance, from contact allergies to food and respiratory allergies. It is useful in digestive disorders such as gastritis, slow digestion, irritable bowel, on to Intestinal Dysbiosis, for migraines, pain, arthrosis, menstrual cycle alterations, autoimmune diseases, rheumatoid arthritis, immune-compromised states, insomnia, stress, and in cases of Benign Prostatic Hyperplasia, among others. The test is conducted, connecting the patient to the Bioresonator using electrodes that capture electromagnetic vibrations that are transferred to the machine. It is there where the pathologic information is modified and resent back to the patient through other electrodes in such a way that they neutralize or erase the pathologic information. Once the session is over, the body will use the main organs and toxin elimination pathways such as the intestine, skin, kidneys and lymphatic system. Therefore, drinking a minimum of 2 liters of water a day and abundant fibers after therapy to eliminate toxins is recommended.

W. Mañon Rossi, MD, MA, is graduated from Medicina, Universidad Autónoma de Santo Domingo (1975); Master in Phytoterapy, Universidad de Barcelona, Spain (2009) and specialized in Genetics. Fellow at the University of Rome, Italy, and University of London, United Kingdom. Author of 5 books about the use of medicinal plants in Dominican Republic and about 20 scientific articles. Member of the Association of Natural Medicine, New York. He was recently elected as Chancellor, National Evangelic University, Dominican Republic.

ASSESSMENT OF THE PHYTOTHERAPEUTICAL RESOURCES OF ECUADORIAN FARMERS

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Common medicinal plants used by Ecuadorian farmers were evaluated, looking for the valorization and conservation of phytotherapeutic resources, in a context of environment and local culture respect. From the base line study about variability and use of medicinal plants in Ecuador and an ethnobotanical survey we achieved 393 accessions, 3 collections in conservation gardens in the Pichincha and Orellana provinces and 42 plant species collected from 9 Ecuadorian provinces. Subsequently, 20 species were preselected for preliminary phytochemical studies, and several bioactivity assays. Finally, 5 species (Croton elegans, Artemisia absinthium, Iresine herbstii, Mansoa alliacea and Phyla strigulosa) were selected for phytochemical studies.
The essential oil of A. absinthium was evaluated, and sabinyl acetate, thujone and sabinene resulted as the main components. The ethereal extract manifested a good minimum inhibitory concentration (MIC) against S. aureus and moderated against P. vulgaris. From P. strigulosa, hernandulcin and epi-hernandulcin were isolated, responsible compounds of the sweetness of the plant, and with industrial potential. In C. elegans, two triterpenes were isolated: friedelin and cycloucalenol, and two alkaloids: pallidin and sebifarin. I. herbstii contains the isoflavonoid tlatlancuayin and showed antibacterial and antioxidant activities. M. alliaceae exhibited the organosulphur garlic compound diallyl ltrisulfide, among them, and oleanolic acid. In conclusion, the assessed species are promising in different applied areas, and specially could be a font of socio-economical progress for Ecuadorian farmers.

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Bibliography
1. Touré, D.et al. *J Ess Oil Bear Plants,* 2014, 17(4): 607-616.
2. Valentová, M.et al. *Fitoterapia* 2011, 82: 272-275.
3. Do, K.T. et al. *J Chromatogr A,*; 2014, 1325: 256-260.
4. Chaudhuri, D., Sevanan, M., *Internat J Phytomed* 2012, 4: 477-485.
5. Patel, I. et al. Interrnat *J Adv Pharmac Res* 2013, 4(6): 1823-1828

Biography
PhD in Chemistry and Pharmaceutical Technology, Università degli Studi di Pavia (Italy). Professor and researcher, Dept Chemistry, Technical University of Loja, Ecuador. He has published 20 papers in reputed journals of natural products chemistry and pharmaceutical applications. He owns two patents in the use of natural products. SILAE Vice-president from 2014.

RELEVANCE OF INTEGRATIVE MEDICINE IN ONCOLOGIC PATIENTS WITH BREAST CANCER

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The cancer is the third cause of dead in Mexico and the second in USA. Actually the treatments against cancer are chemotherapy, cirugy and radiation, all of these treatments have serious adverse effects thus some patients experiment pain, fatigue, nausea and other symptoms that in several cases are too serious and for this reason some patients doesn't want to keep up with the treatment. We made a study with patient of breast cancer with a positive report of cancer by biopsy and all this patients are in chemotherapy. The main goal of this study was to know which are the principal causes that made the patient visit the area of oncology urgencies. 50 women with breast cancer in chemotherapy were included in the study and age, histology of the cancer, Her 2 positive or negative, line of chemotherapy, clinical stage and the main cause the patient require emergency attention were evaluated. Main results were: Age: 55.25 (28-75). Histology: Ductal infiltrate carcinoma 90 %, lobulillar carcinoma 6 %. Her 2 positive: 18 % Line of chemotherapy: 1 line: 64 %, 2 line: 22 %, 3 line: 2 %, 4 line: 8 %. Clinical Stage I: 2 %, IIA: 18 %, IIB: 22 %, IIIA: 16 %, IIIB 18 %, IIIC: 10 %, IV: 14 %. Main Symptom: Pain (48 %), Toxicity (38 %) (Fatigue 57 %, nausea 25 %), Progression 8 %, dyspnea 6 %. These results show that the main cause of attention in urgency were pain and toxicity, which are expected adverse effects with the chemotherapy, but even when the patient is taking painkillers and drugs against nausea or vomiting, the patients required attention in urgencies to control these symptoms. We support the use of other therapies to control pain. In our experience, the neural therapy, which combine acupuncture and drug, has been an addition to the treatment of pain, blocking some point's specific to each pain also in the treatment of the hiccough blocking the solar plexus. In addition against nausea there are a few herbal treatments that we could use when the patient doesn't response to the normal drugs, and we need to find new chemotherapies against cancer, more specific and more effective, to avoid the adverse effects. There are few plants under study, which are a promising option.

Bibliography

1. Cordellat A.B , *Efectos adversos de la quimioterapia;* Guías actualizadas de la Sociedad Española de Oncología Médica. 2013.
2. American Joint Committee on Cancer. *Breast Cancer Staging* 7 ed, 2009, AJCC.
3. Slamon, D.; Eiermann, W. *N Engl J Med* 2011, 365:1273-1283.
4. Toscano F. Pinilla L. *Salud UIS* 2012; 44 (2): 57-65.
5. Olmos Guzmán A et al. *Proceed XIX SILAE Congress,* Cagliari, Italy, Sept. 2010

Biography

Graduated in Medicine, Universidad Michoacán de San Nicolas de Hidalgo, Mexico. Medical Genetics specialization, Hospital of Nutrition and Medical Sciences "Salvador Zuviran", Mexico. He has participated in several national and international congresses, with several awards for his publications, principally about cancer and new combined treatments using plants to reduce side effects of chemotherapies.

ETHNOMEDICINE TRADITIONAL KNOWLEDGE. MEDICINAL SECRETS OF THE GUAJIROS ELDERLY

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The introduction of new cultural patterns, the breakdown of the social fabric and the lack of strategies or programs which contribute to the rescue of traditional knowledge, can be considered the major contributing factors in the loss of cultural values, there is a strong relationship between the destruction of tropical forests and other ecosystems, and the decline of biological diversity as well as cultural loss. The aim of this research was to gather existing information on traditional ethno-medicine in the municipalities, villages and townships of the department of La Guajira. Were visited 44 populations of the department, were interviewed 80 elderly who had information on medicinal secrets used by his predecessors in the cure and prevention of symptoms and diseases. The results indicate that there are approximately 1200 medicinal secrets with an average of 15 secrets per elderly including plants, animals, salts and essences used by their ancestors (parents, grandparents, great-grandparents, etc.) of 200-500 years ago in the prevention and cure of arthritis, colds, conjunctivitis, migraine, “bad” blood circulation, erysipelas, cough, inflammation, body aches, infertility, kidney stones, sexual impotence, snake and insect bites, diarrhea, headache and others. Concluding that there is a great cultural heritage of traditional ethno-medicine in guajiros elderly that has endured for generations, but now presents a breakdown of the cultural channel in the new generations, leading to the near extinction of traditional knowledge, being difficult to find in the populations sampled elderly traditional knowledge.

Bibliography

Chacín HJ, 2005. *Semántica y etnomedicina wayuu*. Ed. Antillas Ltda, Barranquilla, Atlántico, Colombia, 31 p.
Rosado JR, 2009. *Farmacopea Guajira.* 2nd ed. Ediciones Universidad de La Guajira, Ed. Gente Nueva, Bogotá, Colombia. 460 p.
Rosado JR, & Moreno MI, 2011. *Plantas guajiras: de medicinales a tóxicas*. Ediciones Universidad de La Guajira, Ed. Gente Nueva, Bogotá, Colombia. 333 p.

Biography

Jairo Rosado Vega has completed his studies at the University of Antioquia of Biologist and graduate studies at the Autonomous University of Mexico. He is a researcher professor and director of the research group Pichihuel at the University of La Guajira (Colombia). He has published papers in reputed journals, 7 books of research results most notably the book Pharmacopoeia Guajira, some multimedia documents and is member of SILAE and Hydroponics Red of the University La Molina. His present field of research is traditional medicine and productive biology.

POSTERS

EVALUATION OF THE INSECTICIDE ACTION OF FIVE ARGENTINE PLANTS ON TRIBOLIUM CASTANEUM, PEST OF STORED GRAINS

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Plant biodiversity creates ecological niches that host a variety of herbivores and predators. These ones self-regulate each other and maintain a dynamic balance that avoids a population of herbivores becomes a pest (1, 2). Plants are a potential source of active principles. The phytochemical study of native plants and the identification of their secondary metabolites with biological anti-herbivore action that alters their behavior, growth and development, is relevant in the field to design bioinsecticides allowing the replacement of synthetic inputs by other organic alternatives. Compounds not affecting the man and his environment are searched (3).
Solidago chilensis (Asteraceae), Senecio crassiflorus (Asteraceae), Ovidia andina (Thymelaeaceae), Lithraea molleoides (Anacardiaceae) and Hybanthus bigibbosus (Violaceae) were selected to assess the adverse effects of their CH_2Cl_2 and MeOH extracts in Tribolium castaneum ingestion and inhalation trials and then characterize and identify their active compounds. Ingestion trials gave significant mortality with S. crassiflorus CH_2Cl_2 and MeOH extracts (81and 74%, 50.000ppm), O. andina CH_2Cl_2 extract (30%, 5.000ppm) and H. bigibbosus, with sublethal effects (changes in the life cycle) in all evaluated extracts Inhalation trials gave significant mortality with L. molleoides CH_2Cl_2 extract (70%, 10.000ppm).
S. crassiflorus CH_2Cl_2 and MeOH extracts and S. chilensis MeOH extract produced insects immobility for 24 hours. These extracts were analyzed by TLC and HPLC and some of their components were characterized and identified. These promising results allow to continue the bioassay-guided phytochemical study of insecticidal activity of the five species and could contribute to the development of a natural insecticide, safe for human health and the environment.

Bibliography

1- Nicholls, C.I. *Agroecología.* 5: 7-22, 2010.
2- Nicholls, C.I., Altieri, M.A. *Agroecología*. 6: 28-37, 2012.
3- Céspedes, C.,et al. *Rev. Latinoamer. Quím.* 42: 113-132, 2014.

ANTICHLAMYDIAL ACTIVITY FROM LITHRAEA MOLLEOIDES (VELL.) ENGL.

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Lithraea molleoides (Anacardiaceae) is a tree that grows in Argentina, Brazil and Uruguay. Its leaves in decoction or infusion are known in folk medicine for the treatment of various diseases related to inflammation and respiratory affections. Previous investigations on different extracts of L. molleoides have reported antiviral and antimicrobial activities. Chlamydia trachomatis causes the most prevalent sexually transmitted bacterial infections in the world, are often asymptomatic and treatment failures have been frequently observed. Medicinal plants offer a wide resource of new antichlamydial agents. An infusion, an isolated insoluble fraction of methanol extract and a fraction enriched in resorcinol derivatives compounds obtained from dichloromethane extract were assayed. Five Chlamydiae strains were assayed in five different conditions, A: pre incubation with the extract before chlamydial infection, B: pre incubation and inoculation with the extract, C: only inoculation with the extract, D: inoculation and post incubation with the exctract, and E: only post incubation with the extract, all of us with its corresponding controls without extract. Reduction in the number of inclusions was determined with immunofluorescent staining after 48 hs incubation (% of inhibition of infection). Only insoluble fraction showed p ositives results. In all the cases, inhibition of C. trachomatis was observed in the conditions B, C and D when the extract was present during inoculation. According to phytochemical studies, 90% of the insoluble fraction corresponds to ellagic acid. Due to the inhibitory effect of insoluble fraction during inoculation, we remark the potential use of ellagic acid in C. trachomatis infection prevention.

Bibliography

-López, P., Ferraro, G, Anesini, C. *Phytother Res* 245(2), 271-276, 2011.
-Gallo Vaulet M. L.,et al. *BMC Research Notes* 10, 33-34, 2010.
-Rodríguez Fermepin M. (2004) *Epidemiología de la infección por Chlamydia trachomatis. Establecimiento de un sistema de infección persistente in vitro.* PhD Thesis, University of Buenos Aires, Argentina.

Biography

Alejandra Vanina Catalano has completed her degree as pharmacist from the University of Buenos Aires and is a PhD student in the same University. She has participated in several projects supported by official research organisms. She is a collaborator in the Argentinian Pharmacopoeia and has recently published abstracts in national and international congresses. Her present field of research is oriented to evaluate the inhibitory activity in vitro of Chlamydia trachomatis and Chlamydia pneumoniae of extracts and natural compounds isolated from Argentinian medicinal plants.

SCRIBONIUS LARGUS' COMPOSITIONES. MEDICAL RECIPES AND PHYTOTHERAPEUTIC KNOWLEDGES OF THE 1ST CENTURY C. E.

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Scribonius Largus' Compositiones are a medical treatise with 271 recipes based principally on phytotherapeutic knowledges of the 1st century C.E. The medical prescriptions 1-162 are subdivided according to body parts "from head to foots". Other recipes are remedies against poisonings, prescriptions for treatments of wounds, poultices, ointments (163-271). The use of many herbal and mineral drugs is consistent with our modern pharmacological knowledges: opium against cough and pains; squill (Scilla maritima L.) against dropsy; henbane (Hyoscyamus spp.) with antiasthmatic and antispasmodic properties; aloe (Aloe spp.) as cathartic; male fern (Dryopteris filix-mas (L.) Schott) against tapeworms; unexpanded flower-buds of Artemisia maritima L. against round worms; plants containing essential oils, with antimicrobial and rubefacient activities, used in formulations against infectious diseases and for muscular pain; alum for disinfecting and cauterizing wounds.
Many of these drugs are present in modern Pharmacopoeias and also the mode of preparation of various prescriptions is consistent with the current pharmaceutical technique.
The author collects and improves recipes of other ancient physicians (rarely follows folk beliefs) and at the end of his medical treatise identifies, with a scientific modern approach, the correlation between different individual factors affecting the responsiveness of the patient to the drugs.

Bibliography

Gigliola Maggiulli, *La pestis di Hercules Oetaeus* in "RCCM" LIV/1, 2012, pp. 37-46.
Gigliola Maggiulli, *La follia nella Phaedra di Seneca tra tradizione poetica e fenomenologia clinica*, in "RCCM" LV/1, 2013, pp. 75-93.
Gigliola Maggiulli, *L' Augusta (e compositiones) in Scribonio Largo,* in "Silvae di Latina Didaxis" Genova, 2014, pp. 5-33.

Biography

Alessia Romussi graduated in Chemistry and Pharmaceutical Technologies, (University of Genoa, 2005). Internships at PReuroCHEM (a Chemical Services Company, Cork, Ireland) and at the "Laboratoire de stéréochimie dynamique et chiralité, Université Paul Cézanne" (Marseille, France). PhD in Medicinal Chemistry, (University of Genoa, 2009). 2009- 2011: researcher at Nerviano Medical Sciences (Milan, Medicinal Chemistry, oncology area). In 2011 joined the Drug Discovery Unit of the European Institute of Oncology (Milan); her current work is focused on the synthesis of small molecules with desired activity/specificity against defined targets in the oncology field.

STROKE TEAM: MULTI-PROFESSIONAL INTEGRATION AND CARE REDUCING MORTALITY AND IMPROVING ACUTE STROKE CARE

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Integration of medical, paramedical and rehabilitation professionals in acute stroke is the mainstream of a Stroke Unit. It is an effective evidence-based intervention to decrease disability and mortality. Since 2011, professionals from Santa Paula Hospital have started collecting data, as a part off an internal quality patient-centered program, whose one of focuses is acute stroke care. Since 2013, Stroke Unit has started its actives, receiving the Joint Commission International Stroke Accreditation in 2014. Results showed were produced without substantial increasing of our physical and human resources structure. Santa Paula Hospital Stroke Program was based on internal reorganizational of hospital procedures, close follow-up of the selected patients, multi-professional weekly ward rounds and continuing education. The length of hospital stays decreased in 19.81%, from a mean of 10,80 days to 8,66 days. The global time for the first health professional contact decreased 35,34%, from 5,97 minutes to 3,86 minutes.
The global time for initiating intravenous thrombolysis is decreased in 30,36%, from 96,40 minutes to 67,13 minutes. Those improvements are able to reduce disability, mortality and global costs related to stroke care. As an exemple of that, mortality data shown a decreasing of mortality rate, expressed on deaths by 1000 cases, from 16,07 to 4,06 in just two years of the program. This experience reveled that sharing knowledge and experiences between different health professionals has positive and low cost impact over acute stroke out-come.

Bibliography

Matthew R. K. et al. *Stroke* 2014.
Cochrane Stroke Group. *Organised inpatient (stroke unit) care for stroke. Stroke Unit Trialists' Collaboration.* CoChrane Library 2001.
Andrew E. et al. *The Lancet* 2001

Biography

Alexandre S. Bossoni is Clinical Neurologist by Clinical Hospital of School of Medicine of University of São Paulo and Movement Disorders Specialist at the same institution.
He develops clinical activities at Sírio-Libanês and Santa Paula Hospital, where he is tutor in Clinical Neurology of Neurosurgery Medical Residence and Co-responsible for Stroke T eam Program. Now he develops his doctoring program on Cerebral Thrombosis and Chronic Pain Management.

ISOLATION AND IDENTIFICATION OF STEROIDAL SAPOGENIN PRESENT IN DIOSCOREA ALATA L. CULTIVATED IN CHANGUINOLA, BOCAS DEL TORO

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Introduction: The genus Dioscorea is extremely important for the industrial production of sex hormones and cortisone, for the main secondary metabolites present in tubers that contain saponins, sapogenins such as diosgenin and alkaloids, which are used as raw materials in the pharmaceutical industry (Ruvalcaba, 2013). In the province of Bocas del Toro, it's not only cultivated by tradition the popular tuber known as Creole yam, this product is also distributed and consumed as part of the typical dishes of the region, so it is of interest to isolate and identify the sapogenin present in the species Dioscorea alata L.Yam was used during the eighteenth and nineteenth centuries to prevent menstrual pain and complications related to childbirth (Hernández F., 2007), indigenous groups in Panama have known and used this species, from medical point and as food.
Methodology: Fresh sample was dried and subjected to acid hydrolysis with 2.5N HCl solution and then brought to neutral pH. In a soxhlet system saponins are extracted using petroleum ether as solvent.
Results / Discussion / Conclusion: A percentage yield 0.035 ± 0.9691 of Creole yam which is a variety within the Dioscorea alata L, after subjecting the sample to acid hydrolysis and filter a large percentage of raw sample is lost, that's why the percentage of the isolated compound is low. the quantification of sapogenin was performed with the method Hiai, (García Ortiz & Guadalupe, D., 2014) to obtain a concentration of 133.5 µg, to check the presence of sapogenin and other related metabolites was performed a phytochemical screening (Miranda, 2011) testing for the presence of steroid sapogenin.

Bibliography

1. Ruvalcaba, F. S., et al, 2013, *Conservación, manejo y aprovechamiento de Camote del Cerro (Dioscorea spp.) en el Estado de Jalisco*, México.
2. García Ortiz, M., & Guadalupe, D. (2014). *Evaluación de malezas usadas como forraje en el estado de Querétaro en cuanto al contenido de fitatos, saponinas y su actividad hemolítica* (Thesis).
3. Miranda Bazán, J. (2011). *Tamizaje fitoquímico en cinco plantas medicinales de Ixhuatlancillo.*
4. Hernández Ramos, F. (2007). *Antienvejecimiento con nutrición ortomolecular.* Edit. RBA-Integral, Barcelona.

Biography

Anais N. Marrugo Caballero has completed her degree in chemistry from the Universidad Autónoma de Chiriquí, She is junior researcher of the Centro de Investigación de Productos Naturales y Biotecnología (CIPNABIOT).

BIOLOGICAL ACTIVITIES OF ETHANOLIC EXTRACT FROM KIELMEYERA CORIACEA MART. AND ZUCC (CLUSIACEAE)

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Medicinal plants have been investigated as therapeutics for the treatment of various diseases, including peptic ulcers (PU) (Martins et al., 2015). Despite great advances in the understanding of the PU, its etiology has not been completely elucidated; it is believed to result from an imbalance between aggressive and cytoprotective factors (Mota et al., 2009). The main therapeutic target to PU is the control of acid secretion (H2 receptor blockers or proton pump blockers). However, nowadays, gastric ulcer therapy faces a major drawback because most of the drugs currently available in the market show limited efficiency and are often associated with side effects. This study assessed the effects of the ethanolic extract of the Kielmeyera coriacea bark (KCEt) in the gastric ulcer induced by absolut ethanol, as well as its antimicrobial activity. Antiulcerogenic studies were performed on male Wistar rats (n=7). Animals receiving 0,9% Saline (10 mL/kg) and KCEt (50; 100; 200 and 300 mg/kg, p.o.) after a 12-h fast were used. The experimental protocols were approved by the Animals Ethics Committee from Federal University of Goiás (no. 001-14). The phytochemical analysis of the KCEt revealed the presence of triterpenes. Only the doses of 200 and 300 mg from KCEt were able to inhibit the mucosal injury (82.8 and 93.5%, respectively). KCEt showed an antimicrobial activity (MIC 8 µg/mL for S. aureus; MIC 4 µg/mL for E. coli). Our results reveal, for the first time, the importance of K. coriacea as an inhibitor of gastric ulcer and bacterial growth.

Bibliography

Martins, J.L.,et al. Fundam Clin Pharmacol 29, 238-251, 2009.
Mota, K.S.,et al. Molecules 14, 979-1012, 2009.

Biography

Anderson Luiz-Ferreira is current woking as an Adjunct Professor in Department of Biological Sciences at Federal University of Goiás. He finished Ph.D. in Molecular and Functional Biology from Campinas University in 2009 and Msc. in Pharmacology, Campinas University in 2005. Currently, Dr. Luiz-Ferreira's interest is focused in to study the action mechanism of the medicinal plants in the pathophysiology of the diseases that affect the gastrointestinal tract (peptic ulcers and inflammatory bowel disease) and where published more than 30 papers in reputed journals.

ANTITUMORAL ACTIVITY OF EXTRACT FROM DIFFERENT SALVIA SPECIES

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Interest in a large number of traditional natural products has increased. It has been suggested that aqueous and alcoholic extracts from plants used in allopathic medicine are potential sources of antiviral and antitumor agent (1,2). Earlier studies have indicated that Salvia miltiorrhiza Bunge, a traditional Chinese herbal medicine commonly used to treat liver diseases, have significant antitumoral properties, although the underlying mechanism remains to be elucidated.
The aim of the present study was to test the potential antitumoral activity of other species belonging to the genus Salvia, traditionally used for treating numerous diseases. Methanolic extracts of three species of Salvia: Salvia sclarea L. roots, Salvia menthaefolia Tenore roots and Salvia dominica L. leaves were tested in vitro for their potential antitumoral (cytotoxicity) activity. Colon carcinoma cells (WiDr and HT29 cell lines) were grown as a monolayer culture in RPMI medium supplemented with 10% fetal bovine serum, 100 units/ml penicillin, 100 µg/ml streptomycin, 20 mg/ml glutamine. Cells were maintained at 37°C in a humidified 5% CO2 atmosphere. The methanolic extracts of Salvia species were dissolved in dimethyl sulfoxide, diluted in growth medium at concentrations ranging 10-50 µg/ml and incubated for 24 hours. MTT (Tetrazolium blue) colorimetric assays was used to evaluate the reduction of cell viability in presence or absence of the extracts. None of the tested extracts caused a significant cytotoxicity when added to the cell line HT29. Salvia dominica extract induced a weak dose-independent lytic activity on WiDr cells. In contrast, Salvia sclarea and Salvia menthaefolia extracts were found to have a good dose-dependent cytotoxicity against the WiDr cells (35% and 25% cell inhibition at 25 µg/ml respectively, $P<0.05$). Moreover the anti-proliferative effect of Salvia sclarea extract was more effective at 50 µg/ml causing 48% cell inhibition ($P< 0.02$). Further analysis are underway to identify specific molecules (e.g. salvicin, salvinal) present in the methanolic extracts responsible of the cytotoxic activity.

Bibliography

1.Chang JY, et al.. *Mol Pharmacol* 65: 77–84, 2004.
2.Qing C, et al. *Anticancer Drugs* 12: 51–56, 2001.

DIFFERENT SALVIA SPECIES AS LIGANDS FOR SELECTED CENTRAL NERVOUS SYSTEM RECEPTORS: IN VITRO BINDING EXPERIMENTS

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Labiatae are generally known for their multiple pharmacological effects including their analgesic, anti-inflammatory, antioxidant, antimicrobial and Central Nervous System (CNS) depressant activities (1,2). The genus Salvia from the Labiatae family has 58 different species, Salvia sclarea L. is largely used in traditional medicine as antiseptic, for digestion disorders, in kidney disease and as an antitumoral remedy. Furthermore, it has been reported that some compounds from Salvia ssp (specially Salvia divinorum Epling & Jativa) are able to induce allucinogenic activity.
To investigate the mechanism of action on CNS and in order to verify if pharmacological activity depends on species, we have studied five different species of Salvia. Therefore we have evaluated the affinity for the serotoninergic, (5HT1A, 5HT2A and 5HT2C), adrenergic (α1 and α 2) and dopaminergic (D1 and D2) receptors of methanolic extracts of Salvia sclarea L. roots, Salvia dominica L. leaves, Salvia dominica L. flowers, Salvia Spinosa L. aerial parts, Salvia palestina aerial parts and Salvia menthaefolia Tenore roots.
The extract affinity for receptors is defined as inhibition percentage of radioligand/receptor binding and measured as the radioactivity of remaining complex radioligand/receptor.
Interesting results have been shown by S. sclarea extract with elevated affinity for the 5-HT2A receptors (IC50 value = 42.49 ± 0.591 g/ml) and good affinity for the D2 receptors (46% as level of inhibition at the maximum concentration tested, 125 g/ml).
In addition S. palestina extract showed high affinity for D1 and D2 receptors with IC50 values of 68.70 ± 2.421 g/ml and 30.14 ± 3.643 mg/ml respectively, while S. menthaefolia extract displayed moderate affinity only for the 5-HT2A receptors with a level of inhibition of 48.3% at the maximum concentration tested (125 g/ml).
All remaining extracts showed low or no affinity for the examined receptors.

1.Hernandez-Perez M, Rabanal RM, de la Torre MC, Rodriguez B. 1995. Analgesic, anti-inflammatory, antipyretic and haematological effects of aethiopinone, an o-naphthoquinone diterpenoid from Salvia aethiopis roots and two hemisynthetic derivatives. Planta Med 61: 505–509.

2.Hosseinzadeh H, Haddadkhodaparast MH, Arash AR. 2003.Antinociceptive, antiinflammatory and acute toxicity effects of Salvia leriifolia Benth seed extract in mice and rats. Phytother Res 17: 422–425

EVALUATION OF EUGENIA UNIFLORA EXTRACTS AS ANTIVIRAL AND IMMUNOMODULATOR IN DENGUE 2 VIRAL INFECTION

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Eugenia uniflora L. (Myrtaceae) (EU) species popularly used in South America as febrifuge and anti-rheumatic. Two batches of EU dry leaves were macerated 4 days at room temperature with EtOH (5% DER) and 7:3 acetone:H2O (10% DER) to yield EU-1 and EU-2, respectively. This latter was partitioned with AcOEt and the acetate phase was chromatographed in Sephadex LH-20 with MeOH to afford EU-2a, EU-2b, EU-2c and EU-2d. These fractions showed by TLC and HPLC to contain mostly chlorogenic acid, quercitrin, myricetrin and a mixture of the two latter, respectively. These fractions along crude EU-1 were assayed on Dengue-2 virus (DENV2) infected human hepatocellular carcinoma (HuH7) and human monocytes (REC 37230000.009-08). Cell viability was determined by the MTT assay in THP1 monocytes (24 and 48h). HuH7 and monocytes were infected with DENV2 and cultured with the extracts (0.5-10 µg/mL). Antiviral and immunomodulatory properties were accessed by detecting the non-structural protein NS1, TNF and MIF in cell culture supernatants by ELISA (24 and 48h). EU-1 (10 µg/mL) treatment produced a significant dose-dependent reduction (28%) of intracellular DENV antigen in HuH7 by flow cytometry analysis, but did not alter the NS1 production. MIF production by the infected cells (1249±637 pg/mL) was reduced after EU-1 treatment (681±241 and 720±185 pg/mL for 1.0 and 10 µg/mL). Myricitrin and the flavonoid mixture (10 µg/mL) inhibited 28-36% the NS-1 production in preliminary results. E. uniflora showed a potential anti-antiviral capacity to fight dengue or mitigate its damages. FIOCRUZ/RPT11D, IOC/PROEP, CNPq, FAPERJ, CAPES.

Bibliography: (a) H. Lorenzi, F., J.A. Matos. Plantas Medicinais no Brasil, 2nd ed., 2008. Plantarum: Nova Odessa, Brazil. (b) R.S. Lima-Júnior et al. Nat. Prod. Commun. 8, 1547-50 (2013). (c) S.R. Reis et al. Int. Immunopharmacol. 8, 468-76 (2008).

Biography
Dr. A.C. Siani is doctor in Chemistry (1987) with post-doc in organic chemistry (Spain, 1988), working as senior technologist in drug development from natural products in the Oswald Cruz Foundation (Ministry of Health). Main research field is Natural Product Chemistry (essential oils, terpenes, flavonoids, alkaloids) and Pharmacognosy (extraction and separation of bioactive plant metabolites; chemical characterization of medicinal plants). About 85 publications (articles, book participation, book edition, scientific video.

GENETICALLY MODIFIED FOOD: CAN THIS BIOTECHNOLOGY CONTRIBUTE TO HEALTH IMPROVEMENT?

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This work aims to discuss the perception of the influence of genetically modified food (GMF) on human health through a review of the literature. The use of GM organisms is a controversial topic, especially when applied to agriculture for human consumption, but it is one of the few options available to meet present and future food demands. As reported by UN, a serious problem in food biosecurity is the growing need of technologies to improve the efficiency of food production, in view of increasing world population, waste of food, climate change and degradation of environmental resources. Negative arguments associated with GMF have been raised trying to characterize them as unnatural and harmful to the human health and to the environment. However, risk analysis, which includes assessment, management and communication of risk, is routinely conducted by official agencies in many countries before commercial release of GMF. In general, there is close monitoring after commercialization begins and it is kept until the risk is deemed to be negligible, according to the precaution principle. So, biosafety of GMF is controlled through government regulation and active surveillance by the government, the society and the academic community. Our analysis suggests that, beside scientific concern, ethical principles can provide standards for evaluation of research, development and commercialization of GMF. Therefore, GMF, as fertile ground for applications of biotechnology and bioethics, will contribute to a state of complete physical, mental and social wellbeing and not merely the absence of disease, thus complying with WHO definition of health.

Bibliography

MITRE, M.; REIS, B.P.W.. Rev Policy Res 31(2): 125-147, 2014.
NATI, T. et al. Rev. Bras. Pesq. Saúde, 14(4): 97-102, 2012.
KEARNS et al. Transgen Res, 23:1015–1023, 2014.
ARANTES, O.M.N. Rev Bras Pesq Saúde, 14(3): 14-20, 2012.

Biography

B.J.P.Borges has completed her degree in Pharmaceutical Sciences from the University of São Paulo (USP), in Law from the Brazilian College and master studies from the USP. She has started doctoral studies in Biotechnology in Federal University of Espírito Santo (UFES).

MYTHS AND FACTS ABOUT THE USE AND ABUSE OF HERBAL DRUGS

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The use of any illegal plant drug or inappropriate use of licit plant drug is considered drug abuse. Successful interventions to young populations help to prevent risk behaviors before drug abuse occurs. The aim of this study was to measure the level of knowledge about use and abuse of herbal drugs, and the level of acceptance of the workshops implemented.
An interdisciplinary team of 25 future health professionals, performed literature review and critical analysis of available information on the topic in biomedical databases, and developed working material "myths and facts about herbal drugs". With this material, we worked with 110 high school students in workshops. A survey to assess the intervention was performed. From the survey it emerged that 12.3 % of school students consumed an illicit drug in the last year, marijuana being the greatest prevalence (10.3 %). Males consumed more than women. Recreational use of marijuana is considered "safe" by 20.8 % and as "low risk" by 38.3 % of school students. Over 35 % of respondents had not received information at school, whereas 73 % did not have any enough information. Research achieved a positive result (89 %) of acceptance of the workshop, on variables such as the level of information and information source. The programs implemented in schools have the advantage of reaching the majority of young people, their families and even the community. We emphasize the redefinition of school as public space in which it is possible to generate dialogue between adults and youth.

