

7th International Workshop on Biomonitoring of Atmospheric Pollution

14th-19th June 2015 - Lisbon, Portugal



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Trace Element Determinations in Tree Bark Samples for Biomonitoring Atmospheric Pollution in the City of São Paulo

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Concern about air pollution and its effects on public health has become important programs to reduce the levels of pollutants in many countries and, Brazil is no exception. Within this context, the objective of this study was to investigate on use of tree barks as biomonitor to evaluate the levels of element pollutants. Tree bark are considered to be a promising indicators of air pollution monitoring, because of its accumulation of aerosol particles, simplicity of species identification and wide geographical distribution. However, there are no established protocols for its sampling as well as about its capabilities to be used as an alternative or complementary indicator of aerial pollution. Besides, there are contradictory opinions about the accumulation capability of bark as and its adequacy as a bioindicator of atmospheric pollution. In this study barks from very common and dominant arboreal species in urban areas of São Paulo city were analyzed in order to define adequate experimental conditions for their use as biomonitor of air pollution. Tree bark samples collected from Sibipiruna (*Caesalpinia peltophoroides*) and Tipuana (*Tipuana tipu*) species at a height of 1.5 m from the soil were cleaned using a nylon brush. A surface layer of 2 mm was removed using a Ti grater and ground in an agate mortar for the analysis. Instrumental neutron activation analysis (INAA) was applied for the determination of As, Br, Ca, Co, Cr, Fe, K, Na, Sb, Sc, Zn and graphite furnace atomic absorption spectrometry (GF AAS) for Cd and Pb determinations. For analytical control of results certified reference materials were analyzed. Findings of this study demonstrated that the techniques of NAA and AAS provide reliable data for element concentrations with standardized differences, $|Zscore| < 2$. Results obtained in bark samples indicated that sample characteristics such as tree species or bark porosity, bark surface layer taken for analysis as well as tree trunk diameter or age of tree should be considered in its sampling and treatment for use in air pollution monitoring.

Poster Session

Keywords: tree bark, trace element, pollution biomonitoring, biomonitors