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CONFINED OROGEN: THE CONCEPT, A PRECAMBRIAN EXAMPLE AND TECTONIC IMPLICATIONS

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Abstract

Orogeny, as a result of plate convergence, implies in interactions between plate margins. However, mountain building can also take place in intraplate domains. Inversion of aulacogens induced by orogeny occurring in plate margins illustrates such intracontinental orogenic domains. In fact, orogens developed on plate margins and inverted aulacogens are end-members of a whole series of possible orogenic settings. We describe here an intermediate member of this series, which might be of major geotectonic significance: the confined orogen. Confined orogens consist of two distinct longitudinal segments: an ensialic, representing an aborted rift, and a segment with oceanic slivers and magmatic arc, which record oceanic spreading and consumption. Inland-sea basins (i.e., largely encircled by continental crust), partly floored by oceanic crust, are candidates to become confined orogens. A Precambrian example is given by the Araçuaí-West Congo Orogen (Pedrosa-Soares et al. and Tack et al., *Prec. Res.* v. 110). All recent paleogeographic reconstructions show that the São Francisco (Brazil) and Congo (Africa) cratons constituted a single continental piece from the Paleoproterozoic up to the Lower Cretaceous. Yet, during the Neoproterozoic, the Araçuaí-West Congo Orogen developed between the southern lobe of the São Francisco Craton and its African counterpart. Ophiolite slivers occur in the southern Araçuaí Belt (Brazil), whereas the northern sector as well as the West Congo Belt remained ensialic. This implies that a precursor, gulf-like, inland-sea basin partly floored by oceanic lithosphere was carved into the São Francisco-Congo Palecontinent. The main evolution stages of the Araçuaí-West Congo Orogen are: i) ca. 1000-875 Ma, early dikes and bimodal magmatism related to asymmetric rifting with thermal axis in the West Congo Belt; ii) < 900 Ma, glaciation-related sedimentation; iii) ca. 816 Ma, ophiolite slivers of the Araçuaí Belt; iv) ca. 630-585 Ma, development of a precollisional magmatic arc totally located in the Araçuaí Belt; v) ca. 585-565 Ma, syncollisional stage and widespread S-type granite generation; vi) ca. 565-535 Ma, late collisional magmatism and sedimentation; v) ca. 520-490 Ma, extensional collapse of the orogen accompanied by I and S type plutonism. The main tectonic implications concern the closing mechanism: external induction could be required as the cratons remained linked and the oceanic lithosphere could be small to undergo subduction.

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