

## Elemental content determination in leaves and extracts of *Casearia* medicinal plant by neutron activation analysis

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Medicinal plants have been used worldwide in prevention, diagnosis and treatment of various diseases for many centuries. Particularly in the last twenty years, the use of medicinal plants and of their preparations has increased just as the need for information about quality, efficacy and safety of plant medicines. Organic components of these plants, such as essential oils and vitamins, have been extensively studied, however, only few researches have reported their elemental composition. In the present study, instrumental neutron activation analysis has been applied to determine elemental composition of leaves and extracts from three different species of *Casearia* (*C. sylvestris*, *C. decandra* and *C. obliqua*). *Casearia* genus plants are commonly found in American tropical countries and in Brazil they have been traditionally used as antiseptic, cicatrizing and a topical anesthetic agent. Besides, snake and bee venoms neutralization capacity and antiulcer and antitumor activities of *Casearia* plants have been scientifically confirmed. The leaves of *Casearia* species were collected at the Reserva do Morro Grande, located at the Atlantic Forest, São Paulo, Brazil. Before irradiation, the leaves were washed using purified water, freeze dried and ground into homogeneous fine powder. The extracts were obtained in ethanolic solution 75%, at room temperature, and then concentrated and freeze dried before analysis. Samples and element standards were submitted to short and long irradiations with thermal neutron flux of the IEA-R1 nuclear reactor. Essential macro, micro nutrients and trace elements, with biological function in human metabolism, were found both in leaves and in extracts. Elements Ca, Cl, K and Mg were determined at mg g<sup>-1</sup> levels, Na, Br, Fe, Rb and Zn at µg g<sup>-1</sup> levels and the elements Cs, Cr, La and Sc presented the lowest concentrations at µg kg<sup>-1</sup> levels. Toxic elements such as Cu, Cd and Hg were not detected in the leaves neither in the extracts, while As, Sb and Se were found, in some samples, at very low concentrations. Comparison between leaf and extract elemental contents showed similar concentrations for Br, Ca, Cl, Co, Cs, Fe, K, Mg, Na, Rb and Zn, and in the case of Cr, La, Mn, Sb and Sc significant differences were verified. Among these three *Casearia* species, *C. sylvestris* was the one that presented the highest concentrations for most elements. Certified reference materials NIST 1573a Tomato Leaves and NIST 1515 Apple Leaves were analyzed for quality control of the analytical results.