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LECTURES (L)
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LECTURES (L)

L-01: ELUCIDATING POLYPHARMACOLOGICAL MECHANISMS OF CANCER CHEMOPREVENTION BY MANGIFERIN AND WITHAFERIN A BY TRANSCRIPTOME AND (CHEMO) PROTEOME BASED PATHWAY AND DRUG TARGET ENRICHMENT ANALYSIS

Hernández-Balmaseda I[1], Szarc vel Szic K[2], Chirumamilla CS[2], Palagani A[2], Hassania B[3,4], Declerck K[2], Dom M[2], Naulaerts S[5], Op de Beeck K[6], Kaileh M[4,7], Haegeman G[4], Van Camp G[6], Laukens K[5], Heyninck K[4], Van Ostade X[2], Vanden Berghe T[3], Vandenabeele P[3], Rodeiro-Guerra I[1], Delgado-Hernández R[8], **Vanden Berghe W[2,4]**.

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Drugs designed to act against individual molecular targets usually cannot combat multigenic diseases such as cancer, or diseases that affect multiple tissues or cell types such as diabetes and immunoinflammatory disorders. Combination drugs that affect multiple targets simultaneously are better at controlling complex disease systems, are less prone to drug resistance and are the standard of care in many important therapeutic areas. The identification of biologically active and potentially therapeutically useful pharmacophores from natural products has been a long-term focus in the pharmaceutical industry. The steroidal withanolide withaferin A (*Withania somnifera*) and the xanthone polyphenol mangiferin (*Mangifera indica*) hold much promise as potential novel cancer chemopreventive or therapeutic compounds. However, it is a great challenge to elucidate their polypharmacological anti-cancer mechanisms. To address this challenge, we apply bioinformatics methods to identify multiple targets of chemical agents through analysis of the gene expression profiles following *in vitro*/*in vivo* treatment. By using transcriptome based pathway and drug target enrichment analysis and pharmapper in silico modeling studies, it is possible to identify activated or repressed pathways and to predict possible molecular targets. Direct phytochemical-protein interactions can be verified by (chemo)proteomic approaches. The results show that the medicinal effects of withaferin A and mangiferin extend far beyond well-known antioxidant activities of natural products. This method is also applicable to dissect the polypharmacology of other natural products or crude plant extracts.

Citation Format:
Hernández-Balmaseda I, Szarc vel Szic K, Chirumamilla CS, Palagani A, Hassania B, Declerck K, Dom M, Naulaerts S, Op de Beeck K, Kaileh M, Haegeman G, Van Camp G, Laukens K, Heyninck K, Van Ostade X, Vanden Berghe T, Vandenabeele P, Rodeiro-Guerra I, Delgado-Hernández R, Vanden Berghe W (2015) Elucidating polypharmacological mechanisms of cancer chemoprevention by mangiferin and withaferin a by transcriptome and (chemo) proteome based pathway and drug target enrichment analysis. Hepatotoxicity and oxidative stress biomarker study of peg-coated and non-coated gold nanoparticles in Sprague-Dawley rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S1 . Abstract nr L-01.

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L-02: **PREDICTIVE STRATEGY TO SCREENING NATURAL CANDIDATES FOR TYPE 2 DIABETES BASED ON PTP-1B AND DPP-IV INHIBITORY ACTIVITY AND *in vitro* GLUCOSE UPTAKE**

Marrero E[1], Sánchez J[1], Young L[2], Harvey A[2].

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[2]Strathclyde Institute for Biomedical Sciences/Strahclyde University, Scotland, United Kingdom.

Introduction: The present study is aimed to determine the underlying mechanism of the antidiabetic potentiality of seven Cuban plants based on relevant therapeutic target of type 2 diabetes: *Allophylus cominia* (L.) Sw., *Ocimum tenuiflorum*, *Persea americana*, *Sechium edule*, *Momordica charantia* and *Jatropha aethiopica*. **Methods:** Leaves aqueous extracts and its fractions were evaluated on protein tyrosine phosphatase 1B (PTP1B) and dipeptidyl peptidase-IV (DPPIV) enzymatic activities and the glucose uptake to identify candidates as phytopharmaceuticals in treating diabetes. In PTP1B assay (DiFMUP) was used as substrate and (TFMS) as standard inhibitor; in DPPIV assay (Gly-pro-AMC) was used as substrate and as standard inhibitor (P32/98); in both assays, the enzymatic activity inhibition was calculated by fluorescence using excitation wavelength of 360 nm and emission wavelength of 460 nm. Glucose uptake studies were performed on fully differentiated 3T3-L1 adipocyte using 2-deoxy-D-[3H] glucose and insulin as positive control, radioactivity into the cells was measured with a microplate scintillation counter. **Results:** The extracts from *A. cominia*, *O. tenuiflorum* and *P. americana* inhibited the enzymatic activity of PTP1B in a concentration dependent manner, resulting more actives the polar fractions from *A. cominia* and P americana. All the extracts and fractions showed inhibition of enzymatic activity of DPPIV, at higher concentrations. *A. cominia* inhibited enzymatic activity of this protease in an extract concentration dependent manner. *A. cominia*, *O. tenuiflorum* and *P. americana* extracts exhibited enhance of glucose uptake in 3T3-L1 adipocytes. **Conclusions:** The aqueous extracts from *A. cominia*, *P. americana* and *O. tenuiflorum* and some of its fractions could be promising antidiabetic candidates. Further *A. cominia* studies based on bio-guided estructure-activity assays of the aqueous extracts and fractions revealed quercitrin and mearnsetrin flavonoids as the key components in that activity.

Citation Format:
Marrero E, Sánchez J, Young L, Harvey A (2015) Predictive strategy to screening natural candidates for type 2 diabetes based on PTP-1b and DPP-iv inhibitory activity and *in vitro* glucose uptake. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S2. Abstract nr L-02.

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L-03: **NATURAL PRODUCTS: A KEY-POINT FOR THE CUBAN PROGRAM OF TRADITIONAL AND NATURAL MEDICINE**

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In 1991 Commander in Chief Fidel Castro indicated to create the Program of Medicinal Plants in order to promote its rational and scientific usage, as a part of the development foreseen for the Cuban Pharmaceutical Industry. During the first half of the nineties' medicinal plants were combined with other Traditional Medical Systems as a way to assure medical coverage in a time marked by the most difficult economic crisis suffered by the country after the Revolution. Undoubtedly, this was the source of the Program of Traditional and Natural Medicine (TNM) developed by the Ministry of Public Health since 1997. For the past twenty-four years Natural Products (NP) have been a key-point for this Program and after the Sixth Congress of the Cuban Communist Party, a Political Guideline was established to "*pay maximum attention to the development of TNM*". Within this new momentum NP emerge again as an important topic. Considerations about NP are summarized in this lecture, in order to up-date the projections marked by the Ministry of Public Health and the rest of the members of the National Commission for TNM.

Citation Format:
Perdomo-Delgado J (2015) Natural products: a key-point for the Cuban program of traditional and natural medicine. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S3. Abstract nr L-03.

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L-04: **NATURAL AND TRADITIONAL MEDICINE: MAGICAL REALISM?**

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Magical realism as art of the twentieth century and its comparison with the Natural and Traditional Medicine is conceptualized. From the definitions of Natural Medicine, World Health Organization and other international organizations, the presence of the practice and development of the medicine in the world is identified. Mainstream criticisms that were made from the Western allopathic medicine are established. Finally, it refers to the need for an approach to this phenomenon from the public health and some propositions are made.

Citation Format:
Pérez-Peña J (2015) Natural and traditional medicine: magical realism? [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S4. Abstract nr L-04.

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L-05: **CLINICAL TRIALS WITH NATURAL PRODUCTS IN CUBA. RESULTS AND PROJECTIONS**

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The current interest in natural products is marked. The increased use of them and the almost exponential increase in the market proves it. To this end, it has the "support" of ethnomedical use, the increase in pre-clinical studies, and the effort for quality in the pharmaceutical chemical area, but not to ignore, that to make only these types of studies is not sufficient for use as a medicament in humans. They must first be evaluated through clinical trial to demonstrate efficacy and safety, and later be registered and market them. An example of this. It is presented with the medicinal plants or phytomedicine. The world has changed since the first clinical trial with plants was published in 1971, to the present. Few publications were made in the world until 1999, 125 publications, and 4 per year. Better was between 2000 to 2013, 817 publications, 60.5 clinical trials published per year, however systematic reviews do not show the best results, but the marketing of this type of product is growing. In Cuba since 1992 (first authorization of a clinical trial for a natural product) to date have authorized the execution of 51 clinical trial, 38 conducted by the National Coordinating Center for Clinical Trials, 74. 5% and 13 by other centers promoters, 24.5%. The 51 clinical trials have been of 25 products in 23 medical indications, (10 dermatological indications 7 respiratory distress trials in child and adult among others). These trials have been promoted by 16 centers, all Cubans. Of the 25 products, 10 are of vegetable origin, animal 7 and 8 mineral. More trials are phase II, 24, and 21 of phase III and three in phase I and three phase IV. Of them they have registered 10 products in 10 indications, as hypocholesterolemia, migraine, adult and child Distress, bone implant, among others.However, despite the quality of these clinical trial approved by the regulatory agency, and its marketing, Cuba does not escape the current situation facing the natural products in the world, distrust in it use, by a large group of prescribers, because scientific evidence is weak and there aren't consistency in the results of clinical trials. In front of this situation, in March of this year was created, a multidisciplinary working group that develop a "Strategy to minimize inconsistency in the results created phyto clinical trials", which should bear fruit in the 4th quarter of 2015.

Citation Format:
Hernández A (2015) Clinical trials with natural products in Cuba. Results and projections. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S5. Abstract nr L-05.

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L-06: **DEVELOPMENT OF NATURAL PRODUCT DRUGS IN A SUSTAINABLE MANNER, AN EXPERIENCE OF CENTER FOR PHARMACEUTICAL RESEARCH AND DRUG DEVELOPMENT**

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Around half of the drugs currently in clinical use are of natural product origin; this is the most consistently successful source of drug leads. Despite this statistic, pharmaceutical companies have embraced the era of combinatorial chemistry, neglecting the development of natural products as potential drug candidates in favor of high-throughput synthesis of large compound libraries. Perhaps it is time to reassess this prevailing dogma for chasing quantity over quality. Natural products continue to provide greater structural diversity than standard combinatorial chemistry and so they offer major opportunities for finding novel low molecular weight lead structures that are active against a wide range of assay targets. As less than 10% of the world's biodiversity has been tested for biological activity, many more useful natural lead compounds are awaiting discovery. The challenge, is how to bridging the gap between traditional medicine and modern medicine. Our answer is applying the same scientific strictness to the development of natural products than for the synthetics, getting closer to the standardization of phytomedicine, using methods to verify the authenticity of the vegetal material and considering safety issues, as being free from harmful materials like toxic insecticides, pesticides and heavy metals, microbial and radioactive contamination. The extracts should be then checked for cytotoxic, mutagenic and therapeutic perspective in experimental animal models. During the last four decades, the CIDEM has been strengthened its capabilities to develop organic farming on sustainable manner; in the taxonomic, chemical, and biological evaluation of new drugs and on application of advanced technology in formulations design; leading development projects for the national industry and with the scale up of more than 45 natural products.

Citation Format:
González N (2015) Development of natural product drugs in a sustainable manner, an experience of Center for Pharmaceutical Research and Drug Development. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S6. Abstract nr L-06.

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L-07: **OXIDATIVE STRESS REGULATION BY NATURAL ANTIOXIDANT COMPOUNDS: FROM EXPERIMENTAL DATA TO CLINICAL PRACTICE**

Delgado-Roche L[1], Venturi I[2], Menéndez R[1], Malheiros A[2], de Souza MM[2], Filho VC[2], Fernández MD[1], Rodeiro I[1].

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Oxidative stress (OS) is an imbalance between the production of oxidants and the occurrence of cell antioxidant defenses, which disrupts redox signaling. This inevitable process has been implicated in the pathogenesis of a large number of human diseases. Several evidences show that naturally occurring compounds can protect cells from OS, ameliorating various related diseases, such as cardiovascular diseases, cancer, neurodegeneration, diabetes, inflammatory conditions and autoimmune disorders. The protective effect of natural antioxidants, alone or in combination, against lipid, protein and DNA oxidation has been extensively studied in humans and animal models. However, the clear understanding of precise mechanisms of actions of these compounds would shed further light into their application in the prevention and treatment of OS related diseases. The present work summarizes the state of the art in this field. Furthermore, we show the characterization of the *in vitro* and *in vivo* antioxidant activity of *Solanum diploconos* (SD) flowers. Our results demonstrated the scavenging capacity of SD against the formation of DPPH and superoxide anion radicals, as well as the inhibitory effect against the brain phospholipid peroxidation. In addition, the oral supplementation with SD extract (10, 100 and 200 mg/kg during a week) prevented the benzo(a)pyrene-induced oxidative stress in mice, protecting against liver damage. The *in vivo* antioxidant capacity of SD was also addressed in a mice model of cotton pellets-induced granuloma. The results showed a significant reduction ($p<0.05$) of granulomas weight, suggesting the anti-inflammatory effect of SD. Besides, SD protected against lipid and protein oxidation, together with a preservation of systemic glutathione levels. On the other hand, we discuss the results of some clinical trials aimed to evaluate the efficacy of natural products in the primary and secondary prevention of non-communicable chronic diseases.

Citation Format:
Delgado-Roche L, Venturi I, Menéndez R, Malheiros A, de Souza MM, Filho VC, Fernández MD, Rodeiro I (2015) Oxidative stress regulation by natural antioxidant compounds: from experimental data to clinical practice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S7. Abstract nr L-07.

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L-08: *Moringa oleifera*: CHARACTERISTICS AND PHARMACEUTICAL PROPERTIES. DEVELOPMENT OF A TECHNOLOGY FOR OBTAINING HYDRO-ALCOHOLIC EXTRACTS. RESULTS OBTAINING AT FINLAY INSTITUTE

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This roundtable will focus on *Moringa oleifera* Lam as a highly valued plant and its high nutritional value. M. oleifera is very important for its medicinal use, various parts of this plant act as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, antiinflammatory, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, antidiabetic, hepatoprotective, antibacterial and antifungal activities. The roundtable participants offered information on Moringa oleifera research about: Composition and nutritional value, Phytochemistry, Antibiotic Activity, Pharmacological properties, Investigations at Finlay Institute, Clinical trial: Effect of Moringa oleifera on glycemic control in diabetes mellitus patients II. As part of the development of nutraceutical products derived from *M. oleifera* leaves, the group developed a characterization of photochemical composition of *M. oleifera*, to examine a range of compounds from leaves and it´s therapeutic use. The effectiveness on hypoglycemic action of *M. oleifera* leaves preparations (tea and powder) was tested on patients with diabetes type II in clinical assays developed in collaboration with National Institute of Endocrinology. We summarize the discussions considering the characterization carried out to determine the composition and nutritional content of *M. oleifera* leaves powder in order to demonstrate the potentialities as nutraceutical product, the roundtable also discuss the standardization of *M. oleifera* leaves extract and capsules developed in collaboration with the Research Center of Ginseng and Medicinal Materials, Viet Nam. The supply chain of products derived from *M. oleifera* for human use was designed with assistance of LOGESPRO (Industrial Engineering Faculty, CUJAE), conceived since the suppliers to clients by ensuring a mutual cooperation among its members and guarantying a Good Manufacturing Practice for Herbal products as organic productions. Different experiments were carried out on intensive culture, harvesting and transportation, growing and processing, packaging and store proceedings and quality control from *M. oleifera* leaves products. The purpose of these investigations is to promote the cultivation and use of *Moringa* spp. providing the best available evidence on *Moringa* with rigorous scientific evaluation, and suggesting directions for future clinical research that could be carried out by local investigators in Cuba and others developing regions.

Citation Format:
Campa C, Callicó A, Arocha A, Echemendía O (2015) *Moringa oleifera*: characteristics and pharmaceutical properties. Development of a technology for obtaining hydro-alcoholic extracts. Results obtaining at Finlay institute. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S8. Abstract nr L-08.

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L-09: **ROLE OF METABOLIZING SYSTEMS AND TRANSPORTERS IN HERB-DRUG INTERACTIONS, ITS IMPACT IN THE HUMAN HEALTH**

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Herbal medicines have been widely used worldwide for centuries. A major cause of current concern is that herbal remedies may interact with medicinal drugs, altering the pharmacodynamic or pharmacokinetic characteristics of the latter and leading to clinically significant interactions. Herbs are taken not only by health persons who want to protect themselves from the onset of disease or to improve their well-being, but also by patients suffering from life-threatening conditions who simultaneously receive one or more medicinal drugs. Between others, these patients are subjected to suffering the effects derived from the co-administration of the herb and conventional drug, thus at the last years it is a point of discussion. Pharmacological interactions possibly derive from the modulation in expression and/or activity of two major pharmacokinetic disposition systems, namely cytochrome P450 (CYP) and the multidrug transporters where P-glycoprotein is identified as the major. Mixtures and compounds isolated from its have been identified as substrates, inhibitors or inducer of different cytochromes and/or transporters in humans. This works offers an overview of the knowledge about evidences on the in vitro and in vivo effects of natural products on human P450 enzymes and human variability in the modulatory response. Interactions of ginkgo, saw palmetto, hypericum, kava kava, ginseng, between other are revised. Effects observed on P450 system and P-glycoprotein after evaluation of natural products used during several years in the traditional medicine in Cuba is presented. The elucidation of these interactions may be important not only to predict possible undesirable effects deriving from the concomitant intake of herbals and conventional drugs, of these interactions as a way to increase the bioavailability of drugs that are P-gp substrates, as example. Thus, a better understanding of interactions of herbs with these systems will help the regulation of the use of herbs as drugs and food supplements.

Citation Format:
Rodeiro I (2015) Role of metabolizing systems and transporters in herb-drug interactions, its impact in the human health. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S9. Abstract nr L-09.

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L-10: **PHYTODRUGS CAN INCREASE THE EFFICACY OF CANCER CLASSIC THERAPIES**

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Introduction: Cancer is a disease associated to chronic inflammation, which in turn is associated to oxidative stress. The cell regulates the redox unbalance by activating diverse cytokines (nuclear transcription factors, growth factors, inflammatory cytokines and cell cycle regulatory molecules). These processes are altered in tumour cells which favours their multiplication. The main problems of the anti-cancer chemotherapy are its lack of specificity and its serious adverse effects. The defence mechanisms of plants are similar to those of the animal cell. Therefore, phytodrugs capable of increasing the defences of the human organism should at least, diminish the adverse effects of classical anticancer therapy. Lung cancer drade 4 treated with classical chemotherapy has shown in Chile 15% tumour regression, maximum eight successive chemotherapies and only eight months of patient survival. **Methods:** The case of a patient diagnosed in June, 2013 who presented a primary lung tumour of 3.9 cm in diameter and a secondary pleural tumour of 1 cm is presented. From the date of diagnosis to date, the patient has received four chemotherapy that included cisplatin and pemetrexed and 27 with only pemetrexed. Since the beginning of the chemotherapy he has been also treated for all time with phytodrugs enriched in antioxidant, anti-inflammatory and immune system stimulators principles. **Results:** Cotherapy abolished gastrointestinal and hepatic adverse effects of conventional chemotherapy. Moreover, the last check made in July, 2015 showed the disappearance of pleural tumour and regression of the lung tumour of 50%.

Citation Format:
Letelier ME, Galindo H (2015) Phytodrugs can increase the efficacy of cancer classic therapies. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S10. Abstract nr L-10.

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ORAL COMMUNICATIONS (OC)

SYMPOSIA

SYMPOSIUM 1: PRECLINICAL RESEARCH OF HERBAL PRODUCTS

OC-01: **BIOACTIVE EXTRACTS OF CHILEAN NATIVE PLANT FOR THE TREATMENT OF ULCERS**

Rodríguez-Díaz M[1], Rodríguez S[2], Sabando C[2], Gutiérrez C[2], **Torres F[1],** Delgado JM[1].

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Citation Format:
Rodríguez-Díaz M, Rodríguez S, Sabando C, Gutiérrez C, Torres F, Delgado JM (2015) Bioactive extracts of Chilean native plant for the treatment of ulcers. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S11. Abstract nr OC-01.

Introduction: *Gunnera tinctoria* Mol., known as giant-rhubarb, Chilean rhubarb, nalca or pangue, is a continental specie distributed from Coquimbo to Magallanes, Chile. In our research, we develop biofilms starch/pectin functionalized with extracts from native Chilean plant. We carry out a phytochemical and pharmacological screening (*in vitro* antioxidant activity and *in vivo* anti-inflammatory and analgesic activities) from leaves extracts of *Gunnera tinctoria* Mol. **Material and Methods**: 100 g of the dried plant material was prepared by maceration for 48 h at room temperature with solvents of increasing polarity: hexane, dichloromethane, ethyl acetate, methanol, ethanol and water. Phenols quantification was carried out according to the Folin-Ciocalteu method. Topical anti-inflammatory activity was assessed in mice by TPA assay as inflammatory agent. To determinate the antinociceptive effect hot plate test was performed. Evaluation of antioxidant effect *in vitro* was performed using the FRAP and DPPH assays. Functionalized biofilms were standarized and tested pharmacologically. **Results:** Methanol extracts showed antioxidant activity (3.31 ± 0.083 $mMFe^{2+}/g$), although the activity exhibited by this sample is less than that presented by quercetin (7.71 ± 0.198 $mMFe^{2+}/g$ sample) used as reference compound. Both the anti-inflammatory analgesic effect as statistically significant effects, the ethyl acetate extract show the topical antiinflammatory activity higher (54.7%) versus methanol extract (45.0%). **Conclusions:** The methanol extracts obtained from leaves of *Gunnera tinctoria* Mol. showed antioxidant, analgesic and anti-inflammatory activity, allowing support the properties attributed by folk medicine for this species. We develop biofilms functionalized with extracts of nalca.

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OC-02: **VASODILATOR EFFECT OF ALCOHOLIC EXTRACT OF THE LEAVES AND STEMS OF *Oenothera rosea* AIT. "YAWAR SUQU" IN ISOLATED AORTIC RINGS OF GUINEA PIGS, AYACUCHO-2013**

Tinco J, Pariona F.

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Objectives: Evaluating the vasodilating effect of alcoholic extract of the leaves and stems of *Oenothera rosea* Ait. "yawar suqu" in isolated aortic rings of "guinea pigs". **Methods:** *Design*: Experimental. *Location*: Environments of Pharmaco-logy and Pharmacognosy, School of Vocational Training of Pharmacy and Biochemistry of the Faculty of Health Sciences of the National University of San Cristobal de Huamanga, Ayacucho, Peru. *Biological material:* Leaves and stems of *Oenothera rosea* Ait. "yawar suqu" and aortic rings Cavys "guinea pigs". *Interventions:* An extract of the leaves and stems of *O. rosea* was obtained. Macerated for 8 days in 70% ethanol, and subsequent concentration of the product. We worked with aortic rings of guinea pigs in camera isolated organs bathed with Krebs - Hensleit (KH) solution and vasomotor activity was recorded with an isometric tension transducer. Maximum basal contraction occurred with adrenaline (adrenergic α) $1 \times 10^{-3} M$ on which the vasodilator effect of three concentrations of the extract was determined: 5, 10 and 20%. Inhibiting vasoconstriction compared after incubation for 30 min extract 5, 10 and 20% and propranolol $1 \times 10^{-6} M$, β-blocker as the standard of comparison was used. *Main outcome measures:* Tension (g) and height (mm) of vasodilation and vaso-constriction. **Results:** In the phytochemical march moderate presence of flavonoids, phenols, tannins and mild form amino acids, quinones, saponins, triterpenoids or steroids were identified. A reduced pressure (maximum contraction) of 1.24 was observed to 1.38 g; 1.14; 1.28, concentrations of 5, 10 and 20%, respectively. In addition, reduced height (mm) of 6.85 to 6.15; 5.72, 6.37 mm for 5, 10 and 20% concentrations. **Conclusions:** The alcoholic extract of the leaves and stems of *O. rosea* produces vasodilation, whose greatest effect is observed at a concentration of 10%, and compared with standard propranolol similarity observed in the magnitude of vasodilation produced.

Citation Format:
Tinco J, Pariona F (2015) Vasodilator effect of alcoholic extract of the leaves and stems of *Oenothera rosea* Ait. "yawar suqu" in isolated aortic rings of guinea pigs, Ayacucho-2013. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S12. Abstract nr OC-02.

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OC-03: **ANTIINFLAMMATORY AND ANTINOCICEPTIVE EFFECTS OF *Cassia fistula* LINN. (*Fabaceae*) FRUITS**

Palacios-Espinosa JF, Núñez-Peña L, Izquierdo-Sánchez T, Lozada-García MC.

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Introduction: *Cassia fistula* L. is an ornamental Asian-native tropical tree. In Mexico it is also known as "Hoja sen" or golden rain and it is widely used for the treatment of gastrointestinal, inflammatory and painful conditions. **Objective:** To evaluate the antinociceptive and anti-inflammatory potential *in vivo* of three organic and one aqueous extracts (CFFH, CFFD, CFFM and CFFA, respectively) obtained from the fruit seedless of *C. fistula*. **Material and Methods:** The abdominal stretching induced with 0.7% acetic acid and TPA-induced ear edema in mice, were used. Similarly, the acute toxic effects were studied by Lorke´s Test. The extract with the best profile, a bioassay-guided phytochemical study was undergoes to isolate bioactive compounds. **Results:** In abdominal stretching model, at dose of 300 mg/kg, significant anti-nociceptive effects were observed in all extracts. CFFD was the best extract; it decreased 75.4% of stretching caused by acetic acid, immediately CFFH with 71.7%, CFFA 67.2% and CFFM with 54.4%. The reference drug group of metamizol (MET) had 87% of inhibition. For the anti-inflammatory effect, estimated as decreased of TPA-induced ear edema, the following percentages of inhibition were observed: 66% for CFFD, 41% for CFFM and 31% and 22% of CFFH and CFFA, respectively. Those were compared with indomethacin (INDO), which produced 72% of edema inhibition. From the CFFD´s bioassay-guided fractionation, cinnamic acid was obtained as white crystals with modest inhibitory activity on the auricular edema (27.3 %) and a good percentage of 77% inhibition of the abdominal stretching. **Conclusions:** The antinociceptive and anti-inflammatory activities are associated with the presence of active compounds in fruits of *C. fistula*. We are working to isolate additional bioactive products. This study provides evidence of ethno-medical use in traditional medicine in the region.

Citation Format:
Palacios-Espinosa JF, Núñez-Peña L, Izquierdo-Sánchez T, Lozada-García MC (2015) Antiinflammatory and antinociceptive effects of *Cassia fistula* Linn. (*Fabaceae*) fruits. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S13. Abstract nr OC-03.

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OC-04: **CHARACTERIZATION OF THE ANTINOCICEPTIVE ACTIVITIES OF THE ETHANOLIC EXTRACT FROM *Clusia minor* L. LEAVES IN DIFFERENT EXPERIMENTAL MODELS IN MICE**

Reynaldo G[1], de Souza MM[2], Malheiros A[2], Dallas MT[2], Aver K[2], Piovesan LG[2], Rodeiro I[1], Bello A[1], Mangas R[1], **Menéndez R[2]**.

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Introduction: Despite advances in pain treatment, many patients do not achieve optimal pain relief from the existing medications and suffer side effects. Naturally originated agents possibly will substitute chemical therapeutics agents. We previously described that the ethanolic extract from *Clusia minor* L. leaves exhibits antinociceptive effects in the acetic acid-induced writhing and hot plate test. These results merit achieving new research to increase evidences of its anti-nociceptive action. With this aim, we studied the effects of *C. minor* extract on the formalin and capsaicin paw licking acute test and on carrageenan (Cg, 300 µg/paw), tumor necrosis factor (TNF, 50 pg/paw) α and prostaglandin E2 (PGE2, 100 ng/paw) induced mechanical hypernociception. **Material and Methods:** Plant extract (100, 150 and 300 mg/kg, p.o) or vehicle and control drugs (n = 6-7 each) was administered 30 min before the algesic stimulus. **Results:** The extract did not alter the motor activity of mice in the rota-rod or the open field models. The second phase of the nociceptive response induced by formalin was inhibited by the extract (100, 150 and 300 mg/kg) whereas, as occurred in hot plate, the first phase of formalin was inhibited only by the highest dose assayed. Three hours after the injection of the inducer agents, the extract inhibited (150 and 300 mg/kg) the mechanical hypernociceptive response induced by Gg and those induced by TNFα and PGE2 (300 mg/kg). The phytochemical study revealed the presence Vit. E, phytosterols and the triperpenoid α-amyrin as the major components of the extract and the presence of the triterpenoid β-amirin, friedelin and lupeol as minor components. Thus, it is reasonable to conclude that the antinociceptive properties of *C. minor* extract occur via interaction of a variety mechanism that probably occurs via central and peripheral pathways modulating the inflammatory and neuropathic pain.

Citation Format:
Reynaldo G, de Souza MM, Malheiros A, Dallas MT, Aver K, Piovesan LG, Rodeiro I, Bello A, Mangas R, Menéndez R (2015) Characterization of the antinociceptive activities of the ethanolic extract from *Clusia minor* L. leaves in different experimental models in mice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S14. Abstract nr OC-04.

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OC-05: **HYPOCHOLESTEROLEMIC AND ANTI-ATHEROSCLEROTIC EFFECTS OF *Moringa oleifera* LEAF DECOCTION IN APOE KO MICE**

Fuentes D, Fernández N, Díaz BL, León A, Blanco D, Gutierrez M, García A, Ronda M, Prida Y, Torres Y, Cabezas L.

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Introduction: Numerous population studies have linked elevated concentration of total cholesterol or LDL–cholesterol in plasma with increased incidence of atherosclerotic events. It has further been shown that the clinical complications of atherosclerosis could be diminished and life prolonged when plasma lipids are lowered by hypocholesterolemic agents. The leaves of *Moringa oleifera* Lam (Moringaceae) are used in many cultures as a hypocholesterolemic agent in obese patients. Taking into consideration that B6.129P2-Apoe^{tm1Unc}/J mice exhibit a marked increase in plasma cholesterol level and develop atherosclerotic lesions resembling those seen in humans; the main objective of our study was to evaluate the hypocholesterolemic and anti-atherosclerotic effects of *Moringa oleifera* leaf decoction in ApoE KO mice. **Material and Methods:** Males and females B6.129P2-Apoe^{tm1Unc}/J KO with 4 - 8 weeks of age were fed ad libitum with normal diet. The half of the animals was fed with leaf decoction of *Moringa oleifera* during 90 days and the other served as control. C57Bl/6 mice were used as control. Body weight, food consumption, haematological and biochemical parameters, relative weight of the organs and aortic atherosclerotic lesions were measured. **Results:** It was found that administration of *Moringa oleifera* leaf decoction decreased the cholesterol increases in ApoE KO mice serum in comparison with control group, while no changes were found in wild type mice (C57Bl/6). Atherosclerotic plaque formation in aorta was also reduced approximately 35 % in treated ApoE KO mice. The behavior of the body weights showed gain of weight in all animals from the beginning until the end of the study without any obvious signs of toxicity**.** **Conclusions:** It was concluded that the leaves of *Moringa oleifera* have hypocholesterolemic and anti-atherosclerotic activity in B6.129P2-Apoe^{tm1Unc}/J mice and that there is valid pharmacological basis for employing them for this purpose in humans**.**

Citation Format:
Fuentes D, Fernández N, Díaz BL, León A, Blanco D, Gutierrez M, García A, Ronda M, Prida Y, Torres Y, Cabezas L (2015) Hypocholesterolemic and anti-atherosclerotic effects of *Moringa oleifera* leaf decoction in APOE KO mice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S15. Abstract nr OC-05.

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OC-06: *Cymbopogon citratus* FRACTIONS, PROTECTIVE ACTIVITY AGAINST UVC LIGHT IN *Caulobacter crecentus*

Fuentes-León F, García F, Aguilera K, González-Pumariega M, Sánchez-Lamar A.

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Introduction: Ozone layers hole entail the increase in ultraviolet radiation of sunlight on the earth surface, raising the risk of skin diseases, even cancer, in exposed individuals. The use of vegetal compounds is a new strategy to protect against UV damage by overexposure. Substancies obteined from natural sources are less hazardous than synthetic products. They also have a huge molecular diversity and biological function. *Cymbopogon citratus* (DC) Stapf, also known as "caña santa", is consumed as a popular decoction and has several medicinal properties such as: antiinflammatory, analgesic, antispasmodic, hypotensor, anxiolytic, expectorant and antiasmatic. Other studies have also shown anticancer, antitumor and antimutagenic properties. A lot of these studies were assayed in total extract, less in fractioned extract. In this work, we tested the toxicity and the ability to protect against UVC light of three fractions obtained from *Cymbopogon citratus* (aqueous, butanolic and essential oils fractions). **Material and Methods:** SOS Chromotest, Rif^r test and Survival test were used in the experimental model of *Caulobacter crecentus* (NA 1000 p3213 lac z). Increasing concentrations of these fractions (0.1, 0.5, 1, 2 and 4 mg/mL) were applied continuously: before, during and after UVC exposure (45 J/m^2). **Results:** Butanolic fraction posses cytotoxic and genotoxic properties. Aqueous fraction is not toxic but don´t protect DNA from UVC damage induced. Essential oils were cytotoxic at the highest concentration tested (4 mg/mL) but don´t possess genotoxic properties. This fraction decreases the frequency of mutants induced by UVC light in *Caulobacter*. Finally, essential oils showed antimutagenic activity and protect cells from radiation UVC mutagenicity.

Citation Format:
Fuentes-León F, García F, Aguilera K, González-Pumariega M, Sánchez-Lamar A (2015) *Cymbopogon citratus* fractions, protective activity against UVC light in *Caulobacter crecentus*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S16. Abstract nr OC-06.

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OC-07: **ANTI-HYPERNOCICEPTIVE EFFECT OF MANGIFERIN IN PERSISTENT AND NEUROPATHIC PAIN MODELS IN RATS**

Garrido B[1], Garrido G[2], Castro M[1], Merino N[1], Valdés O[1], Rodeiro I[3], Hernández I[3], Godoy J[4], Ferreira S[4], Delgado R[1].

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Introduction: Several evidences suggest the potentiality of the glucosylxanthone mangiferin (MG) to modulate some of the molecular targets implicated in neuropathic pain mechanisms, especially central sensitization, through of its long term effects mediated by transcriptional changes. Nevertheless, a transient mechanism of MG on nociceptive pathway could be implicated. Previously, we advised that MG could be used to treat neuropathic pain supported in preclinical data and preliminary clinical reports with *Mangifera indica* L. extract formulations that contain 15–20% of this polyphenol. **Material and Methods:** The present study examines its possible effect on pain-related behaviors in a tonic acute pain model (formalin test at 5%) and in a chronic constriction injury (CCI) model to clarify the underlying transient and long-term mechanisms. **Results:** Acute administration of MG (10–100 mg/kg, i.p.) reduced licking/biting exclusivity in the tonic phase of formalin test in a naloxone and yohimbine-sensitive manner. This effect was enhanced by a nonselective nitric oxide synthase (NOS) inhibitor (NG-monomethyl-L-arginine) and by a non-competitive N-methyl-D-aspartate (NMDA) antagonist (ketamine), but it was reversed by the NOS substrate (L-arginine). Pre-treatment with intrathecal yohimbine prevented the anti-hypernociceptive effect of systemic MG. Pre-treatment during 4 days before surgical and 3 days after CCI with MG (50 mg/kg, i.p.) reduced mechanical hypernociception and decreased the signs of Wallerian degeneration (WD) of the sciatic nerve. MG improved the PC-12 cellular viability exposure to glutamate-mediated neuronal death, also involved in neuropathic pain. **Conclusions:** The findings of this study suggest that MG shows ability to decrease tonic pain in the formalin test. A transient activity of this xanthone on nociceptive pathways mediated by α_2 adrenergic receptors in cooperation with the opioid system could be involved, at least in part, in this effect. Its neuroprotective effect by preventing WD in mononeuropathic rats could be implicated in the mechano-antihypernociceptive long-term mechanisms. **Financial Support:** Projects MINSAP № 0808001 (Cuba), CAPES № 120/2011 (Brazil), and FONDECYT № 1130601 (Chile).

Citation Format:
Garrido B, Garrido G, Castro M, Merino N, Valdés O, Rodeiro I, Hernández I, Godoy J, Ferreira S, Delgado R (2015) Anti-hypernociceptive effect of mangiferin in persistent and neuropathic pain models in rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S11. Abstract nr OC-07.

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OC-57: **HYPOLIPIDEMIC EFFECTS OF CHITOSAN AND CHITOSAN ACIDS SALTS ON TWO MODELS OF INDUCED HYPERLIPIDEMIA IN MICE**

Menéndez AB[1], Menéndez R[1], Valle[1], Phuong DT[2], Phuong TN[2], de la Paz N[1], López O[1], Fernández M[3], Nogueira A[1].

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Introduction: Hyperlipidemia is currently considered to be one of the most important cardio-cerebral vascular disease risk factors. Cardiovascular disease is the main cause of death in developed countries; it is now widely recognized to be closely related with elevated blood lipids. Lipids mainly refer to the serum cholesterol and triglycerides. Hyperlipidemia refers to either or both of increasing levels of cholesterol or triglyceride. The purpose of this study was to determine the effect of chitosan obtained by deacetylation of chitin from lobster (*Panurilus argus*) shells and its salts on prevention of hyperlipidemia in mice induced by Triton WR 1339 and fed high cholesterol diets. **Material and Methods:** Hyperlipidemic Swiss mice were treated with chitosan and its acetate and lactate salts at dose of 200 mg/kg. Fenofibrate and colestyramine were used as positive control. **Results and Conclusions:** Chitosan and its acids salts caused a significant decrease in total cholesterol (TC) and tryglicerides in serum compared with control group and had an inhibition for above 50%. The data generated by this study demonstrated that chitosan and its acids salts at 200 mg/kg dose are effective in lowering the hyperlipidemia conditions produced by Triton and high cholesterol diet in mice.

Citation Format:
Menéndez AB, Menéndez R, Valle, Phuong DT, Phuong TN, de la Paz N, López O, Fernández M, Nogueira A (2015) Hypolipidemic effects of chitosan and chitosan acids salts on two models of induced hyperlipidemia in mice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S17. Abstract nr OC-57.

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OC-58: **THE IMPACT OF *Ocimum sanctum* LINN. LEAF EXTRACT ON SOME BIOMARKERS WITH REFERENCE TO ANTIFERTILITY POTENTIAL IN FEMALE ALBINO RATS**

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Aim: To study the effect of *Ocimum sanctum* Linn. leaf extract on some biomarkers with reference to antifertility potential in female albino rats. **Methods:** The healthy female albino rats were administered with *Ocimum sanctum* Linn. (Tulasi) leaf extract orally at different dose (100, 200, 300 mg/kg body weight/15 days) and duration (300 mg/kg body weight/30 days). The total proteins, total carbohydrates, total lipids, cholesterol, phospholipids and triglycerides were estimated using standard biochemical methods in control and experimental female albino rat tissues like ovary, uterus, vagina, liver and plasma. **Results:** The oral administration of ocimum sanctum leaf extract was significantly elevated the ovarian total proteins in group-II, III & IV but in group-V it was reduced. No significant changes observed in ovarian total carbohydrates in group-II & III. But in group - IV (300 mg/kg body weight/day for 15 days) and group - V (300 mg/kg body weight/day for 30 days) there was significant elevation over control. The ovarian and uterine lipids were enhanced as the dose and duration of the extract increases. The elevated cholesterol levels observed in ovary and uterus but at higher and prolonged dose and duration uterine cholesterol levels were depleted. The increased hepatic triglycerides were noticed as the dose and duration increased. **Conclusions:** Based on these observations it may be concluded that the extract of ocimum sanctum leaf at higher dose and prolonged duration owing to its potent antiestrogenic nature, alters the biochemical milieu of the reproductive tract.

Citation Format:
Venkataramanaiah P, Srinivasulu K, Changamma C (2015) The impact of *Ocimum sanctum* Linn. Leaf extract on some biomarkers with reference to antifertility potential in female albino rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S19. Abstract nr OC-58.

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OC-59: **SOME NEUROPHARMACOLOGICAL ACTIVITIES OF THE ETHANOLIC EXTRACT FROM *Clusia minor* L. LEAVES IN DIFFERENT CLASSICAL BEHAVIORAL MODELS IN MICE**

Reynaldo G[1], de Souza MM[2], Malheiros A[2], Dallas MT[2], Aver K[2], Piovesan LG[2], Rodeiro I[3], Bello A[1], Mangas R[1], Cechinel V[2], Menéndez R[3].

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Introduction: Nowadays a number of herbal remedies are recommended as complementary medicine for psychiatric illness. Most of the potentialities of these remedies have been assured primarily in a variety of preclinical models. The phytochemical analysis of the ethanolic extract of *Clusia minor* L. leaves allowed the identification of various phytostosterols as well as triterpenoids and flavonoids. Since these compounds have presented several neuropharmacological actions, the present study was focused in evaluating the SNC effects of the extract by means of classical behavioral models in mice. **Material and Methods:** Single oral doses of the plant extract (100, 150 and 300 mg/kg) or vehicle and control drugs (n = 6-7 each) was administered 30 min prior to experiments. General locomotor activity was investigated by assessing open field and rota-rod performance. Anxiolytic and antidepressant effects were studied using Elevated Plus Maze (EPM) and forced swimming test (FST), respectively. **Results**: Neither locomotion nor motor coordination was altered by the oral administration of the extract. Results in EPM suggest no anxiolytic like effects. However, a decrease of the immobility time in FST (150 and 300 mg/kg) was observed. The results in EPM and FST are not simply the result of either a general modification of locomotor activity or of exploratory behavior consequent to exposure to a novel environment. **Conclusions:** The effect observed in the FST suggests an antidepressant like effects that may involve of catecholamine and/or serotonin transmission. However, other kinds of studies are obviously necessary to elucidate this mechanism of action. Our results also suggest that the extract does not act as a typical BDZ anxiolytic agent as the extract does not alter arm entries. Although the results agree with the phytochemical composition of the extract, further studies are necessary to confirm and extend these results.

Citation Format:
Reynaldo G, de Souza MM, Malheiros A, Dallas MT, Aver K, Piovesan LG, Rodeiro I, Bello A, Mangas R, Cechinel V, Menéndez R (2015) Some neuropharmacological activities of the ethanolic extract from *Clusia minor* L. leaves in different classical behavioral models in mice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S20. Abstract nr OC-59.

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OC-60: A MULTIFACTORIAL APPROACH FOR ANTIPLATELET DRUG DISCOVERY FROM MEDICINAL PLANTS

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Introduction: Antiplatelet drugs are prescribed to prevent atherothrombotic diseases. However, the efficacy of currently available drugs is limited. Therefore, new therapeutic options are needed. Antithrombotic agents could be developed from herbs. Nevertheless, "antiplatelet" is not a popular term. Therefore, a research strategy is necessary for this purpose. Some evidence could provide a scientific support for it. For instance, chemical structure- antiplatelet activity relationships have demonstrated the importance of hydroxyl groups, therefore, the presence of metabolites bearing this functional group like flavonoids could provide plant product with an antiplatelet potential. On the other hand, other biological activities that are related with the inhibition of platelet activation could guide the selection of plant species to be evaluated. **Material and Methods:** Extracts from five botanical species (*Citrus aurantifolia* Ch, *Citrus aurantium* L, *Citrus sinensis* L., *Morinda citrifolia* L. and *Wendita calysina* Griseb.) were included in a screening of antiplatelet potentials. Plant products effects on platelet aggregation (PA) was assessed against adenosine diphosphate (ADP)-, collagen-, epinephrine- and arachidonic acid- induced stimulation of human plasma *in vitro* and/or against ADP- induced activation of rat plasma *ex vivo.* Common characteristics of herb-derivate platelet inhibitors (traditional use, other biological properties and major secondary metabolites) were also analyzed. **Results:** All plant preparations, except *A aurantium* fruit peel extract and *M citrifolia* juice, showed inhibitory effects *in vitro* and or *ex vivo* . Traditional uses for fever, inflammation, bronchitis, bronchial asthma and / or vascular disorders; as well as antioxidant and anti-inflammatory pharmacological properties were characteristic features of these species. **Conclusions:** The results suggest that ethnomedical, pharmacological and chemical information about medicinal plants could be useful for antiplatelet drugs discovery from medicinal plants.

Citation Format:
García M (2015) A multifactorial approach for antiplatelet drug discovery from medicinal plants. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S21. Abstract nr OC-60.

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OC-61: **PRECLINICAL PHARMACOLOGICAL VALIDATION AND PHYTOCHEMICAL SCREENING OF *Phania matricarioides***

Duménigo A, García AI, Martínez I, Victoria MC, Brito G, Blanco Y, Acosta L.

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Introduction: *Phania matricarioides* is a plant that can be found throughout Cuba and is grown in gardens. The decoction or infusion from the fresh aerial parts is traditionally used to treat digestive and dermatologic problems. The aims of this work are: to evaluate the preclinical antinociceptive and anti-inflammatory action of the decoction of fresh aerial parts of *P. matricarioides* and the anti-inflammatory activity of five fractions obtained from this plant. Also was realized a phytochemical screening that allow supporting the pharmacological results. **Material and Methods:** The aerial parts of *P. matricarioides* were picked up to make decoction. Several pharmacological studies were conducted: the 0.75% acetic acid-induced contortions (0.1 mL/10 g, intraperitoneally administered); tail immersed in water at 55 ºC in mice, at doses of 1 and 5 g of vegetal material/kg of body weight; croton oil-induced ear oedema, orally (0.1 and 1 g/kg) and topically (10, 30 and 50 % concentrations) in mice and cotton-induced granuloma in rats (5 g/kg). The five fractions obtained were studied topically (0.25, 0.5, 1 y 2 mg/ear) in croton oil-induced ear oedema. Phytochemical screening of the plant was realized by Chabra´s method. **Results:** The decoction significantly inhibited the nociceptive response induced by acetic acid, depending on dose (5 g/kg), but did not affect either the tail withdrawal in immersion or the inflammatory response to cotton-induced granuloma; the inflammation treated orally and topically was inhibited in the ear oedema. Only the aqueous fraction showed topical anti-inflammatory activity. The chemical composition of the fresh aerial parts mainly comprised phenols, tannins, flavonoids and triterpenes or steroids. **Conclusions:** The results allowed performing the preclinical validation of the analgesic and anti-inflammatory action of the decoction of fresh aerial parts and of the aqueous fraction of this plant.

