

THE SIGNIFICANCE OF THE PURUS ARCH, WESTERN PART OF THE AMAZON BASIN, FOR THE ORIGIN OF THE AMAZON RIVER

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RESUMO: The landscape evolution of Amazonia during the Neogene was influenced mainly by Andean tectonics and climate changes that controlled the distribution of sedimentary environments and consequently the fauna and flora were confined in specific environments by several geographic barriers. The most important natural barrier was probably the Purus Arch, a NW-SE trending tectonic structure that separates the Solimões and Amazonas basins located 300 km west of Manaus. This feature was a Neoproterozoic basin filled by sandstones, mudstones and carbonates and tectonically inverted during EoPaleozoic times. Evidences of inversion refer to inclination of Purus Group beds up to 10 degrees towards south, as well the onlap and pinch out disposition of Paleozoic units on the Purus Arch. Additionally, the thickness of Phanerozoic rocks was dramatically reduced in the region of the arch suggesting an uplifted block. These aspects indicate that the Purus Arch was also a compartmental zone during the Cenozoic evolution of the Solimões and Amazonas basins, controlling in part, the lateral migration of the depositional system. While wetlands with swamps, lakes and deltas dominate the Solimões basin, to the east of Purus Arch a fluvial system develops in the Amazonas basin with limited accommodation space and emergence indicated by Neomiocene lateritic profiles sandwiched by deposits of the same age. A pronounced erosion surface between Solimões and Içá Formations, near the Purus Arch region confirms an important uplift after Neomiocene. Reworked Neodevonian palynomorphs (fossil pollen and acritarchs) occur in all sedimentary facies of the Upper Solimões Formation and reaches up to 30% of palynomorph content. Reworked palynomorphs in Miocene beds of Amazonia have been interpreted as been provided from the Andes; however, the excellent preservation of these palynomorphs in the Solimões strata in the homonymous basin suggests proximity of a source area not related to the Andean ridge, hundreds of kilometers distant from Central Amazonia. We suggest that the most probable source-area is the region of the Purus Arch in the northwestern portion of the

Amazonas basin. In this region the exposed rocks are Paleozoic and not younger than Early Devonian (Lochkovian). Evidences for tectonic activity of the Purus Arch are indicated by Cenozoic deformation of the Cretaceous Alter do Chão Formation. This unit is exposed only in the Amazonas basin while in the Solimões basin it is found 500 m below the Solimões Formation. Neogene lateritic-bauxite profiles developed in the Cretaceous and Neogene rocks occurs only in the Amazonas basin, indicating that this basin was recurrently exposed while the Solimões basin was predominantly subsiding. Provenance studies based in detrital zircon geochronology indicate Andean sources for Miocene deposits exposed in the west of the Purus Arch. The deposits of same age in the Amazonas basin had local source areas, suggesting that the Purus Arch was probably an important geographic barrier during Pliocene. These data provide important implications for the establishment of a transcontinental drainage that probably occurred during Neopliocene to Early Pleistocene.

PALAVRAS CHAVE: CENOZOIC, PURUS ARCH, AMAZON RIVER