

The Bashgumbaz “ophiolites” of SE Pamir (Tajikistan): time constraints for the South Pamir accretion to Eurasia

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The Pamir belts, located NW of the Himalaya, formed in response to the Cenozoic collision and indentation of India with Eurasia. Several crustal blocks separated by complex and scarcely studied suture zones form the present day tectonic architecture of the Pamirs. The extreme crustal shortening resulted in strong deformation and bending of pre-existing Paleozoic to Mesozoic orogens. Such deformation hinders straightforward correlations between tectonic terranes of the Himalaya-Tibetan area with their potential continuations through the Pamirs into Afghanistan and Iran.

Central and SE Pamir, together with Karakoram and Qiangtang blocks separated from the Gondwana margin in the Early Permian, drifted northward, following the closure of the Paleotethys and other minor oceanic branches, and diachronously collided with Northern Pamir and Tian Shan. The Central and South Pamir are now separated by the poorly known Rushan-Pshart Suture Zone.

South Pamir is separated into two units: SE Pamir consists of a Permian to Cenozoic sedimentary succession; SW Pamir is instead made of gigantic basement domes that are in contact with the SE block along crustal scale detachments. In SE Pamir, intensively folded and faulted Permian and Triassic units are unconformably covered by lowermost Jurassic terrigenous deposits, testifying for Middle to Lower Triassic tectonics related to the Cimmerian orogenic events. Along the contact between the SE and SW Pamir, a small (a few tens of km² wide) magmatic-metasedimentary unit occurs, reported in literature as the Bashgumbaz ophiolites. They consist of a low-grade metamorphic association of serpentized harzburgites and gabbros, minor bodies of diorite and plagiogranite, basalts and intermediate volcanic rocks, metasediments, and a flyschoid unit containing olistolithic blocks with Triassic faunas attributed to Central Pamir block. Petrographic and geochemical data suggest a supra-subduction zone affinity for the gabbroic complex. U-Th-Pb dating of zircons from a diorite provides a Carnian crystallization age. Deformation and metamorphism (up to greenschist facies) that affected the Bashgumbaz complex should therefore been placed in the Late Triassic.

We suggest that the Bashgumbaz unit formed in a supra-subduction setting and was later underthrust and then obducted onto the southern margin of the closing Rushan-Pshart ocean. The obduction of the Bashgumbaz ophiolites could be considered as a time-marker for the accretion of the South Pamir terrane to the Eurasian margin.