Citation Format:
Duménigo A, García AI, Martínez I, Victoria MC, Brito G, Blanco Y, Acosta L (2015) Preclinical pharmacological validation and phytochemical screening of *Phania matricarioides*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S22. Abstract nr OC-61.

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OC-62: **QUALITY ASSURANCE OF VEGETABLE RAW MATERIAL TO PRODUCE PHYTOPHARMACEUTICAL PREPARATIONS**

Acosta L[1], Rivera MM[2], Rodríguez CA[2].

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[2]Experimental Station of Medicinal Plants "Juan Tomas Roig", Center for Pharmaceutical Research and Drug Development (CIDEM), Cuba.

This Round Table is aimed to discuss the variables that should be taken into account to obtain vegetable raw materials with good quality for the manufacture of phyto-pharmaceutical products, including the agricultural good practices, washing and disinfection norms, as well as those parameters defining the quality of vegetable drugs. The information will be divided into three presentations: the first one deals with agroecological production of plants, based on the accomplishment of agricultural good practices (cultivation place; sowing and recollection system; container, drying and storage of the drug). The second one is aimed to present the integral management of plagues without using chemical but biological and natural products, as well as agricultural practices. The last one will demonstrate that washing and chemical disinfection of vegetable materials after recollection is a guarantee for obtaining drugs with acceptable microbiological quality. Besides, it will be shown the importance of determining the pharmacognostical parameters of the drug to be commercialized. In general, this Round Table will provide evidence supporting that the use of agroecological cultivation has lead to the development of an agricultural technology and the creation of norms for microbiological and pharmacognostical quality control, leading to obtain enough vegetable raw materials with the requirements of quality and safety for the elaboration of phytopharmaceutical preparations. As a result, an increment of drug production has been seen. On the other hand, some phytopharmaceutical products have been registered.

Citation Format:
Acosta L, Rivera MM, Rodríguez CA (2015) Quality assurance of vegetable raw material to produce phytopharmaceutical preparations. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S23. Abstract nr OC-62.

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OC-63: **TRAMIL-CUBA, ITS IMPACT IN RESEARCH AND DIFFUSION OF MEDICINAL PLANT USES**

Victoria MC, Morón F, Brito G, Blanco Y, López M, Peña BR, Acosta L, Morejón Z, Boucourt E, García AI, Duménigo A, Martínez I.

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Introduction: Since 1986, Cuba, represented by Ministry of Public Health of Cuba (MINSAP) and Central Pharmacological Research Unit (LCF) has joined TRAMIL (Program for Applied Research and Diffusion of Medicinal Plants in the Caribbean). In 1988, the III TRAMIL Scientific Workshop was organized in Havana. We also have coordinated the Medicinal Plant Cuban Research Program (1988-2004) to incorporate medicinal plants in our National Health System. We have performed some scientific projects and there results have been published. The aim of this lecture is expose interchange scientific experience between TRAMIL and LCF during 25 years. **Methods**: It was reviewed the most important events, the main impacts in diffusion and higher medical education, as well as our published results and those included in TRAMIL´s Caribbean Herbal Pharmacopoeia during (CHP) 1988-2014. **Results**: It was exposed the scientific-validated medicinal plant uses which has been incorporated to Cuban National Health System, the survey TRAMIL and diffusion workshop are analyzing, our results in pharmacological and toxicological studies of different species had been incorporated to CHP. **Conclusions**: Our data indicate that TRAMIL is a well established regional scientific network which may be useful for health systems and medical universities. There have been an advantageous scientific interchange and two-sided feedback for both organizations during the last 25 years. There is a high percentage of traditional medicinal plant uses which may be supported with preclinical evaluation, the toxicity reaction are almost negative in traditional use forms; some publication shown the impacts in diffusion.

Citation Format:
Victoria MC, Morón F, Brito G, Blanco Y, López M, Peña BR, Acosta L, Morejón Z, Boucourt E, García AI, Duménigo A, Martínez I (2015) TRAMIL-Cuba, its impact in research and diffusion of medicinal plant uses. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S24. Abstract nr OC-63.

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OC-81: **EVALUATION OF PHARMACOLOGICAL SCREENING AND TOXICITY PROFILE OF SELECTED HOMEOPATHIC DRUGS**

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[3]Central Council for Research in Homoeopathy, New Delhi, India.

Aim: Present study was carried out to evaluated pharmacological efficacy and toxicity testing of three homeopathic drugs viz. Ferrum phos. (3X & 6X), Calcarea Phos (6X) and Magnesium Phos (6X). **Material and Methods:** The study was divided into two parts. Pharmacological efficacy, as anti-analgesic, anti-inflammatory and anti-arthritic activity of drugs were evaluated in first part of the study. The pharmacological models employed included, eddy's hot plate induced thermal algesia, carrageenan-induced paw edema and complete freund's adjuvant-induced arthritis in rats. Study was carried out in male Wistar rats with 14mg/kg of drug dose administered orally. In the second part, acute, sub-acute (28 days) and chronic (180 days) toxicity testing of drugs was carried out as per respective OECD guidelines. **Results and Conclusions**: Ferrum Phos 6X established significant anti-inflammatory activity exhibiting 28% percentage inhibition, which was comparable to standard drug indomethacin (38%). Further, a significant anti-analgesic activity was also demonstrated by ferrum phos 6X. However, Ferrum Phos in 3X potency, Calcarea phos and Magnesium Phos showed little or no efficacy in all the pharmacological models screened. All these homeopathic drugs shared a safe toxicity profile at dose up to 2000mg/kg body weight.

Citation Format:
Singh S, Gupta P, Khurana A, Gupta YK, Manchanda R (2015) Evaluation of pharmacological screening and toxicity profile of selected homeopathic drugs. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S25. Abstract nr OC-81.

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SYMPOSIUM 2: CLINICAL AND PHARMACOEPIDEMIOLOGICAL STUDIES OF HERBAL PRODUCTS

OC-08: **A HERBAL REMEDY MADE FROM SUBSPECIES OF *Rosa canina* (LITO), REDUCES SYMPTOMS OF OSTEOARTHRITIS AND THE CONSUMPTION OF PAIN KILLERS**

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Objectives: The aim of this study was to test if a herbal remedy made from the fruits (rose-hip) of a subspecies of *Rosa canina* (Lito) might reduce symptoms of osteoarthritis of the hip or knee, as well as reduce the need for regular pain killers. **Material and Methods**: Ninety-four patients with osteoarthritis of the hip or knee were enrolled in a randomized, placebo-controlled and double-blinded cross-over clinical trial. Forty-seven patients were given 5 g of the rose-hip powder for a period of 3 months, while the rest received a similar amount of placebo. The group initially treated with placebo was then changed to rose-hip and vice versa for another 3 months period. Upon inclusion and after 3 weeks and at the end of the 3 months of each treatment period, symptoms of osteoarthritis such as pain, stiffness, daily activity and the patients personal evaluation of the disease severity were scored on a WOMAC questionnaire. Each day during the whole treatment period, the patients registered their consumption of rescue medication. After 3 weeks of treatment, the study participants were allowed to reduce their consumption of medication if this was considered tolerable. Data were analyzed on the intention to treat. **Results:** Active treatment resulted in a significant reduction in WOMAC pain score ($p<0.013$) as compared to placebo, when testing after three weeks of treatment. A similar pattern was observed for joint stiffness. WOMAC disability (ADL) and the patients evaluation of the severity of their disease decreased significantly ($p<0.018$ and $p<0.035$, respectively) when testing after three month treatment. The consumption of rescue medication such as paracetamol, synthetic opioids and codeine declined by 40% as a result of active treatment ($p<0.031$). **Conclusions**: The data suggests that the herbal remedy based on rose-hip made from Lito subspecies can alleviate symptoms of osteoarthritis and reduce replaced the consumption of rescue medication. It was calculated that if 50% of potential osteoarthritis patients reduce their use of rescue medication by taking this rose hip preparation, the savings to the society could be up to 666 Euro/osteoarthritic patient /year.

Citation Format:
Winther K, Campbell-Tofte J (2015) A herbal remedy made from subspecies of *Rosa canina* (lito), reduces symptoms of osteoarthritis and the consumption of pain killers. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S26. Abstract nr OC-08.

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OC-09: **EFFICACY AND SAFETY OF SURFACEN® IN THE TREATMENT OF CHILDREN WITH RESPIRATORY DISTRESS SYNDROME (RDS)**

Díaz E, Blanco O, Rodríguez VS, Morilla A, Barrese Y, Ávila Y, Uranga R, Machado MC, Castro BL, **Fernández O**.

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Introduction: The RDS in newborns (NRDS) has high incidence. The mortality has decreased by the use of protective ventilation and exogenous surfactants. However, the Acute Respiratory Distress Syndrome in pediatric ages does not have high incidence, but high rate of mortality. **Objective:** to demonstrate the efficacy, effectiveness in newborns, and security of SURFACEN® in the treatment of the SDR in children. **Material and Methods:** Clinical phase III (pediatrics) multicentric, open, controlled and randomized with two treatment groups, SURFACEN® and control. Clinical trial phase IV (neonatology), multicentric, open. Clinical ventilatory and gasometric variables were evaluated, the mortality a day 28 of the treatment and in general, as well as those related with the security and hospital outcomes. **Results:** It was demonstrated in both clinical trials that SURFACEN® treatment, significantly improves oxygenation and lung images, and the patients had a satisfactory evolution. In the study of pediatric age, the mortality at day 28 of inclusion decreased (P=0.0074) in the treated patients with SURFACEN® (20.0%) with regard to the controls (62.0%). In the newborn, ones the answer to the treatment was of 74.22%, (IC 95%, 68 - 80%), those that responded showed decreased length of ventilation necessity (P <0.0001) and low frequency of secondary complications due to ventilation in the preterm newborns (P <0.0001), as well as the days at the intensive care neonates unit. The administration of this medication did not provoke adverse severe/serious irreversible events related with the product. **Conclusions:** SURFACEN® demonstrated to be an effective medication in children in pediatric age as well as in newborn, besides having good security.

Citation Format:
Díaz E, Blanco O, Rodríguez VS, Morilla A, Barrese Y, Ávila Y, Uranga R, Machado MC, Castro BL, Fernández O (2015) Efficacy and safety of Surfacen® in the treatment of children with respiratory distress syndrome (RDS). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S27. Abstract nr OC-09.

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OC-10: **THE IMPACT OF PLACEBO ON PAIN AND PHYSICAL ACTIVITY IN PATIENTS WITH OSTEOARTHRITIS**

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Introduction: Expectations and imagination can blunt reality. Therefore, evaluating pain is difficult because measurements are often dependent on patients' subjective interpretations. How can we trust subjective data obtained from patients? Literature shows that placebo can result in positive responder rates of 60% in osteoarthritis patients. The aim of this study was to distinguish authentic from fake responders in randomized placebo-controlled clinical trials. **Material and Methods**: Patients (120) were included in a trial, in which half received 2.5 g rose-hip powder of *Rosa canina* subtype Lito daily, while the remaining were administered placebo. Pain and physical activity were estimated using WOMAC. In addition, the inflammatory marker - CRP was measured and a correlation test of change in symptom scores: pain and physical activity vs body weight was conducted for each group. **Results:** Pain and daily activity improved significantly ($p<0.01$ and $p<0.01$), respectively, irrespective of treatment. The positive response rate was close to 60% in each group. This indicate that nearly two out of three patients responded to placebo treatment. Placebo was therefore "proven" to be as effective as active treatment. However, CRP levels significantly declined with active treatment and no change was observed with placebo ($p<0.042$) comparing groups. Correlation analysis of weight vs pain scores ($p<0.020$), as well as weight vs physical function ($p<0.004$), revealed significant negative correlations with active treatment, indicating dose-dependency. The lighter patient had more impact on symptom scores than the heavier. With the placebo group, there was no correlation between weight and pain or weight and levels of physical activity. **Conclusions:** Our data indicate that even when active treatment and placebo yield matching outcomes, it is possible to distinguish between the two groups by considering biochemical measurements and correlation analysis of patients' weight *vs* symptom scores.

Citation Format:
Winther K, Marstrand K, Campbell-Tofte J, Hansen P (2015) The impact of placebo on pain and physical activity in patients with osteoarthritis. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S28. Abstract nr OC-10.

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OC-11: **EFFECT OF *Spirulina platensis* IN PATIENTS WITH METABOLIC SYNDROME**

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Introduction: The metabolic syndrome is an important cause of morbidity and mortality, considered a risk factor for cardiovascular disease. Carbohydrate disorders, obesity, dyslipidemia and hypertension associated characterize it. *Spirulina* for its high content of carotenoids and other antioxidants can benefit prevention and improvement, decreasing the blood lipid concentration and intervene in stopping the oxidative processes responsible for the deterioration of the walls of veins and arteries, improving blood pressure. **Objective:** To evaluate the effect of *Spirulina platensis* in patients with metabolic syndrome. **Methods**: A longitudinal, prospective study of 45 adults with a diagnosis of metabolic syndrome, who attended the medical examination control, was conducted for the period 2010-2013. They randomly assigned two groups: a control with dietary advice and one study with dietary advice plus six tablets daily Spirel® 100% natural for six months. Changes in lipid profile and IPS, were evaluated from test Wilcoxon signed ranks after treatment in each group, with alpha=0.05. **Results:** The decrease in cholesterol was significant in the study group (p=0.001). When compared with the control group, the t-test showed no statistically significant difference (p=0.297). Triglycerides decreased significantly in the study group (p=0.001). Both groups experienced significant changes in the IPS, in the control group values decreased (worsened) (p=0.000) and in the study group was significantly increased (p=0.000), resulted in improved peripheral vascular insufficiency. No adverse reactions were reported. **Conclusions:** Consumption of Spirel®100% natural for six months is effective and safe in improving metabolic syndrome and peripheral vascular insufficiency.

Citation Format:
Casamayor Z, González S, Díaz A, Conde E (2015) Effect of *Spirulina platensis* in patients with metabolic syndrome. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S29. Abstract nr OC-11.

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OC-12: **EFFECTIVENESS AND SAFETY OF NUTRISOL AS NUTRITIONAL SUPPLEMENT IN THE TREATMENT OF ADOLESCENTS WITH NUTRITIONAL DEFICIENCY**

González S[1], Domínguez MI[1], Casamayor Z[1], Hernández B[1], Conde E[1], Leal A[1], Filgueira I[1], Agramonte G[1], Casas MJ[2], Povea E[2], Hevia D[2], Díaz M[2], Álvarez B[2], Pérez IM[2], Esplugan A[2], Bejerano CJ[2], Albertine M[2].

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Introduction: The nutritional requirements depend on the spending needed to keep the growth rhythm, changes in body composition and in the energy consumption, hence the need for an adequate nutrition for adolescents to develop their biological potential to the maximum. **Objective**: To evaluate the effectiveness and safety of Nutrisol as a nutritional supplement in the treatment of adolescents with nutritional deficiency. **Material and Methods**: A prospective, longitudinal and analytic study at the University Pediatric Hospital William Soler was performed. 40 adolescents, 20 of each sex, with diagnosis of nutritional deficiency and percentile values equal to 10 or less were included. The teen agers were treated for a period of six months. Group I received the usual treatment (vitamin C, Polivit and dietary assessment) and group II was treated with Nutrisol and dietary assessment. Anthropometric measurements, laboratory data and clinical parameters were evaluated. The evolution of the response variables was performed using the non-parametric Friedman test. **Results**: Adolescents who consumed Nutrisol showed greater variability in the studied anthropometric variables than those receiving the usual treatment (p=0.001). The exploring of haematological variables showed a slight increase of normal values for both sexes after consumption of Nutrisol. Teenage boys had better response to treatment than females. There was no change in the parameters for safety variables assessed during the study. Nausea and loss of appetite were the adverse events reported during the investigation. No serious adverse events were reported. **Conclusions**: The use of Nutrisol is effective and safe in treating adolescents with nutritional deficiencies.

Citation Format:
González S, Domínguez MI, Casamayor Z, Hernández B, Conde E, Leal A, Filgueira I, Agramonte G, Casas MJ, Povea E, Hevia D, Díaz M, Álvarez B, Pérez IM, Esplugan A, Bejerano CJ, Albertine M (2015) Effectiveness and safety of nutrisol as nutritional supplement in the treatment of adolescents with nutritional deficiency. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S30. Abstract nr OC-12.

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OC-13: **CLINICAL TRIALS USING NATURAL PRODUCTS DEVELOPED BY THE CENTER FOR PHARMACEUTICAL RESEARCH AND DRUG DEVELOPMENT. CURRENT STATUS AND PERSPECTIVES**

García-García I, Jiménez-Rodríguez D, Festary-Casanovas T, Delgado-Hernández R.

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Products obtained from medicinal plants with healing properties could be used to improve medical attendance. Nevertheless, their application in some diseases is not always supported by evidence-based medicine criteria. Similar to chemical and biotech products, natural compounds have to be evaluated in the clinics through randomized, controlled clinical trials that clearly demonstrate their efficacy and safety in the treated patients. The aim of this work is to show an overview of the clinical development of natural products obtained by CIDEM, as well as the future prospects in this field. In a placebo-controlled, double-blind trial, *Plectranthus amboinicus* Lour Spreng (French oregano) tablets were a belter alternative than symptomatic treatment to suppress common cold in patients with upper respiratory diseases. A novel oral formulation containing microencapsulated lipophilic extract of pumpkin seed oil (Calprost) was studied in older patients diagnosed with Benign Prostatic Hyperplasia (BPH). Their general effect was similar to a group of patients treated with terazosin capsules (control group) but urinary symptoms decreased more markedly in the Calprost group, with a better tolerability. Regarding future perspectives, the incorporation of natural products with anti-tumor properties, produced by CIDEM, to the conventional treatment of cancer patients could be specially beneficial in advanced stages of the disease. In that sense, several protocols using the products aloe 50% aqueous extract (viscous solution); calendula 1% cream, Calprost capsules and VIMANG®-mangiferin are under preparation. On the other hand, *Justicia pectoralis* Jacq (Linden) tablets will be used in patients with neurotic disorders related to stress, through a randomized, placebo-controlled trial. Additionally, a nutritional supplement containing *Momordica charantia* could be a reasonable option as hypoglycemic in patients with type II Diabetes Mellitus. This biological action will be evaluated in a phase II, randomized, placebo-controlled double-blind trial.

Citation Format:
García-García I, Jiménez-Rodríguez D, Festary-Casanovas T, Delgado-Hernández R (2015) Clinical trials using natural products developed by the center for pharmaceutical research and drug development. Current status and perspectives. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S31. Abstract nr OC-13.

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OC-14: **IMPACT OF QUALITY SYSTEM FOR CLINICAL TRIALS WITH NATURAL PRODUCTS**

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The National Center Coordinating of Clinical Trials, contract research center, for the design and conduct of clinical trials on investigational products natural or not, fulfilling the requirements of Good Clinical Practice (GCP), did not have a Quality Management System (QMS) that would raise the quality of their services, and indicators to measure the effectiveness of its processes. This led to design a QMS according to requirements of the NC-ISO 9001, for the clinical trials process developed in the CENCEC applying the GCP. The QMS is structured in stages, "Exploratory or diagnostic", "Development of intervention actions and implementation" and "Evaluation". With QMS twelve barriers to implementation were eliminated. Documentary system according to ISO 9001 was established, was prepared to human capital and tools for continuous improvement is built was established. A system with 38 indicators that measured the effectiveness of key strategic and support processes complied. The evaluation showed that the system is properly implemented, backed by customer satisfaction, performance indicators and the results of external audits. The implanted QMS raised the quality of services and was certified to comply with the requirements of the NC-ISO 9001, becoming the first contract research center in the third world with the condition.

Citation Format:
Álvarez S (2015) Impact of quality system for clinical trials with natural products. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S32. Abstract nr OC-14.

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OC-15: **SAFETY OF CONSUMING HERBAL MEDICINES. EXPERIENCE FROM FARMACOVIGILANCE STUDIES**

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Introduction: In recent years, there has been an increase in consumption of herbal medicines due to the ecological approach that is being given to health. However although these can modify biological processes that produce beneficial and therapeutic actions, also they cause adverse reactions. In addition, research on safety and efficacy are scarce. The development of research evaluating the use and the results of drugs in real conditions, to provide relevant information and enable clinical decision making is necessary. **Aims:** Increase safety outreach evidence-based phyto-pharmaceuticals. **Methods:** A group of specialists involved in the National School of Public Health of Cuba published a book: "Safety of consuming herbal medicines. Pharmacovigilance expertise" directed those interested in Natural Medicine and Bioenergetics. Editorial ECIMED Medical Sciences edited it in collaboration with the Pan American Health Organization. **Results:** The text included a compendium of research conducted by the authors. Information in three chapters included the theoretical support necessary for conducting research on safety and pharmacovigilance, the methodology for the development of research related to adverse reactions caused by drug use and other major results are presented organized research related to the topic. **Conclusions;** The theory, methodology and results of research on the topic specified grounds can be incorporated into the educational programs of postgraduate education and undergraduate medical sciences to develop skills taxing the quality of prescribing and helps to fill gaps in knowledge on the use of medicines in daily practice and save effort and resources, as well as enable the use of methodological strategies presented in them.

Citation Format:
Ruiz AK, García AJ, Alonso L (2015) Safety of consuming herbal medicines. Experience from farmacovigilance studies. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S33. Abstract nr OC-15.

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SYMPOSIUM 3: CHEMICAL AND ANALYTICAL CHARACTERIZATION OF NATURAL PRODUCTS

OC-16: **CYCLOPEPTIDE ALKALOIDS FROM *Ziziphus oxyphylla***

Tuenter E, Exarchou V, Ahmad R, Apers S, Hermans N, Pieters L.

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Introduction: With about 40 species, the genus *Ziziphus* is one of the larger genera in the *Rhamnaceae* family. The plants, mostly spiny shrubs and small trees, grow in warm-temperate or subtropical climates. Traditionally *Ziziphus* plants are used to treat skin infections, fever, diabetes and many other pathological conditions, but the active compounds are often not known. A specific class of constituents which are typically found in this genus and which might be responsible for certain health benefits claimed in the traditional use are the cyclopeptide alkaloids (CPAs). For some the antimicrobial, antipyretic and/or anti-diabetic activity has already been shown, but only a few compounds were tested up to now. In this project the isolation of CPAs from *Ziziphus oxyphylla* Edgew. was performed. **Material and Methods:** A crude extract was prepared in 80% methanol from 2.9 kg of small dried roots, followed by liquid-liquid partitioning and fractionation by flash chromatography. After this, the isolation of pure compounds was done by means of semi-preparative HPLC-DAD-MS. For the structure, elucidation NMR spectroscopy was used, including ^{1}H, ^{13}C, COSY, HSQC and HMBC spectra. **Results:** Ten CPAs could be identified: the five known compounds hemsine-A (1), nummularine-R (2), oxyphylline-A (3), oxyphylline-C (4) and ramosine-A (5); Odesmethylnummularine-R (6), which contains a hydroxyl-group instead of a methoxy-group; and two oxidized compounds, i.e. hemsine-A-N-oxide (7) and O-desmethyl-nummularine-R-N-oxide (8). Furthermore two new cyclopeptide alkaloids were identified, which both contain cinnamic acid instead of an amino acid as the terminal moiety in the side chain. Given their structural resemblances with the already existing oxyphyllines A-D and the fact that the compounds are isolated from *Z. oxyphylla*, these compounds were named oxyphylline-E (9) and oxyphylline-F (10). **Conclusions:** To our knowledge, it is the first time these alkaloids are being reported. Further research is ongoing, more in particular the evaluation of their antimicrobial and/or anti-diabetic activities.

Citation Format:
Tuenter E, Exarchou V, Ahmad R, Apers S, Hermans N, Pieters L (2015) Cyclopeptide alkaloids from *Ziziphus oxyphylla*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S34. Abstract nr OC-16.

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OC-17: **PHYTOCHEMICAL CHARACTERIZATION OF PLANTS *Scutellaria incarnata* VENT AND *Justicia pectoralis* JACQ**

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Introduction: In the Laboratory of the University National of Colombia in Palmira, a study about the nuclei fulfilled phytochemical of the plants *Scutellaria incarnata* Vent and *Justicia pectoralis* Jacq, was performed. The objective of the study was to consolidate the scientific information for the invima for the two phytotherapeutic products extracted during the industrialization of the *J. pectoralis*. **Material and Methods:** The characterization was made with the extract from each plant using the protocols recomended by The World Health Organization (WHO). **Results:** The extracts are showing medicinal characteristics that can control the symptoms, which produce the sadness, distress, anxiety, depression, irritability, "that make you crying easily" and the stress. All these illness state are the second cause of absenteeism in the world. Once all the protocols were performed the presence of tannins, phenols, flavonoids, saponins, terpenoids and coumarins were detected. **Conclusions:** All chemicals compounds may be responsible for the biological activity. It is important to highlight that coumarins of those plants in associate with other present metabolites can help antioxidants activities and anticarcinogenic.

Citation Format:
Álvarez J, García M, Ordoñez L (2015) Phytochemical characterization of plants *Scutellaria incarnata* Vent and *Justicia pectoralis* Jacq. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S35. Abstract nr OC-17.

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OC-18: **PHYTOCHEMICAL AND PHARMACOLOGICAL STUDY OF *Salvia hispanica* L.**

Mendoza-Espinoza JA[1], Bañuelos-Hernández AE[2], Medina-Valdez M[1], Díaz de León-Sánchez F[2], Pérez-Flores LJ[2], Rivera-Cabrera F[2], Sierra-Palacios E[1].

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Introduction: Mexico is considered the second country in the world with the largest number of inventoried medicinal plants; however, there are pharmacological studies only for 4 % of them. In this context, a qualitative phytochemical study of the hexane, ethyl acetate and methanolic extracts of chia (*Salvia hispanica* L.) seeds was considered. **Material and Methods:** Quantitative phytochemical analysis and antioxidant capacity were determined on the methanolic extracts obtained from seeds and the aerial part of the chia plant. **Results and Conclusions:** The effect of *S. hispanica* seeds aqueous extract on Wistar rats weight gain was also analyzed. In the methanolic extract of *S. hispanica* seeds was found a low content of total flavonoids compared to the methanolic extract of the aerial part of the plant. The antioxidant capacity found in the methanolic extract of seeds and aerial parts is lower than the reported for coffee or green tea. The toxicity of the both parts extracts were assessed in brine shrimp (*Artemia salina* L.) nauplii showing a low lethal effect. Regarding to effects on the body mass and satiety, the Wistar rat *ad libitum* consumption of the extract did not produced significant changes compared to the control group that consumed water.

Citation Format:
Mendoza-Espinoza JA, Bañuelos-Hernández AE, Medina-Valdez M, Díaz de León-Sánchez F, Pérez-Flores LJ, Rivera-Cabrera F, Sierra-Palacios E (2015) Phytochemical and pharmacological study of *Salvia hispanica* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S36. Abstract nr OC-18.

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OC-19: **EVALUATION OF THE CONTENT OF VITAMIN C IN *Malpighia glaba* L. (ACEROLA)**

García CM, Martínez V, García L, Nogueira A, González ML, Rivera MM, Sánchez P, Rodríguez C, Díaz M.

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Introduction: To acerola (*Malpighia glaba* L.) have been attributed different therapeutic effects among which may be mentioned: as immunostimulant, detoxifying, mineralizing, among others, due to the high content of vitamin C in fruit. **Material and Methods:** The plant material was supplied by the Experimental Station of Medicinal Plants Dr. Juan Tomas Roig, while the aqueous extracts were prepared in the department of Pharmaceutical Technology, both belonging to CIDEM. In order to evaluate the content of vitamin C an analytical method was developed by High Performance Liquid Chromatography (HPLC) using a column LiChrosorb RP 18 (5 um) (250-4), a volume of injection of 20 uL, and a wavelength of 254 nm. The mobile phase consisted of a mixture of sodium heptanesulfonate: acetic acid: triethylamine. Validation parameters of specificity, accuracy, linearity, accuracy, detection and quantitation limits were determined. **Results:** The results obtained for every parameter evaluated, showed the reliability of the method developed and their applicability in controlling the quality and stability of the extracts. The specificity study demonstrated that the method could quantify vitamin C in the presence of the degradation products and other components of the extract; while in the precision study it became clear that there were no significant differences between the means and variances obtained by analysts on different days. **Conclusions:** The analytical method developed for the quantification of vitamin C in *Malpighia glaba* L. cultivar `miguel´, was specific, precise, linear, accurate in the range of concentrations studied, demonstrating its applicability in the quality control and stability study.

Citation Format:
García CM, Martínez V, García L, Nogueira A, González ML, Rivera MM, Sánchez P, Rodríguez C, Díaz M (2015) Evaluation of the content of vitamin C in *Malpighia glaba* L. (acerola). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S37. Abstract nr OC-19.

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OC-20: **STUDY OF PHYSICOCHEMICAL PARAMETERS OF DIFFERENT CULTIVARS OF *Mangifera indica* L. LEAVES FOR THEIR USE AS A SOURCE OF MANGIFERIN**

Romero JA[1], Vandama R[1], López M[1], Capote M[2], Ferradá C[1], Carballo C[1], Delgado R[1], Vanden Berghe W[3], Apers S[3].

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Introduction: The leaves of *M. indica* are used as a source of mangiferin for the pharmaceutical industry. The present study deals with the phytochemical and physicochemical evaluation of different varieties in order to identify the most suitable one. **Material and Methods:** The parameters included in this comparative study were extractable matter, mangiferin content, water content and total ash. In addition, the seasonal variation, storage and drying conditions were investigated. **Results:** ANOVA revealed a significant difference between the physicochemical parameters of the different cultivars. The Hierarchical Ascendant Classification divided the 29 cultivars into 4 clusters. For Super Haden cultivar during the stages of flowering, green fruit, ripe fruit and vegetative state, Mangiferin content was: 4.28 ± 0.86, 3.25 ± 0.03, 1.63 ± 0.11, 1.56 ± 0.12 respectively The storage results showed no statistically significant differences in mangiferin content among the different types of containers during a year. **Conclusions:** Of the 29 most economically important cultivars grown in Cuba, the Smith, Estero del Pinar, Super Haden, Chino rojo, Corazón, Santa Cruz and Reina de México varieties are those which combine a higher content of mangiferin with a lower extractable matter, so we consider these the most feasible varieties for use as a source for obtaining mangiferin for the pharmaceutical industry. The most optimal collection period includes the flowering and green fruit stages. Drying the plant material using a solar dryer and storage for one year in glass or polypropylene containers guarantees the retaining of all the physicochemical characteristics.

Citation Format:
Romero JA, Vandama R, López M, Capote M, Ferradá C, Carballo C, Delgado R, Vanden Berghe W, Apers S (2015) Study of physicochemical parameters of different cultivars of *Mangifera indica* L. leaves for their use as a source of mangiferin. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S38. Abstract nr OC-20.

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OC-21: **EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF *Maytenus elaeodendroides* GRISEB AND METABOLIC FINGERPRINT USING FIA/ESI/MS^N**

Spengler I[1], García T[1], Heredia E[2], Fernández A[1], Vilegas W[3], Suárez Y[1], Pérez C[1].

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Introduction: The species of the *Celastraceae* family have a long history in traditional medicine. In the past 30 years, a large number of secondary metabolites with a wide range of biological activity has been extracted from *Maytenus* genus, including flavonoids and pentacyclic triterpenes. Many plants of this sort are used in South America to prepare infusions or decoctions as anti-inflammatory remedies for oral and topical administration. **Material and Methods:** The n-hexane extract (rich in triterpenes) and ethyl acetate (rich in flavonoids and especially catechin derivatives) obtained from *Maytenus ilicifolia* leaves showed high antiinflammatory and antiulcer activity. Extracts of *M. ilicifolia* and *M. senegalensis* are used in several countries to formulate drugs for these purposes; in this study, we set aim to evaluate the anti-inflammatory activity ethyl acetate of the bark of endemic species *Maytenus elaeodendroides* Griseb and obtaining their metabolic fingerprinting using direct flow injection electrospray ionization tandem mass spectrometry (FID/ESI/MS^n). The dried ground plant material was extracted by maceration using diethyl ether/petroleum ether 1:1 and subsequently with ethanol. The ethanolic crude was dissolved in a hydroalcoholic solution and extracted with ethyl acetate. The anti-inflammatory activity assays were performed *in vivo* using the model of acute inflammation, ear edema. The metabolic fingerprint of the crude of ethyl acetate was obtained using a Thermo Finnigan LCQ Deca ion trap mass spectrometer (San Jose, CA, USA) equipped with an ESI interface. **Results and Conclusions**: The extract has anti-inflammatory activity and the metabolic fingerprint shows that the extract is rich in catechins derivatives and proanthocyanidins, some of which have novel structures.

Citation Format:
Spengler I, García T, Heredia E, Fernández A, Vilegas W, Suárez Y, Pérez C (2015) Evaluation of anti-inflammatory activity of *Maytenus elaeodendroides* Griseb and metabolic fingerprint using FIA/ESI/MS^N. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S39. Abstract nr OC-21.

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OC-22: **PHYTOCHEMICAL CHARACTERIZATION AND PRELIMINAR ANTINOCICEPTIVE ACTIVITY OF ETHANOLIC EXTRACT LEAVES OF *Clusia minor* L.**

Mangas R[1], Reynaldo G[1], Menéndez R[2], Montes de Oca R[3], Rodeiro I[2], Bello A, de Souza MM[4], Malheiros A[4].

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Introduction: The phytochemical studies of the genus *Clusia* (*Clusiaceae*) has demonstrated that constitute an important and rich source of metabolites secondaries. **Material and Methods**: In the present work we proposed the characterization of the principles compounds presented in the ethanolic extract leaves of *Clusia minor* L. by Gas Chromatography - Mass Spectrometry. **Results:** This analysis led the identification of nine compounds, principally, triterpenes, steroids and vitamin E. The most abundant compounds were γ-sitosterol (9.61%), mixture α-amyrin-lupeol (7.48%), vitamin E (6.62%) and β-amyrin (4.88%). Antinociceptive activity was evaluated using acetic acid-induced abdominal writhing (0.6%) and hot-plate tests. The acute oral administration of the extract (100, 150 and 300 mg/kg) increased significantly the number of abdominal contortions in the model employed to the all doses with 51, 67 and 32% of inhibition, respectively. In the hot-plate test only the higher dose tested have significant effect. **Conclusions:** These results show that the extract has antinociceptive effect and that this effect could be produced by inhibition of nociception of inflammatory origin or related directly with the stimulation of the afferents fibers where is not directly related to an inflammatory process. This effect could be attributed to the presence of the identified compounds, because some of them have described anti-inflammatory and antinociceptive activities. However, other components in the extract can contribute to this pharmacological activity.

Citation Format:
Mangas R, Reynaldo G, Menéndez R, Montes de Oca R, Rodeiro I, Bello A, de Souza MM, Malheiros A (2015) Phytochemical characterization and preliminar antinociceptive activity of ethanolic extract leaves of *Clusia minor* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S40. Abstract nr OC-22.

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OC-23: **PHYTOCHEMICAL STUDY OF *Croton linearis* JACQ. LEAVES**

García J[1], Escalona JC[1], do Carvallo MG[2], de la Vega J[3], Rojas J[4], Machado R[4].

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Introduction: Cuban population to treat the fever usually uses leaves from *Croton linearis* Jacq., but there is almost no information about this plant; that's why in the present work we accomplish a phytochemical study of *C. linearis* leaves. **Material and Methods**: By hydrodistillation-cohobation method, the essential oils were extracted to be characterized by Gas Chromatography - Mass Spectrometry. The non volatile compounds were separated by thin layer chromatography and colum chromatography. The isolated compounds were characterized by Nuclear Magnetic Resonance 1D (^{1}H and ^{13}C NMR), 2D (^{1}H–H COSY, HMQC and HMBC); UV-visible spectroscopy and Mass Spectrometry. **Results:** Essential oil extraction yield 1.6% being identified 82 compounds with guaiol (7.93%), eudesma-4(15),7-dien-1β-ol (4.94%), guaia-3,10(14)-dien-11-ol (4.52%), selin-4(15),7(11)-diene (4.19%) y el β-elemene (4.13%) as the main constituents. Additionally, seven metabolites were identified as 5-hydroxy-3,7,4′-trimethoxyflavone, tetracosane, hexacosan-1-ol, 2-methyl-2-docosanol, as well as the acids oleic, stearic and the 5,8-dien-tetradecanoic. **Conclusions:** A total of 89 new compounds for this plant was reported, giving it a great pharmacological potentiality.

Citation Format:
García J, Escalona JC, do Carvallo MG, de la Vega J, Rojas J, Machado R (2015) Phytochemical study of *Croton linearis* Jacq. leaves. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S41. Abstract nr OC-23.

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OC-82: *Prosthechea karwinskii*, EXTRACTION METHODS AND THEIR ANTIOXIDANT COMPOUNDS

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Introduction: Orchids are appreciated for their ornamental value and traditional uses, and in many indigenous communities, they comprise part of a biocultural heritage. The orchid *Prosthechea karwinskii* is endemic to Southern Mexico where it grows as an epiphyte in oak or pine-oak forests. This plant has showy yellow flowers with a very pleasant aroma; it is particularly relevant because their medicinal and other traditional uses given by indigenous peoples, showing a promising future for ethnopharmacological research for this species. The goals of this study were 1) to identify antioxidant molecules present in phenolic extracts from *P. karwinskii*, and 2) evaluate the antioxidant activity and to known the phenols content of this species. **Material and Methods**: The phenolic fraction was obtained from dried seudobulbs and leaves of *P. karwinskii* using an extraction method with subcritical water. The antioxidant activity was evaluated by DPPH radical scavenging assay; total phenols ware quantified by a modified method of Folin-Ciocalteu, and detection of phenolic compounds by HPLC-DAD. **Results:** The AAI and IC_{50} for *P. karwinskii* extracts were higher in comparison with values reported for other orchids. The total phenols content in the extract was 370 mg/g. There were identified seventeen phenolic compounds in the extract; the phenols with the highest concentration were hydroxytyrosol, tyrosol, peonidin, apigenin, and delfinidin; all they are compounds well known by their antioxidant properties. **Conclusions:** The compounds detected in this study reveal a promising potential of this species in the pharmaceutical, food, cosmetic, and perfume industries.

Citation Format:
Lagunez-Rivera L, Solano-Gómez R, Rojas-Olivos A (2015) *Prosthechea karwinskii*, extraction methods and their antioxidant compounds. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S42. Abstract nr OC-82.

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SYMPOSIUM 4: NATURAL ANTI-INFECTIOUS PRODUCTS

OC-24: **INHIBITION OF *Helicobacter pylori* BY *Parthenium hysterophorus* EXTRACTS**

Espinosa-Rivero J[1], Durán D[1], Rendón-Huerta E[2], Romero I[1].

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Introduction: *Parthenium hysterophorus* is a medicinal plant used to treat gastrointestinal disorders. *Helicobacter pylori* infects 50% of the world's population and has been described as the etiological agent of gastritis, peptic ulcer, as well as gastric adenocarcinoma. The current therapy fails due to the antibiotic resistance; therefore, it is necessary to find new approaches to control *H. pylori* infection, either by its eradication or by preventing the bacterial colonization. This study investigates the effect of *P. hysterophorus* extracts on *H. pylori* growth and upon its colonization-related factors. **Methods:** Five different polarity extracts from roots and aerial parts were evaluated against *H. pylori* growth by the broth dilution method. Anti-colonization activities: motility in soft agar plates, urease activity by ammonia colorimetrical quantification, and adherence of FITC labeled *H. pylori* to AGS cells by fluorometrical measurement. **Results:** Organic extracts inhibited *H. pylori* growth. The dichloromethane extract from roots showed a MIC of 15.6 µg/mL while the aqueous extracts showed null activity. There is a direct correlation between antibacterial activity and motility inhibition. Urease activity was partially inhibited by organic extracts, at best 46%, except for the roots dichloromethane extract, which reached 74% of inhibition with 500 µg/mL. Plant extracts inhibited adherence in different ranges but the dichloromethane-methanol ones possessed the highest effect (70% inhibition at 1 mg/mL). **Conclusions:** *P. hysterophorus* extracts have various biological activities that could act synergistically against *H. pylori*. This work contributes to the ethnomedical knowledge of this species and underlines the potential of some organic extracts as a good source for the isolation of bioactive compounds.

Citation Format:
Espinosa-Rivero J, Durán D, Rendón-Huerta E, Romero I (2015) Inhibition of *Helicobacter pylori* by *Parthenium hysterophorus* extracts. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S43. Abstract nr OC-24.

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OC-25: **ANTIVIRAL ACTIVITY AND QUALITATIVE CHEMICAL COMPOSITION OF THE CUBAN PLANT *Ageratina havamensis* (KUNTH) R. M. KING & H. ROBINSON**

García TH[1], Quintino da Rocha C[4], Dias MJ[4], Pino L[1], del Barrio G[2], Roque A[2], Pérez CE[1], Campaner dos Santos L[3], Spengler I[1], Vilegas W[4].

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[4]Campus Experimental del Litoral Paulista, Universidad Estadual de São Paulo, São Vicente, São Paulo, Brasil.

Introduction: The flowers and leaves of *Ageratina havanensis* (Kunth) R. M. King & H. Robinson are traditionally used as a tea to cure several diseases. The production of active secondary metabolites can be affected by several environmental factors such as climate, altitude, phonological status and other conditions that may influence the growth of plants. In this sense, the development of a methodology to compare chemical composition of plant extracts is a needed. **Methods:** The cytotoxic effects of extracts in reproductive seasons on Vero cells were determined by the MTT colorimetric assay, as previously described. The influence of *A. havanensis* extract on cell viability was indirectly measured as a function of the ability of mitocondrial enzymes (active in viable cells) to convert MTT in a purple solid formazan precipitate. The antiviral activity of the extracts at noncytotoxic concentrations was assessed by measuring its protective effects on infected Vero cells. SI values greater than 2 were considered indicative of specific antiviral activity. The qualitative chemical composition of the plant collected in both reproductive and non-reproductive season was determinated by flow injection analysis-electrospray ionization-ion trap tandem mass spectrometry (FIA-ESI-IT-MS^n) and ultra high-performance liquid chromatography coupled to electrospray positive ionization-ion trap mass spectrometry (UPLC/ESI-MS^n). **Results:** The ethyl acetate extract was the most active and the qualitative chemical composition of the extracts of the plant collected in flowering and non-reproductive seasons was very similar. Because of this, it can be expected that the extracts of the plant collected in non-reproductive season have antiviral activity. **Conclusions:** The antiviral activity of *Ageratina havanensis* is related to the presence of the flavonoids isolated previously and their synergic effect on the antiviral activity.

Citation Format:
García TH, Quintino da Rocha C, Dias MJ, Pino L, del Barrio G, Roque A, Pérez CE, Campaner dos Santos L, Spengler I, Vilegas W (2015) Antiviral activity and qualitative chemical composition of the Cuban plant *Ageratina havamensis* (Kunth) R. M. King & H. Robinson. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S44. Abstract nr OC-25.

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OC-26: **OLEOZON IN THE TREATMENT OF *Giardia lamblia* IN CHILDHOOD**

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Introduction: Giardiasis is one of the most common infections produced by intestinal protozoans worlwide. It provokes serious health problems due to the quantity of symptoms that accompany the infection. Due to the adverse effects and the treatment failure with some medicines is recommended the use of natural products such as ozoneficated girasol oil (OLEOZON), because of its extraordinary germicidal action. **Methods:** For that reason, and taking into consideration these aspects, we did a clinic controlled study (quasi-experimental) with the objective to evaluate to the effectiveness of oral OLEOZON in the treatment of *Giardia lamblia* in children attended the pediatric interconsult in the Policlinic Julián Grimau in Santiago de Cuba during the period from January to December 2014. The universe was constituted by 58 patients (cases and controls) with the diagnosis of giardiasis, which present as main symptoms abdominal pain, vomit and anorexia. The results were statistically validated by SSPS version 11.5. **Results**: The main results revealed were that the major number of patients showed a relief concerning the abdominal pain and in general, the symptomatology decrease, furthermore the treatment result less expensive and without adverse reactions reported. There is also a positive impact from the economical, social and environmental point of view. **Conclusions**: OLEOZON proved to be an effective therapeutic for the treatment *Giardia lamblia* in childhood.

Citation Format:
Herrero H, Casas S, Ramos L, Gross C (2015) OLEOZON in the treatment of *Giardia lamblia* in childhood. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S45. Abstract nr OC-26.

