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Thoughts on Crustal Structure of Eastern Anatolia, Turkey

The study area is located within the framework of the Eastern Mediterranean Alpides between the Eastern Pontides and the Bitlis-Pötürge fragments. The aim of this study is to demonstrate the different approaches on the crustal structure of the area, depending on the basis of geological evidence and to present new evidence about the structure of the area.

The units occupying the lowermost section in the Eastern Anatolia are overlain by the young formations and therefore crop out in limited exposures. This causes some contradictory approaches in interpreting the lowermost structure of the region. So there are different approaches on the crustal structure of the Eastern Anatolia. For instance, on one hand, Seymen proposes that the melange obducted upon the metamorphic crystalline basement and underlain by a volcanosedimentary cover sequence of Eocene-Quaternary age. On the other hand, the basement of the Eastern Anatolia is commonly accepted as a melange prism (Arni, 1939; Ketin 1977; Şengör and Yılmaz, 1981). But, if the data presented by Yılmaz et al. (1986) and Şenel (1987) or observations made on the other ophiolitic exposures in the Eastern Anatolia are reviewed, it can be proposed that the Eastern Anatolia has a napped structure. The metamorphic crystalline basement is the lowermost level and may be a fragment of the Anatolide-Tauride platform. Ophiolite constitute only a limited extent related to the ophiolite nappe emplacement. These units are unconformably underlain by Maastrichtian-Quaternary volcanosedimentary cover.

According to areal distribution and boundary relationships of the ophiolitic units, it can be concluded that the ophiolitic melange might have been formed due to the contradiction and slicing of the oceanic crust during Cenomanian- Campanian.

The post tectonic Maastrichtian-Quaternary cover is made up of successive and regular transgressive and regressive sequences. There are frequent lateral and vertical facial changes in the sequence. Maastrichtian- Eocene part of the cover contains reworked materials of the ophiolitic rocks, in places. The study area became a piece of land as a whole, as being parallel to the development of the last regressive sequence that began to form during Middle?-Upper Miocene.

Eocene deposits are cut by gabbros and overlain by andesites. Oligocene deposits contain only thin basaltic andesites and basalt interbeds. Middle and Late Miocene-Quaternary deposits include dacite and andesite in the lower levels, but basaltic pyroclastics and lavas in the upper levels.

As a consequence of the compressional events occurring in the Late and post Miocene times, parallel northwest-southeast trending right lateral and parallel northeast-southwest trending left lateral oblique fault zones were developed in addition to the overthrusts and folds, trending approximately east-west. During this times, new basins are developed under the control of the oblique fault zones, in which the lateral offset is dominant.

As a result, it can be postulated that the recent crust has a napped structure and crustal shortening and thickening in Eastern Turkey (Şaroğlu et al., 1980) are the result of compressional oblique system that has began since Late Cretaceous.

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