

KOÇALI COMPLEX (SE TURKEY): Is it a single ophiolite or two different ophiolites formed in different geotectonical environments?

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The Koçali Complex is an important element within the southeastern Anatolian Tuzluk Belt. It consists of the Tarasa volcanics, the Konak sedimentary rocks and the Koçali ophiolite. The Tarasa volcanics are composed of basic volcanic rocks, pelagic limestones, cherts and mudstones. They consist radiolarian faunas indicating Carnian to Rhaetian age. The geochemical features indicate an E-MORB and N-MORB type source for the Tarasa volcanics.

The Tarasa volcanics are upper part of an Neo-Tethyan ocean floor which starting to spread during the Late Triassic. The Konak formation consists of limestones and radiolarites. The Koçali ophiolite consists of mantle peridotites, gabbros, sheeted dikes, ultramafic-mafic dykes, plagiogranite, basaltic pillow lavas and isolated diabase dykes. The Plagiogranites injected into gabbros. Plagiogranites yield an U-Pb zircons age of ca 92Ma. The Koçali ophiolite, displays N-MORB-like REE patterns with LREE depletion respective to HREE, indicating a N-MORB-like mantle source for them. SSZ magmatism results from multistage evolution that reflects a geochemical progression through time and/or space, commonly beginning with MORB-type magmatism and evolving to boninitic and IAT compositions.

The Koçali ophiolite belongs to the southeastern Anatolian ophiolitic belt derived from the Neotethyan ocean. The Neotethyan ocean originated some time during the Late Triassic as a rift basin along the northern margin of Gondwanaland. The rifting was followed by spreading during the Jurassic and Early Cretaceous, resulting in the creation of the southern branch of the Neotethyan ocean. Beginning of the inter-oceanic subduction in the Late Cretaceous. Upwelling asthenosphere melts due to decompression, generating mid-ocean ridge basalt (MORB)-like gabbros, a part of sheeted dykes and basalt accompanied by seafloor spreading in a proto-arc setting during subduction initiation. Emplacement of the ophiolite and the Tarasa volcanics onto the Arabian Plate in Late Maastrichtian.