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OC-27: **VIRUCIDAL ACTION OF AN EXTRACT OF *Punica granatum* L. ON THE STRUCTURAL PROTEINS OF THE INFLUENZA VIRUS**

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Introduction: An extract prepared with the fruit of *Punica granatum* L. (grenade) showed a virucidal effect *in vitro*, against Influenzavirus A strains. The objective of this investigation was to elucidate the anti-influenza mechanism of the grenade extract. **Material and Methods**: Influenza A strains, subtypes (H_3N_2) and (H_1N_1), 8u Hemaglutinating and 100 Embryo Infectious Dose 50 (EID_{50}), concentrated by ultracentrifugation and previously clarified to 10,000 rpm. Subsequently the samples were mixed, volume/volume, with a solution of the extract for a final concentration of 2 mg/mL. Each mixture and its respective controls were incubated during one hour to 25°C and 37°C, respectively. The infective and the hemaglutinating titles of each treatment were determined and an electrophoresis (SDS - PAGE) for total proteins was carried out. The SDS - PAGE were studied by densitometry and the molecular weights to the bands of interest were calculated. **Results**: Alterations did not take place in the electrophoretic profile of the constituent proteins of the influenzavirus in the treated samples and its controls; this was corroborated through the corresponding densitometry measurements and the data of their estimated molecular weights for the proteins of interest. However, the direct treatment with the extract, modified the biological behavior of the virus, by reducing the infectivity of the virion, expressed in the decrease of two logarithms or more than the EID_{50} in the treated viral samples. **Conclusions**: The extract produces a steric impediment in the hemaglutinin of the Influenzavirus, without varying its electrophoretic profile, which explains the confirmed antiviral action.

Citation Format:
Peña BR, Duménigo A, Martínez I (2015) Virucidal action of an extract of *Punica granatum* L. on the structural proteins of the influenza virus. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S46. Abstract nr OC-27.

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OC-28: **ANTI-PLASMODIAL ACTIVITY OF *Parthenium hysterophorus* L. LACTONES**

Fernández-Calienes A[1], **Fraga J[1]**, Mendiola J[1], Scull R[2], Morier L[1], Linares R[1], Mendoza D[1], Cuéllar A[2].

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Introduction: Previous studies compilate information about plant species with reports of antimalarial use in Cuba and demonstrate antiplasmodial activity of crude extracts from *Parthenium hysterophorus* L. This plant produces a wide variety of sesquiterpenoid lactones, between them, parthenin. This lactone showed activity against *Plasmodium faciparum*. The purpose of this study was to evaluate antiplasmodial activity of lactones rich-extracts from root and aerial part of *P. hysterophorus*. **Methods:** Four extracts were prepared, two lactones rich-extracts from root and aerial part and one fraction without lactones each. Extracts activity evaluated *in vitro* against *P. berghei* and citotoxicity against human fibroblast MRC-5 was determined. The most selective extract was evaluated *in vivo* in a murine model. **Results:** Both lactones rich-extracts showed 50% of *P. berghei* schizogony development inhibition at 100 µg/mL (aerial part 23.2 µg/mL and root 55.4 µg/mL), whereas, fractions "without lactones" were inactives to that concentration. Root lactones rich-extract showed the highest selectivity index (IS = 3.1) although the value could be considered as mild. Intraperitoneal treatment with root lactones rich-extract of *P. hysterophorus* was no toxic to animals. It caused parasitemia significative reduction in mice treated with 1000 mg/kg. **Conclusions:** These results reaffirm antiplasmodial action of *P. hysterophorus* root and show lactones implication on this activity.

Citation Format:
Fernández-Calienes A, Fraga J, Mendiola J, Scull R, Morier L, Linares R, Mendoza D, Cuéllar A (2015) Anti-plasmodial activity of *Parthenium hysterophorus* L. lactones. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S47. Abstract nr OC-28.

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OC-29: **ANTIMALARIAL USE VALIDATION OF PLANT SPECIES IN CUBA**

Fernández-Calienes A[1], Fraga J[1], Mendiola J[1], Scull R[2], Cuéllar A[2], Bécquer E[3], Herrera PP[4].

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Introduction: Malaria is the main parasitic disease causing high mortality and morbidity each year. Parasite resistance to current drugs threats malaria control. Based on traditional use and ethnomedical data, quina alkaloids and artemisinin were discovered in the past. Important ethnobotanical studies reveal traditional malaria treatments performed in Cuba before the disease eradication. This work is an attempt to become available a list of plants used empirically to combat malaria in Cuba, to summarise published data regarding the demonstration of their antimalarial activity and to identify natives species with antiplasmodial activity. **Methods:** A non-experimental validation of ethnomedical practices was aimed to point out traditional and probably effective treatments; three levels of validation were established: 1) for Cuban use only; 2) for uses recorded in other countries and 3) for positive antimalarial test. Antiplasmodial activity of 31 ethanolic extract was tested *in vitro* against *Plasmodium berghei*. **Results:** The use of 63 plant species for malaria, intermittent fevers and as quinine substitute were identify. Most represented family was Asteraceae, the majority of species were natives but only four were endemics. Decoction of leaves was the most frequent mode of remedy preparation and higher number of species was used in Eastern Cuba. Similar uses in other countries and/or positive screening against malaria parasites were reported for 36 of the 63 species. The medicinal use of 24 species possesses level 3 of non-experimental validation. Twenty-two extracts from 19 species (13 with level 3, 1 with level 2 and 5 with level 1) exhibited schizonts formation inhibition values upper than 50% at 100 µg/mL. Native species *Baccharis halimifolia, Colubrina arborescens, Koanophyllon villosum, Oxandra lanceolata* and *Scutellaria havanensis* demonstrated antiplasmodial activity for first time worldwide. **Conclusions:** Non-experimental validation and preliminary antiplasmodial test results substantiated the antimalarial use in Cuba for 30 plant species.

Citation Format:
Fernández-Calienes A, Fraga J, Mendiola J, Scull R, Cuéllar A, Bécquer E, Herrera PP (2015) Antimalarial use validation of plant species in Cuba. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S48. Abstract nr OC-29.

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OC-30: **POTENTIALITIES OF EXTRACTS FROM *Solanaceae* FAMILY AGAINST *Leishmania amazonensis***

Monzote L, Cuesta-Rubio O, Jimenez J, Quintino C, Márquez I, Gutiérrez Y, Wagner V.

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Introduction: Leishmaniasis is a disease caused by vector-borne protozoan parasites of the genus *Leishmania*. There is no human vaccine available and control disease relies mainly on treatment. Nevertheless, available drugs are toxic, expensive and not useful against all forms of disease. Therefore, urgent need for novel, effective, and safe drugs for treatment of leishmaniasis continue. Potentialities of plant derived-products have been extensive demonstrated against *Leishmania* parasite. In this study, we perform an *in vitro* assessment of 226 extracts of 12 genus and 46 species from family *Solanaceae* growing in Cuba and *in vivo* evaluation of promissory extracts. Metabolities profile was also determined. **Material and Methods:** Evaluation against promastigotes and intracellular amastigotes of *L. amazonensis* were performed; while cytotoxicity on peritoneal macrophage from BALB/c mice was also determined. Promissory extracts were tested on *in vivo* model of cutaneous leishmaniasis in Balb/c mice, which five doses were administer at 30 mg/kg every 4 days by intralesional route. A comparison of chemical profile of active extracts and probably bioactive constituents responsible of anti-leishmanial activity were also performed. **Results:** Eleven extracts (27.5%) from nine plants were selected as potential products in *in vitro* assay; while in animal model only *Solanum havanense* and *S. myriacanthum* were able to control diseases progression. Six compounds were identified from potential extracts. **Conclusions:** The results demonstrated the versatility of family *Solanaceae* and introduce preliminary pharmacological assay to motivate scientific community the searching of new anti-leishmanial agents in non-explore species of this family.

Citation Format:
Monzote L, Cuesta-Rubio O, Jimenez J, Quintino C, Márquez I, Gutiérrez Y, Wagner V (2015) Potentialities of extracts from *Solanaceae* family against *Leishmania amazonensis*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S49. Abstract nr OC-30.

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OC-31: **INTERFACIAL AND ANTIMICROBIAL PROPERTIES OF THE EXOGENOUS PORCINE SURFACTANT MIXED WITH DRUGS USED IN RESPIRATORY CLINICS**

Blanco O[1], Pérez R[1], Espinosa I[1], Lugones Y[1], Morilla A[2], Faure R[1].

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Introduction: The excellent spreading properties of pulmonary surfactant suggest that the exogenous surfactant could be used as a drug delivery system to the alveolar compartment of the lung in the treatment of several lung diseases. However, it is vital that drugs delivered via lungs did not interfere with the pulmonary surfactant lining layer surface activity. The aim of this study was to evaluate the *in vitro* effect of N-acetylcysteine, hydrocortisone and antibiotics on the surfactant biophysical properties of Surfacen® (clinical pulmonary surfactant). **Methods**: The interfacial property of porcine lipid extract, Surfacen®, was evaluated *in vitro* by Langmuir balance. Measurements were obtained before and after the addition of a low and high concentration of drugs. In parallel, it was researched if Surfacen® affected the antibacterial activity of some antibiotic (amikacin, ampicillin, cefotaxime), by the time–kill studies of *Escherichia coli* and *Staphylococcus aureus*. **Results and Conclusions**: Drugs had no a significant effect on spreading kinetics of Surfacen®. Surfacen® interfered with amikacin activity in both *E. coli* and S. *aureus*. In contrast to the amikacin, the antibiotic activity of cefotaxime and ampicillin was not affect *in vitro* by the presence of Surfacen®. Future directions involve researches of these combinations in animal respiratory models.

Citation Format:
Blanco O, Pérez R, Espinosa I, Lugones Y, Morilla A, Faure R (2015) Interfacial and antimicrobial properties of the exogenous porcine surfactant mixed with drugs used in respiratory clinics. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S50. Abstract nr OC-31.

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OC-32: **CUBAN JOURNAL OF MEDICINAL PLANTS: PRESENT AND FUTURE**

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Introduction: Cuban Journal of Medicinal Plants (RCPM, according abbreviation in Spanish) founded in 1996, provides to professionals related with medicinal plants the possibility to publish the results of their investigations. RCPM aims are create the necessary scientific evidence in this topic and contribute to disease prevention and improve the quality of life. The aims of this work are to analyze RCPM over the past five years. **Methods:** All issues published in the last five years were reviewed. Was analyzed the main data of the journal, most published authors, countries, topics and scientific production. Data were analyzed with an Access database. **Results:** In 2014, 51 articles were published. Cubans are the most published authors followed by Colombia and Brazil. Topic with the highest number of publications was Pharmacology. Until June 2015, average of citations per article during two years was 3.0 and h-index was 17. **Conclusions:** Results demonstrate the importance of RCPM, should increase the visibility and the number of citations per article.

Citation Format:
Martínez I, García AI (2015) Cuban Journal of Medicinal Plants: present and future. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S51. Abstract nr OC-32.

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SYMPOSIUM 5: PHARMACOLOGICAL RELEVANCE OF NATURAL ANTIOXIDANTS

OC-34: THE EFFECTS OF ALIBERNET RED WINE EXTRACT ON NITRIC OXIDE AND REACTIVE OXYGEN SPECIES PRODUCTION IN SPONTANEOUSLY HYPERTENSIVE RATS

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Introduction: Red wine is a rich source of biologically active phytochemicals, chemicals found in plants. Particular compounds called polyphenols found in red wine are thought to have antioxidant and antihypertensive properties. We aimed to perform a chemical analysis of an alcohol free Alibernet red wine extract (AWE) and to investigate the effects of AWE on nitric oxide and reactive oxygen species production as well as blood pressure development in normotensive Wistar Kyoto (WKY) and spontaneously hypertensive rats (SHR). **Methods:** Total antioxidant capacity together with total phenolic and selected mineral content were measured in AWE. Furthermore, young 6-week-old male WKY and SHR were treated with AWE (24.2 mg/kg/day) for 3 weeks. Total NOS and SOD activities, eNOS and SOD1 protein expressions and superoxide production were determined in the tissues. **Results:** Both antioxidant capacity and phenolic content were found to have a high level in AWE. From the minerals Zn, Mg and Ca reached an important level. The AWE increased NOS activity in the left ventricle, aorta and kidney of SHR, while it did not change NOS activity in WKY rats. Similarly, increased SOD activity in the plasma and left ventricle was observed in SHR only. There, however, were no changes in eNOS and SOD1 expressions. **Conclusions:** Phenolics and minerals presented in AWE extract, and zinc especially, may contribute directly to increased NOS and SOD activities in the tissues of spontaneously hypertensive rats. Nevertheless, three weeks of AWE treatment failed to affect blood pressure of SHR yet.

Citation Format:
Pechanova O, Kovacsova M, Klimentova J, Barta A, Matuskova Z, Rehakova R, Cebova M (2015) The effects of Alibernet red wine extract on nitric oxide and reactive oxygen species production in spontaneously hypertensive rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S52. Abstract nr OC-34.

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OC-35: **EVALUATION OF OXIDATIVE STRESS EXPERIMENTAL MODEL AND TOXICITY OF THE SEED OIL EXTRACT *Carapa guianensis* AUBLET**

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E-mail: darencibia@orasen.co.cu
[2]Institute of Pharmacy and Food Science (IFAL). 222 Street between 25 and 27, Lisa, Havana, Cuba.
[3]Havana University, Faculty of Biology. 25 avenue between J and I street. Havana, Cuba.

Introduction: The majoritarian presence of polyunsaturated fatty acids and phenolic compounds in the extract oil from the seed of *Carapa guianensis* Aublet could confer a powerful antioxidant effect. **Methods:** In this work the antioxidant effect of the extract on *in vivo* model of oxidative stress induction with cyclophosphamide (CF) in SD rats of both sexes administered orally for 21 days was evaluated. It was also evaluated the oral toxicity of the extract in acute study, mutagenesis and genotoxicity tests *in vitro* and *in vivo*. **Results:** The extract maintained the basal levels of antioxidant enzymes and markers of damage to biomolecules co-administered with CF (50 mg/kg intraperitoneally) at a dose of 400 mg/kg, also at this dose there was an imbalance in the water and food intake, body weight, hematology and blood chemistry. Non-systemic damages were observed when administered in a single dose of 2000 mg/kg in SD rats in classes' method acute toxicity test. In the Ames test, the extract did not cytotoxic and mutagenic. In the *in vitro* test for chromosomal aberrations, it was not observed cells with increased chromosomal aberrations (structural and numerical) and not modified the mitotic index and number of polyploidy cells. On the comet assay of peripheral blood lymphocytes (SD rats), chromosomal aberrations, micronuclei and sperm head morphology assay performed in BALB/c mice did not genotoxic, but the dose of 2000 mg/kg administered orally for 35 days was cytotoxic in male germ cells. **Conclusions:** The preclinical results obtained indicate that this extract is antioxidant, also non-toxic systemically and is not mutagenic nor genotoxic according to the tests performed.

Citation Format:
Arencibia DF, Narciandi J, Rosario LA, Vidal A (2015) Evaluation of oxidative stress experimental model and toxicity of the seed oil extract *Carapa guianensis* Aublet. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S53. Abstract nr OC-35.

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OC-36: **TOTAL PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF *Eugenia clarensis* (BRITTON & P.WILSON), AN ENDEMIC CUBAN PLANT**

Siverio-Mota D, Coba-Sánchez Y, Nguyen N, Vicet-Muro L, Jorge-Rodríguez ME, Sueiro-Oyarzun ML, González-Mosquera D, Herrera-Pis Y.

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Introduction: Antioxidant compounds can be useful to prevent several degenerative diseases or as preservative in food and cosmetic. Species of the *Myrtaceae* family are able to accumulate phenolic substances and those are closely related to the antioxidant activity due to their capacity to scavenge free radicals, chelate metals and protect against lipid peroxidation. **Purpose**: to investigate the total phenolic content and antioxidant capacity of ethanol, methanol and ethyl acetate extracts of the leaves of *Eugenia clarensis* (Britton & P.Wilson) an endemic plant to Villa Clara, Cuba. **Methods:** phenol and flavonoid content were determined by Folin Ciocalteu and $AlCl_3$ reagent, respectively. The antioxidant activity of extracts were evaluated by employing various *in vitro* antioxidant assay: 1,1-diphenyl-2-picrylhydrazyl free radical scavenging (DPPH), total antioxidant activity determination by phosphomolybdenum method, ferric ion reducing antioxidant power (FRAP) and lipid peroxidation of linoleic acid emulsion by ferric thiocyanate (FTC) and thiobarbituric acid (TBA) methods. **Results:** Ethanol extract showed the higher content of phenol and flavonoids with 246.44 mg equivalent to gallic acid/g of extract and 156.60 mg equivalent to rutin/g of extract, respectively. In addition, the ethanol extract exhibited the better result in DPPH method antioxidant (IC_{50}=41.53 µg/mL) with strong antioxidant activities related to the standard BHT. Total antioxidant activity determination by ferric thiocyanate and FRAP assays showed the better result to ethanol extract too. The inhibitory action by FTC and TBA method determined the antioxidant capacity of ethanol extract. **Conclusions:** this study showed, for first time, the powerful antioxidant activity of *Eugenia clarensis* and demonstrated the potential benefits of specie on different diseases relative with oxidative stress.

Citation Format:
Siverio-Mota D, Coba-Sánchez Y, Nguyen N, Vicet-Muro L, Jorge-Rodríguez ME, Sueiro-Oyarzun ML, González-Mosquera D, Herrera-Pis Y (2015) Total phenolic content and antioxidant activity of *Eugenia clarensis* (Britton & P.Wilson), an endemic Cuban plant. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S54. Abstract nr OC-36.

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OC-37: **ANTIOXIDANT THERAPY IN HUMAN IMMUNO-DEFICIENCY VIRUS–INFECTION**

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Oxidative stress (OS) may play an important role as cofactor in human immunodeficiency virus (HIV) pathogenesis. In populations of HIV-infected patients treated with highly active antiretroviral therapy HAART, the role of OS in disease progression has become more complicated. Whereas HIV itself increases OS levels through replication, control of the virus with HAART may not, as one might expect, reduce oxidative damage levels, as the medications themselves may increase OS. HIV infected individuals is known to be deficient in antioxidant micronutrients that exacerbates de redox status. Antioxidant supplementation may be beneficial in minimizing the co-morbidities associated with these infection, it progression and treatment. The combinations for antioxidants supplementation are diverse as much as controversial the results for efficacy. The option for its use could be an alternative that seeks to both suppresses HIV and restore immune functions with least toxic side effects. At the actual date of HAART´ era we propose the revision about knowledge of oxidative molecular mechanisms involved in disease progression and the use of antioxidants in HIV-seropositive patients with and without HAART.

Citation Format:
Gil L, Gravier R, Tarinas A, Martínez G, León OS (2015) Antioxidant therapy in human immunodeficiency virus–infection. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S55. Abstract nr OC-37.

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OC-38: **EFFECTS OF VIMANG SUPPLEMENTATION IN ANTIRETROVIRAL-NAÏVE HIV/AIDS PATIENTS**

Gil L[1], Martínez G[2], González I[2], Tarinas A[1], Álvarez A[1], Giuliani A[3], Molina R[1], Robaina M[4], Tápanes R[1], Pérez J[1], Guevara M[5], Sellés A[5].

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Introduction: It is previous reported that HIV populations are deficient in antioxidant system and *in vitro* HIV replication and depletion of CD4+ T lymphocytes are increased with oxidative stress. The general strategy and combination of micronutrient supplementation as a cost-effective strategy for improving oxidative and nutritional status in HIV infection represent an important complementary deal for treatment in the era of high active antiretroviral therapy. This study assessed the effect of antioxidant extract of *Mangifera indica* (Vimang) on redox indicators and progression markers of disease. Also toxicological safety was evaluated. **Methods:** Eighty-two HIV-positive patients were randomized in double-blind clinical trial phase 2 to receive supplements of Vimang or placebo, for 6 months. Plasma antioxidants status (TAS), peroxidation potential (PP) glutathione (GSH), malondialdehyde (MDA), plasma total hydroperoxides (TH), superoxide disumutase (SOD), glutathione peroxidase (GPx), percent of DNA fragmentation (%DNA), CD4, CD38, CD95 lymphocytes subsets and hematological, renal and hepatic indexes were measured at baseline and at 6 months. **Results:** The supplemented group (n=42) had an increase in plasma TAS ($p<0.01$), GSH ($p<0.05$) and GPx ($p<0.01$) and a reduction in PP ($p<0.01$), MDA ($p<0.01$), TH ($p<0.01$), %DNA ($p<0.01$) and SOD ($p<0.01$) when compared with placebo group (n=40). There was also a trend towards a reduction in CD95 receptor (mean ± SD changes over 6 month - 6.12 ± 2.30 *vs.* - 13.47 ± 3.31 % $p=0.08$. **Conclusions:** Supplements of Vimang reduce oxidative stress in HIV with a stabilization of CD4+ T lymphocyte relative count. No significant change ($p>0.05$) was noted related to micronutrient intake, renal, hematological and hepatic indexes. Vimang® antioxidant beneficial effect was found without toxically influences in the 6 months period in HIV studied patients. This is worthy of larger clinical trials; especially both in HIV-positive infected persons who cannot afford antiviral therapies and those with them.

Citation Format:
Gil L, Martínez G, González I, Tarinas A, Álvarez A, Giuliani A, Molina R, Robaina M, Tápanes R, Pérez J, Guevara M, Sellés A (2015) Effects of Vimang supplementation in antiretroviral-Naïve HIV/AIDS patients. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S56. Abstract nr OC-38.

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OC-39: **MANGIFERIN: THE CHALLENGE OF TRANSFORM A NATURAL ANTIOXIDANT WITH AN EXCELENT PRECLINICAL PHARMACOLOGICAL PROFILE IN NEW PHARMACEUTICAL PRODUCTS**

Delgado R[1], Garrido B[1], Hernández I[2], Rodeiro I[2], Romero JA[1], Rodríguez JC[1], Quiñones OL[1], Acosta J[3], Nuevas L[1], Salomón S[1], Rodríguez C[1], Haegeman G[4], Vanden Berghe W[5].

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Mangiferin (M) is a very interesting glucosilxanthone, which has been known for its antioxidant, immunomodulatory, antitumoral and anti-inflammatory actions. Precedent investigations showed the results of studies realized with an extract obtained from stem bark and leaves of *Mangifera indica* L. were mangiferin represent the major bioactive component. In general, mangiferin as active ingredient in Vimang extract and in others natural extract or as compound isolated from different sources, represent an important natural compound with potentialities for pharmaceutical formulations against cancer and anti-inflammatory actions. We studies have demonstrated that mangiferin as a natural xanthone present antiangiogenic activities and these properties could be pharmacological relevant for its use of treatment of some tumors where neovascularization result essentially for the development of the malignance process. Our projects have been orientated for to future development of new phytopharmaceutical drug with mangiferin as active ingredient in different pharmaceutical formulations. **Financial Support:** VLIR UOS programme Nr. ZEIN2011PR383 and a National project of CIDEM.

Citation Format:

Delgado R, Garrido B, Hernández I, Rodeiro I, Romero JA, Rodríguez JC, Quiñones OL, Acosta J, Nuevas L, Salomón S, Rodríguez C, Haegeman G, Vanden Berghe W (2015) Mangiferin: the challenge of transform a natural antioxidant with an excelent preclinical pharmacological profile in new pharmaceutical products. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S57. Abstract nr OC-39.

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SYMPOSIUM 6: PHARMACOLOGICAL EVALUATION AND THERAPEUTIC POTENTIALITIES OF NATURAL PRODUCTS IN CANCER TREATMENT

OC-40: *In vivo* ANTITUMOR ACTIVITY OF MANGIFERIN IN MURINE COLON CARCINOMA

Rodríguez-González JC[1], Hernández-Balmaseda I[2], Quiñones-Maza OL[1], Merino N[1], Aparicio-López G[1], Valdés-Martínez O[1], Valentín-Quiñones N[1], Gabilondo-Ramírez T[1], Limonta-Ávalo R[1], Rodeiro-Guerra I[2], Beck Ilse M[3], Wagemans G[3], De Wever O[3], Vanden Berghe W[4], Delgado-Hernández R[1].

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Introduction: Colorectal cancer has high mortality due to recurrent and metastatic disease. Chemotherapy is the most commonly used therapy in these cases but is not effective enough and is limited by their adverse effects and chemoresistance. Natural products are important sources of antitumor compounds. Mangiferin, a natural antioxidant glucosylxanthone, has different pharmacological properties and its anticancer potential is just beginning to be elucidated. **Objective**: To evaluate the *in vivo* antitumor activity of mangiferin in CT-26.WT murine colon carcinoma syngeneic tumor models. **Methods**: Three syngeneic models ectopic/subcutaneous allograf, induced lung metastasis and tumor angiogenesis in matrigel plugs were performed. Target gene specific expression analysis by quantitative PCR assay was accomplished. **Results**: The antitumor and antimetastatic effect was positively correlated with increasing concentration of mangiferin, achieving the greatest effect at 100 mg/kg. In the tumor angiogenesis model, macroscopic observation showed a reduction of blood supply and tumor size, and a significant reduction in hemoglobin content into matrigel plugs was obtained by quantitative analysis at both concentration of mangiferin evaluated (100 and 200 ug/mL). The antiangiogenic effect had significantly impact on decreasing weight and tumor volume. Histological analysis revealed a decreased number of blood vessels. **Conclusions**: Mangiferin holds promise as an effective antitumor agent by triggering antimetastatic and antiangiogenic effects. **Financial Support:** VLIR UOS programme Nr. ZEIN2011PR383, Belgium and from Project of Cuban Ministry of Health nr. 1401049.

Citation Format:
Rodríguez-González JC, Hernández-Balmaseda I, Quiñones-Maza OL, Merino N, Aparicio-López G, Valdés-Martínez O, Valentín-Quiñones N, Gabilondo-Ramírez T, Limonta-Ávalo R, Rodeiro-Guerra I, Beck Ilse M, Wagemans G, De Wever O, Vanden Berghe W, Delgado-Hernández R (2015) *In vivo* antitumor activity of mangiferin in murine colon carcinoma. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S58. Abstract nr OC-40.

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OC-41: MANGIFERIN POTENTIATES PLATIN AND 5-FLUOROURACIL INDUCED CELL DEATH IN SIMPLE AND COMBINATION ANTINEOPLASTIC TREATMENTS IN CT26.WT CELLS

Rodríguez-González JC[1], **Quiñones-Maza OL[1]**, Hernández-Balmaseda I[2], Valentín-Quiñones N[1], Rodeiro-Guerra I[2], Delgado-Hernández R[1].

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Introduction: Mangiferin inhibits NF-kB, which is constitutively activated in cancer and is induced in response to chemotherapy and radiotherapy. Agent inhibitors of NFκB function might be considered as an adjuvant approach in combination with chemotherapy. **Objective**: To evaluate the chemosensitizer adjuvant effect *in vitro* of mangiferin in cotreatments with antineoplastic platinum and 5-fluorouracil. **Methods**: Mangiferin (1-200 µg/mL) was used in simple and combination (sequential and simultaneous) cotreatments of cisplatin, oxaliplatin and 5-fluorouracil at different times and at non cytotoxic concentrations in CT26.WT cells. The cell survival was evaluated by MTT assay. **Results**: In cytostatic simple cotreatments, the highest significant increases of cell death were obtained at lowest concentration of cytostatic (cisplatin 1 µM, 5-fluorouracil 0.1 µM). The best results were obtained in sequential cotreatment for cisplatin and in simultaneous cotreatment for 5-fluorouracil. Mangiferin not increase oxaliplatin-induced cell death. In cytostatic combination treatments with cisplatin/5-fluorouracil at low concentrations (1/0.1 µM) increased cell death was independent of the treatment sequence, instead at high concentrations (5/0.5 µM) there was a dependence on treatment schedule. The best results were obtained in the sequential combination at low concentrations. When mangiferin was combinated with oxaliplatin/5-fluorouracil the best result of all series of experiments was obtained by simultaneous cotreatment at low concentrations of cytostatic (1/0.1 µM) and high concentrations of mangiferin (100/200 µg/mL). **Conclusions**: Mangiferin in combination treatment both in simple and simultaneous cotreatments of cytostatic platinum with 5-fluorouracil potentiates cytostatic-induced cell death in our experimental conditions. **Financial Support:** Cuban Ministry of Health: grant from project nr.1008017.

Citation Format:
Rodríguez-González JC, Quiñones-Maza OL, Hernández-Balmaseda I, Valentín-Quiñones N, Rodeiro-Guerra I, Delgado-Hernández R (2015) Mangiferin potentiates platin and 5-fluorouracil induced cell death in simple and combination antineoplastic treatments in CT26.WT cells. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S59. Abstract nr OC-41.

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OC-42: *Zuccagnia punctata* EXTRACT AND 2',4'-DIHYDROXYCHALCONE (DHC), A NATURAL FLAVONOID FROM THEM AS AN POTENTIAL ANTIMETASTATIC IN MURINE COLORECTAL MODEL

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Introduction: *Zuccagnia punctata* is a shrub from *Fabaceae* family, which commonly grows distributed in arid and semiarid areas in central and western Argentina. This plant is used in ethnomedicine as antimicrobial, anti-inflammatory and antitumor drug and some biological properties were reported for their extracts, and have beneficial effect on some key mechanisms involved in the pathogenesis of cancer (antioxidant, antigenotoxic). The aim of the present study was to determine *in vitro* cytotoxic effects, using mammalian cell cultures, of ethanolic extract from *Z. punctate* (Zp) aerial part and four flavonoids isolated of them: 7-hydroxyflavanone (HF), 3,7-dihydroxyflavone (DHF), 2',4'-dihydroxy-3'-methoxy-chalcone (DHMC) and 2',4'-dihydroxychalcone (DHC), and to evaluate their antimetastatic effect using an *in vivo* model in mice. **Material and Methods:** The cytotoxicity of the natural products was tested using the MTT viability assay on two tumoral cell lines, MCF-7 and CT-26. The assays were performed at 24, 48 and 72 h. In addition, the anti-metastasic effect was evaluated *in vivo* using a CT-26 murine colorectal carcinoma model. **Results:** The results demonstrated that *Z. punctata* ethanolic extract and their flavonoids, induced cytotoxic effects on the tumoral cell lines evaluated. The activity on cell lines after 72 h of exposing was in the following order: DHC>DHCM>DHF>Zp and HF not showed cytotoxic effect. The active samples reduced cell viability in a concentration-dependent manner and the effect increased with the incubation time. In *in vivo* assay the oral administration of crude extract and the more *in vitro* cytotoxic compound, DHC, showed capacity to decrease the number of tumor nodules and lung volume after 14 day of administration of products once a day. **Conclusions**: These results may provide valuable information for further designing and developing of anticancer natural agents.

Citation Format:
Zampini IC, Francisco M, Nuño G, Carabajal A, Isla M, Piloto-Ferrer J (2015) *Zuccagnia punctata* extract and 2',4'-dihydroxychalcone (dhc), a natural flavonoid from them as an potential antimetastatic in murine colorectal model. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S60. Abstract nr OC-42.

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OC-43: THE CYTOTOXIC EFFECTS OF BROWN CUBAN PROPOLIS DEPEND ON THE NEMOROSONE CONTENT AND MAY BE MEDIATED BY MITOCHONDRIAL UNCOUPLING

Pardo-Andreu GL[1], Núñez-Figueredo Y[2], Delgado-Hernández R[2], Cuesta-Rubio O[3], Alberici LC[4].

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Introduction: Three main types of Cuban propolis directly related to their secondary metabolite composition have been identified: brown, red and yellow propolis; the former is majoritarian and is characterized by the presence of nemorosone. We recently reported that this molecule and its chemical analogues guttiferone A and clusianone presented strong cytotoxic effects mediated by mitochondrial uncoupling. Therefore, it can be hypothesize that the cytotoxic and antiparasitic effects of the brown Cuban propolis reported elsewhere may be related to their nemorosone's content and mediated by a mitotoxic uncoupling effect. **Material and Methods**: Studies were performed in both hepatic carcinoma (HepG2) cells and primary rats hepatocytes. Mitochondria isolated from rat liver were also used. **Results**: In this study, brown Cuban propolis extracts were found cytotoxic against HepG2 cells and primary rat hepatocytes, in close association with the nemorosone contents. In mitochondria isolated from rat liver the extracts displayed uncoupling activity, which was demonstrated by the increase in succinate-supported state 4 respiration rates, dissipation of mitochondrial membrane potential, Ca^{2+} release from Ca^{2+}-loaded mitochondria, and a marked ATP depletion. As in cells, the degree of such mitotoxic events was closely correlated to the nemorosone content. The propolis extracts that do not contain nemorosone were neither cytotoxic nor mitotoxic, except R-29, whose detrimental effect upon cells and mitochondria could be mediated by its isoflavonoids and chalcones components, well-known mitochondrial uncouplers. **Conclusions**: Our results at least partly unravel the cytotoxic mechanism of Cuban propolis, particularly regarding brown propolis, and raise concerns about the toxicological implication of Cuban propolis consumption.

Citation Format:
Pardo-Andreu GL, Núñez-Figueredo Y, Delgado-Hernández R, Cuesta-Rubio O, Alberici LC (2015) The cytotoxic effects of brown Cuban propolis depend on the nemorosone content and may be mediated by mitochondrial uncoupling. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S61. Abstract nr OC-43.

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OC-44: **ASSESSMENT OF GENOTOXIC AND CYTOTOXIC EFFECTS OF ENDEMIC *Phyllanthus* PLANTS AQUEOUS EXTRACTS**

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Introduction: Plants of the genus *Phyllanthus* have been widely use by traditional medicine all over the world. In Cuba, there is a plentiful variety and endemism of them, and various species have proved antiviral, antioxidant and antimutagenic properties against chemical and physical mutagens. In order to extend the search for natural compounds presenting genoprotective properties to other species of this genus, previous studies about their possible genotoxic and cytotoxic properties must be done. **Methods:** In the present work, the aqueous extracts of three endemic *Phyllanthus* species were assessed: *P. williamioides*, *P. chamaecristoides*, and *P. microdictyus*, at concentrations ranging from 0.1 to 2 mg/mL and using *Caulobacter crescentus* cells as the *in vitro* experimental model. Genotoxicity was assessed through evaluating primary DNA damage by means of the SOS Chromotest assay. Cytotoxicity was measured through the survival assay, by the capacity of colony formation. **Results:** the genotoxic and cytotoxic effects were only statistically significant by way of a Dunnett Test ($p<0.05$), for the highest concentration tested and only in case of the *P. williamioides* plant extract. In all cases, the LD_{50} values were higher than the maximum concentration assayed, and *P. chamaecristoides* and *P. microdictyus* extracts showed a survival rate over 90%. **Conclusions:** These outcomes are in correspondence with preceding studies about the genotoxicity and cytotoxicity of several *Phyllanthus* species, through different experimental models, *in vitro* and *in vivo*, and they validate future researches about the possible antimutagenic properties of these plants aqueous extracts.

Citation Format:
Menéndez I, Sánchez-Lamar A (2015) Assessment of genotoxic and cytotoxic effects of endemic *Phyllanthus* plants aqueous extracts. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S62. Abstract nr OC-44.

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OC-45: **ANTI-PROLIFERATIVE ACTIVITY OF FRACTIONS ISOLATED FROM *Boldoa purpurascens* CAV. IN HUMAN PROSTATE AND LUNG CANCER CELLS**

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Introduction: *Boldoa purpuracens* Cav. is a plant belonging to *Nyctaginaceae* family used in Cuba and other Latin America regions as diuretic. Phytochemical analysis has shown the presence of biologically active compounds such as flavonoids and triterpenic saponins in the plant. The aim of the present investigation was to evaluate the antiproliferative potential of a fraction of saponins isolated from stem of the species in H-460 and H-125 human lung cancer cells and PC-3 human prostate carcinoma grade IV. **Methods:** Dried and pulverized stem bark (1.2 kg) of *Boldoa purpurascens* were defatted and subsequently extracted with 80% ethanol. Ethanol extract was evaporated and extracted with water-saturated *n*-BuOH (crude of saponins). The crude was applied onto the Sephadex LH-20 column, using a mixture of chloroform/methanol/water (100: 10: 0 to 100: 100: 1) to get the fractions. Fraction 2 was used for the antiproliferative assay. PC 3 (7, 5 x 10^4 cells/mL), H 460 (1 x 10^4 cells/mL), H 125 (1 x 10^4 cells/mL) and MCR5 (7.5 x 10^4 cells/mL) cells were seeded in 96-well plates. Concentrations of 100, 10, 0.1, 0.01 and 0.001 µg/mL of F2 were used and *Quillaja saponaria*, paclitaxel and cisplatin were used as standards. Absorbance was measured at 562 nm. **Results:** The high cell density assay showed IC_{50} values of 23.05, 133.99 and 13.06 µg/mL for PC-3, H-460 and H-125 tumor cancer cells, respectively. **Conclution:** the fraction of saponins isolated from stem bark of *Boldoa purpurascens* showed a potent antiproliferative effect.

Citation Format:
Hernández Y, González DM, Rodríguez T, Tamargo B, Sierra G, Apers S (2015) Anti-proliferative activity of fractions isolated from *Boldoa purpurascens* Cav. in human prostate and lung cancer cells. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S63. Abstract nr OC-45.

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OC-46: *Rhopalurus junceus* SCORPION VENOM: ANTITUMORAL, ANTIMETASTATIC EFFECT AND MECHANISM OF ACTION AGAINST EPITHELIAL CANCER

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In Cuba, the venom from the endemic scorpion *Rhopalurus junceus* has been used, in the traditional medicine, for anticancer treatment. Recently the potentialities of this scorpion have been identified in studies *in vitro* and *in vivo* as antitumoral. The mechanisms of action of the scorpion venom have been not been described for this species. The antitumoral and antimetastatic effect is executed against tumor from epithelial origin. The natural extract at low concentrations induces the cellular death through apoptosis, which include the increase of the expression levels of apoptotic genes as well as the decrease of level expression of anti-apoptotic genes, loss of mitochondrial membrane potential, and DNA nuclear fragmentation while at higher concentration is capable of inducing necrosis. The mechanism of action of the scorpion venom involves the affectation to the functional activity of ionic channels related to the proliferation and metastatic process in epithelial cancer cells. Besides, the scorpion venom induces the affectation of the cellular signalling pathways PI3K and MAPK. The peptides present in the scorpion venom represent the active components responsible for the anticancer effect. The antitumoral effect, biodistribution and localization of peptides, in mice, corroborate the cytotoxicity and high selectivity against tumor cells from solid tissue. All these evidences confirm the anticancer therapeutic potential of the scorpion venom against cancer and the possibility of obtaining the peptides through recombinant and biotechnological techniques.

Citation Format:
Díaz-García A, Yglesias A, Ruiz-Fuentes JL, Rodríguez H, Rodríguez L (2015) *Rhopalurus junceus* scorpion venom: antitumoral, antimetastatic effect and mechanism of action against epithelial cancer. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S64. Abstract nr OC-46.

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OC-47: **CHARACTERIZATION OF THE PROTEIN KINASE CYSTEINOME TARGETED BY WITHAFERIN A TO OVERCOME GC THERAPY RESISTANCE IN MULTIPLE MYELOMA**

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Introduction: Multiple myeloma is a clonal B-Cell malignancy characterized by the uncontrolled proliferation of malignant plasma cells in the bone marrow. Myeloma patients are widely treated based on the risk with different combinations of novel agents such as bortezomib (proteasome inhibitors), thalidomide (immuno-modulatory drugs) and prednisone (glucocorticoids). Despite the progress in therapy, MM remains largely incurable, due to low remission rates of conventional therapies and the development of drug resistance. It is now widely accepted that B-Cell receptor (BCR) signaling pathways and genetic aberrations are important factors for initiation and progression of cancer in MM patients. As such there is an urgent need to (1) develop GC analogues with improved therapeutic profile (increased efficacy, reduced side effects) (2) Investigate signaling pathways, which are associated with GC therapy response. Previously, we and others observed that the natural steroid and kinase inhibitor withaferin A (WFA), (isolated from *Withania somnifera*, also referenced as Ashwagandha in Ayurveda Medicine) chemosensitizes drug resistant cancer cells for induction of cell death. In this respect, withaferin A holds promise as a novel class of therapy sensitizing drugs. **Methods:** The *in vitro* effect of WFA on kinase activity profiles of multiple myeloma cell line models MM1.S and MM1.R were analyzed by means of innovative peptide array based kinase activity profiling by PamChip® peptide microarrays. This chip contains peptide sequences from known human phosphorylation sites of both Serine/threonine kinases (STK's) and Phospho tyrosine kinases (PTK's). **Results:** A comparison of the tyrosine kinase activity profile between the Dexamethasone sensitive (MM1.S) and resistant (MM1.R) myeloma cell types revealed a significant difference (p-value <0.05, student t test) in basal phosphorylation of 34 out of 144 peptide substrates tested. Of special note, treatment of cells with 1.5uM WFA reduced peptide tyrosine phosphorylation of non-receptor tyrosine kinases. **Conclusions:** We observed that glucocorticoid therapy resistance in multiple myeloma cells is associated with hyperactived non-receptor tyrosine kinases Moreover, the natural kinase inhibitor withaferin A can chemosensitize GC resistant multiple myeloma cells in part by inhibiting non-receptor tyrosine kinase activities.

Citation Format:
Chirumamilla CS, Heyninck K, Dom M, Van Ostade X, Vanden Berghe W (2015) Characterization of the protein kinase cysteinome targeted by withaferin a to overcome GC therapy resistance in multiple myeloma. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S65. Abstract nr OC-47.

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OC-48: **WITHAFERIN A INDUCED DNA HYPERMETHYLATION CONTRIBUTES TO SILENCING OF TUMOR PROMOTING GENES IN TRIPLE NEGATIVE BREAST CANCER**

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Withaferin A (WA), isolated from the plant *Withania somnifera* (Indian name, Ashwagandha), is a steroidal lactone, which holds promise as a chemopreventive agent for treatment of triple negative breast cancer. By Infinium HumanMethylation450, we determined genome-wide DNA methylation profiles in non-metastatic MCF-7 and highly metastatic MDA-MB-231 breast cancer cells, left untreated or exposed for 72h to pharmacologically effective concentrations of WA. Remarkably, in contrast to DNA hypomethylation effects triggered by global cancer epigenetic drugs (i.e. 5-aza-2'-deoxycytidine), WA treatment of MDA-MB-231 cells rather tackles an epigenetic cancer network through gene-specific hypermethylation of multiple tumor promoting genes including ADAM metallopeptidase domain 8 (*ADAM8*), urokinase plasminogen activator (*PLAU*), tumor necrosis factor (ligand) superfamily, member 12 (*TNFSF12*), as well as genes related to detoxification (glutathione S-transferase mu 1, *GSTM1*), or mitochondrial metabolism (malic enzyme 3, *ME3*). Furthermore, promoter-specific loss of active H3K4me3 chromatin mark and DNA hypermethylation in response to WA silences *PLAU* gene expression and suppresses invasive tumor behavior. Overall, our data suggest that WA treatment of triple negative breast cancer cells suppresses multiple cancer hallmarks and silences invasion-related gene expression through epigenetic reprogramming, involving interplay of JARID1B (*KDM5B*) induced loss of histone K4 tri-methylation and DNA hypermethylation.

Citation Format:
Szarc vel Szic K, Declerck K, Crans RAJ, Diddens J, Scherf D, Gerhäuser C, Vanden Berghe W (2015) Withaferin A induced DNA hypermethylation contributes to silencing of tumor promoting genes in triple negative breast cancer. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S66. Abstract nr OC-48.

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OC-64: **PHARMACOLOGICAL ACTIVITIES OF PROTEOLYTIC *Vasconcellea* LATEX FRACTION PAPAYA**

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The lactiferous species *Vasconcellea cundinamarcensis* (ex *Carica candamarcensis*) is native to Latin America and belongs to the Caricaceae family. Members of this family possess a set of isomorphous proteolytic enzymes in their lattices whose role has been associated with plant protection against predation. We can imagine that plant latex plays a role akin to blood in mammalian circulatory system. Some of the proteinases present in *V. cundinamarcensis* display mitogenic activity in mammalian cells, which set the basis to study their potential as healing agents. The results confirmed the healing effect in various animal ulcer models including humans and a mechanism was proposed to explain the healing stimulus. More recent studies show that these latex proteinases are immunomodulatory, anti-inflammatory, dissolve thrombus and display antitumor/antimetastasic activity. We currently develop a phase II clinical study to validate the healing effect of a formulation containing the proteolytic fraction in individuals bearing recalcitrant lesions. An overview of the results obtained is discussed in this presentation.

Citation Format:
Salas CE (2015) Pharmacological activities of proteolytic *Vasconcellea* latex fraction papaya. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S67. Abstract nr OC-64.

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OC-65: **SAFFRON-BASED BIOACTIVE MOLECULE "CROCIN" PREVENTS LIVER CANCER**

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Hepatocellular carcinoma (HCC) is the second most common cause of cancer-related death worldwide. The prognosis of patients with HCC is usually poor; hence, a novel approach against HCC is essential for a better therapeutic outcome. Saffron and its active constituents were reported to have antioxidant, anti-inflammatory, and anti-tumor properties. The aim of this study was to investigate chemopreventive action of crocin, one of the promising active constituents of saffron, against diethylnitrosamine (DEN)-induced liver cancer in rats, and the possible mechanisms by which crocin exerts its anti-tumor effects. Findings reported herein demonstrated the anti-proliferative and pro-apoptotic properties of crocin when administrated in DEN-treated rats. Additionally, crocin exhibited anti-inflammatory properties that inhibited NF-kB, among other inflammatory markers. Taken together, our findings introduce crocin as a potent chemopreventive and therapeutic agent against HCC.

Citation Format:
Amin A (2015) Saffron-based bioactive molecule "crocin" prevents liver cancer. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S68. Abstract nr OC-65.

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OC-66: EVALUATION OF A COMPLEMENTARY THERAPY WITH INMUNOMODULATOR BIOMODULINA T IN PATIENTS WITH NEOPLASIC DISEASE

Aznar-García E[1], Súarez-Fundora S[1], Battista-Speranza G[2], Perea Y[3], Rodriguez-Chávez S[1].

