



## Metamorphic belts of Anatolia

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Investigating metamorphic rocks from high-pressure/low-temperature (HP/LT) belts that formed during the closure of several oceanic branches, building up the present Anatolia continental micro-plate gives insight to the palaeogeography of the Neotethys Ocean in Anatolia. Two coherent HP/LT metamorphic belts, the Tavşanlı Zone (distal Gondwana margin) and the Ören–Afyon–Bolkardağ Zone (proximal Gondwana margin), parallel their non-metamorphosed equivalent (the Tauride Carbonate Platform) from the Aegean coast in NW Anatolia to southern Central Anatolia. P–T conditions and timing of metamorphism in the Ören–Afyon–Bolkardağ Zone (>70–65 Ma; 0.8–1.2 GPa/330–420°C) contrast those published for the overlying Tavşanlı Zone (88–78 Ma; 2.4 GPa/500 °C). These belts trace the southern Neotethys suture connecting the Vardar suture in the Hellenides to the Inner Tauride suture along the southern border of the Kirşehir Complex in Central Anatolia. Eastwards, these belts are capped by the Oligo–Miocene Sivas Basin.

Another HP/LT metamorphic belt, in the Alanya and Bitlis regions, outlines the southern flank of the Tauride Carbonate Platform. In the Alanya Nappes, south of the Taurides, eclogites and blueschists yielded metamorphic ages around 82–80 Ma (zircon U–Pb and phengite Ar–Ar data). The Alanya–Bitlis HP belt testifies an additional suture not comparable to the northerly Tavşanlı and Ören–Afyon belts, thus implying an additional oceanic branch of the Neotethys.

The most likely eastern lateral continuation of this HP belt is the Bitlis Massif, in SE Turkey. There, eclogites (1.9–2.4 GPa/480–540°C) occur within calc-arenitic meta-sediments and in gneisses of the metamorphic (Barrovian-type) basement. Zircon U–Pb ages revealed 84.4–82.4 Ma for peak metamorphism. Carpholite-bearing HP/LT metasediments representing the stratigraphic cover of the Bitlis Massif underwent 0.8–1.2 GPa/340–400°C at 79–74 Ma (Ar–Ar on white mica). These conditions compares to the Tavşanlı–Afyon realm. However the differences in time and P–T conditions (eclogite- vs. blueschist-facies units) in the Bitlis Massif indicate that the different metamorphic peak conditions were reached at different times in a single subduction zone. Exhumation from approx. 65 to 35 km depth occurred within <10 myr. The special relations between eclogite–blueschist are due to the fact that collision with the Arabian plate was and still is on going in the Bitlis area. The Bitlis HP rocks represent a subduction realm that separated the Bitlis–Pütürge(–Bistun?) continental block from the South-Armenian (Tauride?) block, further north. Post-Eocene blueschists south of the Bitlis Massif witness the separation of the Bitlis–Pütüre block from the Arabian plate, and the southward migration of the subduction zone from the Late Cretaceous to the Oligocene. Continuous convergence of Africa and Eurasia engendered the simultaneous consumption of several, separated branches of the Neotethys Ocean and amalgamation of different terranes. The rise of the Eastern Anatolia Plateau is related to this complex geodynamic setting. Reduced seismic velocities inferred from geophysical observations, which are interpreted as complete replacement of lithospheric- by asthenospheric mantle, can be explained by thermodynamic modelling as partial hydration of the lithospheric mantle wedge during protracted subduction. Hydrated lithospheric mantle is interpreted as result of the complex geodynamic setting in Anatolia with multiple simultaneous subduction zones.