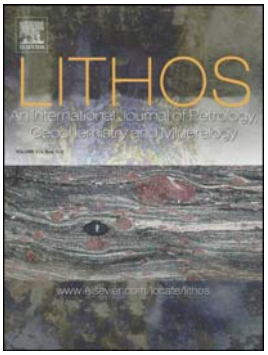


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# High-pressure subduction-related serpentinites and metarodingites from East Thessaly (Greece): Implications for their metamorphic, geochemical and geodynamic evolution in the Hellenic-Dinaric ophiolite context

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## Abstract

Metaophiolites that consist mainly of serpentinites or metabasites outcrop in the East Thessaly region, Central Greece. These formations, along with some ophiolite outcrops, have been variably emplaced onto the Pelagonian tectonostratigraphic zone as dispersed and deformed thrust sheets. Based upon their estimated metamorphic degree, serpentinites from the metaophiolites and ophiolitic units of East Thessaly have been divided into three groups: Group-1 serpentinites include lizardite and antigorite in balanced amounts, defining low-temperature blueschist facies metamorphic conditions (~320-340 °C, P≈9-10 kbar). Group-2 serpentinites are marked by further prevalence of antigorite over lizardite, suggesting medium-temperature blueschist facies metamorphism (~340–370 °C, P≈10-11 kbar). Group-3 serpentinites are characterized by the predominance of antigorite corresponding to medium or high temperature blueschist facies metamorphism (~360–400 °C, P≈12 kbar). The chemical composition and mineral chemistry of the East Thessaly serpentinites suggest that their protoliths were highly depleted harzburgites. Group-1 serpentinites exhibit higher Mg/Si ratio values and LOI compared to serpentinite Groups -2 and -3, due to increasing metamorphic conditions of the latter groups. The prominent Cs, U, Pb, As and Sb enrichments point to subduction-related serpentinites that were subjected to fluid/rock interactions. The East Thessaly serpentinites also seem to have undergone deserpentinization retrograde metamorphism (estimated at P<8 kbar and T<350 °C). Retrograde metamorphism also had a significant impact on the rodingite intrusions hosted within the serpentinites, forming metarodingites through late-stage derodingitization processes.

**Keywords:** Metaophiolites; Exhumation; Blueschist metamorphism; Retrograde metamorphism