



## **Misho mafic complex - A part of paleotethyan oceanic crust or a magmatism in continental rift?**

Zohreh Azimzadeh (1), Ahmad Jahangiri (2), Emilio Saccani (3), and Yildirim Dilek (4)

(1) Tabriz, Islamic Republic Of Iran, Tabriz university (azimzadeh@tabrizu.ac.ir), (2) Tabriz, Islamic Republic Of Iran, Tabriz university (a\_jahangiri@tabrizu.ac.ir), (3) Ferrara, Italy (sac@unife.it), (4) Axford, Ohio, Miami univerveity (dileky@muohio.edu)

Misho Mafic Complex (NW Iran) represents a significant component of the West Cimmerian domain in Paleotethys. The Misho Mafic Complex (MMC) consists of gabbro (mainly) and norite, olivine gabbro, anorthosite and diorite with the east-west sereight. MMC has intruded in Kahar sedimentary Infta- Cambrian rocks, crosscut by abundant basaltic dykes and the overlying basaltic sheeted dyke complex. Kahar sedimentary rocks are representing the northern margin of Gondwana. Misho mafic complex are covered by Permian sedimentary rocks. The gabbros and basaltic dykes have MORB affinities.

MMC formed as a product of interactions between a depleted MORB-type asthenosphere and plume-type material. Mafic rocks represent an early Carboniferous magmatic event developed during the continental break-up of the northern edge of Gondwanaland that led to the opening of Paleotethys. Alternatively, these magmas may have been emplaced into the continental crust at the continental margin soon after the oceanic crust was formed (that is the oceanic crust was still narrow). There is no data for discriminating between these two hypotheses. In first hypothesis MMC is a part of ophiolites related to paleotethyan oceanic crust and the rocks that were above this crustal level should have necessarily been eroded. In another hypothesis Misho complex represents an aborted rift in a triple junction. Above a mantle plume, the continental crust breaks along three directions at 120 degrees. But, soon after, the extension proceeds along two of these three direction. Between them is formed the oceanic crust. The continental extension along the third direction is aborted. Here no oceanic crust if formed and there is only rifted, thinned continental crust. But, also in the aborted branch MORB magmatism can occur for short time.

In this hypothesis, the Misho complex was never associated with oceanic crust, but was anyway associated with the opening of the Paleotethys.

This magmatism was originally triggered by a mantle plume. This model is consistent with the well-documented late Devonian - early Carboniferous mantle plume activity to the east, along the Paleotethys margins in central-eastern Asia, and suggests that the initial rift-drift tectonics of Paleo-Tethys was strongly affected by plume-related magmatism and associated lithospheric weakening at a regional scale.