Bibliography

Czeresnia, D., & Freitas, C. M. D. (2006). Promoción de la salud: conceptos, reflexiones, tendencias. Lugar Editorial.
Di Leo, P. F. (2009). Salud colectiva, 5(3), 377-389.
Fernández, S., Nebot, M., & Jané, M. (2002). Revista Esp Sal Publ, 76(3), 175-187.
Hawkins, J. D., Catalano, R. F., & Arthur, M. W. (2002). Addict Behav, 27(6), 951-976.
Joanxich, J. M. S., Cerezuela, E. S., & Peña, C. C. (2011). Rev Soc Drog Alc, 23(1), 11-16.
Pentz, M. A. (2003). J Psychoact Drugs, 35(sup1), 143-152.

Biography

Currently completing a Masters in Epidemiology, Public Health and Management, National University of Lanus (UNLa). Teacher of Pharmacobotany and Pharmacognosy. Involved in outreach projects related to the health area.

SYSTEM FOR REGULATION AND CONTROL OF HERBAL MEDICINES IN CUBA. EXPERIENCES FROM THE PERIOD 2002-2014.

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In Cuba, the Center for the State Control of Drugs, Equipment and Medical Devices (CECMED), which is the National Regulatory Authority, has part of its objectives aimed at the developing of the System for Regulation and Control of the Quality of Drugs, whose scope includes regulations for the manufacturing of herbal and homeopathic medicines. This investigation resumes the experiences starting on 2002, when the Cuban regulatory authority (CECMED) began its control, until 2014, when were included in our regulations those for local production centers from all over the country. Local production centers are small laboratories manufacturing herbal products in order to supply needs from a specific location, according to the indicators of health, morbidity and mortality from each region of the country. The regulatory environment for these centers goes from the implementation of Agricultural Good Manufacturing Practices to the prescription of herbal medicines.

Bibliography

1. EMA. *Guideline on specifications: test procedures and acceptance criteria for herbal substances, herbal preparations and herbal medicinal products/traditional herbal medicinal products*. http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2011/09/WC500113210.pdf, 2011.
2. CECMED. Regulación 54-2012. *Buenas prácticas de fabricación de productos naturales de producción local.* http://www.cecmed.cu/Docs/RegFarm/DRA/BPPF/2010-2012/Reg/Reg_54-2012.pdf, 2012.
3, WHO, *Quality control methods for medicinal plant materials*. 2011.
3. *Guía para la prescripción de productos naturales.* 2014. http://instituciones.sld.cu/hgrilloscu/files/2014/04/Gu%C3%ADa-para-la-prescripciC3%B3n-de-productos-naturales-2.pdf.
4. Regulación M28-2013. Requisitos para el registro sanitario de medicamentos de origen natural de uso humano. CECMED, http://www.cecmed.cu/Docs/RegFarm/DRA/LicProd/2013/Reg/Reg_M%2028-13.pdf,2013.

Biography

MsC in Health Economy, National School of Public Health (ENSAP) Head, Research Dept in CECMED. Member, Cuban Society of Pharmacology. She has published 5 papers in reputed journals.

ACTIVITY OF VEGETABLE EXTRACTS ON BIOFILM PRODUCTION BY LISTERIA AND STAPHYLOCOCCUS

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Introduction

The biofilm transfers contamination to food products and impose risk to public health. Novel strategies or more effective agents with anti-biofilm ability are of great interest. The aim of this study was to evaluate the activity of three vegetable extracts and their mixture on biofilm-grown of Listeria and Staphylococcus strains.

Methods

The aqueous extracts of Acacia caven (A), Prosopis torquata (B) and Nepeta cataria (C) and the combinations (1:1) of A+B, A+C and B+C at their minimal inhibitory concentration were tested for their ability to interfere with the biofilm production by 4 strains of Listeria and 4 strains of Staphylococcus aureus. The tested concentrations ranged between 1mg/mL and 5 mg/mL. An aliquot of each bacterial suspension (108 CFU /ml), nutrient broth and extracts or mixture were placed in 96 well plates. After 48h incubation at 37°C. The plates were washed with PBS, dried, fixed with methanol and stained with crystal violet 1%. The content adhered was resuspended in ethanol and read in ELISA reader. OD550 ≥ 0.300 was considered producing biofilm. Positive and negative controls strains were used.

Results / Discussion/ Conclusions

None of extracts assayed displayed activity effective on the formation of biofilm by Listeria and S. aureus. The combinations A+B, A+C and B+C neither showed inhibitory effect of biofilm. While previous studies we detect antibacterial activity of Acacia caven and Prosopis torquata (1), however in this study no anti-biofilm activity was observed in the tested concentrations. Subsequent assays with other concentrations of extracts will performed.

References

1) Martinez M. A et al.. *PharmacologyOnLine*. 2014, 3 (1): 1-6

Biography

PhD, National University of Río Cuarto, Córdoba, Argentina. Professor of Bacteriology and Virology, National University of San Luis, Argentina. She has published 20 papers in reputed journals. Her present field of research is Microbiology.

ANTIOXIDANT, ANTIMICROBIAL AND ANTITUMOR ACTIVITIES OF THE ETHANOLIC EXTRACT RICH IN DITERPENES FROM LEAVES OF CASEARIA SYLVESTRIS SW. (SALICACEAE)

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Casearia sylvestris Sw. belongs to the family Salicaceae, order Malpighiales and can be found in all Brazil. This plant is popularly known as “guaçatonga” and has being used as antiparasitic and anti-inflammatory. Some studies showed that C. sylvestris has antitumor properties (Bou et al., 2014, Felipe et al., 2014, Albano et al., 2013). Furthermore, C. sylvestris is a plant species selected by the Brazilian government to be used in the public health system (SUS). More than 100 diterpenes, some of them clerodane-type, have been isolated from C. spp (Prieto et al., 2013, Ferreira et al. 2010, Wang et al., 2009, Bou et al., 2014). This study aimed to investigate the chemical composition as well as the antioxidant, antimicrobial and antitumor activities of the ethanolic extract from the leaves of C. sylvestris collected in the Rio de Janeiro State. The dry powdered plant material was extracted by maceration with ethano l5 %. The extract was submitted to phytochemical investigation by UPLC-DAD-MS (Shimadzu, Japan) and to biological investigation. The antioxidant activity was measured by the DPPH method; the antimicrobial assays were accomplished using eight microorganisms (E. coli, S. aureus, C. albicans, C. neoformans, T. rubrum, E. floccoson, F. pedrosoi, M. canis); and the antitumor activity was evaluated by wst-1 against A549 cell line (human lung carcinoma). UPLC-DAD-MS analysis of the ethanolic extract showed signals with retention time at 19.2, 20.4, 23.6, 26.0, 26.4, 26.9, 27.7, 29.0, 30.1, 30.8, 31,4, 32.0, 33.6 and 35.0 minutes with UV and MS spectra compatible with diterpenes with MW ranging from 400 to 640. The ethanolic extract showed a high antioxidant activity (EC50 = 5.0 µg/mL); a selective antimicrobial activity against C. albicans and C. neoformans (MIC = 19.5 µg/mL); and a dose dependent cytotoxic activity against A549 tumor cells (EC50 = 0.75 µg/mL). Our results point out the ethanolic extract from leaves of C. sylvestris is rich in diterpenes and promising antioxidant, antimicrobial and antitumor activities.

Bibliography

1. Albano M.N et al. *J Ethnopharmacol* (2013). 147(3): 612 – 617.
2. Bou, D.D et al. *Phytomed* (2014) 21(5): 676 – 681.
3. Felipe, K.B. et al. *J Ehtnopharmacol* (2014) 155(3): 1492 – 1499.
4. Ferreira, P.MP et al. *Chem Biol Interact* (2010) 222(5): 497 – 504.
5. Prieto, A.M. et al. *Food Chem Toxicol* (2013) 53: 153 – 159.
6. Wang, W. et al. *Fitoterapia* 80(7): 404 – 407.

Biography

PhD in Chemistry of Natural Products, Federal University of Rio de Janeiro, Brazil. Researcher, Institute of Pharmaceutical Technology, Oswaldo Cruz Foundation (Fiocruz), Rio de Janeiro, Brazil. He has published more then 40 papers in Chemistry of Natural Products, Toxicology and Analytical Chemistry (GC-MS and LC-MS). His present field of research is chemistry of natural products and analytical toxicology.

BIOACTIVITY-DIRECTED IDENTIFICATION OF THE CYTOTOXIC FRACTION OF PERESKIA ACULEATA MILLER LEAVES

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Pereskia aculeata Miller (Cactaceae) is a climbing shrub which leaves are used in Brazilian traditional cuisine and folk medicine to treat several diseases. In previous studies, the hexane fraction (HF) obtained from the methanol extract of P. aculeata leaves showed antioxidant and cytotoxic activity against human promyelocytic leukemia and human breast adenocarcinoma cells (HL-60 and MCF-7 cell lines, respectively). So, the aim of the present study was to fractionate HF by silica gel column chromatography and to perform a biomonitored study evaluating the cytotoxic activity of the obtained fractions against human breast adenocarcinoma (MCF-7 and MDA cell lines), leukemia (HL-60, JURKAT and THP-1 cell lines), colorectal carcinoma (HCT-116 cell line), and non-tumor cells (VERO cell line). MTT assay, which is based on the ability of viable cells to metabolically reduce the (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) to formazan, was used. It was obtained 21 fractions (F1-F21). F6 fraction showed promising results against all the leukemia cell lines, inhibiting HL-60, JURKAT and THP-1 cell proliferation by 90%, 80% and 65%, respectively. In addition, this fraction showed low cytotoxicity for VERO cells (30%). For this reason, this fraction was analyzed by gas-chromatography coupled to mass spectrometry equipped with Wiley 275.1 mass spectral library, which leaded to the identification of vitamin E, methyl palmitate and linolenic acid methyl ester as the major constituents. Those results suggested that the leaves of P. aculeata are endowed with chemical constituents that should be further investigated for their potential to treat cancer diseases, especially leukemia.

Bibliography

Carvalho EG et al. *Rev Bras Farmacog* 2014; 24: 677-682.
Pinto NCC et al. *Pharmac Biol* 2015; 18: 1-6.
Pinto NCC et al. *PharmacologyOnLine* 2012; 3: 63-69.
Pinto NCC, Scio E. *Plant Foods Human Nutr* 2014; 69: 189-195.

Biography

Ph.D. in Chemistry of Natural Products, Oswaldo Cruz Foundation and University of Illinois at Chicago. Member, Brazilian Society of Pharmacognosy. She has published 40 research articles, book chapters, and comprehensive reviews. Her research interests are focused on Bioactive Natural Products: fractionation of bioactive plant extracts, isolation of active compounds and evaluation of biological activities as hypoglycemic, anti-inflammatory, antimicrobial, and antioxidant.

DETERMINATION OF THE POLYPHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF EXTRACTS OF SENNA RETICULATA (SARAGUNDÍ) IN THE NORTH PART OF COSTA RICA

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The Saragundi is a shrub, which presents various ethnobotanical uses; it is traditionally used to treat various conditions in humans as well as animals. It is also used as a biological control due to its antibacterial and antifungal properties. “Senna” leaves are used as a laxative and as a supplement for weight loss. This study sought to validate the phytochemical properties and potential biological activity of saragundi using laboratory techniques that enable progress in establishing protocols to ensure their proper use; as well as to allow this knowledge to be used as a basis for the development of phytho-pharmaceuticals. The species were georeferenced, parts separated, dried and processed for the production of extracts with solvents of different polarity, proceeding with the fractionation and analysis by UPLC-DAD techniques / TQ-ESI MS and NMR. Antioxidant activity via two methodologies, ORAC DPPH as well as cytotoxicity in cancer cell lines with the MTT method was also determined.
The results obtained showed a total polyphenols (PT) value of 79.30 ± 4.18 mg GAE/g sample and total proantocinidinas (PRO) of 1.63 ± 22.35 mg CAE/g sample. The antioxidant potential obtained with the DPPH method was low with a IC50 of 72.88 ± 1.1 (ug sample/mL) and the antioxidant activity obtained with ORAC was moderate (3.52 ± 0.03 TE/mg sample). The IC50 obtained for the cytotoxic effect with the MTT method was 208.4 ± 48.9 ug sample/mL for AGS and 202.5 ± 39.1 ug sample/mL for SW 460 with a higher value (>500 ug sample/mL) for Vero. These results showed no citoxicity towards normal cells and similar cytotoxicity values towards both cancer cell lines AGS and SW460.

Bibliography

Lizcano, L. *Food Chem* , 2010, 119: 1566–1570.
Nunes, R.. *Quim. Nova* , 2008, 31: 1979-1981.
Omur, L. *Rec. Nat. Prod* , 2011, 54, 261-270.
TROPICOS # 01700356. http://mobot.mobot.org/cgi-bin/search_vast Accessd: 12.03.2010

Biography

Master in Sciences in Biology, University of Costa Rica. Researcher and professor, Technological Institute of Costa Rica. Research experience in reproductive biology of plants, environmental biology and the use of natural resources as a mean to contribute to the sustainable economic development of developing regions. She has published 90 scientific articles.

POLYPHENOLIC CONTENT ON EXTRACTS OF PHYLLANTHUS NIRURI CHAM. & SCHLTDL (CHANCA PIEDRA) IN COSTA RICA

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Chancra stone (Phyllanthus niruri) is a monoecious herb, that has been reported to contain different components such as lignans, terpenes, lupeol; flavonoids; fatty acids, steroids; also alkaloids and tannins, among others. It has been found to have antiviral activity, inhibits the growth of melanoma and leukemia, it showed antihepatotoxic effect in rats, it has nematicides effects, it contains glycosides which help inhibit cell lines of myeloma, as well as the presence of other activities. This study sought to validate the phytochemical properties and potential biological activity of P. niruri using laboratory techniques that enable progress in establishing protocols to ensure their proper use as well as to use this knowledge as a basis for the development of phyto-pharmaceuticals. The species were georeferenced, parts separated, dried and processed for the production of extracts with solvents of different polarity, proceeding with the fractionation and analysis by UPLC-DAD techniques / TQ-ESI MS and RMN. Antioxidant activity via two methodologies, ORAC and DPPH, as well as cytotoxicity in cancer cell lines with MTT method was also determined. It was found that there are differences between the composition of the root and aerial part. The analysis by UPLC-DAD techniques / TQ-ESI MS and RMN allowed to elucidate structures, such as phenolic acids, both hydroxybenzoic and hydroxycinnamic acids, as well as flavan-3-ols, including monomers and procyanidin dimers and trimers, and also differences were found in the total contents of polyphenols, total contents of procyanidins, the antioxidant activity with both methodologies, ORAC DPPH as well as cytotoxicity results in gastric cancer cell lines (AGS) and Colon (SW620).

Bibliography

1. Germosén-Robineau, L (ed.). (2005). *Farmacopea vegetal caribeña*, TRAMIL. Segunda edición. Editorial Universitaria UNAN-León, Nicaragua.
2. Jiménez, M.; Alvarenga, S.; Alan, E. Tecnología en Marcha 2007, 20(2): 32-40.
3. Mdlolo C.M. et al. *African. J Biotechnol* 7/5: 639-643, 2008.
3. Trópicos. 2009. # 01700356. http://mobot.mobot.org/cgi-bin/search_vast. Accessed on 20.3.2010.
4. Trópicos.2013.http://www.tropicos.org/PublicationReferences.aspx?titleid=24966. Accessed on 4.3.2013.

Biography

Master in Sciences in Biology, University of Costa Rica. Researcher and professor, Tchnological Institute of Costa Rica. Experience in reproductive biology of plants, environmental biology and the use of natural resources as a mean to contribute to the sustainable economic development of developing regions. She has published 100 research articles.

EFFECT OF SPERMINE AND NITROGEN LIMITATION IN GROWTH AND SECONDARY METABOLISM OF CASTILLEJA TENUIFLORA BENTH. SHOOTS CULTURE

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Castilleja tenuiflora Benth. (Orobanchaceae) is a medicinal plant commonly known in México as “cancer herb”. It has been long used in folk medicine to treat inflammation, gastrointestinal disorders and the symptoms of various cancers (1). These uses may be related to the biological activities of its secondary metabolites, including flavonoids and phenylethanoid glycosides (2). Nitrogen limitation enhanced the secondary metabolism in Castilleja tenuiflora shoots culture. However, biomass production is scarce and tissue chlorosis occurs (3). Spermine is a polyamine that regulates cell division and differentiation (4). The aim of this study was to evaluate the effect of spermine and nitrogen limitation in the growth and secondary metabolism of Castilleja tenuiflora shoots culture. Three week old in vitro shoots were cultured in temporary immersion bioreactors in B5 culture medium and the effects of spermine (5 µM; Sp) and nitrogen limitation (0. 63 mM; LN) in four different treatments as follows: total nitrogen in B5 medium (25.6 mM; Nt); Nt+Sp; LN and LN+Sp were tested. LN+Sp treatment promoted shoots and roots elongation without significant differences in shoots multiplication. The highest concent of phenolic compounds was obtained in leaves (LN) and stem tissue (LN+Sp) after 21 days. In conclusion Sp promotes shoots elongation and TPC production but does not produce a significant change in shoots multiplication rate.

Bibliography

1. Sanchez, P. M. et al. *J Ethnopharmacol,* 2013, 150 (3), 1032-1037.
2. Gómez-Aguirre, Y. A. et al. *Industr Crops Prod*, 2012, 36(1), 188-195.
3. Medina-Pérez, V. et al. *Acta Physiol Plant,* 2015, 37(5), 1-8.
4.4 Ahmad, P. et al. *Polyamines: role in plants under abiotic stress. In Crop production for agricultural improvement.* Springer, Netherlands, 2012. (pp. 491-512).

ANTIFUNGAL ACTIVITY OF VIROLA PLANTS AGAINST FUSARIUM OXYSPORUM

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Natural compounds are promising prospects for antifungal bioactives. On this context, Virola plants are a good source of biologically active compounds because they have also been reported with antifungal properties [1]. Thus, as part of our research on antifungals, eighteen ethanol-soluble extracts from different parts of plants belonging to the genus Virola (V. carinata, V. elongate, V. peruviana, and V. callophhylla) were evaluated using the micro-scale supplemented medium method against Fusarium oxysporum. The extracts were profiled using RP-UFLC-DAD chromatographic techniques, and total phenolics and flavonoids were also quantified [2] in order to get fingerprints and determine similarities in the composition thereof. The results indicated that extracts exhibited dose-dependent inhibition of fungal mycelium at different levels. The UFLC-derived profiles allowed determining that the chemical composition of the extracts considerably varies between species, although they showed some similarities between extracts from the same part of a plant. Additionally, a principal component analysis (PCA) with antifungal activity and total contents data and a partial least squares (PLS) analysis with chromatography data clustered the extracts by common chemical and biological features, indicating a composition-activity relationship useful for further studies focused on rational isolation of antifungals from Virola species. The present work is a product derived by the Project INV-CIAS-1788 financed by Vicerrectoría de Investigaciones at UMNG - Validity 2015.

Bibliography

1. Sartorelli, P., M.C.M. Young, M.J. Kato. *Phytochem* 47(6): 1003-1006, 1988.
2. Martínez Valderrama, J.C. *Phytochem* 55(6): 505-511, 2000.

Biography

Resarcher, Military University Nueva Granada, Colombia. Head, Bioorganic Chemistry Laborator.. He has published more than 45 papers in reputed journals. His current research is focused on natural product chemistry, organic synthesis, medicinal chemistry, molecular modeling and chemoinformatics, and plant metabolomics.

GENOTOXIC AND PRO-APOPTOTIC ACTIVITY OF CHLOROFORMIC FRACTIONS FROM AGERATINA GRACILIS ON CANCER CELL LINES

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Ageratina gracilis (Kunth) R.M. King & H. Rob has been reported as specie with a high content of flavonoids (1) suggesting therapeutic properties such as others species of the Ageratina genus used for a long time in traditional medicine (2, 3, 4). The DNA damage and pro-apoptotic induction were evaluated on lung A549, colon HT29, breast MDA-MB231, prostate PC3 and cervical SiHa cancer cell lines after exposure to chloroformic fractions derived from total ethanolic or petrol extracts from leaves and inflorescences of A. gracilis at IC50 values determined by cell viability test MTT. The values of DNA damage were analyzed by a single cell electrophoresis comet assay, measuring the displacement between the genetic material of the nucleus and the resulting tail. According with the results, a high percent of DNA tail, above of 80 percent, resulted on MDA-MB231, PC3 and SiHa treated with the chloroformic fraction derived from the total leaves ethanolic extract (C-LEE) also on A549 and HT29 exposed to the chloroformic fraction derived from the total inflorescences petrol extract (C-IPE). Pro-apoptotic activity of chloroformic fractions was confirmed by the detection of phosphatidil serine residues translocate to the extracellular membrane, with fluorescently labeled Annexin-V. No cells labeled only with propidium iodide were found on these analyzes discarding a cellular death by necrosis. The results indicated that C-LEE and C-IPE showed early and late pro-apoptotic response on cancer cell lines. A. gracilis has demonstrated an important genotoxic and pro-apoptotic activity against cancer cells, being a starting point for forthcoming studies of its antineoplastic activity.

Bibliography

1. Torrenegra R.D. et al.. *Rev Fac Ciencias.* 1987, 1:141-152
2. Romero-Cerecero O. et al. *Planta Med* 2013, 79(8): 622-7(doi: 10.1055/s-0032-1328462)
3. Bustos-Brito C. et al. *J Nat Prod* 2014, 77(2): 358-63 (doi: 10.1021/np400964w)
4. Romero-Cerecero O. et al. *J. Planta Med.* 2011, 77(10): 979-83 (doi: 10.1055/s-0030-1250743)

Biography

PhD, Universitá di Roma, TRE in Biology Applied to Human Health. Present research interests are in cell apoptosis induction exposed to antineoplastic agents.

CITOTOXIC ACTIVITY OF ANNONA SQUAMOSA, PETIVERIA ALLIACEA Y PUNICA GRANATUM ON CANCER CELL LINES.

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The use of natural products in the traditional medicine in Colombia is increasing due to high diversity and easy access to medicinal plants. The purpose of this research was to evaluate the cytotoxic activity of the extracts from Annona squamosa, Petiveria alliacea and Punica granatum over MDA-MB231 breast, HT29 of colorectal, SiHa of cervix, A549 of lung and PC3 prostate cell lines. Citotoxicity was evaluated by MTT assay (tetrazolium bromide) and an analysis of the organic compounds of the extracts was made by chemical tests. The results shown that the ethanolic extract from seeds of Annona squamosa caused the highest cytotoxicity over the cancer cell lines with IC50 values of 17,54 µg/mL for MDA-MB231; 13,07 µg/mL for PC3; 39, 683 µg/mL for A549; 16,09 µg/mL for SiHa and 19,74 µg/mL for HT29. Additionally, severe morphological changes were also detected on cytoskeleton, mitochondria and nucleus in the cancer cell lines with the seed ethanolic extract of Annona squamosa by immunofluorescence microscopy technique. Secondary groups of metabolites were identified in the active extracts as flavonoids, triterpenes, sesquiterpenlactones, in addition to acetogenins reported in previous studies. This study provides new biological information about the species Annona squamosa, Petiveria alliacea and Punica granatum and supports previous reports about the response caused by the extracts of the evaluated plants over cancer cell lines not studied before.

Bibliography

Chen Y. et al. *J Ethnopharmacol* 2012 7/13; 142(2): 462-466.
Hernández JF et al. *J Ethnopharmacol* 2014 5/14; 153(3): 641-649.
Urueña C. et al. *BMC Complement Altern Med* 2008, 8: 60-68.
Yuan SF et al. *Life Sci* 2003, 72(25): 2853-2861.
Yunianto P et al.. *Microbiology (Indonesia)* 2012;, 6(1): 23.

Biography

PhD, Universitá di Roma, TRE in Biology Applied to Human Health. Present research interests are in cell apoptosis induction exposed to antineoplastic agents.

α-MANGOSTIN FROM GARCINIA MANGOSTANA BY HIGH -PERFORMANCE LIQUID CHROMATOGRAPHY WITH PDA DETECTION

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Garcinia mangostana (GM) fruit, also called mangosteen, is an exotic fruit used in the therapeutic practice of Chinese and Ayurvedic medicine only recently rediscovered and revaluated by the "Western". GM has been shown to contain a variety of secondary metabolites such as prenylated and oxygenated xanthones that have been classified in five groups: (a) simple oxygenated xanthones, (b) xanthone glycosides, (c) prenylated xanthones, (d) xanthonolignoids and (e) miscellaneous xanthones. Several studies have shown that xanthones obtained from mangosteen have remarkable biological activities able to counteract infectious, oxidative stress, inflammation, apoptosis, oncogenic proliferation and metastasis. α- mangostin is a main constituent of the mangosteen pericarp. Several findings have suggested that SIRT1, a nuclear histone deacetylase, could influence cellular function by inhibition of NF-kB signaling, a major inducer of inflammatory responses. ROS can inhibit SIRT1 activity by oxidizing its cysteine residues, up-regulating the NF-κB signaling, resulting in inflammatory responses. The purpose of the present study is to evaluate the quantity of α-mangosteen in the extract of GM (Vithagroup Spa) and to investigate its effects in U937 cell line subjected to inflammatory insult, analyzing the possible changes on the activation of SIRT-1 protein via NF-Kb. For this purpose a HPLC with PDA method was developed and validated.

α-Mangostin

The chromatographic analysis was carried out using a HPLC system (Waters, Milford, MA, USA) combined with a pump (Model 600), absorbance detector (Model PDA 2996), thermostated column compartment (Model Jetstream2 Plus) and a degasser (Model 1260). A Rheodyne model 7125i injector (Rheodyne, Cotati, CA, USA) equipped with 20 µL loop was used. The entire configuration was operated by an Empore software System Manager. A Visiprep SPE The chromatographic separation was performed on a Kinetex C18 (100 x 4.6 mm I.D., 2.6 µm particle size) column (Phenomenex, Torrance, CA, USA). The mobile phase consisted of a mixture of formic acid solution (0.1% v/v) , acetonitrile and methanol in a ratio of 30:60:10, v/v/v. All separations were performed in isocratic mode at a flow rate of 1.0 mL/min. The ultraviolet detection wavelength was set to 316 nm. Total run time was 15 minutes.

ANTIINFLAMMATORY AND ANALGESIC ACTIVITIES OF N-BUTANOL EXTRACT FROM LINARIA REFLEXA DESF IN RATS

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Introduction
The genus Linaria contains several species considered as medicinal plants based on their healing. Chemically, they are characterized by flavonoid and iridoids constituents. Linaria. reflexa Desf., a folk medicine herb in the north Africa population known for the treatment of certain skin diseases.
Objective
In this study on the genus Linaria (Scrophulariaceae), we have investigated the anti-inflammatory and analgesic properties of the n-butanol extract from the aerial parts of L. reflexa Desf. (L.R n-BuOH).
Methodology
The anti-inflammatory activity was evaluated on carrageenan-induced paw edema in rats. Assessment of analgesic activity was used for detecting peripheral in rats with acetic acid induced writhing test.
Results
For the anti-inflammatory test, the L.R n-BuOH used in our study inhibited oedema induced by carrageenan at various degrees showed significant reduction of oedema. This anti-inflammatory response was also significant as compared in rats pretreated with indomethacin. These analgesic experimental results indicated that L.R n-BuOH (200 mg/kg) decreased the acetic acid-induced writhing responses.
Conclusion
Our investigation revealed that in vitro anti-inflammatory and analgesic activities present good effect of our extract L.R n-BuOH.

CHICKPEA COOKED ANTIOXIDANT EFFECT IN A MODEL OF COLON CANCER INDUCED BY AZOXYMETHANE AND DEXTRAN SODIUM SULFATE

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Cancer cells present high levels of reactive oxygen species which can be derived from the metabolic activities (1, 2). Therefore, it is important to find antioxidants sources which protect body from this damage. For its composition, legumes can offer this benefit (3). The aim of this study was to evaluate the antioxidant effect of chickpea consumption for a colon carcinogenic process, for which ICR male mice were used. The experimental animals were fed with diet a dded with 2 and 10% of cooked Chickpeas (ACD) and azoxymethane (AOM) as a carcinogenesis initiator, followed by dextran sulfate sodium (DSS) as promoter. The animals were sacrificed 20 weeks after the administration of AOM. The colon was extracted, then oxidation was quantified via lipid concentration of malondialdehyde (MDA) and oxidized proteins through oxidized carbonyls. The ACD groups administered with AOM / DSS showed a significant reduction of MDA (61 and 71%) in the diet with 2 to 10% chickpea respectively, compared to the standard diet group. Additionally, the concentration of carbonyl groups was significantly reduced compared to the group treated with AOM / DSS showing a dose-response effect, with a decrease of 40% in those animals which consumed ACD 2% and 57% reduction in those who consumed ACD to 10%. Derived from these results, it is possible to say that the daily consumption of chickpea confers protection against oxidation of lipids and proteins during carcinogenesis.

Bibliography

1. Liu G and Storz P. *Free Oxyg Sp Cance*r.2010;1-31
2. Yum HW, et al.. *Antioxid Redox Signal.* 2013; 102-114.
3. Sánchez X. et al. *Nutr Cancer,* 2015, 401-410.

Biography.

Master in Science, National Polytechnic Institute, Mexico. He has published an article in an international magazine, and participated in 10 international conferences. Present studies mainly focused on chemoprevention with legumes and their compounds.

EVALUATION OF THE ANTIOXIDANT ACTIVITY OF EXTRACTS OF DIFFERENT POLARITY OF MAYTENUS OCTOGONA" (L'HÉRITIER) DC.

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In the presence of various ailments and chronic diseases related to oxidative stress search is necessary compounds with antioxidant activity. Medicinal plants are a valuable source for this, this interest has allowed us to consider the need for a study to evaluate the in vitro antioxidant activity of a plant of the Celastraceae, Maytenus genus of the family coast region. The ethanol extract will phytochemical action was performed where secondary metabolites were identified by staining reactions and / or precipitation. The antioxidant capacity of extracts: n-hexane, dichloromethane, ethyl acetate and methanol, was evaluated by methods: ABTS 2,2'-azino-di- (3-ethylbenzothiazo-line-6-sulfonatodiamonio) Ferric Reducing Antioxidant Power (FRAP) and inhibition against the free radical 2,2-diphenyl 1-picrilhidraizil (DPPH). In the phytochemical screening of the ethanol extract it showed the existence of several families of secondary metabolites of biological and pharmacological interest among which stand out for their significant presence flavonoids, triterpenes and / or steroids, free phenolic groups, catechins, primary amino groups and secondary. To determine the IC50 all extracts was found that there are significant differences between the extracts, ethanol extract being the most active. In the method FRAP each one milligram (1mg) of ethanol extract is equivalent to 1.68 mM Trolox. ABTS one milligram (1mg) of ethanol extract is equivalent to 0.4678 mM of Trolox, by DPPH method it is equivalent to the IC50 2.2908 mg of the extract.

Bibliography

1. Gandia Herrero, F; et al. *J. Nat. Prod.,* 75 (6): 1030–1036, 2012.
2. Mei Lu, et al. *Food Res Internat* 44/2: 530-536, 2011.
3. Yunbao Liu and Muraleedharan G. *J. Nat. Prod*.; 73 (7): 1193 -1195, 2010.
4. Gandia Herrero, F. et al. *J. Nat. Prod.*, , 72 (6): 1142–1146, 2009.
5. Hostettmann, Kurt; et al. *Manual de estrategias para el aislamiento de productos naturales bioactivos*. Programa Iberoamericano de Ciencia y Tecnología. CYTED. Convenio Andrés Bello. 2008.

HEMISYNTHESIS AND ANTICANCER ACTIVITY OF ARILAMINES DERIVATIVES OF EUGENOL

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Eugenol is a major component of essential oil isolated from the Eugenia caryoplyllata, which has been widely used as an herbal drug. It is a remarkably versatile molecule incorporated as a functional ingredient in numerous products and has found application in the pharmaceutical, agricultural, fragrance, flavor, cosmetic and various other industries. Its vast range of pharmacological activities has been well-researched and includes antimicrobial, anti-oxidant and anticancer activities, amongst others. One of its derivatives, nitrated eugenol (4-alil-2-metoxi-6-nitro-phenol), has proven antineoplastic activity on cancer cell lines: with IC50 of 34,98 µM on DU-145 cells (human prostate cancer cell lines) and IC50 of 33,97 µM on KB cells (oral carcinoma). In this work, we synthesized 10 compounds derived from eugenol and its acetyl derivative, whose anticancer activities have not been demonstrated before, of which the amine-eugenol (4-alyl-2-methoxy-6-aminephenol [AB1]) exhibited activity on prostate (PC-3) and colon (HT-29) cancer cell lines, with IC50 48,28 µM and 51,9 µM respectively. In addition, it was the only molecule with selective activity since it affected just the cancer cell lines and no to the non-tumoral cell line CoN (normal human colon epithelial cells).

Bibliography

1. Carrasco, H. et al. *J. Braz. Chem. Soc*., 2008, 19: 543-548.
2. Carrasco H.et al. *Molecules*. 2012, 17: 1002-1024.
3. Hidalgo M. et al. *Quim. Nova*. 2009, 32: 1467-1470.
4. Nam, H., Kim, M-M. *Food Chem. Tox.* 2013, 55: 106-112.
5. Pramod, K. et al. *Nat. Prod. Commun.* 2010, 5, 1999-2006.

