



An Approach to Geochemical and Protolith Features of the Mesozoic HP/LT Rocks in the Biga Peninsula, NW Turkey

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The Biga Peninsula in northwestern Anatolia is a tectonic mosaic comprised of different tectonic units which represented by continental and oceanic assemblages in different origin and ages. High-degree metamorphic rocks occur in the both Çamlı ca metamorphics and Çetmi Group. HP eclogite/blueschists are associated with quartz-mica schist within the Çamlı ca metamorphics. On the other hand, another HP eclogite/blueschist unit is associated with garnet-mica schist in the Çetmi Group. The host Çamlı ca metamorphic rocks record only a single - stage greenschist - facies metamorphism and were juxtaposed with the high - grade metamorphic rocks along ductile – semi-brittle (?) strike - slip faults after the high degree metamorphism and during or after the low-grade metamorphism of the Çamlı ca metamorphic unit.

Major, trace and rare earth elements (REE) compositions of HP eclogite/blueschist and associated metasedimentary rocks from the Biga Peninsula have been determined to reveal their protolith, source area and tectonic setting.

Whole-rock geochemistry for the HP eclogite/blueschist suggests that their protoliths were basalt with high TiO_2 and K_2O-Na_2O content and Nb/Y ratios. Most HP metabasite samples plot in the tholeiitic basalt field. $\sum REE$ abundances range from 47.55 to 107.4 ppm. Europium anomalies are variable ($Eu/Eu^*=0.9-1.1$) and generally small negative (average $Eu/Eu^*=1$) which is implying weak plagioclase fractionation. REE pattern and trace element contents similar to typical MORB based on tectonic discrimination diagrams. The relatively high concentrations of CaO and low concentrations of K_2O suggest that the protoliths were derived from a depleted source.

Metasedimentary rocks coexisting with HP metamorphic rocks have different SiO_2 , Al_2O_3 and TiO_2 values in the both Çamlı ca metamorphics and Çetmi Group. Those of the Çamlı ca metamorphics have high SiO_2 and low Al_2O_3 and TiO_2 values. However, those of the Çetmi Group have low SiO_2 and high Al_2O_3 and TiO_2 values. Major compositions of metasediments indicate that two schist units did not take place from the same source. The protolith of these schist units within the both Çamlı ca metamorphics and Çetmi Group is arkose-subarkose and greywacke, respectively. Tectonic setting discrimination diagrams for quartz-mica schist, associated with HP rocks, indicate that developing on an active continental margin. On the other hand, garnet-mica schist is derived from the island arc and including contribution from a mafic source.