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Abstracts

Chairmen:
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Plant species from the Peruvian Amazon rainforest (Peru) and their antimicrobial activity

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The plant species reported here are traditionally used by indigenous and Mestizo populations from the lowland rainforest in Peru for their anti-infective and anti-inflammatory properties. Extracts from these plants were evaluated for their anti-inflammatory and anti-microbial properties against 36 sensitive and multi-resistant bacteria or fungi. Of the 39 plants analyzed (50 methanolic extracts), 9 species showed MIC ≤0.3 mg/ml for one or several microorganisms and only 6 extracts were inactive. This study supports the traditional use of these plants. It may help to discover new chemical classes of antibiotics that could serve as selective agents against multi-resistant bacteria.

Cistanthus ladanifer as a source of phenolic compounds with antifungal activity

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A screening of the antifungal potential of phenolic extract of Cistanthus ladanifer from Northeast Portugal, against Candida species was performed. The extract was characterized by HPLC-DAD-ESI/MS. Phenolic acids and their derivatives, ellagic acid derivatives and flavonoids, such as catechins, flavonols, and flavones, were found in the sample. The most abundant group was ellagic acid derivatives in which punicalagin gallate, a derivative of punicagin attached to gallic acid, was found in highest amount. These compounds could be related to the strong inhibition of C. albicans, C. glabrata and C. parapsilosis growth. Moreover, the best antifungal activity was against C. glabrata, where the studied extract was able to cause at least 3 Log of reduction at concentrations below 50 μg/ml and a total growth inhibition at concentrations above 625 μg/ml.

Effects of Ocimum sanctum Linn (OS) leaf extract on stress, memory and attention in healthy humans

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Anti-stress effects and memory enhancing effects of OS have been documented in animal models but no human studies available. Double blind RCT on healthy adult humans. 300 mg capsules of ethanolic leaf extract of OS or placebo were administered to 30 volunteers for 30 days. Recordings were taken on day 1, 15 and 30. Parameters assessed were: a) STAI questionnaire b) Sternberg memory task c) Stroop task d) Heart rate (HR) & e) GSR. Results: showed significant improvement in reaction time p < 0.043 in Sternberg task, and improved % of correct responses in facilitation task of stop (p < 0.001). STAI HR, GSR and P300 latency showed no significant change. P300 amplitude showed a significant increase (p < 0.02). All changes were significant only at day 30. OS possesses memory enhancing effects at dose of 300 mg/day od by 30 days. There is also significant improvement in attention as assessed by P300 amplitude. However, no significant reductions in Stress parameters were seen at this doseduration of OS. Further trials have to be conducted in more subjects and for longer duration for the effects to be validated.

Phytochemical investigation of Rauvolfia nukuhivensis, a Marquesas traditional medicinal plant

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Rauvolfia nukuhivensis (Apocynaceae) is an endemic species of the Marquesas archipelago where it is used as a traditional gynecological anti-septic. Over-exploited because of the frequent use of the bark (mace), the plant is now classified as an endangered species (*Critical Rare* IUCN status). Data regarding pharmacological and chemical studies were not available until now. The phytochemical investigation of the main constituents of this popular medicinal plant resulted in the isolation and identification of several alkaloids belonging to the secocicline and ajmaline type, among them also a new and unknown derivative. In order to test the efficacy against human pathogens, (Staphylococcus aureus, Escherichia coli and Candida albicans) bioassays were carried out, showing moderate antifungal activities of some compounds.

Analysis of leaf epidermal characters of medicinal and poisonous Brazilian menispermeae

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We carried out a multivariate analysis of leaf anatomy of five genera and nine species of Menispermeae known to be toxic or used as medicinal in Brazil. The dendrogram obtained by Ward's method showed two groups (A and B). With cophenetic correlation coefficient of 0.9178. The group A with six species and two subgroups: the subgroup A1 brought together four species of Cissampelos with anomocytic stomata (Fig 1A), with inclusion of calcium oxalate (Fig.1E) and sclereids; the subgroup A2 with Cissampelos pareira, Odoniucaria and Disciphania. The group B consists of Chondrodendron platyphyllum with anticlinal walls cells straight (Fig.1G) and Hyperbaena dominated with spongy crater (Fig.1B), brochid cells in the spongy parenchyma (Fig.1C), and secretory canals (Fig.1D) were seen. Cissampelos sympodiad and Chondrodendron platyphyllum were the species with lower similarity in the dendrogram. Financial support: CNPq.

Cissampelos sympodiad

Cissampelos endromorpha

Cissampelos ovatiloba

Cissampelos gabertima

Cissampelos pareira

Disciphania sp.

Odoniucaria sp.

