

Variation of hydrological cycle in South Brazil observed by n-alkane distribution in peatbogs

SANDRO FROEHNER*¹, PAOLA HUNGERBUHLER¹,
JUAN SANEZ¹, JULIANE RIZZI¹, IRANI DOS
SANTOS²

¹Department of Environmental Engineering, Federal University of Parana, Curitiba-PR, 81531-980, Brazil

²Department of Geography, Federal University of Parana, Curitiba-PR, 81531-980, Brazil

sandro.froehner@gmail.com

Climate change has caused variations in the hydrological cycle of Earth through its history. Paleoclimatology aims to study these climatic variations, providing record of Earth's past without human intervention. Those studies are considered extremely important for the current climate modeling. Peat bogs are considered ideal environments for evaluating the records of hydrological variations; their formation is associated with the topography and the local hydrological regime [1]. n-Alkanes compounds with different chain lengths are deposited by the decay of specific types of plants growing in these regions. Humid environments with terrestrial plants tend to have predominance of C₂₉ n-alkanes and, in some cases, Sphagnum mosses are characterized by C₂₃, C₂₅ and C₃₁. In dry locations, C₃₁ are the dominant among n-alkanes. A core of peatbog sample, constituted mostly by modern Sphagnum moss species, was collected in Southern Brazil. The n-alkanes distribution from total lipid extracts analyzed by gas chromatography/mass spectrometry was determined. The study showed changes in the predominant n-alkanes (C₂₃, C₂₅ and C₃₁) and, consequently, changes in vegetation due hydrological variations. Wet and dry periods were confirmed by traditional ratios such as n-alkane index (C₃₁/C₂₉ + C₃₁), C₂₃/C₂₉ and C₂₃/C₃₁. The proxies that have been applied showed similar patterns. According to the ratios, it was identified the prevalence of wet weather periods in the region with short dry ones - including the most recent period of deposition (Figure 1).

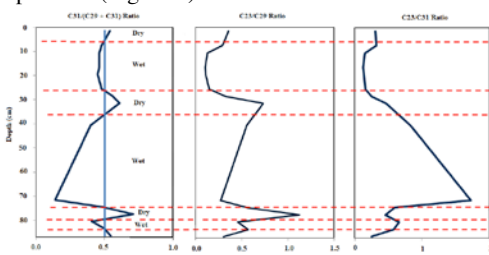


Figure 1. Traditional ratios among n-alkanes associated with wet and dry periods in the investigated area in South Brazil.

Reference: [1] Nichols et al. (2006), *Organic Geochemistry* 37, 1505-1513.