

ATMOSPHERIC Pb ISOTOPE EVOLUTION IN BRAZIL

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The isotope evolution of atmospheric Pb in Brazil is still poorly understood. Two relevant studies developed over the last 10 years can be mentioned and may provide preliminary insights into the subject. They are related to sediment cores that record at least 6000 yr of Pb depositional history in the Lagoa Feia lake, Goiás, and present-day samples of aerosols from São Paulo city. The Lagoa Feia sediments reveal a positive correlation between the palynological study and the Pb isotopic composition of the sediments indicating that the carbon-rich layers have a more radiogenic Pb composition, with $^{206}\text{Pb}/^{207}\text{Pb}$ between 1.195 and 1.220. This interval represents the pre-anthropogenic period in Brazil (> 2529 yr. BP) during a dry period, which occurred in a large area in Central Brazil. After the climate change and the start of human activity in this area, at 2,222 yr BP, Pb isotope signatures became less radiogenic, with $^{206}\text{Pb}/^{207}\text{Pb}$ ranging from 1.170 to 1.204. Nowadays, the intensification of human activity in Brazil is best observed in São Paulo, where air quality can be so bad that is responsible for human health problems. Pb isotope signature is more varied now than in the past. Aerosols, collected during the summer of 2006, displayed $^{206}\text{Pb}/^{207}\text{Pb}$ isotopic ratios ranging between 1.1491 and 1.2527, and sources varied between 1.054 and 1.340. Pb concentrations in aerosols of São Paulo can be higher than the limit established by CETESB, especially during unfavorable meteorological conditions to pollutant dispersion. The history of atmospheric Pb emission in Brazil is related to past climate changes and periods of anthropic activity, recorded in Lagoa Feia sediments, and is now characterized by urban pollution like that observed in São Paulo city, which has a very complex system of pollutant sources, and more significant atmospheric Pb emissions.