

Suturing Gondwana in the Cambrian – the orogenic events of the final amalgamation

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Abstract

Gondwana was consolidated in the late Cambrian after 180 m.y of tectonic convergence among Neoproterozoic paleocontinents and smaller fragments. We present a compilation of 55 orogens that record its final amalgamation. Collisional events are registered by the metamorphic peak assemblages and contractional deformational structures. Two main periods of orogenic activity are recognized. The first at ca. 670-575 Ma includes few orogens (ca. 15) but over larger areas. During this stage, the Saharan, West African, São Francisco-Congo and Paranapanema paleocontinents, along with the Arabian Nubian shield that consisted of juvenile Tonian terranes and some East African Orogen microcontinents were accreted to form the proto-Gondwana core. The second stage, at 575-480 Ma, incorporated more orogens, ca. 40, that sutured the Amazonia, Rio de La Plata, Kalahari, Dhawar, East Antarctica and Australian paleocontinents. The collisional orogens pattern throughout both western and eastern Gondwana is similar, indicating that although Gondwana was built up by the convergence of distinct paleocontinents, their approximation might be orchestrated by global geodynamics. In SW Gondwana, opening of ca. 610-570 Ma basins, some with oceanic crust, coincides with the suturing of the proto-Gondwana core. They were rapidly formed but even faster inverted during the second and last 575-480 Ma collisional stage, represented by the major E-W Kuunga and N-S South Atlantic belts. We propose that the 570-500 Ma collision of the Damara-Lufilian-Zambesi belt was coeval with the Cuchilla Dionisio-Saldania-Gariép- Dom Feliciano-Kaoko- Ribeira-Cabo Frio orogens. This South Atlantic orogenic system consists of the main SW Gondwana suture, reactivated 350 m.y. later to form the South Atlantic Ocean. The suture is preserved by old orogenic high pressure and oceanic derived rocks on the actual conjugate continental margins.

Keywords: *Gondwana, Ediacaran-Cambrian tectonics, sutures, South Atlantic orogenic system*
