

Trace elements and lead isotopes in lichen transplants, mosses and soils close to a coal-fired power station in Guangzhou, Southern China

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Lichen transplantation and moss have been used as a proxy for assessing air quality in industrial areas. Trace metals (As, Cd, Cr, Cu, Ni, Pb and Zn) and Pb isotopic compositions were measured in *Parmotrema tinctorum* lichen, *Fissidens ceylonensis* moss and soil samples collected from two sampling sites in 2018 close to a coal-fired power station in Guangzhou, southern China.

1. The concentrations of trace elements in moss samples are varied: As 1.8-9.9 mg/kg, Cd 0.22-0.59 mg/kg, Cr 3.5-16 mg/kg, Cu 24-53 mg/kg, Ni 4.9-9.7 mg/kg, Pb 37-167 mg/kg and Zn 109-223 mg/kg.
2. The geometric concentrations of trace elements in soils are 7.4 mg/kg for As, 0.03 mg/kg for Cd, 16 mg/kg for Cu, 18 mg/kg for Ni, 8.6 mg/kg for Pb and 76 mg/kg for Zn.
3. Lichen samples were transplanted from a national forest park to a polluted area for three months. Lead concentrations of the lichen transplants were higher than that collected from the background site, suggesting a continuous accumulation of atmospheric Pb.
4. *Fissidens ceylonensis* mosses and *Parmotrema tinctorum* lichens from the sampling sites have ²⁰⁶Pb/²⁰⁷Pb and ²⁰⁸Pb/²⁰⁷Pb isotope ratios of 1.171-1.212 and 2.423-2.490, respectively.
5. Lead isotopic compositions of transplanted lichens and moss demonstrated that geogenic inputs from the local rock and anthropogenic inputs from coal burning were the main source of contamination.