



Understanding the Tectonic Deformation of Turkish Blocks since Mesozoic; A Paleomagnetic study on the Nigde-Kirsehir Massif and the Taurides

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It is reported that the Nigde-Kirsehir massif which constitutes the main fragment of Anatolia is rifted from the Taurides-Anatolides in Mesozoic and that the Intra-Tauride ocean exist between these blocks. Another group of researchers believed that the Intra Tauride ocean did not exist. They assumed that the Nigde-Kirsehir massif existed as a promotory of the Taurides. In this sense, both the Nigde-Kirsehir massif and the Taurides experienced several deformation phases due to the consumption of the oceanic strand (s) and the amalgamation of the Anatolian blocks after collision in the end of the paleotectonic time, whereas in the neotectonic time the traces of the westwards excursion of Anatolia was effective.

Previous paleomagnetic studies showed that the Nigde-Kirsehir massif rotated 90° anticlockwise during Jurassic to Eocene time and other studies showed that the collision between the Nigde-Kirsehir massif and the Pontides resulted by deformation which was accomodated by regional faults. In the south of the Nigde-Kirsehir massif, it was proposed that all the rocks in Carboniferous to Eosen were remagnetized due to nap emplacement in Eocene.

Because of several alternative interpretations about the tectonic deformation of the Nigde-Kirsehir massif in relation between the Taurides and the Pontides, we report new paleomagnetic results from Late Jurassic to Miocene rocks in the Nigde-Kirsehir massif and its surrounding. A total of 138 different sites were sampled from Jurassic to Miocene rocks in the south of the Nigde-Kirsehir massif around Kırkkale, Tuzgözü, Ulukışla and Kayseri, whereas in the Central Taurides Late Jurassic- Lower Cretaceous platform type carbonates and ophiolitic rocks from Mersin and Pozantı were collected.

Paleomagnetic results evaluated together with previous paleomagnetic data indicate that all the studied rocks carry a magnetization before folding according to positive incremental fold tests. It has been shown that in the SE/E (SE Taurides) and the SW/W (Central Taurides) area two different sense of rotation occurred. In the SE/E area, counterclockwise rotation of 18° took place in the period between Lower Cretaceous–Middle Eocene. The rotations are consistent with the thrust directions, indicating evidence for the consumption of the Intra Tauride ocean in Late Cretaceous. This result was supported by the paleolatitudes obtained for the Taurides and the Niğde Kırşehir massif which showed a spatial gap of 1000 km between the Pontides and the Taurides in Late Jurassic- Lower Cretaceous and Late Cretaceous. In the SW/W, however, clockwise rotation of 47° between Middle Eocene and Miocene time, imply that the deformation occurred in a later phase as a result of consumption of the South Neotethys ocean and the collision between the African and Eurasian plates. Accordingly to the paleomagnetic rotations which took place gradually in the SE/E area in Middle Eocene, it is shown that counterclockwise rotations of 25° took place in the Niğde Kırşehir massif during Paleocene. This implies that the Nigde-Kirsehir massif underwent similar deformation together with the adjacent block in the SE/E. In the Neotectonic period, counterclockwise rotation of 17° was obtained in the SE/E area. It is shown that the westwards movement of Anatolia affected mainly the SE/E areas despite the SW/W and the Nigde-Kirsehir massif, which show no significant rotations.

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