Biography

PhD,University of Sevilla, Spain. Senior Researcher, Autonomous University of Chile. He has published 20 papers in reputed journals. His present field of research is the Hemisynthesis from Natural Products and determination of their biological activity.

CYTOTOXIC ACTIVITY AND PROAPOPTOTIC EFFECT OF LEPTOCARPIN, A PLANT-DERIVED SESQUITERPENE LACTONE, ON HUMAN CANCER CELL LINES

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Leptocarpine is a sesquiterpen lactone isolated from a native Chilean plant, Leptocarpha rivularis or rather known in popular language as “palo negro”, widely used in traditional medicine for the Mapuche people which have demonstrated interesting activity over cancerigen cells. In this study, the citotoxic effect of leptocarpin on different cancer cell lines, such as HT-29, PC-3, DU-145, MCF7 and MDA MB-231, and on human dermal fibroblasts (HDF) has been evaluated. Additionally we observed, by staining with Hoescht 333342, what leptocarpin induce condensation and/or fragmentation of chromatin in the cells lines analyzed, indicating a possible process of cell death by apoptosis. The apoptotic process is validated with the registration of the increase in caspase activity was observed following treatments with leptocarpin. Finally it was determined by immunocytochemistry that leptocarpin is capable of inhibiting the nuclear localization of NF-κB. The data obtained in this work demonstrates that leptocarpin is an effective inhibitor of NF-κB in different cancer cell lines, suggesting that the mechanism of cell death induced by leptocarpin involves in some degree the inhibition of NF-κB signaling pathway. All previously data mentioned suggest that leptocarpine could be a therapeutic agent from cancer treatment.

Bibliography

1. Newman, David J.; Cragg, Gordon M., *J. Nat. Prod.,* 2012, 75: 311-335.
2. Mathema, VB et al. *Inflammation*, 2012, 35: 560-565.
3. Martinez, R. Et al. *J. Chil. Chem. Soc*., 2006, 51:, 1010-1014.
4. Wang, YW et al. *J. Cancer Res. Clin.,* 2012, 138: 785-797.
5. Dhingra, S. et al. *Cardiovasc. Res.*, 2009, 82: 59-66.

Biography

PhD, University of Sevilla, Spain. Senior Researcher, Autonomous University of Chile. He has published 20 papers in reputed journals. His present field of research is the Hemisynthesis from Natural Products and determination of their biological activity.

HYPOCHOLESTEROLEMIC EFFECT OF PENIOCEROL IN C57BL/6N MICE

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Hypercholesterolemia is a metabolic disorder characterized by an increase of cholesterol c oncentration (over 200 mg/dL in plasma). This metabolic disorder is considered as the main risk factor for developing cardiovascular diseases. In México, it is considered a public health problem. One of the pharmacological treatments for hypercholesterolemia is the administration of statins. These drugs inhibit cholesterol biosynthesis in the liver, however, many adverse reactions generated in liver and muscle. Ezetimibe is another drug used for treating hypercholesterolemia by inhibiting the intestinal absorption of cholesterol. On the other hand, it has been reported natural therapy agents against this disease, such as β-sitosterol, which has been shown hypocholesterolemic effects in experimental models. The peniocerol is a cytotoxic, anti-inflammatory and antimicrobial sterol. Because of its chemical similarity to the β-sitosterol, the objective of this study was to evaluate the effect of peniocerol as a hypocholesterolemic agent. For this purpose, 30 female mice C57BL/6N that were randomly divided into five experimental groups (n=6) were used. A group constituted an integral control group (untreated). While the others were fed with high cholesterol diet (1% cholesterol and 0.5% cholic acid). The later were treated with peniocerol orally (vo) or intraperitoneal (ip) at a dose of 10 mg/kg. One hypercholesterolemic group was treated with ezetimibe at a dose of 10 mg/kg vo. The results showed that the peniocerol administered ip inhibited significantly ($p > 0.05$) the concentration of total cholesterol in mice, while it orally administrated was inactive. All results were compared with the group of mice that developed only hypercholesterolemia. Also, the peniocerol significantly decreased LDL cholesterol levels without affecting HDL cholesterol content. The results of the histopathological analysis of the liver showed that peniocerol does not damage the cellular structure of the hepatocytes. These results indicate that the peniocerol represents a significant contribution to the research of treatment for hypercholesterolemia with natural agents.

Bibliography

Lee SD et al. *Pharmac Res* 29(12): 3235-3250, 2011.
Salakhutdinov NF et al. *Curr Med Chem* 18(26): 4076-4105, 2011
Salazar JR et al. *Z Naturforsch C* 66(1-2): 24-30, 2011.

URSOLIC ACID IN ILEX GUAYUSA LOES. (AQUIFOLIACEAE)

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I.guayusa is a species from equatorial Amazonia closely related to "yerba mate" (Ilex paraguariensis St.Hil.). Considered a holly plant by many indigenous cultures, it is popularly used as a stimulant, anti-diabetic and promoter of fertility. Several authors have quantified their methylxanthine content. It has also been described the presence of steroids and terpenoids, although they have not been characterized or quantified so far. This study aimed to perform, on a comparative basis, the chromatographic profile TLC terpenoids present in I.guayusa and I.paraguariensis and the presence of ursolic acid in them. The dichloromethane extracts from powdered leaves of I.paraguariensis and I.guayusa were analyzed by thin layer chromatography (TLC) on Merck silica gel 60F254 0.25mm using three solvent systems: toluene: ethyl acetate (8: 2) toluene : ethyl acetate (95: 5) and dichloromethane: methanol (95: 5). Reference substance: 1% chloroform ursolic acid solution. To develop the plate p-anisaldehyde sulfuric was used and subsequent heating in stove at 110 ° C for 1 minute. The chromatographic profiles in the three solvent systems used are very similar, differing by the presence of a green band in I.guayusa (Rf 0.78, 0.71 and 0.75 respectively) not observed in I.paraguariensis. The presence of ursolic acid was tested against control in the three solvent systems used in both extracts I.guayusa and I.paraguariensis. Because ursolic acid has demonstrated a potent antidiabetic effect, increasing insulin secretion, augmented glycogen content and stimulating the glucose uptake by GLUT 4, their presence in I.guayusa could justify one of the traditional uses of this species.

Bibliography

1. Castro, A. et al. *Biochim Biophys Acta.* 1850(1): 51-61, 2015.
2. Fernández, V. *Evaluación de extractos orgánicos de Ilex guayusa como nutracéuticos en el tratamiento de la diabetes tipo 2* (Thesis). Universidad del Azuay, Cuenca, Ecuador. 2014.
3. Melo, V. *Composición y Análisis Químico de la Especie Ilex guayusa Loes* (Thesis). Universidad San Francisco de Quito, Quito, Ecuador. 2015.
4. Qi MY et al. *Zhongguo Ying Yong Sheng Li Xue Za Zhi*. 30(5): 445-8, 2014.
5. Tuquinga, M. *Efecto estrogénico del extracto de las hojas de Guayusa (Ilex guayusa Loes.) en ratas (rattus novergicus)* (Thesis). Escuela Superior Politécnica de Chimborazo, Riobamba, Ecuador, 2013.

Biography

Master in Biologic-Naturistic Medicine, University of Leon, Spain Studying Master in Medicinal Plants. National University of La Plata, Argentina. Dedicated to the research of medicinal plants related to the metabolic syndrome and the establishment of protocols for cultivation of medicinal plants in vitro.

PHYTOCHEMICAL STUDIES OF LEAVES OF CAVENDISHIA COMPACTA (ERICACEAE)

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Cavendishia compacta is Neotropical specie that grows on Andes Mountain but it is very common at the pacific slope of the western mountain of Colombia. The genus Cavendishia known for its nutritional and medicinal properties, its fruits are used as food in jams and jellies, edible, juicy and pleasant taste; decoctions are used as astringents and ant-rheumatic, it is used to heal inflammation, toothache, pimples and itch. This paper describes the results of the phytochemical study of the ethanolic extract of leaves of the specie classified as Cavendishia compacta at the National Colombian Herbarium, under number 574699 COL, in order to contribute to research in the Ericaceae family and Cavendishia gender, because this no reports phytochemical studies. The methods used to get the extracts and fractions were: Column chromatography (CC), Thin Layer chromatography (TLC) and preparative thin layer (PTLC), yielded a mixture type diterpene of compounds formed by kaurano, biformeno and rimueno (9.2 mg), a mixture of aromatic compounds consisting of acetophenone and benzaldehyde (21.6 mg), a mixture of compounds consisting of type triterpene α-amyrin and β-amyrin (30 mg) and the isolation of two flavonoids: morin (87 mg) and myricetin (120 mg).The structural elucidation of mixtures and isolated compounds were carried out using techniques GC-MS and 1H and 13C NMR.

Bibliography

1. Abreu, O. et al. Emirates *J Food Agric*, 26(7), 577–591, 2014.(doi:10.9755/ejfa.v26i7.16404)
2. Amezouar et al. *Pathol Biol*, 61(6), 254–8, 2013. doi:10.1016/j.patbio.2013.03.005
3. Arora, R. et al. *Bioactive Food as Dietary Interventions for the Aging Population*. Elsevier. 2013.
4. Dampc, A., & Luczkiewicz, M. *Fitoterapia,* 85, 130–432, 2013. doi:10.1016/j.fitote.2013.01.013
5. Shikov, A. N. et al. *J Ethnopharmacol*, 154(3), 481–536, 2014. doi:10.1016/j.jep.2014.04.007

Biography

Master in Biological Sciences with emphasis on Chemistry of Natural Products Plant. Professor, University Francisco Jose de Caldas (Bogotá - Colombia). Seven publications in the area of natural products in reputed journals. The main area of research is oriented to the isolation, purification and structural elucidation of fixed and volatile metabolites of Colombian plants.

PHYTOCHEMICAL STUDY OF LEAVES OF SENNA RETICULATA (FABACEAE) AND EVALUATION OF THEIR ANTIOXIDANT ACTIVITY

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Senna reticulata is a species belonging to the family Fabaceae; distributed in Colombia found its highest concentration in the departments of Tolima and Cundinamarca; it has traditionally been used as a laxative, diuretic, laxative and also for the treatment of constipation and fever. In terms of chemical composition studies they have reported the presence of flavonoids, alkaloids, tannins, saponins and anthraquinone. The main objective of this study was to contribute to the phytochemical study of the leaves of this species and assess their antioxidant activity. To this end, from plant material collected in the municipality of Honda (Tolima) and identified in the Colombian National Herbarium collection under number COL573012 ethanol extract (131.18 g) was obtained; which separations by column chromatography, and preparative thin layer formed by a mixture erythritol, isoamyl acetate and L-pyroglutamic acid and isolation of quercetin, kaempferol and hyperoside, first reported for this species was obtained in our country. The structural elucidation of the isolated compounds was carried out using techniques GC-MS and 1H NMR, 13C.
The antioxidant activity is evaluated by the method of DPPH, where it was established that the presence of flavonoids and phenolic compounds, were responsible for the antioxidant activity presented for the ethanol extract, fractions of dichloromethane and ethyl acetate and kaempferol, a inhibition rate above 40% with reference to the uptake of gallic acid antioxidant free radical DPPH.

Bibliography

1. Nerilson, L. et al. *Investigación en Productos Naturales*, 27, 4-5, 2013.
2. Ortiz, H., Sánchez, J., & Murillo, E. *Rev Acad Colomb Ciencias. Botanica.* 183-191, 2009.
3. Vargas, C. E*studio de la actividad cicatrizante y antiinflamatoria del extracto alcohólico de las hojas de la Senna reticulata (Willd.) H. Irwin y Barneby (Retama).* Lima, Perú. (2007).
4. Nunes, S. *Estudio químico y farmacológico de la Senna reticulata Willd*. (Thesis) Universidade Federal do Ceará, Fortaleza. (2007).

Biography

Master in Biological Sciences with emphasis on Chemistry of Natural Products Plant. Professor, University Francisco Jose de Caldas (Bogotá - Colombia). Seven publications in the area of natural products in reputed journals. The main area of research is oriented to the isolation, purification and structural elucidation of fixed and volatile metabolites of Colombian plants.

CHEMICAL COMPOSITION OF ESSENTIAL OIL LEAVES OF GUAZUMA ULMIFOLIA (MALVACEAE)

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From fresh leaves of the plant species Guazuma ulmifolia (Malvaceae) collected in the municipality of Bituima - Cundinamarca (4 ° 52 '28 "N, 74 ° 32' 26" W) the essential oil by distillation technique was obtained by steam stripping; determination was performed by GC-MS, comparing retention index, mass spectral and data reported in the literature. The essential oil is obtained in a yield of 0.028%; in which 38 compounds which constitute about 67.2% of the total composition of the essential oil, within which are 7 monoterpenes, 26sesquiterpenes, and 5 aliphatic hydrocarbons being β-caryophyllene and citronellol the major components were identified. Sesquiterpenes found represent 46.7% of the essential oil composition, in which the major compounds found were: caryophyllene (11.9%), β-farnesene (6.0%) and caryophyllene oxide (5.44 %). As monoterpenes represent 19.6% where the constituent is in higher percentage β-citronellol (12.7%) followed by citronellal (2.5%) and trans-shisool (2.0%). Aliphatic hydrocarbons account for only 1% where the majority compound corresponds to hexatriacontane (0.26%). This study is a contribution to the phytochemical investigations of the Malvaceae family in Colombia and in particular of the genus Guazuma, since this is the first report at the national level in terms of the constitution of volatile metabolites of a genre that has few chemical studies.

Bibliography

1. Augusti , A.,Cassel, A., & Litao, A. Essential oil composition. Antioxidant and antimicrobial Activities of Guazuma Ulmifolia from brazi medicinal y aromatic plants, 2-3. (2013).
2. Maloni.M. et al. *Phytochem*, 86,64-71, 2013.
3. Babushok, V., & Zenkevich, I. *Chromatographia* , 69, 257-269, 2009.
4. Adams, R.P. *Identification essential oil components by gas chromatography/mass spectrometry,* 4th ed. Allured Publishing Co, Carol Stream, Illinois, 2008.
5. Goodner, K. *Food Sci Technol*, 41, 951-958, 2008.

Biography

Master in Biological Sciences with emphasis on Chemistry of Natural Products Plant. Professor, University Francisco Jose de Caldas (Bogotá - Colombia). Seven publications in the area of natural products in reputed journals. The main area of research is oriented to the isolation, purification and structural elucidation of fixed and volatile metabolites of Colombian plants.

SYNTHESIS, DOCKING AND BIOLOGICAL EVALUTION AGAINST TRYPANOSOMA CRUZI OF THIOPHENO-2-THIOUREIC AND THIOPHENE-2-IMINOTHIAZOLIDINE COMPOUNDS

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Neglected diseases constitute a major public health problem worldwide, quantifying a total of 1 billion people suffering from some kind of infection of bacterial, viral or parasitic origin. Among them, we can highlight Chagas disease, caused by the parasite Trypanosoma cruzi, which affects more than 8 million people around the world. In order to discover new agents against T. cruzi, developed herein the synthesis of new prototypes of thiophene-2-thioureic and 2-iminothiazolidine, biological evaluation and study docking. Initially, start material were polysubstituted thiophene derivatives (Gewald reaction), converted into thioureic derivatives and then cyclized with electrophiles, generating thiophene-2-iminothiazolidine derivatives. The intermediates and final compounds were synthesized in yields between 60 and 98%, and characterized by NMR. For docking study was performed by AutoDock Vina® software. The pharmacological tests were performed in amastigotes and trypomastigotes, line of C2C12 and MK2, respectively. In addition, the most active compounds were selected for the cytotoxicity assay, in J774 cell line, using higher concentrations. The compound LQM68 probably develops its mechanism of action by inhibition of the trans-sialidase enzyme (IC50= 10.3 μM) in trypomastigotes. Since, LQM82 (IC50= 5 μM) and 83 (IC50= 9.2 μM) possibly inhibit the dihydrofolate reductase enzyme in amastigotes (IC50= 5 μM and 9.2 μM). Finally, it was observed that the most active compounds obtained in this study were more effective than benznidazole, gold standard drug applied in pharmacotherapy clinical of the Chagas disease, additionally has a low cytotoxicity.

Biography
PhD, Federal University of Rio de Janeiro and Université Claude Bernard, Lyon-France. Director of Nursing and Pharmacy School. Senior Researcher, Medicinal Chemistry Laboratory, Federal University of Alagoas, Brazil. He has published more than 50 papers in reputed journals. His present fields of research are Pharmaceutical and Medicinal Chemistry, Natural Products, Cardiovascular Pharmacology, and Pharmacognosy.

MORPHOMETRIC AND BIOCHEMISTRY EVALUATION IN PROTECTIVE EFFECT ON MYOCARDIAL OF THE ETHYL ACETATE FRACTION OF TRICHILIA CATIGUA IN INFARCTED RATS WITH ISOPROTERENOL

A.K.B. Ferreira, J.X. Araújo-Júnior; E.P. Tenório, J. Clementino-Neto, A.C. Bernardino, R.R. Lima, A.O.F. Silva, G.C. Lopes, J.C.P. Mello, and E.A.N. Ribeiro

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Trichilia catigua is a tree, has been used in folk medicine as a tonic for the treatment of fatigue, stress, impotence, and memory deficits. The objective of this study is to evaluate the effect of ethyl acetate fraction of T. catigua in isoproterenol (ISO) induced myocardial infarction (MI) in rats. T. catigua (200, 100, 50, 20 and 10 mg/kg, p.o) was administered for 30 days in rats. MI was induced a tow dose of ISO (85 mg/kg, s.c.) on the 29 (th) and 30 (th) day. At the end of the experimental period (i.e., on the day 31), serum and heart tissues were collected and fraction MB creatine kinase (CK-MB, mg/dL) marker of tissue damage, thickness ventricular of left (TVL, cm), reason cardiac weight by body weight (WC/WB, mg/g-1), and reason ventricular of left weight by body weight (WVL/WB, mg/g-1) were determined. Administration of ISO in control rats showed a significant ($p < 0.001$) increase serum CK-MB. There was a significant increase ($p < 0.001$) in the TVL, ($p < 0.01$) in the WC/WB and ($p < 0.05$) in the WVL/WB of heart tissues as compared with respective control groups. Rats treated with T. catigua significantly ($p < 0.001$) decreased CK-MB, ($p < 0.001$) in the TVL, ($p < 0.01$) in the WC/WB and ($p < 0.05$) in the WVL/WB as compared with the control group ISO. The results indicate that treatment with AETC was able to promote protective activity in myocardial infarction.

Bibliography

1. R. Longhini et al. *Sep. Sci.* 36, 1247–1254, 2013. doi: 10.1002/jssc.201200911.
2. M.T. Truiti et al. *J Ethnopharmacol. ,* 15, 424-9, 2015. doi: 10.1016/j.jep.2015.05.060.
3. J.P. Kamdem et al. *Neurochem Res.* 37, 2826-35, 2012. doi: 10.1007/s11064-012-0876-0.

Biography

PhD, Federal University of Rio de Janeiro and Université Claude Bernard, Lyon-France. Director of Nursing and Pharmacy School. Senior Researcher, Medicinal Chemistry Laboratory, Federal University of Alagoas, Brazil. He has published more than 50 papers in reputed journals. His present fields of research are Pharmaceutical and Medicinal Chemistry, Natural Products, Cardiovascular Pharmacology, and Pharmacognosy.

ANTIOXIDANT PROPERTIES INDUCED BY HYDROALCOHOLIC EXTRACT OF FRUITS SOLANUM MELONGENA

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Solanum melongena (Solanaceae) is vegetable known as “eggplant” participates on a diet around the world. Recently, many reports has been describes the antioxidant properties of several fruits eaten by people elevating them functional food category. Besides, many functional food´s it has been correlated with cardiovascular benefits. We evaluating the antioxidant potential of the hydroalcoholic extract of fruits solanum melongena (SMEH) in chemical tests by scavengers oxidant species activity (DPPH, ABTS, NO. reactive species, reducing Fe3+ powder, chelating Fe2+powder) andthe capacity of the chronic treatment orally (300 mg/kg p.o 26 days) reverse myocardial infarction by isoproterenol (ISO 85 mg/kg 2 x s.c 25º and 26º days) in Wistar rats. The results were statistical analyzed by ANOVA followed Newman-keuls post-test.
All procedures in vivo were approved by ethics committee nº010852/2009-01. In folin-ciocalteu tests, SMEH showed high quantity of the phenolic acids [(T=1.258,3)/(GA=546,4)/(Q=462,1)/(CA= 418,2) µg/mL-1 respectively] similarly equivalents to trolox (T), Gallic acid (GA), Quecertin (Q) and Caffeic acid (CA). DPPH [IC50%=(SMEH=282.95.8)/(T=11.9)/(Q=5.8)/(CA=4.8)(GA=2.6) µg/mL-1 respectively]. ABTS [IC50%=(SMEH=100.8);T=5.6/Q=1.4/CA=3.8/GA=1.7)]. Scavengers activity NO .by Griess reaction.
SMEH=(T0=12,5/T30=36,5/T60=63/T90=72.5/T120=77.5/T150=86)/T=(T0=22.6/T30=44/T60=48/T9=52.1/T120=55.8/T150=59.5)/Q=(T0=20.6/T30=39.4/T60=52.3/T90=59.5/T120=63.2/T150=64.2)/CA=(T0=35.5/T30=35.7/T60=70/T90=70.7/T120=70.1/T150=72.5)/GA=(T0=15.1/T30=33.1/T60=35.8/T90=38.5/T120=49.6/T150=51.40) % inhibit/min], reducing Fe3+ powder SMEH=0.151)/(T=(0.216)/Q=0.484)/(CA=0.758)/(GA=0.833) Abs700 nm -10.0 µg mL-1 respectively)], chelating Fe2+ powder [IC50% (SMEH=678.5)/(EDTA=2.6) µg.mL-1], In vivo tests, the treatment with SMEH (300 mg/kg) chronic manner in wistar rats (250-300 g) was able reverse cardiotoxic effects by catecholamine (ISO 85 mg/kg) [CK-MB (ISO=765.2±54.5)/(SMEH=376.6±27.6b”)/(SC=452.7±11.5) U/L] [CK-NAC (ISO=862.3±203.9)/(SMEH=419.5±50.4b)/(SC=326.3±37.3) U/L]. In conclusions, SMEH has protective effects against isoproterenol-induced myocardial infarction and it seems possible that this protection is due to its antioxidant effects.

Bibliography

G. Mennella et al. *J Agric Food Chem.* 60, 11821-31, 2012. doi: 10.1021/jf3037424.

Biography

PhD, Federal University of Rio de Janeiro and Université Claude Bernard, Lyon-France. Director of Nursing and Pharmacy School. Senior Researcher, Medicinal Chemistry Laboratory, Federal University of Alagoas, Brazil. He has published more than 50 papers in reputed journals. His present fields of research are Pharmaceutical and Medicinal Chemistry, Natural Products, Cardiovascular Pharmacology, and Pharmacognosy.

METHLYLENE BLUE IS EFFECTIVE IN REDUCING PERITONEAL IMPLANTATIONS IN HAMSTER EXPERIMENTAL PANCREATIC DUCTAL CANCER MODEL

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Methylene blue, an hematoporphyrin derivative Halle and chlorophyllin produce a markedly reduction in the tumor weight. In addition, it is known to inhibit the generation of oxygen radicals. This dye has been tried experimentally to prevent adhesion formation with good results. However, it has never been reported in the prevention of tumoral adhesion. The aim of the present study was to clarify the effectiveness of methylene blue to prevent peritoneal tumoral implantation in hamster experimental pancreatic cancer model.

Materials and Methods: HaP-T1, a cell line derived from nitrosamine induced pancreatic cancer was used. Tumor cell suspensions were injected intraperitoneally. Animals were divided in two groups: A. only injection (positive control, n=10) and B. injection and administration of methylen blue after the injection (n=10). They were observed and weighed until 14 days, when they were sacrificed. After necropsy, ascites volume was quantified and number of implantations were measured.

Results: Hamsters of Group 1 showed to be heavier throughout the experiments. After necropsy, Group 1 had in average 7.4 ml of ascites and generalized peritoneal carcinomatosis including diaphragm and Group 1 had in average 2.6 ml of ascites and in average 19.4 implantations located mainly in pelvic region. In conclusion, methylene blue could inhibit the implantation of pancreatic cancer cell lines. This therapy may be used in the future to decrease or even prevent the adhesion of possible metastatic cells in peritoneal wall.

Bibliography

MORIOKA, CY et al. *HPB Surgery,*.6/1: 171, 2004.
MORIOKA, CY et al. *Pancreatology, Suiça*, 2004.
MORIOKA, CY et al. *Gut*, 2005.
MORIOKA, CY. *HPB Surgery.* 7: 96, 2005.

MEDICAL USES OF MARIJUANA DERIVATES IN NEUROLOGICAL DISEASES AND ITS COMPLICATIONS, REVIEWING THE LITERATURE.

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Marijuana production and commercialization is forbidden in Brazil by National Sanitary Surveillance Agency. However, its resolution nº. 17/2015, allowed the cannabinoids imports for personal medical use. This study reviews the most up-dated medical evidence for using cannabinoids in Neurological diseases and its complications. Spasticity is symptom reported in patients with Multiple Sclerosis (MS), frequently associated with spasms, sleep disturbances, pain and poor quality of life.
The effectiveness of oral treatments current available is limited. The oromucosal spray formulation from a mixture of Tetrahydrocannabinol (THC) and Cannabidiol (CBD) showed good outcomes in the treatment of symptoms named above, reducing it in 272 (47.6%) patients treated. Many countries in Europe approved TCH/CDB formulation for spasticity in MS. Epilepsy accounts for approximately 1% of the global burden of disease. Pure CBD demonstrated anticonvulsivant effects in acute animals models and in intractable human epilepsy. A 2014-Cochrane review inform that no conclusion can be drawn from literature about cannabinoid use in Epilepsy, considering the bias and the small amount of participants enrolled. In spite small evidence in favor, more studies are necessary to clarify the effectiveness of CDB in epilepsy. On Movement Disorders Symptoms, marijuana derivates shown no improvement. Authors found no response in patients with Huntington`s Disease under Nabilone use. On Cervical Dystonia, studies not achieved statistical power to detect neither benefit nor lack of benefit. On Parkinson`s disease, 19 patients treated with CBD showed no improvement on Unified Parkinson`s Disease Rating Scale.

Bibliography

BRASIL. MINISTÉRIO DA SAÚDE. ANVISA. Diário Oficial [da] República Federativa do Brasil, Poder Executivo, Seção 1, nº 86, p. 50-51, Brasília, DF, 8 maio 2015.
Annon. *Epilepsia* 55(6): 791-802, 2014. doi: 10.1111/epi.12631. Epub 2014 May 22.
Novotna A. et al. *Eur J Neurol*; 18: 1122–31, 2011.
Gloss, D. and B. Vickrey. *Cannabinoids for epilepsy.* Cochrane Database Syst Rev 3: CD009270. (2014).
Velayudhan, L. et al. *Curr Pharm Dev* 20(13): 2218-2230, 2014.

Biography

Clinical Neurologist, Clinical Hospital of School of Medicine, University of São Paulo. He develops clinical activities at Sírio-Libanês and Santa Paula Hospital, where he is tutor in Clinical Neurology of Neurosurgery Medical Residence and Co-responsible for Stroke Team Program.

EFFECTS OF DICHLOROMETHANE PHASE FROM ETHANOL EXTRACT OF SERJANIA CARACASANA (JACQ.) WILLD. (SAPINDACEAE) ON RESPONSE CONTRACTILE OF ILEUM AND AORTA RAT

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Serjania caracasana also known as “timbó”, is found in states of Brazil. It presents few studies, but previous results showed that the ethanolic extract obtained from aerial parts of S. caracasana (Sc-EtOH) presented gastrointestinal effects in vivo and in vitro on rats and without acute toxicity on mice and new chemicals. The aim was to observe effects of the dichloromethane phase (Sc-CH2Cl2) obtained from Sc-EtOH partition on pre-contracted rat ileum and aorta. The ileum and aorta were isolated from rats (250-300g), then prepared on glass baths containing adequate physiological solutions, at 37 °C, 1g/force resting tension and bubbled O2. Tissue contractile response was recorded by acquisition analogy system. The isometric contractions (control) were stimulated by addition of carbachol (1υM) for ileum, and KCl (60mM) for aorta, followed by Sc-CH2Cl2 addition (9-730 υg/mL) was incubed. The results were calculated by percentage (Emax %) of control response to contractile agents. These procedures were approved for ethics committee in animal use of Federal University of São Paulo (CEUA 4195060514/14). The data were expressed as mean ±SEM and analyzed by GraphPad Prism software, tested for significance by T-test or ANOVA one-way ($p<0.05$). Sc-CH2Cl2 (81, 243 and 500 υg/mL) inhibited in a concentration-dependent and significant manner the contractions (n=4) induced by carbachol (Emax= 62.7 ± 12.6; 47.6 ± 5.6 and 20.2 ± 3.7 %, respectively) in rat ileum. Also, Sc-CH2Cl2 (500 and 730 υg/mL) relaxed significantly aorta pre-contracted with KCl (n=3) (Emax= 35.1 ±12.6 and 7.3 ± 7.3 %, respectively). Those results suggest that Sc-CH2Cl2 phase present antispasmodic effects, probably due to having active metabolites.

Bibliography

SILVA, F.L. *Estudo fitoquímico de Cardiospermum corindum L. e Serjania caracasana (Jacq.) Willd. (Sapindaceae) com potencial atividade antiúlcera.* (Thesis, UFPB, 2013)
SILVA et al.. PharmacologyOnline, 1: 22 - 26, 2012.
SILVA et al. *IX Encontro de Iniciação Científica da UNINOVE.* Resumos 12596. São Paulo, 2012.
SILVA et al. *Propriedade Gastrointestinal De Espécies Vegetais Nativas Do Brasil*. In: V Seminário Nacional de Pesquisa da UNINOVE, 2011.

Biography

PhD, Federal University of Paraiba. Professor in Medicine and Pharmacy, Senior Researcher in Pharmacology/CNPq. He has developed studies in pharmacology and toxicology of natural products and medicinal plants. He has published 10 papers in journals and more than 100 abstracts in national and international events. He is member of SBFTe, SBFgnosia, Silae and SBPC.

GREEN TEA EXTRACT INHIBITED THE TUMOR GROWTH AND INVASIVENESS OF 5-FU AND MMC-RESISTANT METASTATIC AND REMETASTATIC CELL LINES IN A HAMSTER PANCREATIC CANCER MODEL?

C.Y. Morioka, J.L.V. Silva, M.C.C. Machado, J.P. Otoch, D.S. Pereira Filho, F.P. Costa, S. Saito, A. Watanabe, and C.C. Huang

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Polyphenolic compounds present in tea may reduce a risk of a variety of illnesses, including cancer. Research findings have shown the chemopreventive potential of tea polyphenols in cancer.
Aim.To elucidate whether the same drugs, which could inhibit the tumor growth in the parental pancreatic cancer cell line, could inhibit in the metastatic and remetastatic pancreatic cancer ones, comparing the inhibition with green tea extract.
Methods. HaP-T1:a cell line derived from nitrosamine induced pancreatic cancer,MS-PaS-1: a pancreatic metastatic cell line established from a “return trip” metastases of liver implanted tumor,which showed pancreatic metastases,and MS-PaS-2:a pancreatic remetastatic cell line established from metastases of MS-PaS-1 were used for the experiments. 5-Fluorouracil (5FU), Mytomicin C (MMC) and green tea extract (GTE) were used. MTT assay and MTT agarose assay were performed. In vitro chemoinvasion assay was done.
Results. The inhibitory concentration (IC50) of 5-FU,which inhibited the HaP-T1,had to be increased in 50 folds to inhibit MS-PaS-1,and 100 folds to inhibit MS-PaS-2.MMC had to be increased 10 folds to inhibit MS-PaS-1,and 50 folds to inhibit MS-PaS-2.However, IC50 of GTE had to be increased 3 folds to inhibit MS-PaS-1,and 5 folds to inhibit MS-PaS-2.GTE inhibited the invasiveness of 3 cells lines in a dose dependent manner.Conclusions GTE may be a new cancer strategy for pancreatic cancer because it could inhibit the tumor growth and invasiveness in metastatic and remetastatic cells as well as in primary tumor cells in small doses when compared to 5-FU and MMC, leading to the fact that side effects could be decreased.However,further studies will be necessary.

Bibliography

MORIOKA CY et al. *In Vivo*. 14(3): 467-9, 2000.
MORIOKA CY et al *In Vivo*. 18(2): 113-7, 2004
MORIOKA, CY et al. *HPB Surgery* 7/4: 616-616, 2005.
MORIOKA, CY et al. *J Clin Oncol,* v26 (May 20 suppl; abstr 15621), 2008.
MORIOKA, CY et al. *Pancreas* 42: 1369, 2013.

