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Aquatic ecosystems in Miocene western Amazonia – marine ingressions vs. salt leaching

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Before the onset of the modern Amazon river system, north-western South America was shaped by an extensive wetland during the Miocene. This 'Pebas mega-wetland' kept a well renowned endemic mollusk and ostracod fauna, which initiated a persisting debate about marine ingressions reaching the center of Amazonia at that time. Due to high endemism, uniformitarian principles are hardly applicable to this biota but also other paleontological, sedimentological and geochemical information led to ambiguous paleoenvironmental interpretations. These results are based on ostracod and foraminiferal assemblages and the oxygen and carbon stable isotopy of their biogenic calcite from an outcrop at the cutbank of the Amazon river (NE-Peru, ~55 km S of Iquitos). While ostracods (e.g., *Cyprideis*) are able to calcify their carapaces along the entire salinity range, at least low saline conditions are a prerequisite for the biomineralization of calcareous foraminiferan tests. Hence, the finding of calcareous foraminifers (*Ammonia*, *Elphidium*), associated mainly with brackish water ostracods, indicates the presence of saline waters. In contrast, δ^{18}O- and δ^{13}C-analyses performed on co-occurring ostracod valves and foraminiferan tests yielded constantly very light ratios. Such values refer to a pure freshwater environment and are incompatible with the interference of isotopically heavier, marine waters or an evaporative stable isotope enrichment. Based on these opposing data, we hypothesize that the Pebas mega-wetland was episodically influenced by mineralized but isotopically light groundwater discharge. Possibly, the resulting specific hydrochemistry contributed not only to the evolution of the endemic Pebasian fauna but also facilitated the sporadic settlement of euryhaline foraminifers, which mimics short-lived marine incursions.