

S1: PARADIGMS AND CHALLENGES IN HEALTH TECHNOLOGIES – ENVIRONMENT AND HEALTH

Breakthroughs and Innovations in Pharmacy

The objective of the present symposium is to explore the new breakthroughs and Innovations in the pharmacy field. These innovations play a major role in improving the health care system and may range from the discovery of new medicines to the application of technology.

These pharmacy advancements have helped to improve quality of life for people facing all kinds of conditions, from Cancer to Alzheimer.

Speakers will address the following topics focusing on discoveries that may have a major impact on improving patient care and modernizing the pharmacy field, along with some examples of innovations currently under investigation.

Moderator: Agostinho Cruz (ESTSP.IPP)

New drugs from traditional medicines: pharmacological evaluation of plant extracts from Chapada Diamantina (Brazil)

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Introduction: Plants are rich sources of medicines and Brazil is among the most biodiverse nations in the world.

Objectives: The work focus on the pharmacological evaluation of four plant extracts from Chapada Diamantina (Brazil), particularly the antioxidant and cytotoxic properties.

Materials and Methods: The work started with an ethnopharmacological survey and data were collected using interviews in the community of Igatu (Bahia). *Poiretia bahiana* (Pb), *Acrítropappus confertus* (Ac), *Cuphea carthagenensis* (Cc) and *Polygala multiceps* (Pm), were selected for further studies, based on their high use among the community and their lack of scientific information. Antioxidant effect of the extracts were determined by DPPH and superoxide scavenging assay, Fe²⁺ chelating activity, lipid peroxidation and measurement of non-enzymatic antioxidants. Gene expression of antioxidant enzymes was also determined. Pb and Ac were tested for their cytotoxicity against cancer cell lines, using MTT assay.

Results and Discussion: Plants selected are traditionally used for the treatment of various ailments, and despite its traditional use, there is a lack of investigation on their pharmacological properties. HPLC fingerprints of the extracts showed the presence of several phenolics. All extracts significantly decreased cell death induced by t-BOOH. Pm exhibited effective scavenging of superoxide radical and Fe²⁺ chelating ability. Incubation of HepG2 cells with Cc and Pm extracts also induced significantly increased in GSH levels and expression of cytoprotective enzymes. Pb and Ac demonstrated, in general, cytotoxic activity against cell lines tested.

Conclusion: Further studies are needed in order to elucidate the relationship between the compounds present in plant extracts and their protective and cytotoxic effects.

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Development of polymeric nanoparticles containing neuroprotective compounds of *Hypericum perforatum*

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Introduction: Neurodegenerative process involves several mechanisms. *Hypericum perforatum* extracts have been used for their antidepressive effects. A selected fraction (HP) of these extracts proved to be neuroprotective.

Objectives: Study the neuroprotective potential of *H. perforatum* selected compounds and entrap them into polymeric nanoparticles for brain delivery.

Materials and Methods: Compound isolation from *H. perforatum* was performed through isolation and purification methods and characterized by HPLC-DAD. HP poly(ϵ -caprolactone) (PCL)-nanoparticles were prepared by nanoprecipitation, extensively characterized and antioxidant activity was assessed. HP and its nanoparticles assessment of cellular toxicity was performed by MTT assay in several cell lines. To study HP ability to protect cells against t-BOOH-induced toxicity two incubation regimens were used. In the lipid peroxidation assay, co-incubation regimen was used. Permeability assays of HP and its nanoparticles were performed in an in vitro BBB model.