New constraints on the Cenozoic historyof the Guyana-Suriname Basin: implications for the arrival of the North Brazilian Current in the Guyana-Suriname equatorial margin

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Résumé

The "Guyanas Equatorial Margin" is one of the most active spot of hydrocarbon exploration since the last 10 years . Most of the recent studies have been focused on the late Cretaceous stratigraphic sedimentary record , but little is known about the Cenozoic infilling of this basin. Here, we provide new preliminary palynological and provenance data on the Cenozoic sedimentary record of the Powesi well. Preliminary geochemical results of 20 sedimentary rocks indicate that the analyzed Cenozoic Powesi samples are characterized by enrichment in Ba and Co against the Post Archean Australian Shales (PAAS). Rare earth elements (REE) patterns of the Powesi samples show variation in concentrations due to variation in grain size but overall flat patterns with slight positive Eu anomalies. These indicate that the REE concentrations are controlled by terrestrial input from a source slightly less differentiated than the Upper Continental Crust. Absence of REE input by authigenesis is also confirmed by the Middle REE and High REE patterns where all the analyzed shales have continental, terrestrial characteristics . Hence, the REE and Sm-Nd isotopic compositions can be used as provenance proxies. Sample between 700 and 240 m have Nd(0) values ranging from -20.1 to -24.9, which are similar to those the Suspended Particular Matter (SPM) of

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the Maroni River indicating sources located in the Paleoproterozoic terranes of the adjacent Guyana craton. An increase of +8 Nd unit from -22.3 to -13.5 is noted which we interpreted to reflect a shift in provenance from Maroni like provenance to a mix between Amazon and Maroni provenances. Finally, at depth 140-150m, the Powesi well is characterized by a fully Amazon provenance with Nd(0) value of -10.3. The latter suggest that the effect of north Brazilian current capable of transporting sediments from the Amazon along the Guyana-Suriname coast is recorded between 250 and 200 m depth in the Powesi well. This interval is provisionally dated as Plio-Pleistocene. Further studies of deep-sea wells in the Guyana Basin should confirm if indeed the onset of Amazon River influence in the Guyana coastal basin is as recent as Pliocene, or perhaps older.

Mots-Clés: Guyana, Suriname Basin, Palynology, Provenance, Sm, Nd isotopes, Brazilian coast current