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ABSTRACTS
BOOK

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Tectonic evolution of the Dom Feliciano belt and its role during Central Gondwana formation

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Few records of the Neoproterozoic Adamastor Ocean that existed between the major cratons of SW Africa and southeastern South America can be found on either side of the Atlantic Ocean, where a diachronous history of at least 300 Ma can be characterized. Its closure led to the establishment of the major supracrustal belts of Central Gondwana. The events that led to the opening of the Adamastor Ocean began in the Tonian, around 950–850 Ma, with the fragmentation of pre-existing continental masses. Between 780 and 640 Ma rifting, deposition of siliciclastic successions and intrusion of various granitoids occurred. The completion of the volcano-sedimentary paleobasins related to Adamastor seems to have been achieved by ~ 600 Ma.

In the Dom Feliciano belt the consumption of the Adamastor Ocean can be characterized by the development of a long granitoid belt with magmatic-arc signatures (Florianópolis, Pelotas, and Aiguá batholiths). Despite the large area occupied by these granitoids, most of the U-Pb zircon ages are between 640 and 595 Ma, with the vast majority in the narrow interval of 610 to 600 Ma. On the African side there is no evidence of corresponding Neoproterozoic magmatic arcs, with the exception of the westernmost domain of the Kaoko Belt (granitic rocks of the Skeleton Coast) whose ages and geochemical characteristics suggest an affinity to the Florianópolis-Pelotas-Aiguá magmatic arc. In all these arcs the isotopic and geochemical signatures and negative ϵNd values indicate the involvement of continental crust in their generation.

The supracrustal rocks of the Dom Feliciano belt exhibit a low to medium metamorphic overprint controlled by temperature variations. Ages of volcanic rocks intercalated in the metasedimentary piles and intrusive post-tectonic granitoids constrain the main collisional phase of Dom Feliciano belt between 640 and 600 Ma.

In concordance with what is observed on the South American side, the Neoproterozoic belts of southwestern Africa present the same structural and temporal evolution. Detrital zircon ages of around 550 Ma indicate that deposition of western units of the Saldania, Gariep and Kaoko belts took place after the collisional phase observed in the belts of SE Brazil. Thus, it is suggested that in the SW African belts there are metamorphic units that reflect Ediacaran/Early Cambrian basin fills not associated with the Adamastor Ocean, as this ocean had already closed at that time. It is proposed that these younger units were deposited in an epicontinental sea developed at the eastern border of the Florianópolis-Pelotas-Aiguá magmatic arc, spatially superimposed on older basin fills, making it difficult to distinguish between the metamorphic products of these two episodes.

The detrital zircon age signature typical of the Kalahari Craton (0.9–1.2 Ga) is also a striking feature in the metasedimentary cover of the Florianópolis-Pelotas-Aiguá batholiths. This provides further evidence of a genetic relationship with the Neoproterozoic supracrustal belts in southwest Africa and of juxtaposition of the various segments of the Dom Feliciano belt and its African counterparts only during the closure of the Adamastor Ocean.