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Introduction: In the neoplasic disease the immune system recognizing an immunodeficiency state. Therefore the use of immunomodulators in these patients has become one of the most important therapies. Biomodulina T (BMT) is a natural product, obtained from bovine thymic fraction and produced in BioCen. The polypeptide composition of BMT could permit its use as immunomodulator and was demonstrate in geriatric patients. In these studies, the aim was to evaluate immunomodulator effect to BMT in the neoplasic patients. **Material and Methods:** Were studied 22 neoplasics patients.The protocol was approved by the Ethical Committee of the hospital. The patients was treated with chemotherapy (QT) and radiotherapy (RT) and divided in two groups: Group 1 treated with QT/RT and (BMT) (3 mg) by intramuscular rout, one daily dose. Group 2 untreated BMT. The studied evaluate the Clinical analyses, the leukocyte count, total lymphocytes and CD3;CD4/CD8, CD19, Interferon gamma. We compared the results in both groups after 3, 6 and 12 months of treatment. **Results:** The Group 1 (received BMT) was an increase in the number of total leukocytes in the 54.5 % after the 6 months and 86.3 % (19) after 12 months. In these patients, the CD4/CD8 demostrated an increased in 17 patients (77.2 %) after 6 months in the Group 1 (BMT use) and 18 patients (81.8 %) after 12 month of BMT treated. The CD19 lymphocytes demonstrated an increase after 6 months, in 20 patients (91%) and, after 12 months. Group 2 that did not showed any change in immunological parameters. Clinical evaluation demonstrated an improvement the quality of life in the patients G1. **Conclusions:** The use of BMT associated with QT/RT was capable of restoring and keeping the immune response and reducing the immunosupressor and collateral damages induced by antineoplastic therapy without RAM.

Citation Format:
Aznar-García E, Súarez-Fundora S, Battista-Speranza G, Perea Y, Rodriguez-Chávez S (2015) Evaluation of a complementary therapy with inmunomodulator biomodulina T in patients with neoplasic disease. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S69. Abstract nr OC-66.

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OC-67: **ANTIPROLIFERATIVE EFFECTS OF *Sapindus saponaria* L. ON PROSTATIC CANCER PC3 CELL LINE**

Tamargo B[1], Mena L[1], Plaza LE[2], Gómez Y[3], Oliva BM[3], Sierra G[4].

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[4]BioCubaFarma. Group of Cuban Biotechnology & Pharmaceutical Industries.

Introduction: *Sapindus saponaria* L. presents important biological and pharmacological activities making them an object of study for the treatment of several diseases, including cancer. Among others, studies realized has been referring a good *in vitro* cytotoxic activity of *S. saponaria* L. against cancer cell lines Hela, WiDr and KB by other authors. **Objectives:** To detect and quantify the saponins present in the aqueous extracts of the seed, stem and fruit of *S. saponaria* L. and detect other phytoconstituents present in these extracts and evaluate the antiproliferative *in vitro* effect of these extracts on the cell line PC3 (human carcinoma of prostate) and to appreciate the toxicity of the same on blood's erythrocytes. **Methods:** The Erythrocyte Hemolysis Assay was used to determine the concentration of saponins. In order to establish the presence of other possible components, phytochemical screening was performed. The effect of extracts from *S. saponaria* on PC 3 cell viability was determined by High Cell Density Assay. A spectrophotometric technique was used to determine the haemolytic potential of the extracts. **Results:** The extract of the pericarp had higher concentration of saponins, followed by the seeds and stem. Phytochemical analysis suggested the presence of saponins, tannins, reducing sugars and flavonoids in the three extracts. The three extracts showed a strong cytotoxic effect on cancer cell lines PC3. The fruit extract exhibited an inhibition percent of cell proliferation similar to paclitaxel on evaluated cancer cell line. The fruit extract showed a higher haemolytic potential than the seeds and stem extract, due to it contains higher concentration of saponins. **Conclusions:** The three extracts contained saponins and showed a good cytotoxic activity against PC3 cell line. *S. saponaria* is a valuable source of metabolites and could have a large relevance for alternative pharmacological therapy of prostate cancer and others.

Citation Format:
Tamargo B, Mena L, Plaza LE, Gómez Y, Oliva BM, Sierra G (2015) Antiproliferative effects of *Sapindus saponaria* L. on prostatic cancer PC3 cell line. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S70. Abstract nr OC-67.

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OC-68: **BIOACTIVITY-GUIDED FRACTIONATION FOR ANTI-CANCER ACTIVITY OF *Xanthium strumarium* L. AND THEIR RESPONSIBLE CONSTITUENTS**

Piloto-Ferrer J, Zampini IC, Cuello S, Francisco M, Romero A, González ML, Pasquale S, Fiore M, Sánchez-Lamar A, Isla M.

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Introduction: *Xanthium strumarium* L. (Family: *Asteraceae*) a medicinal plant commonly found as a weed, is widely distributed in North America, Brazil, China, Malaysia and hotter parts of India. *Xanthium strumarium* L., have been used in traditional Cuban medicine as an effective diuretic drug. Internationally some others activities has been reported, e.g. antifungal, antiinflammatory, hypoglycemic, antioxidant, diuretic effects, by in particular, anti-tumour, anti-cancer activity, so much attention is focussed on the herb. The aim of this study was to fractionate an extract of *X. strumarium* (XSE) grown in Cuba to investigate the anticancer properties and the isolation of compounds potentially responsible for this activity. **Material and Methods:** The whole extract was subjected to a bioassay-guided multistep separation procedure, aiming at isolating the active molecule(s) responsible for its activity. Initially, an ethanol partitioning procedure yielded the XSE extract that was subsequently fractionated with chloroform resulting in a XSCF fraction. XSCF was subsequently fractionated by chromatography methods and was determined the cytotoxic and antimitotic effect against cancer cell lines. The active fractions subjected to semipreparative HPLC for isolation of bioactive compounds. The identification the compounds were by GC-MS. **Results:** Bioassay-guided fractionation of XSE led obtained six sub-fractions (SF1 to SF6). Sub-fractions SF1 and SF6 showed the strongest inhibitory effect. The HPLC-DAD fingerprint of SF6 showed a single peak that was identified by GC-MS as (-) spathulenol, while that SF1 showed three compounds identified as xanthatin, 8-epi- xanthatin and xanthinosin. **Conclusions:** The compounds (-) spathulenol, xanthatin, 8-epi- xanthatin and xanthinosin are responsible for the anticancer activity of the Cuban species of *X. strumarium* L.

Citation Format:
Piloto-Ferrer J, Zampini IC, Cuello S, Francisco M, Romero A, González ML, Pasquale S, Fiore M, Sánchez-Lamar A, Isla M (2015) Bioactivity-guided fractionation for anti-cancer activity of *Xanthium strumarium* L. and their responsible constituents. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S71. Abstract nr OC-68.

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SYMPOSIUM 7: ETHNOMEDICINE AND OTHER PHARMACOTHERAPEUTIC RESEARCHES WITH NATURAL PRODUCTS

OC-49: **FLORISTIC AND PHYTOCHEMICAL STUDY OF PLANTS COLLECTED IN AMECAMECA, MEXICO FROM FEBRUARY TO MARCH 2014**

Mendoza-Espinoza JA[1], Peña-Miranda I[1], Bañuelos-Hernández AE[2], Aarland RC[1], Peralta-Gómez S[3], Sierra-Palacios E[1], García-Ocón B[3].

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[2]Laboratorio de Fisiología Bioquímica y Biología Molecular de Plantas, Departamento de Ciencias de la Salud, DCBS, Universidad Autónoma Metropolitana (UAM), campus Iztapalapa.
[3]Casa Libertad Herbario, Universidad de la Ciudad de México (UACM), campus Casa Libertad.

Introduction: A floristic research in the Amecameca community was carried out of several plants collected from February to May of 2014. **Material and Methods:** The species collected were *Castilleja tenuiflora* Benth, *Lupinus campestris* Cham & Schlecht, *Salvia gesneriflora* Lindl & Paxton, *Senecio barba-johannis* DC, *Salvia hispánica* L, *Stevia monardifolia* HBK, *Senecio salignus* DC, *Zephyranthes verecunda* Herb, *Asclepias notha* WD Stevens, *Cestrum roseum* HBK, *Bouvardia ternifolia* (Cav) Schlecht, *Phaseolus coccineous* L. The plant material was submitted to a qualitative assessment of the principal chemical groups present. **Results:** Secondary metabolites such as caffeic and chlorogenic acid, total phenols and flavonoids were detected and measured. In addition, the antioxidant capacity of the collected species was evaluated using the DPPH method. The plant commonly known as 'chamiso' in the Amecameca community was taxonomically identified as *Stevia monardifolia* and presented promising antioxidant properties (109 ± 11.0 mM EAA/g dw). **Conclusions**: These results correlate with the high content of caffeic and chlorogenic acid (6.1 and 553 ppm, respectively), phenolic compounds (967 ± 36 mEGA/gdw) and total flavonoids (136 ± 10 mEQ/g dw), which makes this plant an interesting candidate for more specific pharmacological studies related to the antioxidant activity.

Citation Format:
Mendoza-Espinoza JA, Peña-Miranda I, Bañuelos-Hernández AE, Aarland RC, Peralta-Gómez S, Sierra-Palacios E, García-Ocón B (2015) Floristic and phytochemical study of plants collected in Amecameca, Mexico from February to March 2014. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S72. Abstract nr OC-49.

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OC-50: **STUDY OF *Nostoc sphaericum* VAUCHER POLYSACCHARIDES AND ITS APPLICATION AS ADDITIVE IN PROCESSED FOOD**

Rivera B, Cárdenas L, Alvarado B, Strong C, **Milla F**.

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Introduction: This study aimed to extract the *Nostoc sphaericum* Vaucher polysaccharide, blue - green algae, known as "cushuro", and use it as a food additive. It grows naturally in lakes located at high altitudes and is used as a food. **Material and Methods:** It was collected in Lake Conococha (Ancash, Peru), algae form gelatinous spherical colonies that float freely around the edge of the surface. The experiment was conducted in three phases: I: Collection and botanical classification of *Nostoc sphaericum* Vaucher algae. They underwent physical and chemical treatments for the extraction and purification of polysaccharides. II: Physicochemical analysis of viscosity, gel point, density, solubility tests and pH determination were performed. III: An ice cream formulation was made by incorporating extracted and purified polysaccharides from algae; for sensory evaluation. **Results:** 1- Established ice cream formulations were prepared using the extracted polysaccharide powder and we found improvement in the texture and flavor of the ice cream. 2- Physicochemical analysis was performed in the ice cream and its results are within established parameters. The viscosity increases and it is related to the texture improvement. 3- The sensory analysis evaluation (taste, color, aroma, texture and appearance) performed in a panel of 30 people, had a 71% acceptance. 4- **Conclusions**: The results show that the Nostoc viscosity pro-perty can be used as a natural additive. **Recommendations**: 1- We propose to use the cyanophytes *Nostoc* algae polysaccharides as food viscosifying agent. 2- We recommend conducting comparative studies of the existing protein level in *Nostoc sphaericum*. 3- We recommend spreading the traditional use of *Nostoc sphaericum*, as a base of different Peruvian dishes, promoting their cultivation and commercialization.

Citation Format:
Rivera B, Cárdenas L, Alvarado B, Strong C, Milla F (2015) Study of *Nostoc sphaericum* Vaucher polysaccharides and its application as additive in processed food. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S73. Abstract nr OC-50.

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OC-51: **COMPUTATIONAL STUDY OF THE DNA PROTECTIVE EFFECT OF THE 2,6–DISECBUTILPHENOL EXTRACTED FROM THE PLANT *Phyllanthus orbicularis* KUNTH**

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Introduction: The appearance of chronical degenerative diseases has a close relationship with the DNA damage in somatic cells. The damage can be originated by different genotoxic agents, as for example the aromatic amines. At the present, it is considered as possible way to prevent and treat these affections the use of chemoprotective phythocompounds. It has been studied that the total aqueous extract of the cuban specie *Phyllanthus orbicularis* Kunth reduce significantly the damage induced by the aromatic amines: m-phenilendiamine (m-PDA), 4-aminobiphenyl (4-ABP) y 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) and from the total aqueous fractioned extract was isolated and identified the 2,6 – disecbutilphenol (DSBP). However, it is not known how the DSBP protects at a molecular level. Thanks' to the advances in computational chemistry and modelations tools is possible to study the direct chemical interaction between the DSBP and the aromatic amines as possible genoprotective mechanism. **Material and Methods:** The starting chemical structures of the DSBP and the three amines: m–PDA, 4 – ABP and PhIP were geometrical and electronically optimized. The different association complexes between the phenol and the aromatic amines were generated by Multiple Minimum Hypersurface (MMH) and optimized with the semiempirical methods AM1 and PM6 – d. The association energies for each complex were obtaining with the program Q3. Finally, the more stable complexes were reoptimized at a DFT level using the B3LYP and M052x functional. **Results:** The results allowed demonstrated that the association between the phenol and the amines was thermodynamically favored and it can be predicted through this research a genoprotective order for the phenol against each amine and which chemical groups of the amine and the phenol interact. **Conclusions:** This research work allows us to propose the chemical direct interaction between the phenol and the amines as possible molecular mechanism for the DNA protection.

Citation Format:
Monteserín A, Pérez Y, Sánchez A (2015) Computational study of the dna protective effect of the 2,6–disecbutilphenol extracted from the plant *Phyllanthus orbicularis* Kunth. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S74. Abstract nr OC-51.

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OC-52: **THE TOXICOLOGICAL PROFILES OF *Pimenta dioica* (PIMENTO) AND TWO OF ITS CONSTITUENTS**

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Introduction: *Pimenta dioica* (pimento*)* from the family *Myrtaceae* is one of the major spices produced in Jamaica and is used in the treatment of arthritis. In this study, the toxicological profiles of pimento oil and two of its components; eugenol and methyleugenol were investigated in an adjuvant-induced mono-arthritic murine model. **Material and Methods**: Arthritis was induced in Sprague-Dawley rats (250-300 g) with a single injection of complete Freund's adjuvant (CFA) (1 mg/mL) in the synovial cavity of the right knee of each rat and arthritis allowed to develop over 26 days. A day before CFA injection and throughout the experimental period, control rats received a daily dose of corn oil (0.4 mL/kg). Test rats received pimento oil (0.4 mL/kg), eugenol (0.37 mL/kg) or methyleugenol (0.02 mL/kg) (Shama, 1994). The LD_{50} for all three agents were calculated. Sub-chronic toxicity studies were done for 26 days and the effects of the agents on the stomach, liver and kidneys were observed. **Results:** *P. dioica* oil and eugenol caused irritation of the mucus membrane in the mouth, labored breathing and dose dependent sedation. Methyleugenol produced slight sedation but there were no signs of irritation. In chronic toxicity studies, pimento oil, eugenol and methyleugenol produced toxicity of the mucous epithelium of the stomach and deposition of spherical basophilic bodies in the lumen of the kidney tubules. There was no evidence of damage to the liver. **Conclusions**: The therapeutic usefulness of *Pimenta dioica* oil and its constituents is dependent on the associated toxic effects. The exfoliation of the gastric epithelium and the nephrotoxicity observed with the agents would limit their potential uses to topical treatments rather than oral therapeutic preparations.

Citation Format:
Shelly-Campbell J, Oswald S (2015) The toxicological profiles of *Pimenta dioica* (pimento) and two of its constituents. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S75. Abstract nr OC-52.

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OC-53: **IMMUNEREGULATORY PHENOTYPE SHIFT BY BEE *Apis* ACCUPUNCTURE IN PRIMARY PROGRESIVE MULTIPLE SCLEROSIS (PPMS)**

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Introduction: Apitherapy has been used to immunological chronic disease treatment. We present a PPMS case report with cognitive and evidence based medicine focus. **Objective:** Show clinical, biochemical, chronobiological and immunological state changes before and after apipunctural treatment in PPMS. **Methods:** Beeapipuncture were made two times a week as evidence and cognitive in individual focus selected points. The clinical evolution was assessed by comparing the related significant symptom scale in Multiple Sclerosis Ross Test, which explores 15 aspects of the affective, conative, and volitional spheres. Biochemical clasics varibles were analyzed. Chronobiological changes tested by means of tow points circadian temperature cycle, and Immunological status by ESR and cytokine pattern change. **Results:** Ross test score items for integrity clinical function increased, shows an improvement in the neurological condition. The functions more improved were: balance, bowel control, muscle strength in the upper limbs and mood. No significant differences in biochemical variables, only a slight decrease in triglycerides, demonstrating the therapeutic safety of apipuncture. There is an increase in the robustness of circadian temperature rhythm. We found a displacement from proinflammatory Th1 and Th17 phenotypes towards Th2-ThF regulatory phenotype in CD4 lineage after apitherapy. So suggests an improvement to more competent state in the immune system and less reactive behavior. **Conclusions:** Apipuncture show effective and safety in PPMS.

Citation Format:
Abuín A, Fernández F, Milián L, Rodríguez Y (2015) Immuneregulatory phenotype shift by bee *Apis* accupuncture in primary progresive multiple sclerosis (PPMS). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S76. Abstract nr OC-53.

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OC-54: **KNOWLEDGE AND CONSUMPTION OF NATURAL PRODUCTS IN THE PROVINCE OF ARTEMISA IN THE PERIOD 2014-2015. THEIR APPROPRIATE USE**

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Introduction: The use of natural products has played a key role in maintaining human health. Today, despite the advances of modern medicine, there is an increase in the consumption of these products in the world. However, in Cuba the use of natural medicine in the therapy, has been affected by the ignorance of the population and health professionals and scientific evidence does not exist on the properties that are attributed to these products. A descriptive, observational and retrospective study was conducted to evaluate the awareness and consumption of natural products recommended by the National Directorate of Pharmacy (DNF), with pharmacological activity Industrial local and home production by the population and professional's provincial health Artemisa. **Methods:** The sample consisted of 70 patients and 40 health professionals. **Results:** The study allowed verifying that the plant *Plectranthus amboinicus* was the most used and appropriating safety margin. Health professionals and the public showed lack of knowledge about the pharmacological efficacy of natural products, but had high confidence in their use. **Conclusions:** The results show the need to provide health education on this topic to the public and health professionals in the province under consideration.

Citation Format:
Moreno S, Bermúdez I, Casado CM, Cabrera JR, Hernández M (2015) Knowledge and consumption of natural products in the province of Artemisa in the period 2014-2015. Their appropriate use. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S77. Abstract nr OC-54.

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OC-55: **RESULTS AND EXPERIENCE OF 24 YEARS OF TRADITIONAL AND NATURAL MEDICINE IN THE PHARMACEUTICAL SERVICES OF PINAR DEL RÍO PROVINCE**

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Introduction: The production of natural medicines in Cuba dates from 1991. The province of Pinar del Río since that time developed a group effort that included the birth of a small factory and production at its 11 municipalities and mountain laboratories for meet the ever growing needs of its people. **Objective:** Socialize the work developed in the production of natural medicines in Pinar del Rio and sharing new experiences with fellow participants in FAPRONATURA. **Material and Methods:** Through a data collection, overall development of production processes including the farms of medicinal plants shows the organization of provincial factories, municipal pharmacy, laboratories of mountain and its system of quality assurance integral. **Results:** This organization has allowed the implementation of plans of increasingly ambitious production and incorporating new products and approach compliance with the GPM. **Conclusions:** We show that when there is political will coupled with professional experience, material conditions and the organization can meet all the Cuban state guidelines aimed at improving the care of the health of the people, taking into the account the guideline 158 of the PCC says: "Take utmost attention to the development of natural and traditional medicine".

Citation Format:
Callava CC, Quintana N, Padrón G (2015) Results and experience of 24 years of traditional and natural medicine in the pharmaceutical services of Pinar del Río province. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S78. Abstract nr OC-55.

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OC-56: **MODEL OF SUSTAINABLE MARKETING FOR AGRO INDUSTRIAL BUSINESSES IN GLOBAL MARKETS: CASE OF AGRO INDUSTRIAL BUSINESSES INCUBATOR OF CAUCA (AGROINNOVA) AND THE ENTREPRENEURSHIP OF THE TECHNOLOGICAL BASE AND ITS EXPERIENCE OF THE RELATIONSHIP UNIVERSITY – BUSINESS – STATE**

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The recent interest of the Colombian government in the development of science, technology and innovation has linked the practices of business to allow the results from an investigation process to the relationship University – Business – State to generate tradable products in potential markets. This lineament and the commercial needs of Cauca agro industrial businesses motivated the new design of a sustainable marketing model for small and agro industrial business with competitive strategy towards, new opportunities and challenges from the global market to meet, without losing autonomy over their findings. For this study, the pilot case is the process of business incubation developed by the Corporation Incubator of Agro industrial Business of Cauca - Agroinnova to Agroindustrias Savia S.A.S. It is a small company technologically based, that has used the results of the phytochemical characterization of plants *Scutellaria incarnata* Vent and *Justicia pectoralis* Jacq for the elaboration of natural extracts with positioning potential in the industry of the wellbeing. Once the variables that allow the entry of natural products to specialized markets have been analyzed, it was found that after performing the integrated business management made by the answers to the marketing management needs of other small agro industrial businesses optimizing the resources, reducing the costs of commercial, logistic and marketing representation in comparison to those made by each management member in an independent way and improve their local, national and international positioning and the sustainability of the small business.

Citation Format:
Agudelo O (2015) Model of sustainable marketing for agro industrial businesses in global markets: case of agro industrial businesses incubator of Cauca (Agroinnova) and the entrepreneurship of the technological base and its experience of the relationship university – business – state. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S79. Abstract nr OC-56.

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OC-83: **AYURVEDA: AN EVIDENCE BASED MEDICINE**

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It is general perception that herbs are safer than the pharmaceutical drugs, as they are obtained from natural resources. The origin of Indian Systems of Medicine namely Ayurveda, Siddha, Sowa Rigpa etc. originated from India and have been widely in practice for ages. These have been used as primary system of medicine used for treatment of various ailments. The herbal medicine has been largely used in developing countries and is also increasingly used among the western countries for various ailments ranging from cosmetics to cancer. As like the pharmaceuticals, the inadvertent use of herbal medicines in large doses may result in potential adverse effects. Many herbal products have been reported to contain pesticide levels above the permissible limits and also to have been adulterated either with prescription drugs or substituted with incorrect/wrongly identified plant. Hence, there is a need to regulate the use and monitor the safety of herbal medicine and their products. Therefore, it has become important to objectively evaluate the quality and safety of herbal medicines for its safe use. A nationwide study is required to be undertaken on therapeutic actions of concentrations of heavy metals in the different herbs, which vary in different parts of the herbs and the soil and climatic conditions of the place where they grow. However, so many research works have been carried out to provide additional evidence of its safety and efficacy profile. But the quantity and quality of the safety and efficacy data on Ayurvedic medicines are far from sufficient to meet the criteria needed to support its use worldwide. To ensure quality, Government of India has prepared Pharmacopoeial standards for single herbs and multi ingredient formulations. There are wide publication showing standardization, safety and efficacy of Ayurvedic single drugs and compound formulations. In research of new drugs, the procedure of preclinical studies are appropriately followed like proper identification, phytochemical analysis, quality control, safety/toxicity and efficacy studies and then clinical trial is conducted following ethical norms. Central Council for Research in Ayurvedic Sciences (CCRAS) is a pioneer organization in the field of research on Ayurvedic medicine. This organization has given enormous efforts since last forty years in research on Ayurvedic medicines. In this present paper, the studies on standardization and safety/toxicity profile of Ayurvedic preparations have been enlightened.

Citation Format:
Gaidhani SN, Dhiman KS, Padhi MM (2015) Ayurveda: an evidence based medicine. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S80. Abstract nr OC-83.

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SYMPOSIUM 8: REGULATORY TOPICS ON NATURAL PRODUCTS DEVELOPMENT

OC-69: **REGULATORY FRAMEWORK OF TRADITIONAL MEDICINE IN CUBA. CONSIDERATIONS ABOUT HERBAL MEDICINES**

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In the last decade, there has been a global upsurge in the use of traditional medicine and complementary and alternative medicine in both developed and developing countries. This is one of the main reasons for reinforcing the surveillance of the safety, efficacy and quality control of traditional medicine, complementary and alternative medicines This work describes the updated regulatory framework of traditional medicine in Cuba, it means the regulations involved in this topic. Taking into account the increase of production of herbal medicines elaborated in the Local Production Centre, this work will focus in details the regulation involved for these kind products. Besides that, the necessity of implementation the Good Manufacturing Practices in these Centres will be presented as well as the strategy for getting the certification of these Centres. **Conclusions:** CECMED as Regulatory Agency has strengthened during the last two years the Regulatory framework of herbal medicines in order to ensure the quality, safety and efficacy of traditional medicines for human using.

Citation Format:
de la Cruz CB, Ceballos N, Remírez D, Debesa F (2015) Regulatory framework of traditional medicine in Cuba. Considerations about herbal medicines. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S81. Abstract nr OC-69.

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OC-70: **CLINICAL TRIAL, GCP AND CERTIFICATION IN NATURAL PRODUCTS**

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The basic function Clinical Trial Authorization in CECMED guarantee protection, benefits, rights and safety of individuals (healthy and diseased) involved in clinical research, as well as a design, conduct and analysis according to scientific principles. The scope includes drugs, biological and natural products. Because of the importance and need to strengthen the clinical development in natural products, the aspects of clinical trials are discussed including the implementation of Good Clinical Practice (GCP) and Certification of GCP in clinical sites that perform these studies. This allows the analysis about knowledge, control and level elevated of exigency of direct and stable way on quality assurance and compliance with GCP. Twenty years of experience CECMED, Cuban Regulatory Authority (MRA), in developing guidelines GCP (1992, 1995 and 2000) with their implementation and control for the National Program of Inspections to Clinical Trials has allowed develop a Certification System for GCP to evaluate and qualify the clinical sites that carry out the requirements for this certification. Since 2008, the regulation 52-08 Requirements for GCP Certification to Sites and/or Clinical Services that perform clinical trials was implemented. This normative started up the GCP Certification System to achieve the identified institutions that met the conditions were certified and prove to the international scientific community that develops and evaluates drugs, credibility and reliability in compliance with GCP and its implementation in Cuba. To evaluate their implementation has been compiled information compliance inspection program for clinical trials and related system between 2008 and 2012, including: inspections, type, institutions, results and issued documents. The training and preparation of institutions and professionals to obtain certification was evaluated. In addition took place the presentation and discussion for this topic in national and international activities. Finally, you can limit the implementation of GCP Certification System has allowed systematic evaluation of compliance GCP in the institutions involved, the responsibilities of the parties and level of knowledge on the topic and continuous improvement of the activity. Creates the basis for the country to ensure GCP compliance in institutions and recognition, reliability and national and international credibility of this condition.

Citation Format:
Orta D (2015) Clinical trial, GCP and certification in natural products. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S82. Abstract nr OC-70.

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OC-71: **MAIN REGULATORY CRITERIA FOR THE CLINICAL DEVELOPMENT OF NATURAL PRODUCTS**

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Introduction: The use of the natural medicine for the treatment of the different illnesses has increased their use and importance in the international trade. In spite of this situation, the data of security and effectiveness of a number of plants, their extracts, their active principles and the finished products are poor. The requirements of security and effectiveness that should complete these products for being marketed under their medical use are settled down by Regulatory Agencies of Medicines (RMA). **Objective:** To show an overview of main regulatory criteria for the clinical development of natural products. **Methods:** An exhaustive bibliographical search was carried out using as key words: Regulation - Products - Natural. The primary sources of information were, Web of the FDA, EMEA and IBERO-AMERICAN COUNTRIES, Web of the World Organization of the Health (WHO) and Databases (MEDLINE, CENTRAL BIOMED and HINARI). **Results:** The analysis of the information showed that the focus of the RMA regarding the clinical development of these products differs of a country to other. Most of the underdeveloped countries have a great quantity of phytomedicines based on popular knowledge and with big lacks of legislative approaches to establish these products of traditional use as medications. **Conclusions:** Europe takes the leadership in the development of regulatory framework for the clinical development of the natural products. The United States in June 2004 opened the way of natural products as drugs with the release of the document "Botanical Drug Products", establishing the first guideline for the registration of this product type as a drug. With some exceptions most of the regulations in existence is directed to the control of herbal products and it does not take into account all the products conceived inside the natural medicine. These products in Cuba are regulated by the regulation 28-13.

Citation Format:
Rodríguez J (2015) Main regulatory criteria for the clinical development of natural products. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S83. Abstract nr OC-71.

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OC-72: **FIFTEEN YEARS OF EXPERIENCE IN SAFETY ASSESSMENT OF HERBAL EXTRACTS**

González Y, Mancebo A, Bada AM, Arteaga ME, González B, Fuentes D, Hernández O, Blanco D, León A.

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Introduction: The use of extracts of medicinal plants in Cuba is not an alternative, but an essential component of health care in Cuba. However, as any product intended for human consumption, the risk derived from its single or repeated ingestion must be assessed. In our institution, natural products with different medicinal purposes have been evaluated for 15 years. **Objective:** The evaluation has focused on the possibility of acute and repeated doses exposure, using the Sprague Dawley rat as biomodel. **Material and Methods**: In this work were evaluated fifteen medicinal plants. The administrations were performed by intragastric intubation and the tested doses were 2000 mg/kg of body weight in the acute assays, and 1000 mg/kg of body weight in repeated doses, for which in each test was established a control and a treated group. Clinical observations were performed daily, weekly determinations of body weight, and necropsy of all animals at the end of the study, including in the repeated dose studies the evaluating of water and food consumption, the determination of hematological and biochemical parameters, and macroscopic and microscopic analysis of organs and tissues. **Results:** In this work, we show the main results obtained in the safety assessment of herbal extracts in our institution.

Citation Format:
González Y, Mancebo A, Bada AM, Arteaga ME, González B, Fuentes D, Hernández O, Blanco D, León A (2015) Fifteen years of experience in safety assessment of herbal extracts. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S84. Abstract nr OC-72.

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OC-73: **ACADEMIC TRAINING OF HUMAN CAPITAL FOR POSITIONING NATURAL AND TRADITIONAL MEDICINE**

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Introduction: To contribute to the monitoring of the safety of herbal medicines sold in the country, the National School of Public Health draws a training intervention strategy/action. **Goal.** Providing tools that allow the positioning of the Natural and Traditional Medicine (NTM) with scientific evidence in medical practice. **Methods:** Twenty-two prescribers using criteria linkage to the NTM and primary health care in the capital were selected. A strategy for training skills prescribers NTM divided into three phases, the first two workshops in which the preparation of a project initiated by teams presented at a scientific conference in the third developed was designed phase and is the evaluation of the results. **Results:** Two workshops of classroom training in order to foster a debate between the principles of marketing and implementation of strategies to raise the positioning prescribers and the consumer population of herbal medicines were developed. In addition to encouraging a mastery of the principles of prescription evidence of natural and traditional medicine. Finally, a scientific session in which were presented (5) works on marketing strategies to raise the positioning of this practice. **Conclusions:** The realization of modalities capacitated linking theory and skills training, allows prescribers that pursuing an interest and ownership of marketing as a tool for the positioning of the NTM. Knowledge of marketing and its applicability, by professionals, expands the vision of them in facing and solving the problems of public health from a social perspective.

Citation Format:
García AJ, Suárez N, Ruiz AK (2015) Academic training of human capital for positioning natural and traditional medicine. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S85. Abstract nr OC-73.

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OC-74: **EVOLUTION, STRENGTHS AND WEAKNESSES IN REGULATION OF NATURAL HERBAL MEDICINE. BASES FOR NEW PRODUCTS**

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Introduction: Natural and Traditional Medicine (NTM) is in a renovated space nowadays. **Objectives**: To characterize the development of regulations for the MNT and perform a critical assessment of their impact in terms of support of related products and processes. **Methods**: It was conducted a descriptive, cross-sectional and retrospective study of regulatory dispositions from 1989 to 2015. The strengths and weaknesses, the shortcomings and opportunities for improvement and limitation for new products regulations were analyzed by means of group analysis techniques like brainstorming and analysis of experts. The results were organized in a SWOT Matrix. **Results:** The number of compiled provisions amounted to 24, mainly issued for the Center for State Control of Drug, Medical Equipment and Devices (CECMED). It were identified five broad strengths, five weakness, four opportunities for improvement, and four threads. The lack of a systemic approach in regulations was considered a limitation for the development of new NMT products. Among the negative aspects are that regulations for dispensaries should be strengthened, should be enacted, and that implementation of dispositions for herbal products should be encreased. It was found a positive regulatory evolution of products and processes of NMT, and a political decision of their development and support. The relevance of regulatory base oriented to scientific research was also a necessity identified for new NMT products and for validation of indications and safety in some cases. Improvement strategies were proposed. **Conclusions:** Regulation for NMT in Cuba is progressing and moving forward for ensuring that the health medications such as herbal medicines used in the modes of MNT exhibit quality, safety, efficiency and effectiveness in favor of preserving the right to Cuban health. The space for new products is expending, gaps have been analyzing, and there are strategies for elimination of these fissures on course.

Citation Format:
Sánchez C (2015) Evolution, strengths and weaknesses in regulation of natural herbal medicine. Bases for new products. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S86. Abstract nr OC-74.

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SYMPOSIUM 9: MARINE BIOPRODUCTS AND ITS PHARMACOTHERAPEUTIC RELEVANCE

OC-75: *In vivo* ANTITUMORAL ACTIVITY OF *Thalassia testudinum* EXTRACT IN A SYNGENEIC COLON TUMOR MODEL

Hernández I[1], Vanden Berghe W[2], Paz-Lopes M[3], Labrada M[4], Delgado L[1], Op de Beeck K[5], Naulaerts S[6], Laukens K[6], Van Camp G[5], Hevia G[4], Rodríguez JC[7], dos Reis C[8], Cassali D[8], Fernández MD[1], Delgado R[9], Rodeiro I[1].

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Introduction: The diversity of organisms in the marine environment has identified novel marine natural products that could be developed as antitumor compounds. The aqueous ethanol extract from the leaves of marine plant *Thalassia testudinum* is currently being developed in Cuba as a nutritional supplement due to its promising pharmacological properties. **Methods:** The present study explored the antitumor activity of *T. testudinum* extract in a primary colon cancer model. This syngeneic model, ectopic/subcutaneous allograft was performed: with CT26.WT cells. **Results:** A significant reduction of tumor volume and survival with increasing oral dependent dose of the product was observed. The highest antitumor effects were obtained at 100 mg/kg. Histological and immune-histochemical analysis revealed a protection of progression tumor dose-dependent manner. In addition, *T. testudinum* extract prevented the tumor-induced oxidative stress in a mice colon cancer model by reducing lipid and protein damage, together with a preservation of antioxidant system. Upon further investigation of up/down regulation oncogenes in response to *T. testudinum* extract by Illumina bead array and subsequent Ingenuity Pathway Analysis, various molecular and cellular targets were identified related to cancer progression. **Conclusions:** these results revealed that *T. testudinum* extract and its phytochemical constituents hold promise for development of new antitumor product.

Citation Format:
Hernández I, Vanden Berghe W, Paz-Lopes M, Labrada M, Delgado L, Op de Beeck K, Naulaerts S, Laukens K, Van Camp G, Hevia G, Rodríguez JC, dos Reis C, Cassali D, Fernández MD, Delgado R, Rodeiro I (2015) *In vivo* antitumoral activity of *Thalassia testudinum* extract in a syngeneic colon tumor model. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S87. Abstract nr OC-75.

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OC-76: **NEUROPROTECTIVE COMPOUNDS FROM MACROALGAE: IMPLICATIONS FOR NEURODEGENERATIVE DISEASES**

Menéndez R, García T, Morales RA, Valdés O, González K, Hernández Y.

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Marine environment has proven to be a rich source of novel and diverse compounds with numerous interesting biological effects. Macroalga are currently being explored for searching these novel bioactive compounds whose therapeutic potential has been assessed in a variety of animal models. There is an increasing prevalence of different forms of dementia worldwide and therefore, researchers have been focusing their attention on the discovery and development of new compounds with potential application in the amelioration of cognitive dysfunction. Cognitive disorders, including neurodegenerative diseases such as Alzheimer's disease (AD) and other memory related disorders are characterized by progressive neurodegeneration triggered by neuro-inflammation, oxidative/nitrosative damage and synaptic loss. Therefore, compounds exerting neuroprotective action could present an approach in the management of dementia. In fact, several studies had already provided promising insights into the neuroprotective effects from different macroalgae species. The objective of this review is to provide an overview on these results and those obtained in our center and their potential application to treat and/or prevent memory disorders.

Citation Format:
Menéndez R, García T, Morales RA, Valdés O, González K, Hernández Y (2015) Neuroprotective compounds from macroalgae: implications for neurodegenerative diseases. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S88. Abstract nr OC-76.

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OC-77: **ANTITUMORAL EFFECT OF ST II, A CYTOLYSIN ISOLATED FROM SEA ANEMONE *Stichodactyla helianthus*, ON TUMORAL CELLS *in vitro* AND *in vivo***

Soto C[1], del Valle A[1], Blanco R[2], Bencomo A[2], Rodríguez JC[3], Lanio M[1], Álvarez C[1], Hernández AM[2].

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Introduction: SticholysinII (StII) is a cytolysin produced by anemone *Stichodactyla helianthus* with high affinity for sphingomyelin, which induces cell death by forming pores in membranes. This research explores the binding of StII to lipids, the mechanism that mediates its cytotoxicity on tumor cells *in vitro* and its effect on a solid tumor model *in vivo*. **Material and Methods**: StII association to lipids was studied by Dot blott Immunostaining, monolayers, liposome, docking and molecular dynamics. Sticholysin cytotoxic activity against Raji cells was tested by MTT and propidium iodide incorporation assays. Caspase activity was measured by caspase kit. Cytoskeleton contribution to cell death was studied in the presence of cytochalasin. The effect of toxin on mitochondria was studied with JC-1 probe. Morphological alterations and apoptotic bodies formation induced by StII in Raji cells were analyzed by optical microscopy. Contribution of MAPKs to cytotoxic effect of StII was studied by MTT and Western blot. Anti-tumor effect *in vivo* was study in a subcutaneous X63 tumor model in Balb/c mice. **Results:** Binding intensity in a decreasing order was sphingomyelin, phosphatidylcholine, ceramide, gangliosides. Pore formation in Raji cells leads to cellular swelling and the release of cytoplasmic components. Cellular death was inhibited in presence of cytochalasin. Toxin did not induce caspase activation or apoptotic bodies' formation suggesting a mechanism of necrosis. Cytotoxicity induced by St II in the presence of ERK pathway inhibitor, decreased. In addition, toxin induces activation of the pathway, which was demonstrated by an increase in the ERK1/2 phosphorilation levels. The intra-tumoral injection of StII significantly reduced the tumor volume and induces extense necrosis areas and neutrophyl infiltration, without systemic toxicity. **Conclusions:** St II induces cell death necrosis, which induces partial mitochondrial depolarization and needs actin polymerization. This toxin showed a potent anti-tumor effect *in vivo*.

Citation Format:
Soto C, del Valle A, Blanco R, Bencomo A, Rodríguez JC, Lanio M, Álvarez C, Hernández AM (2015) Antitumoral effect of ST II, a cytolysin isolated from sea anemone *Stichodactyla helianthus*, on tumoral cells *in vitro* and *in vivo*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S89. Abstract nr OC-77.

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OC-78: **ACTINOPORINS, PORE-FORMING PROTEINS FROM SEA ANEMONES, THEIR OLIGOMERIZATION PATHWAY**

Mesa-Galloso H[1], Delgado-Magnero KH[1], Pedrera L[1], Hernández-González JE[1], Cabezas S[1], Alvarez C[1], Lanio ME[1], García-Saez A[2], Ros U[1], Valiente PA[1].

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Introduction: Actinoporins are soluble pore-forming isolate from sea anemones. The biomedical application under development of this toxin has been devised as inmunotoxins against undesirable cells and toxin-liposome complexes to deliver molecules to cell cytosol. The three-dimensional (3D) structure of equinatoxin II (EqtII), sticholysins I and II (StI, and StII), and fragaceatoxin C (FraC) have been solved. The mechanism of pore-formation of actinoporins is based on an initial binding step followed by membrane insertion of the N-terminal sequence and oligomerization. Recently, was proposed an octameric 3D pore structure for FraC formed via protein dimerization and partial unfolding of the N-terminal region, suggesting similar pore architecture for the others eukaryotic actinoporins. However, mutagenesis experiments to clarify if the oligomerization interface is conserved among the actinoporins family are still lacking. **Methods**: Here, we designed a double mutant to disrupt the putative actinoporins oligomerization interface by combining sequence and structure analysis with free energy calculations, and coarse grained (CG) molecular dynamics (MD) simulations. **Results:** We observed that the presence of both mutations at positions V60 and F163, decreased the stability of the 3D oligomeric structure by disrupting the structure complementarities of this hydrophobic region, and impairing dimer formation. A free energy calculation supports our hypothesis and predicts the electrostatic repulsion among V60D of one protomer face and F163D, and E173 in another protomer face as the driving force to destabilize the oligomerization step. To test our predictions, we obtained, expressed and purified the double mutants $FraC^{V60D/F163D}$, $EqtII^{V60D/F163D}$, and $StII^{I58D/I161D}$. Circular dicroism and fluorescent spectroscopy showed a similar spectrum for the three mutants compared to the native proteins. Finally, the functional characterization by fluorescence and hemolytical activity techniques revealed that mutants kept a similar ability to bind model membranes while loss completely their pore-forming activity. **Conclusions:** Our results indicate that actinoporins share a conserved oligomerization interface.

Citation Format:
Mesa-Galloso H, Delgado-Magnero KH, Pedrera L, Hernández-González JE, Cabezas S, Alvarez C, Lanio ME, García-Saez A, Ros U, Valiente PA (2015) Actinoporins, pore-forming proteins from sea anemones, their oligomerization pathway. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S90. Abstract nr OC-78.

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OC-79: **NEUROPROTECTIVE EFFECT OF PHYCOCYANOBILIN EXTRACTED FROM *Spirulina platensis***

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Introduction: Although the huge economic and social impact and the predicted incidence increase, neuroprotection for ischemic stroke remains as a therapeutically empty niche. The C-phycocyanin is a natural compound, a biliprotein, found in some blue-green algae such as *Spirulina platensis*. C-phycocyanin has previously been shown to have strong antioxidant, anti-inflammatory, and neuroprotective actions. Its structure consists of two polypeptide chains (α and β), which have attached a tetrapyrrole compound, denominated phycocyanobilin. To administer C-phycocyanin *in vivo*, it is digested and releases the phycocyanobilin. In the present study, we investigated the rationale of the phycocyanobilin treatment focal cerebral ischemia/reperfusion (I/R) injury in rats. **Methods:** In this study, Wistar rats were injured with endothelin-1 intracerebrally with perforation of skull and inserting an injection needle. Treatment was applied intraperitoneally with cumulative doses of phycocyanobilin 50, 100, 200 μg/kg at 30 min, 1, 3, and 6 h post-surgery. After 48 h, the neurological examination was performed and 24 h later the cerebral infarct volume was determined. **Results:** The post-ischemic phycocyanobilin treatment was able to improve the clinical status and significantly reduced the volume of brain stroke, according to the results obtained with the neurological evaluation. Phycocyanobilin is able to penetrate the blood-brain barrier and enters the brain parenchyma, where they exert pharmacological actions such as antioxidants. **Conclusions:** In our study, a neuroprotective effect of phycocyanobilin was demonstrated in animal models of I/R brain in rats.

Citation Format:
Piniella B, Pentón G, Campos R (2015) Neuroprotective effect of phycocyanobilin extracted from *Spirulina platensis*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S91. Abstract nr OC-79.

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OC-80: **NEW MARINE COMPOUNDS OF BIOMEDICAL INTEREST AND OTHERS INDUSTRIAL APPLICATIONS**

Fernández MD[1], Núñez R[2], Ortiz E[2], Rodeiro I[1], Menéndez R[1], Hernández I[1], Valdés O[3].

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The Cuban marine flora and fauna is characterized by its richness in species that represents an extraordinary natural source of unexplored biomolecular diversity. Many of those biomolecules could represent important tools for industrial applications. For this reason, in our Centre the main aim was focused on the isolation, purification and characterization of bioactive compounds present in marine invertebrates with particular emphasis on sponges, seaweeds and marine plants. Microorganisms represent also an important source of biologically active compounds that were included in our studies. In our Institution, research is performed by a multidisciplinary team. The purpose of this work is to review the most important results of the Centre of Marine Bioproducts in the last few years.

Citation Format:
Fernández MD, Núñez R, Ortiz E, Rodeiro I, Menéndez R, Hernández I, Valdés O (2015) New marine compounds of biomedical interest and others industrial applications. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S92. Abstract nr OC-80.

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POSTERS
PRECLINICAL PHARMACOLOGY

PPP-01: ANTIALLODYNIC EFFECT OF MANGIFERIN IN NEUROPATHIC PAIN

Espinosa de los Monteros-Zuñiga A, Izquierdo-Sánchez T, Godínez-Chaparro B.

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Introduction: The neurobiology of neuropathic pain is complex and is produce by injury in the central or peripheral nervous system. Mangiferin has been shown antioxidant properties that could be modulated a few molecular targets in this type of pain. The present study was undertaken to determinate the possible antiallodynic effect of mangiferin in neuropathic pain in rats, as well as the possible mechanisms of action of this compound. **Methods:** The rat was subjected to L5/L6 spinal nerve ligation (SNL) in order to induced allodynia. Further, allodynia was evaluated through up-down method. **Results:** The intrathecal administration of mangiferin prevented the mechanical allodynia induced by SNL, in a dose-dependent fashion. The antiallodynic effect induced by mangiferin was blocked by glibenclamide (50 µg/rat, a channel blocker of ATP-sensitive K^+), methiothepin (30 µg/rat, a non-selective antagonist of 5-HT receptors), L-NAME (100 µg/rat, inhibitor nitric oxide synthase), ODQ (10 µg/rat, an inhibitor of guanylate-cyclase), SB-659551 (6 µg/rat, an selective antagonist of 5-HT_{5A} receptor), but not by naloxone (50 µg/rat, a non-selective antagonist of opioids receptors). This data suggest that the antiallodynic effect induced by mangiferin is mediated by the serotoninergic system involving the activation of 5-HT_{5A} receptor as well as the oxide nitric-cyclic GMP- K^+ channel dependent of ATP pathway but not by the opioidergic system in a model of neuropathic pain in rats. **Conclusions:** Mangiferin may prove to be effective in treating neuropathic pain in humans.

