



THE USE OF THE NEUTRON ACTIVATION ANALYSIS TECHNIQUE TO DETERMINE HEAVY METALS IN *NICOTIANA TABACUM SOLANACEAE*

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Tobacco addiction has been mentioned as a leading cause of preventable illnesses and premature disability and tobacco smoking is the main cause of lung cancer and one of the factors that most contribute to the occurrence of heart diseases, among others. The herbaceous species *Nicotiana tabacum* is a plant of the *solanaceae* family used for tobacco production.

Some authors have researched about heavy metals and the toxicity of tobacco. Heavy metals are frequently found in low concentrations in ground, superficial and underground waters, even though it does not have environmental anthropogenic contributions. However, with the increase of the industrial activities and mining and the agrochemical use of contaminated organic and inorganic fertilizers, an alteration of the geochemical cycle occurs. As a consequence, the natural flow of heavy metals increases the release of these elements into the biosphere, where they are frequently accumulated in the superior layer of the ground, accessible to the roots of the plants.

Traces of available heavy metals may be found in surface and subsurface aquatic systems and soils, even when there is no anthropogenic influence on the environment, and they frequently accumulate in the upper layer of the soil, where they are accessible to the roots of the plants. Except for the exclusion species, most plant species that grow on soil contaminated by heavy metals cannot avoid the absorption of these elements, but only limit their translocation.

During planting and plant development, fertilizers and insecticides, including organochlorines and organophosphates, are used and the smoke from cigarette smoking presents various toxic substances, including heavy metals such as Chromium (Cr) and Manganese (Mn).

The samples preparation procedures were carried out in our laboratories and submitted to the irradiation with thermal neutrons in the IPEN/CNEN-SP, in the IEA-R1 research reactor. The irradiated material was analyzed by gamma spectrometry using a high purity germanium detector (HPGe).