The history of terrigenous and marine biomarker lipids in Southeastern Brazilian continental slope in the last 50000 years

Leticia G. Luz[1,*], Renato S. Carreira[1], Timothy I. Eglinton[2]

**leticiagluz@gmail.com*

[1]LabMAM/Departamento de Química, Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brasil

[2]Department of Earth Science, Geological Institute, ETH Zürich, Zürich, Switzerland

Abstract: To better understand the carbon cycles and biogeochemical process in the ocean is important to study organic tracers preserved in the underlying sediments. Lipid markers (including *n*-alkanes, sterols, and alkenones) in sediments from 2 cores cross slope (water depth: 328 m and 1598 m, stations 1501 and 1502 respectively, n = 139) from Santos Basin, SE Brazilian continental slope were analysed. In this study, the sampled interval of core 1501 covered the period between 42.4 and 1.7 ka cal BP and 1502 covered the period 50.0 to 7.0 ka cal BP. The abundance of *n*-alkanes, sterols, and alkenones normalized to total organic carbon (TOC) fluctuated within 1 to 2 orders of magnitude with age. The long-chain *n*-alkanes compositions are prevailed by the C_{29} homologue over the time in the 1501 and 1502 stations. The stations exhibit long-chain *n*-alkanes values (ΣnC_{25}-nC_{33}) with an increase from Late MIS3 to LGM and Early HS1, and a decreasing to Holocene (327.7 to 13.7µg $gTOC^{-1}$ for core 1501 and 409.5 to 26.8 µg $gTOC^{-1}$ for core 1502). The data indicate that the glacial and LGM sediments are enriched with amounts of terrigenous carbon on the MIS3 and MIS2 relative to MIS1 results. The $CPI_{25\text{-}33}$ in the sediments appear to have a homogeneous evolution along the entire core in lower slope. The location closer to the continent suffered a decrease (> 4 to < 2) over Holocene, an indicator of the least predominance of the vegetation-derived *n*-alkanes as compared with other periods. Four different biomarkers were chosen to describe temporal variability in marine inputs (haptophyte algae from alkenones, diatoms from diatomesterol, dinoflagellates from dinosterol and zooplankton from cholesterol). After the glacial time, a diatom and dinoflagellate fraction (colder water algae) was probably replaced by coccolithophorids in shallower slope, which the relative abundance of alkenones varied from 71% to 77% of marine lipids chosen, between MIS2 and Holocene. In the sediments, the proportion of sterols is greater around twice in 1502 when compared 1501. The labile lipids in high amount in the deeper station imply that the presence of organic matter has a potential for supplying the food requirements of both benthic communities and pelagic heterotrophic organisms. This investigation exhibited that biomarkers in the slope sediments had reconstructed biogeochemical processes, which may be notably affected by variations in the water exchange processes such sea level changes and transport of terrigenous matter, mainly in the upper slope, and surface oceanographic dynamic variability.