HYDROLOGICAL CHANGES IN THE EASTERN AMAZON DURING THE LATE HOLOCENE

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RESUMO: Investigations regarding the effects of past precipitation changes in the Amazon Basin have gained attention as the Amazon ecosystem is transformed by human action at unprecedented rates. Even so, because of the lack of suitable records, few studies provide information about possible changes in water discharge of the Amazon River and its tributaries during the Holocene. Currently, diachronous water level oscillations between the Xingu and the Amazon Rivers promote baroclinic and barotropic flows that carry water and sediments of the Amazon River into the broad, drowned incised valley of the lower Xingu River (Xingu Ria). Since the sediment load of the Xingu River is markedly different from Andean-draining tributaries, variations in the relative water and sediment discharge of the Amazon and Xingu Rivers can be geochemically traced. Thus, we analyzed grain size, major elements distribution, and plant wax isotope records of a sediment core (XC-03, ca. 4,000 to 300 cal yr) collected at the lowermost section of the Xingu Ria to characterize hydrological variations in the Amazon Basin during the Late Holocene. In parallel, we collected a sediment core from a fluvial island in the Xingu River for comparison (XC-01-2, ca. 2,800 to 400 cal yr). Compound-specific plant wax isotope records suggest a subtle decrease in rainfall in the Amazon lowlands throughout the studied period. In addition, we found a marked reduction in the input of coarse and potassium-rich Amazon River sediments to the studied site from about 2,600 to 1,400 cal yr BP. A synchronous shift is observed in the sedimentary record of XC-01-2. We interpret the observed anomalies as being linked to a decrease in the relative water discharge of the Amazon Rivers. This was possibly caused by a decline in the extratropical temperatures of the Southern Hemisphere, which would weaken the South American Summer Monsoon and lead to decreased precipitation in the western Amazon lowlands. Our study shed new light on how abrupt shifts in Eastern Amazon precipitation could affect river and sediment dynamics in the studied area. Additionally, it may contribute to the current discussions regarding the link between multi-centennial climatic events, technological changes, and the regional increase in socio-political complexity in Amazonian populations during the Late Holocene.

PALAVRAS-CHAVE: PALEOCLIMATE, AMAZON, GEOCHEMISTRY

ISBN | 978-65-992688-3-0