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# From rifting to orogenesis – insights from the Brusque Metamorphic Complex of the Dom Feliciano Belt, Brazil

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The Neoproterozoic Kaoko–Dom Feliciano–Gariep orogenic system outcrops along the south Atlantic coastlines of South America and Africa. The Brusque Metamorphic Complex (BMC) forms the northern part of an extensive schist belt in the Dom Feliciano Belt in Brazil and comprises metamorphosed volcano-sedimentary rocks intruded by Neoproterozoic granitoid plutons. Detrital zircon age spectra from clastic metasedimentary rocks show several peaks between 1.0 and 2.2 Ga, fitting with erosion of Congo and Nico Perez–Luis Alvez cratonic basement and inferred Mesoproterozoic cover sequences. The maximum age of deposition of the BMC protolith is constrained at ca. 1.0 Ga by detrital zircon records, and the minimum age at 811 $\pm$ 3 Ma by the age of a deformed felsic dyke. Two metasedimentary samples in the northeast BMC yielded detrital zircon age spectra containing late Cryogenian ages, which are akin to signatures found in the weakly deformed post-orogenic Itajaí Basin molasse sediments to the north, and constrain a maximum deposition age at ca. 565 Ma.

Inversion of the rift basin and thickening of BMC protolith began with NW-directed thrusting and the development of a flat-lying metamorphic foliation and overprinting intrafolial folding as the result of progressive heterogeneous strain accumulation. Peak metamorphic conditions reached greenschist- to lower amphibolite-facies, with a minimum age of ca. 630 Ma constrained by intrusive syn-tectonic granitoids. Subsequently, the strain partitioned into sub-vertical, NE striking strike slip-dominated shear zones, and pure shear-dominated domains in which tight to open folds and axial-planar cleavage developed. Late folding also affected the young Itajai Basin sediments.

The detrital zircon record in early Neoproterozoic rocks of the BMC correlates well with that from an African counterpart in the Kaoko Belt, suggesting that the two units belong to a single paleo-rift basin. Similarly, inferred timing of deposition of the BMC metasedimentary protolith fits with the age of syn-sedimentary volcanism and associated magmatic activity in the high-grade Coastal–Punta del Este Terrane in the centre of the Kaoko–Dom Feliciano–Gariep orogenic system. We argue that the peak metamorphic assemblage and associated fabric in the BMC metasedimentary rocks likely formed due to thrusting of the rift centre (high-grade Coastal–Punta del Este Terrane) over the sedimentary cover of the paleo-rift edge during the early stages of inversion. Although no direct evidence of the thrust sheet remains in the BMC, similar structures can be found in the Encruzilhada Block (Rio Grande do Sul, Brazil) and Punta del Este Terrane (Uruguay) further south in the Dom Feliciano Belt where the overriding high-grade units are still preserved. The switch to transcurrent movement along major shear zones likely occurred by ca. 600 Ma, as constrained by syn-tectonic granitoids preserving shear-fabrics in the magmatic-state. Prolonged sub-horizontal shortening led to localised thrusting of the BMC over the Itajaí Basin molasse sedimentary rocks, and their subsequent metamorphism and folding.

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