



## **Cretaceous high-pressure metamorphic belts of the Central Pontides (northern Turkey): pre-collisional Pacific-type accretionary continental growth of Laurasian Margin**

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Cretaceous blueschist-facies metamorphic rocks crop out widely in the central part of the Pontides, an east-west trending mountain belt in northern Turkey. They comprise an accretionary wedge along to the southern Laurasian active continental margin and predate the opening of Black Sea basin. From North to South, the wedge consists of a low grade metaflysch unit with marble, Na-amphibole-bearing metabasite and serpentinite blocks. An extensional shear zone separates the accreted distal terrigenous sediments from HP/LT micaschists and metabasites of oceanic origin, known as Domuzdağ Complex. The shear zone reaches up to one km in thickness and consists of tectonic slices of serpentinite, metabasite, marble, phyllite and micaschist with top to the NW sense of shear. The Domuzdağ Complex predominantly consists of carbonaceous micaschist and metabasite with serpentinite, and minor metachert, marble and metagabbro. Metabasites consist mainly of epidote-blueschists sometimes with garnet. Fresh lawsonite-blueschists are found as blocks within the shear zone. Peak metamorphic assemblages in the micaschists are chloritoid-glaucophane and garnet-chloritoid-glaucophane-lawsonite in addition to phengite, paragonite, quartz, chlorite and rutile (P:  $17 \pm 1$  Kbar, T: 390-450 °C). To the south, lithologies change slightly, with metabasite and thick, pale marble with few metachert and metapelitic horizons. The degree of metamorphism also changes. The metabasites range from high-pressure upper-greenschist facies with growth of sodic-amphibole to lower greenschist without any HP index mineral, suggesting a general decrease in pressure toward south within the prism. While Domuzdağ Complex represents deep-seated underplated oceanic sediments and basalts, the carbonate-rich southern parts can be interpreted as seamounts integrated into the accretionary prism.

Ar/Ar dating on phengite separates both from terrigenous and oceanic metasediments give consistent plateau ages of  $100 \pm 2$  Ma. One of the Cl<sub>2</sub>-micaschist, exposed to the South, gives a  $92 \pm 2$  Ma age. This documents a southward younging of metamorphism within the accretionary prism. A mid-Jurassic (160 Ma) age, previously reported from a micaschist in the southern part of Domuzdağ Complex, is also supported in this study. These rocks however differ from the Cretaceous HP unit both in lithology and degree of metamorphism (P:  $10 \pm 2$  Kbar, T:  $620 \pm 30$  °C; Okay et al. 2013). It is not clear whether these rocks indicate episodic subduction process or represent tectonically emplaced slivers of the overriding plate which has widespread Mid-Jurassic high-grade metamorphic rocks and intrusions.

The Cretaceous accretionary complex structurally overlies an arc-related low-grade metavolcanic unit, which is thrust over the ophiolitic rocks of the main Tethyan İzmir-Ankara-Erzincan Suture zone that separates the Pontides from the Gondwana-derived terranes. In the tectonic framework discussed above, the study area represents subduction and accretion related units, which are sandwiched between the southern Laurasian active margin and the Gondwana-derived Kırşehir Block without any continental fragments. This indicates that Pacific-type pre-collisional accretion has a major role in the Tethyan geology of the Central Pontides during Cretaceous.

Okay et al. (2013) *Tectonics* 32: 1247–1271.