
Tectonostratigraphic latitudinal evolution of the eastern Red Sea rifted margin

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Résumé

Since the 1960s, two end-member tectonic models have been debated about the nature of the crust below the Red Sea. The "mainly rift" model specifies that thinned continental crust prevails throughout the Red Sea except for young oceanic crust (< 5 Ma) within a narrow central trough in the south. The "mainly ocean" model suggests oceanic spreading has occurred throughout the Red Sea since the Middle Miocene.

To address these scenarios, this study presents a new tectonostratigraphic model along the eastern necking domain of the Red Sea based on the interpretation of well-calibrated industrial seismic data and a review of onshore geology.

We characterize for the first time the eastern Red Sea necking domain through its north-south structural and stratigraphic evolution. 1) Along-strike segmentation occurs during rifting (~ 28 -16 Ma), with tilted blocks filled by siliciclastic sediments structuring the northern poor-magmatic segment (28N-21.5N), while clastic/volcanoclastic sediments and volcanic flows interpreted as SDRs characterize the southern magmatic segment (21.5N-13N). 2) It evolves in a passive margin-type basin controlled by thermal subsidence since Middle Miocene (~ 14 Ma), suggesting the Red Sea is mainly floored by oceanic crust. This work provides new insights to understand the Red Sea geology and the tectonostratigraphic evolution of rifted margins in magma-poor and magma-rich settings.

Mots-Clés: Red Sea, Segmentation, Tectonostratigraphy

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