



The Paleotethys collision zone in north eastern Iran

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The Paleotethys suture zone between the Turan Plate and the Iranian block has been firstly recognized in north eastern Iran south of Mashad. Thin slices of meta-ultramafics associated with phyllites are known since long time in the Binalood and Virani region and have been interpreted as an accretionary wedge formed during the EoCimmerian tectonic event (Alavi, 1991). Aim of this work is to present a revision of similar units which are exposed east of Mashad close to the Afghan Border in the region extending between the Kopet Dag and the city of Torbat Jam. The whole collision zone is marked by a 100 kilometres wide belt which is unconformably covered by the flat-lying Middle Jurassic Kashaf Rud Formation which seals the accretion of the Iranian Plate to the southern margin of Eurasia. Field work has been performed in Summer 2005 in the frame of a PRIN Project (40% MIUR).

The northernmost tectonostratigraphic unit forms the Aghdarband erosional window which has been studied in detail by Ruttner (1991) and partially revised by Alavi et al. (1997). The window consists of a Permian to Middle Triassic continental to marine succession evolving from the Kara Gheitan Fm to the shallow water Sefid Kuh Limestone in turn covered by deep sea ammonoid rich Nazarkardeh Fm and by the Sina Fm. volcanics. The succession is covered at the top by the coal-bearing Mi-ankuhi Fm., Norian in age. The whole succession is strongly deformed and forms an E-W trending north-vergent imbricate thrust stack which is truncated to the north by an important Cimmerian left-lateral strike-slip fault. This fault which may represent the reactivation of the northern tectonic boundary of the Aghdarband Triassic basin which is bounded by a very low grade Paleozoic metasedimentary succession. “Schlingen”

folds formed along the fault are also sealed by the Kashaf Rud Fm. Subsequent right-lateral reactivation of the same fault system is probably related to the recent evolution of the Kopet Dagh intracontinental belt.

The southern part of the Aghdarband units is tectonically overthrust by a thick continental red conglomeratic succession including metamorphics, granitoids, gabbros to diorites, Permian limestones and especially volcanic arc lava flows. These conglomerates are in tectonic contact to the south with the Darreh Anjir Complex which consists of a very low to low grade succession of basic lava flows and lava breccias with limestones and radiolarian cherts which have been previously interpreted as an ophiolitic succession. The metavolcanics are overthrust to the NE by gabbros and related ultramafics consisting of cumulitic piroxenites.

A complex unit which might be the lateral equivalent of the Binalood Complex forms an elongated strip a few tens of kilometres large and about 80 km long which extends with an ESE-WNW trend from the town of Fariman to Torbat Jam. Several different subunits have been mapped by the Geological Survey of Iran, including a thick succession of well-preserved non-metamorphic pillow lavas with radiolarian cherts and slivers of Permian massive limestones, silicoclastic turbidites, meta-quartzites and ultramafics in a carbonatic matrix. Thin slices of greenschist metabasites have been also recognized within the complex.

New structural, stratigraphic and petrological data concerning the main units which belong to the accretion zone will help to understand the time and mechanism of accretion of the Iranian micropalate to Eurasia.