ANTIMICROBIAL ACTIVITY OF PORIFERANS EXTRACTS FROM THE COLOMBIAN CARIBBEAN ON DRUG-RESISTANT HUMAN PATHOGENS

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The phylum porifera have numerous compounds with high biological and chemical interest; this marine biodiversity offers a great opportunity to agribusiness, ecology, biotechnology, pharmacology and medicine. Besides, these kinds of molecules represent an alternative for the treatment of drug-resistant pathogens associated with health care. In order to test the antimicrobial activity, aqueous extracts from Colombian Caribbean sponges Suberites aurantiacus, Desmapsamma anchorata e Ircinia campana were prepared using extraction buffers, followed by centrifugation, precipitation, dialysis and freeze dried. The In vitro bioassays were performed against Enterococcus faecalis (ATCC 19433), Escherichia coli (ATCC 25422), Klebsiella pneumoniae (ATCC 700603), Pseudomonas aeruginosa (ATCC 27853), Staphylococcus aureus (ATCC 25923), Staphylococcus aureus methicillin-resistant (MRSA - ATCC 43300) and a yeast Candida albicans of clinical origin. In addition, complementary hemolysis bioassays and LC-MS/MS-based metabolite identification were carried out. Overall, broad-spectrum antimicrobial activity was observed to all samples tested by using Kirby-bauer and microdilution methodology. The fraction 70 from S. aurantiacus extract resulted 36,68 µg/mL and 51,41 µg/mL Minimal Inhibitory Concentration (MIC) values to S. aureus and MRSA, respectively. Likewise, P. aeruginosa showed MIC < 10 µg/mL when samples from D. anchorata were used. The blood red cell hemolysis bioassays showed that none of the extracts evaluated present effect. The LC-MS profiling analysis show the presence of typical metabolites from sponges with biological activity potential reported such as: Lasonolide A (Anticancer), Manzamenone A (Anti-inflammatory), Peloruside A (Antifungal), Simplexidine (cytotoxical), Trikentriorhodin (pesticidal), among others. Finally, the bioprospecting of molecules from marine animals to control drug-resistant human pathogens is an important approach in the search for biotechnological solutions to this problem.

Bibliography

Mishra, B. et al. *Biochim Biophys Acta* 1828(2): 677-686, 2013
Ravichandran, S. et al Russian *J Bioorg Chem;* 37(4): 428-435, 2011

ANTIMICROBIAL ACTIVITY OF A METALLO TETRA(4-CARBOXYPHENYL)PHTHALOCYANINE BY USING PHOTODYNAMIC THERAPY

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During the last years, Photodynamic Therapy (PDT) has emerged as a promising technique to treat drug-resistant pathogens; previously, it has been confirmed as an effective method in-vitro against bacteria, fungi, viruses and protozoa. For this reason, the antimicrobial activity of photosensitizer tetra(4-carboxyphenyl) Zinc phthalocyanine was performed against nine drug-resistant strains Candida albicans ATCC 90028, Candida krusei ATCC 6258, Candida parapsilosis ATCC 22019, Escherichia coli ATCC 25922, Enterococcus faecalis ATCC 27853, Klebsiella pneumoniae ATCC 70503, Pseudomonas aeruginosa ATCC 27853, Staphylococcus aureus ATCC 25923 and the Methicillin Resistant Staphylococcus aureus (MRSA) ATCC 43300. Likewise, the percentage inhibition and Minimal Inhibitory Concentration (MIC) was calculated with the photosensitizer prior and after photoactivation. The results show that all yeast, E. coli and K. pneumoniae were completely inhibited; the MIC values were <10 µg/ ml to C. krusei and K. pneumoniae. Furthermore, statistical analysis showed significant differences between the inhibitory effect obtained prior and after photoactivation of the photosensitizer. These results support the potential of photodynamic therapy with this metallo tetra(4-carboxyphenyl) Zinc phthalocyanine to design alternative treatments to infectious diseases.

Bibliography

1. A. M. Rkein, D. M. Ozog. *Dermatol Clin* 32:3 (2014) 415–425.
2. C.A. Robertson, et al. *J Photochem Photobiol B* 96 (2009) 1–8.
3. S.J. Mora, M.E.Milanesio, E.N. Durantini. *J Photochem Photobiol C* 270 (2013) 75–84.

SYNTHESIS AND ANTIBACTERIAL EVALUATION OF ALKOXYLATED CHALCONE RC4

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Recently, are necessaries new sources of compounds with specific biological activities and pharmaceutical applications in order to develop drugs or for fighting against human pathogens. From them, the chemical synthesis of molecules has been an alternative. In this research, a series of Alkoxylated Chalcones were initially synthesized and the antibacterial of the chalcone RC4 was assayed on Escherichia coli ATCC 25922, Enterococcus faecalis ATCC 27853, Klebsiella pneumoniae ATCC 70503, Pseudomonas aeruginosa ATCC 27853, and the Methicillin Resistant Staphylococcus aureus (MRSA) ATCC 43300 by microdilution methodology.
The results show percentages inhibition ranged 41,87 % to 60,56 % to all Bacteria and MIC values < 50 µg/ ml and < 25 µg/ ml to P. aeruginosa and Methicillin-resistant S.aureus (MRSA), respectively. Finally, due to fast increment of drug-resistant bacteria around the world the search for new compounds from natural or synthetic sources is completely necessary.

Bibliography

1. Foresti R. et al. *J Pharmacol Exp Ther.* 312(2):686–693, 2005
2. Tenover, F. *Amer J Med,* 63-70, 2006
3. Xin S, et al.. *Med Chem Res.* 2011; DOI: 10.1007/s00044-011-9640.
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ACUTE TOXICITY TEST OF A NOVEL ANTI-ALLERGIC VACCINE

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In the past few decades, the prevalence of allergic disease has been increasing in many developed countries.The global burden of allergic diseases demands effective disease prevention strategies and in recent years, promising studies have emerged regarding oral immunotherapy (OIT). OIT is a promising method for modulating the immune responsebecause many immune cells exist in the mucosa of the digestive tract. For this reason a novel formulation for immunotherapy was developed by using a probabilistic approach to select those allergens that sensitize ≈80% of allergic subjects tested at Allergy External Service of the Central Military Hospital in Mexico. The formulation obtained is a mixture of four allergens.Three of them are normal flora germs: Candida albicans, Staphylococcus aureus, Staphylococcus epidermis and the fourth is the ubiquitous Dermatophagoides pteronyssinus, at fixed concentration (Patented vaccine).
Then, an acute toxicity test of the vaccine was performed in CD1 female mice according to what is established in the 423 OECD guideline, starting with a dose of 300mg/kg of the vaccine. The results of the acute toxicity test revealed that the novel anti-allergic vaccine can be classified into category 5: 2000mg/kg<LD50<5000mg/kg. The histology analysis did not reveal any organ alteration caused by the vaccine administration.
The present study found that this novel vaccine could be asafealternative in the treatment of respiratory allergic disease. Further studies must be conducted in order to exploreits efficiency and elucidate its mechanism of action.

Bibliography

1. Trejo-Tapia, D. *Anti-allergic vaccine for treating recurrent inflammation of the respiratory tract*. WO/2009/136780. 12/11/2009.
2. OECD. Test No. 423: *Acute Oral Toxicity – Acute Toxic Class Method*. OECD Guidelines for the Testing of Chemicals. 2001, Section 4, OECD Publishing.

Biography

PhD, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, Mexico City. Professor of Immunology, Instituto Politécnico Nacional. His field of research is the development of novel pharmaceutical products for the treatment of allergic disease. He is a recognized allergist with 30 years of experience in the diagnosis and treatment of allergic asthma.

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AURICULAR ACUPOINT SIMPATHETIC MODIFIES PULSE TRANSIT TIME IN HEALTH SUBJECTS

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Background.
Auriculomedicine is frequently used in the treatment of cardiovascular disorders. The Sympathetic point of auriculomedicine is used in the treatment of disorders associated with autonomic nervous system activity. The pulse transit time (PTT) has been used to characterize arterial stiffness. The purpose of this research was to examine the effect of Sympathetic point in pulse transit.
Methods.
We recruited 20 healthy volunteers: 29.1. ± 8.2 years (mean ± SD). The PTT was calculated as the difference in the onset of the wave digital pulse volume at the hand versus foot right toe. The wave of the digital volume pulse was obtained by photoplethysmography. The left Sympathetic point was needled at second 60 and the needle remain in place for 10 seconds. After a washout period of one week the same experimental procedure was repeated with the Sympathetic point of the right ear. Comparison of the data was performed using the t Student test. A difference $P < 0.05$ was considered as significant. Besides, we examined the degree of correlation between the pulse transit time with heart rate.
Results.
Stimulation of left Sympathetic point, but not right point, elicited almost significant increases in PTT in 3 to 6 minutes. No significant correlations were found between the pulse transit time and heart rate.
Conclusion.
Results showed that auriculopuncture of Sympathetic point has a differentiated effect between ears. The increase in PTT could indicate that the decrease in the speed of the pulse wave may be related to vasodilatation of large vessels.

Bibliography
Rivas-Vilchis JF et al. *Am J Chinese Med.* 35(3):427- 436, 2007
Rivas-Vilchis JFet al. *J Acupunc Merid Studies*. 1:58-61, 2008.
Rivas-Vilchis JF et al. *Proc West Pharmacol Soc* 52:61-62, 2009

Biography
PhD in Biological and Health Sciences. Full professor. Published articles: 10. Head of chronic degenerative diseases laboratory. Research fields: cardiovascular physiology, acupuncture, autonomic regulation.

DECONVOLUTION INDICES OF DIGITAL VOLUME PULSE MODIFIED BY ACUPUNCTURE IN PC6 IN NORMAL SUBJECTS VERSUS SMOKERS

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Background.
Smoking increases the arterial stiffness. It has been recently demonstrated that gaussian analysis of digital volumen pulse (DVP) could provide additional information about the arterial functioning in normal subjects or with cardiovascular disorders. PC6 (Neiguan) is an acupuncture point that has shown to regulate cardiovascular functions and to modify cardiovascular pathophysiology. The aim of this study was to assess and compare the acute effects of acupuncture in PC6 in nonsmokers healthy subjects versus smokers using indices derived from gaussian analysis of DVP.
Methods.
Forty healthy nonsmokers subjects: 28.3 ± 3.0 and smokers: n=30, 29.9 ± 2.9 (mean ± SD years). The DVP was obtained and examinated by gaussian analysis and of total gaussian area (TGa), component areas named: GAa, GAb and slopes TGs, GAs, GSb, were calculated. It was considered as significant differences with a $p<0.05$.
Results.
Basal comparison of groups showed that the GAa/TGa percentage and TGs, GSa, BGCs were significantly higher in the nonsmokers group; while, the GAa and the percentage GAa/TGa were significantly higher in the smokers group. In nonsmokers acupuncture elicited a significant decrease of GAa/TGa percentage, TGs and GSa values; otherwise, acupuncture decreased GAa and GAa/TGa percentage, and increased GAa and GAb/TGa percentage in the group nonsmokers.
Conclusion.
These results indicated that acupuncture in PC6 could acutely revert some of the physiopalogical cardiovascular indices in chronic smokers.

Bibliography
Rivas-Vilchis JF et al. *Am J Chinese Med.* 35(3):427- 436, 2007
Rivas-Vilchis JF et al. *J Acupunct Merid Studies.* 1:58-61, 2008.
Rivas-Vilchis JF et al. *Proc West Pharmacol Soc* 52:61-62, 2009

Biography
PhD in Biological and Health Sciences. Full professor. Published articles: 10. Head of chronic degenerative diseases laboratory. Research fields: cardiovascular physiology, acupuncture, autonomic regulation.

BIOLOGICAL ACTIVITY OF ESSENTIAL OILS OF P. CAERULEA COLLECTED IN DIVERSITY REGIONS FROM COLOMBIA

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The genus Persea (Lauraceae) is a widely distributed in mesoamerica and has been the subject of various studies for its great uses in traditional medicine: anti-inflammatory, treatment of hypertension, infectious diseases, tuberculosis and cytotoxic1, 2. The species P. caerulea is commonly known as "aguacatillo", tree widely distributed (500-2000 m) from lowland forests to pre-montane forests in mesoamerica and South America, mainly in the countries of Colombia, Bolivia, Ecuador, Peru and Venezuela. The aim of our research was to evaluate in vitro biological activities of leaves essential oils from different P. caerulea specimens collected in various Colombian areas. In this report, we explore the chemical composition of P. caerulea by a gas chromatography-mass spectrometry (GC–MS), the antifungal activity against Aspergillus fumigatus ATCC 46645, A. fumigatus CBS 144, 89, Candida albicans MY1055 y C. glabrata MY 992, as well as cytotoxicity against three cancer cell lines, cervix cell carcinoma SiHa (ATCC: HTB-35), Colorectal Adenocarcinoma HT-29 (ATCC: HTB-38) cervix epithelial adenocarcinoma HeLa (ATCC: CCL-2),. The results of leaves essential oil composition from P. caerulea, led to the identification of sesquiterpenes and monoterpenes. The major essential oil components were β- caryophyllene, β-E-farnesene, sabinene y germacrene-D.The results showed that essential oils of the species under study exhibited antifungal activity evaluated at the minimum concentration. The results obtained by individuals collected in the northern part of the country are the most significant.

Bibliography

1. Ding, H. et al. *Seminars in Cancer Biology*. 17, 386–394, 2007.
2. Tabuti, J. et al. *J Ethnopharmacol* 127, 130-136, 2010.

Biography

PhD in Chemistry, Universidad Nacional de Colombia. Professor, Universidad del Magdalena. Junior Researcher in the field of natural products chemistry, phytochemistry, and medicinal/food plants.

PHYTOCHEMICAL EVALUATION OF WATERY EXTRACT OF BRAD (ERODIUM CICUTARIUM)

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Introduction.
The brad is a vegetal about which the locals say it has curative actions, especially on damaged skin or some digestive diseases. The brad grows almost among Argentina. The objective of this Project is to determine the phytochemical and antimicrobial activity of brad (Erodium cicutarium).

Method.
With brad, we prepare a watery extract based on the same preparation described by local rural residents, who were consulted about how to prepare it and the use that they gave to the plant.
To a preliminary evaluation of the phytochemical groups in the aerial parts of brad, a methodology described by Rondina and Coussio (1969), was applied.
TLC and HPLC analyzed chromatographic profile in the brad watery extract.
To evaluate the antimicrobial activity we applied the diffusion technique using antigen-antibody reaction of Staphylococcus epidermis. The Azitromycin diffusion disk reference method was used.

Results / Conclusion.
According to the results, which were obtained from the phytochemical march carried out on aerial parts of brad, the presence of polyphenolic components (phenolic acids and flavonoids) was determined. Analysis of chromatographic profiles by TLC and HPLC, confirmed the presence of such elements. TLC and HPLC analysis, in different chromatographic systems, let detect in watery extract of brad, the presence of flavonoids such as rutin, chlorogenic acid, isoquercitrine, quercitrine and luteoline, as well as other phenolic components, which could not have been identified due to a standards' lack. In the antimicrobial test of the watery extract, halo zone of inhibition was detected, which indicate an antimicrobial activity.

Bibliography
-Leyton S., Monge G. *XV Jornadas de Divulgación Técnico Científicas 2014*. Universidad Nacional de Rosario, 2014.
-Toribio M. et al. *BLACPMA ,* 2007 Disponible en: <http://www.redalyc.org/articulo.oa?id=85617472027> ISSN 0717-7917.
-Antunez Ferreira F. et al. *Ciencia Hoy,* 23(133):39-43, 2013.
-Pantozzi F. et al. *Rev. Argent. Microbiol* [serie en Internet]. 2010 42(1): 4p. Disponible en: http://www. scielo.org.ar/pdf/ram/v42n1/v42n1a11.pdf
-Cifarelli M., 2014 Disponible en: http://bacterioyalgomas.com.ar/quinolonas-accion-y-mecanismos-de-resistencia/

IN VITRO EVALUATION OF THE ANTIOXIDANT CAPACITY OF T.ROSEA (BERTOL) DC AND T CHRYSANTHA (JACQ) G. NICHOLSON EXTRACTS.

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Plants from the genus Tabebuia have been used in traditional medicine as anti-inflammatory, anti-carcinogenic and anti-microbial agent, in rural areas of South America. Also, several ethnobotanical and ethnopharmacological studies have shown the therapeutic potential of these plants for the treatment of several human diseases. These studies suggest a potential use of plant biodiversity in order to find new molecules with potential uses in pharmacology and therapeutics [1]. However, most of the studies have been done on Tabebuia impetiginosa [2]. The antioxidant capacity of several extracts obtained from the inner bark of T. rosea and T. chrysantha were studied. The evaluation of the amount of total phenols in all extracts did show that in both species, the ethyl acetate extract displayed a high amount of total phenols (2.185 and 2.083 mg of gallic acid/g of extract in T rosea and T chrysantha, respectively. The oxygen radical absorbance capacity (ORAC activity) did show that the ethyl acetate extract displayed the highest ORAC activity on both inner bark and leaves from T. rosea (824.6 and 1112.2 υmoles Eq Trolox/g sample, respectively).
Based on these results, experiments are in progress in order to evaluate the effect of Tabebuia extracts on the Nrf2-mediated antioxidant system in HepG2, HeLa and HEK 293 cells.

Bibliography.
1. Jiménez-González, F.J. et al. *Universitas Scientiarum* 18: p. 257-267, 2013
2. Franco Ospina, L.A., et al. *Rev Cub Plantas Med,*. 18(1): p. 34-46, 2013

Biography.
PhD, Universidad Del Valle, Colombia, and Würzburg University, Germany). He has published more than 30 papers in reputed journal. His present fields of research are Immunomodulation by natural products, immunology of infectious diseases, and regenerative medicine.

PHARMACOGNOSTIC STUDY OF HYPERICUM JUNIPERINUM (HYPERICACEAE).

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The genus Hypericum is of great interest because of its multiple pharmacological activities reported. It is well accepted the importance of H. perforatum because of its widely use in the treatment of mild and moderate depression. Having in consideration the huge number of species from this genus which are found in Cundinamarca and Boyacá departments (Colombia), and that they have not been analyzed yet, we have characterized histologically and chemically a species which has no previous reports, Hypericum juniperinum. In this work we carried out a preliminary phytochemical characterization by means of thin layer chromatography (TLC). Additionally, we performed a microscopic evaluation of cross sections of stem, leaves and flowers from H. juniperinum. The presence of flavonoids, phenolic acids and terpenes was established, thus as the absence of alkaloids and anthraquinones (hypericin and pseudo-hypericin). At microscopic level, in comparison with H. perforatum, important differences were found. The absence of secretory glands was evident in H. juniperinum. More detailed studies, about chemistry and biological activities of H. juniperinum, are currently being carried out.

Bibliography

1. Ernst, E. (2003). *Medicinal and aromatic plants - Industrial profiles–Hypericum: The genus Hypericum*. Vol 31. Taylor & Francis, CRC Press. 1st Ed. 256.
2. Crocketta, S.L; Robson K.B. *Plant. Sci. Biotechnol*. 5:1–13, 2011.
3. USP. Dietary Supplements Compendium (DSC). (2012). USA. 1st Ed.1000.
4. Bladt, S; Rickel, V. (2009). *Plant Drugs Analysis: A thin Layer chromatography Atlas*. Springer, New York. 2nd Ed. 384.

Biography

Juan Camilo Marín-Loaiza received both, his degree in Pharmacy and his magister in chemistry from the Universidad de Antioquia (Colombia). He received his Ph.D studies from the Universidad Nacional Autónoma de México (UNAM). He is currently an associate proffesor and researcher from the Department of Pharmacy from the Universidad Nacional de Colombia-Bogotá. He has published four book chapters and 14 papers in peerreviewed
journals. His present field of research is on pharmacognosy and bioactive natural products.

EFFECT OF ETHANOL EXTRACT OF THE FRUITS OF PHYSALIS PERUVIANA ("AGUAYMANTO") ON BLOOD GLUCOSE IN EXPERIMENTAL ANIMALS

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Objective: to determine the blood glucose lowering effect in normal and diabetic rats (alloxan-induced) to manage the ethanolic extract of the fruits of Physalis peruviana (Aguaymanto).
Materials: fruits of Physalis peruviana (Aguaymanto) and 56 male Holtzman strain rats.
Method: Experimental animals were divided into 7 groups (Normal, overload of glucose on glucose load and glibenclamide, insulin and three concentrations of extract) then performed the experiment was allowed to stand for 2 weeks and came to randomize and divide in 7 groups (Normal, alloxan, alloxan and glibenclamide, insulin and three concentrations of extract); after 24 hours the animals had glucose levels > 250 mg / dL and proceeded with experiment; likewise histological study of the pancreas was performed.
Result: When administering the extract in 3 concentrations, a hypoglycemic effect reaching 41.5% decrease in blood glucose in rats with oral glucose load on is observed. In the experiment with alloxan diabetes induction decreased 4.38% was observed after 2 hours with the extract 600 mg / dL; well observed in the histological study of the pancreas reduced damage.
Conclusion: The hypoglycemic effect of ethanol extract of fruits of Physalis peruviana (Aguaymanto) administered orally in rats on overload glucose and alloxan diabetes was demonstrated.

Bibliography

1. Dostert N. et al. *Hoja Botanica: Aguaymanto* 1ra Ed., Lima, Perú, 2012
2. Das J, Vasan V, Sil PC. *Toxicol Appl Pharmacol* 258: 296-308, 2012.
3. Etuk EU. A*gric Biol J N Am* 1: 130-4, 2010
4. Lachin T, Reza H. *Rec Pat Endocr. Metab Immune Drug Discov* 6: 67-72, 2012.
5. Zhang R et al. *Nutr Metabol*, 8: 85, 2011

Biography

Master in Pharmacology, Experimental Pharmacology (2015). He has published an article in the Journal of the Chemical Society of Peru.

DETERMINATION OF LEAD IN WARTY CRAB (ERIPHIA VERRUCOSA) FROM THE SOUTHERN TYRRHENIAN SEA

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Pollution of marine environments has been progressively increasing over the years mainly due to anthropogenic activities. Aquatic invertebrates tend to be highly vulnerable because they are exposed to several xenobiotics present in these environments. Because heavy metals can be found in seawater and sediments, benthic invertebrates such as crabs are permanently exposed to these contaminants. These organisms are known to take up and accumulate heavy metals, both essential and nonessential, from water and sediments as well as from their food supply. Thus, it is expected that species inhabiting coastal environments with a moderate anthropogenic impact should bioaccumulate heavy metals within their tissues. European Union regulations establish the Pb maximum levels for crab taking into account only concentrations found in muscle of claws and appendages (white meat), therefore excluding other organs and tissues (brown meat). Since in certain populations of Mediterranean region, such as Italy, the consumption of whole crabs including brown meat is not infrequent. The objective of the present study was to evaluate Pb levels in white and brown meat of Warty Crab (Eriphia verrucosa) collected from the southern Tyrrhenian Sea. Forty samples of warty crab were caught along the coast of the southern Tyrrhenian Sea between May and July 2014. The white and brown meat from each animal were individually separated and weighted. Aliquots of each sample were digested in ultrapure 65% HNO3 and H2O2 in a microwave digestion system. Pb concentrations were determined by atomic absorption spectrometer (GF-AAS). The results obtained showed the presence of Pb in all samples analyzed, underlying its presence in the marine environment. Mean values of the Pb concentrations were of 0.077 mg/kg in white meat and 0.194 mg/kg in brown meat and were largely below the Pb maximum levels established by the European Commission for muscle from crab appendages (Reg CE 1881/2006). The observed results highlighted that brown meat showed the highest metal concentration, confirming the primary role of digestive gland in bioaccumulation and detoxification processes of heavy metals. Considering the low level of Pb both in white and brown meat, the contribution of the Pb exposure derived by this crab did not increase the estimate weekly intakes. Although, we suggest to reduce the consumption of brown crab meat, taking into account the high levels of cadmium that may reaches this tissue in warty crab.

IN VITRO OVICIDAL ACTIVITY OF HYPOESTES FORSKAOLII (VAHL) ROEM. & SCHULT. (ACANTHACEAE) ON SHEEP GASTROINTESTINAL NEMATODES: PRELIMINARY RESULTS

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Infections by gastrointestinal nematodes (GIN) is one of the main threat to the health, welfare and productivity of small ruminant farms worldwide. Nowadays, the increasing resistance of the helminths to the conventional drugs makes more difficult the effective control of these parasites[1]. In last years, many studies confirm the efficacy of plant products as alternative strategies against GIN due to the anthelmintic activity of their secondary metabolites[2]. This study was carried out to evaluate the in vitro activity of the methanolic and n-hexane extracts of Hypoestes forskaolii aerial parts against GIN eggs collected from sheep bred in the Campania region (southern Italy) naturally infected the following species of GIN: Teladorsagia circumcincta, Haemonchus contortus and Trichostrongylus spp. The effectiveness of in vitro activity of the plant extracts was evaluated using the egg hatch assay (EHA) [3]. The concentrations of methanolic and n-hexane extract, used for this study, ranged from 0.005mg/mL to 1mg/mL. Furthermore, thiabendazole (0.2µg/mL and 0.5µg/mL) was used as a positive control and untreated eggs in water served as the negative control. Both the extracts exhibit a weak ovicidal activity against GIN (less than 50% of egg hatch). Noteworthy, the methanolic extract showed a percentage of inhibition of egg hatching greater than the n-hexane extract inhibiting the 32% at the concentration of 0.05 mg/mL. The ovicidal activity reported from H. Forskaolii could be attributable to the glycosides flavonoids or terpenoids that were present in the methanolic and n-hexane extracts [4], [5].
Further studies are needed to investigate the effects of extracts used and to evaluate the ovicidal effects of other extracts of H. Forskaolii.

Bibliography

1. Kaplan, R.M., *Trends Parasitol.* 20(10): 477-81, 2004.
2. Hoste, H., et al. *Trends Parasitol,*. 22(6): 253-61, 2006.
3. Coles, G.C., et al. *Vet Parasitol,.* 136(3-4): 167-85, 2006.
4. Al Musayeib, N.M., et al., *Phytochem Lett,*. 10: 23-27, 2014.
5. Ubaha G.A , I.B.A., Omoniyi I. *Nature and Science*, 10(12): 158-162, 2012.

EFFECTS OF TWO ANTIMICROBIAL PEPTIDES WITH FOOD INDUSTRY POTENTIAL APPLICATION ON MACROPHAGE CELL LINE

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Two peptides, rNterC and rTM2C, including 13 and 15 aminoacids respectively, were designed from proteins which are known to bind orto be targeted to outer mitochondrial membrane. These peptides were modified to increase antimicrobial potential considering the appropriate balance among their total net charge, amphipathicity and hydrophobicity. These peptides were able to efficiently and selectively inhibit Listeria monocytogenes (NCTC 11994-HPA - London) growth, an important foodborne pathogen. Therefore rNterC and rTM2C could be proposed in food industry to increase the shelf life of very valuable foods. In this study we assessed the toxicity of rNterC and rTM2C on the murine macrophage cell line J774.A1. Antiproliferative assay, performed at 24, 48 and 72 h, showed a weak antiproliferative effect, concentration and time-related, in particular for rTM2C. To asses if rNterC and rTM2C influence nitric oxide (NO) production, and important mediator of inflammatory response, we measured nitrite release, a stable end-product of NO, in cellular medium of the murine macrophage cell line J774A1 stimulated with rNterC and rTM2C alone or in combination with Lipopolysaccharide from E.coli (LPS). Our results showed that rNterC and rTM2C peptides induce a weak reduction of NO release in inflammatory conditions for both peptides in J774.A1 cells. Between the two peptides the more safe with food industry potential application seems to be rNterC despite the evaluation of other parameters both in vitro and in vivo will be necessary to further assess its safety.

PHYTOCHEMICAL INVESTIGATION OF TRICHILIA MAYNASIANA C. DC.

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Meliaceae plants are a woody family widely distributed throughout the tropics and subtropics, with only slight penetration into temperate zones; Meliaceae synthesize and accumulate bitter and biologically active nor-triterpenoids, which are also known as limonoids and meliacins1. These and other compounds have aroused considerable commercial interest due to their insect-antifeedant, insect-repellent or/and insecticidal molluscicidal, antifungal, bactericidal activities as well as their numerous medicinal effects in humans and animals2. Trichilia genus belonging to Meliaceae family consists of about 70 species, mainly distributed in tropical America and Africa, of which 43 species occur in Brazil1. Previously we had already studied Trichilia emetica from which we isolated limonoid derivatives, androstanes and pregnanes, with interesting biological activities 3,4. For this reason we started a phytochemical investigation of Trichilia maynasiana C. DC. The leaves of Trichilia maynasiana were powdered and exhaustively extracted using n-hexane chloroform and methanol. A portion of chloroform extract (5 g), was subjected to column chromatography using silica gel , to give 12 pooled fractions (A–J). The fractions more interesting were purified by RP-HPLC to give a new compound 3β-24-dihydroxytirucalla-7,25-dien, 24-sulphate; and five known compounds such as: Lochmolin F5, 3β-25-dihydroxytirucalla-7,23-diene6, 1,7-Azulenediol7, Aromadendrane-4β,10α-diol8 and betulinic acid9. The structures of all isolated compounds were elucidated by 1D- and 2D-NMR Spectroscopy (1H, 13C, 13C DEPT, DQF-COSY, HSQC, HMBC, ROESY) and confirmed by mass spectrometry studies.

Bibliography

1. Muellner A.N. et al. *Am J Botany* 90 (3): 471–480, 2003.
2. Curcino Vieira I.J. et al. *Am J Anal Chem* 5: 91-121, 2014
3. Malafronte N. et al. *Phytochem*, 96: 437-42, 2013.
4. Dal Piaz, F. et al. *Phytochem* 7:, 78-89, 2012.
5. Tseng Y.J. et al. *Marine Drugs* 10(7):1572-81, 2012.
6. Luo X.D. et al. *Phytochem* 54(8): 801-5, 2000.
7. Ozen H. C., Pollastro F, Appendino G. *Nat Prod Comm*, 3(6): 849-850, 2008.
8. Xiong J. et al. *Phytochem Lett* 6(4): 586-589, 2013.
9. Muhammad D. et al. *Phytochem Anal* 26(2):137-44, 2015.

PHENOLIC COMPOUNDS FROM OLEA EUROPAEA L. POSSESS ANTIOXIDANT ACTIVITY AND INHIBIT CARBOHYDRATE METABOLIZING ENZYMES IN-VITRO

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Olea europaea L. is a typical fruit-tree widely cultivated in the Mediterranean area, belonging to Oleaceae family, even that its cultivation has been extended to many other regions of the world. The olive fruit contains high concentrations of phenolic compounds that can range from 1 to 3% of the fresh pulp weight [1]. The main classes of phenols in olive fruit are phenolic acids, phenolic alcohols, flavonoids and secoiridoids [2]. In this study, phenolic composition and antioxidant activities [3] of fruit extracts from Italian and Algerian Olea europaea L. cultivars together with their potential inhibition of α-amylase and α-glucosidase enzymes [4, 5] were investigated. Three complementary assays were used to measure their antioxidant activities (DPPH, FRAP, BCB assays) and consequently Relative Antioxidant Capacity Index (RACI) was used to compare and easily describe obtained results [3]. Moreover 14 different phenolic compounds were identified, and their profiles showed remarkable quantitative differences among analysed extracts. Results showed that Chemlal, between Algerian cultivars, and Coratina, among Italian ones, had the highest RACI values. On the other hand all extracts and the most abundant phenolics were tested for their efficiency to inhibit α-amylase and α-glucosidase enzymes. Leccino, among all analysed cultivars, and luteolin, among identified phenolic compounds, were found to be the best inhibitors of α-amylase and α-glucosidase enzymes. Results demonstrated as Olea europaea fruit extracts can represent an important natural source with high antioxidant potential, and significant α-amylase and α-glucosidase inhibitory effects.

Bibliography

1. Charoenprasert S. and Mitchell A., *J. Agric. Food Chem*. 60: 7081−7095, 2012.
2. Bakhouche A. et al. *Food Res Int* 50: 401–408, 2013.
3. Milella L. et al. *Food Chem* 160: 298–304, 2014.
4. Ranilla L.G. et al. *Bioresour Technol* 101(12): 4676-4689, 2010.
5. Vinholes, J. et al. *Food Chem.*, 129: 454-462, 2011.

CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF ESSENTIAL OILS OF VALLEA STIPULARIS L.F. AND PHYLLANTHUS SALVIIFOLIUS KUNTH ON DIFFERENT MICROBIAL STRAINS

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Vallea stipularis L. F. (Raque) and Phyllanthus salviifolius Kunth. (Cedrillo) are native species of Colombia, which are distributed in the cundiboyacense plateau between 2400 and 3400 meters above sea level. The essential oil (EO) was obtained from the leaves by hydrodistillation; the chemical composition was determined by gas chromatography coupled to mass spectrometry (GC-MS), comparing retention index, and mass spectral data reported in the literature. The agar diffusion method (Kirby-Bauer) was used to evaluate the antimicrobial activity. The Minimum Inhibitory Concentration (MIC) values of the EO were determined using the microplate dilution method as described by de Araujo, using MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) as an indicator of the viability. Raque and Cedrillo essential oils were obtained with a yield of 0.10 %; monoterpenes, sesquiterpenes and oxygenates were identified, which constitute about 82.4%, and 72.4% of the total relative composition of the oils, respectively. The components present in greater proportion in the oils were: cedrene epoxide (12.0%), α -tujene (6.6%) and □-pinene (4.9%) for Raque; and aristolene (13.3%), cis- α -bisabolene (8.8%) and geranyl tiglate (5.9%) for Cedrillo. Both oils showed the most activity against Salmonella typhimurium and Pseudomonas aeruginosa with percentages of inhibition of 58.07 and 52.86 for Raque and 64.36 and 60.57 for Cedrillo, respectively. These results suggest the potential use of the oils of the species analyzed, in the treatment of infectious diseases associated with P. aeruginosa and S. typhimurium.

