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Medicinal plants from Argentina: Phytochemical analysis and ethnopharmacological screening

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From ancient times, plants were the main source of renewable energy and biomass on earth. They provide man with all his needs including food, shelter, clothing, flavors, fragrances and medicines. Many plant species are exposed to a gradual extinction owing to a rapid destruction of their ecosystems and the intensive recollection in their natural habitats. In these contexts, it is imperative the isolation and identification of new chemical bioactive compounds that can be used directly or as models for the development of pharmacologically active drug metabolites.

The recognized native medicinal flora of Argentina consists of around 1,529 taxa.

More than 45% of the species has not yet been chemically analyzed, while 58% has not been tested pharmacologically. *Asteraceae* is the richest family among medicinal taxa (272) and medicinal endemics (36). The northwestern and northeastern regions of Argentina show the greatest diversity in terms of native medicinal flora. The provinces of Salta and Jujuy have the highest number of medicinal taxa (795 and 756 taxa respectively). The Monte ecoregion is the richest area in medicinal endemics. Catamarca has the highest percentage (48.69%) in its medicinal flora; Mendoza has the highest number of endemics (14.55%) respecting the medicinal flora per province. Formosa is one of the poorest areas in endemics medicinal plants (1.73%) and Tierra del Fuego has not any endemic.

Chemical constituents and biological activity are aspects scarcely explored in the medicinal flora of Argentina, probably due to a combination of lack of appropriate policies and laws to support the use of medicinal plants to fulfil healthcare needs, and low interest in their research among the scientific community. Therefore, due to its rich flora and empirical background which should not be ignored, pharmaceutical bioprospection is a promising ground.

Relatively few native medicinal plants species are cultivated. The great majority is still provided by collection from the wild. This trend is likely to continue because most medicinal plants are traded locally and regionally rather than internationally, the costs of domestication and cultivation are still high, and land is mainly used for cultivation for food crops. Moreover, collection practices are the unique secure valuable income for many rural households.

Medicinal plant species, like *Minthostachys verticillata, Hedeoma multiflorum, Achyrocline satureoides, Passiflora caerulea, Acantholippia seriphioides, Lippia turbinata, Baccharis crispa, Zuccagnia punctata, Caesalpinia paraguariensis* cultivation is a conservation option because the constant drain of material from their populations is much higher than the annual sustained yield. In these cases, the need for strict conservation of remaining populations, improved security of germplasm "*ex situ*" and investment in selection and improvement programmes is extremely urgent. For all other harvested medicinal species the conservation option is sustainable harvest from wild populations.

Due to the richness and distribution of medicinal flora in Argentina, the importance of preserving the prevailing natural and seminatural ecosystems of our territory needs to be is a national priority. Overharvesting, land conversion (deforestation and clearing for agriculture, and urban development) poses a serious threat to many medicinal plants, especially given the small population density of some species or their restricted distribution. For these reasons, approaches to wild species collection that engage local, regional, and national collection enterprises and markets in the work of conservation and sustainable use of medicinal species are urgently needed. The ecoregions that deserve special attention due to the number of species collected are: Puna, Yungas, Chaco, and Altos Andes, finally the Monte ecoregion deserves special attention mainly due to its endemism. A national program on medicinal germplasm conservation needs to be created.

Biography

Marta A. Vattuone has completed her Ph.D. at the age of 32 years in the National University of Tucumán, Argentina and the postdoctoral studies in this University and in the Service of Soil Microbiology of the Pasteur Institute, Paris, France. She is Titular Professor of Phytochemistry in the Institute of Plant Sciences "Dr. Antonio R. Sampietro" of the Faculty of Biochemistry, Chemistry and Pharmacy of the National University of Tucumán, Argentina; Director of the Laboratory of Biology of Bioactive and Phytopathogenic Agents, Director of the Career of Magister in Plant Sciences in the same University. She is Principal Researcher of The National Research Council of Argentina (CONICET). She was distinguished with several prizes and mentions in different Congresses and Symposia. She has published more than 150 papers in journals of recognized international prestige.

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