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Abstracts

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EFFECT OF NATURAL PRODUCTS ON BIOLOGICAL SYSTEMS

S3-1.

BIOLOGICAL PROPERTIES OF MEDICINAL PLANTS FROM HIGH ALTITUDE ECOSYSTEM AND POTENTIALS USES IN THE PHARMACEUTICAL INDUSTRY

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Plants from arid and semiarid regions are subjected to intense environmental stress and to adapt to these conditions of life, they have developed valuable defense strategies such as the chemical compound production. The finding of new molecules with potential uses in the pharmaceutical industry in the treatment and prevention of some pathologies is very interesting. The aim of this study was to evaluate the biological properties (antioxidant, antimicrobial, anti-inflammatory and genotoxicity activity) of medicinal plants from high altitude ecosystem and the isolation of the bioactive compounds. In this work were selected plant species used traditionally as medicinal in the Argentine Puna, including: *Baccharis incarum*, *Baccharis boliviensis*, *Chuquiraga atacamensis*, *Parastrephia lucida* (Asteraceae family) and *Fabiana punensis*, *F. bryoides*, *F. densa* and *F. patagonica* (Solanaceae family). The plants extracts showed antibacterial activity against antibiotic resistant bacteria, also showed antioxidant activity, by scavenging activity of free radical and reactive oxygen species, and showed anti-inflammatory activity by the inhibition of enzymes involved in the inflammatory process. None of the plant extracts were genotoxic. From the most promissory plants extracts, were obtained some bioactive compounds through assay-guided isolation and were formulate phytotherapeutic products with antibiotic and antioxidant properties. The results of this study justify the traditional medicinal uses of plants from high altitude ecosystem.

S3-2.

EFFECT OF A SECONDARY METABOLITE OF ARTEMISIA DOUGLASIANA BESSER, THE DEHIDROLEUCODINA, THE MEIOTIC CELL CYCLE

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Sesquiterpenic lactones (STL) are a group of secondary metabolites. The natural diversity of this group of natural compounds is related to a very wide range of biological activities, which have an important defensive role in the plants that synthesize them. The majority of STL have been isolated from the Asteraceae family, which belong to one of the biggest and most diverse group of plants in our planet. Dehydroleucodine (DhL) is a sesquiterpenic lactone, isolated from the leaves of *Artemisia douglasiana* B, popularly known as "matico". Nowadays, there is a lot of interest in finding vegetal compounds that act on the cellular cycle. In this regard, active vegetal compounds have demonstrated potent control of cell proliferation. The utilization of ovocyte meiosis as a study model of the effect of lactones on cellular cycle has many advantages. In amphibians, meiosis stops at two points: Prophase I and metaphase II. Its progression is controlled mainly by the activity of a cytoplasmatic compound, maturation promoter factor (MPF). Our group has demonstrated that DhL and its hydrogenated derivative, in which the alpha-methylenelactone (2H-DhL) function has been inactivated, inhibit the reinitiation of meiosis in amphibian ovocytes, keeping cells in prophase I. The analyses of the effect of DhL on transduction signals, which lead to the activation of MPF, suggest that the Myt1 kinase is the target of the lactones, either directly or through the inhibition of phosphatase PP2A. During fecundation, the sperm induces ovocyte activation by the inactivation of MPF, that permits meiosis end and the formation of pronuclei. Our laboratory has demonstrated that DhL induces the activation of mature ovocytes of *Rhinella arenarum* by interfering with the activity of MPF. DhL could be useful in techniques of reproductive biotechnology, where the low rate of viable offsprings is attributed to failures in the process of ovocyte activation.

S3-3.

CHEMICALS PRODUCTS FROM VEGETABLE ORIGIN USED ON WEEDS CONTROL

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Since the birth of agriculture, one of the major concerns was the weeds control. On the other hand, species of agricultural interest tend to lose their defenses during the domestication process, making them more susceptible to pests and diseases than wild species. The plants synthesize and accumulate in their bodies a variety of secondary metabolites. One of the theories proposes that plants use these compounds for their defense against weeds, pathogens and superior opponents. Substances with various chemical structures and functions, such as organic acids, naphthoquinones, coumarins, flavonoids, tannins, sesquiterpene lactones, alkaloids and others, were found having biological activities. Numerous studies indicate that they may inhibit seed germination, seedling development and persuade natural detractors, fungi or bacteria. Our team has focused its research on some highly invasive plant species as *Centaurea diffusa* Lam. (native from Minor Asia) and the Argentine species *C. tweediei* Hook & Arn, both from the Asteraceae family, looking for the metabolites they produce. The purpose of isolating them is to study its effect on other weeds and pathogens, so as to serve as tools for integrated pest management. We evaluated the extracts, subextracts and pure compounds isolated of those species, on *Triticum aestivum* (wheat), *Lycopersicon esculentum*, var. San Pedro (tomato), *Lactuca sativa* (lettuce) and the weed *Leonurus sibiricus* (black weed). The tests were performed *in vivo* in organic substrate, and *in vitro* in Petri dishes containing soft agar as a support base to contain the seeds. We evaluated the percentage of germination, seedling development, weight and activity of dehydrogenases. The results obtained were varied, allowing evidence of different effects as inhibitors of germination, seedling growth retardant and antibacterial action.