



Tectonic evolution and paleogeography of the Kırşehir Block and the Central Anatolian Ophiolites, Turkey

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In Central and western Anatolia two continent-derived massifs simultaneously underthrust an oceanic lithosphere in the Cretaceous, and ended up with very contrasting metamorphic grades: high-pressure, low-temperature in the Tavşanlı Zone and the low-pressure, high-temperature in the Kırşehir Block. To assess why, we reconstruct the Cretaceous paleogeography and plate configuration of central Anatolia using structural, metamorphic, and geochronological constraints and Africa-Europe plate reconstructions. We review and provide new $^{40}\text{Ar}/^{39}\text{Ar}$ and U/Pb ages from Central Anatolian metamorphic and magmatic rocks and ophiolites, and show new paleomagnetic data on the paleo-ridge orientation in a central Anatolian ophiolite. Intra-oceanic subduction that formed within the Neotethys around 100-90 Ma along connected N-S and E-W striking segments was followed by overriding oceanic plate extension. Already during supra-subduction zone ocean spreading, continental subduction started. We show that the complex geology of central and southern Turkey can at first order be explained by a foreland-propagating thrusting of upper crustal nappes derived from a downgoing, dominantly continental lithosphere: the Kırşehir Block and Tavşanlı Zone accreted around 85 Ma, the Afyon zone around 65 Ma, and Taurides accretion continued until after the Middle Eocene. We find no argument for Late Cretaceous subduction initiation within a conceptual 'Inner Tauride Ocean' between the Kırşehir Block and the Afyon Zone as widely inferred. We propose that the major contrast in metamorphic grade between the Kırşehir Block and the Tavşanlı Zone primarily results from a major contrast in subduction obliquity and the associated burial rates, higher temperature being reached upon higher subduction obliquity.