Citation Format:
Espinosa de los Monteros-Zuñiga A, Izquierdo-Sánchez T, Godínez-Chaparro B (2015) Antiallodynic effect of mangiferin in neuropathic pain. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S93. Abstract nr PPP-01.

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PPP-02: **(-)-EPICATECHIN REDUCES ALLODYNIA IN RATS WITH PAINFUL DIABETIC NEUROPATHY**

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Introduction: The Painful Diabetic Neuropathy (PDN) is among the most debilitating consequences of chronic diabetes, with a prevalence estimated up to 34% in diabetic population. Allodynia, sensory loss and motor nerve deficit are included within the symptoms described by diabetic patients. The treatment of PDN is frequently unsatisfactory. It has been suggested that antioxidant therapy could be an approach to relief PDN. The antioxidant drug (-)-epicatechin has shown effects in attenuate inflammatory pain in a mouse model. The aim of this study was to investigate the (-)-epicatechin's effect on allodynia, sensory loss and motor nerve deficit in rats subjected to painful diabetic neuropathy (PDN). **Methods:** Female Wistar rats (220-240 g) were injected with streptozotocin (STZ) (50 mg/kg, i.p.) to produce experimental diabetes. **Results:** After 8 weeks, the chronic treatment with (-)-epicatechin (3 mg/kg, i.p.) prevented tactile allodynia and partially motor nerve conduction velocity (MNCV), but not thermal hypoalgesia displayed in diabetic rats. In addition, chronic treatment with (-)-epicatechin (3 mg/kg, i.p.) did not prevent SOD expression reduction observed in diabetic rats. Finally, the data showed that (-)-epicatechin did not have effects on the motor coordination test and parameters such as glucose and body weight in diabetic rats. **Conclusions:** Our data suggest that (-)-epicatechin treatment has antiallodynic effects in PDN rats.

Citation Format:
Quiñonez-Bastidas GN, Calcutt NA, Frizzi K, Rocha-González HI, Granados-Soto V, Murbartián J (2015) (-)-Epicatechin reduces allodynia in rats with painful diabetic neuropathy. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S94. Abstract nr PPP-02.

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PPP-03: **PROTEOLYTIC FRACTION FROM *Vasconcellea cundinamarcensis* LATEX REDUCES ACTIVITY OF THE MATRIX METALLOPROTEINASE DURING MELANOCYTE TRANSFORMATION *in vitro***

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Introduction: CMS2 is a proteolytic fraction from *Vasconcellea cundinamarcensis* latex obtained after chromatographic fractionation. Previous studies showed that this fraction presents antimetastatic activity on murine melanoma and colon carcinoma models. This effect may be related to an increase in DNA fragmentation, along with a reduction of cell adhesion and invasion. **Aim:** The present study evaluates the action of CMS2 on metalloprotease activity, used as marker during melanocyte (Melan-a, nontumorigenic murine cell line) differentiation undergoing cell transformation by sequential cycles of anchorage blockage. **Methods and Results:** The Melan-a cell viability, exposed to CMS2 (1-50 µg/mL) for 24 h, was assessed by metabolization of rezasurin (reading 570/600 nm). The assay showed a 50% cell inhibitory concentration (IC_{50}) at 5 µg/mL. Next, Melan-a cells were pretreated with CMS2 (1-10 µg/mL) for 12 h and seeded (10^5 cells/mL) on 1% agarose. The resulting spheroids, after 96 h, were harvested and seeded on culture flasks, to favor cell adhesion (procedure repeated five times). In cells obtained in each cycle, the secreted metalloprotease 9 (MMP-9) activity was determined by zymography. The densitometric analysis of gels (software ImageJ® 1.46) showed that treatment with 5 - 10 µg/mL CMS2 reduced the activity of MMP-9 until 94% (5.54 ± 0.95) relative to the untreated group (100.00 ± 11.38, $p<0.0001$, *one-way* ANOVA *test*, Student-Newman-Keuls *post-test*). **Conclusions:** These results suggest that CMS2 can prevent the melanocytes transformation, by the reduction of MMP-9 activity, which consequently can affect the ability of cell invasion, since MMP-9 is closely linked to this process. **Financial Support**: CNPq, CAPES and FAPEMIG.

Citation Format:
Santos VG, Lemos FO, Lage FDO, Salas CE, Lopes MTP (2015) Proteolytic fraction from *Vasconcellea cundinamarcensis* latex reduces activity of the matrix metalloproteinase during melanocyte transformation *in vitro*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S95. Abstract nr PPP-03.

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PPP-04: **PROTEOLYTIC FRACTION FROM *Vasconcellea cundinamarcensis* LATEX PROMOTES MACROPHAGE TUMORICIDAL ACTIVITY AGAINST BREAST CANCER CELLS**

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Introduction: Previous studies demonstrated that a proteolytic fraction (P1G10) from *Vasconcellea cundinamarcensis* latex has antitumor/antimetastatic activity on 4T1 breast carcinoma model by reducing inflammation, angiogenesis and increasing tumor associated-macrophages (TAMs) activity. Moreover, macrophages exposed to P1G10 are capable to reduce 4T1 cells number in co-culture model. **Aim:** Investigate the ability of P1G10 proteolytic sub-fractions (CMS1 and CMS2) to promote macrophage tumoricidal phenotype and its mechanisms of activation. **Methods and Results:** Balb/c female mice macrophages were harvested by peritoneal laved after received thioglycollate (3%, i.p., 2 mL, 3 days) (CETEA 219/2012). These cells were seeded (3 x 10^5 cells/well) and exposed to sub-fractions (10-40 µg/mL, 24 h). Treatments were removed and co-cultures made by 4T1 tumor cells addition (10^5 cells). After 40hrs, by MTT metabolization, 4T1 cells viability was determined (O.D. co-culture – O.D. macrophage culture). Just macrophages pre-exposed to CMS2 (20-40 µg/mL) reduced 4T1 cells viability until 57% (0.36±0.02 ΔO.D., control, $p<0.0001$).The fluorescence(480_{Ex}–530_{Em} nm) was measured as ROS production in macrophages exposed to sub-fractions (5-40 µg/mL, 24 h) and labeled with DCFH-DA (15 µM, 30 min). CMS1 and CMS2 increased ROS production until 104% and 171%, respectively (8,613.00 ± 103.00 ΔFU/cell number, control, $p< 0.0001$). Both sub-fractions (20-40 µg/mL), increased nitric oxide (NO) production, determined indirectly using Griess method, reaching until 969.00% (CMS1) and 2,249.00% (CMS2) (0.09 ± 0.02, control, $p< 0.0001$). *Statistical analysis:* One-way ANOVA test, Student-Newman-Keuls post-test. **Conclusions:** The results suggest that ROS and NO are involved in macrophage cytotoxic activity induced by P1G10 and that the proteins contained in CMS2 sub-fraction are mainly responsible for this effect. **Financial Support:** CNPq, Capes and Fapemig.

Citation Format:
Braga AD, Freitas KM, Teixeira LCR, Salas CE, Lopes MTP (2015) Proteolytic fraction from *Vasconcellea cundinamarcensis* latex promotes macrophage tumoricidal activity against breast cancer cells. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S96. Abstract nr PPP-04.

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PPP-05: **PARTICIPATION OF CYSTEINE PROTEINASE CMS2MS3 IN ANTIMETASTATIC ACTIVITY OF FRACTION FROM *Vasconcellea cundinamarcensis*' LATEX: EFFECTS ON ADHESION AND CELL DEATH**

Dittz D[1], Tatsumi GC[1], Salas CE[2], Lopes MTP[1].

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Introduction: Our research group has demonstrated that proteolytic fractions from *Vasconcellea cundinamarcensis*' latex (P1G10 and CMS2) have antitumor/antimetastatic activity on murine melanoma. We aim to identify a possible protease from CMS2 and its cellular mechanisms that contribute to the effects described previously. **Methods**: For determination of IC-50, B16F10 cells were exposed to proteases (0.1-500 ug/mL) for 72hs. The cellular viability was assessed by resazurin metabolization, quantified at 570/600 nm. The effect on cell adhesion was determined by exposing B16F10 to proteases (1-50 ug/mL) for 2-24hs. Finally, cells that remaining adhered was quantified by resazurin metabolization. In B16F10 cells, exposed to CMS2MS3 (10 ug/mL) by 2-24hs were evaluated the α5β1 integrin levels (flow cytometer), number of focal adhesion by vinculin measurement (immunohistochemistry), sub-diploid content (flow cytometer), activation of casp3, casp9 and BAX (Western Blot) and calcium transient (confocal microscopy). **Results**: Among the five analyzed proteases, CMS2MS3 showed the lowest IC-50 (7.81 ug/mL). All proteases promoted loss of adhesion in B16F10, especially CMS2MS3 at 10-50 ug/mL. The level of α5β1 integrin was reduced by CMS2MS3 10 ug/mL in all analyzed time. The number of vinculin/cell reduced 65-85% from 2hs exposure to CMS2MS3. After 2-24hs of exposure to CMS2MS3, sub-diploid DNA increased only at a concentration of 50 ug/mL. When exposed to 10 ug/mL of CMS2MS3, a reduction in intracellular levels of casp3 and casp9 was observed from 2 h of exposure and an increase in BAX levels after 24 h. A rapid increase in nuclear calcium was observed after when B16F10 were exposure to CMS2MS3 10 ug/mL for 10 s. **Conclusions:** Among the five proteases from *V. cundinamarcensis*' latex, CMS2MS3 showed the best cytotoxic effect and ability to reduce the adhesion, mediated by α5β1 integrin in B16F10 cells. The cell death, by apoptosis, occurs after loss of adhesion, an event known as Anoikis.
Financial Support: CNPq, FAPEMIG and CAPES.

Citation Format:
Dittz D, Tatsumi GC, Salas CE, Lopes MTP (2015) Participation of cysteine proteinase CMS2MS3 in antimetastatic activity of fraction from *Vasconcellea cundinamarcensis*' latex: effects on adhesion and cell death. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S97. Abstract nr PPP-05.

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PPP-06: **DIRECT ACTIONS OF FLAVONOIDS ON RAT CARDIAC MUSCLE**

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Introduction: Flavonoids are a class of natural polyphenolics that are ubiquitous in plants, vegetables, fruits, and beverages of plant origin, such as tea and wine. Numerous prospective epidemiological studies have found beneficial effects of flavonoid consumption on overall cardiovascular mortality. Conventionally, these beneficial effects have been attributed primarily to nonspecific antioxidant and antithrombotic properties of flavonoids, however little is known about actions of flavonoids on cardiac muscle. Aims: To evaluate the effects of three flavonoids (naringenin, quercetin and genistein) on the surface electrogram (ECG) and the force of contraction (FC) of rat hearts. **Material and Methods:** ECG and FC were recorded on rat hearts perfused in a Langendorff column **Results:** Only genistein from studied flavonoids tended to prolong the QT interval of ECG in concentration dependent manner. None of flavonoids had any action on the QRS interval or the RR of ECG. Genistein and naringenin produced a negative inotropic effect on the entire range of concentrations studied; they decreased FC with an IC50 of 8.4 μM and 0.5 μM, respectively. Quercetin at low concentrations had a positive inotropic effect and negative inotropic effect at high concentrations. **Conclusions:** The results indicate that these flavonoids have direct actions on rat cardiac muscle. These actions should be taken into account when considering these molecules either as dietetic supplements or as templates to develop therapeutic agents for human diseases.

Citation Format:
Fleites A, Galán L, Herrera I, Alvarez JL (2015) Direct actions of flavonoids on rat cardiac muscle. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S98. Abstract nr PPP-06.

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PPP-07: ***In vivo*** **ANTI-INFLAMMATORY ACTIVITY OF EXTRACTS, FRACTIONS AND ISOLATED COMPOUNDS OF *Tabebuia* spp.**

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Introduction: Inflammation is a defense mechanism of the body and occurs against harmful stimuli; however, the extension may cause damage to cells and tissues. Chronic inflammatory diseases are a major health problem due to the lack of effective and safe drugs for use for long periods; this has augmented the investigations to provide new safer anti-inflammatory agents. Throughout history, nature, especially plants, has provided a source of medicines for the treatment of a wide spectrum of diseases. *Tabebuia* spp. is an endemic plant of Cuba, unexplored from the standpoint chemist-pharmacologic. **Material and Methods:** This research was conducted in order to assess the possible anti-inflammatory effect of this species using the carrageenin-induced paw edema models and the croton oil induced auricular edema in mice. **Results:** The methanolic extract of the leaves has no anti-inflammatory effect in the dose evaluated, whereas the methanolic extract of the stems showed an anti-inflammatory activity at dose of 500 mg/kg relative to the negative control group. Subsequently, the fractionation of the methanolic extract of the stems and pharmacological evaluation of these fractions is conducted, where ethyl acetate-methanol fraction was the most active. Moreover, it was possible to isolate a compound in ether-petroleum ethyl acetate fraction, it proved to be the majority in the stems, with an anti-inflammatory activity similar to indomethacin used as a positive control. **Conclusions:** The results of this research demonstrate the anti-inflammatory activity from *Tabebuia* spp stems, constituting the first preclinical report of anti-inflammatory effect in the species. *Tabebuia* spp. and their constituents could represent in the future a new therapeutic option for the treatment of inflammatory diseases.

Citation Format:
Regalado AI, Sánchez LM, Mancebo B, Flogio MA (2015) *In vivo* anti-inflammatory activity of extracts, fractions and isolated compounds of *Tabebuia* spp. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S99. Abstract nr PPP-07.

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PPP-08: **A PHARMACO TOXICOLOGICAL STUDY OF THE EXTRACTS OBTAINED FROM THE PLANTS *Tagetes lucida* CAV. AND *Lippia alba* MILL. ELABORATED IN THE INSTITUTE OF PHARMACY AND FOODS OF THE UNIVERSITY OF HAVANA**

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Introduction: We denominated medicinal plants to those plants whose parts or extracts are used like drugs or medicine for the treatment of some affection or illness that suffers an individual or animal, among them we can mention *Tagetes lucida* Cav. and *Lippia alba* Mill. **Material and Methods:** In our work we carried out the pharmacological assay to demonstrate the analgesic effect of the *T. lucida* and the anti-inflammatory effects of the *L. alba,* both assay are described by the CYTED. On the other hand, the tests of oral and dermal acute toxicity were made to *T. lucida* and *L. alba* respectively by the procedures that are described in the Economic Organization for the Cooperation and Development (OECD). **Results:** The pharmacological assay showed that *T. lucida* presented similar results that the Aspirin, use as pattern, for the analgesic effects. On the other hand, when we studied the anti-inflammatory effect of the *L. alba* we used as pattern the cream of indometacina both showed similar effects. In the case of dermal and oral acute toxicity for the studied extracts, we use the dose limit assay of 2000 mg/kg. No deaths neither clinical signs were presented, as well as damages in the organs of the rats, for that reason we can classified inside the range according to the European Union of: without classification. **Conclusions:** Both extracts possess the attributed pharmacological effects and that they did not present acute toxicity when the doses limit assay was used.

Citation Format:
García G, Casanova M, Jorge N, Gutiérrez Y, Sánchez A, Scull R, Pardo GL (2015) A pharmaco toxicological study of the extracts obtained from the plants *Tagetes lucida* Cav. and *Lippia alba* Mill. elaborated in the Institute of Pharmacy and Foods of the University of Havana. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S100. Abstract nr PPP-08.

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PPP-09: **PHARMACOKINETICS AND RELATIVE BIOAVAILABILITY OF ZINC IONS RELEASED FROM A ZINC-ZEOLITIC (ZZ) MODIFIED RELEASE PRODUCT IN WISTAR RATS BY BOOTSTRAP**

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Introduction: Intestinal zinc absorption has a saturable component and proceeds over the entire intestinal length. Thus, administration of zinc in modified release drug products could increase zinc bioavailability if the release of non-saturating zinc concentrations in intestinal lumen over an extended period could be achieved. Researchers from the Institute of Science and Technology of Materials of the University of Havana developed a zinc-containing zeolitic product (ZZ) that can release zinc ions in a controlled manner *in vitro* by ionic interchange with the medium. The objectives of this work were to study the pharmacokinetics and to determine the relative bioavailability of Zn released from ZZ using $ZnSO_4$, $7H_2O$ as reference product. **Material and Methods:** After the intragastric administration of ZZ (15 mg Zn/kg) or $ZnSO_4$, $7H_2O$ (3.41 mg Zn/kg) to Wistar rats, blood samples were collected by one-point sampling. Serum Zn concentrations were determined by atomic absorption spectroscopy. Using random numbers and permitting replacements of the experimentally determined serum concentration values, 1000 pseudoprofiles were generated by bootstrap. For each pseudoprofile, pharmacokinetic parameters were determined by non-compartmental analysis. **Results and Conclusions:** The coefficient of variation calculated for each parameter after three replicates of the bootstrap algorithm was less than 1%, indicating that the procedure was sufficiently reliable. The half-lives of Zn released from both products were significantly different, suggesting a *flip-flop* type kinetic associated to ZZ. The absorption rates were very similar between both products suggesting the rapid release of an initial portion of the dose included in ZZ, followed by the controlled release of a maintenance dose. Zinc released from ZZ was 90% more bioavailable than zinc released from $ZnSO_4$ $7H_2O$.

Citation Format:
Acuña G, del Toro H, Rodríguez L, de Castro N, Rodríguez G (2015) Pharmacokinetics and relative bioavailability of zinc ions released from a zinc-zeolitic (ZZ) modified release product in Wistar rats by bootstrap. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S101. Abstract nr PPP-09.

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PPP-10: **MECHANISM OF THE NEGATIVE INOTROPIC EFFECT OF NARINGIN IN MOUSE HEART**

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Introduction: Naringin (NRG) is the major flavonoid (flavanone glycoside) in grapefruit juice. Its biological activity has been only partially characterized and little is known about the mechanism of the negative inotropic action of this flavonoid. Aims: To evaluate the effects of NRG on the surface electrogram (ECG) and the force of contraction (FC) of mice hearts as well as on the sodium (I_{Na}), calcium (I_{CaL}) and Na^+/ Ca^{2+} exchange (I_{NaCaX}) currents of enzymatically isolated mouse ventricular cardiomyocytes. M**aterial and Methods:** ECG and FC were recorded on mouse hearts perfused in a Langendorff column. Ventricular cardiomyocytes were enzimatically dissociated and ionic currents recorded with the patch-clamp technique. **Results:** NRG increased RR interval and shortened corrected QT only at high concentrations (30-100 µM). However, at a fixed heart rate, it decreased FC with an IC50 of 0.4 µM. NRG reduced I_{Na} with an IC50 of 0.07 µM but with a maximal inhibition of 60%. NRG also depressed I_{CaL} with an IC50 of 0.013 µM and increased its fast inactivation time constant. The effects on I_{CaL} were not voltage-dependent. I_{NaCaX} was not affected by NRG. **Conclusions:** Our results indicate that NRG exerts a negative inotropic effect in mice hearts that could be explained by a decrease in I_{Na} and I_{CaL}. These actions should be taken into account when considering this molecule either as a dietetic supplement or as a template to develop therapeutic agents for human diseases.

Citation Format:
Herrera I, Álvarez-Collazo J, López AI, Rodríguez AA, Galán L, Fleites A, Alvarez JL (2015) Mechanism of the negative inotropic effect of naringin in mouse heart. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S102. Abstract nr PPP-10.

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PPP-11: **EFFECTS OF *Kigelia pinnata* FLOWERS EXTRACTS ON VOLTAGE-OPERATED-CALCIUM CHANNELS**

Hernández-Barreto E, Pérez-Donato JA, Ribalta V, Torres LA, Sueiro M, Armas Y.

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Introduction: The objective of this study was to determinate the possible voltage-operated-calcium channels (VOCCs) antagonism of *Kigelia pinnata* flowers extracts. **Methods:** *Plant material:* Fresh flowers of *K. pinnata* were collected in the Botanical Garden of the Central University of Las Villas. Plant sample was identified as *Kigelia pinnata* DC. (*Bignoniaceae*) by Orestes R. Méndez a taxonomic expert of above Institution. *Phytochemical procedure:* Etanolic (EF), Ethylacetate (EAF) and butanolic (BF) fractions from flowers were obtained by following method: 30 g of dry powder were subject to extraction in soxhlet apparatus with EtOH (90%w/v) for 6 hours. The initial ethanolic extract was re-suspended in bi-distilled water and subject to sequential liquid-liquid extraction procedure with n-hexane (discard), ethylacetate and n-butanol in order to obtain the respective fraction. The organic solvents were removed under vacuum at 40°C and solids residues were kept at -4°C for further studies. *Isolated tissue studies*: Aortic rings (5 mm) from Wistar rats 250-300 g were suspended in 10 mL organ bath filled with Krebs-Henseleit solution (pH=7.4), 37^0C and continuously aerated with carbogen gas. Two grams of basal tension and equilibrate period of 1 h were applied before any drug exposure. KCl (30 mM) was used for elicited contraction and to check the tissue viability. KCl (50 mM) was used for VOCCs activation and after *K. pinnata* fractions were added (62 - 2000 µg/mL) in cumulative manner. Verapamil (0.01-10 µM) was used as reference. *Statistics:* Values are expressed as means ± S.D. One-way Anova test was used for statistical analysis, with $p < 0.05$ considered significant. **Results:** The relaxant potency order was: EAF, BF and EF. A direct relation with Phenols and Flavonoids contents was observed. EAF at 1000 µg/mL decreased contractile response about 50%. **Conclusions:** These results reveal at first time the vasorelaxant properties of *K. pinnata* flowers.

Citation Format:
Hernández-Barreto E, Pérez-Donato JA, Ribalta V, Torres LA, Sueiro M, Armas Y (2015) Effects of *Kigelia pinnata* flowers extracts on voltage-operated-calcium channels. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S103. Abstract nr PPP-11.

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PPP-12: **EVALUATION OF THE ANTI-INFLAMMATORY AND ANALGESIC ACTIVITIES OF *Mosiera bullata* LEAVES**

Vicet-Muro L, Armas-González Y, Siverio-Mota D, Sueiro-Oyarsun M, Ribalta-Ribalta V[1], Concepción-Marrero G, Fuentes-Valdés M.

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Introduction: *Mosiera bullata* (Britton & P. Wilson) Bisse is an endemic Cuban plant, which belongs to the family *Myrtaceae*. Its use in Natural Medicine is unknown, but phytochemical screenings suggest that this species has potential as an anti-inflammatory drug. **Objective**: Considering the importance in the search for bioactive molecules from medicinal plant the aim of this study was to evaluate of probable anti-inflammatory and antinociceptive effects of an ethanolic extract of *Mosiera bullata*. **Methods**: Dried powder of leaves of *M. bullata* was exhaustively extracted with (80%) ethanol. The resulting *M. bullata* ethanol extract (MBEE) was investigated in acute model of inflammation by carrageenan-induced paw edema model in rats and topical edema induced by TPA (12-0-tetradecanoylphorbol acetate) in the mouse ear. Additionally, the analgesic activity was evaluated in writhings induced by acetic acid in mice. Total phenolic compounds were determinated spectrophotometrically using Folin-Ciocalteu reagent and the results are expressed as galic acid equivalents per gram dry weight. **Results**: The extract (1 mg/ear) inhibited significantly ($P<0.05$) topical edema induced by TPA and its activity (97.43%) was statistically comparable with indomethacin inhibition (98.18%). In the systemic edema of the rat paw, the ethanol extract (MBEE) (400 mg/kg b.w) significantly ($P<0.05$) suppressed the development of paw edema induced by carrageenan. Its activity, at 3 h post administration of carrageenan, (54.60%) was higher than ibuprofen (47.23%) and diclofenac (44.71%) but lower than indomethacin inhibition (%) oral administration of the ethanol extract (MBEE) reduced significantly ($P<0.05$) the number of writhings induced by acetic acid. The presence of total phenols (246.80 mg GAE/g DW) can be related to its anti-inflammatory and analgesic properties showed for the evaluated extract. **Conclusions**: Our results suggest that (80%) ethanol extract of leaves of *Mosiera bullata* possess significant anti-inflammatory and analgesic properties, consequently, it could be a new source for natural products.

Citation Format:
Vicet-Muro L, Armas-González Y, Siverio-Mota D, Sueiro-Oyarsun M, Ribalta-Ribalta V, Concepción-Marrero G, Fuentes-Valdés M (2015) Evaluation of the anti-inflammatory and analgesic activities of *Mosiera bullata* leaves. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S104. Abstract nr PPP-12.

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PPP-13: **ACUTE AND CHRONIC ANTI-INFLAMMATORY ACTIVITY OF THE *Cucurbita moschata* DUCH VEGETABLE OIL**

Sueiro-Oyarzun ML[1], Torres-Pla G[1], Cabrera-Santos K[2], Siverio-Mota D[1], Jorge-Rodríguez ME[1].

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Introduction: The *Cucurbita moschata* seed oil is used for medicinal purposes. The anti-inflammatory effect of the *Cucurbita* species' oil has not been scientifically proven. The objective was to evaluate the acute and chronic anti-inflammatory activity of *C. moschata* oil. **Material and Methods:** An experimental study was conducted at the Central University of Las Villas. Evaluation of acute anti-inflammatory activity of the oil (0.5, 1 and 2 mL/kg) was performed by plantar edema induced by histamine and serotonin and chronic anti-inflammatory activity was done using granuloma induced by cotton pellet model, both in Wistar rats. **Results:** The inflammation of the groups treated with oil induced by histamine and serotonin was lower than the negative control (sodium chloride). For histamine-induced edema, groups treated with oil showed similar percentages of inflammation to the positive control (cyproheptadine). For serotonin edema, groups treated with oil showed higher percentage of inflammation than the positive control (indomethacin). Chronic inflammation assay showed higher weight values for the wet content than for the dry content. The weight of the wet content was higher for the negative control (sodium chloride) and lower for those groups treated with oil. The negative control value reaches the highest weight of dry content and the lowest value is the dose of 2 mL/kg. The percentage of swelling of the wet and dry content were lowest at 2 mL/kg, for this group the highest inhibition of inflammation dry content was 78.15% and 66.17% for the wet content. **Conclusions:** The acute and chronic anti-inflammatory models evaluated showed an anti-inflammatory effect of *Cucurbita moschata* oil at doses of 0.5, 1 and 2 mL/kg with a possible dose-dependent behavior.

Citation Format:
Sueiro-Oyarzun ML, Torres-Pla G, Cabrera-Santos K, Siverio-Mota D, Jorge-Rodríguez ME (2015) Acute and chronic anti-inflammatory activity of the *Cucurbita moschata* Duch vegetable oil. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S105. Abstract nr PPP-13.

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PPP-14: **STUDY OF PROPERTIES HEALING *Aloe* COMPARED WITH SHOSTASKOWKY BALM IN THE MALE ALBINO RATS**

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Introduction: The use of aloe (*Aloe vera/Aloe barbadensis*) was popularized in many Western countries during the 50s attributing various medicinal properties. The population has used topically for its antibacterial and healing effects so that a preclinical experimental study was conducted to scientifically prove the healing time of wounds using the plant in its natural form compared with the balm of Shostaskowsky as standard. **Material and Methods:** For this purpose were used 48 male albino rats, with weigh between 130 and 150 g and not subject to any previous study. These were divided into three groups: control group, experimental group (with aloe, aloe pure) and a group with a scar pattern (Russian Balm Shostakowsky). In the rats were underwent an incisional wound of 1 cm in length affecting the skin and subcutaneous tissue. The product was applied one time at day until spontaneous fall of the crust with smooth and shiny surface which was the criterion for considering the wound healed using as measured by daily observation and histological studies of the affected area for which a rat from each group was sacrificed daily randomly selected. With the reorganization was accelerated colagenasen fibers showed the experimental group. **Results and Conclusions**: The healing time of lesions in the animals of experimental group was significantly lower for the group with regard to control and pattern.

Citation Format:
Cardosa E, Dorado L (2015) Study of properties healing aloe compared with Shostaskowky balm in the male albino rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S106. Abstract nr PPP-14.

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PPP-15: **PHARMACOLOGYCAL AND TOXICOLOGYCAL ACTIVITY OF AQUEOUS EXTRACT OF *Solanum torvum***

Pérez L, Puente E, Fong O, Salas H, Cedeño N, Wawoe N, Larramendi D, Barreiro AV.

Dirección de Ciencia e Innovación Tecnológica. Universidad de Ciencias Médicas. Avenida de las Américas s/n entre Calle E y Calle I. Reparto Sueño. Santiago de Cuba. E-mail: elizet.jackson@medired.scu.sld.cu

Introduction: The medicinal plants contain active principles that although they are those responsible for the therapeutic properties that are attributed. **Objectives:** to evaluate the anti-inflammatory activity, acute oral toxicity for the method of the classes and the toxicity to repeated dose of the aqueous extract of leaves and shafts of *Solanum torvum* in Sprague Dawley rats. **Methods:** was carried out a test of anti-inflammatory activity for the method of formalin to 1%, a test of acute oral toxicity for the method of the classes, toxicity assay was realized by the repeated doses method (Limit Test) during 28 days. The anti-inflammatory activity of the extract was evaluated respectively in three experimental groups that they received unique administrations from the product to the dose levels of 600, 300 and 150 mg/kg, using the positive controls indomethacine and Ibuprofeno. The administration in the toxicological acute evaluation was made to unique dose of 2 000 mg/kg, and 1 000 mg/kg, in the case of the toxicity by the repeated doses method. Anatomopathology, histology, hematology and biochemist blood studies were made. **Results:** The study result shows that the aqueous extract of the *Solanum torvum* plant in a 600 mg/kg dose inhibits inflammation at a 72.03 %, without altering the clinical and physiological parameters; macroscopically they were not proven alterations of diagnostic value. **Conclusions:** The extract test exhibits anti-inflammatory properties in the animal pattern and dose level used under the experimental conditions, the aftermath of the study did not evidence signs of toxicity in the experimental model.

Citation Format:
Pérez L, Puente E, Fong O, Salas H, Cedeño N, Wawoe N, Larramendi D, Barreiro AV (2015) Pharmacologycal and toxicologycal activity of aqueous extract of *Solanum torvum*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S107. Abstract nr PPP-15.

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PPP-16: **PRECLINICAL EVALUATION OF ANTINFLAMATORY AND GASTROPROTECTIVE ACTIVITY OF THE LIQUID EXTRACT FROM THE LEAVES OF *Capraria biflora* L.**

Valido-Díaz A[1], Vicet-Muro L[2], Boffill-Cárdenaz M[3], Pizarro-Espín A[1], Valdés-Álvarez M[1], Blanco Machado F[1].

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[3]Medicine Faculty. Villa Clara´ Medical College, Cuba.

Introduction: *Capraria biflora* L, belongs to the family *Schrophulareaceae*. It´s a plant with a long history in traditional medicine, commonly used in chronic pathologies associated to inflammatory processes. **Objective:** In this current study, it has been proofed for the first time through experimental techniques, its antinflamatory and gastoprotective effects in chronic events of a liquid extract obtained from the leaves of this plant. **Methods:** For the study of its anti-inflammatory effects was put into practice the model of chronic inflammation of granulomas induced by cotton pellets, meanwhile for its gastroprotective effects were evaluated two technics of severe gastric ulcers using like ulcerogenic agent the absolute ethanol (1 mL/200 g) and the indomethacin (500 mg/kg). In the experimental design were used doses of 200, 400 and 800 mg/kg of weight. As positive controls were used: indomethacin 5 mg/kg (chronic inflamation model), atropine 20 mg/kg (model of ulcers by absolute ethanol) y ranitidine 100 mg/kg (model of ulcers by indomethacine) and like negative control was used filtered water. **Results:** The extract of *Capraria biflora* L., provided antinflamatory activity to all studied doses. The 200 mg/kg dose showed statistically significant similar results to indomethacin, while the 400 and 800 mg/kg were significant higher to this control. In addition, it was proofed the gastroprotective effect of the extract through the model of ulcer by absolute ethanol, to all studied doses with inhibition percents similar to atropine. Similar results were obtained with the model of ulcers by indomethacin being the 400 and 800 mg/kg doses the most active with percents of inhibition similar to ranitidine. **Conclusions:** The results warrant the gastroprotective and anti-inflammatory potential of the evaluated extract.

Citation Format:
Valido-Díaz A, Vicet-Muro L, Boffill-Cárdenaz M, Pizarro-Espín A, Valdés-Álvarez M, Blanco Machado F (2015) Preclinical evaluation of antinflamatory and gastroprotective activity of the liquid extract from the leaves of *Capraria biflora* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S108. Abstract nr PPP-16.

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PPP-17: **PHYTOCHEMICAL SCREENING, GASTOPROTECTIVE ACTIVITY AND SEVERE TOXICITY OF *Cnidoscolus chayamansa* MC. VAUGH LEAVES**

Mena Y[1], González DM[2], Valido A[1], Pizarro A[1], Castillo O[1], Blanco F[1].

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Introduction: The specie *Cnidoscolus chayamansa* MC. Vaugh is an important nutritive source because of its high percent of proteins and minerals. Traditionally, it is used for diabetes, obesity, arthritis and anti-inflammatory in several disturbances associated to inflammatory processes. **Objective:** Due to the interest of performing this investigation to evaluate the gastoprotective activity and its secure usage through oral way of the leaves of this specie. **Methods:** Also there were identified the principal groups of secondary metabolites present in liquid, ethanolic and ethereal extracts of the dried leaves through a phytochemical screening. It was carried out a study of severe oral toxicity through the procedure of fixes dose (5000 mg/kg) and the gastroprotection though an experimental model of gastric severe ulcers induced by absolute ethanol (1000, 2000 and 4000 mg/kg). In both studies were used rats of the line Sprague Dawley. **Results:** The corporal mass as indicator of the toxicity was according to the growing curve of and the line of the biological model used. There were found differences in the composition of the secondary metabolites for the three extracts. In the gastroprotective study we could observed a progressive rising of inhibition percent of the ulceration grade from 21% to the dose of 1000 mg/kg to 99 and 100% to the dose of 2000 mg/kg and 4000 mg/kg respectively. The values obtained in this case did not show significant statistic differences in relation to omeprazole used like positive control. **Conclusions:** The results warrant the gastroprotective potential of the evaluated extract and its security trough the oral way.

Citation Format:
Mena Y, González DM, Valido A, Pizarro A, Castillo O, Blanco F (2015) Phytochemical screening, gastoprotective activity and severe toxicity of *Cnidoscolus chayamansa* MC. Vaugh leaves. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S109. Abstract nr PPP-17.

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PPP-18: **ASSEMENT OF *Agave brittoniana* NATURAL PRODUCTS ON EXPERIMENTAL METABOLIC SYNDROME**

González-Madariaga Y[1], Orestes-Guerra J[2], Nieto-Reyes L[2], Castillo-Alfonso O[1], Santiesteban-Muñoz D[1], Toledo-Soriano R[1], Casanova-Noche P[3].

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Introduction: Finding new pharmacological objectives allowing the metabolic syndrome control in medicinal plants constitutes one of the main investigation lines developed worldwide by numerous researchers. **Objective**: Assessment of the pharmacological activity of different natural products derived from *Agave brittoniana* Trel. in an experimental model of metabolic syndrome. **Methods**: A rich furostanic-espirostanic saponin n-butanolic extract from the leaves of *A. brittoniana* was obtained. Next, this saponin crude was fractionated by column chromatography, using methanol mixtures. The n-butanolic extract and two fractions obtained from it were used for biological researches. The experimental metabolic syndrome was achieved supplying a sucrose solution to 35% to male Wistar rats recently weaned during 18 weeks. The natural products were orally administered (1 mg/kg) during 14 days after the metabolic syndrome induction and the hyperglucidic diet was maintained so far. Biometrics and lipidic parameters, and the arterial tension were registered. **Results:** The *A. brittoniana* products diminished significantly the body weight when concluding the study. The best results were obtained in the more polar saponin fraction. The triglyceride, systolic and diastolic arterial tension values showed substantial reductions in all the *A. brittoniana* products tested. **Conclusions:** The n-butanolic extract of *A. brittoniana* and two fractions obtained from it revealed effectiveness in the reduction of body weight, triglycerides and arterial tension in a model of metabolic syndrome.

Citation Format:
González-Madariaga Y, Orestes-Guerra J, Nieto-Reyes L, Castillo-Alfonso O, Santiesteban-Muñoz D, Toledo-Soriano R, Casanova-Noche P (2015) Assement of *Agave brittoniana* natural products on experimental metabolic syndrome. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S110. Abstract nr PPP-18.

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PPP-19: **EVALUATION OF ANALGESIC ACTIVITY OF FLAVONOIDS OF *Boldoa purpurascens* CAV IDENTIFIED BY VIRTUAL SCREENING**

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Introduction: The actual analgesic therapy is unsatisfactory for the treatment of pain because of its multiples side effects that is why the search of new molecules from natural products continues for this purpose is very important nowadays. The aim of this paper is to identify new analgesic molecules of *Boldoa purpurascens* Cav. through the Virtual Screening using QSAR-LDA models and *in vivo* experimental corroboration. **Methods:** LDA- QSAR models using linear, bilinear and quadratic indices stochastic and non-stochastic-based relationships are developed. The obtained were used in virtual screening of flavonoids isolated of *B. purpurascens* as potential analgesics. Finally, those identified compounds of natural origin (DMR 1, DMR 2, DMR 3 and DMR 4) were evaluated at doses of 50, 100 and 150 mg/kg by the hot plate and acetic acid writhing tests. **Results:** The four tested compounds showed analgesic activity in two animal models of pain, and were previously identified by Virtual Screening. **Conclusions:** TOMOCOMD-CARDD program and QSAR-LDA models have allowed the identification of four compounds isolated from *Boldoa purpurascens* Cav. as new analgesics, showing a good correlation between theoretical and experimental results. TOMOCOMD-CARDD/ QSAR-LDA demonstrate the potential in the selection of new compounds with analgesic activity.

Citation Format:
López A, González D, Marrero Y (2015) Evaluation of analgesic activity of flavonoids of *Boldoa purpurascens* Cav identified by virtual screening. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S111. Abstract nr PPP-19.

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PPP-20: **TOXICOLOGICAL AND PHARMACOLOGICAL EVALUATION OF A WATERY EXTRACT OF *Pseudelephantopus spicatus* ROOTS OR CAW´S TONGUE, CUBA**

Hernández M[1], **Pizarro A[2]**, García D[1], Saucedo Y[3], Armas Y[3], Zaita Y[1], Santos N[1], Bauta R[1], Artiles M[1], Galbán M[1].

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Introduction: Fever generally accompanies the inflammatory and painful processes. Among their therapies, the tendency prevails to the use of the analgesic, antipyretics and anti-inflammatory non-steroidal drugs well-known as NAIDs. But the adverse reactions that NAIDs exhibits, makes necessary the search of new alternatives, finding in the traditional and natural medicine a novel exploration line. *Pseudelephantopus spicatus* is medicinal specie with tradition of antifebrile use by the Cuban people. However, the scientific literature do not refer any pharmacological study that endorse the usefulness off the plant as antipyretic, neither describe his toxicologist potential. An experimental preclinical study was carried out with the objective of evaluate from the pharmacological and toxicological point of view a watery extract obtained starting from the roots of *Pseudelephantopus spicatus*, well-known as caw´s tongue in Cuba. **Methods:** The toxic potential of the extract was determined in Sprague Dawley rats to unique dose for oral way, being not toxic when applying the Procedure of Fixed Dose, being its superior DL_{50} to 2000 mg/kg of weight. The antipyretic pharmacological activity of the watery extract of roots was evaluated using the chemical method in Wistar rats. The doses studied for oral way they were of 200, 400 and 800 mg/kg for the extract and the positive control was ibuprofen 100 mg/kg of weight. It was conformed a group control that received distilled water. All the groups consisted of six distributed animals in an aleatory way. Fever was induced by subcutaneous injection from a solution to brewer's yeast (15 %) in chloride of sodium at 0.9%. The rectal temperature variable was valued at 1, 2 and 3 h after the treatment. **Results and Conclusions:** The results demonstrated effect antipyretic being the dose with more effectiveness was 400 mg/kg of weight for the used pattern.

Citation Format:
Hernández M, Pizarro A, García D, Saucedo Y, Armas Y, Zaita Y, Santos N, Bauta R, Artiles M, Galbán M (2015) Toxicological and pharmacological evaluation of a watery extract of *Pseudelephantopus spicatus* roots or caw´s tongue, Cuba. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S112. Abstract nr PPP-20.

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PPP-21: **CHEMOSENSITIZER EFFECT OF MICRO-ENCAPSULATED SEED LIPID EXTRACT OF *Cucurbita pepo* L. IN CT26.WT TUMOR CELLS**

Rodríguez-González JC, **Quiñones-Maza OL**, Valentín-Quiñones N, Nogueira-Mendoza A, Delgado-Hernández R.

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Introduction: Decreasing side effects and chemo-resistance and increasing specific tumor targeting is the greatest challenge in cancerology research. Natural compounds have been identified that enhance the effectiveness of conventional chemotherapy and radiotherapy. The chemical components of seed lipid extract from *Cucurbita pepo* L. have antitumor and chemosensitizer adjuvant activities; however, the use of seed lipid extract as phytochemical chemosensitizer adjuvant in anticancer combination therapy has not been reported yet. **Objective**: To evaluate the chemo-sensitizer adjuvant effect *in vitro* of microencapsulated seed lipid extract of *C. pepo* in combination treatments with antineoplastic platinum and 5-fluorouracil cytostatic agents. **Methods**: CT26.WT cell line was treated with the extract (1-200 µg/mL), cisplatin, oxaliplatin, carboplatin and 5-fluorouracil in simple and combination (sequential and simultaneous) treatments at different incubation times and at non cytotoxic concentrations. The cell survival was evaluated by MTT assay. **Results**: The extract was not cytotoxic and CT26.WT cells showed different sensibilities to anti-neoplastic agents (IC_{50}: 5-FU = 0.457 µM, oxaliplatin = 1.009 µM, cisplatin = 2.625 µM, carboplatin = 26.07 µM). The results from combination treatments showed a general trend that the highest increases in cell death were obtained at higher concentrations of the extract (100/200 µg/mL) and the lowest concentration of antineoplastic agents (0,1 µM 5-fluorouracil, 1 µM oxaliplatin and cisplatin, 2 µM carboplatin). In relation to treatment schemes, the best increases of cell death is achieved by simultaneous combination treatment in the cases of 5-fluorouracil, oxaliplatin and carboplatin; while presensitization sequential treatment of the cells with the extract was the best for cisplatin. The best of all chemosensibilizer effect was achieved in simultaneous scheme with oxaliplatin. **Conclusions**: Microencapsulated seed lipid extract of *Cucurbita pepo* L. in combination treatment with cytostatic platinum and 5-fluorouracil potentiates cytostatic-induced cell death in our experimental conditions. **Financial Support:** Project of Cuban Ministry of Health nr. 1401049.

Citation Format:
Rodríguez-González JC, Quiñones-Maza OL, Valentín-Quiñones N, Nogueira-Mendoza A, Delgado-Hernández R (2015) Chemosensitizer effect of microencapsulated seed lipid extract of *Cucurbita pepo* L. in CT26.WT tumor cells. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S113. Abstract nr PPP-21.

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PPP-22: **ANTIINFLAMATORY ACTIVITY OF *Azadirachta indica* A. JUSS**

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Introduction: The neem tree (*Azadirachta indica* A. Juss) is a medicinal plant with an ancestral use and has been widely used in traditional medicine since it has a wide spectrum of medicinal properties, however, scientific research of its therapeutic properties are developed for some years. Therefore, in the following work we set as **Objective**: To determine the phytochemical composition and evaluate the anti-inflammatory activity of the hydroalcoholic extract of leaves and stems of the plant *Azadirachta indica*. **Material and Methods:** The hydroalcoholic extract was obtained using a Soxhlet apparatus, which was subjected to a preliminary phytochemical screening and characterized by UV/VIS spectroscopy. For assessing anti-inflammatory activity, we used the model of acute inflammation of the paw edema induced by 1% formalin in Sprague Dawley rats using ibuprofen as a positive control and three dose levels of each extract to thereby obtain the curve dose - response. **Results**: the presence of abundant flavonoids, phenols and tannins, saponins, followed by triterpenes, glucosides, saponins, alkaloids and carbohydrates was determined. Anti-inflammatory activity was evidenced by reducing edema in the model used at doses of 600 and 300 mg/kg when compared to the reference drug, it can be given by the combined action of different secondary metabolites present in the extract. **Conclusions**: The evaluated plant showed anti-inflammatory activity, thus justifying the traditional use that has had this plant by the population for the acute treatment of diseases with an inflammatory component.

Citation Format:
Berenguer CA, Landazuri S, Puente E, Rodríguez E, Fong O (2015) Antiinflamatory activity of *Azadirachta indica* A. Juss. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S114. Abstract nr PPP-22.

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PPP-23: **SPONTANEOUS WITHDRAWAL IN SPRAGUE DAWLEY RATS EXPOSED TO THE COMBUSTION PRODUCTS OF *Mimosa pudica***

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Introduction: Toxic plants are those, which produce injuries, disease or cause death to humans or animals. There are about 388 species of plants considered toxic in Cuba, including native or exotic. However, there are plants being used as drug enhancers like marihuana, in the southeastern provinces of Cuba, such as *Mimosa pudica*, and are not included in such inventories. This research aims to evaluate the addictive potential of the combustion products of *Mimosa pudica* plant in Sprague Dawley rats. **Material and Methods**: We developed a plant phytochemical screening and it was evaluated the addictive potential through a non-precipitated withdrawal test, using a plant doses of 1000 mg/kg and a reference group with chlordiazepoxide 64 mg/kg. **Results**: The phytochemical screening showed the presence of triterpenes, steroids, saponins, carbohydrates, alkaloids and phenolic compounds. The plant showed signs of physical dependence, characterized by the manifestation of signs hyperactivity (excitability and aggressiveness), piloerection and soft feces, as well as decreased body weight and increased rectal temperature during the withdrawal period. **Conclusions**: The plant showed signs of mild dependence similar to chlordiazepoxide.

