Foliar nutrient and metal levels of crops in the Mount Cameroon area—reference values for plant nutrition and environmental monitoring

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Abstract

The growing population number and traffic loads, increasing environmental pressures, agricultural intensification, and the establishment of Mount Cameroon National Park demand farsighted environmental management in the region and the definition of a favorable ecological status. Since plants grow in the interface between soils and the atmosphere they can be used as passive biomonitors for the environmental quality. At the same time, the accumulation of nutrients and pollutants in crops is linked to human health, so that foliar elemental levels can be used as an integrative measure for environmental pollution and impact assessment. In the present study, we collected leaf samples of plantain, cassava, cocoyam, and maize on 28 sites at the southern flanks of Mt. Cameroon and determined 20 chemical elements. Air pollution in the study area comes from biomass and waste burning mainly, but emissions from traffic and a large refinery were believed to also play a significant role. However, spatial patterns in foliar elemental concentrations reflected the geochemistry rather than specific sources of pollution. Significant differences in foliar metal and nutrient levels were observed between the four species, indicating a different demand and uptake of specific elements. The results were compared to published data on nutrient concentrations in the tested species and the so-called reference plant. The data can be used as a baseline for future studies in plant nutrition and the environmental monitoring in inner tropical regions where these crops are grown.

Keywords

Air pollution Biomonitoring Cassava Cocoyam Geochemistry Plantain

Acknowledgements