

Revision of the Miocene Upper Red Formation in the Avaj-Abegarm area, west of Iran

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Abstract

The Upper Red Formation (URF) was chosen to review due to tectonic and stratigraphic complication of the Avaj area and the extent of the URF in this area. The URF was investigated through sedimentological and tectonic aspects. The URF deposits in the Avaj area were divided into two members (M1 and M2). Based on sedimentological investigations (mineralogy, lithology and sedimentary structures), the URF two members are different in lithology (e.g., quartz, feldspars, volcanic rock fragments and carbonate cementation differences in sandstones and clay mineral composition difference in mudrocks). The paleocurrent direction changed from SE to NW in the lower member to NNW to SSE in the upper member. Field observations revealed an unconformity between these two members. The Shurab salt dome deformed the lower member but deformation did not reach the upper member. According to the mentioned evidence, two previously known members of the URF (M1 or the Avaj Red Beds and M2 or the Bi-Ab conglomerate) did not belong to the same formation, and the upper member (Bi-Ab conglomerate) should be considered as a new lithostratigraphic unit. Based on tectonic evidence, the late Alpine movements (<20 Ma.) triggered the inversion of Avaj Fault and deposition of the URF. The Atikan orogeny (5 Ma.) caused the deformation of the URF and the unconformity at the base of the Bi-Ab conglomerate. The Atikan movements also reactivated the Hassan Abad Fault, causing the creation of the Khar Rud shortcut. The uplift of the Khar Rud block provided the Bi-Ab conglomerate sediment supply. The Bi-Ab conglomerate might be deposited during Pliocene and deformed by the Pasadanian movements (2-1.8 Ma.).

Keywords: Upper Red Formation, Salt Dom, Avaj area, Central Iran, Miocene