Citation Format:
Fong O, Berenguer CA, de la Vega JE, Mira H, Salas H, Álvarez F (2015) Spontaneous withdrawal in Sprague Dawley rats exposed to the combustion products of *Mimosa pudica*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S115. Abstract nr PPP-23.

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PPP-24: **PRECLINICAL VALIDATION OF THE *Costus pictus* D.DON (CAÑA MEXICANA) SPECIES**

Blanco Y, Victoria MC, Martínez I, López M, Acosta L, Brito G, Duménigo A, Morejón Z, Morón F, Cabrera H, Martínez JM.

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Introduction: *Costus pictus* belong to *Zingiberaceae* family, in Cuba is known as *caña mexicana* and decoction of leaves and fresh stems is traditionally used for urinary disorders like infections, lithiasis and renal colic. The aim of this work was to identify the main groups of secondary metabolites and to validate pharmacology and toxicology properties of a decoction of fresh leaves and stems from *C. pictus*. **Methods:** Airs fresh parts were collected and conducted a farmacognostic and pharmacology study. A phytochemical screening identified the main groups of secondary metabolites present in the decoction 30%. Analgesic activity was determinate by contortions induced by acid acetic (0.75% via i.p) and removal of the tail submerged into water at 55°C. Anti-inflammatory activity was assay in cotton-induced granulomas in rats and relaxations of smooth musculature in urethra. Toxicology test were CTA and toxicity in repeat doses. **Results:** Main secondary metabolites were phenol, tannins, and flavonoids. Decoction of *C. pictus* inhibits contractions of the urethra induced by KCl. The toxicology study not presents nor intoxications, nor death. It significantly reduced the painful response both models, but there was no anti-inflammatory effect on cotton-induced granuloma. **Conclusions:** The results contributed to validate the traditional use of *C. pictus* fresh leaves and stems in order to relieve the pain caused by renal diseases.

Citation Format:
Blanco Y, Victoria MC, Martínez I, López M, Acosta L, Brito G, Duménigo A, Morejón Z, Morón F, Cabrera H, Martínez JM (2015) Preclinical validation of the *Costus pictus* D.Don (caña mexicana) species. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S116. Abstract nr PPP-24.

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NATURAL ANTIOXIDANTS

PNA-25: ANTIOXIDANT AND ANTI-INFLAMMATORY EFFECTS OF PROTEOLYTIC FRACTION FROM *Vasconcellea cundinamarcensis* LATEX ON HAIRLESS MICE SKIN IRRADIATED WITH MULTIPLE DOSES OF UVB

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Introduction: UV radiation induces skin damage by imbalance of the endogenous antioxidant system leading to an increase of free radical and inflammation. The P1G10 fraction from *Vasconcellea cundinamarcensis* latex, rich in cysteine protease, displays angiogenic, mitogenic and anti-inflammatory activities and enhances wound healing on different cutaneous lesion models. Here, we investigated the possible antioxidant and anti-inflammatory effects of topical P1G10 formulation against damage induced by multiples doses of UVB on mice skin. **Methods**: Hairless mice (n=49) were irradiated with UVB light (240 mJ/cm2/312 nm) on the dorsal area (protocol CETEA 174/2010). P1G10 (0.1-1.0% or vehicle - Natrosol®) was applied topically after daily UVB exposure for 10 days. One day after last treatment, the animals were anaesthetized, fragments of damaged skin were excised and analyzed for different markers. The catalase and GSH (Glutathione) activities were measured using spectrophotometric and fluorescent assays, respectively. Cytokines levels were determined by ELISA. The data were expressed as mean ± standard error and statistically analyzed by one way ANOVA, Newman-Keuls post-test. **Results:** The catalase activity was significantly enhanced by 0.1% or 0.5% P1G10 treatment (0.04 ± 0.003 *vs* 0.02 ± 0.003 ΔABS/µg protein/min – vehicle, $p<0.05$). Furthermore, a decrease in GSH, TNF-α and IL1β ($p<0.05$) levels was observed following each dose of P1G10. In addition, VEGF levels were reduced at 0.1% of P1G10 (2.70 ± 0.22 *vs* 3.06 ± 0.28 ρg/mg – vehicle, $p<0.05$). **Conclusions:** The changes in catalase/GSH activities and cytokines levels suggest a role for P1G10 as antioxidant and anti-inflammatory, respectively, on tissue repair following UVB-induced damage. **Financial Support:** CNPq, FAPEMIG and CAPES.

Citation Format:
Freitas KM, Salas CE, Lopes MTP (2015) Antioxidant and anti-inflammatory effects of proteolytic fraction from *Vasconcellea cundinamarcensis* latex on hairless mice skin irradiated with multiple doses of UVB. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S117. Abstract nr PNA-25.

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PNA-26: *In vitro* AND *in vivo* ANTIOXIDANT EFFECT OF THE ETHANOLIC EXTRACT OF *Solanum diploconos* FLOWERS

Venturi I[1], Delgado-Roche L[2], Menéndez R[2], Morales RA[2], Valdés O[3], Hernández Y[3], Malheiros A[1], de Souza MM[1], Cechinel-Filho V[1], Rodeiro I[2].

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Introduction: *Solanum diploconos* is a species that belongs to the family of *Solanaceae* and the gender *Solanum*. The plant grows in Brazil, mainly in the regions of Santa Catarina. The scientific literature contains wide information on its botanic characteristics; however, little is known on the chemical composition and the biological properties of the plant. Thus, the aim of the present work was to evaluate the *in vitro* and *in vivo* antioxidant effect of the ethanolic extract of *Solanum diploconos* flowers. **Material and Methods:** The ethanolic extract was obtained by maceration and concentrated in a rotary evaporator at 40°C. The total content of flavonoids and phenolic compounds in the flowers extract was determined using standard procedures. The *in vitro* characterization of flowers included the ferric reducing power (FRAP), the inhibitory effect of brain phospholipid peroxidation, as well as the DPPH and superoxide anion scavenging capacity. Furthermore, a mouse model of benzo(a)pyrene (BaP)-induced oxidative stress was used to assess the *in vivo* antioxidant capacity of Solanum diploconos flowers. **Results:** The ethanolic flowers extract contains flavonoids (19.02 µg/g of dried extract) and phenolic compounds (3.14 mg/g of dried extract). The *S. diploconos* flowers inhibited (85.23%) the brain phospholipid oxidation (IC50=68.86 µg/mL), meanwhile the DPPH and superoxide anion scavenging capacity (IC50= 97.74 and 110.90 µg/mL, respectively) increased as the concentra-tion increases. The ferric reducing power was comparable with ascorbic acid. In addition, the oral administration of flower extract (10, 100 and 200 mg/kg) during a week prevented BaP-induced glutathione levels diminishment, together with a significant reduction ($p<0.05$) of lipid and protein damages. **Conclusions:** The present results demonstrated by the first time the *in vitro* and *in vivo* antioxidant capacity of *Solanum diploconos* flowers. Thus, the present work supports the potential use of this plant as a natural source of antioxidants to prevent oxidative stress-associated diseases.

Citation Format:
Venturi I, Delgado-Roche L, Menéndez R, Morales RA, Valdés O, Hernández Y, Malheiros A, de Souza MM, Cechinel-Filho V, Rodeiro I (2015) *In vitro* and *in vivo* antioxidant effect of the ethanolic extract of *Solanum diploconos* flowers. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S118. Abstract nr PNA-26.

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PNA-27: **ANTIOXIDANT CAPACITY AND FATTY ACID PROFILE OF *Swinglea glutinosa* (BLANCO) MERR, CULTIVATED IN CUBA**

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Introduction: The small tropical tree *Swinglea glutinosa* (Blanco) Merr. is a member of the *Rutaceae* family. Originally brought to South America from Southeast Asia, it is used as an ornamental plant in Cuba and as a natural barrier in rural areas and gardens. Extracts from this tree have been assessed for cytotoxic and antimalarial activity in previous studies but never been evaluated its antioxidant activity. **Material and Methods:** The antioxidant capacity of the methanolic extracts and the fatty acid composition of leaves and fruits *S. glutinosa* (Blanco) Merr was investigated. Six different chemical methods were used to determine the antioxidant capacity. The fatty acid composition was analyzed using gas chromatography. **Results:** The IC_{50} value of the extracts was determined being 28.2 g/mL to leaf extract and 10 µg/mL to fruit extract (in the DPPH method. The concentration of the extracts resulted in increased in the ferric reducing antioxidant power to both extracts tested. The amount of total phenolic content was detected as 48.5 mg and 35.9 gallic acid equivalent (GAE)/g in the fruit and the leaf extract, respectively; meanwhile the total antioxidant capacity was 94.93 and 75.3 mg ascorbic acid equivalent (AE)/g for fruits and leaves, respectively. The peroxidation lipid assays (FTC and TBA methods) shows highest antioxidant effect for the leaf extract. **Conclusions:** The results permit to deduce that the fruit extract has highest anti-radical effect and the leaf extract has highest effect against the lipid peroxidation. The major fatty acid in the composition of *Swinglea glutinosa* was found to be the ω_6 (linoleic) and ω_9 (oleic) acids by GC analysis, with 0.5 % for both. This study reveals that *Swinglea glutinosa* is an attractive source of ω fatty acid components, especially the essential ones, as well as of effective natural antioxidants.

Citation Format:
Goya E, Jorge E, Saucedo Y, Vander Heyden Y, Le Thi Cam Tú (2015) Antioxidant capacity and fatty acid profile of *Swinglea glutinosa* (Blanco) Merr, cultivated in Cuba. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S119. Abstract nr PNA-27.

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PNA-28: **TROPICAL FRUITS POLYPHENOLS: EXCELLENT INHIBITORS OF THE OXIDATION OF THE LDL**

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Introduction: Epidemiological studies have demonstrated that fruit polyphenols can inhibit the oxidation of lipoproteins of low density (LDL), factor that trigger cardiovascular illnesses. Therefore, this work evaluated the antioxidant power of tropical fruits polyphenols, that never have been studied, present in papaya (*Carica papaya*), soursop (*Annona muricata*), mammee (*Pouteria sapota*), guava (*Psidium guajava*), banana cv. *vietnamese* (*Musa paradisiaca*) tamarind (*Tamarindus indicus*). **Methods:** The oxidation was performed at 37°C with different concentrations of polyphenols. The oxidation products were measured by the 2-tiobarbituric acid method. The IC_{50} was estimated as an antioxidant quality index and the Antioxidant Potential per Serving (APS) as a parameter that categorize the fruits relating the quality and quantity of phenols. **Results:** The *Tamarindus indicus* and *Pouteria sapota* evidenced the best antioxidant quality of polyphenols. Likewise, the *Tamarindus indicus* and *Psidium guajava* showed the biggest APS.

Citation Format:
Herrera E, Fernández R, Bebelagua Y, García MA, Rodríguez JL (2015) Tropical fruits polyphenols: excellent inhibitors of the oxidation of the LDL. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S120. Abstract nr PNA-28.

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PNA-29: **EVALUATION OF ANTIOXIDANT ACTIVITY AND ACUTE TOXICITY OF AQUEOUS FRACTION OF *Dichrostachys cinerea* (L.) WIGHT & ARN. (*Mimosaceae*) LEAVES**

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Introduction: The aim of this study was to evaluate the *in vitro* antioxidant properties and the acute oral toxicity of the aqueous fraction of the *D. cinerea* leaves (AFDC) in Sprague-Dawley rats. **Material and Methods:** *Plant material:* Leaves were collected in the Botanical Garden of the university. Plant sample was identified as *Dichrostachys cinerea* by a taxonomic expert of the above institution. *Phytochemical procedure:* Dry powder (30 g) was extracted with methanol using Soxhlet apparatus. Methanol was removed under reduced pressure at 40°C to obtain a residue. It was suspended in water and partitioned with n-hexane to degrease. AFDC was collected and store at 2-8 °C until use. *Antioxidant properties of* D. cinerea**:** The ferric-reducing antioxidant power (FRAP), 2,2-diphenyl-1-picryl dihydrazyl (DPPH) and Fe^{2+}-chelating assays were used. The total phenolic (TPC) and total flavonoids contents (TFC) were estimated by Folin-Ciocalteu and $AlCl_3$ methods respectively, using galic acid (GA) and quercetin (Q) as standards. *Acute Oral Toxicity*: Test was carried out according to the single doses method on Sprague-Dawley rats at 2000 mg/kg body weight. **Results and Discussion:** Positive results were found for flavonoids, tannins and saponins. *Antioxidant activity:* AFDC had effective antioxidant properties giving IC_{50} values of 5.83 ± 0.03 µg/mL by ferric ions (Fe^{3+})- reducing power, 3.00 ± 0.00 µg/mL by DPPH assay and 8.28 ± 1.04 µg/mL by ferrous ions (Fe^{2+}) chelating activity. The total phenolic content (TPC) and total flavonoids content (TFC) were 243 ± 8.71 µg GAE/mg and 20 ± 0.48 µg QE/mg, respectively. *Acute Toxicity:* There was no mortality or behavioral abnormality in rats treated orally with a dose of 2000 mg/kg body weight. **Conclusions:** The results obtained suggest that the aqueous fraction of *D. cinerea* leaves possess significant *in vitro* antioxidant activity and can be considered as safe up to 2000 mg/kg body weight.

Citation Format:
Ribalta V, Torres L, Hernández E, Sueiro M, Armas Y, Ruz V (2015) Evaluation of antioxidant activity and acute toxicity of aqueous fraction of *Dichrostachys cinerea* (L.) Wight & Arn. (*Mimosaceae*) leaves. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S121. Abstract nr PNA-29.

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NATURAL ANTI-INFECTIOUS

PNAI-30: *In vitro* ANTILEISHMANIAL ACTIVITY OF *Heliotropium indicum* LINN AND *Cordia dentata* POIR FRACTIONS

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Introduction: Medicinal plants play an important role between different biological processes as antitumor, cytotoxicity, antimicrobial, anti-inflammatory, anti-estrogen, anti-allergic, antioxidant, among other. Colombia has about 10% of all plant species in the world, being the North coast with highest medicinal herbs few studied. This study **aims** to evaluate *in vitro* cytotoxic activity on human promonocytic cell line U937 and leishmanicidal activity against intracellular amastigotes of *Leishmania* (V) *panamensis* (MHOM/CO/87/UA140-EpiR-GFP strain) of fractions obtained from leaves *Heliotropium indicum* Linn and *Cordia dentata* Poir. **Material and Methods:** The plants were collected in 2013 at the North of Bolivar (Colombia). The cytotoxic activity was performed using 2,5-diphenyl-tetrazolium enzymatic method 3-[4,5-dimethylthiazol-2-yl] (MTT) and antileishmanial assessment by flow cytometric technique. The assays were done by triplicate in at least two independent experiments, as positive control was used amphotericin B. Results were expressed as fifty cytotoxic concentrations (CC_{50}), concentration necessary to kill 50% of cells, and fifty effective concentrations (EC_{50}) calculated by Probit analysis (Parametric method of linear regression that permits doses-response analysis); it was similarly determined the Selectivity Index (SI). **Results:** *H. indicum* (Hi) fractions were more cytotoxic than *C. dentata* (Cd) against cell line U937. Hi-I- 18B and Hi-I-18E fractions were considered as potentially cytotoxic (CC_{50} 11.7 and 13.9 µg/mL). Moreover, the Cd-I-13C fraction was midly cytotoxic (CC_{50} 139.1 µg/mL). The fractions were first screened for antileishmanial activity against *Leishmania* (V) *panamensis* at 13. 5 ± 0.3 µg/mL, IS = 0.9 (Hi-I- 18B) and 11.5 ± 2.6 µg/mL, IS = 1.2 (Hi-I-18E) showed % growth inhibition were 18.5 and 21.8%. Cd-I-13C at 24.5 µg/mL, IS = 5.7, growth inhibition was 54.3%. **Conclusions:** This suggests that plants species are rich potential source of molecules useful for treatment of cancer and parasitic diseases.
Financial Support: COLCIENCIAS, Colombia (Project 1107-569-33684/512-2012)

Citation Format:
Gómez-Estrada H, Mercado-Camargo J, Cervantes-Ceballos L, Jiménez-Villalobos T, Robledo-Restrepo S (2015) *In vitro* antileishmanial activity of *Heliotropium indicum* Linn and *Cordia dentata* Poir fractions. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S122. Abstract nr PNAI-30.

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PNAI-31: **ANTIMICROBIAL ACTIVITY AND PHENOLIC COMPOUND IN TWO CUBAN *Phyllanthus* SPECIES**

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Introduction: Various species of the genus *Phyllanthus* are used in natural medicine. Multiple studies *in vitro* and *in vivo* tested antiviral, anti-tumor, anti-inflammatory and anti-microbial properties. Numerous investigations show that the origin of the antiviral activity of these species is due to the presence of phenolic compounds that inhibit DNA polymerase and reverse transcriptase in the replication of DNA. Studies in two endemic species of Cuba demonstrate antiviral activity evidenced by: inactivation of surface antigen Hepatitis B viral, inhibition of multiplication of herpes simplex type 2 virus(HSV-2) in human foreskin fibroblasts (FPH) and bovine type 1 herpes virus (BHV-1) in bovine kidney cells (MDBK). The possibility of antimicrobial activity of extracts with antiviral properties would provide added value for topical use, since many opportunistic microorganisms infect broken skin regions. It is for these reasons that the work **aims** at studying the antimicrobial action of aqueous extracts of *Phyllanthus chamaechristoides* ssp *baracoensis* URB. (Webster) and *Phyllanthus orbicularis* HBK against reference strains of pathogenic organisms such as *Escherichia coli, Staphylococcus* aureus, *Pseudomonas aeruginosa* and *Candida albicans* rigged to the quantification of phenolic compounds present in these. **Material and Methods:** For antimicrobial activity against the organisms, microdilution in broth technique was used. The quantification of the phenolic compounds was performed by colorimetric technique of colored complexes with ferric salt by reaction in alkaline medium with absorbance reading at 490 nm. **Results:** None of the extracts had a significant inhibition allowing antimicrobial activity correlate with the concentration of phenolic compounds. The possibility of microbial action of these plants is not discarded as fractions of low polarity are positive for other species.

Citation Format:
Chevalier P, Galdós M, Electra E (2015) Antimicrobial activity and phenolic compound in two Cuban *Phyllanthus* species. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S123. Abstract nr PNAI-31.

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PNAI-32: **ANTIBACTERIAL EFFECT OF *Costus spiralis* LEAVES EXTRACT ON PATHOGENIC STRAINS OF *Vibrio cholera***

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Introduction: The use of remedies from plant origin covers a wide variety of maladies and constitutes an alternative way to antibiotic therapy, which otherwise seems to be no longer promising due to antibiotics widespread resistance among pathogenic microorganisms. Active principles having antimicrobial activity may be extracted and purified from plants for developing new drugs. Among several illnesses that have historically scourged man, cholera has been potentially epidemic and one of the most outstanding. The bacterium *Vibrio cholerae*, the causal agent, can be eliminated with antibiotics so that besides the traditional treatment of rehydration via oral or intravenous, antibiotics such as tetracycline, ciprofloxacin, norfloxacin or azithromycin are commonly applied. **Material and Methods:** The antimicrobial effect of *Costus spiralis* (Roscoe) leaves extracts on various pathogenic strains of *Vibrio cholerae* was assayed *in vitro* by means of the agar plate diffusion technique. Fresh leaves from this plant were picked up, ovendried for 48 h at 50°C, powdered and finally ethanol-extracted. After drying, the remaining residue was suspended in distilled water up to 100 mg/mL (w/v) and the antimicrobial assays carried out. The pathogenic strains representing the pandemics of the 20th Century: C7258 (O1, El Tor, Ogawa), C6706 (O1, El Tor, Inaba), O395 (O1, Classic, Ogawa), CRC266 (O139) and 569B (O1, Classic, Inaba) were apparently killed, as judged by halos of inhibition of growth in the assays. Similar minimal inhibitory concentrations (MICs) of the extracts for the various strains were obtained. The above results were similar to those from ampicillin. **Results and Conclusions:** *Costus spiralis* may be used as a source of active principles against *Vibrio cholera* and may be considered as an alternative way to antibiotic therapy for cholera, mostly in those cases where the disease becomes epidemic and sanitary conditions were not promptly available.

Citation Format:
Pérez C, Falero A, Hung BR, Ledón T, Fando R (2015) Antibacterial effect of *Costus spiralis* leaves extract on pathogenic strains of *Vibrio cholera*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S124. Abstract nr PNAI-32.

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PNAI-33: **CYTOSTATIC AND CYTOTOXIC EVALUATION OF EXTRACTS FROM FIVE CUBAN PLANTS WITH POSSIBLE ANTIMICROBIAL, ANTIPARASITIC AND ANTI-PROLIFERATIVE EFFECT**

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Introduction: The inhibition of seed germination and *Artemia salina* lethality test are considered a useful tool for the preliminary toxicity determination of plant extracts. The objective of the present work was to determine the cytostatic and cytotoxic effect of total methanol extracts from leaves and stems obtained from the species Ta, Th, Gl, Va and Cc belonging to *Bignonacea* family; and hexane, ethyl acetate and methanol fractions. **Material and Methods:** The cytostatic effect was determined by the seed germination inhibition test of *Solanum lycopersicum* (tomato) and *Lactuca sativa* (lettuce) of total methanol extracts and fractions of the species under study. Cytotoxicity was performed by *Artemia salina* lethality test. **Results:** From 10 of the total methanol extracts studied, four showed cytostatic effect at the tested concentrations, where Gl (leaves) extract showed the best effect. Moreover, of the 15 fractions studied, Gl (leaves) acetate, Th (leaves) acetate and methanol and Cc (leaves) acetate, showed promising cytostatic effect, where Th (leaves) acetate fraction showed the highest activity. As regards toxicity study with brine shrimp larvae, all total methanol extracts showed moderate activity, however Gl (leaves), Ta (leaves) and Th (leaves) fractions were classified as highly toxic. **Conlusions:** The cytostatic and cytotoxic activities of the species studied are showed by the results of this research, constituting the first report of the same, which could have active substances associated with promising antimicrobial, antiproliferative and antiparasitic activity.

Citation Format:
Mancebo B, Regalado AI, Sánchez LM (2015) Cytostatic and cytotoxic evaluation of extracts from five Cuban plants with possible antimicrobial, antiparasitic and anti-proliferative effect. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S125. Abstract nr PNAI-33.

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PNAI-34: **ANTIMICROBIAL ACTIVITY OF LEAF EXTRACTS OF *Moringa oleifera***

Echemendía O, Callico A, Lago V, Almora E, Bolaños G, Fidalgo O, Monteagudo R, Morales Y.

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Introduction: Many natural products possess antibacterial activity which can be used as therapeutic alternative due to the emergence of antimicrobial resistance. *Moringa oleifera* Lam plant native to the India, use as food, water treatment and traditional medicine. *Moringa* also has other properties like anti-inflammatory, antimicrobial, antioxidant, anticancer, cardiovascular, hepatoprotective, anti-ulcer, and diuretic activities. **Objective:** The aim of the present study was to evaluate the antimicrobial activity of alcoholic and aqueous extracts leaf from of three variants of *Moringa oleifera* (*criolla*, *plain*, *supergenius*) against of the references strains *Escherichia coli* (ATCC10536), *Staphylococcus aureus* (ATCC 6538), *Candida albicans* (ATCC 10231), *Pseudomonas aeruginosa* (ATCC9027), *Salmonella thyphi* (9992v), *Vibrio cholerae* (C7258) and microorganisms isolated from clinical samples. **Material and Methods:** The antimicrobial activity was determinated for microdilution plating method for determining the Minimum Concentration Lethal (MCL) according the National Committee for Clinical Laboratory Standar (NCCLS). The microorganisms were adjusted with the turbidity standard McFarland 0.5. Two-fold dilutions of the extracts were prepared from concentrations 100 mg/mL until 0.78 mg/mL. **Results:** The alcoholic extract 70% of *criolla* variant exhibited the strongest antimicrobial activity against the studied bacterial and yeast strains, with CML 3.1 mg/mL to 5.8 mg/mL. The alcoholic extracts of *plain* variant showed a weak to moderate activity against the tested microrganisms. The antimicrobial activity of aqueous extracts of the three variants was generally low. **Conclusions:** *Moringa oleifera* extracts possess good antimicrobial activity and could be used as source for new therapeutic treatment of infections caused by these infectious agents.

Citation Format:
Echemendía O, Callico A, Lago V, Almora E, Bolaños G, Fidalgo O, Monteagudo R, Morales Y (2015) Antimicrobial activity of leaf extracts of *Moringa oleifera*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S126. Abstract nr PNAI-34.

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PNAI-35: **ANTIMICROBIAL ACTIVITY OF THE TOTAL EXTRACT, FRACTIONS AND PURE COMPOUNDS OF THE LEAVES OF *Excoecaria lucida* SW.**

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Introduction: The Cuban population utilizes *Excoecaria lucida* Sw. (Aité) *(Euphorbiaceae)* for medicinal purposes (antimicrobial, antiasthmatic, toothache, callus destruction); however, the available scientific information is insufficient. Considering this background a study of its phytochemical and pharmacologic potential to support its terapeutic use is required. **Methods:** Seven samples obtained from the leaves of this plant species were tested for the antimicrobial activity [Total extract (10 and 100 mg/mL); ethyl acetate and butanolic fraction (5 and 100 mg/mL, respectively); Ellagic acid (1 and 20 mg/mL); 3,3´,4´-Tri-O-methylellagic acid; 3,3´,4´-Tri-O-methylellagic-4-O-B-D-glucopyranoside and Corilagin (1 mg/mL)]. The diffusion in disc method (Kirby-Bauer) was used for the six bacteria (*Staphylococcus aureus; Escherichia coli; Enterococcus faecalis; Pseudomonas aeruginosa; Bacillus cereus; Bacillus megaterium*), four fungi (*Aspergillus niger; Alternaria alternata; Fusarium solani; Aspergillus versicolor*) and a yeast (*Candida albicans*). The Minimum Concentration Inhibitory (MCI) and Minimum Concentration Bactericide (MCB) were determined using the broth dilution method. **Results:** The positive results were for the Total extract (100 mg/mL, sample 1) and ethyl acetate fraction (100 mg/mL, sample 2) that presented activity against *Staphylococcus aureus, Enterococcus faecalis, Bacillus cereus and Bacillus megaterium*, also butanolic fraction (100 mg/mL) had activity against *Bacillus cereus and Bacillus megaterium.* The sample had no antifungal activity. **Conclusions:** The total extract and ethyl acetate fraction had a large spectrum of antibacterial action as compared to the butanolic fraction. Ethyl acetate fraction demonstrated more antibacterial activity against the bacteria tested. The MCI and MCB were determined for the samples 1 and 2, with this confirming the highest antibacterial activity of the ethyl acetate fraction.

Citation Format:
Gross C, Munyewu B, Ochoa A, Escalona JC, Camacho M, Fechine J, Sobral M (2015) Antimicrobial activity of the total extract, fractions and pure compounds of the leaves of *Excoecaria lucida* Sw. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S127. Abstract nr PNAI-35.

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PNAI-36: **ANTIMICROBIAL ACTION OF *Bixa orellana* L.**

Morales M[1], Galdós MC[1], López I[1], Vázquez R[2], Piña JC[1].

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Introduction: *Bixa orellana* L. is a plant that grows in Cuba, to which medicinal properties are attributed. **Material and Methods**: An experimental study was carried out in order to determine the antimicrobial action of ethanolic extracts and dyes of *B. orellana* leaves against *Candida albicans*, *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomona aeruginosa*. The macrodilution method was used and the concentration minimum germicide was determined expressed in dilutions. Stumps of international reference from American Type Culture Collection of *E. coli*, *S. aureus*, *P. aeruginosa* and *C. albicans* were used. **Results**: The dyes to 10% and 20% of the leaf showed inhibitory activity against *S. aureus* in dilutions up to 1:8 and 1:32 respectively; in *E. coli*; the dye to 10% presented activity up to 1:8, the dyes were not active against *P. aeruginosa* and *C. albicans*. The flowing extract to 50% showed inhibitory activity in front of *S. aureus* up to 1:4. The flowing extract to 50% and the dyes of the leaf to 10% and 20% was active in front of *S. aureus* to inferior concentrations with regard to the rest of the microorganisms, but they lacked antimicrobial activity in front of *C. albicans* and *P. aeruginosa*. **Conclusions**: *S. aureus* turned out to be the most sensitive germ to the pharmaceutical forms studied to smaller concentrations minimum germicides expressed in the dilutions. The dye to 10% showed a bigger spectrum of antimicrobial activity. The dye to 20% was the most effective.

Citation Format:
Morales M, Galdós MC, López I, Vázquez R, Piña JC (2015) Antimicrobial action of *Bixa orellana* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S128. Abstract nr PNAI-36.

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PNAI-37: ***In vitro* ANTIFUNGAL ACTIVITY OF CRUDE HYDRO-ALCOHOLIC EXTRACT OF *Petiveria alliacea* L. ON CLINICAL *Candida* ISOLATES**

Velar RE[1], Illnait MT[1], Illnait J[2], Fernández CM[1], Martínez GF[1], Perurena MR[1], Monroy EX[1], Meis JF[3].

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Introduction: The global burden of infections due to *Candida* and the emerging resistance to antifungals has led to the search for new therapeutic alternatives. The aim of the present work was to evaluate the *in vitro* antifungal activity of crude hydro-alcoholic extract of *Petiveria alliacea* L. (HAEPAL) *versus* fluconazole against *Candida* isolates. **Methods:** *In vitro* antifungal activity was evaluated by broth microdilution method in front of 125 *Candida* isolates (60 *C. albicans*). Inoculum of 1.5 x 10^6 CFU/mL in sterile saline solution was incubated with five dilutions of the extract (128, 64, 32, 16 and 8 µg/mL). The minimum inhibitory concentration (MIC) was defined as the lowest concentration of HAEPAL showing ≤50% growth compared with the extract-free growth control estimated by counting the CFU/mL. Fluconazole susceptibility was assessed by ATBTM Fungus 3 and E-test according to manufacturer's instructions. **Results:** HAEPAL showed higher antifungal activity compared to fluconazole. Only four isolates (one *C. albicans*, one *C. glabrata* and two *C. krusei*) exhibited high MICs (≥ 64 µg/mL) compared to 34 (19 *C. albicans* and 15 *Candida* non-*albicans*), which were resistant to fluconazole. **Conclusions:** These results show the antifungal potentiality of HAEPAL, which could become a potential alternative for *Candida* treatment.

Citation Format:
Velar RE, Illnait MT, Illnait J, Fernández CM, Martínez GF, Perurena MR, Monroy EX, Meis JF (2015) *In vitro* antifungal activity of crude hydro-alcoholic extract of *Petiveria alliacea* L. on clinical *Candida* isolates. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S129. Abstract nr PNAI-37.

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PNAI-38: **ANTIPLASMODIAL ACTIVITY AND ACUTE ORAL TOXICITY OF HYDROALCOHOLIC EXTRACTS OF *Zuelania guidonia***

Puente E[1], Mora C[2], Jaramillo M[2], Berenguer C[1], Rodríguez E[1], Salas I[1], Reinert A[1], Cedeño N[1].

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Introduction: According to estimates by the World Health Organization (WHO), malaria is a disease caused by parasites of the *Plasmodium* family. In 2013 it produced 198 million cases, which caused the death of about 584 000 people. The malaria mortality rate has dropped by over 47% since 2000 worldwide. A There is no licensed vaccine against malaria or other human parasite. Ethnobotanical studies showed data on the *Zuelania guidonia* and antiparasitic activity in areas of Cuba and Central America. Considering the biological evaluation performed raised two hydroalcoholic extracts *vs Plasmodium*, *in vitro* plant and acute oral toxicity thereof. **Material and Methods:** Extracts were obtained by the Soxhlet method, using as raw material to extract one leaves and bark extract two, a hydroalcoholic at 60 and 70 respectively menses. The antimalarial activity was performed by the method of continuous *in vitro* culture developed by Trager and Jensen (1976), chloroquine diphosphate (CQ) was used as positive control. To evaluate acute oral toxicity class method was used, following the rules of the OECD # 423 always starting dose of 300 mg/kg. **Results:** Evaluation in malaria Extract 1 was the active, with more than 45% of inhibition; the extract 2 had more than 18% inhibition. In acute oral toxicity they showed mortality rate of 300 < LD_{50} >2000 mg/kg. **Conclusions:** Thus it reaffirms that the formulations of the present antiplasmodial *Zuelania guidonia* toxicological activity and classified as dangerous in the animal model, dose levels employed and under the experimental conditions.

Citation Format:
Puente E, Mora C, Jaramillo M, Berenguer C, Rodríguez E, Salas I, Reinert A, Cedeño N (2015) Antiplasmodial activity and acute oral toxicity of hydroalcoholic extracts of *Zuelania guidonia.* [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S130. Abstract nr PNAI-38.

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TOXICOLOGICAL STUDIES

PTS-39: **CHRONIC ORAL TOXICITY OF TANNIN POWDERS OBTAINED FROM BARK OF *Pinus caribaea* MORELET IN RATS**

Curbelo A[1], Bada AM[1], Santana JL[2], González B[1], González Y[1], González C[1], Arteaga ME[1], Gómez D[1], Mancebo A[1].

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Introduction: Effects of antimutagenic and non-genotoxic agents of tannins from *Pinus caribaea* Morelet, as well as its influence in improvement of quality life of patients have been demonstrated. Our aim was to assess chronic oral toxicity of tannin powder obtained from bark of *P. caribaea* in Cenp:SPRD rats. **Material and Methods**: Rats were randomly distributed into four experimental groups: Control, Low (1 mg/kg), Median (2 mg/kg) and High Dose (5 mg/kg). Administration was made daily along the six months of the study. Rats were inspected daily for clinical signs. Body weight and food and water consumption were weekly measured. Hematological and biochemical analysis were performed at the beginning, three months and at the end of experimentation. Gross necropsy and histological examination of tissues were performed on animals at the end of the assay. **Results:** During the study a female in Low Dose group died, the remainder finished the study in a good state. Clinical signs described were distributed by all groups and were considered not to have relation with the tested substance. Body weight curve was similar for all groups. Water consumption increased in animals treated with the higher dose, but the food consumption was normal. Clinical laboratory parameters had differences, although they were within normal ranks reported for the species. There were no macroscopic or microscopic lesions related with the tested substance. **Conclusions:** The tannin powder obtained from bark of *P. caribaea* appears to be safe under the experimental conditions established.

Citation Format:
Curbelo A, Bada AM, Santana JL, González B, González Y, González C, Arteaga ME, Gómez D, Mancebo A (2015) Chronic oral toxicity of tannin powders obtained from bark of *Pinus caribaea* Morelet in rats. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S131. Abstract nr PTS-39.

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PTS-40: **DERMAL AND OCULAR IRRITATION STUDIES OF TWO CREAMS INTENDED FOR ITS USE FOR PSORIASIS**

Rivero Y[1], González Y[1], Mancebo A[1], Scull I[2], Arteaga ME[1], González C[1], Bada AM[1].

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Introduction: The introduction of novel materials into clinical practices requires safety evaluations as well as an understanding of the impact of the products on human health. Sebomori and Psomori are two creams intended for use as a lubricant for the skin affected by psoriasis. The active ingredients of Sebomori are extracts of plants *Jacobinia mohintle* and *Morinda citrifolia*, while the active ingredients of Psomori are extracts of plant *Morinda citrifolia* and seed oil of *Azaridachta indica* (Nim). Skin and eyes have the highest risk of exposure to Psomori and Sebomori, because deposition to the superficial organs has the potential to be a major route of exposure during the manufacturing, use, and disposal of these products. **Material and Methods:** This study was performed to examine the potential irritating of Psomori and Sebomori on the skin and eyes. The dermal and eye irritation study was performed using rabbits according to the Organisation for Economic Co-operation and Development (OECD) Guidelines 404 and 405, respectively. The substances in the test were the maximum allowable for administration according to regulations, using the commercial formulation. **Results:** No dermal responses, including erythema/eschar or edema, were found in rabbits treated with tested subtances. No rabbits exhibited corneal opacity, abnormality of the iris, or chemosis eye at any time point after the application of Sebomori and Psomori. **Conclusions:** Both products were classified as Non Irritant.

Citation Format:
Rivero Y, González Y, Mancebo A, Scull I, Arteaga ME, González C, Bada AM (2015) Dermal and ocular irritation studies of two creams intended for its use for psoriasis. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S132. Abstract nr PTS-40.

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PTS-41: **STABILITY AND TOXICITY OF LEAF EXTRACT OF *Spondias mombin* L.**

Pérez-Portero Y[1], Losada-Martínez L[1], Bignott-Tissert Y[1], Rodríguez-Leblanch E[3], Cedeño-Soularit N[3], Mourlot-López A[3], González-Giro Z[3], Escalona-Arranz J[2].

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Introduction: *Spondias mombin* L. is a species used for the treatment of various infectious diseases. In this research was determined the physical-chemical and microbiological stability of a 70% alcoholic extract from leaves of *Spondias mombin* L. **Material and Methods:** For this purpose, the samples of (EHSM) were analyzed during 360 days and the oral acute toxicity in one dose was determined by performing the CTA method. Samples were collected at "El Caney" region, Santiago de Cuba; 50 g of dried leaves by oven were manually crushed and then, 150 mL of alcohol-water solvent (70:30) were added; after that procedure, maceration was performed for 48 h and subsequently rotoevaporated to 50 mL. To determine the physical-chemical stability these parameters were measured: relative density, total dissolved solids, pH, relative viscosity and electrical conductivity, established by the current Cuban Norm (NRSP 312, 1991) and, for the microbiological stability, the Cuban Norm 68-2007 was followed; parameters were determined at 0, 7, 30, 90, 180 and 360 days. The acute oral toxicity test based on the class method was conducted in Sprague Dawley rats. **Results and Conclusions:** The EHSM showed physical-chemical and microbiological stability. This extract did not show any clinical signs of toxicity or animal deaths and orally administered at one dose is regarded as unclassified for the animal model and the dosage used under the observed experimental conditions, according to the specific standard of the Organization for Economic Cooperation and Development (OECD 423: 2001).

Citation Format:
Pérez-Portero Y, Losada-Martínez L, Bignott-Tissert Y, Rodríguez-Leblanch E, Cedeño-Soularit N, Mourlot-López A, González-Giro Z, Escalona-Arranz J (2015) Stability and toxicity of leaf extract of *Spondias mombin* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S133. Abstract nr PTS-41.

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PTS-42: **TOXICOLOGICAL STUDIES TO THE PRODUCTS CODASAL PLUS, CODAHUMUS 20, CODACÍTRICOS, CODAMIN RADICULAR, CODAMIN B-Mo AND CODAN USED IN THE AGRICULTURE AS BIO-FERTILIZERS**

García G, Casanova M, Jorge N, Pardo GL.

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Introduction: The products CODA from Sustainable Agrosolutions SA (CodasalPlus, Codahumus 20, Codacítricos, Codamin Radicular, Codamin B-Mo, and Codan) are composed by a natural mixture of amino acids, and biostimulant sand are used to get maximum yields and qualities of crop growing by improving earth and water. In this study we carried out the first barrier toxicity assays for these products: **Material and Methods:** It were used the norms described in the Technical Guidelines of the Organization for the Cooperation and Development (OECD), and other reported by the International Organization of Standardization (ISO) for tests of Sensitization, Oral and Dermal Acute Toxicity, and Ocular and Dermal Irritability. **Results:** The results indicated that the above mentioned products are not sensitizing agents. In the case of Ocular Irritation test, only the Codacítricos was rejected do to its toxicity to ocular structures. In relation to the Dermal Irritation, the index or punctuation was 0, indicating the dermal safeness of the bio-fertilizers. Concerning the Oral Acute Toxicity test, all the products analyzed passed the test. Finally, regarding the Dermal Acute Toxicity test, visible damages were localized in the skin, but non deaths except in the Codahumus 20 were observed. In this case, it was necessary to reduce the dose. **Conclusions:** These products can be used and manipulated by humans, providing the suitable cautions emanated from this study.

Citation Format:
García G, Casanova M, Jorge N, Pardo GL (2015) Toxicological studies to the products Codasal Plus, Codahumus 20, Codacítricos, Codamin Radicular, Codamin B-MO and Codan used in the agriculture as bio-fertilizers. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S134. Abstract nr PTS-42.

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PTS-43: **ASSESSMENT OF ACUTE AND SUBCHRONIC ORAL TOXICITY OF SEED OIL *Carapa guianensis* AUBLET EXTRACT**

Curveco D[1], Arencibia D[2], Rosario L[3], Narciandi J[3], Alonso A[3], Crespo Y[3], Vidal A[4].

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Introduction: The seed oil extract of *Carapa guianensis* has various biomedical applications as solar protector, anticancer, antioxidant and antigenotoxic. The aim of this work was determined toxic effects of oil extract orally administered to Sprague Dawley rats from both sexes. **Methods:** Oral acute toxicity (2 000 mg/kg) was investigated according to the Acute Toxic Class Method and the subchronic study, rats were treated with doses at 400, 1 000 and 2 000 mg/kg for 90 days. **Results:** No evidence of treatment-related toxicity was detected. Thus, clinical observations, body weight, food intake, haematological parameters, organ weight ratios and histopathological findings showed no significant differences between control and treated groups. However, 2000 mg/kg in subchronic study, only in male rats, evidenced smaller increment in liver weight and alanine aminotransferase (ALT). **Conclusions:** These studies showed no evidences related oral toxicity in the administration of *Carapa guianensis* oil extract. It is recommended hepatic toxicity studies to demonstrate the mechanism that leads to an increase in liver enzymes in the highest dose evaluated.

Citation Format:
Curveco D, Arencibia D, Rosario L, Narciandi J, Alonso A, Crespo Y, Vidal A (2015) Assessment of acute and subchronic oral toxicity of seed oil *Carapa guianensis* Aublet extract. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S135. Abstract nr PTS-43.

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PTS-44: **ACUTE ORAL TOXICITY AND ANTIINFLAMMATORY ACTIVITY OF THE ETHANOLIC EXTRACT AND FRACTIONS OF LEAVES OF *Eugenia clarensis* (BRITTON & P.WILSON)**

Nguyen N[1], Vicet-Muro L[1], Siverio-Mota D[1], Jorge-Rodríguez ME[1], Coba-Sánchez Y[1], González-Mosquera D[1], Montenegro N[2].

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[2]Chemical Bioactive Center, Universidad Central "Marta Abreu" de Las Villas, Santa Clara, 54830, Villa Clara, Cuba.

Introduction: *Eugenia clarensis* (Britton & P.Wilson) is an endangered plant endemic to Villa Clara, Cuba due to lack of knowledge of its uses. **Objective**: This study was aimed at evaluating acute toxicity and anti-inflammatory activity of the ethanol extract of leaves of *E. clarensis* and their fractions. **Methods:** The dried powder of leaves of *E. clarensis* was exhaustively extracted with ethanol and the resulting crude ethanol extract (CEE) was successively fractionated with n-hexane (HF), chloroform (CHF) and ethyl acetate (EAF) and lastly aqueous (AQF) fraction remained. Acute oral toxicity study was performed following OECD test guidelines 420 that the CEE was administered at 2000mg/kg b.wt. p.o and animals were observed for toxic signs at 0, 0.5, 1, 4, 24 h and for the next 14 days. The anti-inflammatory effects of CEE and their fractions were investigated in the model of acute 12-O-tetradecanoylphorbol-13-acetate (TPA) induced ear edema in mouse. **Results:** No adverse effects were observed in the acute CEE toxicity study. All the products showed strong anti-inflammatory activities in relation to the standard. The initial screening with CEE proved that this extract significantly inhibited ($p \leq 0.05$) ear edema in mice by 88.84%. The fractions of CEE were evaluated and showed that inhibition effect of CHF (96.53%), HF (95.36%) and EAF (91.93%) were statistically comparable with the indomethacin (97.65%). Acute study reveals that the LD_{50} of CEE is greater than 2000 mg/kg, b.wt. in female rats and can be classified as Category 5. **Conclusions:** Our results suggest that CHF, HF and EAF of leaves of *Eugenia clarensis* (Britton & P.Wilson) possess significant anti-inflammatory properties related to the presence of phenolic compounds (condensed tannins, flavonoids), coumarins y terpenes. Leaves of *E. clarensis* may therefore be considered as a good source for natural antiinflammatories and a possible pharmaceutical drug for the treatment of inflammation and related disorders.

Citation Format:
Nguyen N, Vicet-Muro L, Siverio-Mota D, Jorge-Rodríguez ME, Coba-Sánchez Y, González-Mosquera D, Montenegro N (2015) Acute oral toxicity and antiinflammatory activity of the ethanolic extract and fractions of leaves of Eugenia clarensis (Britton & P.Wilson). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S136. Abstract nr PTS-44.

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PTS-45: **TOXICITY EVALUATION AT SINGLE DOSE AND DIURETIC ACTIVITY OF THE HYDROALCOHOLIC EXTRACT *Mosiera bullata* (BRITTON & P. WILSON) BISSE LEAVES**

Armas-González Y, Sueiro-Oyarzun ML, Vicet-Muro L, Ribalta-Ribalta V, Hernández-Barreto E, Siverio-Mota D, Ruz-San Juan V, Valdés-Fuentes M.

