

## Atmospheric heavy metal deposition reconstructed using archived moss in Guangzhou city, Southern China

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Atmospheric heavy metal pollution have a serious impact on environmental and human health in urban areas. Heavy metals (As, Cd, Cu, Pb and Zn) and Pb isotopic compositions were determined in historical and contemporary moss (*Barbula*, *Bryum*, *Campylopus*, *Claopodium*, *Ditrichaceae*, *Fissidens*, *Haplocladium*, *Holomitrium*, *Leucobryum*, *Marchantia*, *Mnium*, *Ptychomitrium*, *Syrrhopodon*, *Taxiphyllum*, *Trematodon*) samples from Guangzhou city (Guangdong Province, China) collected between 1932 and 2018.

1. The heavy metal concentrations of the archived moss samples are varied: As 0.2-108 mg/kg; Cd 0.08-3.19 mg/kg; Cu: 4.3-94 mg/kg; Pb 4.2-594 mg/kg; Zn 23-1220 mg/kg.
2. In the 1930s, the geomean moss Pb concentration is 11.0 mg/kg. Marked Pb concentration (28.0 mg/kg) are observed during the period 1957-1964 following the establishment of the People's Republic of China in 1949. During the period of leaded petrol use from 1970s to 1980s, the moss Pb concentration rose to 38.2 mg/kg. Although the phase-out of leaded petrol started in 1991 in China and the sales and uses of leaded petrol were banned in Guangzhou in 1997, the moss Pb concentration continued to increase.
3. Lead isotopic composition data indicate that geogenic inputs, *inter alia* anthropogenic inputs, such as leaded petrol emissions and industrial activities, are important sources of atmospheric heavy metal depositions in Guangzhou city.