



The Cimmerian accretion of SE Pamir and its relationships with the surrounding Cimmerian blocks

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Here we show that the sedimentary succession of SE Pamir comprises a syn-rift succession (Bazar Dara Group) in the Carboniferous-Early Permian, followed by a marked deepening from the late Early Permian, with increasing volcanic activity and synsedimentary tectonics in the Gan and Takhtabulak formations, related to the opening of the Rushan ocean between South and Central Pamir; carbonate deposition characterizes most of the Triassic, but then Upper Triassic flysches record the progressive closure of the Rushan ocean. We also show that this Permian-Triassic stratigraphic and biotic evolution broadly matches that of Karakoram. We consider these blocks plus Central Pamir equivalent to the Qiantang Terrane of Tibet, all of Palaeozoic Gondwanan ancestry, which detached from Gondwana in the Early Permian to form the Cimmerian belt.

This was dissected into distinct terranes separated by deep extensional basins (i.e. the Rushan basin between SE Pamir and Central Pamir, the Wakhan basin between SE Pamir and Karakoram; the Shuanghu basin in Qiangtang). The northward drift of this composite belt from the Gondwanan margin since the late Early Permian onward is well supported by statistical palaeobiogeographical se analyses which show that the biotic affinity of its blocks shifted from Gondwanan in the Asselian-Sakmarian (Early Permian) to Palaeoequatorial in the Roadian-Wordian (Middle Permian).

We also show the occurrence of lowermost Jurassic deposits suturing intensively faulted and folded Permian and Triassic units, which record a marked Cimmerian unconformity, suggesting that South Pamir collided against Central Pamir along the Rushan-Pshart suture at the T-J boundary. The closure of the Rushan ocean was at least in part coeval to the closure of the Palaeotethys, which caused the collision of Central Pamir against North Pamir, at that time located at the southern Eurasian margin. Collision of Karakoram to South Pamir happened slightly later along the TBZ zone.

Progressive time shifting of deformation can thus be related to the complex setting of the Cimmerian belt, which was subdivided into minor blocks by incipient oceanic basins, providing strong crustal mobility.