



## **Indonesian-type evolution for the Triassic of Naxhlak (Central Iran)**

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Naxhlak in Central Iran, is one of the key areas for the understanding of the Triassic paleogeographic evolution of Cimmerian blocks in Iran. The 2,400 m thick Triassic succession (Olenekian to Carnian) exposed at Naxhlak is thrust on a poorly exposed ophiolitic succession. The succession is divided into three units (Alam, Baqroq and Ashin Fms) and documents the complex history of an active margin, characterised by interaction of siliciclastic and volcanoclastic supply vs carbonate sedimentation, relative sea level changes, regional subsidence vs uplift, synsedimentary tectonic activity and volcanic activity.

The Alam Fm (1.2 km thick) was deposited in a marine setting and records a succession of deepening and shallowing trends. The sedimentation was mostly siliciclastic and volcanoclastic, but with three calcareous-dominated intervals. The upper part of the formation displays a shallowing trend to transitional/lagoonal sedimentation with increasing intercalations of fluvial conglomerates.

The Baqroq Fm, about 900 m thick, represents an alluvial fan deposited in a fluvial environment. It documents the uplift and the erosion of a metamorphic basement and of volcanic centers. The overlying Ashin Fm (about 300 m thick) documents a rapid evolution from the continental and fluvial environment of the Baqroq Fm to a deep water turbiditic system.

The whole Triassic succession is strongly deformed, showing fold and thrust structures which are sealed with an angular unconformity by the Upper Cretaceous shallow water limestones. This indicates that folding and thrusting occurred between the Late

Triassic and the end of the Early Cretaceous and that these tectonic structures can be related to the Cimmerian orogeny s.l.

The Naxhlak succession is located a few kilometres north of the E-W trending Anarak Metamorphic Complex (AMC), which consists of low grade metamorphic rocks including metapelites, metabasites and marbles associated with slivers of ultrabasic rocks possibly representing fragments of an oceanic lithosphere section. Blueschist relics also occur as small boudins in greenschists facies metabasites. This peculiar rock association suggests that the AMC may be interpreted as an accretionary wedge developed in front of the Triassic Naxhlak volcanic arc.

On the basis of these observations, the Naxhlak-Anarak area can be interpreted as an arc-trench system developed between the North and Central Iran microplates during the Cimmerian orogeny. This new interpretation suggests that the Iranian plate was probably formed by different microblocks which collided in a complex way during their accretion to the Eurasian margin. The reconstructed tectonic scenario resembles the present-day geodynamic setting of the Indonesian region. This idea is in open contrast with previous interpretations, suggesting a unique suture (Paleotethys suture) between Eurasia and the Iranian Plate located along the south Caspian coast.