Bibliography

Bonilla, R. CJ. *Rev Acad Peru Salud*. 122: 102–10, 2006.
Muñoz V. et al. *J Ethnopharmacol.*71(1-2): 123–31, 2000.
Gonzales de la Cruz M, et al. *J Ethnopharmacol* 155(2):1093–117, 2014.
Araujo AR et al. *Ann Clin Microbiol Antimicrob.* 14:25, 2015.

Biography

Master in Science, Javeriana University, Colombia. Research Director, Corpas University. He has published more than 35 papers, 4 in reputed journals. His present field of research is phytochemistry and natural products.

CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL OF PELARGONIUM ODORATISSIMUM (L) L`HÉR (GERANIACEAE)

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Pelargonium odoratissimum species (Apple pelargonium) belongs to the family Geraniaceae. In their chemical composition, flavonoids such as quercetin, kaempferol and myricetin are present; the essential oil of the leaves is rich in methyl eugenol, limonene and fenchone. From leaves and flowers of the species P. odoratissimum, the essential oil was obtained by hydrodistillation; the chemical composition was determined by gas chromatography coupled to mass spectrometry (GC-MS), comparing retention index, mass spectral and data reported in the literature.
The essential oil was obtained with a yield of 0.3% (m /v). It was determined the presence of 4 monoterpenes, 20 sesquiterpenes and oxygenated compounds including 7 esters and one acid, which constitute about 74% of the total oil relative composition. The identified monoterpenes represent 22.60% of the composition of the essential oil, in which the main components found were geraniol (12.69%) and citronellol (8.99%). The antimicrobial activity measured as the Minimum Inhibitory Concentration (MIC) was made by the microdilution method in microplates of 96 wells and using as an indicator of the viability the MTT (3-4 [4,5dimetiltiazol-2-yl] -2, 5-diphenyltetrazolium bromide). The essential oil showed activity against all tested microbial strains. The highest activity was found for Staphylococcus aureus with a MIC <3.9 ug / mL, Proteus mirabilis with a MIC <3.9 ug / mL, Aspegillus brasiliensis and Candida albicans with a MIC <3.9 ug / mL, in both cases. Less inhibitory activity was found, but not least, for Trichophytum rubrum (MIC = 62.5 ug / mL) and Trichophytum mentagrophytes (MIC = 125 ug / mL).

Bibliography

Boukhatem, M. N. et al. Food Control, 34(1), 208–213, 2013.
Bussmann, R. W. ret al. J Ethnopharmacol, 132(1), 101–108, 2010.
Langeveld, W. T. et al. Crit Rev Microbiol, 40(1), 76–94, 2014
Matusinsky, P. et al. Industrial Crops and Products, 67, 208–215, 2015.
Zore, G. B. et al. Mycoses, 54(4), 99–109, 2015.

Biography

Master in Science, Javeriana University, Colombia. Research Director, Corpas University. He has published more than 35 papers, 4 in reputed journals. His present field of research is phytochemistry and natural products.

EVALUATION OF THE ANTIOXIDANT CAPACITY AND CHARACTERIZATION OF PHENOLIC COMPOUNDS OBTAINED FROM TEA (CAMELLIA SINENSIS) FOR PRODUCTS OF DIFFERENT BRANDS SOLD IN COLOMBIA.

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The active compounds from natural sources, have become an interest in the scientific community, especially phenolic compounds due to their effects on health and nutraceutical use as food, [1] Tea is one of the most consumed beverage worldwide. In the present study were determintated the phenolic composition and antioxidant activity of four commercial brands of tea consumed in Colombia, (Oriental, Hindu, Lipton, Jaibel) The extract was obtained by reflux, the assays were performed in triplicate. The content of phenolic compounds and total flavonoids was determined by spectro-photometric methods, [2], finding the highest content in the Oriental mark (10.01 mmol/L-eq-gallic-acid; 1.36 mmol/L-Eq-catechin) and retail for brand Jaibel (7.35 mmol/L-eq-gallic-acid; 0.48-mmol/L-Eq-catechin). These results are consistent with studies by Damiani, E-et-al-2014, which compares these compounds with hot and cold extraction, the latter achieved the highest phenol content (4.77-7.63 mmol/L-Eq-gallic-acid), and flavonoids (1.47-2.53 mmol/L-eq-catechin). [3] The antioxidant activity was determined by two methods ORAC and DPPH, [4]. The Oriental tea had the highest antioxidant capacity evaluated by both methods (1588.05 and 1138.45 umoles-Eq-Trolox/g-sample) while the lowest activity Jaibel (740.83 and 748.09 umoles-Eq-Trolox/g-sample). All samples showed similar chromatographic profiles (HPLC) [5] evidencing the presence of catechin, gallic acid, chlorogenic acid, ferrulic acid and caffeine, except Jaibel which did not present chlorogenic acid and caffeine. It is concluded that antioxidant capacity of tea is due to the content of phenolic compounds, having a high correlation (R2 = 0.9911) between them and the ORAC antioxidant activity.

Bibliography.

1. Kopjar, M. et al. *Chem Biol Technol Agric*,. 2(1): p. 1-6, 2015.
2. Musa, K.H., et al. *Food Chem*,. 141(4): p. 4102-4106, 2013.
3. Damiani, E., et al., *J Food Comp Anal,* 33(1): 2014. p. 59-66, 2014..
4. Krishnaiah, D.,et al. *Food Bioprod Proc,*. 89(3): p. 217-233, 2011.
5. Baptista, J., et al. *Food Sci Technol*,. 59(2): p. 1152-1158, 2014.

Biography

Ph-D in Science, University Pablo Olavide, Sevilla-Spain . Junior Researcher and Professor, Technological University of Pereira. She has published more than 18 research papers in reputed journals.

YIELD AND CONTENT OF COUMARIN IN MIKANIA LAEVIGATA GENOTYPES CULTIVATED IN BRAZIL

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Mikania laevigata is widely used in the treatment of respiratory diseases and the Brazilian Pharmacopoeia recommends the use of leaves as an expectorant (BRASIL, 2011). The increase of herbal raises use regarding authenticity, purity and chemical composition of plant raw materials (ALVARENGA, 2009). The genotype selection adapted to the producing region and the quantification of the active ingredient guarantee the quality of raw material and the therapeutic safety. Coumarin is the chemical marker described in M. laevigata leaves (BOLINA, 2009). The influence of genetic (FÖRSTER, 2015) and environmental (BERTOLUCCI, 2013) variations in the secondary metabolites of plants may have implications on their biological effects. This work aimed to evaluate the coumarin yield in M. laevigata genotypes cultivated at organic system. Herbarium specimens of three genotypes (Embrapa, Cpqba and Unaerp) were incorporated into the Herbarium PAMG under the numbers 57032, 57033 and 57031 respectively. The cuttings were rooted and transplanted in a 2 x 1 m spacing in Brazil. Two harvest seasons (winter and summer) were made and it was evaluated the coumarin content in dried leaves. There were not significant differences (Tukey 5%) between genotypes fresh weight of the leaves in both seasons. Unaerp genotype presented coumarin levels (2,02g/100g) significantly higher than Cpqba (1,61g/100g) and Embrapa (1,47g/100g) in winter and summer. The coumarin content yield depends on the genotype and environment interaction. Aiming at the quality of the raw material produced, Unaerp genotype are recommended, possibly for being more adapted to the conditions of the region.

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Bibliography

ALVARENGA, F. C. R. et al. *Rev Bras Farmacog,* 19: 442-448, 2009.
BERTOLUCCI, S. et al. *Chem Biodiv,* 10: 288-295, 2013.
BOLINA, R. C. et al. *Rev Bras Farmacog* 19: 294-298, 2009.
ANON, Formulário de Fitoterápicos da Farmacopeia Brasileira. ANVISA: Brasília, 2011; p 126
FÖRSTER, N et al. *J Agric Food Chem* 63: 2852−2861, 2015.

Biography

PhD, Federal University of Viçosa. Researcher, Agricultural Research Company of Minas Gerais. She has published 27 papers in reputed journals and is member of the International Society for Horticultural Science. Her present filed of research is on medicinal species selected by Green Component (GC).

LEVELS OF PHENOLIC COMPOUNDS IN LEAVES OF PERESKIAACULEATA DRIED AT DIFFERENT TEMPERATURES

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Pereskiaaculeate Mill. (Cactaceae) is tropical specie used folk medicine (ALMEIDA, 2012). It's natural occurrence in Americas, from Florida to Argentina.It is consumed as vegetable and its flour is used as functional food. The presence of phenolic compounds in the genus Pereskiawas detected by recent studies (SOUZA, 2014; SIM et al., 2010). Quantification of phenolic is very interest due to the antioxidant activity (GHASEMZADEH, 2011). Because of flour leaves use, is necessary to quantify these compounds in different conditions of handling and processing of plant material. The aim of this study was to quantify phenolic compounds in leaf extracts of P. acculeate submitted to different drying temperatures. Leaves from six plants were collected and processed inViçosa (Brasil). The factorial experimental design included new leaves (NL) and mature leaves (ML),and twotemperatures(45°C and 55°C), with four replicates. Dryingleaves (10g) were extracted in ethanol until exhaustion. The extract was evaporated, obtaining the crude extract. The concentrations of phenolics in extracts of P. aculeatewere measured according to Folin-Ciocauteu described by Agostini-Costa et al. (2011) and expressed in mg/g of tannic acid. The total phenolic contents were compared by Tukey test at 5% probability. Drying temperatures did not influence the levels of phenolic compounds (NL40=1,3893±0,0001 mg/g; NL55=1,3859±0,0553 mg/g; ML40=1,0167±0,1097 mg/g; ML55=1,0213±0,0395 mg/g), however the different maturation stages were significant in phenolics levels, (approximately 26.56 %).

Acknowledgement: CNPq/ CAPES, FAPEMIG, EMBRAPA and EPAMIG

Bibliography

AGOSTINI-COSTA, T. D. S. et al *Rev Bras Fruticult,* 34/1: 234-238, 2012.
DE ALMEIDA, M. E. F.; CORRÊA, A. D.. *Ciencia Rural* 42/4. 751-756, 2012.
GHASEMZADEH, A.; GHASEMZADEH, N. *J Med Plant Res,* 5/31: 6697-6703, 2011.
SIM, K. S.;et al. *African J Pharmac Pharmacol*, 4/5: 193-201, 2010.
SOUZA et al. *Biosci J,* 30/1: 448-457, 2014.

ANTIOXIDANT ACTIVITY OF EXTRACTS EQUISETUM SP.

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Equisetum is traditionally used in Brazil in the urinary system diseases such as anti-hemorrhagic and anti-anemic1.The chemical composition stands our silica and phenolic.This study investigated the antioxidant activity by DPPH in extracts in ethyl acetate, ethanol and methanol in stems of Equisetum sp. collected in the city of Ouro Preto, Brazil. Voucher specimen of propagation material is deposited under PAMG-number 575998 (EPAMIG Herbarium). Fresh stems were subjected to total steeping process into ethyl acetate (HACOET); ethanol (HETOH) and methanol (HMEOH). After obtaining the extract, what werepreceded to filtration and evaporation at 40ºC. The dry residue is obtained 20mg of the residues were diluted in 2mL of methanol PA, added to 500µL the solution of DPPH 0,4m Mandabsorbance measured in spectrophotometer at 517nm at 0 and 30 minutes. BHA 100ppm; DPPH 0,4Mm and Methanol PA they were used as controls and white. All treatments were replicated four times and the date were measured in function of the consumption of DPPH radical using the following equation AAT% = [(AbsControl - AbsSample)/ AbsControl] x 100, and the results analyzed by ANOVA and mean test 1% significance level. At time 0 minutes HMEOH and BHA were similar, averaging 6.20±0.46% e 11.52±1.62%; and higher ATT they were equivalent in HETOH and HACOET respectively 80.34±1.21% e 80.23±2.47% (CV=10.24%). The superiority of ethanol extracts and ethyl acetate, the time 30 is equivalent to BHA, antioxidant standard, being respectively 91.71±0.96% (BHA); 89.89±1.03% and 88.34±0.84 (CV= 6.55%).

Acknowledgements: CNPq/ CAPES, FAPEMIG and UFOP

Bibliography

SANTOS, M.C.; et al. *Reflexões fitoterápicas sobre a cavalinha (Equisetumsp.) com base na antroposofia.* XVII Congresso de Iniciação de Cientifica, UFPEL, 2009.

EXTRACTION PROCESS INFLUENCE ON THE ANTIOXIDANT ACTIVITY AND AMOUNT OF RUTIN OF CALYCES EXTRACT OF PHYSALIS PERUVIANA BY HPLC-DAD

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Physalis peruviana is a plant used in traditional medicine for its antioxidant properties which are attributed to its phenolic compounds. This work evaluated the effect of some variables of the extraction process of P. peruviana calyces on the total phenolic and rutin contents and in vitro antioxidant activity of the extracts obtained. The plant material was harvested in three Colombian regions. First, the influence of certain factors of the extraction process on the above mentioned response variables were evaluated. Subsequently, The response variables were then evaluated using in vitro assays such as NO and DPPH uptake for antioxidant activity; the Folin-Ciocalteu method for total phenolic content; and the external standard method by HPLC-DAD for quantification of rutin. As results, it was determined that the optimal conditions needed to obtain the best results on the response variables evaluated are the use of ethanol 70% as extraction solvent and percolation time of 72 hours as the factors that positively influenced in the results. The collection region of the plant material was also an important factor of influence in the results.

Bibliography

Puente L. et al. *Food Res Internat* 44, 1733–1740, 2011.
Licodiedoff S. et al. *Acta Sci Technol.* 35, 393-399, 2013.
Toro R. et al. *Nat Prod Comm* 9,1-2, 2014.

Biography

Master in Pharmaceutical Sciences, Universidad Nacional de Colombia. Her currently research field is extraction process of vegetable species and antioxidant activity, with emphasis in Physalis peruviana species.

ANALYSIS OF THE CHEMICAL COMPOSITION AND PERFORMANCE OF THE ESSENTIAL OIL OF MELALEUCA ARMILLARIS SM. (MYRTACEAE) GROWN IN ARGENTINA.

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In the present work, it is carried out the extraction of essential oil of leaves of M. armillaris collected in the month of July near Coronel Brandsen, Buenos Aires, Argentina. This is a perennial native species of Australia but widely cultivated in Argentina as an ornamental. This extraction was carried out by hydrodistillation following the recommendations of the FA VII Ed. and USP XXI (1985). The composition was analyzed by GC-MS and was determined the presence of: 1,8-cineol (major component), β-caryophyllene, terpinolene, 4-terpinenol, p-cymene, α-pinene, sabinene, β-fenchyl alcohol, myrcene , γ-terpinene, trans-β-ocimene, α–phellandrene, α-terpinene, limonene. The literature reports about M. armillaris remain scarce. GC-MS investigation of its essential oil revealed the presence of 1,8-cineol as main component and the presence of trans-β-ocimene and β-fenchyl alcohol that have not been previously reported for this specie. In terms of performance, containing 1.55% V / P was determined. This value is higher than that obtained for the same species in studies in Egypt and Tunisia. As for the pharmacological activity, there are jobs that performed well in vivo using this essential oil in the treatment against the parasite Schistosoma mansoni, inhibitory activity, in vitro, of bacterial species as Bacillus subtilis and Staphylococcus aureus, and anticancer activity. Activity studies are scarce but interesting. The results of this study show a good yield of essence for this region of Argentina for the winter time, and in the composition there are known pharmacologically active compounds, such as 1,8-cineol.

Bibliography

1. Amri I, et al. *Int. J. Mol. Sci.* 13: 16580-16591, 2012.
2. Chabir, N. et al. *J. Med. Food* 14: 1383–1388, 2011.
3. Rizk M. et al. *Pakistan J Biol Sci.* 2012; 15(20): 971-978, 2012.
4. Yvon, Y. et al. *J Food Sci* 77/8: H185-H191, 2012.

Biography

Graduated from Biotechnology and Molecular Biology, National University of La Plata. and he is pursuing his master studies on medicinal plants at the same university. Senior researcher of PhD, Nora Mestorino. Current interst are phytomedicine, and potentiation of antibiotics with essential oils.

CHEMICAL DIFFERENCES BETWEEN MAYTENUS ILICIFOLIA MART. EX REISSEK (CELASTRACEAE) AND JODINA RHOMBIFOLIA HOOK ET ARN. (SANTALACEAE)

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Congorosa (M.ilicifolia) and Sombra de toro (J.rhombifolia) are both native species of Argentina, Brazil, Paraguay, Bolivia and Uruguay. The leaves of both species are widely use in folk medicine f or different kind of treatments. M.ilicifolia leaves are mainly used as a gastric antiulcerous, antitumor, antiasthmatic, slimming and for birth control. On the other hand, J.rhombifolia leaves are commonly used for bowel disorders, cough and ulcers treatment, antiinflamatory, antialcoholic, kidney and balder disorders. However, since this two species have similar looks, and are also commonly named “sombra de toro” they tend to be commonly mistaken between them. The aim of the current work was to demonstrate the chemical differences between J.rhombifolia and M.ilicifolia extracts, through characterization reactions and TLC profiles. We analyzed the aqueous, ethyl acetate and dichloromethane extracts obtained from J.rhombifolia and M.ilicifolia.
For the Liebermann Bouchard reaction we obtained the same response from both species for the ethyl acetate and dichloromethane extracts, being positive for steroidal saponins the dichloromethane extracts. The results of the characterization reactions of saponins for the aqueous extracts (afrogenus capacity, emulsifying power, indirect Fehling and precipitation reactions with Ca(OH)2 and lead subacetate) once again show the same profile for both species. For the TLC analysis for the dichlorometane extract, employing two different solvent system (toluene:ethyl acetate (8:2) and dichloromethane:methanol (95:5), we were able to obtained different elution profiles for both species. Thus we conclude that TLC analysis may be a helpful tool for the correct identification and differentiation of J.rhombifolia and M.ilicifolia.

Bibliography

1. Barboza, G. E. et al. *Kurtziana* 34 (1-2), 2009.
2. Furlan, V. et al. *Bonplandia*; 20 (2): 285-307, 2011.
3. Oliveira, S. G. D. et al. *J Ethnopharmacol* 140: 428-437, 2012.

Biography

B.S. in Chemistry, Universidad Autónoma del Estado de Morelos (México), currently completing her Master in Science in Medicinal Plants at the Universidad Nacional de La Plata, Argentina.

SECONDARY METABOLITE PROFILING OF LUPINUS BOGOTENSIS GROWN AT DIFFERENT LOCATIONS USING LC-DAD-ESI-MS AND NMR

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Fabaceae family has been recognized to produce a high diversity of bioactive secondary metabolites. Lupinus sp is a genus of plants in the legume family with worldwide distribution that have been recognized by the presence of phenols and flavonoids with pharmacological and industrial uses (Wink, 2013, Wojakowska et al., 2013). The aim of the present study was to define the secondary metabolite profiles of wild Lupinus bogotensis at different geographical locations. Metabolite profile of unfractionated ethanolsoluble crude extracts from leaves, stems, flowers, pods and seeds were determined using HPLC-DAD-ESI-MS and NMR techniques in order to analyze the chemical variability for this plant. LC and NMR profiles were compared by Principal Component Analysis (PCA) and were correlated to their location and plant part by means of Orthogonal Partial Least Square-Discriminant Analysis (OPLS-DA). The set of extracts exhibited a chemical profiles involving several common compounds (flavonoid-type) between samples but other constituents were found to be restricted to some accessions. This fact indicated a marked chemical variability throughout L. bogotensis samples. Thus, unsupervised and supervised multivariate statistical analysis showed significant differences between extracts according to location (e.g., natural and modified environments) and plant part. This study corresponds to an endeavor to characterize L. bogotensis plants by metabolic profiling in the way for metabolomics studies of this plant. The present work is a product derived by the Project IMP-CIAS-1567 financed by Vicerrectoría de Investigaciones at UMNG.

Bibliography

Wink, M. *South African J Bot*, 89, 164–175,2013.
Wojakowska, A. et al. *Off J Metabol Soc*, 9(3), 575–589, 2013.

Biography

L. Vargas-Medina has completed her degree at MU Nueva Granada, Colombia. She was then joined to Bioorganic Chemistry Laboratory at MU Nueva Granada since 2013. She has published one paper in a reputed journal. Her present field of research is focused on plant metabolomics, plant biotechnology and chemical ecology.

CAROTENOIDS CHARACTERIZATION OF TALEGGIO CHEESE SURFACE

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The smear cheeses are constituted by a complex microbiota that contributes to the development of the typical flavor, texture, and color of the final product. The surface of the cheeses is, in fact, rich in a large variety of bacteria and yeasts, which generally have a red-orange colour, largely due to pigments mostly represented by carotenoids. Up to 20 bacterial genera, producing carotenoids and pigments, are described in some cheeses. To date there is no study on the composition of the Taleggio surface pigments produced by microorganisms. This study was carried out in order to characterize the pigments present on the surface of the Taleggio and to correlate them with the producing microorganisms. The carotenoids producing bacteria here reported were isolated from surface-ripened cheeses, purchased in retail outlets. Samples from the surface layer and core of the cheese were homogenized in physiological saline solution, plated with Nutrient Agar and incubated at 30◦C for 72 h. After incubation, yellow-orange colonies coming from the rind of cheeses, were randomly selected and inoculated in nutrient broth. Cells were harvested by centrifugation and used for identification of microorganisms and pigments. Carotenoids determination was performed by HPLC-DAD-APCI/MS analysis. Four carotenoids were identified: stafiloxantin, nirubin, isorenieratene and its cis-isomer, other two compounds could be classified as carotenoids but these are not identified yet.

Bibliography

-Feligini M, et al. *J Food Sci,* 77 (11): M609-15, 2012.
-Fontana C, et al. *Intl J Food Microbiol*138:205–11, 2010.
-Yun Xu, et al. *Appl Microbiol Biotechnol* 97(22): 9647–9655, 2013.

Biography

PhD and postdoc studies, Institute of Food Research, University of Messina, Italy.
She has published 6 scientific articles.

STATISTICAL ANALYSIS OF METALS CONCENTRATION BY MEANS OF ICP-MS FOR THE GEOGRAPHICAL IDENTIFICATION OF GARLIC

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In this paper we have performed a statistical analysis on the concentration of mineral elements, by means of ICP-MS, in different varieties of garlic from Spain, Turkey and Italy. Some of the Italian varieties of garlic that we have considered, belong to a traditional Italian food products (P.A.T.) of the Ministry of Agriculture, Food and Forestry known as red garlic of Nubia (Sicily). The obtained results suggest that the concentrations of the considered elements can be used as geographical indicators for the discrimination of the origin of the different samples.

Bibliography

1. Lawson, L.D., Wang, Z. J.. *J Agric Food Chem*, 53, 1974–1983, 2005.
2. Yoshida M.,Kalali H. *Proceed 7th International Symposium on Recent Advance in Exploration Geophysics (RAEG2003)*, Kyoto University, Japan (2003).
3. European Pharmacopoeia Technical Guide 2011, EURACHEM/CITAC Guide: *Quantifying Uncertainty in Analytical Measurement* (3rd Edition). Eds. S L R Ellison & A Williams

^{1}H NMR SPECTRUM OF INTERDONATO LEMON JUICE PGI BY HR-MAS

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We have studied by means of High Resolution Magic Angle Spinning Nuclear Magnetic Resonance (HR-MAS NMR) the metabolic profile of the famous Sicilian lemon known as “Interdonato Lemon of Messina PGI”. Thanks to its organoleptic and healthy properties, the PGI Interdonato lemon of Messina is universally recognized as one of the most nutrient fruit. Some of its constituents are actively studied for their chemo-preventive and therapeutic properties. Due to the relatively high price of the final product, commercial frauds originated in the Italian and international markets. Hence, there is a growing interest to develop analytical techniques able to reveal the origin of a lemon sample, indicating whether or not it originates from the area of Messina. In this paper we have determined by means of Nuclear Magnetic Resonance (NMR) spectroscopy the molar concentration of the metabolites constituent the PGI Interdonato Lemon of Messina.

Bibliography

1. Patil BS.; Turner ND.; Miller EG.; Brodbelt JS.; *ACS Symp Ser,* 936: 1-259, 2006.
2. Mucci A.; Parenti F.; Righi V.; Schenetti L.; *Food Chem*, 141: 3167-317, 2013.
3. Mannina L.; Sobolev AP.; Viel S.; *Progr Nucl Magn Res Spect*, 66: 1-39, 2012

AQUAFEED PRODUCTION FROM FISH WASTE AND LEMON PEEL

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In order to obtain an high protein supplement for aquaculture feeds, in this study Saccharomyces cerevisiae and Lactobacillus spp strains were used as starters for fermenting fish waste supplemented with lemon peel, as carbohydrates source and filler. Fish wastes, represented by viscera, skin and bones of Dicentrarchus labrax, were provided by Acqua Azzurra spa (Pachino, SR, Italy), whereas lemon peel was provided by Simone Gatto S.r.l. (San Pier Niceto, ME, Italy). All the wastes were homogenized together and supplemented with 20 mL of S. cerevisiae and 20 mL of Lactobacillus spp. culture (108 cells per mL). Fermentation tests were carried out for 5 days, until the pH stops decreasing. All the samples collected were tested for protein determination and for fatty acid analysis by HRGC-FID. Moreover microbiological analyses for coliforms bacteria identification were carried out. At the end of the fermentation the substrate was enriched in protein and in crude lipid and no more coliforms were detected in the media, whereas the amount of Lactobacillus spp. was around 1012 cells per mL. The proposed study could allow to obtain an aquafeed enrich in protein and healthy microorganism (Giraffa, 2010), having a protective effect on aquaculture fish (Hoseinifar, 2014). Further studies are in progress for testing the effect of the final product on growth and immune response of fish from aquaculture and consequently in human consumers.

Bibliography

1. G. Giraffa, N. Chanishvili, Y. Widyastuti. *Res Microbiol* 161:480-487, 2010.
2. S. H. Hoseinifar, et al. *Immunol* 39: 231-236, 2014.

ORGANIC POLLUTANTS IN EUROPEAN SEABASS (DICENTRARCHUS LABRAX) FROM SICILIAN FISH FARM

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Among organic pollutants (OPs) there are some toxic chemical compounds such us organochlorine pesticides (OCPs), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs), that are persistent in the environment, causing adverse effects to human health and the environment by bioaccumulation and biomagnifications through the food chain. Fish consumption is one of the mayor significant source of human exposure to OPs (Trocino, 2012). The aim of this research was to determine the PCBs, PAHs and OCPs residues in European seabass (Dicentrarchus labrax) from one Sicilian fish farm. Analyses were carried out on 18 muscle samples of seabass, 10 rearing in intensive concrete tanks and 8 rearing in sea-cages. Moreover, commercial feed was analyzed. Four different sizes (from 250 g to 700 g) samples, selected from each rearing system, were collected over a 5-months period, from January to June 2015. Extraction was performed using a mixture of distilled water, ethyl acetate and QhEChERS. The extract was purified in silica columns with 3:1 n-hexane:dichloromethane (Kalachova, 2011). The contaminant residue levels were performed by HRGC-MS/MS. The preliminary results showed that OPs contamination levels of European seabass and feed were always below the Maximum Risk Level, established by ECs legislation (Reg.1259/2011 – Reg. 277/2012). Moreover, no relevant, PAHs, PCBs and OCPs concentration differences were detected in samples coming out from the two different rearing systems. In conclusion the results allow us to point out that the analyzed samples are safe for human consumption.

Bibliography

1. K. Kalachova, et al. *Anal Chim Acta* 707: 84-91, 2011.
2. EC (2011) Commission Regulation (EU) No 1259/2011 Off J Eur Union. 03.12.2011, L320/18.
3. A. Trocino, et al. *Food Chem* 134: 333-338, 2012.
4. EC (2012) Commission Regulation (EU) No 277/2012. Off J Eur Union 29.03.2012, L91/1.

WOUND HEALING EFFECT AND POSSIBLE FLAVONES OF FICUS PARAENSIS (MORACEAE)

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Ficus paraensis (Moraceae) collected in Pasco (Perú) have been traditionally used for treatment of cancer and internal wounds by decoction in this region, and rheumatism, fractures and sprains by maceration1. It was authenticated in MHN (UNMSM) and any phytochemistry or biology investigations. Dried stem bark was extracted by maceration with EtOH 70% yielding Etanol Extract, (EE). Phytochemical screening revealed presence of flavonoids, phenolic compounds, steroids, terpenes and alkaloids. The wound healing effect of EE was determined for Vaisverg method. EE gels prepared at 0.5%, 1% and 10% also positive and negative control of six each group. The effectiveness showed: 17.7%, 66.2% and 71.9% ($p<0.001$) respectively compared with basis gel. The wound healing was better with EE 10% and showed concentration-dependent effect. Other investigations express that flavonoids has wound healing2-3. The EE was fractionated for partition with Petroleum Ether (FPE), Chloroform (FC) and MeOH (FM). The FM was purified with preparative TLC 4-5 to give 15 sub-fractions (M1-M15). Analysis Spectroscopy UV6 with NaOMe, AlCl3 and AlCl3/H+ showed next structures: One flavone O-Me in C-5, hidroxylated in C-6 and O-sustitued in C-7 (M8), flavone hidroxylated in C-7 and O-sustitued in C-5 and C-6 (M14) and flavone O-sustitued in ring A and none hidroxyl in orto (M7). This research will continue by isolation compounds with wound healing effect.

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Bibliography

1. Sanz-Biset J, Cañigueral S. *J Ethnopharmacol*.137: 271–88, 2011.
2. Cho M, et al. *Phytomed* 21(4): 560-9, 2014.
3. Süntar IP, et al. *J Ethnopharmacol*. 129(1): 106-14, 2010.
4. Wang XG, et al. *Chinese Acad Agric Sci* 9(5): 690–4, 2010.
5. Mathew BC, et al.. *J Chem Sci*. 2012;2(2):54–60, 2012.

Biography

PhD, UNMSM. Associate Professor, UIGV. She has published in reputed journals and is member or reviewer of several scientific journals.

THE SCIENTIFIC VS THE PROFANE ABOUT ABRUS PRECATORIUS L. (PEONY) SEED

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From the herbal memory magical-religious symbolism is evident and is attributed to the plant Abrus precatorius L. (Peony) multiple uses, for example, be an amulet to counter the "evil eye" in children (to frighten evil spirits), which precedes the scientific knowledge who ascribed highly toxic properties, which justified the realization of this work. It conducted a diagnostic phase, where it was known that 40% of respondents knew the use of the seed as a charm for the "evil eye" and 60% did not know the toxicity and mortality related to the intake of the peony seed, and an experimental phase where it was used twelve (12) rats as experimental animals, administering seeds peony orally, and presenting intoxication which was proved by pathologic studies, which revealed vascular hemodynamic changes, characterized by macroscopic epistaxis, and histologically by edema, pulmonary congestion and hemorrhage, sub-epicardial bleeding, spastic and splenic hemorrhage, cerebral edema and hemorrhagic gastroenteritis, with varying degrees of intensity. Finally macroscopic and histological findings showed toxic effect of "peony" on the endothelial wall of rats. From the popular belief the collective imagination attributed magical properties that repel evil spirits and protect against the evil eye, and from the scientific all injuries that can cause ingestion of Abrus precatorius L. seeds are evident.

Bibliography

1. Martinez,N, et al. *Emirates J Food Agric* 24/2: 159, 2012.
2. Martínez N, et al. *Proceed 16th Rencontres en Toxinologie* ; Nov 20-21 ; París, France ; p. 111-118, 2008.
3. Martínez, N. URL: www.slam.org.ve/publicaciones/ completas/plantas_medicinales_1.asp.
4. Martínez, N. Farmacia al día. 20: 68-77, 2009.
5. Martínez, N. *3er Congreso Nacional de Ciencia Tecnología e Innovación*. Caracas, Venezuela, 2013
6. Sisa, J. URL: http://www.ecoaldea.com/plmd/regaliz_americano.htm

PHYTOCHEMICAL STUDY AND EVALUATION OF LEISHMANICIDAL POTENTIAL OF ESENBECKIA LITORALIS (RUTACEAE)

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An Phytochemical study and evaluation of leishmanicidal activity of Esenbeckia litoralis species (Rutaceae)1,2 to obtain secondary metabolites with high biological potential were carried out and completed. The obtained extracts were fractionated using chromatographic techniques and the compounds were identified by spectroscopic analysis including infrared, nuclear magnetic resonance (1H and 13C) and Mass Spectrometry. Seven compounds were isolated and identified, six alkaloids: Flindersiamine (1), 1-hydroxy-3- methoxy-N-methylacridone (2), Maculosidine (3), Kukosaginine (4), Maculine (5), Dictamine (6) and a flavonoid, Gardenin B (7). The compound 2 and ethyl acetate extract of bark showed significant activity against Leishmania panamensis3 with an IC50 = 37.5 and 9.2 ug / ml respectively. The study showed the presence of active metabolites with high potential of leishmanicidal activity in these extracts, which could represent an alternative therapy for treatment of diseases caused by Leishmania4,5.

Bibliography

1. Coy, C.A.; et al. *Rev. Cub Plantas Med:* 18(4): 638-653, 2013.
2. Cuca, L.; et al. *Rev. Cub Farm* 45 (2): 275-282, 2011
3. Sanchez, E.L.et al. *Biomédica* 34: 605-11, 2014.
4. Taylor, V. M. et al. *Antimicrob Agents Chemother* 55(10): 4755–4764, 2011.
5. Torres, O.L.; et al. *Información Tecnológica* 25(6): 91-100, 2014.