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Introduction: *Mosiera bullata* (Britton & P. Wilson) Bisse is an endemic plant of the central region of Cuba, but its use is unknown. Previous phytochemical studies suggest potentialities for the therapeutic use. The objective of this study was to evaluate the acute toxicity at single dose and the possible diuretic effect of the hydroalcoholic extract from the leaves of the plant. **Material and Methods:** Acute toxicity test was carried out using the single doses method, where the extract was administered at 2000 mg/kg body weight to Sprague-Dawley rats. Diuretic activity of the extract (400 mg/kg) was conducted following the Lipschitz protocol. Male rats of the Wistar line were used in a weight range from 170 to 210 g, using sodium chloride (0.9%) as negative control and furosemide (20 mg/kg) and hydrochlorothiazide (10 mg/kg) as positive control. Concentration of sodium and potassium ions from the excreted urine and pH were also evaluated. **Results:** Normal behavior in animals, normal postural reflex, toilet habits and habitual response to nociceptive stimuli as well as food and water consumption were observed according to the specie. No sign of apparent toxicity nor death was observed. It was observed an increment in the volume of the urine The diuretic activity in the groups had an increment of the excreted urine, overcoming the excretion caused in the group negative control (chloride of sodium). The experimental group treated with the extract showed similar results to the volumes excreted by the group treated with hydrochlorothiazide, without significant statistical differences ($p>0.05$). **Conclusions:** The hydroalcoholic extract of *Mosiera bullata* (Britton & P. Wilson) Bisse is non toxic when the toxicity was evaluated at 2000 mg/kg. For the diuretic effect, the ratio Na^+/K^+ shows values that can be comparable with the thiazide diuretic.

Citation Format:
Armas-González Y, Sueiro-Oyarzun ML, Vicet-Muro L, Ribalta-Ribalta V, Hernández-Barreto E, Siverio-Mota D, Ruz-San Juan V, Valdés-Fuentes M (2015) Toxicity evaluation at single dose and diuretic activity of the hydroalcoholic extract Mosiera bullata (Britton & P. Wilson) Bisse leaves. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S137. Abstract nr PTS-45.

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PTS-46: **THE COMET ASSAY. A METHOD TO DETERMINE THE ANTIGENOTOXIC EFFECT OF A GRAPE SEED PROCYANIDIN EXTRACT**

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Introduction: Reactive oxygen species induce lesions in DNA and this damage is associated to a number of degenerative processes, including cancer. Various experimental methods have been proposed for measuring oxidative DNA damage. The comet assay is a very sensitive method for studying oxidative DNA damage at a single cell level. Because of that, we studied the genotoxicity of hydrogen peroxide and the effect of a grape seed procyanidin extract on DNA lesions induced by hydrogen peroxide in Fao cells. **Material and Methods:** Fao cells were incubated with hydrogen peroxide (50-600 µM H_2O_2) so that the H_2O_2 concentration, which induced considerable DNA damage could be found. Cells were incubated with 600 µM H_2O_2 for 3 or 21 h. A procyanidin extract from grape seed (PE) was incubated or preincubated (1 h) during the exposure to H_2O_2. The ability of procyanidins to protect against the genotoxicity of H_2O_2 was compared with those of the monomeric flavanols catechin and epicatechin and the flavonol quercetin. DNA damage was monitored using the comet assay. **Results:** Fao cells incubated with increasing quantities of H_2O_2 for 3 h led to increasingly greater damage. The percentage of cells at level 3 and 4 increased to 90% at 600 µM of H_2O_2. PE decreased the damage caused by H_2O_2. The results also showed that quercetin was the most effective antioxidant of the flavonoids tested. The results indicate that procyanidins are more effective than the corresponding individual monomers, catechin and epicatechin, at preventing DNA lesions in hepatocytes and that this protection is higher after preincubation than after co-incubation. **Conclusions:** The protective action of the flavonoids on DNA damage may be a contribution to the antitumorigenic potential of red wine.

Citation Format:
Llópiz N, Céspedes E, Puiggros F, Arola L, Ardévol A, Blade C, Salvadó MJ (2015) The comet assay. A method to determine the antigenotoxic effect of a grape seed procyanidin extract. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S138. Abstract nr PTS-46.

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PTS-47: **TOXICITY STUDIES OF *Curcuma longa* EXTRACTS**

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Introduction: The Cumin Extract is a pharmaceutical form prepared from the *Curcuma longa* L. The *C. longa* is harvested from the Northeast of Pinar del Rio province, Cuba. From 1995 was isolated an antirretroviral protein (tyrphostine) of 18-19D molecular weight (Garcia Martin, 2003). The toxicity in *C. longa* extracts was our principal objective in this case. **Material and Methods:** Biological assays were realized using 40 female mice from Switzerland Stock of-1 (Barcelona), with maintenance diet using an aqueous extract of *C. longa*. Twenty mice received extract and twenty were the control group. This group received a standard diet. Experimental studies with 4 mg/kg mouse per day= 0.4 mg/kg mouse per day with curcumin in human doses. The evaluation made to the mice was about in the Thomas media measure, weight sequence, muscular coordination method, String-Test of Miguel Blasco (Don't fall in a row), Spontaneous explorer (Labyrinth test in T: explore the first arm of the labyrinth in 60 seconds). Passing four weeks the mice were sacrificed and we take blood from the neck, a piece of liver (Lipid peroxidation) looking for malonialdehyde concentration by thiobarbituryc method and proteins concentrated by Lowry method. **Results and Conclusions:** *Curcuma longa* extracts did not cause any toxicity in mice, besides decreased lipids peroxides in blood and finally the 25 higher doses of *Curcuma* are not toxics.

Citation Format:
Quintana N, García JJ (2015) Toxicity studies of *Curcuma longa* extracts. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S139. Abstract nr PTS-47.

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CLINICAL TRIALS AND PHARMACOVIGILANCE

PCT-48: BENEFICIAL EFFECTS OF A ROSE-HIP PRAPARATION CONTAINING SEEDS AND SHELLS ON AGING AND WRINKLES OF THE SKIN

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Objectives: To evaluate the effects of Rose-hip powder (LiTo) from Langeland, Denmark, on cell senescence and skin wrinkling. **Material and Methods**: A total of 34 healthy subjects, aged 35-65 years with wrinkles of the face (crow's feet) were subjected to a randomized and double-blinded clinical study of the effects of the Rose-hip powder as compared to a well established facial skin modifier, astaxanthin. Half of the study participants ingested LiTo rose hip (3 g daily) for 8 weeks, while the other half were administered 4 mg of astaxanthin, twice daily for the same period of time. Objective measurements of wrinkles, skin moisture and elasticity were made by using visioscan, corneometer and cutometer at the beginning of the study and after eight weeks. The effect of LiTo on cell longevity was measured in terms of leakage of hemoglobin through red cell membranes (hemolytic index) in blood samples kept in a blood bank for 5 weeks. The test blood samples used here were collected from 17 healthy subjects aged 30 – 59 years, who had been administered LiTo (45g daily) for 4 weeks. Significance was attained with $p \leq 0.05$. **Results**: In the double blinded study, the Rose-hip group showed statistically significant improvements in crow's feet wrinkles ($p<0.034$), skin moisture ($p<0.003$) and elasticity ($p<0.039$) after 8 weeks of treatment. A similar improvement was observed for astaxanthin, with *p* values: 0.003, 0.001 and 0.014 respectively. Hence, there was no overall significant difference in effectiveness when comparing the present rose-hip powder and astaxanthin group. Both treatments reduced wrinkles of the skin. LiTo rose hip powder also reduced the leaking of haemoglobin through erythrocyte membranes. **Conclusions**: It is suggested that the present Rose-hip powder aliviates wrinkles and some elements of aging through mechanisms involving collagen, anti-oxidants and particular fatty acids.

Citation Format:
Petharat L, Wongsuphasawat K, Winther K (2015) Beneficial effects of a rose-hip praparation containing seeds and shells on aging and wrinkles of the skin. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S140. Abstract nr PCT-48.

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PCT-49: **CLINICAL-HEMATOLOGICAL EVALUATION OF NEOTROFIN IN THE TREATMENT OF ANEMIC PREGNANT WOMAN IN 10 DE OCTUBRE MUNICIPALITY**

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Introduction: Anemia by iron deficiency is highly prevalent, especially in pregnant women. Iron salts have been used as conventional therapy, however, its low solubility and high doses used, cause intolerances that can induce failure of treatment. Neotrofin is a new antianemic with natural components produced at the National Center of Bioproduct (BioCen); it is a compound which contains proteins, amino acids and heme iron. The objective of this study was to determine the effectiveness of Neotrofin in the treatment of iron deficiency anemia in pregnant women. **Material and Methods:** The study was performed in a longitudinal design, single-center, randomized, open-label, hemoglobin value was less than 110 g/L in the detection of pregnancy, attended in consultation on Nutrition at the Maternal and Child Teaching Hospital (Hijas de Galicia) 10 de Octubre. The estimated sample size was 250 patients and the inclusion of these pregnant in the study was conducted randomly, administering doses of three tablets per day of Neotrofin to recovery of hematological parameters. **Results:** The study demonstrated the high prevalence of anemia in the area, more than 60%. It was found that 56% of patients Neotrofin was effective in improving hemoglobin levels with a number needed to treat of 2. In addition, Neotrofin guaranteed at a high percent the restoring of iron stores as ferritin. **Conclusions:** The use of Neotrofin as antianemic in pregnant has a high efficiency by making it possible to use as antianemic in this population.

Citation Format:
Suárez S, Aznar E, Silva N, Fernández JR, González M, Rodríguez S, Revilla Y (2015) Clinical-hematological evaluation of Neotrofin in the treatment of anemic pregnant woman in 10 de Octubre municipality. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S141. Abstract nr PCT-49.

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PCT-50: **PHARMACOLOGICAL EVIDENCES OF ANTIFUNGAL ACTION OF OZONIZED SUNFLOWER OIL OLEOZON®**

Ledea O, Zamora Z, Falcón L, Fernández L, Fernández I, Calunga J, Menéndez S.

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Introduction: Ozonized sunflower oil (OLEOZON®) is a national registered drug with a natural origin. It is obtained from the reaction between ozone and vegetable sunflower oil. The active pharmaceutical ingredients of this drug are peroxidic compounds with germicide action. The aim of this work is to summarize the results of two pre-clinical studies and three clinical trials that evaluate the antifungal properties of topical OLEOZON®. **Material and Methods:** The first preclinical experiments were related to the *in vitro* evaluation of the drug antifungal activity in three genera of fungus. It was followed by an *in vivo* study of dermatomicoses developed in rabbits. Two controlled randomized phase III clinical assays, comparing topical OLEOZON® with ketoconazole cream were developed. A phase IV clinical trial that included 2596 patients was also concluded. The efficacy was evaluated clinically and mycologically. **Results:** The *in vitro* antifungal activity obtained for OLEOZON® showed a dependence of the fungi genera. *M. canis* was more sensible and *T. mentagrophytes* was more resistant. The *in vivo* study showed that OLEOZON® was effective in the cure of the 100% of the rabbit's in the experimental model. The evaluation of the phase III studies showed that OLEOZON® and ketoconazol treatments produced a complete clinical and mycological cure of patients, and a similar efficacy was obtained, with no significant differences between both groups. Patients were evaluated six months after the end of the treatment and no recurrence was observed in the OLEOZON® group. **Conclusions:** The phase IV study showed that OLEOZON® present an efficacy of 93% and no side effects or bacterial super-infections were observed. The preclinical action and the clinical efficacy and safety shown by topical OLEOZON® in the treatment of *Tinea pedis* justify the extension of this treatment in the national or international clinical practice because of its low cost and its remarkable germicidal action.

Citation Format:
Ledea O, Zamora Z, Falcón L, Fernández L, Fernández I, Calunga J, Menéndez S (2015) Pharmacological evidences of antifungal action of ozonized sunflower oil Oleozon®. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S142. Abstract nr PCT-50.

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PCT-51: **EFFECTIVENESS OF COMBINATION THERAPY WITH 25% ALOE CREAM AND RELAXATION-VISUALIZATION TECHNIQUES IN PSORIASIS**

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Introduction: *Psoriasis vulgaris* is an inflammatory and chronic disease, determined by multiple factors. **Objective:** Evaluate the effectiveness of treatment with 25% aloe cream, together with relaxation and visualization techniques, in patients with *Psoriasis vulgaris* at the Provincial Development Center of Natural and Traditional Medicine during the period December 2013 to December 2014. **Material and Methods:** A phase II clinical trial was conducted, open sequentially, for which there was a sample of 100 patients selected at simple random with the probability method. The sample was divided into two groups. In the control group there was applied aloe cream 25% and in the study group there was imposed a combination therapy (aloe cream 25%, Relaxation -Visualization). Age, gender, skin color, family medical history of psoriasis, triggers, and categorization of patients as PASI: variables were operationalized. The information processing was performed using SPSS for version 15.0 statistical package. **Results:** There predominated the ages between 31 and 45 years (48%), male (44%) sex, white race (56%), and absence of family history of psorisis (82%). Combination therapy was significantly more effective than treatment alone with aloe cream and satisfaction was significantly higher in patients receiving combination therapy (88%). **Conclusions:** The combined treatment was significantly more effective than treatment with aloe cream only.

Citation Format:
Serrano Y, Miranda T, Díaz T (2015) Effectiveness of combination therapy with 25% aloe cream and relaxation- visualization techniques in psoriasis. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S143. Abstract nr PCT-51.

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PCT-52: **VIMANG®: *Mangifera indica* L. EXTRACT AS DERMATOLOGICAL PROTECTOR DURING RADIATION TREATMENT**

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Introduction: The radiodermitis is an illness of the skin that affects the patients that have maintained exposed any area of the body to the action of the radiations ionizantes emitted by the equipment of radio diagnosis or therapeutic treatments. It is classified as acute or chronicle diseases. The incidence during the treatment with radiations of the wicked tumors varies among the 20 - 80%. **Material and Methods**: A total of 83 patients were studied in relationship to effectiveness and security of the Vimang® cream like part of open, randomized clinical trial phase II. During the treatment with radiotherapy, the patients were divided in two groups, one with 41 cases, tried with the cream Vimang® and another with 43 individuals that used the local hygienic measures, according to the established protocols. In the studied sample, the 60-69 year-old ages prevailed (36.14%), the masculine sex (57.83%) and the white race with 50 cases (60.24%). The radiation dose more frequently received was 200 cGy, as daily total dose (DTD) and 50 Gy, as total dose of the tumor (DTT). **Results**: One case presented radiodermitis in the group tried with the Vimang® cream, while they happened seven cases in the control group. One patient belonging to the group tried with the cream was reported as radiodermitis degree I, without necessity of suspending the radiant treatment and the lesions disappeared with the continuous use of the cream. All the patients of the group control, showed radiodermitis degree II and the radiotherapy were suspended in a case. An individual tried with Vimang®, presented as adverse event, pruritus degree I in the first week, and it disappeared with the time, without necessity of suspending the treatment. **Conclusions**: The Vimang® cream diminished the radiodermitis appearance, what suggests the possibilities of its use as dermatologic protective drug.

Citation Format:
Gil D, Fleitas R, Cruz JL (2015) Vimang®: *Mangifera indica* L. extract as dermatological protector during radiation treatment. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S144. Abstract nr PCT-52.

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PCT-53: **EFFECTIVENESS OF IMEFASMA SYRUP IN THE TREATMENT OF BRONCHIAL ASTHMA**

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Introduction: Asthma is a chronic disease of the respiratory system, with a high prevalence in our province, for its control, Imefasma syrup is a good therapeutic alternative, and it is prepared from natural drug of apiculture and herbal medicine with bronchodilator properties. For this reason we decided to realize this research to evaluate the effectiveness of this syrup for the treatment of bronchial asthma in patients of Armando Garcia`s health care area of Santiago de Cuba in 2014. **Method:** An uncontrolled and therapeutic intervention study was performed with Imefasma syrup in 120 asthmatic patients of Armando Garcia`s health care area of Santiago de Cuba during the year 2014. The patients were included in the study taking in consideration the diagnostic stratification of six health sectors of the area. To evaluate the effectiveness were considered clinical and functional variables of response by spirometry. It was also considered control variables such as age, sex, and irritating or toxic gas exposition. All patients gave their consent to participate in the research. **Results:** The use of Imefasma syrup reduced the clinical manifestations concerning symptoms and number of crisis. There was an increase of the functional capacity in terms of vital capacity, ventilatory frequency and forced expiratory flow. These clinical and functional benefits were in proportion to the period of time the syrup was used. **Conclusions:** Imefasma syrup was effective in asthmatic patients who were studied.

Citation Format:
Ramos L, Casas S, Herrero H, Vega S, Planas N (2015) Effectiveness of Imefasma syrup in the treatment of bronchial asthma. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S145. Abstract nr PCT-53.

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PCT-54: **OUTLINE TREATMENT OF ASTHMATIC PATIENTS WITH TRADITIONAL MEDICINE IN THE AREA NORTH OF MORON**

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Introduction: A pre-experimental study was carried out with the outline treatment based in national protocol for the management of this entity with traditional technical that took place in the period from July 2013 to July 2014, with asthmatic patients whom belong to the consultory 25 the North Policlinic in Moron. **Material and Methods:** The procedures used were digit pression, moxibustion, physiotherapy suck or a diet and environment manage, which were applied on period of intecrisis. The sample took place with 60 patients who fulfilled with the criterion inclusion. **Results:** It was observed a great tendency with this pathology in patients from 18 to 29 years old, with predominant in masculine sex. In reference to personal antecedents, pathology prevailed the addiction of smoking followed by chronic obstructive pulmonary disease (COPD). The most group was ubicated in the classification of intermittent asthma. With the treatment informed diminish gradually the symptom of this entity within 15 days and at the month the patients ubicated in the category of severe persistent remaining in three months that the treatment into the intermittent nivel the high per cent of the sample. **Conclusions:** It was reported weak adverse reactions so that the, traditional treatment informed result to be satisfactory.

Citation Format:
Cepero S, Cintra J, Rodríguez A, Pino L (2015) Outline treatment of asthmatic patients with traditional medicine in the area North of Moron. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S146. Abstract nr PCT-54.

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PCT-55: **NODULE OF LUNG. PRESENTATION OF AN ONCOLOGIC PATIENT TREATED WITH NATURAL MEDICINES**

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Introduction: In Cuba, the wicked tumors occupy the second place among the main causes of death, solely overcome by the illnesses of the heart, with a significant increment starting from the year 1970. In Laboratory Vimang, the incidence of consultations for oncological illnesses has been superior in the last year until more than 40% where they are included patient that receive treatment oncoespecific in specialized centers of the country and patient that refuse this intervention for own will. **Material and Methods:** The radiological clinical evolution of the patient masculine JLDR is presented, of the white race and of 74 years of age, smoker (three daily packs), with diagnostic of lung nodule, suspect of oncoproliferative process that began in October of 2010. It was carried out a retrospective study supported in the theoretical method of analysis and synthesis for the revision of the patient's clinical history. The treatment consisted on diminishing the consumption of cigarettes, the ingestion of natural products (Vimang, Vidatox and Noni) and the periodic pursuit in reconsults. **Results:** It was observed gradual decrease of the disnea and the cough until disappearing and corporal weight was increased. The hemoglobin values and eritro-sedimentacion they were stabilized and there was significant radiological decrease of the lung nodule. **Conclusions:** The combination of the natural products Vimang, Vidatox and Noni, achieve beneficial in improving some parameters of quality of the patient's life.

Citation Format:
Miranda R, Fernández JL, Morales MC (2015) Nodule of lung. Presentation of an oncologic patient treated with natural medicines. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S147. Abstract nr PCT-55.

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PCT-56: **STUDY OF PRODUCTION AND PRESCRIPTION OF ANTICATARRHAL SYRUPS IN TRINIDAD**

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Introduction: A descriptive and retrospective study was done about the production and selling of the different extracts, elaborated in the municipal laboratory and dispensary pharmacies in Trinidad, with the objective to value the elaboration and dispensation of them. **Method:** It was analyzed the fulfillment of their production and selling to people during the year 2014. **Results and Conclusions:** It was demonstrated that in all the period that the study lasted, the plans of production proposed were not accomplished, mainly because the lack of bottles and covers, the agricultural system did not supply enough raw material, there were also difficulties with the supply of distilled water and the lack of chemical products to preserve them at 85% to avoid the increasing of the microorganisms. The calendula extracts was the highest demanded product, being considered the most effective by the family doctors who prescribed them. Then a study about the production and prescription of those extracts was done where it was suggested to do the coordination among all the entities involved in the process of production, such as: the agricultural system, the raw material enterprise and the producer lab, to guarantee the stability in the necessary products.

Citation Format:
Rodríguez A, Rodríguez V, Zerquera R (2015) Study of production and prescription of anticatarrhal syrups in Trinidad. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S148. Abstract nr PCT-56.

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PCT-57: **PHARMACOVIGILANCE OF PHYTOMEDICINES AND APIMEDICINES, MATANZAS 2005 – 2014**

Santos L, Marín N, Sánchez D, Hidalgo M.

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Introduction: Cuba has developed further phytomedicines and apimedicines used in a wide range of diseases. The current investigation has the purpose to characterize the adverse reactions associated with the use of phytomedicines and apimedicines sold in Matanzas from 2005 to 2014. **Method:** observational descriptive and retrospective study of pharmacovigilance. The sample consisted of all the reports on suspected adverse drug reactions caused by phytomedicines and apimedicines submitted to the Provincial Pharmaco-vigilance Coordinating Unit during the study period. **Results:** Most reports on suspected adverse reactions corresponded to the female sex (68.9 %) and the 20-59 age group (57.6 %). The phytomedicines most frequently reported were garlic tincture and syrup (32.9 %), oregano (*Plectranthus amboinicus* [Lour] Spreng.), (21.8 %), and eucalyptus syrup and tincture (15.4 %), whereas the most frequently reported apimedicine was propolis tincture (18.6%). The digestive system was the most commonly affected by adverse reactions (69.2%). In the causality assessment, the highest percentage of adverse effects was classified as probable (76.8%). According to the national behaviour of the suspicions of adverse reactions and severity, the moderate reactions were the most notified (60.3 %), followed by the mild. There was no mortal adverse effect. **Conclusions:** It is important that specialists provide appropriate instructions about the use of medicinal plants.

Citation Format:
Santos L, Marín N, Sánchez D, Hidalgo M (2015) Pharmacovigilance of phytomedicines and apimedicines, Matanzas 2005 – 2014. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S149. Abstract nr PCT-57.

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PCT-58: **UTILITY OF PHYTOTHERAPY IN INSOMNIA**

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Material and Methods: A controlled phase II clinical trial was made, in which the hypnotic effect of the fluid extract of *Passiflora* in patients with primary insomnia who attended the consulting room created for such purpose in the service of traditional and natural medicine of the clinic located in the north of Morón was shown, in the period between the months of January to November 2014. The study group was composed of 92 patients who attended the already mentioned consulting room, suffering from primary insomnia, aged 15 to 50, of both sexes. Once these patients consent and meet the criteria for inclusion, they were applied the instruments designed and validated for this purpose, which were treated with fluid extract of *Passiflora* 46 of them, belonging to the study group and with the same number was supplied nitrazepan , included in the control group therapy in both cases that lasted 21 days. **Results and Conlusions:** Insomnia predominated in female patients being the group of 35-49 years old the most affected. *Passiflora* has proved to be equally effective in treating insomnia than allopathic treatment modalities with nitrazepan in fewer visits the improvement associated with many benefits was obtained and any adverse effects, which appear absolute in conventional therapies, presupposing that the risk-benefit ratio, with the use of *Passiflora* justifies the use of this therapy.

Citation Format:
Cintra J, Betancourt O, Rodríguez A (2015) Utility of phytotherapy in insomnia. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S150. Abstract nr PCT-58.

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PCT-59: **CLINICAL EVALUATION OF PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA TREATED WITH THE NUTRITIONAL SUPPLEMENT CALPROST**

Jiménez D[1], Festary T[1], Machado M[2], Suarez M[2], Silveira D[3], Wong H[3], Barroso E[4], Fernández R[4], García I[1], Tuero A[5], Delgado R[1].

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Introduction: Benign prostatic hyperplasia (BPH) is a common disease in over 50 years-old men. **Objective:** To evaluate the effect and safety of Calprost (microencapsulated lipophilic extract of pumpkin seed oil) in patients with BPH. **Material and Methods:** A multicenter, randomized, controlled, open exploratory study was conducted. A total of 131 patients diagnosed with BPH and lower urinary tract symptoms (LUTS) from "Dr. Luis Díaz Soto Hospital", Joaquín Albarrán" Hospital and "Iván Portuondo" Hospital were included. Two experimental groups, study group (G1-Calprost) (N=81), and control group (G2-terazosin) (N=50) were formed. Efficacy was evaluated through assessing prostate symptom, symptoms urinals, quality of life (IPSS); residual volume (RV) and prostate volume (PV). Safety evaluation included the registration of adverse events (AE) presented together with their intensity, severity and causality. **Results:** It was found that treatment during three months with Calprost 140 mg capsules had a similar therapeutic effect compared with conventional treatment terazosin 2 mg. There was a significant improvement (p=0.000) in the prostate symptoms score (IPSS) for both groups. Most of the obstructive and irritative urinary symptoms (intermittency, weak stream, frequency and urgency) decreased more markedly in the Calprost group. Meanwhile, in the terazosin group only the nocturia was reduced. At the end of treatment, most of the patients in the study group were classified as pleased quality of life (44.4%); Terazosin-treated patients were mostly classified as Mixed (46%). Median RV (p=0.048) and median VP (p=0.002) decreased significantly in the Calprost group. Most of the AE were recorded the terazosin group (79.4%). **Conclusions:** The supplement Calprost was probed as a successful treatment of patients with BPH/LUTS, being also well-tolerated.

Citation Format:
Jiménez D, Festary T, Machado M, Suarez M, Silveira D, Wong H, Barroso E, Fernández R, García I, Tuero A, Delgado R (2015) Clinical evaluation of patients with benign prostatic hyperplasia treated with the nutritional supplement Calprost. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S151. Abstract nr PCT-59.

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PCT-60: **ADVERSE EVENTS ASSOCIATED TO ACUPUNCTURE PRACTICE IN CUBA. 2003-2010**

García-Milián A[1], **Perdomo-Delgado J**[2], Alonso-Carbonell L[3], Ruiz-Salvador AK[4], López-Puig P[1].

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Introduction: Data from clinical trials evaluating security and efficacy of Tradicinal Medicine (TM) products and practices are insufficient. **Objective:** To characterize the adverse events (AE) associated to the practice of acupuncture in Cuba, from 2003 to 2010. **Methods:** Observational, descriptive retrospective study about the report of suspected AE related to the practice of acupuncture received at the National Pharmacovigilance Unit. The information was obtained from the National Database of the Cuban Pharmacovigilance System. The reports were classified according to the affected organ, severity and imputability. **Results:** A total of 194 reports of suspected AE were received. The most common range of age was from 31 to 60 years, for the 61.2% of the total of patients. Women (67.0%) were more related to AE than man, despite age. Syncope (24.7%), hematoma (17.0%) and bleeding (14.4%) were the most frequent AE reported. General and local area of application ranged for more than a half of the reports (54.6%). Mild AE were more frequent (69.1%) as well as probable (84.0%). **Conclusions:** The studied series describe a pattern of security in the practice of acupuncture, characterized by mild and probable AE in women and young adults, being syncope, hematoma and bleeding the most frequent AE reported.

Citation Format:
García-Milián A, Perdomo-Delgado J, Alonso-Carbonell L, Ruiz-Salvador AK, López-Puig P (2015) Adverse events associated to acupuncture practice in Cuba. 2003-2010. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S152. Abstract nr PCT-60.

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PCT-61: **PHYTODRUGS DEVELOPMENT AND ITS CLINICAL APPLICATIONS**

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One of the main aims of the pharmaceutical industry is developing drugs for quality, safety and efficacy. In Chile herbal medicines are officially recognized; its inclusion in the therapeutic arsenal, either to prevent, mitigate disease or as adjuvant in different treatments, it remains a major challenge. Developing a phytodrug requires: 1) knowing the therapeutic objective will fulfill that must be previously studied, 2) quality, homogeneity and reproducibility of raw materials (vegetable), 3) standardized extracts that have the support of pharmaceutical technology to ensure product quality and reproducible certified. Moreover, the manufacture of phytodrugs must comply with Good Manufacturing Practice (GMP), Good Laboratory Practice (GLP), have a quality assurance program and to comply with existing legislation (DS 03/10), which requires between other validation both production processes and analytical methods. Once formulated the phytodrug, it must comply rigorously, like any other synthetic drug, preclinical, toxicological and clinical studies (Phase I, II, III). These studies provide evidence of therapeutic activity and test the efficacy and safety. These studies provide evidence of therapeutic activity and test the efficacy and safety of using the phytodrug. Post-market monitoring of the drug through the pharmacovigilance is necessary, in order to collect and record notifications of possible adverse drug reactions (ADRs). This long process is exemplified with the product "MATIMEL", which is active extract BG-126® Patent Office Nº8852654 parts and USA brands, "Use of a standardised dry extract of leaves of *Buddleja globosa* Hope, BG126, for the treatment and prevention of gastrointestinal disorders caused by treatment with nitrofurantoin and other antimicrobials".

Citation Format:
Barbery S (2015) Phytodrugs development and its clinical applications. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S153. Abstract nr PCT-61.

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PCT-62: **USE OF MEDICINAL PLANTS INDIVIDUALLY IN THE TREATMENT OF ACUTE RESPIRATORY INFECTIONS**

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Introduction: Acute respiratory infections (ARI) have been treated with medicinal plants, but its effects in practice have been poorly evaluated. In this study, the effects of individualized use of medicinal plants in patients with ARI, are described. **Methods:** A retrospective study involving 28 patients, aged 18 to 75 years old, with ARI between the second and third day of starting symptoms is made. Patterns according to Traditional Chinese Medicine (TCM) were identified according to symptoms: Wind cold, wind heat, wind dampness, wind cold dampness and wind heat dampness. Medicinal plants were prescribed individually as the patterns found and season of the year in which symptoms appear. Progression of symptoms like fever, general condition, cough, sputum, dyspnea and complications, was recorded daily. **Results:** The patterns prevailing were wind heat dampness (35.7%), wind cold dampness (25.0%) and cold wind (17.9%). Common plants used were: Bejuco ubí (*Cissus sicyoides* L.), salvia de Castilla (*Salvia officinalis* L.) and sour orange (*Citrus aurantium* L.). Slight improvement of symptoms was observed at day 2nd of treatment in 89.2% of patients. At the day 5th, intense improvement in 92.8% was noted. At the 7th day, total resolution in 96.4% of patients was observed. One patient achieved only slight improvement. Mild asthenia was reported in 60% of patients. **Conclusions:** The use of plants individually appears safe and may be effective in resolving symptoms in IRA. It is suggested to do controlled clinical study to assess the efficacy of this intervention.

Citation Format:
Méndez-Alonso CM, Cardoso-Suárez T (2015) Use of medicinal plants individually in the treatment of acute respiratory infections. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S154. Abstract nr PCT-62.

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ETHNOMEDICINE

PETM-63: **APPLICATION OF HERBAL REMEDIES IN SKIN DISEASES**

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Introduction: Phytotherapy is the science that studies the use of medicinal plants and their derivatives for therapeutic purposes. **Objective:** Describe the results of the application of herbal medicine in patients with skin diseases at the Clinic of Natural and Traditional Medicine Manuel Ascunce Domenech Provincial Hospital in the period from 2 January to 31 December 2014. **Material and Methods:** A cross-sectional observational there was study with a universe that comprised 421 patients, by applying simple random sampling, with a choice of 298 patients. Age, sex, skin diseases, phytodrug used and time of response to treatment: variables were operationalized. The data collected were processed by computerized means. **Results:** Female sex predominated with 169 women (56.71%) and a higher proportion of patients over 45 years with 119 patients (39.93%). The disease with the highest impact was dermatitis in 125 patients (41.59%). Dermatitis showed higher response to treatment with the cream *Maticaria recutita* with 112 patients (37.58%). It was evident that between the 2nd and 3rd week of treatment patients who had dermatitis responded to treatment. **Conclusions:** Given the results, it was concluded that herbal medicine is a therapeutic method that can be used in the treatment of skin diseases.

Citation Format:
Miranda T, Serrano Y, Díaz T (2015) Application of herbal remedies in skin diseases. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S155. Abstract nr PETM-63.

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PETM-64: **MEDICINAL PLANT OF TRADITIONAL USE IN THE SANTO DOMINGO MUNICIPALITY. ETHNOBOTANICAL STUDY**

López M[1], López S[2], García O[1], Cabrera K[2], González N[3].

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Introduction: Ethnobotanic studies constitutes the base for the development of programs guided to obtain the maximum knowledge on the use of the traditional medicine, the enrichment of the cultural wealth and the best use of the medicinal plants. Keeping in mind this was carried out a study guided to establish the medicinal plants of traditional use in the municipality of Santo Domingo. **Material and Methods:** The data for the analysis were obtained by means of the interview realization to the most remarkable experts in the place - faith healers and other practitioners - that gave their consent to participate in the investigation; in the period between January and May of 2015. **Results:** A total of 53 residents were included. It were registered 99 medicinal plants employed in 27 different affections. It was also related the scientific names of each species, their grouping in family, their taxonomic representation, as well as the properties that are attributed them in the study area. **Conclusions:** This work allowed toestablish the traditional use of medicinal plants in the municipality of Santo Domingo, in the province of Villa Clara.

Citation Format:
López M, López S, García O, Cabrera K, González N (2015) Medicinal plant of traditional use in the Santo Domingo municipality. Ethnobotanical study. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S156. Abstract nr PETM-64.

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PETM-65: **USE OF THE NATURAL AND TRADITIONAL MEDICINE IN STOMATOLOGY SERVICES OF THE PLAYA MUNICIPALITY DURING 2014**

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Introduction and Objective: According to the Cuban economics policy of paying the main attention to the Natural and Traditional Medicine (NTM), in all the institutions and services de health system the professionals work for the integration of this discipline in every protocol. The purpuse of this study was identifying the use of the different modalities of NMT in stomatology services of Playa municipality and the behavior in 2014. **Methods:** It is a descriptive and longitudinal study that includes all the patients who had received some of the modalities of NMT as dentistry treatment. In the study was quantified number of patient according to modality and data was analyzed every month during 2014. **Results:** NTM was applied 138 679 patients, 13% of them in urgency services. The most frequently prescribedor used modality was phytotherapy with 109 010 patients (78%). During 2014 the prescription of phytomedicines had similar behaviour. Apitherapy was the second modality in frequency of use but only with 15%, followed by the ozone therapy (4091 patients for 3%). Others as the homeopathy and the acupuncture show an increment sustained in their use during the year. **Conclusions:** The use of NTM is increased in stomatology services of Playa municipality. Although phytotherapy and apitherapy are the most prescribed modalities, there are others used in benefit of the population's oral health.

Citation Format:
Estupiñán M, Lara C, Delfín M (2015) Use of the natural and traditional medicine in stomatology services of the Playa municipality during 2014. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S157. Abstract nr PETM-65.

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PETM-66: **ETHNOMEDICAL STUDY OF THE *Justicia secunda* PLANT**

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Introduction: The *Justicia secunda* Vahl is an exotic plant in Cuba, belonging to the family *Acanthaceae* that is cultivated as medicinal and ornamental all over the country. This species does not appear in the taxonomic referential literature of the Cuban flora, neither in the principal works of medicinal and aromatic plant studies, which indicates that this plant has recently been introduced in our country and that due to its wide-spreading behavior; has it had qualities of persistent and aggressive establishment after cultivation. With the objective of investigating about the information and popular use of this species, a survey to the population of the Health Center Area of the Sancti Spíritus municipality between Januarys – March of 2012 was performed. **Methods and Results:** Two-hundred people were chosen at random for the sample. It was found that most of the interviewees corresponded to elders of 40 years. The popular names they referred were sangre de Cristo (Christ's blood), yerba de la sangre (blood Herb), tapón, arnica, chicota (Chicot) and tilo mejicano (Mexican Tile). Ten percent of people affirmed that it comes from the Oriental region of our country. The popular uses given to this plant are: Antidiarrheal 52 %, analgesic and anti-inflammatory agent 35%, anesthetic 3%, prevention and treatment of prostatic affections 2%, to heal 1%, anti fungus 1%, sedative 1%, the rest, did not know the plant. People use its foliage of oral way as decoction and for local use as frictions in maceration. Adverse reactions were not reported after the administration of the preparations in any of the pharmaceutical forms. **Conclusions:** These results prove that the experience of our grandparents offers a safe medicine based in the evidence and in the observation of nature, which is transmitted from generation-to-generation.

Citation Format:
León Y (2015) Ethnomedical study of the *Justicia secunda* plant. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S158. Abstract nr PETM-66.

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PETM-67: **PRECLINICAL VALIDATION OF TRADITIONAL USE OF *Hibiscus rosa-sinensis* (MARPACÍFICO)**

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Introduction: In Cuba and Caribbean countries *Hibiscus rosa-sinensis* are very common in garden. Reports of traditional use are related with conjunctivitis, fever, headache, flu and cough. Our aim was to determinate preclinical anti-inflammatory, analgesic and antipyretic effect of decoction of leaves and flowers of *H. rosa.* **Material and Methods:** Activity was assayed on acute inflammation model (ear edema test), applying 10 µL croton oil, 75 µg/per ear. Different doses of decoctions 30% of flowers and leaves were evaluated topically and orally; 10 µL of decoctions were applied at each side of the treated ears. Model of analgesic was writhing test (acid acetic 0.75 %, 0.1 mL/10 g i.p) and tail flick test (water at 55°C). All experimental models was conducted in male OF-1 mice (20–25 g). Finally antipyretic activity was tested inducing pyrexia with brewer's yeast (15% in water; 1 mL/100 g, sc.) in male Wistar rats (180-200g). **Results:** The extracts from leaves and flowers (30%) applied topically inhibited inflammation on 54.7% and 30.9% respectively. Orals administrations do not showed a significantly antiinflammatory activity in both extracts, but they have a significant anti-nociceptive response to thermal stimulus compared to control group. Decoctions of *H. rosa* significantly decreased the number of abdominal stretching in all cases. Only decoction of flowers showed a significant antipyretic activity similar to paracetamol, from the 1fts hour to 4 h after administration. **Conclusions:** Results validated traditional use of leaves or flowers of *Hibiscus rosa sinensis* in inflammation, flu, cough and pain process.

Citation Format:
Brito G, Martínez I, Morón F, Victoria MC, Duménigo A, Morejón Z, Nossin E (2015) Preclinical validation of traditional use of *Hibiscus rosa-sinensis* (marpacífico). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S159. Abstract nr PETM-67.

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PETM-68: **KNOWLEDGE OF PATIENTS WITH CARDIOVASCULAR AFFECTIONS ABOUT MEDICINAL HERBS FOR THEIR TREATMENT**

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Introduction: Cardiovascular affections constitute one of the main causes of death in our country and medicinal herbs could be an alternative for the control them, that, it was decided to do the present paper; the objective of this paper is to identify the herbs known by the patient to treat their cardiovascular affections. **Methods:** A cross-sectional descriptive study was done in 60 patients, with cardiovascular affections admitted in internal medicine and cardiology service at Saturnino Lora Hospital in Santiago de Cuba in April 2015. A questionnaire was applied to the patients, the main variable was their knowledge about medicinal herbs, and the references were match with the therapeutically effect of each herb in the FITOMED to analyze whether they had or not scientific support. **Results:** A 58% of the patients referred to know at least one herb to the treat of their disease. This knowledge was not related to the age and sex. Pathologies with more references of medicinal herbs knowledge were hypertension and myocardial infarction (MI). To hypertension, 19 species were referred and only Caña santa, lemon and tila had therapeutically effect with scientific support for the treatment of this disease, meanwhile for MI 4 species were referred and only garlic has scientific support. **Conclusions:** The interviewed patients reported many medicinal herbs for the treatment of cardiovascular disorders, but few of them with scientific support to treat hypertension, MI and heart failure.

Citation Format:
Casas S, Ramos L, Camps I, Herrero H, Vuelta L (2015) Knowledge of patients with cardiovascular affections about medicinal herbs for their treatment. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S160. Abstract nr PETM-68.

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PETM-99: **HERBAL MEDICINAL TINCTURES USE IN PATIENTS WITH NON-TRANSMISSIBLE CHRONIC DISEASES FROM THE POLYCLINIC II, TRINIDAD AREA, IN TWO YEARS, 2014-2015**

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Introduction: A descriptive longitudinal study was made, with the aim to assess the level of knowledge of patients with chronic non-communicable diseases about the use of herbal medicinal tinctures in the health area during two-year (2014 to 2015). **Methods:** The study population consisted of all patients categorized at the group III (a total of 443), belonging to the area of the Polyclinic II Celia Sanchez Manduley, Trinidad. Non-probability sample was selected in a targeted manner with volunteers (225 patients). Demographic, epidemiological and cognitive variables were used. **Results and Conclusions:** A total of 64.0% of patients with chronic non-communicable diseases have no knowledge about the use of herbal medicinal tinctures and have little knowledge on how they act. Mild essential hypertension was the most common chronic disease found in this study, and so, the most frequent use of these preparations was to lower blood pressure.

Citation Format:
Toledo A, Guerra D (2015) Herbal medicinal tinctures use in patients with non-transmissible chronic diseases from the Polyclinic II, Trinidad area, in two years, 2014-2015. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S161. Abstract nr PETM-99.

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NATURAL PRODUCTS FROM MARINE ORIGEN

PMO-69: **MEMORY ENHANCING EFFECTS OF BM-21, AN AQUEOUS-ETHANOLIC EXTRACT OF THE MARINE PLANT *Thalassia testidinum*, IN AGED AND ALUMINIUM INTOXICATED MICE**

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Introduction: Memory is one of the earliest cognitive functions that decline during normal and pathological aging and it has a devastating social and economic impact. Oxidative damage accumulation in macromolecules has been considered one of the causative mechanisms. Here we assessed the effects of oral administration of BM-21 on learning and memory, and on indicators of oxidative stress in mice. **Material and Methods:** After examining general motor activity by open field and rota rod test, reference spatial memory performance was assessed by Morris Water Maze. Latency to find the escape platform (escape latency, EL) during the training sessions, time in the target quadrant in the probe trial and the number of platform crossing were measured as indicators of cognitive performance. **Results:** Al-exposed (50 mg/kg daily, 3 months) and aged mice (19-month-old) showed more difficulties in learning the task when compared to non-Al exposed and young mice, respectively. BM-21 given at 100 mg/kg/day for 3 months significantly enhanced cognitive performance by decreasing EL and by increasing the time spent in the target quadrant and the number of platform crossing. Besides, the extract significantly reduced malondialdehide (MDA) concentration and increased reduced glutathione (GSH) and superoxide dismutase activity (SOD) in brain homogenates of aged and Al-exposed mice. Micronucleus studies showed that BM-21 extract reduced the frequency of micronucleated-binucleated cells in aged mice bone marrow, which would be associated with its potent antioxidant properties. In addition, the increase of AChE activity observed in Al-exposed group was reverted to normal by BM-21 administration. **Conclusions:** our results showed that sub-chronic administration of the extract (100 mg/kg) blocks age-dependent and Al-induced declined in spatial cognition in mice with a simultaneous reduction of oxidative stress in brain. It is thus possible that an antioxidant mechanism in brain will contribute to beneficial effects of BM-21 on memory lost.

Citation Format:
García T, Morales RA, Palmero A, García N, Valdés O, Fernández G, Pérez C, Menéndez R (2015) Memory enhancing effects of bm-21, an aqueous-ethanolic extract of the marine plant *Thalassia testidinum*, in aged and aluminium intoxicated mice. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S162. Abstract nr PMO-69.

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PMO-70: **STUDY OF POTENTIAL DRUG INTERACTION BETWEEN *Thalassia testudinum* BM-21 EXTRACT AND SOME DRUGS ACTING IN CNS: A PRECLINICAL STUDY**

Morales RA, García T, Palmero A, Valdés O, González K, Hernández Y, Menéndez R, Rodeiro I.

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Introduction: Herbal medicine may cause significant toxicity with additive, synergistic or antagonistic effects when taken in combination with allopathic drugs. BM-21 is the extract from the sea grass *Thalassia testudinum* standardized to thalassiolin B (5.8 ± 0.9%) that has promising memory enhanced and antitumoral activities. *In vitro* and *in vivo* experiments have showed that BM-21 and thalassiolin B can modulate the activity and expression of P450 (CYP) enzymes. The potential interaction between BM-21 with diazepam, imipramine and thiopental was investigated on 2-week, oral, once daily administration in mice. **Material and Methods:** Healthy OF-1 male mice were divided in to eight groups of ten each. Control group I was administered distilled water. Group II received diazepam (5 mg/kg) or imipramine (15 mg/kg). Group III, IV and V received BM-21 (40, 100 and 400 mg/kg), while Groups VI and VII and VIII received the extract and single oral administration of diazepam and imipramine 30 min prior to experiment. Open field (OF), rota rod behavior (RRB), tail suspension test (TST) and maximal electro-shock seizure (MES) were evaluated. In Thiopental Sleeping Time test, a control group I administered with thiopental and groups II, III and IV that received BM-21 and thiopental (60 mg/kg s.c, 60 min after the last administration) were used. **Results:** In TST and MES there was no change in immobility time and duration of maximal convolutions neither in groups III, IV and V compared to control nor in groups VI, VII and VIII compared with with imipramine and diazepam, respectively. In thiopental sleeping time there was a significant reduction of sleeping time in groups II, III and IV when compared with the control. When BM-21 was administered alone, there was not effect on locomotor activity and motor coordination. This indicates non-sedative and non-tranquillizing properties. **Conclusions:** BM-21 does not possess antidepressant-like and anticonvulsant effect. Results also revealed no interaction between BM-21 and diazepam/imipramine. However, according to the effects in pharmacological models assayed in the present work, the reduction of sleeping time suggest an interaction of BM-21 with thiopental that seems to be of pharmacokinetic nature.

