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Comparison of metal accumulation in tree bark and soil from urban parks in São Paulo city, Brazil

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The main sources of air pollution in the São Paulo megacity are gases and particulate matter released by the ever increasing fleet of light and heavy vehicles (more than 7 million) as well as industrial process emissions. These emissions are of great concern due to their effects on human health, causing lung cancer and respiratory problems, since they contain a wide range of potentially toxic metals and organic contaminants. In the present paper, the concentration levels of the metals Ba, Co, Cr, Cu, Fe, Ni, Pb and Zn in superficial soil and tree bark samples collected in urban parks of São Paulo city were determined and compared. The analytical techniques employed were neutron activation analysis and X-ray fluorescence spectrometry. Higher concentrations of Ba, Cr, Cu, Pb and Zn were obtained both in the soil and bark trees samples in relation to reference values, in the case of soils, and to a control area, in the case of the tree barks, indicating the influence of anthropogenic sources. Statistical analysis applied to the soil and tree barks concentration data showed that the studied metals presented the same behavior in the soil as well as the tree bark samples. There was an association between the traffic-related metals Cu, Zn and Pb, suggesting that these three metals originate from vehicular emissions. The utilization of these two different environmental compartments for pollution monitoring may improve the comprehension of metal pollution in urban parks in megacities, in order to identify the emission sources and to implement pollution-control strategies

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