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Metamorphic evolution of the high-pressure metamorphic rocks from the Kemer area (Biga Peninsula, NW Turkey): Implications for the accretionary continental growth and closure of the Intra-Pontide Ocean

M. Aygül (1), G. Topuz (1), and M. Satır (2)

(1) İstanbul Teknik Üniversitesi, Avrasya Yerbilimleri Enstitüsü, TR-80626 Ayazağa, İstanbul, Turkey (aygulm@itu.edu.tr),
(2) Universität Tübingen, Institut für Geowissenschaften, Wilhelmstrasse 56, D-72074 Tübingen, Germany

The northwestern part of the Biga Peninsula, NW Turkey, corresponds to the so-called Intra-Pontide suture, separating the Rhodope-Strandja zone to the north and Sakarya zone to the south. This suture zone is marked by the exposures of high-pressure metamorphics, oceanic accretionary complexes and ophiolites, which are widely covered by Eocene to Miocene volcanics and volcano-clastics, and crosscut by Eocene to Miocene granites. The Kemer area is one of the key-areas where high-pressure metamorphics and an ophiolitic mélange were widely exposed. This contribution deals with the metamorphic evolution of the Kemer high-pressure rocks, and their implications for the geodynamic evolution.

The Kemer high-pressure rocks comprise predominantly micaschist, calcschist, marble and minor metabasite and serpentinite. The micaschists contain mineral assemblages involving garnet, phengite (3,30-3,44 c.p.f.u.), paragonite, epidote, chlorite, albite and titanite, and the metabasites consists of garnet, barrosite, albite, chlorite, epidote, albite and titanite. The equilibrium conditions are poorly constrained as 550 $\pm$ 50 ºC temperature and >8-10 kbar pressure by Fe-Mg partitioning between garnet and phengite, and phengite-barometry, respectively.

Timing of the high-pressure metamorphism is constrained as 84-64 Ma by Rb-Sr phengite-whole rock dating on four samples. Although the obtained age values display a wide scatter, they are consistent with geochronological data from the neighboring high-pressure areas: 86 $\pm$ 2 Ma from the Şarköy blueschists (Topuz et al. 2008) and 65-69 Ma from the Çamlıca garnet-micaschists (Okay and Satır, 2000).

These data in conjunction with those from the literature suggest that Late Cretaceous represent a time of substantional accretionary continental growth related to the northward subduction of the Intra-Pontide Ocean. The closure of the Intra-Pontide Ocean is constrained between Late Cretaceous and Eocene, because Eocene volcanics and volcano-clastics cover the suture zone, and Eocene granitoids ($\sim$52 Ma, Beccaletto et al. (2007)) crosscut the high-pressure rocks.

References:
Beccaletto et al. (2007) Geological Magazine 144: 393-400.
Okay AI & Satır M (2000) Turkish Journal of Earth Sciences 9: 47–56.
Topuz et al. (2008) Journal of Metamorphic Geology 26: 895-913.