Biography

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ANTIOXIDANT ACTIVITY OF ESSENTIAL OILS FROM LEAVES OF CONYZA BONARIENSIS, GNAPHALIUM PELLITUM AND ACHYROCLINE SATUREIOIDES

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Los aceites esenciales a nivel mundial son muy importantes en la industria alimenticia y farmacéutica, industrias en aumento creciente y generador de millones de empleos. Estos aceites se obtienen por diversos métodos, entre ellos está el de hidrodestilación (HD) (equipo Clevenger) y el arrastre por vapor (AV). Empleando estas dos técnicas se obtuvieron los aceites esenciales de Gnaphalium pellitum, Achyrocline satureioides y Conyza bonariensis, colectadas en la región Cundiboyacense donde proliferan naturalmente. Con ellos se evaluó su actividad antioxidante por el método DPPH*. Encontrando que a 250 ppm de aceite los porcentajes de inhibición (IC50) y actividad antioxidante relativa (AAR) respecto al ácido ascórbico por las técnicas de hidrodestilación y arrastre por vapor para las especies fueron: G. pellitum (HD; AV) 39.4% y 29.9%; 61.6% y 48.4%. A. satureioides (HD; AV) 39.6% y 37.3%; 51.6% y 57.3% y C. bonariensis (HD; AV) 39.6% y 37.3%; 61.9% y 59.1%, con variaciones poco significativas entre las tres especies.

Bibliography

Antolovich, M. (2002). *Analyst* 127: 183- 198, 2002.
Araujo, L., et al. *Nat Prod Comm* 8(8): 1175-1178, 2013.
Avello, M, Suwalsky, M. *Atenea (Concepción),* (494), 161-172, 2006.
Prior, R., et al. *J Agric Food Chem* 53(10): 4290, 2005.

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ACCUMULATION OF HEAVY METALS BY CONYZA BONARIENSIS (L.) CRONQ FROM THE HIGH BASIN OF BOGOTA RIVER

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Los vertimientos a los que se ve sometido el río Bogotá a lo largo de su recorrido generan problemas ambientales y en la salud de la población. En la actualidad, su paso por el municipio de Chocontá-Colombia, ha recibido la descarga de aguas industriales vertidas por las curtiembres, contaminando a su vez los suelos con metales. En este estudio se analizó la presencia de los metales Pb, Cr, As, Co y Cd en Conyza bonariensis (L.) Cronq, colectada en el margen occidental de la cuenca Alta del Río Bogotá, entre Villapinzon y Chocontá, zona de alta contaminación por las industrias de las curtiembres y en Usme, específicamente en el páramo de Sumapaz (Cundinamarca, Colombia), como control de no contaminación por metales debido a que no hay presencia de industrias en la zona. Con los datos obtenidos de los análisis de suelo, podemos concluir que el Cromo presenta un incremento en concentración del 457% con respecto al suelo de Usme. Los datos obtenidos en la raíz y tallo de la especie Conyza bonariensis colectada en la zona de Villapinzón, mostraron un incremento en la bioacumulación de Cromo en un 6342 % y 2628 % respectivamente, comparados con los analizados en la Zona de Usme; el Pb, Cd, Co y As en suelos se incrementó entre 114% y 148% y en los diferentes órganos de la planta se presentaron incrementos de bioacumulación entre 111% y 270%, datos que nos indican que la Conyza bonariensis es una especie potencial para procesos de Fitorremediación de suelos.

Bibliografía:

1. Lora S. R, Bonilla G. H, Rev. *U.D.C.A Act. & Div. Cient.* 13(2):61-70, 2010.
2. Lupino G. et al. *Braz. J. Plant Physiol.* 17(1): 53, 64, 2005.
3. Remon E., et al. *Chemosphere,* 69/1: 41-47, 2007.
4. Roy, S. L. *Plant Soil*, 272, 277–290, 2005.
5. Sánchez P. MS et al. *Rev. Fac. Nal. Agr. Medellin* 63(1): 5209-5224, 2010.

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QUANTIFICATION OF HEAVY METALS IN LICHENS LOCATED IN THE HIGH BASIN OF BOGOTA RIVER

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Los líquenes debido a su naturaleza simbionte, presentan características únicas que les confieren un papel clave como bioindicadores de contaminación ambiental. En este estudio se cuantificaron los metales Pb, Cr, As, Co y Cd en los líquenes Ramalina celastri, Usnea sp. , Flavopunctelia flaventor, Teloschistes exilis, Punctelia subrudecta , Parmotrema simulans, Ramalina complanata, Parmotrema bangii, Everniastrum columbiense, Parmotrema praesorediosum, Parmotrema reticulatum, Heterodermia leucomela). Los líquenes fueron colectados en el margen occidental de la cuenca Alta del Río Bogotá, en el sector de Villapinzón-Colombia, donde el aire y por ende la comunidad que habita en la rivera padece por estos vertimientos provocados por la industria de curtiembres. Este trabajo nos ha permitido demostrar que en la zona de Villapinzón se han presentado niveles altos de contaminación con Cd, Co, As y Cr; encontrando niveles mucho mayores a los reportados en el aire urbano. Dicha contaminación proviene de estas industrias, donde se encontraron valores de Pb que oscilan entre 4.1 y 25.8 ppm, siendo Parmotrema reticulatum la especie que presenta mayor acumulación; el Cd entre 0.8 y 45.7 ppm, donde la especie Parmotrema simulans presento el nivel más alto; el Co entre 0.8 y 6.3 ppm, con mayor bioacumulación en Heterodermia leucomela; el As entre 9,8 y 76 ppm, más bioacumulado en Heterodermia leucomela y el Cr entre 0.1 y 141.0 ppm con niveles altos en Teloschistes exilis. Lo anterior demuestra que se debe enfatizar en los controles del aire en zonas industriales específicamente en curtiembres.

Bibliografía:

Gabriele B, Callegaretti S. *The Patern*, 2005.
Kosanić M. et al. *Food Chem Toxicol* 53:112-118, 2013.
Manojlović N. et al., *Phytomed,* 19(13): 1166-1172, 2012.
Rubiano L.J. *Rev.Acad. Colomb. Cienc.* 28(109): 509-528, 2004.

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NEUROPROTECTIVE ACTIVITY OF SOLANUM OVALIFOLIUM (SOLANACEAE) AGAINST THE TOXICITY INDUCED BY ROTENONE IN DROSOPHILA MELANOGASTER

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The reactive oxygen (ROS), among other radicals can generate oxidative stress (EO), phenomenon which is attributed to be the main cause of neurodegenerative diseases that include of Parkinson disease (PD) [1]. Several investigations have shown that the phytocompounds can prevent or delay these neuronal pathologies [2,3]. By which this study determined the species methanol extract neuroprotective activity Solanum ovalifolium model vivo de Drosophila melanogaster [4]. To assess the neuroprotective effect 75 male flies were exposed seven days to a diet supplemented with 0.1% extract and rotenone to 100 µM, food with rotenone (100 µM) and normal eating used as witness, after this period, carried out the evaluation for negative geotaxis with the prototype RING [4] and also the content of dopamine in the brain region of flies was quantified by liquid chromatography high efficiency (HPLC-UV) [5]. Methanol extract of Solanum ovalifolium showing a lower locomotive deficit in males tested treatments and present a complete protection to the effects of toxicity induced by rotenone and dopamine content of 61-65 (µg/L). This activity can be attributed mainly to the flavonoids (66.66% flavone-flavonol / 33.33% dihidroxiflavona) present.

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Bibliography:
1. C Henchcliffe, Beal MF. *Nature Clin Neurol* 4 (11): 600-9, 2008.
2. Park JH, et al. *Pesticide Biochem Physiol* 104(2): 118-25, 2012.
3. Nistico R, et al. *Int J Immunopathol Pharmacol.* 24 (2): 313-22, 2011.
4. Gargano JW, et al. *Experim Gerontol* 40(5): 386-95, 2005.
5. C Girish, Muralidhara. *Neurotoxicol***.** 2012; 33 (3): 444-56, 2012.

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CYTOTOXIC ACTIVITY OF CONYZA TRIHECATACTIS DICHLOROMETHANE FRACTION ON HUMAN BREAST ADENOCARCINOMA (MCF-7)

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Conyza trihecatactis is a ruderal plant growing in the Sumapaz paramo (Colombia) situated at an altitude of 3000 m amsl. C. trihecatactis has been used in the traditional medicine for rheumatism treatment and gastrointestinal disorders. The plant was collected on “La Regadera” sidewalk in the Sumapaz paramo. The ethanol extract (ExEtOH) was subjected to a continuous liquid-liquid fractionation with solvents of increasing polarity, yielding fractions of dichloromethane (FCH2Cl2), ethyl ether (FEt2O), ethyl acetate (FAcOEt) and a hydroalcoholic residue (RHEtOH).
The cytotoxic activity of the extract and the fractions was evaluated by the MTT method ([3- (4,5-dimethylthiazol-2-yl) -2,5-diphenyl tetrazolium bromide]), on murine mammary adenocarcinoma cell lines 4T1 and TSA and human breast adenocarcinoma cell line MCF-7. Dichloromethane fraction (FCH2Cl2) showed a higher cytotoxic activity on all tumor cell lines compared to polar fractions, with an inhibitory concentration (IC50) estimated of 48.15 µg/mL (4T1), 50 µg/mL (TSA) and 44.84 µg/mL (MCF-7). From this fraction we identified by MS and NMR techniques (1H and 13C experiments, HSQC, HMBC), two flavonoids: Apigenin and Hispidulin. In conclusion, FCH2Cl2 fraction has the highest specific cytotoxic activity against the human breast tumor cell line MCF-7 which could be explained by the presence of the flavonoids Apigenin and Hispidulin. Actually, we are studying the mechanism of cytotoxicity induced by the flavonoids and evaluating antitumoral activity using in vivo models.

Bibliography

1. Gaiten, Y. *Estudio Farmacognóstico de Phyllanthus orbicularis HB, especie endémica de Cuba*. Universidad de la Habana, 2011.
2. El-Sayed, et al. *BioMed Res Internat.* http://doi.org/10.1155/2013/945638
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Biography

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CONTRIBUTION TO THE DESIGN OF POLYMERIC MICROPARTICLES OF CALYCES FROM PHYSALIS PERUVIANA USING A STATISTICAL EXPERIMENTAL DESIGN.

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Cape gooseberry (Physalis peruviana L., Solanaceae) is an Andean plant widely used in folk medicine as for the treatment of diseases associated with oxidative stress. Currently, the gooseberry is the second most exported fruit in Colombia, and chalices, a material that encloses the fruit to protect it, is regarded as post-harvest residue.
The Rutine (quercetin-3-O-rutinósido) are observed as one of the major compounds calyx extract of P. peruviana, the flavonoid was selected as an analytical marker crude extract by HPLC-DAD methodologies to quantify both the crude extract and microparticles polymer were validated (1). As exploratory manner, using an experimental design placket Burman type, polymer microparticles were produced using the methods of emulsification / solvent evaporation and spray drying, using different polymers, Eudragit® E and Eudragit® RS PO 100, respectively. Using validated methodologies for routine quantification in order to characterize the microparticles in terms of encapsulation efficiency and extract load. According to the results the experimental conditions, for the microparticles prepared by the method emulsificación- solvent evaporation, producing an increased yield of microparticles and encapsulation, loading and encapsulation efficiency were selected and a particle size reduction. These variables are: Eudragit RS 100 4% 2% PVA, polymer ratio - extract 2: 1, stirring temperature 35 ° C, 100 mL of aqueous phase, stirring intensity of 11000 rpm and a stirring time 2 minutes. For spray drying methodology results enabled the selection of the experimental conditions: Inlet temperature 60 ° C, spray rate 15 mL / min, 80 rpm vacuum flow, ratio Polymer - Extract 2: 1 and 50 mL volume to sprinkle such as those which can obtain better characteristics microparticles.

Bibliography

Toro, R., et al. *Nat Prod Commun*, 9, 1-3, 2014.

PRELIMINARY STUDY FOR THE CULTIVATION OF AGRICULTURAL PRODUCTS OF GREATEST CONSUMPTION, WITH PARTICULAR REFERENCE TO THE SAN MARZANO TOMATOES IN SOILS CONTAMINATED BY HEAVY METALS.

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The “La Terra dei fuochi” and the Agro Sarnese-Nocerino, defined as homogeneous areas from both geographically and economically, or territories in great agricultural tradition with productions of excellence and PDO .It distinguish, for their common problems such as the presence of different and differentiated sources of pollution due to various human activities. On the one hand the wastewater pollutants carried by the Sarno River and its tributaries and on the other hand, the illegal discharges pose a problem of living in relation to the influence that these molecules can have genotoxic on the growth of plants cultivated and consumed in urban areas described above.
And 'well enough to justify a suspicion that the toxic load present in surface and ground water will not only pollute the soil, but most likely also affect the normal physiological metabolism in plants in production. Moreover, the frequency of documented outbreaks of illnesses due to consumption of fruits and vegetables eaten raw has increased in recent years (1)
In years past it was considered that dump toxic substances in the soil constituted a risk more or less acceptable, but the reality is very different and the presence of heavy metals in agricultural soils remains a serious problem because we see the change in the chemical composition of plants without there are easily visible damage. Current research aimed at protecting the health of consumers is addressed in knowing the mechanisms of translocation of heavy metals from soil to plants used as food in order to establish a threshold of cytotoxicity. For this purpose, a preliminary study was conducted in the territory of Nocera Inferiore cultivating San Marzano tomatoes in pots containing soil contaminated medium to study their ability to absorb and move in the edible parts heavy metals and also evaluate if the amount absorbed can become a danger to public health.
The final results of this initial trial have shown that the growth of the plants, in terms of fresh weight and allocation of biomass, is not influenced by the presence of heavy metals but, I 'as many interesting aspect is the presence of cadmium in the leaves and the Lead that is absorbed in the root. Considering the danger of the presence of heavy materials in vegetables, these studies are of utmost importance when placed in view of the food security considering the tomato a food widely used in our food. Further studies are underway to evaluate the effects of increasing toxicity of contaminated soil in the cultivation of tomatoes.

ISOLATION OF FURANOCUMARIN FROM RUTA GRAVEOLENS AND ITS TRYPANOCIDE ACTIVITY

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Parasitic infections cause major public health problems leading to morbidity and sometimes mortality of the victims, while an estimated 60 million people are at risk of contracting the disease, which is fatal if untreated. The chemotherapy of Chagas disease has been undermined by the fact that currently used drugs are relatively toxic unwanted side effects associated or to a certain extent ineffective by the spreading of resistance1. Therefore, there is an urgent need to discover new effective agents2,3,4. Previous studies have shown trypanocidal effect of Ruta graveolens5. The objective of this work was to find the active compound, on Trypanosoma cruzi strain Ninoa, in vitro evaluation, after carrying out a chromatographic separation of the chloroform extract. Bioassay-guided fractionation of the chloroform extract of R. graveolens was carried out using as toxicity bioassay Artemia salina. Trypanocide activity in vitro Ninoa strain was evaluated by method Pizzi of active fractions and active constituent. The chloroform extract which showed a 67% mortality Artemia salina was separated by column chromatography over silica gel. Fractions 232, 234, 306, 311, 328 and 397 presented the lowest LC50. Selected fractions 306 and 328 for a second chromatographic separation were chosen, obtaining fractions 292-318 and 340-390 which presented an LC50 less. Furanocumarin was isolated from 340-390 fractions. Of fractions tested against Trypanosoma cruzi was found that the fraction from 340 to 390 and furanocumarin at a concentration of 100 µg/mL showed higher percent lysis against Nifurtimox as reference drug at concentrations of 50, 25 and 100 µg/mL.

Acknowledgements: SIP-IPN Clave 20151111 and COFAA-IPN.

Bibliography

1.Díaz C.D.L., et al. *Acta Trópica*, 122: 108-112, 2012.
2.Habila N., et al. *J. Parasitol Res*. 20: 534-601, 2010.
3.Jiménez-Coello M, et al. *Zoo Publ Health,* 2: 327-330, 2012.
4.Santos K., et al. *Pharmac Biol,* 50(2): 162-166, 2012.
5.Wink M. *Molecules* 17: 12771-12791, 2012.

Biography

Master in Chemistry (1992), Faculty of Chemistry, Universidad Nacional Autónoma de México. Professor Phytochemistry, ENCB/IPN. She has over 15 publications in scientific journals. Her research area is medicinal plants with antiparasitic and antimicrobial activity.

EVALUATION OF ANTIOXIDANT ACTIVITY AND GENOTOXICITY OF METHANOLIC EXTRACT FROM PELTOGYNE MEXICANA

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Palo Morado tree (Peltogyne mexicana) is endemic specie from Mexico which has purple heartwood that is its main attraction1. Currently there are no studies of the compounds present in the heartwood; however previous works with other species of the genus has been reported that these compounds are structurally related to the peltogynoids2,3,4, a group of flavonoids little studied, so it could show valuable functional properties such as polyphenols, which have antioxidant activity. However, it is necessary to determine that these compounds do not show genotoxicity that could prevent their consumption. The objectives of this study were to determine the antioxidant activity by ABTS assay of methanol extract (ME) obtained from the heartwood of Palo Morado, determine the genotoxicity of EM by the Ames test with three Salmonella typhimurium strains (TA98, TA100 y TA102) and ME doses of 25, 50 and 100 ug/plate. Finally, determine by HPLC if a set of standards of phenolic compounds widely distributed are present in the ME. The results showed that ME had an antioxidant activity of 3.8 ± 0.02 µmol TE/mg. Number of revertant colonies in the Ames test with a ME dose of 100 mg/plate for S. typhimurium TA100 was 146.33 (without S9) and 137.5 (with S9), for S. typhimurium TA102 of 465.17 (without S9) and 459.5 (with S9) and S. typhimurium TA98 31.5 (without S9) and 33.33 (with S9), which were much lower values compared to the positive controls (without S9: 2649, with S9: 762.42 for strain TA100; without S9: 2182.67, with S9: 2120 for strain TA102 and without S9: 213.5, with S9: 2389 for strain TA98), this concludes that the ME is negative to the test genotoxicity. By HPLC analysis it was confirmed that in ME were not found the acids: gallic, 3,4-dihydroxybenzoic acid, 4-hydroxybenzoic, 2,5-dihydroxybenzoic acid, chlorogenic, vanillic, caffeic, syringic, p-coumaric, ferulic, sinapic , transcinamic neither flavonoids: hydrated routine, naringin, hesperidin, 3- acetyl coumarin, quercetin, narangenin, kaemferol, eugenol, daidzein, (-)-epicatechin and myricetin.

Acknowledgments: SIP-IPN- Clave 20151111 and COFAA-IPN.

Bibliography:

1. Navarro, M. J., et al *Revista Chapingo*. 11(1): 73-82, 2005.
2. Robinson, G.M., Robinson, R. (1935).
3. Drewes, S.E., Roux D.G. *J Chem Soc (C)*, 1407-1410, 1967.
4. Brandt, E. V., Roux, D. G. *J Chem Soc Perkin Trans*. 7:1879-83, 1979.

IN VITRO TRYPANOCIDAL ACTIVITY OF EXTRACTS OF ARGEMONE OCHROLEUCA SWEET, CHENOPODIUM GRAVEOLENS WILLD AND TAGETES LUCIDA CAV. ON TRYPANOSOMA CRUZI STRAIN INC-5

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American trypanosomiasis is a zoonosis caused by Trypanosoma cruzi1.The clinical evolution presented acute and chronic phase. Treatment, long lasting, has two drugs: nifurtimox and benznidazole those are effective only in early chronic and acute phase, but have side effects in patients. Medicinal plants may serve as source of potentially useful new compounds for the development of effective therapy to combat a variety of ailments2,3. According to World health organization (WHO) more than 80% of the world population relies on plants for their prymary health care Needs. The aim of this study was to determine the in vitro trypanocidal effect of plant extracts from Argemone ochroleuca4 Sweet and Tagetes lucida5,6. 200g of dry plants were grinded and extracted with methanol, chloroform and hexane at room temperature. The extracts were concentrated under reduced pressure by rotary evaporator. Subsequently, the brine shrimp bioassay was carried out at different concentrations and the LC50 was determined. The chloroform extracts selected were those with LC50 value below 1000 ppm. Dilutions were made with DMSO at 10, 50 and 100□g/ml which were contacted with 1x106 blood trypomastigotes and after incubation 24h at 4°C percent lysis was determined by the method of Pizzi, comparing Nifurtimox. The chloroform extracts Argemone ochroleuca Sweet and Tagetes lucida Cav. showed trypanocidal activity greater than or equal to the reference drug at all concentrations probed. Finally, our results indicate that both species, could be a source of active compounds against Chagas disease.

Acknowledgements: SIP-IPN Clave 20151111 and COFAA-IPN.

Bibliography

1. Abdel E, Maes L & Salama M. *Phytother. Res*. 24(9): 1322, 2010.
2. Azeredo C, et al. *BMC Complem Altern Med.* 14:309, 2014.
3. Bressan R, et al. *Elsevier.* 132(2):125, 2012.
4. Canales M, et al. *Redalyc* .10(2):1445, 2011.
5.Durán C, et al. *Salud UIS*. 41(3):281-284, 2009.
6. Nibret E, Wink M. *Phytomed,* 17:911-920, 2010.

CYTOTOXIC ACTIVITY CELL CULTURE WITH LUNG CANCER FRUIT EXTRACT SECHIUM EDULE (CHALLOTE)

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Although there are several therapies for lung cancer, this neoplasia remains one of the most common worldwide. Plants have been for decades the main source of anticancer compounds. Because of this, it was evaluated the cytotoxic effect of S. edule methanolic fractions on the cell line A549 of lung cancer. A crude extract of S. edule (with 70% ethanol) was prepared and subsequently fractionated. The A549 human lung adenocarcinoma epithelial cell line was cultured in standard conditions of humidity, temperature and nutrients. Subsequently, the cytotoxic activity of fractions 7,17 and 4,5 was evaluated by flow cytometry with Annexin V-FITC and PI. Actinomycin D was used as a positive control and 2% FBS as negative control. In the crude extract of S. edule, the presence of coumarins, anthraquinones, terpenes, alkaloids, sterols and flavonoids was found. The crude extract of S. edule contained initially 76 fractions, after further processing 26 fractions were obtained. The 4,5 fractions showed no cytotoxic activity. The percentage of apoptotic and necrotic cells in samples exposed to negative control was 6.13 and 1.36%, respectively.
The percentage of apoptotic and necrotic cells in those samples exposed to the positive control was 20.34% and 3.94 respectively. The percentage of apoptotic cells exposed to 25, 50, 75 and 100 µL of the 7,17 extract was 13.87, 13.06, 15.04 and 12.48% respectively. The percentage of necrotic cells exposed to 25, 50, 75 and 100 µL of the 7,17 fractions extract was 5.53, 8.85, 8.08 and 10.77%, respectively. The 7, 17 extract fractions produced toxicity by increasing apoptosis and necrosis in A549 cells.

Bibliography

1.-Tiwary BK,et al. *BMC Complem Altern Med*. 15:22, 2015.
2.-Firdous SM, et al. *Internat J Pharm Pharmac Sci.* 4(1): 374-377, 2012.
3.-Rajabi M, et al. *J Photochem Photobiol B.* 3;148:66-72, 2015.

Biography

PhD, Escuela Nacional de Ciencias Biológica, National Polytechnic Institute and Loughborough University of Technology, Great Britain. Postdoc studies at Museum National D`Histoire Naturelle, Paris, France. He has published more than 15 papers in reputed journals and 2 book chapters and has been serving as editorial board member of repute journals. Member, National Association of Pharmaceutical Sciences and American Chemical Society. His present research activities are focused on the antitumor properties of medicinal plants such as: Sedum praealtum DC., and Sechium edule

IDENTIFICATION OF ESSENTIAL OILS METABOLITES WITH INHIBITORY EFFECT ON DENGUE VIRUS INFECTION

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An antiviral drug is not currently available for treatment of dengue. Hence, identification of terpenes derived from plant with antiviral and anti-inflammatory properties could contribute to discovery of anti-dengue drugs. Pure terpenes (n = 13) present in essential oils were examined. Tendency of terpenes to human toxicity was evaluated in four cell line by using MTT assays. Antiviral and anti-inflammatory activities were evaluated in human hepatic cells (HepG-2) infected with virus serotype-2 for 72 h and measuring virus-NS1 protein and cytokines (IL-8, RANTES) in culture medium. All terpenes presented low tendency to toxicity (CC50: > 200 μM in at least three cell lines). At the highest concentration (30 μM), only β-caryophillene, citral and estragole showed relevant antiviral effect in HepG-2 cells (reduced NS1 between 63.5% and 49.0%; $p < 0.05$), presenting IC50 values of 22.5 ± 5.6, 31.3 ± 4.5 and 26.8 ± 7.4 μM and SI values of 71.7, 28.8 and 8.2, respectively. Neryl-acetate, (+)-limonene-oxide, p-cymene and α-phellandrene reduced NS1 between 32.0% and 27.1%, and the rest of terpenes (Nerol, (R)-(-)- and (S)-(-)-Carvone, geranyl-acetate, (+)-dihidrocarvone and α-terpineol) presented no significant inhibitory effect (NS1 reduction < 22.0%; $p > 0.05$). Time-of-drug-addition studies revealed that active terpenes inhibited at very early stages of virus-infection. Active terpenes reduced ($p < 0.03$) IL-8 (89.0% - 62.4%), and citral and p-cymene reduced RANTES (78.5% and 52.2%). These data show promising molecules against dengue virus infection, which could be used as a starting point for consideration in designing effective drugs for treatment of dengue.

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Bibliography

1. Gómez LA, Stashenko E, Ocazionez R.. *Nat Prod Comm*. 8(2), 249-252, 2013.
2. Pájaro-Castro N, et al. *BLACPMA* 14 (3): 141-155, 2015.
3. Meneses R, et al. *Ann Clin Microbiol Antimicrob*. 6/8: 8, 2009
4. Muller DA & Young PR. *Antiviral Res.* 98(2), 192-208, 2013.
5. Ngo L, Okogun J, Folk W. *Nat Prod Rep,* 30(4), 584-592, 2014.

Biography

PhD, Universidade de São Paulo, Brazil. Associate Professor, Medicine School, Universidad Industrial de Santander; Senior Researcher, Centro de Investigaciones en Enfermedades Tropicales (CINTROP). She has published several papers in reputed journals. Member, Colombian Association of Biological Sciences. Her present field of research is antivirals for dengue and phylodynamics of dengue serotypes.

PHYSICOCHEMICAL PROPERTIES AND ANTIOXIDANTS IN HONEY FROM STINGLESS BEES (PLEBEIASPP AND TETRAGONISCAANGUSTULA) OF WESTERN PANAMA.

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Six honey samples fromstingless bees were analyzed; four of them came from Plebeiasppand twofrom Tetragoniscaangustula. The samples were provided by two beekeepers with stingless bees from two rural western regions of Panamá. The following physicochemical values were obtained: pH (4.0 - 4.6) Total acidity (25.1 - 25.8 meq / kg of honey) , humidity (24-25 %) , reducing sugars (58-62 %), glucose (26- 29%), HMF (2.5 - 10.0 mg / kg) and Brix (75 -76 %). Antioxidants for the samples were: Total polyphenols (44 -74 mg / 100g) and flavonoids (12-27 mg / 100g). Honey fromTetragoniscaAngustulahad the highest levels of antioxidants. The uses of stingless bee honey are more focused on natural and traditional medicine, but it may be an option for home consumptionbecause of the benefits providedby its easy yet sound management and at the same time this would encourage the growing of the beekeeping with stingless bees in the region.

Bibliography

1. Duarte, Fernandes, AW, et al. *J Apicult Res* 51(1): 23-35, 2012.
2. Quezada E. , J. J. G. *Biología y uso de las abejas sin aguijón de la península de Yucatán, México (Hymenoptera: Meliponini).* Universidad Autónoma de Yucatán, (2004) 102 p.
3. Vattuone MA. et al *BLACPMA* 6 (5): 299-300, 2007.
4. Wilczyńska, A.(2010). *Pol. J. Food Nutr. Sci.* 60/4: 309-313, 2010.

Biography

Master in Science, University of Costa Rica. He has 2 publications. Director, Chemistry Department, Universidad Autónomae Chiriquí. Researcher, CIPNABIOT - UNACHI . Member, Panamanian Chemists Association.

HEMATOPOIETIC ACTIVITY IN VITRO AND IN VIVO OF EXTRACT FROM SOLANUM CHRYSOTRICHUM.

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Solanun chrysotrichum (Solanaceae) is a spiny shrub, the infusion of leaves is used against different kinds of cancer. In previous studies we reported cytotoxicity in vitro for human carcinoma cells from breast and prostate. The objective of the present study is to determine if the extracts are cytotoxic for hematopoietic normal cells. The plant was collected in Puebla, Mexico, leaves milled and macerated at room temperature overnight in hexane, chloroform, methanol and water. In vitro assays: Each extract was added to mouse spleen cells cultures at final concentrations of 1, 10 and 100 µg/mL. and incubated for 48 hours at 37oC. In vivo assays 40 male mice CD1 were used and distributed into groups A, B, C and D with 10 animals each one. Groups A, B and C received by intragastric via 0.05, 0.1, and 0.2 mg/kg of aqueous extract, respectively on days 0, 2 and 4. At sixth day hematological determinations were performed along with Group D (control) which received saline solution. In vitro assays. Hexane extract reduced cell count 14% $p < 0.01$. Chloroform extract 1 and 100 µg/mL increased 16 and 46% the cell count, respectively. $p<0.001$. Other extracts were cytostatics. In vivo assays: No hematological variations were observed in mice treated with the extract, although a significant increase in reticulocytes was observed.
Except hexane extract, no other extract was cytotoxic in vitro. Moreover, chloroform extract 100 µg/mL stimulated plenty proliferation of mouse spleen cells. In vivo no cytotoxicity was detected for blood cells.

Biography

PhD in Biological Sciences, Universidad Autónoma Metropolitana, Mexico City. Full time Professor. He has published 23 scientific articles in peer review journals and 7 book chapters. His research areas are Hematology and Pharmacology of medicinal plants.

EVALUATION OF ANTIBACTERIAL ACTIVITY OF THREE SPECIES OF THE GENUS SOLANUM

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Due to the antimicrobial, cytotoxic and antitumor properties attributed to Solanum torvum, Solanum chrysotrichum and Solanum verbascifolium, they are empirically used to treat various ailments. These shrubs grow from Mexico to Panama. The goal of our study is to evaluate the antibacterial activity of such plants by the method of resazurin S. torvum and S. chrysotrichum were collected in Puebla, and S. verbascifolium in Chichicastle, Veracruz. Seeds of S. verbascifolium and leaves of S. torvum and S. chrysotrichum were used. Each material was macerated overnight at room temperature consecutively with hexane, dichloromethane, methanol and water. Organic solvents were eliminated under reduced pressure and water by evaporation. A stock of 10 mg/mL of each extract was prepared in dimethyl sulfoxide 10%. dilution were made and to plate culture containing 4 x 106 CFU/mL and resazurin (0.675% w/v in water) all placed in RPMI media and incubated 20 hours at 37°C. The bacterial strains used were; Escherichia coli, Salmonella typhimurium, Shigella flexneri, Salmonella typhi, Proteus sp, Bacillus subtilis and Staphylococcus aureus. Each extract was tested by triplicate at least in three times.
The minimum inhibitory concentration (MIC) was observed with 0.63 mg/mL of methanol and dichloromete extracts from S. verbascifolium on B. subtilis and S. aureus, followed by the concentration 125 mg/mL of methanol extract from S. torvum over S. typhimurium and S. aureus. E. coli was not inhibited by any of the tested materials. Methanol extract from S. verbascifolium presented the best antibacterial activity.

Biography
PhD in Biological Sciences, Universidad Autónoma Metropolitana, Mexico City. Full time Professor. He has published 23 scientific articles in peer review journals and 7 book chapters. His research areas are Hematology and Pharmacology of medicinal plants.

CHEMOPREVENTIVE EVALUATION OF PHASEOLIN IN MOUSE

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Introduction.
Phaseolin is the main protein from beans (Phaseolus vulgaris), and studies have shown that may have chemopreventive activities. Therefore, the aim of the present study was to determine the capacity of phaseolin to inhibit the number of aberrant cypt foci (ACF) in mouse treated with azoxymethane (AOM). ACF are the first histological, pre-carcinogenic lesions observed in mucosal colon tissue, and it is known that they usually evolve to adenomas and carcinomas. AOM. on the other hand, is a well known specific colon carcinogen.

Methodology.
Phaseolin from P. vulgaris was obtained and identified by means of acrilamide gel electrophoresis. The experiment was carried out in 8 groups with 6 mice each. Substances were applied by the intragastic route except for AOM that was intraperitoneally injected.
The evaluated groups included a control group, other treated with AOM, three groups administered phaseolin (40, 200 and 400 mg/kg), and the last three groups administered the same doses of phaseolin plus AOM. At the end of the 4-week treatment animals were cervically dislocated, the colon was longitudinally open and stained with methylene blue. Then, the number of single and multiple crypts were registered along the whole organ.

Results.
Sixty g of phaseolin was obtained from 4.7 kg of beans with a yielding of 22.1 %. The protein was identified by two bands at 42 and 46 kDA in the electrophoresis profile. In regard to its chemopreventive effect, we determined an inhibition of 75.7%, 85.9%, and 86.8% with 40, 200, and 400 mg/kg, respectively.

