

Total Organic Carbon Fluxes During the Last 30,000 Years in the Southern Hemisphere. Palaeoclimatic Implications

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We made a comparison between total organic carbon fluxes in sediment cores recovered from three sites: two in South America, Carajas (Eastern Amazonian, Brasil), Siberia (altitude cloud forest, Bolivia) and Tritrivakely lake, situated on a high plateau in Madagascar (Africa). The total organic carbon flux variation in these records shows a decrease before the last glacial maximum (LGM), at the same time (30,000 years BP), in all regions. During the LGM, fluxes of total organic carbon are characterized by very low values in Siberia and Tritrivakely while during this period Carajas record is marked by a hiatus. These results show that all three records are controlled by global climate changes. At 14 kyrs BP, the sediments from the three sites are characterized, at the same time, by an increase of total organic carbon fluxes. This event is almost synchronous with the last deglaciation at approximately 15 kyrs BP.

During the Holocene, total organic carbon flux is marked by different behaviors in the three sites. In Carajas it is maximum between 7 and 4 kyr characterized by the presence of carbonized wood debris, showing the existence of frequent fires. Maximum carbon accumulation in Siberia site at the beginning of Holocene corresponds to development of the peat. Maximum, in Tritrivakely lake, at the middle Holocene, is marked by the establishment of the peat-bog which progressively turns into lacustrine sedimentation and then turns back to the recent peat-bog. These Holocene differences between these records are result of regional climate variations.