Stratigraphy and geological age of the Shyok Formation in the Shyok Suture Zone, Ladakh Himalayas

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The Shyok Suture Zone of northwest India separates the Cretaceous Ladakh Arc to the south from the southern margin of the Asian continent (Karakorum block) to the north. The suture zone comprises the Late Cretaceous Khardung Volcanics and older Shyok Formation (Shyok Group, Shyok Volcanics). The definition of these two units has chenged with respect to each author(s). Dunlap and Wysoczanski (2002) restricted use of the term Khardung Volcanics to the felsic volcani-clastic rocks distributed around the type locality (Khardung) and dated it as Late Cretaceous-Paleogene based on the SHRIMP U-Pb ages (67.4 and 60.5 Ma). They regarded the remaining volcani-clastic rocks along the Shyok Suture Zone as the Shyok Formation, metamorphosed into the green schist facies prior to 124 Ma. It would appear, however, that the Shyok Formation of Dunlap and Wysoczanski (2002) comprises some rock units having different lithofacies and ages. They are as follows:

1) Metamorphic, clastic and igneous rocks with probable melange rocks distributed along the Nubra River and the Shypk River, except for its southern bank near Hundar. They roughly coincide with the Shyok Formation of Thakur et al. (1981) and the main part of the pre-120 Ma gree schist facies metamorphic rocks of Dunlap and Wysoczanski (2002).

2) Tuffaceous clastic rocks along the southern bank of the Shyok River near Hundar, and clastic rocks with limestone, alternating beds of siliceous tuff and tuffaceous mudstone, pyroclastic rocks and basalt distributed in the area northeast of Chang La Pass to the south of Tangtse. The limestone intercalated in the lower part lie to the east of Tsoltak, east of Chang La yields early to middle Albian foraminifers: Mesorbitolina minuta (Douglass), M. texana (Roemer), Simplorbitolina sp. (Matsumaru et al., 2006).

3) Mudstone dominated facies cropped out to the east of Tsoltak. Ehiro et al. (2007) separated this unit from the Shyok Formation as a new stratigraphic unit, the Tsoltak Formation. Callovian (late Middle Jurassic) ammonoids, Macrocephalites and Jeanneticeras, have been recovered from the lower part.