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Paleomagnetic Investigations Along The Bitlis-Zağros Suture Zone From Mesozoic to Recent

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Abstract

The tectonic evolution of SE Anatolia is associated with the collision between the Taurides and the Arabian platform in the Early Cenozoic, after the final closure of the southern branch of the Neotethys Ocean during Upper Cretaceous to early Eocene times. The ongoing deformation was characterized by northward movement of Arabia, followed by westward extrusion of the Anatolian region, by displacement along the northern and eastern Anatolian Transform Faults. Previous paleomagnetic studies in the investigation area are limited by Pliocene-Miocene rocks, concerning the tectonic deformation due to neotectonic phase whereas no data are reported about the tectonic deformation history since the closure of the southern Neotethyan oceanic basin. For this purpose we carried out a paleomagnetic study from Mesozoic and Cenozoic rocks at a total of 34 localities along the Bitlis-Zağros suture zone.

Preliminary paleomagnetic results from Upper Jurassic platform carbonates show a mean direction of D/I = 12.7°/58.3°, (k =32.9 , α95 = 5.6°) after tilt correction and a paleolatitude of 39° N ($\pm$5) which is consistent the Eurasian paleolatitude. The Upper Cretaceous rocks were defined with a mean direction of D/I = 349.1°/39.5°, (k = 3.86 , α95 = 6.5°) and a paleolatitude of 18.9° N (+3.8 / - 3.5) which is in agreement with coeval paleomagnetic directions from stable Africa-Arabia. The paleomagnetic rotations suggest $\sim$17° and $\sim$40° CW rotation in the western site of the Bitlis-Zağros suture zone whereas the eastern part show CCW rotation in the order of $\sim$40° and $\sim$5°, suggesting two phase of contemporaneous rotation. The Middle Eocene mean direction D/I = 4.3°/32.2°, (k =16.26 , α95 =5.7 °) differ significantly from the Middle Miocene mean direction (D/I = 324.9°/58.3°, k =11.41 , α95 = 8°), indicating that the region experienced important rotation since the Middle Eocene.

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