Hyperbaena dominated

A. anomocytic stomata; B. cyclocytic stomata; C. brochid cells in the spongy parenchyma; D. secretory canals; E. inclusions of calcium oxalate; F. Papillae; G. Anticalinal walls cells straight.
by (DPN) as well as diabetes mellitus. We carry on the fraction and compound of Radix Astragali for DN. The fraction was identified by LC/MS on the basis of compounds, besides astragalin IV (AS) was focus on. 16 peaks in the HPLC spectrum were determined by LC/MS spectra and retention time with isolated compounds according to literatures. Astragalin and flavonoids are in bioactive fractions.

Simple HPLC method for detecting adulteration by ginkgo extracts with flavonol aglycones

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More than 45 flavone glycosides, most of which are flavones quercetin, kaempferol andisorhamnetin [1]. Quercetin, quercetin and other plant extract has been documented and the EP/BP monographs for ginkgo extract stipulate that for pharmaceutical methods cannot effectively detect flavonoids, because of the high and lower ginkgo glycone content after acid hydrolysis. We developed to the pharmacopoeial methods that enables quantifying flavonoids and free aglycones and applied it to 5 leaf samples. The results show that flavonoid aglycones were not detected in or in two products. Most products largely met flavonoid glycone content and aglycone content test B. Our method revealed high sensitivities and kaempferol in three products, suggestive of the presence of free aglycones in these products. Methods for calculating flavonoid glycosides and flavonoid glycone content by up to 40%. We suggest the USP monographs for ginkgo extract be modified to increase their detection with flavonol glycosides. References: 1. Lim, Food Agric Chem 56:6671 – 9. 2. Franzi, C. et al. (2011) 3. Liu, C. et al. (2005) Analyst 130:325 – 9.

The determination of absolute configurations of 1-hydroxy acids by the expansion of Marfrey’s method

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Often biosynthetically incorporated in natural small peptides from nonribosomal peptide synthetase (NRPS). The absolute configurations of α-amino acids are conformed by the LC/MS-based analysis of Marfrey’s derivatives. In the current methods to determine the absolute configurations of α-hydroxy acids, the corresponding α-hydroxy acids require more complete expanded Marfrey’s method and developed a facile accessing the absolute configurations of α-hydroxy acids. The expanded Marfrey’s method was evaluated with the LC/MS analysis of the reaction of LD-α-hydroxy acids coupled with Marfrey’s reagent. The expanded method is operationally simple and applicable to a wide range of compounds without any purification of the reaction mixture. The procedure to a natural depsipeptide, nystagmin, caused to develop a facile accessing of its α-amino acids and α-hydroxy acids. We believe that our method may be useful for natural product chemists.

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Mutual interference problems in the simultaneous volumetric determination of ultra-trace total mercury (II) and toxic metals in medicinal herbs matrices

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The work describes the volumetric determination of mercury (II), copper (II), lead (II), cadmium (II), and zinc (II) by square wave anodic stripping voltammetry (SWASV) in medicinal herbs. The digestion of each of the metals was carried out using a concentrated HCl-HNO3 mixture. The determination was carried out using a conventional three electrode cell, employing, as working electrodes, a gold electrode (GE) and a stationary hanging mercury drop electrode (HMD). The analytical procedure has been verified on the standard reference materials Spinach Leaves NIST-SRM 1570a, Tomato Leaves NIST-SRM 1573a and Apple Leaves NIST-SRM 1515. For all the elements, the precision as repeatability, expressed as relative standard deviation (s%) was of the order of 3 – 5%, while the accuracy, expressed as relative error (e) was of the order of 3 – 7%. Once set up on the standard reference materials, the analytical procedure was applied to commercial tea leaves samples. A critical comparison with spectrometric measurements is also discussed.

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Analysis of phenolic compounds in flowers from wild medicinal plants from northeastern Portugal

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This study aimed to analyse phenolic compounds in wild medicinal flowers of Crataegus monogyna, Cytisus multiflorus, Malva sylvestris and Sambucus nigra by HPLC-DAD-ESI/MS. Flavonoids and flavones were the main groups in almost all the studied samples. C. multiflorus sample gave the highest levels of flavonoids, being a chrysospermic derivative the most abundant flavone. C. monogyna revealed the highest concentration in phenolic acids that were not found in C. multiflorus; 5-O-calceoloyquinic acid was the most abundant phenolic acid found in the first species, being a procyanidin trimer also found. Kaempferol-3-O-rutinoside and quercetin-3-O-rutinoside were the main flavonoids present in M. sylvestris and S. nigra, respectively. The studied flowers could be selected for processing extracts with health-promoting properties or to be incorporated into functional beverages or products with bioactive properties related to oxidative stress. Acknowledgements: PEST-OE/AGR/UI0690/2011, SFRH/BPD/4609/2008 (L. Barros), Ramón y Cajal (M. Dueñas).