HERBAL MEDICINES: NEW ARGENTINIAN REGULATIONS INSTRUMENTS

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ANMAT is the Argentinian health authority with competence in herbal medicines. Since 2013 ANMAT has been active member of the International Regulatory Cooperation for Herbal Medicines (IRCH) - WHO. Its constant searchings, regulating inspections, and monitoring activities on traditional medicines, in consonance with the developments achieved by Argentinian and Regional Pharmacopoeia commissions, ANMAT has collected vast information on herbal products valuable to be guided in favor of the public health. Regulatory science paradigm was defined as the utilization, in each decisional act, of the best scientific evidence available as a result of the conjunction of professionals, academics, regulatory authorities and society. In relation with its objectives, it has adopted the new paradigm based on regulatory science impulsing shared efforts with several organisms as National Institute for the National Institute of Agricultural Technology, University of Buenos Aires, Universiy of Belgrano and University of Córdoba. The efforts were focused on companies strategies, control market, good manufacturing practices, herbal medicinal products vigilance, pharmacopoeia monographs and a technical advisor group with expertise in the field. All this tools were found in the conjunction of a working group harmonized. In 2015, ANMAT has implemented two regulations instruments based on the new focus: Disposition N° 5418/2015 for the registration-permit of herbal medicines and traditional herbal medicines use and Disposition N° 5482/2015 for the stablishments authorizations. These two tools helped to ameliorate the way of registering new market tendencies in consonance with traditional medicines. Future perspectives are based on innovation to generate knowledge and technological innovation in value chains.

Bibliography

Advancing Regulatory Science for Public Health, FDA. 2010
Directive 2004/24/EC of The European Parliament and of the Council. EMA, 2004.
Chico, S; Catalano.,AV. *Proceed 20mo Congreso Latinoamericano de Farmacología y Terapéutica*. ISBN 978-959-7076-49-0.
Resolution N° 1718/2013. Health Ministry.
Disposition N° 5418/2015. ANMAT.
Disposition N° 5482/2015. ANMAT.

Biography

Master in Public Health, Isalud University. She has implemented several works in the health authority from Tucumán related with pharmacy practices. National Director, National Institute of Drugs, Foods and Medical Devices (INAME-ANMAT).

ANTI-STAPHYLOCOCCAL ACTIVITY IN VITRO AND IN VIVO OF MULINUM ECHEGARAYII

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Introduction:
Mullinum echegarayii is an Argentinean endemic plant whose references on its use in folk medicine are not known. Nasal carriers of Staphylococcus aureus are important reservoirs with risk of developing endogenous infections or transmitting infections to susceptible individuals.
The aim of this study was to evaluate in vitro antibacterial activity of M. echegarayii extract and the effect in BALB/c mice infected with methicillin-resistant S. aureus (MRSA).
Method: extract was prepared using flash chromatography. The antibacterial activity was assayed using microplate method according to the CLSI (1) in tripticase soya broth with 2,3,5-triphenyltetrazolium chloride. Extract was submitted to a subculture on tripticase soya agar plates to evaluate the minimal bactericidal concentration (MBC). The minimal inhibitory concentration (MIC) of 30:70% ethyl acetate: n-hexane M. echegarayii extract was tested (8000-500µg/ml). Mice were infected intranasally with MRSA strain ATCC 43300, the next day, the extract (4000µg/ml) was administrated in their nares. Mice were used like control without extract. The third day, the nares and lung were removed and homogenized for bacterial quantification.

Results/Discussion/Conclusion:
M. echegarayii extract showed activity with MIC: 500µg/ml and MBC: 1000µg/ml. No significant difference was observed in the nasal carriage of S. aureus after instillation with the extract.
No bacterial count was observed in lungs. The study in vitro showed that M. echegarayii was active against MRSA. Some studies have demonstrated in plants belonging to Mulinum genus an interesting group of bioactive metabolites with antibacterial activity (2). However, the experience in vivo not was able to reduce the bacterial counts.

Bibliography
1. Clinical and Laboratory Standard Institute. *Performance Standards for antimicrobial susceptibility testing:* M100 - S21. Vol.31, nº1, 2011. Wayne, Pensylvannia. USA.
2. Molina-Salinas G, et al. *Fitoterapia.*81:50-54, 2010.

Biography
PhD, National University of San Luis (UNSL). Adjunct Professor, UNSL. She has published more than 20 papers in reputed journals and co-authored a book. Reviewer of international manuscripts. Her present field of research is Bacteriology and Immunology.

EFFECTS OF ZINNIA PERUVIANA EXTRACT IN NASAL COLONIZATION OF STAPHYLOCOCCUS AUREUS IN AN ANIMAL MODEL

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Introduction:
S. aureus is a pathogen and frequent colonizer of human mucosa and skin. Nasal carriage of S. aureus is a risk factor mainly in susceptible people. Medicinal plants that presented compounds with anti-staphylococcal properties would provide an important alternative to reduce the spread and transmission of S. aureus, especially those resistant to methicillin (MRSA). The aim of this study was to analyze the effect of administration of extract of Zinnia peruviana in nasal colonization of BALB/c mice by MRSA and perform histological studies of their nares.

Method:
mice were infected intranasally with MRSA strain ATCC 43300, the next day 30:70% ethyl acetate: n-hexane Z. peruviana extract (8000 µg/ml) was administrated in the nares. Mice were used like control without extract. The third day, the nares and lung were removed and homogenized for bacterial quantification.

Results/ Discussion/Conclusion:
Studies in vitro showed that Z. peruviana extracts were active against MRSA (1). In this study, a significant increase in nasal carriage of S. aureus was found in mice inoculated with the organic extract. No bacterial count was observed in lungs. Histological examination of the mice inoculated with Z. peruviana showed stratified epithelium slightly eroded and great development undifferentiated mesenchymal cells with altered nuclear morphology located in connective stroma. This allows us to postulate that the cytotoxic effect observed in the connective cells, could be responsible for an increased bacterial count in the nares. Authors showed that compounds of plants of the Asteraceae family like sesquiterpene lactones possess cytotoxic and anticancer effects (2).

Bibliography
1- Satorres S, et al.. *Emir. J. Food Agric.* 24: 344-347, 2012.
2- Gach K, et al. 2015. *Naunyn Schmiedeberg's Arch. Pharmacol.* 388:477-486, 2015.

Biography
PhD, National University of San Luis (UNSL). Adjunct Professor, UNSL. She has published more than 20 papers in reputed journals and co-authored a book. Reviewer of international manuscripts. Her present field of research is Bacteriology and Immunology.

ETHNOBOTANY IN THE HIGHEST VILLAGE IN EUROPE: A HERITAGE THAT MUST BE PROTECTED

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Trepalle is a small village made of houses scattered along a glacial valley whose lowest point is 1,900 m a.s.l., while the highest is Passo D'Eira at 2,208 m. The distance from bigger towns, the isolation in winter, the morphology of the land and the sharp borders created by the surrounding mountains contributed to the idea that this is a world apart, especially in the past. The peculiar environmental conditions had a great influence on life of its inhabitants that always live there all year round. Often, however, nature helped them with its products. They were used both as food source and as health remedies. Through the present investigation, we wanted to codify the ethnobotanical tradition in all its aspects as it was handed down over the years, before a significant part of it is lost forever. In the years 2013-2014, information was obtained through semi-structured interviews subjected to eighty-six informants native in the study area and selected using snowball techniques. The collected data were evaluated by quantitative parameters also comparing abandoned and current uses. A total of 76 botanical taxa were recorded. Results included medicinal (48%), alimentary (37%), veterinary (9%) and other uses (6%). Medicinal plants were employed to treat a wide range of diseases, mainly disorders of digestive, respiratory and skin çsystems. A great traditional importance was retained by species such as Achillea moschata Wulfen and Arnica montana L. The study revealed that the local people gave up about 40% of the known uses.

Biography
PhD in Plant Biology and Crop Production, Milan State University (MSU), Italy. Specialist in Medicinal Plants and Natural Compounds. Senior Researcher, MSU. She has published more than 35 peer-reviewed papers. Her present fields of research are (i) biological activity of secondary metabolites, (ii) chemotaxonomy of medicinal plants, (iii) ethnobotany, and (iv) effects of resistance inducers on secondary metabolite content in food species.

ESSENTIAL OILS FROM PLANTS GROWN IN COLOMBIA WITH POTENTIAL USE FOR DISCOVERING NATURAL MEDICINES FOR DENGUE

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Antiviral drugs are not currently available for treatment of dengue despite that numerous synthetic inhibitors have been identified. Essential oils (EOs) obtained from aromatic and medicinal plants could be a source for discovering natural medicines. In this work, EOs obtained from nineteen distinct plant species were studied. Tendency of EOs to human toxicity was evaluated in seven cell types by using MTT assays. Hierarchical clustering of toxicity patterns was performed using the concentration 50 (CC50) values, and the sum of individual weighted hierarchy values (∑iWH) was considered as similarity indicator. The top five Eos, in descending order of cytotoxicity (∑iWH value in parentheses), as follows: Piper cf. subflavum (7.8) > Lipia alba (7.7) > Hyptis dilatata (6.4) > Piper holtonii (6.2) > Cymbopogon nardus (6.1). The five latest in ascending order of cytotoxicity as follows: Tagetes caracasana (2.9) > Lantana colombiana (3.2) > Baccharis decusata (3.3) > Ageratina popayanensis (3.5). Virucidal activities were evaluated in cells (Vero) infected five days with virus treated with EO (30 µg/mL), 4 h at 37oC. The top four Eos, in descending order of anti-dengue activity (Percentage of cytophatic effect inhibition with respect to control in parentheses), were as follows: Lippia origanoides (57.7%) > Lippia alba (25.8%) > Hyptis dilatata (24.4%) > Piper holtonii (19.9%), with SI values, respectively, of 3.0, 15.3, 14.6 and 11.5. These data show promising EOs with antiviral activity, which could be used as a starting point for consideration in designing natural medicines for treatment of dengue.

Acknowledgement. Patrimonio Autónomo Fondo Nacional de Financiamiento para la Ciencia, la Tecnología y la Innovación, Francisco José de Caldas, grant # RC-0572-2012. Ministry of the Environment and Sustainable Development and BioRed-CO-CENIVAM.

Bibliography

1. Gómez LA, Stashenko E, Ocazionez R. *Nat Prod Commun.* 8(2): 249-252, 2013.
2. Ocazionez R, Meneses R, Stashenko E *Mem Inst Oswaldo Cruz*. 105(3): 304-309, 2010.
3. Meneses R, Ocazionez R, Martínez J, Stashenko E. *Ann Clin Microbiol Antimicrob.* 6/8: 8, 2009.
4. Ngo L, Okogun J, Folk W. *Nat Prod Rep,* 30(4): 584-592, 2014..

Biography

PhD, Universidade de São Paulo, Brazil. Associate Professor; Medicine School, Universidad Industrial de Santander; Senior Researcher, Centro de Investigaciones en Enfermedades Tropicales. She has published several papers in reputed journals.
She serves on the scientific advisory committee of the Colombian Biotechnology Network UT-BioRed-Co-CENIVAM. Member, Colombian Association of Biological Sciences.
Her present field of research is antivirals for dengue and phylodynamics of dengue serotypes.

DEVELOPMENT AND OPTIMIZATION OF UPLC-ESI-MS/MS METHOD FOR THE DETERMINATION OF FREE AMINOACIDS IN HONEY

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Normally the traditional method to determine the floral origin of the honey is pollen recognition. even if many studies have proposed markers of botanical origin for honey, based on aroma compounds, sugar or flavonoid profile as well as organic acids or isotopic relations and, finally, protein and amino acid compositions. Amino acids, in particular, appear to be the best option as markers for honey fingerprintings. European Community food laws establish compositional and quality parameters for honey but these parameters have no relationship to botanical or geographical origin of honey. About amino acid even if the occurrence of more than 30 amino acids in honey has been confirmed in literature, in European Union laws only proline amount is specified. Proline is the major contributor of the total amino acids and come mainly from the honeybee during the conversion of nectar into honey. Its amount in honey has been proposed as an indicator of honey ripeness. The other amino acids and their relative proportions, depending on honey origin (nectar or honeydew), could be characteristic of botanical origin and may be used for authentication. A method for free amino acids analysis by Ultra Performance Liquid Chromatography with electrospray ionization tandem mass spectrometry (UPLC-ESI-MS/MS) has been developed and optimized. A total of 17 amino acids have been optimized according with the precursor (m/z), product (m/z), dwell time (msec), Q1 (V), Q3 (V) and collision energy (V). The sample preparation was kept only on an extraction and separation of metabolite without derivatization or solid phase extraction steps. The performance of this method has been validated for each amino acid.

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Bibliography
1. R. Rebane, K. Herodes. *Anal Chim Acta* 672: 79-84, 2010.
2. S. Santos, R.F.A. Moreira, C.A.B. De Maria. *Food Chem* 171: 421-425, 2015.

MODULATORY POTENTIAL OF BRAZILIAN JALAP ROOT RESIN GLYCOSIDES ON THE MULTIDRUG RESISTANCE PHENOTYPE IN HUMAN CANCER CELLS

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Multidrug resistance is the expression of one or more efflux pumps, such as P-glycoprotein (multidrug resistance protein 1, P-gp) and the breast cancer resistance protein (BCRP/ABCG2), and is the major obstacle for cancer therapy. The use of potent and non-cytotoxic efflux pump modulators co-administered with antineoplastic agents is an alternative approach for increasing the success rates of therapy regimes with combinations of different drugs. This report describes the isolation of resin glycosides from the methanol-soluble fraction of the Brazilian jalap root (Operculina macrocarpa syn. Ipomoea operculata) as mammalian multidrug-resistance modifying agents. Operculinic acid H (hexasaccharide of ipurolic acid) was identified as the constitutive glycosidic acid of the active fraction while exogonic, isovaleric, 2-methylbutyric and tyglic acids as the esterifying residues for the oligosaccharide core. HPLC profiles of the crude extract allowed the identification of three major constituents, which were purified by recycle HPLC. The total extract and isolated compounds demonstrated a modulatory effect of the multidrug resistance phenotype in vinblastine-resistant breast cancer cells (MCF-7/Vin).

Bibliography

1. Lorenzi, H, Abreu-Matos, F.J., *Plantas medicinais no Brasil. Nativas e exóticas*. Ed. Instituto Plantarum. Brasil, 2002. pp. 183-184.
2. Ono, M. et al . *Chem Pharm Bull* 2009, 57(3): 262
3. Figueroa-González, G.et al. *J Nat Prod* 2012, 75: 93-97.
4. Bautista, E. et al. *J. Nat. Prod.* 2015, 78: 168-172.
5. Castañeda-Gómez, J., Pereda-Miranda, R.. *J. Nat. Prod*. 2011, 74: 1148-1153.

Biography

Ph.D. in Organic Chemistry (1994), Federal University of Rio de Janeiro. Professor of Pharmacognosy at the UFRJ. She has published over 70 papers on plant secondary metabolites with medicinal importance. Her main research interests are in ethnopharmacology and the isolation, structure elucidation, and biological evaluation of chemotherapeutic agents from plant origin.

TUNISIAN OLIVE LEAVES POLYPHENOLS EXTRACTS INHIBIT OXIDATIVE STRESS IN INTESTINAL EPITHELIAL CELLS DURING ACTIVATING NUCLEAR FACTOR (ERYTHROID-DERIVED 2)-LIKE 2

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The medicinal use of different parts of olive tree have been known for long time ago. Thanks to its different potential bioactive composition, olive leaves has a wide range of pharmacological and health promoting properties1. The aim of this study was to investigate the potential anti-oxidant effect of olive leaves methanolic extracts from Tunisian cultivated (Chemchali, Fouji and Zarrazi) and wild (Oleaster 1, Oleaster 2 and Oleaster 3) trees, on Lipopolysaccharide from E.coli plus Interferon-γ in IEC-6 cells line. The olive leaves methanolic extracts injected to HPLC-DAD revealed that the main present polyphenol was oleuropein, it was more abundant in the extracts from wild trees than cultivated one, in addition to verbascoside, luteolin 7 glucoside and ligstroside. The results evaluated by cytofluorimetry and confocal microscopy demonstrate that olive leaves polyphenols reduced oxidative stress in IEC-6 decreasing Reactive Oxygen Species generation and activating nuclear factor (erythroid-derived 2)-like 2 antioxidant response associated to the expression of the cytoprotective enzyme Heme Oxygenase-1. MTT assay show that, at tested concentrations, the extracts doesn't affect IEC-6 viability, thus indicating the absence of toxic effect on this cells line. The antioxidant potential in IEC-6 was stronger for the extracts from cultivated tree than wild one. Because the extracts biological activity is not related to the oleuropein content, minor polyphenols can be responsible for the anti-oxidant potential. Despite further investigation will be necessary to establish the constituents responsible for this activity, this study indicates that polyphenols from olive leaves possess an anti-oxidant activity on intestinal epithelial cells.

Bibliography

1. Taamalli, A., et al. J Food Sci, 77: 83-92, 2012.

Biography

Prof. Nunziatina De Tommasi has completed her degree and doctoral studies from the University of Naples. Full Professor of Pharmaceutical Biology, University of Salerno.
She has published more than 200 papers in reputed journals. Her present filed of research is isolation, structural elucidation and analytical methodologies of plant secondary metabolites, structural study of ligand-target interactions and chemical proteomics studies.

POLYPHENOLS EXTRACT FROM TUNISIAN OLIVE OIL INHIBITS INFLAMMATORY RESPONSE IN LPS-STIMULATED MACROPHAGES

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Extra Virgin Olive Oil (EVOO) is obtained from the fruit of the olive tree Olea Oleuropaea L. and it is generally considered to be a major contributor to human health in Mediterranean diet1. Converging studies indicates that the EVOO unsaponifiable fraction, rich in phenols, significantly promotes human health2. The aim of the current study was to investigate the potential anti-inflammatory effect of polyphenols extracts from EVOO on LPS-stimulated murine macrophage cell line J774A.1. The phenolic fraction was obtained from three different Tunisian olive oil (Chemchali, Fouji and Zarrazi) at three maturity index (3, 4 and 5) by methanolic extraction. The total phenol content was estimated by the Folin-Ciocalteu method. Nitric oxide (NO) production was analyzed by Griess method and inducible nitric oxide synthase (iNOS) and cyclooxygenase (COX)-2 expression by cytofluorimetric analysis. The results showed that the polyphenols from EVOO reduced LPS-induced inflammatory responses through significantly decreasing NO release and iNOS and COX-2 expression. Moreover MTT assay revealed that, at tested concentrations, the extracts doesn't affect macrophage vitality, thus indicating the absence of toxic effect in macrophages. Those biological activities were related to the concentrations of phenolic compounds in oil extracts. The variety Chemchali was the more active on NO and iNOS inhibition release while the variety Zarrazi show the best COX-2 inhibition release. In general, each activity decrease with the increase of maturity index. This study establishes that polyphenols from EVOO possesses an anti-inflammatory activity on LPS-stimulated J774A.1 murine macrophages.

Bibliography

1. Perez-Trujillo, M., et al. J Agric Food Chem 58: 9129-9136, 2010.
2. Cicerale, S., Lucas, L and Keast, R. Int. J. Mol. Sci, 11: 458-479, 2010.

Biography

Prof. Nunziatina De Tommasi has completed her degree and doctoral studies from the University of Naples. Full Professor of Pharmaceutical Biology, University of Salerno.
She has published more than 200 papers in reputed journals. Her present filed of research is isolation, structural elucidation and analytical methodologies of plant secondary metabolites, structural study of ligand-target interactions and chemical proteomics studies.

CONSTITUENTS ISOLATED FROM NECTANDRA TURBACENSIS (KUNTH) NEES (LAURACEAE).

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Eight known compounds were isolated from the ethanol extract of bark Nectandra turbacensis (Kunth) Nees (Lauraceae); which were identified as meso-dihydroguaiaretic acid 1 [1], threo-dihidroguaiaretic acid 2 [2], sauriol B 3 [3], and threo-austrobailignan-6 4; vitexin (8-C-β-D-glucopyranosyl-5,7,4'-trihydroxyflavone) 5 [4]; stigmast-4-en-3-one 6 [5] and sitosterol 7/ stigmasterol 8 mixture. The structures of the compounds were elucidated by spectroscopic methods, techniques involving 1D and 2D NMR, GC/MS and by comparison of spectral data, reported in the literature, of related compounds. This is the first report of the presence of such compounds in the species. The chemotaxonomic implications are also described; related to the frequent presence of lignans in the genus Nectandra.

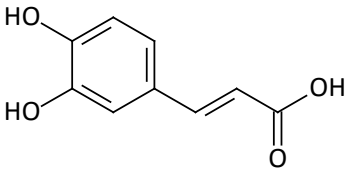
Bibliography

1. M. Miyazawa, H. Kasahara, and H. Kameoka, *Phytochem*, 46: 1173-1175, 1997.
2. J. Guzmán, L. Cuca, and J. Isaza, *Rev Prod Nat* 1: 6-12, 2008.
3. N. Mori, H. Watanabe, and T. Kitahara, *Biosci Biotechnol Biochem*, 70: 1750-1753, 2006.
4. C. Choo, N. Sulong, F. Man, and T. Wong, *J Ethnopharmacol,* 142; 776-781, 2012.
5. R. L. Alexander-Lindo, E. S. A. Morrison, and M. G. Nair, *Phytother Res,* 18: 403-407, 2004.

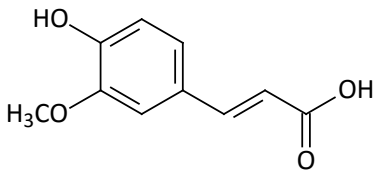
ANALYSIS OF CAFFEIC ACID, TRANS FERULIC ACID AND CHLOROGENIC ACID IN HUMAN PLASMA BY HPLC-PDA DETECTION

V. Ferrone, S. Bacchi, M. Carlucci, G. Palumbo, and G. Carlucci

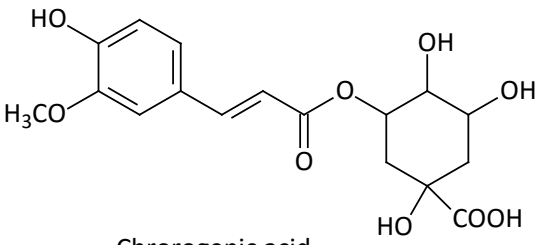
Caffeic acid or 3-(3,4-dihydroxyphenyl)-2-propanoic acid, ferulic acid or 3-(4-hydroxy-3-methoxy-phenyl)-2-propenoic acid and chlorogenic acid or [1S-(1α3β,4α,5α)-3-[[3-(3,4-dihydroxy-phenyl)-1-oxo-2-propenyl]oxy]-1,4,5-trihydroxycyclohexanecarboxylic acid are secondary metabolites phenolics of plants, fruits and vegetables contribute that contribute to several organoleptic attributes and nutritional properties.



Caffeic acid



Ferulic acid



Chrorogenic acid

Polyphenols have been reported that possess health-promoting effects in different biological systems as antioxidant, anti-inflammatory, anti-carcinogenic, anti-mutagenic and anti-proliferative activities highlighting the importance of their identification and quantification. Chromatographic techniques, especially high-performance liquid chromatography (HPLC) coupled to PDA detector have been the choice for the analysis of polyphenols. The aim of this study was to develop and validate a simple, selective and sensitive reverse-phase HPLC method for the simultaneous determination of caffeic acid, ferulic acid and chlorogenic acid in human plasma.

IRIDOIDS GLYCOSIDES OF GENIPA AMERICANAS ISOTONIC DRINKS DYE

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Introduction.

Fruits of Genipa americana L. present iridoids as genipin ((1R,2R,6S)-2-Hidroxi-9-(hidroxim-etil)-3-oxabiciclo [4.3.0] nona-4,8-dieno-5-carboxilato de metilo), with anti-tumor and antioxidant effects, inhibiting the growth of Gram-positive and Gram-negative bacteria (Lárez, 2014).

The drinking isotonic beverages or sports drinks are more popular today by university students considering color as one of the selection criterion (Ramón, 2013). Since these dyes are of synthetic origin, we propose to use iridoid glycosides from extracts genipa fruit, which are rich in nutrients and it adds color (Morales, 2011). However, natural colors are unstable to temperature and pH changes, so that color stability is evaluated as a substitute blue dye, used in commercial beverages (Araneda, et al., 2014; Arrazola, 2014).

Methodology.

Genipa green fruits were collected in David city, Chiriqui, and stored at 5 °C. The fruits are put in a commercial juicer extractor, to separate the pulp from the juice and cold stored at 5 °C.

The degree of maturity, acidity titulable, total soluble solids (TSS) and pH is determined as control parameter. The extracts were centrifuged at 5 °C at 5000 rpm for 30 minutes. The supernatant liquid was stored in the freezer and dilutions are prepared to add color to the isotonic drinks. The presence of iridoids extracts was confirmed by phytochemical characterization. The colored drinks were stored at 15 °C and evaluated for 120 days. We analyzed four beverages brands containing blue dye (E133) and compared with coloring drinks.

Results

No statistically significant differences were found for wavelength mean values between commercial isotonic drinks and colored in the laboratory. Results indicated homogeneity of the drink commercial dyes and extracts prepared in laboratory with extracts of Genipa americana, proposing these iridoids glycosides as potential dyes industry isotonic drinks.

Bibliography

Arrazola, G., Herazo, I., y Alvis, A. I*nformación Tecnológica,* 25(3), 31-42, 2014.

Araneda, X. et al . (2014). *Scientia Agropecuaria*, 5/3, 2014.

Lárez Velásquez,C. ,Rivas, A., Santos Ocanto, I. *Avances en Química*, 9(2): 75-86, 2014.

López-Carreras, N.; Miguel, M.; Aleixandre, A. *Nutr. Clín. Diet. Hosp*. 32(3): 81-91, 2012.

Morales-V., et al. *Estabilidad del colorante azul obtenido de de los frutos deshidratados de Genipa americana.* 2do Encuentro Científico. UNACHI, 2011.

Ramón-Salvador, D.;et al. *Salud en Tabasco,* Enero-Abril, 10-14, 2013.

Biografía

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ALKALOIDS FROM CRINUM ERUBESCENS AITON

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Plants belonging to the Amaryllidaceae family are well known for containing an exclusive group of alkaloids, which have been considered a distinctive taxonomic characteristic of this family. Crinum is a pantropical genus that has extensive traditional use in Africa in a wide range of therapeutic applications, including antitumoral and antimalarial, and treatment of rheumatism and kidney and bladder infections, among others. Alkaloids purified from the Crinum species have been confirmed as responsible for some of these properties, particularly the antiproliferative action. The alkaloid-rich extracts from Crinum have shown significant antibacterial and antifungal activities. To date, approximately 130 species found throughout Africa, America, southern Asia and Australia have been classified within the Crinum genus. Eight alkaloids have been identified from fresh leaves of Crinum erubescens (Amaryllidaceae) collected in Costa Rica. The alkaloid 1-epidemethylbowdensine, detected by means of GC-MS as part of a global Amaryllidaceae Phytochemical Program, is reported for the first time and completely characterized by physical and spectroscopic methods. The absolute configuration of this compound is also reported.

Bibliography

1. Andrade, J.P., et al. *Phytochem Rev,* 2015. DOI 10.1007/s11101-015-9411-7.
2. Berkov, S., et al.*Phytother. Res*. 25: 1686-1692, 2011.
3. Ianello, C., et al. *Nat. Prod. Res.* 28, 704-710, 2014.
4. Refaat, J., et al. *J. Pharm. Sci. Res*. 3, 3091-3100, 2012.
5. Torras-Claveria, L.et al. *Ind. Crops Prod.* 43, 237-244, 2013.

Biography

Warley de Souza Borges: PhD, University of São Paulo, Brazil. Leader, Research Group on Natural Products, Federal University of Espírito Santo. He has published more than 15 papers in reputed journals. Member, Brazilian Chemical Society. His present field of research is natural products from Amaryllidaceae plants.

ANTI-INFLAMMATORY ACTIVITY OF AN IRIDOID ISOLATED FROM LOASA SPECIOSA

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Medicinal plants have been traditionally used to control inflammatory symptoms and associated pathologies in many countries around the world. This approach has produced a significant increase in the clinical-experimental research field intended to validate the anti-inflammatory properties attributed to these natural products [1]. The Loasaceae family is a plant commonly used for anti-inflammatory treatment in the Latin American folkloric medicine; however, those properties have not been formally tested as part of this activity [2]- This family of plants has 15 genders and 250 species, it is commonly recognized by their harsh and stinging hairs and it is typically found in tropical and subtropical regions of the American continent [3]. Considering the properties previously described, the present study was performed on Loasa speciosa of Loasaceae in Costa Rican, which grows in higher lands. Samples were collected close to Turrialba's Volcano in the province of Cartago, Costa Rica, at 2634 MASL. A hydromethanolic extract obtained from the dry leaves and stems was analyzed in a TLC, detecting iridoids. Anti-inflammatory activity was studied using the carrageenan induced rat paw edema model; the dose used was 500 mg of extract/Kg of rat, obtaining a similar biological effect to the indomethacin (positive control) in a dose of 50 mg/Kg of rat. Based on the positive results showed by the hydromethanolic extract, a phytochemical fragmentation in a HP-20 Diaion resin was performed and the richest iridoid fraction was fragmented using a C18 silica gel resin obtaining two fractions enriched with iridoids. Those fractions were put together and the active compound was purified using a RP-HPLC. The chemical structure of the isolated metabolite was elucidated by 1H-RMN, 13C-RMN, COSY, HMBC y HSQC spectroscopy. The structural analysis of the metabolite indicates a monoterpene lactone (iridoid) known as Loganin. Anti-inflammatory activity of the isolated iridoid was evaluated in mice, using 15 and 30 mg/Kg of the mice doses. Anti-inflammatory data was studied by ANOVA analysis comparing the results with control group, using a Tukey statistical test as post-hoc. A similar anti-inflammatory effect was detected for both evaluated doses of the purified iridoid. Additionally, the anti-inflammatory response of the iridoid Loganin was statistically similar to the synthetic anti-inflammatory indomethacin during the bioassays. The results of the biological evaluation of the hydromethanolic extract showed a higher anti-inflammatory effect than the one shown by the pure iridoid.

Bibliography

1. Badilla B, Mora G, Poveda LJ. *Rev Biol Trop*;47:723, 1999.
2. Müller et al. *Phytochem*. 49(6): 1705-1707, 1998.
3. Montiel L. *Introducción a la flora de Costa Rica.* 2nd ed., Universidad de Costa Rica, Costa Rica. 1991.p. 248.

IN VITRO EFFECT OF LUPEOL DERIVATIVES ON PROSTATE CARCINOMA CELL LINES

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Human prostate cancer (PCa) is the most common form of non-cutaneous cancer, and metastatic late-stage PCa represents a significant challenge with few successful treatment options. Statistics shows that PCa is the most common cancer in American men (WHO, 2012). Recent investigations suggest that consumption of fruits, vegetables and medicinal plants rich in triterpenoids, could be beneficial against a variety of diseases, including cancer, due to their ability to target multiple signaling pathways, their cost-effectiveness, and most importantly, their wide acceptance [1]. Lupeol, a pentacyclic triterpenoid, has shown growth inhibition of androgen-responsive and unresponsive human PCa cells lines, without exhibiting toxicity towards normal human prostate epithelial cells [2]. Also, novel synthetic triterpenoids which mimic natural ones, have been effective in suppressing inflammation and inducing apoptosis in a wide variety of tumor cells, through diverse mechanisms [3,4].Recently, we have prepared a series of derivatives from natural calenduladiol that were evaluated for its in vitro cytotoxic activity against human tumor cell lines. These studies have revealed that the introduction of sulfate groups enhances cytotoxic activity of these compounds [5]. These results prompted us to synthesize some lupeol derivatives by transformations on C-3. These semisynthetic compounds were evaluated as anti-tumor agents against two human prostate carcinoma cell lines, LNCaP (androgen dependent) and PC-3 (androgen independent). The pharmacological results show that some of these compounds exhibit higher growth inhibition activities than lupeol (IC50 7-42 μM). Both lupeol and calenduladiol were obtained from Chuquiraga erinacea (Asteraceae), an endemic species growing wildly in our region.

Bibliography

[1] M.K. Shanmugam, R. Kannaiyan, G. Sethi. *Nutr Cancer* 63_161: 73, 2011.
[2] M.K. Shanmugam, etal. *Cancer Lett* 320: 158-170, 2012.
[3] M.B. Sporn, et al.. *J Nat Prod* 74: 537-545,2011.
[4] S. Yang, etal. *Chem Cent J* 6: 141-149, 2012.
[5] M.J. Castro, et al. *Tr Natl Prod Res* (2014).

Biography

M.B. Faraoni has completed her degree and doctoral (PhD) studies from the Universidad Nacional del Sur (Argentina). She is senior researcher of INQUISUR-CONICET. She has published 20 papers in reputed journals and is member of SAIQO. Her present field of research is in organic chemistry, particularly in the area of natural products.

