



The Kemer metamorphics (NW Turkey): Subducted passive margin of the Sakarya Zone

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High pressure and ultrahigh pressure metamorphic rocks crop out widely in the northern Aegean. In many instances their ages and tectonic setting are poorly constrained. Here we report newly discovered high pressure rocks of continental origin of Late Cretaceous age southwest of the Marmara Sea. These high pressure rocks, called as the Kemer metamorphics, occur at the contact between the Rhodope-Strandja-Circum-Rhodope zones in the north and the Sakarya Zone in the south. They are in tectonic contact with an accretionary ophiolitic mélange with limestone, basalt, serpentinite, greywacke, radiolarian chert and metabasite blocks. Some of the metabasites contains Na-amphibole and lawsonite mineral assemblage documenting a subduction origin for the mélange. The ages of the limestone blocks range from Late Triassic to Late Cretaceous. The Kemer metamorphics and the Çetmi mélange are intruded by a granodiorite of Eocene (52 Ma) age.

The Kemer metamorphics are mainly composed of micaschist, calcschist and marble with minor metabasite and metaserpentinite. The micaschists contains garnet, phengite (3,30-3,44 c.p.f.u), (\pm) paragonite, albite, epidote, calcite, chlorite and titanite. The high pressure metamorphic origin of these rocks is shown by the high silica contents of the white micas and by glaucophane inclusions in the garnets. In the metabasites the high pressure mineral assemblage is completely overprinted; the mineral assemblage in the metabasites, is garnet, barroisite, epidote, albite, titanite, quartz, (\pm) phengite and (\pm) chlorite. Metaserpentinites form well-foliated small (2-3 m in width) tectonic slivers in the micaschists. They caused metasomatic growth of new minerals in the neighbouring rocks such as Mg-rich non-pleochroic amphibole, epidote and talc. Metamorphic conditions of the Kemer metamorphics are constrained by mineral equilibria as 560-640 °C temperature and 10-16 kbar pressure. The metamorphism is dated as 64-84 Ma by Rb-Sr phengite-whole rock method.

Over 90% of the Kemer metamorphic rocks are composed of metapelitic micaschist, calcschist and marble, which indicate a passive margin rather than oceanic or active margin setting for the protolith. Northward subduction under the Strandja and Rhodope zones is evidenced by the Upper Cretaceous magmatic rocks (Sredna-Gora arc magmatism), therefore the Kemer metamorphic rocks were probably initially deposited on the southern passive margin of this ocean. During the Late Cretaceous continuing northward subduction caused accretionary growth of Rhodope-Strandja continental domain and final collision with Sakarya zone. Hereby, it is suggested that the high-pressure Kemer Metamorphics represent subducted passive margin of the Sakarya Zone.