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TRACE ELEMENT DETERMINATIONS IN EXTRACTS FROM MEDICINAL PLANTS: HYMENEA sp, SAPINDUS saponaria and CASEARIA sylvestris

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Extensive use of medicinal plants in Brazil entails the evaluation of trace element contents to study their usefulness in relation to their medicinal value or their toxicity.

The knowledge of trace elements in medicinal extracts is also indispensable to detect any alterations as a therapeutic agent due to the nature of the soil where the plant was cultivated, to climatological conditions or to environmental pollution.

Instrumental neutron activation analysis (INAA) followed by high resolution gamma spectrometry has been applied in the present work to elemental determinations in extracts obtained from several parts (leaves, fruits or barks) of the plants: Hymenea sp, Sapindus saponaria and Casearia sylvestris.

Fresh and dried plant materials were extracted separately using an alcoholic solution that was filtrated, concentrated under a reduced pressure and lyophilized afterwards.

The INAA consisted of irradiation of dried extracts together with synthetic standards of the elements. Short irradiations of 10 min under a neutron flux of 10^{11}n $cm^{-2}s^{-1}$ of IEA-R1 nuclear reactor were carried out to determine Cl, K, Mg, Mn and Na. Irradiations of 8 or 16 hours under a flux of about 10^{13}n $cm^{-2}s^{-1}$ were performed for Br, Ca, Co, Cr, Cs, Fe, K, Rb, Sb, Sc and Zn determinations.

Results obtained presented a good precision. Extracts obtained from different parts of a same plant as well as the extracts from dried and fresh materials presented difference in the contents of some elements such as Ca, K, Fe, Mn and Zn. Toxic elements such as Hg and Cd were not found in the plant extracts.

The reliability of the method was checked by analyzing NIES Peppperbush and NIST Citrus Leaves reference materials. (Work supported by the CNPq and FAPESP from Brazil)