CHARACTERIZATION OF EXTRACTS OBTAINED FROM CAMPOMANESIA LINEATIFOLIA WITH POTENTIAL APPLICATION FOR FOOD INDUSTRY

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Fruit consumption has increased in recent years in response to a culture with healthier habits. In addition, epidemiological studies have assosiated high consumption of fruits and vegetables to lower risk of chronic diseases. The Champa (Campomanesia lineatifolia) is a fruit native to the Colombian Amazon, characterized by an agreeable taste and aroma, but its marketing is limited due to postharvest losses reaching 97%. In this regard, to add value as a source of bioactive compounds, this study aimed to evaluate the effect they can have different conditions of phenolic compounds (solvent: water, water: ethanol 3:7, ethanol, and temperatures: 20, 50 and 70OC). Dried extracts obtained from the lyophilized fruit were characterized quantitatively by HPLC-DAD. The higher extraction yields were achieved with aqueous extracts (above 45%). Regarding the chemical composition of the extracts, all contain gallic acid and theobromine, reaching higher levels using the mixture water: ethanol at 70 ° C and ethanol at 50 OC, respectively. While no differences were found between the compounds present in the extracts obtained with water and mixture etanol:water, there is a differences in the number of compund extracted with the ethanol extracts, where additionally it was found naringenin and kaempferol and epigallocatechin gallate. The research extends the knowledge of this fruit and indicates a path to use it to obtain bioactive compounds that can be incorporated as functional additives in other food matrices.

Bibliography

• Balaguera, H. E. *Rev. Bras. Frutic*. 34 (2) :460-468, 2012.
• Balaguera, H. E., Álvarez, J. G., Bonilla, D. C. Rev U.D.C.A 12 (2): 113-123, 2009.
• European Food Information Council. Informes EUFIC 01/2012. Acceso http://www.eufic.org/article/es/expid/Consumo-frutas-verduras-Europa/
• Morillas, J. y Delgado, J. (*Nutr. Clín.Diet. Hosp.* 32(2):8-20, 2012D
• Pérez-Nájera V., et al. *Rev Ciencias Biol Salud.* 15(3): 18-22, 2013.

Byography

Master in Chemical Sciences. Member, Molecular Biology and Inmunogenetics Research Group (BIOMIGEN) and CISVI Research Center, Faculty of Health Sciences, Universidad de La Salle (Colombia). She has published 8 articles in reputed journals.

EVALUATION OF ANTIMICROBIAL ACTIVITY OF MEDICINAL PLANT EXTRACTS AGAINST FIVE STRAINS OF STAPHYLOCOCCUS ISOLATED FROM MICROBIOTA CONJUNCTIVAL

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Microbiota in the eye frequently coagulase negative Staphylococcus species are the most resistant to antibiotics. An alternative is to control the development of topical medicines from plant extracts with antimicrobial potential. Therefore, the aim of this study was to evaluate the susceptibility eleven medicinal plant extracts against the most prevalent bacteria in conjunctiva. Plants were selected by quantitative analysis of the information provided by herbalists for treating infectious diseases. Obtaining the extracts it was performed by cold maceration with ethanol and were concentrated by distillation under reduced pressure. For the evaluation of the antimicrobial ethanolic crude extracts disk diffusion method it was used against five strains of Staphylococcus (warneri, epidermidis,capitis, hominis and lentus). The extraction yields ranged from 4 to 11%. The antimicrobial activity of the 44 trials showed that 17 had sensitivity to some strains of Staphylococcus and three extracts a percentages of inhibition higher than 75% was observed at a concentration of 30 mg/mL and MIC values below 6 mg/mL, corresponding to ethanol extracts of Arnica sp. and Besleria calantha against S. hominis and Pseudognaphalium viravira against S. warneri. The results show that the selection of plants with ethnomedical use against random is effective in obtaining extracts with biological activity and the search for active principles that can be used as topical ocular use phytomedicament.

Bibliography

1. Capriotti, J. et al. *J Ophthalmo*l, 29(2): 81-84,2009.
2. Dong, Q. et al. *Invest Ophthalmol Visual Sci,* 52(8): 5408-5413, 2011.
3. Keshav, B. Basu, S. *Ophthalmol Microbiol* 5(1):16-18, 2012.
4. Romeu, B. et al. *Rev CENIC: Ciencias Biol*, 41: 1-9, 2010.

Byography

Master in Chemical Sciences. Member, Molecular Biology and Inmunogenetics Research Group (BIOMIGEN) and CISVI Research Center, Faculty of Health Sciences, Universidad de La Salle (Colombia). She has published 8 articles in reputed journals.

EFFECT ON ORAL SQUAMOUS CELL CARCINOMA OF ALKALOID NITENSIDINE A ISOLATED FROM PTEROGYNE NITENS

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Cancer is defined as a set of different diseases that have in common the uncontrolled proliferation and differentiation of cells. Cancer is a serious health problem that affects the population. Nowadays, it is necessary to research products with effective properties against tumors, such as the guanidinic alkali nitensidine A, isolated from Pterogyne nitens. The study assessed the 24h cytotoxicity on oral epidermoid carcinoma cell lines (HSC-3) and human keratinocytes (HaCaT) by Sulforhodamine B assay. IC50 values determined as of 23.1 μM for HSC-3 and 25.0 μM for HaCat. Additionally, the type of cell death (apoptosis and/or necrosis) was analyzed by means of Hoechst and Propide Iodide (HO) assay and Annexin assay, in concentrations of 7.3, 14.6 and 29.2μM, after 12 and 24 hours of treatment. Doxorrobicin (46.0μM) and curcumin (100.0μM) were used as controls; 0.5% DMSO as vehicle control. The Annexin V and HO assay evidence early apoptosis for both cell lines on lower concentrations and increasingly percentage of late apoptosis/necrosis according to concentration and treatment time. It is also shoen that HaCat cell line seems to be slightly more sensitive to nitensidine A, since after 12 hours of treatment, at the highest concentration, 39.67%±3.6 of HaCat cells died by necrosis pathway and 35% of HSC-3 cells died by late apoptosis/necrosis. After 24 hours of treatment, cell death occurred predominantly by necrosis in both strains, showing a concentration-response activity. These results indicate that nitensidine A promotes cell death and may be an interesting prototype against oral squamous cell carcinoma.

Financial support: CAPES, CNPq, UNESP.

Bibliography:

TAJIMA et al. *Cytotechnol* . 67. 585-92, 2013.
PODLODOWSKA, J.; et al.. *Pol. Merkur. Lek,* 32: 135–137, 2012.
SHARMA, M.K.; et al. *Asian Pac. J. Cancer Prev*, 12:. 1215–1218, 2012.
JOHNSON, N. W.; et al. “Global oral health inequalities in incidence and outcomes for oral cancer: causes and solutions.” *Adv Dent Res* 23/2: 237-246, 2011.
DUARTE, R.A.; et al *Tumor Biol*, 31/5: 513-522, 2010.

Biography:

Master in Science (2011) and currently a Ph.D. student, UNESP. Her current research area is related to Brazilian natural products, oral squamous cell carcinoma, antitumor activity in animal models of induced carcinogenesis, cytotoxic, and cell death.

STABILITY TESTS FOR PASSIFLORA QUADRANGULARIS L. AQUEOUS LEAF EXTRACT SPRAY-DRIED MICROENCAPSULATED

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Passiflora quadrangularis is a plant widely distributed in Colombia and South America. Its fruits have been widely used in the preparation of foods and the leaves are employed in the traditional medicine as tranquilizer1; recently, neuropharmacological activities such as sedative and anxiolytic have been observed2. The aim of this study was to compare stability of the Eudragit ® E PO spray dried microparticles loaded with P. quadrangularis aqueous leaf extract with the free extract.

Micro particles were manufactured with Eudragit ® E PO by spray- drying an acid solution containing co-polymer and extract. Stability was evaluated under stress conditions and under controlled storage conditions. For strees tests, free and encapsulated extract were submitted to hydrolysis (water, reflux, 24 h), alkaline hydrolysis (NaOH 0,1 N reflux, 8 h), acid hydrolysis (HCl 0,1 N reflux, 8h) and oxidation (hydrogen peroxide 30%, room temperature, 24 h). For controlled storage conditions, both, free and encapsulated extract were put into a stability chambers at 30ºC and 65% HR and at 40ºC 75% by three months. The stability was monitoring by quantification of total flavonoids and vitexin trough HPLC-DAD method previously validated. Relative abundance of the flavonoids vitexin, vitexin 2”-O- glycoside, vitexin 2”-O- xyloside, orientin, orientin 2”-O- glycoside and orientin 2”-O- xyloside contained in each sample was also calculated.
Results show that encapsulated extract is more stable than free extract in stress conditions as hydrolysis and alkaline hydrolysis, and in storage conditions at 30ºC and 65% HR and at 40ºC with 75% HR. Additionally results allow to infer that vitexin and orientin could be used as a stability marker on quality control for the extract (free or encapsulated) and as in process control for extract microencapsulation. Microparticles obtained made extract more stable, since they protect it from environmental conditions, additionally Eudragit ® E is a copolymer soluble in acid pH, thus would allow a gastric release.

References

1. Dhawan, K., Dhawan, S. & Sharma, A., *J Ethnopharmacol* 94: 1-23, 2004.
2. Córneo, A., 2012. *Avaliação química e neurofarmacológica de espécies de passiflora da américa do sul. Florianopolis.*(Thesis)

Biography

Hilbert Medina has completed his degree and master (MSc) studies from the National University of Colombia. His present field of reserasch is microparticles and phamaceutical technology.

DIFFERENTIAL PROTEOMIC ANALYSIS OF HUMAN CERVICAL CARCINOMA CELLS USING THE NATURAL GUANIDINIC ALKALOID NITENSIDINE B

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Cervical cancer is the third most common neoplasia among women and have been associated with human papillomavirus (HPV), which infects squamous epithelial cells. Given the need to find new drugs with antineoplastic activity, we have sought to identify compounds derived from plants, which would be capable of preventing the proliferation of cancerous cells infected by HPV. Nitensidine B is a guanidinic alkaloid isolated from Pterogyne nitens Tul. (Fabaceae) a Brazilian plant. Thus, this present study performed a differential proteomic analysis of proteins of human cervical carcinoma cells infected by HPV-16 (SiHa, ATCC: HTB-35) and non infected (C-33 A, ATCC: HTB-31), treated (IC50: 30,0 µM) and untreated with nitensidine B through the technique iTRAQ (Isobaric tag for relative and absolute quantification). Were identified 38 and 34 differentially expressed proteins in SiHa and C-33A cells, respectively. In human cervical carcinoma cells infected with HPV-16 (SiHa), was observed a subexpression of proteins related to the glycolytic pathway and cell metabolism and overexpression of protein synthesis and ATP, chaperone activity , ubiquitization and related with cytoskeleton. In human cervical carcinoma cells not infected by HPV-16 (C-33A), which was noted a subexpression of proteins related to calcium signaling and cytokinesis and overexpression of protein synthesis, proteins of cytoskeleton, mitochondrial stress, also overexpression of endoplasmic reticulum proteins , chaperone activity and ubiquitization. These results presume that nitensidine B promotes cell death with different mechanisms and may be used as an interesting prototype for the study against human cervical cancer.

Financial support: CNPq, CAPES, UNESP.

Bibliography:

Unwin et al. *Nat. Prot.* 5.1574-82, 2010.
Palasap et al. *Asian Pac J Cancer Prev*. 15. 449-54, 2014.
Kim et al. *Cell Biol Toxicol*. 4. 259-72, 2013.
Tajima et al. *Cytotechnol* 67. 585-92, 2013.
Zhao et al. *Clin Transl Oncol.* DOI 10.1007/s12094-015-1287-x (2015)

Biography:

Ph.D., UNESP (College of Pharmaceutical Sciences of Araraquara/Brazil). His present field of research is in the area of Brazilian natural products and cervical cancer cells studying cell death and proteomic analysis.

COCONUT RESIDUE UTILIZATION FOR THE DEVELOPMENT OF NUTRACEUTICAL IN OBESITY

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Obesity is a common chronic disorder of carbohydrate and fat metabolism which is characterized by excessive fat deposition in adipose tissue and other internal organs. A dramatic increase has been developed of obesity-associated diseases such as hyperlipidemia, type 2 diabetes mellitus and ischemic heart disease. Cocos nucifera L is considered an important fruit crop. Due to cross linking between phenolics, lignin and polysaccharides, the mesocarp and exocarp becomes hard and fibrous. Fibrous coconut fruit is not edible but also studies had reported extensive polyphenol content. However, has been considered a waste. Therefore, the object of this study was to evaluate the pharmacological efficacy of Cocos nucifera residue at preclinical and clinical level. Males ICR mice were fed high-fat diets and an oral dose coconut residue extract (CRE) at 1mg/kg, 1000 mg/kg and ciabatta with coconut residue extract (CCRE) (420, 1280 mg/kg) for 28 days. The abdominal fat, triglycerides and glucose levels were significantly reduced in mice with CRE at 1000 mg/kg oral dose. Notably, mice fed high-fat diets and 1 mg/kg decreased the triglycerides levels by compared with mice fed a high-fat diet. CCRE at 420 mg/kg dose significantly reduced glucose level. Both CCRE doses (420, 1280 mg/kg) showed an important significant reduction on body weight. On the basis of these findings, it was concluded that CRE had anti-obesity effects by suppressing adipose tissue formation, and reducing triglycerides and glucose levels, CCRE reduced body weight gain and glucose levels.

Bibliography

1. Brown, L.A., . *Br J Nutr*. 106: 1880-1889, 2011.
2. Chang, C.L., Wu, R.T. *Food Chem* 126: 710-717, 2011.
3. Chaudhari, D., et al. *Case Reports in Nephrology*.Article ID 124604: 1-3, 2013.
4. Ganz, M., Csak, T., Szabo, G. *World J Gastroenterol* 20(26): 8525-8534, 2014.
5. Santos, L.A.,et al. *An Acad Bras Ciências*. 85: 1-22,2013.

Biography

PhD, Instituto Politécnico Nacional,Mexico. Senior researcher,Escuela Nacional de Ciencias Biológicas. She has published more than 31 papers in reputed journals. Member, Institute of Food Technologists; Colegio Mexicano de Ingenieros Bioquímicos. Her present field of research is the study of biocompounds presents in agroindustrial byproducts.

EFFECT OF COCONUT HUSK FIBER POLYPHENOLIC EXTRACTS ON MICE LIPID PROFILE

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Dyslipidemia is characterized by an increase in lipids, which is a risk factor to obesity development related to cardiovascular diseases. To treat these disorders some biocompounds present in foods could be used as the coconut and its residues (husk fiber). Thus, the aim of this study was to evaluate the effect of coconut husk fiber in the mice lipid profile. Male mice were treated orally with a hypercholesterolemic-high fructose diet (HHF- 60% fructose). Mice were feed with polyphenolic extracts of fresh, conventional dried and microwave dried fiber husk at the same time at different doses (1, 10,100 y 1000mg/kg). After six days of treatment the blood samples were taken from the retroorbital sinus and lipid profile was determined. Hypercholesterolemic diet increased lipid profile COL-T (from 2.86 to 5.56 mmol/L), C-LDL (from 1.66 to 4.52 mmol/L) and glucose (from 59 to 130.66 mg/dL). Microwave coconut fiber husk extract presented the best and significant effect lowering lipids and cholesterol at two different doses (1 and 10 mg / Kg). Total cholesterol was reduced from 5.56 to 4.8 mmol /L), LDL-C (from 4.52 to 3.77 mmol / L) and Glucose (from 130.66 to 56 mg/dL). The results can attribute not only to the inhibition of cholesterol intestinal absorption or the inhibition of pancreatic lipase but also in the prevention of LDL oxidation in which polyphenols acts as antioxidants. We can conclude that coconut husk fiber extracts have a positive effect on lipid profile and it can be considered to develop functional foods.

Bibliography

1. Argüeso Armesto R, et al. *Galicia Clinic;* 72 (Supl. 1): S19-S22, 2011.
2. Chang C. L., Wub R. T. *Food Chem* 126 710–717, 2011.
3. Durackova Z., *Physiol Res*; 59: 459–469, 2010.
4. Mahbubeh S., et al. *J. Med Plants Res,* 5(9): 1518-1525, 2011.
5. Manisha D., Shyamapada M., n *Asian Pac J Trop Med*, 241-247, 2011.

Biography

PhD, Instituto Politécnico Nacional,Mexico. Senior researcher,Escuela Nacional de Ciencias Biológicas. She has published more than 31 papers in reputed journals. Member, Institute of Food Technologists; Colegio Mexicano de Ingenieros Bioquímicos. Her present field of research is the study of biocompounds presents in agroindustrial byproducts.

EFFECT IN LIPID PROFILE IN HYPERCHOLESTEROLEMIC MOUSE MODEL OF XOCONOSTLE´S PERICARP AND ENDOCARP

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Dyslipidemia and cardiovascular diseases are caused by several factors such as obesity, hypercaloric diet, smoking and some others; the use of functional foods rich in polyphenols is an alternative for the treatment of such conditions. Therefore, the objective of this study was to evaluate the effect of xoconostle´s endocarp and pericarp on the lipid profile in male mice feed with a hypercholesterolemic-high fructose diet (HHF 60% fructose). Mice were separated into six groups: a) standard comercial diet, b) hypercholesterolemic diet, c) hypercholesterolemic-xoconostle pericarp diet, d) hypercholesterolemic-xoconostle endocarp. After six days of treatment, the blood samples were taken from the retro-orbital sinus and lipid profile was determined. Groups treated with xoconostle´s pericarp and endocarp showed decrease in triglycerides (15 - 25%), total cholesterol (37 - 54%), LDLcholesterol (46 - 35%) and Atherogenic index (50%) and an increase in HDL-cholesterol (33 - 49%). The results obtained for xoconostle´s endocarp and pericarp could attributed to both: a) dietary fiber content (soluble and insoluble), and b) xoconostle´s polyphenolic compounds due to their ability to decrease cholesterol intestinal absorption by reducing its solubility in the micelles. The decrease in atherogenic index could be attributed to betalains a water-soluble pigments present in pericarp and endocarp of xoconostle. We can conclude that xoconostle endocarp and pericap have a hypolypemiant effect, benefiting HDL concentration and having satisfactory anti-atherogenic effect.

Bibliography

1. Fernández C. *Nutr. Clín. Diet. Hosp*. 30/2, 4-12, 2010.
2. Morales G. 2010. *Obesidad. Un enfoque multidisciplinario.* Univ. Autón. Estado de Hidalgo, México. 267-274 y 293-303, 2010.
3. Al-Dosari, M.S., *African J Pharmac Pharmaco*l 5, 1475-1483, 2011.
4. Morales P, et al *Food Res Int* 46(1):279–285, 2011 rev.: 13.52.02 24.07.2015
5. Osorio-Esquivel, O., et al. *Plant Foods Hum Nutr* 67(4), 365-370, 2012.

Biography

PhD, Instituto Politécnico Nacional,Mexico. Senior researcher,Escuela Nacional de Ciencias Biológicas. She has published more than 31 papers in reputed journals. Member, Institute of Food Technologists; Colegio Mexicano de Ingenieros Bioquímicos. Her present field of research is the study of biocompounds presents in agroindustrial byproducts.

PROTECTIVE EFFECT OF PHENOLIC-RICH EXTRACTS FROM EPICARP OF XOCONOSTLE (OPUNTIA JOCONOSTLE) FRUIT AGAINST CARBON TETRACHLORIDE-INDUCED OXIDATIVE STRESS IN MICE

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Xoconostle (Opuntia joconostle) is a rich source of biocompounds such as polyphenols. The xoconostle has been used in folk medicine as a treatment of diabetes, hypertension, obesity and respiratory ailments. Thus the aim of this study was to evaluate the protectiveeffect of methonolic extracts from endocarp of xoconostle (MEE) against CCl4-inducedoxidative stress in a mouse model. The animals were treated orally withpolyphenols rich extract at 50, 100 and 200 mg/kg BW for 30 consecutive days. On day30th the mice received carbon tetrachloride as hepatoxic agent. Biochemical evaluationswere carried out 24 h after induction of the oxidative stress. Histology examinationrevealed that group treated with MEE had much less severe hepatocellular necrosiscompared with the group that did not receive any treatment. These results are due toendocarp of xoconostle is rich in betalains which are recognized as potent antioxidants therefore the good response might be a counteraction of polyphenols and pigments. We can conclude that epicarp methanolic extracts of xoconostle had protective effect reducing the damage induced by CCl4 in mice.

Bibliography

1. Osorio-Esquivel O,et al. *Food Res Int* 44(7):2160–2168, 2011.
2. Argüelles N, et al. *Bioorg Med Chem* 18 (12):4238–4248, 2010.
3. Morales P, et al. *Food Res Int* 46(1):279–285,2012.
4. Terpinc P, et al. *Food Chem* 131(2):580–589, 2012.
5. Yadav M, et al. *Appl Biochem Biotechnol* 160(8):2388–2400, 2010.

Biography

PhD, Instituto Politécnico Nacional,Mexico. Senior researcher,Escuela Nacional de Ciencias Biológicas. She has published more than 31 papers in reputed journals. Member, Institute of Food Technologists; Colegio Mexicano de Ingenieros Bioquímicos. Her present field of research is the study of biocompounds presents in agroindustrial byproducts.

STROKE TEAM: MULTI-PROFESSIONAL INTEGRATION AND CARE REDUCING MORTALITY AND IMPROVING ACUTE STROKE CARE

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Integration of medical, paramedical and rehabilitation professionals in acute stroke is the mainstream of a Stroke Unit. It is an effective evidence-based intervention to decrease disability and mortality. Since 2011, professionals from Santa Paula Hospital have started collecting data, as a part off an internal quality patient-centered program, whose one of focuses is acute stroke care. Since 2013, Stroke Unit has started its actives, receiving the Joint Commission International Stroke Accreditation in 2014. Results showed were produced without substantial increasing of our physical and human resources structure. Santa Paula Hospital Stroke Program was based on internal reorganizational of hospital procedures, close follow-up of the selected patients, multi-professional weekly ward rounds and continuing education. The length of hospital stays decreased in 19.81 %, from a mean of 10,80 days to 8,66 days. The global time for the first health professional contact decreased 35,34 %, from 5,97 minutes to 3,86 minutes. The global time for initiating intravenous thrombolysis is decreased in 30,36 %, from 96,40 minutes to 67,13 minutes. Those improvements are able to reduce disability, mortality and global costs related to stroke care. As an exemple of that, mortality data shown a decreasing of mortality rate, expressed on deaths by 1000 cases, from 16,07 to 4,06 in just two years of the program. This experience reveled that sharing knowledge and experiences between different health professionals has positive and low cost impact over acute stroke out-come.

Bibliography

M.R. Kesinger et al. *Stroke* 2014.
Cochrane Stroke Group. *CoChrane Library* 2001.
A. Evans et al. *The Lancet* 2001

Biography

Clinical Neurologist, Clinical Hospital, School of Medicine, University of São Paulo. Movement Disorders Specialist. He is developing his doctoral program on Cerebral Thrombosis and Chronic Pain Management.

ANTIOXIDANT ACTIVITY OF GALLINA WORTH

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Introducción.
Actualmente, en México, la importancia de las plantas medicinales no sólo radica en su riqueza como parte de la cultura, sino también en el conocimiento científico que se genera a partir de su estudio y análisis. Los usos medicinales que se le atribuyen a la hierba de la gallina, hacen referencia a desórdenes del aparato digestivo, para dolor e inflamación de estómago y riñones, estos dos últimos procesos están relacionadas con el estrés oxidativo, razón por la cual, el presente trabajo tiene como objetivo determinar la actividad antioxidante de los extractos de esta

Objetivo.
Determinar el efecto antioxidante de Helianthemum glomeratum
Material y métodos. La planta fue adquirida en el mercado de Sonora de la Ciudad de México, para obtener los extractos de la planta se sometió a reflujo con diferentes solventes (agua, metanol, etanol acetato de etilo) durante 6 h, posteriormente se concentraron a presión reducida en un rotoevaporador, luego se liofilizaron para obtener polvos solubles. Se realizó el tamizaje fotoquímico para obtener la composición de los extractos previamente obtenidos, se midió la capacidad antioxidante con la técnica del ABTS.

Resultados.
El tamizaje fitoquímico mostro la presencia de metabolitos secundarios de gran importancia como son: alcaloides, flavonoides y cumarinas; de los cuatro extractos obtenidos el metanólico fue el que mayor actividad antioxidante presento con un 95.24% respecto a la vitamina C.

Conclusiones.
El extracto metanólico de hierba de la gallina presento una actividad antioxidante muy similar en comparación con la vitamina C.

ANTIOXIDANT ACTIVITY OF BERRY WORTH

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Introducción.
La hierba mora se usa en medicina tradicional para tratar padecimientos dermatológicos como psoriasis, tiña, sarna, hasta los gástricos, como bilis, cirrosis, estreñimientos, se ha documentado su uso como antiinflamatorio y anticancerígeno, procesos donde interviene una sobreproducción de radiales libres de oxígeno, razón por la cual el presente trabajo tiene como objetivo determinar la actividad antioxidante de los extractos de la hierba mora.

Planteamiento del problema.
Actualmente la gente está considerando el uso de las plantas medicinales para tratar sus padecimientos, muchas veces el fundamento mediante el cual actúan las plantas se desconoce, razón por la cual esta tipo de investigaciones tiene como finalidad tratar de describir cómo funcionan estas plantas.

Objetivo.
Determinar el efecto antioxidante de Solanum nigra.
Material y métodos. La planta fue adquirida en el mercado de Sonora de la Ciudad de México, para obtener los extractos de la planta esta se sometió a reflujo con diferentes solventes (Agua, metanol, etanol y acetato de etilo) durante 6 h, posteriormente se concentraron a presión reducida en un rotavapor, luego se liofilizaron para obtener polvos solubles. Se realizó el tamizaje fitoquímico para obtener la composición de los extractos previamente obtenidos, se midió capacidad antioxidante con la técnica del ABTS.

Resultados.
El tamizaje fitoquímico mostro la presencia de metabolitos secundarios de gran importancia como son: alcaloides, taninos, flavonoides y quinonas; de los cuatro extractos obtenidos el metanólico fue el que mayor actividad antioxidante presento con un 91.19% respecto a la vitamina C.

Conclusiones.
El extracto metanolico de hierba mora presento una actividad antioxidante muy similar en comparación con la vitamina C. Bibliografia. Gonzalez E. M. 2004,IPN,

TRUPILLO (PROSOPIS JULIFLORA): ITS ROLE IN THE MEDICINAL AND NUTRITIONAL ASPECTS OF THE WAYUU ETHNICITY, LA GUAJIRA, COLOMBIA

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The xerophytic forest of the department of La Guajira plays an important role in diet and traditional medicine of the indigenous Wayuu, being the trupillo or Ai'pia (*Prosopis juliflora*) one of the trees that most contributes to its sustenance and has been used medicinally. The aim of this research was to identify the medicinal and nutritional uses of trupillo by the ethnic Wayuu ethnic group, in the department of La Guajira (Colombia). Interviews were made to shamans, female herbalists and indigenous communities in the Upper and Middle Guajira investigating the use of trupillo or Ai'pia. The results show that the tree is associated with the cure of 16 diseases, using 8 parts of this plant and 9 forms of preparation. Regarding its role in the Wayuu power, these primarily use its ripe fruit to make "arepas" (pone), "chichas" (fermented beverage) and juices. The physicochemical and nutritional analysis of the plant revealed a high protein, minerals and vitamins, but especially excels its high fiber value.

Bibliography

Lacera A, 2006. *Extracción de miel a partir de mucílago del fruto seco del trupillo (Prosopis juliflora)* p. 1-39.
Rosado JR, *Farmacopea Guajira*. 2nd ed. Ediciones Universidad de La Guajira, Ed. Gente Nueva, Bogotá, Colombia. 460 p.
Rosado JR, Moreno MI. *Rev CENIC Ciencias Biol,* 41: 1-10, 2010.
Rosado. JR, 2013. Perspectiva agroindustrial en el departamento de La Guajira. Ediciones Universidad de La Guajira. Ed. Tonos del Caribe.

Biography

Malka Moreno Fernández has completed his studies at the University of La Guajira of Industrial Engineer and is pursuing a Master degree in Food Science and Technology at the University of Zulia (Venezuela). Researcher professor and member of the Research group Pichihuel at the University of La Guajira (Colombia). She has published papers in reputed journals, 2 books of research results. His present field of research is traditional medicine and productive biology (hydroponics, production of biofertilizers and agroindustry).

CONTRIBUTIONS TO THE FLORA OF THE DEPARTMENT OF LA GUAJIRA IN THE CONTROL OF MOSQUITO LARVAE OF THE SPECIES AEDES AND CULEX

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Traditionally chemical controls are used to counter the presence of mosquitoes that transmit diseases such as malaria, dengue and Chikungunya that constantly affect the guajira population. The department of La Guajira (Colombia) has three areas with different environmental conditions, characterized by having a large floral biodiversity, traditionally used as food and medicine, and they can be used to control mosquito larvae. The aim of the research was to identify the floristic species have been reported worldwide as effective agents in controlling the larvae of the species of Aedes and Culex mosquitoes. A literature review on the plant species have been reported worldwide in the control of these larvae and contrasted with botanical inventories conducted in the department of La Guajira. The results indicate that there are 45 botanical species whose organic compounds are effective agents in controlling the larvae of the Aedes and Culex mosquitoes in that department, reporting 29 species for control of Aedes and 26 for Culex, overhanging the effectiveness of agents assets: Tabernaemontana cymosa, Azadirachta indica, Argemone mexicana, Catharanthus roseus, Piper adumcum, Calotropis procera and Melia azedarach. Concluding that in the department of La Guajira there is great potential phytochemical can be used in the control of Aedes and Culex larvae.

Bibliography

Azhari H. Nour,et al. *Sci Res Essays*, 7 (31): 2810-2815, 2012.
Díaz F, et al. *Rev Cub Plantas Med,* 17 (3): 256-267, 2012.
Rosado JR, *Plantas Guajiras. Bosque Seco.* Imp. Ediciones Universidad de La Guajira. Ed. Gente Nueva, 2015.
Shahi M, et al. *J Vector Borne Dis.,* 47 (3): 185-188, 2010.
Warikoo R. & Kumar S. *J Enthomol Zool Studies* 2 (4): 11-17, 2014.

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Jairo Rosado Vega has completed his studies at the University of Antioquia of Biologist and graduate studies at the Autonomous University of Mexico. He is a researcher professor and director of the research group Pichihuel at the University of La Guajira (Colombia). He has published papers in reputed journals, 7 books of research results. His present field of research is traditional medicine and productive biology.

CHARACTERIZATION OF CHEMICAL CONSTITUENTS FROM FOOD DERIVATES IN CALABRIAN LICORICE "GLYCYRRHIZA GLABRA" USING UHPLC-HRMS AND TANDEM MASS SPECTROMETRY (MSN)

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Glycyrrhiza glabra, commonly known as licorice, is a popular herbal supplement used from ancient Assyrian, Egyptian, Chinese and Indian cultures for its extensive medicinal properties such as demulcent, expectorant and in ulcer healing (Armanini et al., 2002). Pharmacological effects of licorice including inhibition of gastric acid secretion, anti-inflammatory, antiviral and anti-atherogenic properties have been well verified for the treatment of chronic inflammatory conditions and possesses anticancer and antiviral activities. These biological effects are attributed to a variety of biologically active constituents: terpenoids, alkaloids, polysaccharides, polyamines, saponins and flavonoids (Fenwick et al., 1990; Simons et al., 2009; Zhang and Ye, 2009). Unfortunately among all these bioactive compound the presence of great ammount of glicirizic acid is consider responsible of much of some side effect, it may interfere with the balance of mineral salts, causing the increase blood pressure (Heikens et al., 1995). The Calabrian licorice well know as *"cordara"* has lower side effects if compare to the same species cultivate in other part of world for the lowest content of glycyrrhizic acid. For these reason, is very important develop a power analytical tool for the identification and classification of geographical origin of Calabrian licorice. In the present study, in order to identify geographical markers to trace the origins and history of the product an analytical method for qualitative evaluation of the secondary metabolites present in Calabrian licorice has been developed using UHPLC HRMS.

HISTOLOGICAL AND MOLECULAR PHOTOPROTECTION OF BUDDLEJA CORDATA EXTRACT AND VERBASCOSIDE IN SKH-1 MICE ACUTE AND CHRONIC EXPOSURE TO UVR-B RADIATION.

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In recent years there has been increased the interest in the use of botanical agents to prevent skin damage resulting from solar UV-radiation (UVR). The UVR is involved in sunburn and development of skin cancer, which is the malignancy of highest incidence in the world. This work investigated the photoprotective effect of verbascoside and methanolic extract of B. cordata (MEBC) in SKH-1 mice exposed to acute and chronic UVR-B. In acute experiment, 100% of irradiated mice protected with MEBC or verbascoside showed absence of signs of sunburn and histological inflammatory process. In the chronic experiment, unprotected mice irradiated with UVR-B showed skin carcinomas. In contrast, the mice treated topically with MEBC or verbascoside the presence of lesion decreased at more than 60%. The differential protein expression showed that the banding pattern was similar in the group without exposure to UVR-B and treated MEBC or verbascósido. Unlike unprotected irradiated groups, which lost the original banding pattern. The analyses of histological and molecular results allow us to infer that topical application of MEBC or verbascoside on SKH-1mice skin irradiated with UVR-B is effective sunscreen.

Bibliography

Afaq F. 2011. *Arch Biochem Biophys* 508(2):144-51, 2011.
Alipieva K, et al. *Biotechnol Adv* 32(6):1065-76, 2014.
Avila AJG,et al. *BMC Complement Altern Med* 14:281, 2014.

Biography

PhD Student and professor at the Laboratory of Phytochemistry of UBIPRO, FES Iztacala, UNAM. Her present research interest is on the evaluation of photoprotective activity of natural extracts and compounds of plant origin.

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Xavier VF..... PS061
Xu B..... PL04

Y

Yepez O..... SL22

Z

Zarrouk M..... PS098,PS099