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The geology and petrochemistry of the pre–Middle Jurassic Pontic Ophiolites, central-northern Turkey

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The Pontic ophiolite sequences are found along the Intra–Pontide Suture Zone (IPSZ) by collision with microcontinental terranes (i.e. Devrekani Massif, Kargı Complex) of the Sakarya Continent in central–northern Turkey. These ophiolite fragments are thrust over the intra–oceanic subduction-accretion complex (Domuzdağ Melange) formed by northward subduction of the Intra–Pontide Ocean (IPO).

The oceanic assemblages consist of strongly serpentinized mantle peridotites, and minor gabbros, diabase dykes and pillow lavas interbedded with deep sea sedimentary rocks. The oceanic crust rocks generally underwent ocean–floor hydrothermal alteration. Some basic rocks were metamorphosed to garnet– and glaukophane–bearing greenschist facies rocks indicating high pressure metamorphism. Bands and lenses of glaucophane–bearing eclogite are also found, within sheared serpentinites along tectonic contacts between mantle peridotites and subduction–accretion melange. We obtained ⁴⁰Ar/³⁹Ar ages of *ca.* 150 Ma from the metabasic dykes intruded into serpentinized ultrabasic rocks, and U–Pb zircon ages of *ca.* 169 Ma for a dacitic porphyry related to Middle Jurassic magmatic arc rocks. We interpret that these metabasic rocks are exhumed remnants of the Intra–Pontide oceanic crust. The

undisturbed ophiolitic rocks that escaped the down going oceanic slab are found in the northernmost section of the sequence. The ophiolitic rocks are overlain by epi-ophiolitic volcanic units of Late Triassic–Liassic age. The SiO₂ contents (46.97–68.84 wt.%) and alkali (Na₂O+K₂O) values (3–6 wt%) of the volcanic units show tholeiitic and calc-alkaline affinities. Their Ti/V ratios (12.08–32.12) indicate IAT- and MORB-like compositions.

We interpret that the pre-Middle Jurassic ophiolites in central-northern Turkey formed in a marginal oceanic basin by continental rifting in the Pontides as a result of northward subduction of northern Tethyan oceanic lithosphere (similar to ophiolites of other backarc systems). Middle Jurassic magmatic arc rocks are related to the closing of this marginal oceanic basin.