Citation Format:
Morales RA, García T, Palmero A, Valdés O, González K, Hernández Y, Menéndez R, Rodeiro I (2015) Study of potential drug interaction between *Thalassia testudinum* BM-21 extract and some drugs acting in CNS: a preclinical study. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S163. Abstract nr PMO-70.

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PMO-71: **ANTIOXIDANT EFFECTS FROM THE SEAWEED *Sargassum* SPP. EXTRACT IN UVB-RADIATED MURINE SKIN: POTENTIAL DERMOPROTECTIVE ACTION**

Morales R[1], **Rodríguez M[1]**, Menéndez R[1], García T[1], González K[1], Hernández Y[1], Valdés O[1], Fernández M[1], Nuñez R[1], Cáceres L[2], Govin L[2].

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Introduction: Ultraviolet (UV) radiation is a potent initiator of photooxidative mechanisms exerting detrimental effects on human skin by inducing oxidative stress responses mediated by reactive oxygen species. Thus, one approach to protecting humans from the harmful effects of UV irradiation is to use antioxidant substances, which can be added to preparations for topical application. The aim of this research was to determine *in vivo* antioxidant capacity of the seaweed *Sargassum* spp extract on mice exposed to acute UVB irradiation. **Material and Methods:** Male albino mice (Balb/C, 22-24g) were used. Prior to the assay, mice were depilated, irradiated for an interval of 6 min and treated with the dose 500, 250 y 125 µg of extract per cm^2 of skin. One side was shielded from irradiation to be used as control. The effects of *Sargassum* spp extract on markers of skin oxidative stress namely reduced glutathione (GSH) and superoxide dismutase (SOD) activity was studied. In parallel a group of treated and non-treated animals were observed to detect macroscopic dermal alterations. **Results:** Biochemical assays revealed a significant enhancement in the levels of skin GSH and SOD at doses 250 and 500 µg of extract per cm^2. Results of dermal alteration were consistent with favorable modification of oxidative stress parameters. **Conclusions:** Thus, our results suggest that the extract may contribute to skin repair by attenuating oxidative stress due to its *in vivo* antioxidant activity. However, further studies are now in progress in order to confirm these results by mean of histological assessment.

Citation Format:
Morales R, Rodríguez M, Menéndez R, García T, González K, Hernández Y, Valdés O, Fernández M, Núñez R, Cáceres L, Govin L (2015) Antioxidant effects from the seaweed *Sargassum* spp. extract in UVB-radiated murine skin: potential dermoprotective action. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S164. Abstract nr PMO-71.

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ANALYTICAL AND CHEMICAL CHARACTERIZATION OF NATURAL PRODUCTS

PACH-72: **PHYSICO-CHEMICAL EVALUATION OF THE PERSEITOL OBTAINED FROM PERU AND CUBA AVOCADO (*Persea americana*)**

García CM, Martínez V, González ML, Martínez L, Rivera MM, Sánchez P, Rosas LO.

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Introductions: This study summarizes the main findings of the preliminary characterization of plant material obtained from the bark of avocados from Peru and Cuba (*Persea americana*) used to obtain perseitol, an active ingredient, with a high potential as raw material in the further development of pharmaceutical formulations. **Material and Methods:** Avocado plants, purple variety, used in the study were planted in the Experimental Station of Medicinal Plants Dr. Juan Tomas Roig, Cuba. To study the physico-chemical parameters were used IR spectroscopy and high performance liquid chromatography (HPLC), as well as other tests described in the Branch Standard of the Ministry of Public Health (NRSP 309). **Results:** The results obtained for each sample tested, showed no significant differences between the perseitol obtained from Cuba in relation to Peru. **Conclusions:** These preliminary results demonstrated that perseitol has quality enough for its use in pharmaceutical formulations.

Citation Format:
García CM, Martínez V, González ML, Martínez L, Rivera MM, Sánchez P, Rosas LO (2015) Physico-chemical evaluation of the perseitol obtained from Peru and Cuba avocado (*Persea americana*). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S165. Abstract nr PACH-72.

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PACH-73: **OPTIMIZATION OF EXTRACTION CONDITION FOR FLAVONOIDS IN *Taliparitiy elatum* S.W. USING RESPONSE SURFACE METHODOLOGY**

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Introduction: *Tiliparitiy elatum* S.W. (majagua) is considered an endemic specie of Cuba and Jamaica. Its flowers are prized by traditional medicine as expectorant and antiasthmatic. Rutin, quercetin and gossypitrin are the main flavonoids presents in the petals. Gossypitrin is the major component and it has been demonstrated its antioxidant, metal chelator and antimicrobial activity. **Objective:** The determination of optimal conditions of extraction with maximum yield of flavonoids, as markers from *T. elatum*, were determined by HPLC and total flavonoids using aluminin chloride method. **Material and Methods:** The extraction ratio (ratio of solvent to herbal drug), extraction time and extraction number were set as individual values and the yields of the metabolite were the response value that was optimized with a Box–Behnken design. **Results:** The optimal conditions obtained from response surface methodology (RSM) were 1:24.92 for the extraction ratio, 110.17 min for the extraction time and 3 for the extraction number. Under the optimal conditions, the response value of the experiment closely agreed with the predicted response value. **Conclusions:** The result suggests that RSM is successfully applied for optimizing the extraction of the marker compounds in *T. elatum*.

Citation Format:
Barrios M, Romero JA, López M (2015) Optimization of extraction condition for flavonoids in *Taliparitiy elatum* S.W. Using response surface methodology. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S166. Abstract nr PACH-73.

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PACH-74: **GAS CHROMATOGRAPHY DETERMINATION OF THE FATTY ACIDS CONCENTRATION DURING SUNFLOWER OIL OZONATION**

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Introduction: The ozonized vegetable oils are products of natural origin that presents an increasing interest in the development of drugs, nutraceutics and cosmetics. The vegetable oils are composed by a mixture of triglycerides with different grades of unsaturation, depending of its components fatty acids. Through of its unsaturation, these compounds react with ozone. The aim of this work is the determination by gas chromatography of the fatty acids concentration during the ozonation reaction. In addition, a correlation of this determination with the peroxide value, usually employed in the physico- chemical characterization of this ozonized compounds is required. **Material and Methods:** The sunflower oil was ozonated in a burbling reactor at controlled temperature. The determination of the fatty acids concentration in the sunflower oil during the ozonation was making by gas chromatography analyzing its fatty acids methyl esters derivatives. In addition, samples were characterized by peroxide and acidic values, viscosity and UV-visible spectroscopy. **Results:** The composition of fatty acids found in the sunflower oil confirms the reported in the literature. The decreasing of the linoleic acid (C18:2) concentration followed by the oleic acid (C18:1), during the ozonation reaction of the oil, was also confirmed. The peroxide value increases with the unsaturated fatty acids reduction. **Conclusions:** The employed technique for the determination of the fatty acid concentration was found to be effective for following the ozone - sunflower oil reaction. A good correlation was found between the decreasing of the unsaturated fatty acids and the peroxide value, usually indicator used.

Citation Format:
Támbara Y, Flores D, Hernández K, Álvarez A, Fernández LA, Gil D, Ledea O (2015) Gas chromatography determination of the fatty acids concentration during sunflower oil ozonation. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S167. Abstract nr PACH-74.

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PACH-75: **BACTERICIDAL ACTIVITY OF PLANT *Wedelia trilobata* L. PRELIMINARY STUDY OF THE TYPES OF METABOLITES PRESENT IN ITS EXTRACTS**

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Introduction: Plants are a valuable resource in the health systems of developing countries. The World Health Organization has estimated that more than 80% of the world population, uses traditional medicine for their primary health care needs and that much of the traditional treatments involve the use of extracts of plants or their active ingredients. The plant *Wedelia trilobata* L. known in Cuba as "camomile of garden" is widely disseminated in our territory, specifically in gardens and parterrier, as it has very showy yellow flowers. In the literature appears reported bactericide activity of n-hexane from the stems of this plant crude, so us performed the evaluation of the bactericide activity of the crude of n-hexane and ethanol obtained from the leaves and the study of the types of metabolites in both crudes. **Material and Methods:** The dried ground plant material was extracted by decoction using n-hexan and subsequently with ethanol. Both extract were concentrations and the identification of the types of metabolites was performed using the Rondina and Cossio method. The evaluation of the bactericide activity of the extracts from n-hexane and ethanol were performed at concentrations from 500 mg/mL up to 31.25 mg/mL using disk diffusion method to determine antibacterial sensitivity, according to the rules of the standard laboratories Committee (NCCLS). **Results and Conclusions:** N-hexane crude showed bactericide activity against the strains *Staphylococuus aureus*, *Staphylococuus cuagulasa negativo*, *Acinetobacter liroffi*, while the ethanolic showed no activity. N-hexane crude is rich in triterpenes-steroids, alkaloids, and quinones, while the ethanolic triterpenes-steroids, flavonoids and glycosides.

Citation Format:
Pérez C, Echemendía OA, Spengler I, García T (2015) Bactericidal activity of plant *Wedelia trilobata* L. Preliminary study of the types of metabolites present in its extracts. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S168. Abstract nr PACH-75.

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PACH-76: **ANTITUMORAL ACTIVITY OF ETHANOLIC EXTRACT OF THE BARK OF *Maytenus buxifolia* SUBSP. *cajalbanica* (BOHIRDI; O.MUÑIZ). METABOLIC FINGERPRINT BY (FIA/ESI/MS^N)**

Pino L[1], Rodeiro I[2], Hernández I[2], Spengler I[1], García T[1], Fernández A[1], Vilegas W[3], Pérez C[1].

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Introduction: Severals plants of the genus *Maytenus*, belonging to the family *Celastraceae*, are used in South America to prepare infusions or decoctions that are used as anti-inflammatory, analgesics, anti-ulcer remedies. Phytochemicals and biological studies of extracts from various species of the genus *Maytenus* demonstrated some anti-inflammatory, analgesic, diuretic, antitumor, antioxidant, antiulcer, aphrodisiac, among others properties. In addition, previous researches highlighted the existence of numerous secondary metabolites, which include flavonoids, catechins, galocatechins and their epi isomers, which sometimes are responsible for their activity. The species *Maytenus buxifolia* subsp. *cajalbanica* (Bohirdi; O.Muñiz) is endemic from Cuba and has not gone in to phytochemical and biological studies. In this work we set aim to evaluate the anti-tumoral activity of ethanolic extract of the bark of this endemic species and obtaining their metabolic fingerprint using direct flow injection electrospray ionization tandem mass spectrometry (FIA/ESI/MS^n). **Material and Methods:** The dried ground plant material was extracted by soxhlet extraction using diethyl ether/petroleum ether 1:1 and subsequently with ethanol. Qualitative chemical composition of the extract was determined by direct flow injection electrospray ionization tandem mass spectrometry (FIA/ESI/MS^n) in negative mode. Thermo Finnigan LCQ Deca ion trap mass spectrometer (San Jose, CA, USA) equipped with an ESI interface was used. The cells used in antitunoral study are acquired from the American type culture collection (ATCC). **Results and Conclusions:** Here we reported for the first time the antitumoral activity of ethanolic extract of the bark of this endemic species against the tumour cell lines 4T1 and EA.hy926. Monomers, dimers, trimmers and tetramers of proanthocyanidins were identified.

Citation Format:
Pino L, Rodeiro I, Hernández I, Spengler I, García T, Fernández A, Vilegas W, Pérez C (2015) Antitumoral activity of ethanolic extract of the bark of *Maytenus buxifolia* SUBSP. *cajalbanica* (Bohirdi; O.Muñiz). Metabolic fingerprint by (FIA/ESI/MS^N). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S169. Abstract nr PACH-76.

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PACH-77: **PHARMACOGNOSTIC STUDY OF *Schinus terenbinthifolius* RADDI (FALSE COPAL)**

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Introduction: The hydro-alcoholic extracts obtained from the *Schinus terebinthifolius* Raddi (false copal) leaves are broadly used by their anti-inflammatory and antimicrobial properties. The objective was to develop a pharmacognostic study of the *S. terebinthifolius*. **Material and Methods:** The botanical species was taxonomically classified and the morphology of the leaves was visually evaluated. The drying study was developed under different conditions and humidity, drying temperature and weight loss were measured. The dry vegetable material was stored in flasks of amber glass, bags of kraft paper and in polyethylene bags. Humidity, the organoleptic characteristics and microbial load were evaluated. From a hydro-alcoholic extract to 80% obtained by maceration, the secondary metabolites were identified using the technique of Rondina and Coussio (1969) modified by Durand (1986). The physico-chemical parameters: organoleptic characteristics, pH, relative density, refraction index, alcoholic content and total solids were determined. The metabolites of interest were identified by chromatographic in thin layer. Total phenols were quantified by visible UV spectrophotometry to 765 nm. **Results and Conclusions:** The results indicated that it was the *Schinus terebinthifolius* Raddi species according to the consulted bibliography. The solar dryer and the nylon bags were the most efficient methods to obtain and store the dry vegetable material. Several secondary metabolites were identified in the hydro-alcoholic extract (pH: 5.30, density: 0.8902, total solids: 8.4%, refraction index: 1.3786, alcoholic content: 72%), steroids, resins, alkaloids, phenols and tannins , by obtaining a 7.88% of total phenols in correspondence with what other authors have found.

Citation Format:
Águila C, Álvares Y, Mena O (2015) Pharmacognostic study of *Schinus terenbinthifolius* Raddi (false copal). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S170. Abstract nr PACH-77.

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PACH-78: **CONTENT OF SOLIDS OF *Caesalpinia vesicaria* L. ACCORDING TO THE PART AND AGE OF THE PLANT**

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[2]Drug and Food Institute of Havana University.
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[4]Experimental Medicinal Farm Plants in La Sierrita, Cienfuegos.

Introduction: *Caesalpinia vesicaria* L. is a rather small tree about 10 m high, and is one of the plants successfully used in traditional medicine at the region of La Sierrita, Cienfuegos province, by Mr. Enrique Otero, so called *The Popular Scientist*, who used the aqueous maceration from adult plants trunk chips for genitourinary track ailments. Nevertheless, it is interesting to study other parts of the plant, which could be easier to obtain and to handle, due to the extreme hardness of the wood. The purpose of this paper is to determine the solid content in different parts of the plant at different ages. **Material and Methods:** Samples of trunks and branches from trees at San Juan area in Cumanayagua municipality were collected. The samples matched Cienfuegos Botanical Garden HAJBC5829 and HAJBC7813 herbarium specimens. Morphological studies were performed on the wood for age determination. Trunks were chipped and separated into heart, timber and bark. Branches were separated into sterns and leaves. They were also organized by age groups: 17 years, 3 years and less than one year old. All the material was ground and shadow dried. The determinations performed were water content and soluble matter in pure water, 30 and 80 percent hydro alcoholic mixtures and pure alcohol. **Results:** According to the plant part, the higher soluble matter content in all solvents belonged to the leaves, followed by the stem, timber and bark. According to the solvent, hydro alcoholic mixtures gave the higher extraction rates. According to the age, trees over 5 years exhibited higher solids content. **Conclusions:** Due to their high solid content, the leaves should be further studied. Samples older than 5 years must be preferred.

Citation Format:
Celorio S, Cuellar A, Cuesta A, Otero E (2015) Content of solids of Caesalpinia vesicaria L. according to the part and age of the plant. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S171. Abstract nr PACH-78.

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PACH-79: **CHEMICAL CHARACTERIZATION AND INSECTICIDAL ACTIVITY OF THE *Ocimum basilicum* L. LEAVES ESSENTIAL OIL**

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Introduction: Aromatic plants and their essential oils have been worldwide used for the human being. *Ocimum basilicum* (L.) (*Lamiaceae*) commonly known as basil, is one of the most widely consumed herbs in the world as flavor in food and fragrance in pharmaceutical products. **Material and Methods:** A chemical composition study by Gas Chromatography/Mass Spectrometry and the insecticidal activity of *O. basilicum* leaves essential oil against *Musca domestica* is accomplished. **Results:** A yellow essential oil with a yield of 0.5% (w/v) and a total of 20 identified compounds, tree of them in high concentration as eugenol 21.96%, β- caryriophyllene 20.79% and bicyclogermacrene 20.38%. From a chemical point of view, the major part of the constituents is sesquiterpene types (16 compounds). The biological activity shows a mortality dependant of the concentration. The medium lethal dose was estimated in 9.41 µg. **Conclusions:** The major compounds of this essential oil can be considered as the responsible of the insecticidal action.

Citation Format:
Chil I, Escalona JC, Mendonça PM, Dutok CM, Cortinhas LB, de Carvalho MG, Queiroz MMC (2015) Chemical characterization and insecticidal activity of *the Ocimum basilicum* L. leaves essential oil. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S172. Abstract nr PACH-79.

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PACH-80: **INFLUENCED OF EXTRACTION MEDIUM IN THE COMPOSITION OF VOLATILE COMPONENTS OF *Zanthoxylum pistacifolium* GRISEB LEAVES (*Rutaceae*)**

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Introduction: *Zanthoxylum pistacifolium* Griseb is an endemic plant that grows in the forests and hills of the Southeastern cost of Cuba. In the reviewed bibliography none report regarding to the chemical composition, ethnobotanic and/or pharmacological information was find out. **Objective**: To extract and to identify the volatile components of leaves collected in the locality of "el Palenque", Siboney beach, Santiago de Cuba. **Material and Methods**: The hydrodistillation-cohobation extraction method in three different mediums: neutral, acid and basic was used, while Gas Chromatography coupled to a Mass Spectrometry was considered for the chemical separation and characterization of the volatile compounds extracted. **Results and Conclusions**: The acid and basic medium increases the extraction yield but attempts against the structural integrity of the volatile compounds that is why the conventional method was selected as the most effective. In neutral medium, 82 compounds (97.76% of the total extracted) were identified, most of them belonging to terpene type. The main compounds isolated were α-pinene (12.35%), linalool (6.68%), (4E,6Z)-2,6-dimethyl-2,4,6-octatriene (6.50%), limonene (6.19%) and phytol (6.06%).

Citation Format:
Heredia Y, González R, Escalona JC, García J, de la Vega J (2015) Influenced of extraction medium in the composition of volatile components of *Zanthoxylum pistacifolium* Griseb leaves (*Rutaceae*). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S173. Abstract nr PACH-80.

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PACH-81: **POLYPHENOLIC PROFILE OF *Solanum lycopersicum* FRUITS IRRIGATED WITH STATIC MAGNETIC FIELD**

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Introduction: The polyphenols are secondary metabolites of *S. lycopersicum* that act against the oxidative stress and they diminish free radicals, which cause degenerative illnesses in the man. In this plant, favourable results have been obtained in their yield, quality and in the metabolites synthesis when being used magnetic treatment during their cultivation. The objective of the research was to determine the present polyphenols in the fruits of *S. lycopersicum* irrigated with static magnetic field of 150 mT with view to its employment as nutraceutic. **Material and Methods**: An experimental design was used totally randomized with two treatments. The plants of the treatment control were irrigated with normal water and in the other treatment with static magnetic field of 150 mT. To the mature fruits, they were carried out the polyphenols extraction with ethanol (80%). The high performance liquid chromatography (HPLC)-diode array detection (DAD) procedure to obtain the polyphenols profile was used. As confirmative analysis by high performance liquid chromatography with mass spectrometry detection (HPLC-PDA-MS/MS) was employed. **Results**: In the two treatments the polyphenols were identified: caffeic, coumaric, gallic, chlorogenic and ferulic; besides the flavonoids rutin and catequine. The presence was ratified of each one of the certain polyphenols, considering the molecular mass of the precursory ion and its time of retention. The ionic products and the collision energy were obtained for each compound and in some cases, it coincides with the literature. The identified polyphenols contributes significantly in the total antioxidant capacity in synergy with carotenes and vitamins. **Conclusions**: These results indicate that the polyphenols presence in the *S. lycopersicum* fruits is not affected significantly by the irrigation of the plants with treatment of static magnetic field of 150 mT. For such a reason the pharmacological properties these compounds could be evaluated in the antioxidant defence of the human organism.

Citation Format:
Ferrer AE, Fung Y, Gómez LM, Lage MA, López J (2015) Polyphenolic profile of *Solanum lycopersicum* fruits irrigated with static magnetic field. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S174. Abstract nr PACH-81.

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PACH-82: **MINERAL CONCENTRATION IN *Rosmarinus officinalis* CULTIVATED WITH MAGNETICALLY TREATED WATER, AN ALTERNATIVE AS NUTRITIVE SUPLEMENT**

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Introduction: Plants are nutritional sources of minerals; the same ones strengthen and offer great efficacy in the treatment of different diseases, it plays an essential function in nutrition. *Rosmarinus officinalis* (rosemary) used like medicinal plant and spice, the chemical composition was essential oils, phenolic acids, flavonoids and terpens, and it is considered as source of natural antioxidants. The aim was evaluate the minerals concentrations in *R. officinalis* leaves cultivated with water treatment with static magnetic fields. **Material and Methods**: To magnetic treatment was used an induction magnetic of 0.12 T and a control. The content of water, dry mass, carbohydrates were evaluated, and the content of minerals by the method of mass spectrometry with source of plasma of inductive coupling (ICP MS). **Results:** The plants with 0.12 T was values of dry mass (5.98 ± 1.02 g) and control plant (3.75 ±0.08 g); water content to 0.12 T plants (65.0%) and the control plant (69%); carbohydrates to 0.12 T plant (0.35 ± 0.034 mg/L) and the control plant (0.16 ± 0.050 mg/L). For the concentration of minerals in 0.12 T plant, the bigger values of the ions were calcium, potassium, magnesium, manganese, sodium, copper, phosphor, sulphur and zinc, in comparison with the control plants. **Conclusions:** This work contributes to increment the scientific information about the chemical compounds in the *R. officinalis* and establishing the sustainable of this species with more quality. This plant can use as natural antioxidant, and the same time it can be consumed in the nutritive products for a better food safety.

Citation Format:
Fung Y, Ferrer AE, Hendrix S, Gómez L, Cuypers A (2015) Mineral concentration in *Rosmarinus officinalis* cultivated with magnetically treated water, an alternative as nutritive suplement. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S175. Abstract nr PACH-82.

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PACH-83: **PROCEDURE TO CHARACTERIZE PURIFIED HEME SOLUTIONS USING PHISICAL, CHEMICAL AND SPECTROSCOPIC METHODS**

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Introduction: Heme solution employed was obtained from sterile bovine blood, using physical and chemical methods. To characterize it, is necessary to separate molecules by size within it. Therefore the aim of this study was to design a method for separating the different fractions present in said solution Hemo (PM-616 Da) and characterize them with spectroscopic techniques. **Material and Methods**: Dialysis membranes 1 000 Da, 6-8000 Da and 15,000 Da and centrifuge tubes Amicon membrane 10 000 Da were used. Two lots of hemo solution adjusted to pH 4.4 and 5.0 were used. The dialyzed solution was treated with nitric acid (HNO_3) and 86% concentrated to 20 mL to determine iron by atomic absorption (AA). Dialysis was performed with 2 L of distilled water and concentrated to 10 mL heat, also the case with HNO_3. Purity was determined by mass spectrometry (MS) being used as a standard swine hematin (PM-633.9 Da, Sigma). **Results:** The hydrolyzated to pH 4.4 achieved the best results with a 82.32% with molecules smaller size 1000 Da, 2.72% between 1000 and 6-8 000 Da, 4.24% between 6 - 8 000 and 15 000 Da and 15 000 Da above 10.72%, which is attributed to form aggregates where the heme is present in monomeric form was obtained. The purity and protein concentration is presented in the results obtained by MS.

Citation Format:
González M, Gómez JA, Otero Y, Revilla Y (2015) Procedure to characterize purified heme solutions using phisical, chemical and spectroscopic methods. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S176. Abstract nr PACH-83.

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PACH-84: **PHYTOCHEMICAL EVALUATION AND ESTIMATION OF THE CONTENT OF POLYPHENOLS AND FLAVONOIDS IN HYDROALCOHOLIC EXTRACTS OF MULBERRY (MORERA) LEAVES HARVESTED IN CUBA**

Almora E[1], Lago V[1], González K[2], Callicó A[1], Bolaños G[2], Valdéz O[2], Echemendía O[1], Adames Y[1], Monteagudo R[1], Fidalgo O[1], Morales Y[1].

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Introduction: *Morus alba*, commonly known as mulberry, is a tree belonging to the genus *Morus*, family *Moraceae*. It is used as an ornamental plant; its leaves are rich in minerals, vitamins, folic acid, amino acids, and it is the only food of the silkworm. It has several medicinal properties, which have been used in the treatment of acne, as an antipyretic, diuretic and reducing cholesterol and blood pressure. Recent studies have developed the antiproliferative capacity against cancer. Phytochemical characterization of plants is important because through these studies may suggest the presence of actives principles with biological activity such as flavonoids, polyphenols, among others. **Objective:** Phytochemical screening and determining the content of polyphenols and flavonoids in hydroalcoholic extracts of mulberry leaves. **Material and Methods:** The plant material was dried under controlled temperature and humidity. The screening was performed by classical fractionation methodology solvent polarity. Alcoholic extraction was performed at different concentrations (96, 70, 50 and 30%), at room temperature for three days and the polyphenol and flavonoid content was determined by standard techniques as described using pyrogallol and quercetin, respectively. **Results:** Oil/fat, alkaloids, triterpenes/steroids, catechins, reducing sugars, flavonoids and phenol/tannins were detecting. The highest polyphenol content was found in 95% ethanol extract (293.29 mg/g) and the lowest in extract 30% (52.74 mg/g). The flavonoids behaver was similarly to polyphenols, being the 95% ethanol extract the higher value (455.46 mg/g) and 30% the lower value (62.61 mg/g). **Conclusions:** Six groups of metabolites were observed. The highest polyphenols and flavonoids content were found in 95% ethanol extract.

Citation Format:
Almora E, Lago V, González K, Callicó A, Bolaños G, Valdéz O, Echemendía O, Adames Y, Monteagudo R, Fidalgo O, Morales Y (2015) Phytochemical evaluation and estimation of the content of polyphenols and flavonoids in hydroalcoholic extracts of mulberry (morera) leaves harvested in Cuba. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S177. Abstract nr PACH-84.

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INFORMATIC AND SCIENTIFIC INFORMATION

PISI-85: **NATURAL ANTIOXIDANT COUMARINS: QSAR APPROACHES REGARDING THEIR GENOTOXICITY**

Guardado E[1,2], Molina E[1,2], Abreu OA[1], Santana L[2], Uriarte E[2], Matos MJ[2].

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Introduction: Coumarins are a group of phytochemicals with multiple applications in different fields, such as food and medicine. Many of their benefits are based on the different activities that they display, within which stand antioxidant properties. However, some conflicting evidences suggest the need to clarify or estimate the safety aspects and genotoxicity of this group of compounds. In this sense it has been shown in previous studies that some of them have presented pro-oxidant activity *in vitro* and clastogenic activity *in silico*. Therefore, in this paper chemical structures of natural coumarins that come from various natural sources were studied. **Material and Methods:** This database became topological-structural information, using molecular descriptors from the TOPSMODE approach. A virtual screening was also held that used a model of structure-clastogenic activity relationship, and linear discriminant analysis (LDA) technique. The probability of being active to the presence of hydroxyl and methoxyl groups in the molecules. **Results:** From a scan for regularities between chemical subclasses, it can be observed that when the scaffold has minimal substitutions, these molecules are inactive, e.i. umbelliferone, psoralen and xanthyletin. The presence of an electron-withdrawing group (carbonyl) an esterified oxygen, saturated and unsaturated aliphatic and aromatic groups, are associated with inactivity of molecules (i.e. ammoresinol, ostruthin, osthole and mammea AB). Methoxyl and hydroxyl radicals cause increased toxicity. **Conclusions:** It is of particular significance the large number of active molecules from the subclass of pyranocoumarins (angular type), which has been linked to the positive contribution of the fragment that forms the *bay region* of the pyranocoumarinic system

Citation Format:
Guardado E, Molina E, Abreu OA, Santana L, Uriarte E, Matos MJ (2015) Natural antioxidant coumarins: QSAR approaches regarding their genotoxicity. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S178. Abstract nr PISI-85.

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PISI-86: **ESSENTIAL RESOURCES AVAILABLE IN TELEMATIC NET OF HEALTH IN CUBA FOR NATURE MEDICINE**

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Infomed, the Telematic Net of Health in Cuba, favorable the use of multiple products and services of information in health, ignored many times, very useful for the upgrade of the medical knowledge and the taking of clinical decisions. It constitutes, without place to doubts, an indispensable resource for the administration of the medical information to improve the health starting from the intensive and creative employment of the technologies of the information and the communication. The return of the Western world toward the alternative medicine, the employment of the medicinal plants and their derived to achieve new products, as well as the development of the investigations, they have caused an increment in the scientific literature. For the prosecution of the different sources of information, different resources and systems have been developed with the purpose of gathering the product of this explosion. The objective of this work is to offer the description of some available sources in the National System of Information of Medical Sciences, portals of specialties and topics of health, databases that contribute to the improve element of this discipline with its knowledge.

Citation Format:
Delgado I, Lara C (2015) Essential resources available in telematic net of health in Cuba for nature medicine. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S179. Abstract nr PISI-86.

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PISI-87: **MULTIMEDIA: "TRADITIONAL AND NATURAL MEDICINE IN PRIMARY HEALTH CARE", AN USEFUL TOOL IN PRIMARY HEALTH CARE**

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Introduction: A multimedia with the objective to provide and to improve the knowledge in medicine students and professors, health care doctors and population in general, concerning the ways of preventing, treating and rehabilitating the most frequent affections in doctors' offices using different kinds of Natural and Traditional Medicine (NTM) was made. **Material and Methods**: This tool has an introduction, a program of subjects, bibliography, help and credits. In the Content module, images and the principal characteristics of each therapeutics subject are shown. This multimedia is based on Crheasoft, which do not require deep knowledge in informatics, as well as others in design and setting up media, Photoshop, Sony Vegas and Adobe audition. **Results and Conclusions**: The navigation in the multimedia is simple through the links to the different modules and their contents. The multimedia has a great importance in post graduating and pre graduating teaching, because it gathers information of different sources in an unique material and it favours doctors´ fulfillment in the health areas by providing them with a new and therapeutical tool, with few or none adverse reactions and saving of time and resources for the patient and the institution.

Citation Format:
García M, Durán Y (2015) Multimedia: "Traditional and Natural Medicine in Primary Health Care", an useful tool in primary health care. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S180. Abstract nr PISI-87.

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PISI-88: **"MEDICINAL PLANTS" INTERACTIVE GUIDE**

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Introduction: From the most remote traditions and cultures, the employment of the medicinal plants has gone winning spaces like a form a lot but it heals of promoting health, at the present time have been carried out diverse scientific investigations that show its effectiveness in the improvement of the quality of the human being life. The poor knowledge of the health workers about posology, indications, contraindications and warnings of the phytopharmaceuticals derived from those plants limited the use of the therapeutic options. The objective of this work is to give to the facultative of primary health care one practice and effective implement for prescription of products in natural form or pharmaceuticals forms from medicinal plants. **Material and Methods**: The data that are shown and they prosecute of information in Natural Tradicional Medicine Programs, Guide of Natural Products, Herbal Medicine Books and diverse databases (PubMed, INFOMED,,Scielo), also the review of specialized original articles, and the author's scientific experience in this topic. **Results**: The medicinal plants Interactive guide is important instruments for practice educations and adequate phytotherapeutic prescription in primary health care for professional of health .Medicinal plants in the guide approved by MINSAP show the ways of administration, posology, contraindications and warnings of them. Additional data on medicinal plants and their active principles are given to the physician can have comprehensive knowledge of the phytopharmaceuticals derived from them. **Conclusions:** The Interactive guide could be represents a useful tool for professional health.

Citation Format:
Melgarejo N, Álvarez L, Alonso A (2015) "Medicinal Plants" interactive guide. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S181. Abstract nr PISI-88.

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PISI-89: **INFORMATION RESOURCES FOR RESEARCH AND DEVELOPMENT OF NATURAL PRODUCTS IN THE CENTER FOR PHARMACEUTICAL RESEARCH AND DRUG DEVELOPMENT. REALITIES AND PERSPECTIVES**

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Introduction: Investigation on medicinal plants with potential curative properties took part of the daily work of many scientists at the worldwide. In Cuba, the Center for Pharmaceutical Research and Drug Development (CIDEM) is a leadership in drug development and several informational resources are continually originated to support research projects associated with medicinal plants. The general objective of this work is to highlight the role of the Drug Information Center (CINFA) as documental and promotional supporter in medicinal plants topics. The specific objectives are the following: – To identify and to characterize the information resources created for several medicinal plants topics. – To expose the significance of each information resource. – To mention the new information resources expected to be created. **Methods:** – Review of current records. – Consultation with experts in these fields. **Results:** A total of 15 information resources were identified in several formats by the CINFA: databases, compendiums, websites, scientific articles, promotional papers, among others. **Conclusions:** The work of CINFA was consolidated due to the creation and dissemination of relevant information resources regarding the scientific field of medicinal plants.

Citation Format:
Elizagaray B, Castro R, Pons M, de las Cuevas R (2015) Information resources for research and development of natural products in the Center for Pharmaceutical Research and Drug Development. Realities and perspectives. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S182. Abstract nr PISI-89.

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OTHER STUDIES AND APLICATIONS OF NATURAL PRODUCTS

POS-90: **A HERBAL REMEDY MADE FROM *Rosa canina* SUBSPECIES LITO ACT AS AN ANTI-INFLAMATORY AGENT IN HORSES EXPOSED TO STRENOUS EXERCISE**

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Objectives: A standardized rose-hip powder containing seeds and shells from subspecies LiTo has shown anti-inflammatory properties and improves flexibility and reduces pain in humans suffering from osteoarthritis. A galactolipid GOPO with strong anti-inflammatory and anti-oxidative properties was recently isolated from the product. The same remedy has been proven effective also in dogs. The present study aimed to test if the powder would improve the immune system and working capacity in horses exposed to strenuous exercise. **Material and Methods:** Seventyfour horses, all trotters, which often develop osteoarthritis early in their life due to intensive training and performance in an oval track were included in a double-blind placebo controlled trial. Horses were randomly allocated to either LiTo rose hip powder (210 g daily added to their food) or placebo powder for a three-month period. The anti-inflammatory capacity was estimated as chemotaxis of peripheral blood neutrophils using a Boyden Chamber and the anti-oxidative capacity by using chemiluminescence and by measuring vitamin C levels in plasma. The working capacity was estimated by counting the seconds used to run a 1000 meter and the behavior was evaluated by questionnaires answered by the staff taking care of the horses. **Results:** During active treatment, chemotaxis significantly declined indicating enhanced anti-inflammatory activity and the anti-oxidative capacity significantly rose. No such change was observed during placebo treatment. Horses on active treatment shortened their time to run a 1000 meter with 1.1 ± 1.5 s ($p<0.02$). The horses on placebo slightly increased their time to run the same distance. It was reported from questionnaires that horses were more lithe and easier to work with the day after strenuous exercise when on the present active treatment. **Conclusions:** The present data suggest that powdered rose hip from subspecies LiTo works as an anti-inflammatory agent in horses and improves the working capacity.

Citation Format:
Winther K, Kharazmi A, Hansen P (2015) A herbal remedy made from *Rosa canina* subspecies *lito* act as an anti-inflamatory agent in horses exposed to strenous exercise. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S183. Abstract nr POS-90.

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POS-91: **ULTRASOUND ASSISTED EXTRACTION OF FLAVONOIDS FROM LEAVES OF *Annona muricata* L.**

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[3]Centro de Investigación y Desarrollo de Medicamentos (CIDEM), 26 y 51, Plaza, La Habana, Cuba.

Introduction: *Annona muricata* L. is a native tree of Mexico and the Caribbean**,** widely spread at the tropical regions of America, Asia and Africa. It has used, for years, for the treatment of many diseases due to its anticancerous, bactericide, antitumoral and antidiabetic properties. Flavonoids are one of the composed bioactive groups more studied due to its anticancerous and antiviral properties. The ultrasound assisted extraction as nonconventional method of extraction is important for the rapidity and efficiency in phytoconstituents obtaining, in comparison with the traditional methods of extraction. **Material and Methods:** The influence of operation parameters was evaluated (time of extraction, concentration of ethanol and solvent/vegetal material relation), in flavonoids extraction from *A. muricata* leaves, by ultrasound. An orthogonal experimental design was used and the results were compared with the method of extraction by stirred tank. **Results:** The best conditions for the extraction are: time of 2.5 h, 90% of ethanol concentration and solvent/vegetal material ratio of 53 mL/g, for an optimal value of yield of flavonoids of 0.321 ± 0,003 mg/g. In the comparison between the ultrasound-assisted extraction (UAE) and the stirred tank methods, was obtaining as result that time in the last one was 0.7 times shorter than when the work is done by UAE. Nevertheless, the flavonoids amount is 1.8 times greater in UAE. **Conclusions:** The method of extraction by ultrasound is more efficiency than stirred tank.

Citation Format:
Sevilla I, Rodríguez E, Henry Y, Acosta J, Salomón S (2015) Ultrasound assisted extraction of flavonoids from leaves of *Annona muricata* L. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S184. Abstract nr POS-91.

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POS-92: **FORMULATION OF A NOURISHING CREAM WITH *Moringa oleifera* OIL SEED**

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Introductión: *Moringa oleifera* is a plant with well-known properties and for that reason has prestige and recognition in the scientific community. The seed oil has as main features have excellent emollient power and high oxidation stability that make it a strong candidate in the cosmetics industry. This work aims to formulate with the *M. oleifera* oil a nourishing cream for daily use for all skin types. **Material and Methods**: In order to determine the best formulation were designed four formulations with different concentrations of oil and coded CNM1, CNM2, CNM3 and CNM4. The cosmetic product has two phases, the aqueous phase consisting of distilled water; the oil phase by: isopropyl myristate, ethoxylated alcohol, mineral oil, cetyl alcohol, propyl and methyl paraben, and fragrance. To check the reliability of the formulation were performed accelerated stability studies, where the samples were placed in rack and subjected to six cycles (one cycle every 12days) heating of 45 ± 20°C and cooling to -5 ± 20°C and the organoleptic and physicochemical tests were conducted. **Results and Conclusions**: The tests were performed only in the CNM3, the CNM2 and CNM4 samples were discarded because total phase separation, CNM1 for being very inconsistent. Shelf-life stability study: It was noted that the formulation vials were stable (in relation to its color, odor, skin and extensibility in appearance) at room temperature (25 °C) for 12 days. Accelerated stability study: It was observed that the formulations had little variation in odor, color. The mixture remained homogeneous. The skin extensibility not changes. With respect to the pH variation it is observed increases as the temperature increases and decreases when temperature decreases, maintaining a stable range 6 to 8.

Citation Format:
Wong L, Segarte R (2015) Formulation of a nourishing cream with *Moringa oleifera* oil seed. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S185. Abstract nr POS-92.

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POS-93: **PRELIMINARY STUDY FOR OBTAINING SYRUP OF *Stevia rebaudiana***

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Introductión: *Stevia rebaudiana* or ka'ahe'e leaves aqueous extracts, are worldwide used since some time ago as a substitute of common sugar in many foods and beverages. Their high sweetening power is due to the presence of steviol glycosides or steviosides which show a low calorific value, which can be used in the treatment of diabetics. **Material and Methods**: Aqueous extractions of *S. rebaudiana* leaves were carried out using two methods to obtaining syrup: maceration and infusion. Each one of these methods were made with dry leaves and dust by mean of statically and stirring way. All obtained syrum samples were physically, chemically and microbiologically tested and measured their cytotoxic and antiviral activity. **Results and Conclusions**: All the samples were found to have a brown to dark brown color; these were odorless, sweet and slightly bitter. None showed cytotoxic activity in cell culture, or present antiviral activity against herpes simplex type 1 and 2, but showed a high antimicrobial activity.

Citation Format:
Fidalgo O, Monteagudo R, Bolaños G, Echemendía O (2015) Preliminary study for obtaining syrup of *Stevia rebaudiana*. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S186. Abstract nr POS-93.

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POS-94: **METHODOLOGY FOR DEVELOP A NATURAL PRODUCT IN THE FORM OF TROCHES: "MENTISAN"**

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Introduction: Troches are tablets manufactured by compression, designed to dissolve or slowly erode at the oral cavity because they are intended to exert a local effect in the mouth or throat. This special type of tablets, which should be pleasant for the consumer, is commonly used to combat halitosis and to treat sore throat or to control coughing in the common cold, offering a bigger quality of life to the population. Appreciating the perspective of utilization of essential oils obtained from some medicinal plants at our country (specifically from Pinar del Río), as well as evaluating the feasibility of troches production in the manufacturing conditions of the Pharmaceutical Laboratory Oriente, **Objectives:** To establish a methodology for develop a pharmaceutical product in the form of troches with anesthetic, antiseptic and antibacterial actions based on the use of the national essential oils of natural origin. **Material and methods:** The active ingredients were menthol, eucalyptol, thymol and eugenol; a flavoring agent, peppermint oil, and excipients of pharmaceutical quality certificated by the USP/BP Pharmacopoeias. For analyzing, the finished product validated identification and semi-quantification methods by thin layer chromatography were used. Wet granulation was used for manufacturing troches. **Results:** A product in the pharmaceutical dosage form of troches was obtained, which for its design and formulation and adequate texture, aroma and taste, proves to be effective and pleasant, fulfilling the quality specifications established. The stability evaluated allowed a period of initial validity of one year. **Conclusions:** The obtained product, which commercial check mark is <Trociscos MENTISAN>, was registered by the Cuban Regulatory Authority. Its large-scale production proves to be feasible, with the guaranty of quality that offers an industrial pharmaceutical product, and the resulting technical- economic and social impacts.

Citation Format:
Lemus Z, Vigo M, Nápoles R, Rodríguez M, Chong A (2015) Methodology for develop a natural product in the form of troches: "Mentisan". [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S187. Abstract nr POS-94.

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POS-95: **PREFORMULATION STUDY OF A MOUTHWASH WITH *Salvia officinalis* L. (CASTILE SAGE)**

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Introduction: The ethnomedical use of *Salvia officinalis* L. has been reported as antiseptic, disinfectant and anti-inflammatory. Due to these properties, the Medical Specialties Regulation recommends it to be used in Phytopharmacology and Apipharmacology as an object of revision, widening and improvement on account of the practical experiences obtained after its application and future investigations, because of the low availability of herbal products to treat otolaryngological complaints that bring about hoarseness, cough, rhinitis, pharyngeal inflammation and pain; on the other hand, the plant´s fluid extract and its tincture is too unpleasant to be used in gargling. It was decided to elaborate a mouthwash using the fluid extract of this plant. **Methods:** An experimental study of preformulation of a mouthwash was done. In a first stage, the components, elaboration way and the dosage of the active principle were selected. Then a mouthwash was elaborated, the physical, chemical and microbiological (organic-leptonic properties, pH, density, total solids, refraction index and microbiological stability) parameters were determined and evaluated taking into account the time. The data were statistically processed analyzing the variance for repeated measurements (ANOVA) to carry out the standardization of the measured parameters, establishing the intervals of confidence (95%) to a significance level minor than 0.05. **Results:** It was determined the physical-chemical and microbiological stability concerning the three lots that were elaborated in 0, 3 and 6 months. The product presented an acceptable appearance, with a pleasant smell and flavor, statistically showing a significant variation only of the pH starting from the third month. **Conclusions:** The formulation turned out to be physical-chemical and microbiologically stable in the container and the storing conditions where was studied, proposing the expiration date at the third month in room temperature.

Citation Format:
Ortiz Y, Ramos K, Lahera M, Moreno O, Martínez H (2015) Preformulation study of a mouthwash with *Salvia officinalis* L. (Castile sage). [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S188. Abstract nr POS-95.

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POS-96: **EVALUATION OF ANTIFUNGAL ACTIVITY OF HOMOEOPATHIC MEDICINES AGAINST HUMAN PATHOGENIC FUNGI *Candida albicans in-vitro* MODEL**

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Objective: The objective of the present study was to evaluate *in-vitro* antifungal activity of homoeopathic medicines on the growth of human pathogenic fungi *Candida albicans.* **Methods:** Homoeopathic medicines (ϕ, 3x, 6x & 12x) of *Allium sativum, Allium cepa, Ocimum sanctum* and *Ficus religiosa* were tested against the growth of human pathogenic fungi *Candida albicans* obtained from MTCC, Institute of Microbial Technology; Chandigarh by using paper disc method. The diameters of inhibition zones (mm) were measured and the results so obtained were compared with that of the control. Ketoconazole was used as reference standard fungicide. **Results:** The results indicates that mother tinctures (both water and alcohol based), 6x of *A. sativum*; mother tincture (alcohol based), 6x, 12x of *A. cepa*; 6x, 12x of *O. sanctum* and 12x of *F. religiosa* showed inhibition zones against the growth of *C. albicans* as compared to control. Out of all the four medicines tested, *A. sativum* showed maximum zone of inhibition as compared to *A. cepa, O. sanctum* and *F. religiosa*. **Conclusions:** The present study suggests that these homoeopathic medicines possess i*n-vitro* antifungal effect against human pathogenic fungi *C. albicans*.

Citation Format:
Gupta P, Sundaram EN, Dwivedi B, Changani S, Kaur H, Nayak D, Khurana A, Manchanda R (2015) Evaluation of antifungal activity of homoeopathic medicines against human pathogenic fungi *Candida albicans in-vitro* model. [Abstract]. In: Proceedings of the FAPRONATURA 2015; 2015 Sep 21-25; Topes de Collantes, Sancti Spiritus: CSF. J Pharm Pharmacogn Res 3(Suppl. 1): S189. Abstract nr POS-96.

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