



PALEOFIRES IN SOUTH BRAZILIAN AMAZONIA

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Fire is a critical earth-system process that has broad consequences for vegetation dynamics, biogeochemical cycling, and atmospheric chemistry. Variations in fire activity were an important trigger of past biotic reorganizations, and they are implicated as a primary agent of ecosystem change in the future. On century and millennial time scales, changes in fire activity are linked to changes in atmospheric and ocean circulation that affect regional vegetation patterns and fuel conditions. On longer time scales ($>10^3$ yr), fire occurrence is often related to variations in effective moisture arising from changes in the seasonal cycle of insolation, atmospheric composition, and land-ocean interactions. Past, present, and future human activities also affect fire-climate-vegetation linkages at all spatial scales.

The hypotheses to be tested in this work are:

- The middle Holocenic dry phase extended to south Amazon;
- There is a connection between this dry phase and the Taylor Dome record (this will be done with the comparison of all other studies that were done in Amazonia).

This study was carried out between Alta Floresta city, in the Northern portion of the Mato Grosso state (MT) and São Benedito region, located on the South portion of Pará state in an area of the Central Crystalline Plateau covered by Dense Tropical Forest. This region has a climate type Am according to Köppen's classification, humid with a very intense dry season, between June to August with 1700 mm of annual precipitation.

The results for water content, density, granulometry and Hg concentrations allow some observations and suppositions about the sedimentation environment and climate conditions of the lake where the samples were collected.

The base of the sediments in Saci lake has been dated at 28260 ± 270 ^{14}C yrs BP. For the core sampled at the margin of the lake (9.118214°S , 56.265373°W), distinct sections could be identified. They consist of an upper organic-rich layer almost homogenous from the top of the core to 200 cm, with the water content about 75% and the density between 0.2 and 0.3 g/cm^3 . The granulometry is basically silt and clay, with an input of coarse sediments between 180 and 200cm. The Hg concentrations varied between 130 and 170 ppb, with a peak of 260 ppb between 50 and 65cm. Other phase is showed between 200 and 250cm, with highest values of density (near $1\text{g}/\text{cm}^3$) and lowest values of water content (below 50%). This phase showed a great input of sand and coarse sediments and the highest values of Hg concentrations of the entire core (about 280 ppb). The relationship of Hg and sand input suggests that it was a dry phase with episodic intense rains that caused erosion in the lake basin, and biomass burning attested by high charcoal concentration in these section. From 250 cm to the base of the core, the density values became highest (from 0.5 to 1.5 g/cm^3) and the water content (60 to 25%) and Hg concentrations (280 to 80 ppb) decreased.