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Metamorphic sole formation, emplacement and blueschist overprint: early obduction dynamics witnessed by W. Turkey ophiolites

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Western Turkey, with a >200 km long-belt of unmetamorphosed ophiolite overlying continental lithosphere is one or even the largest obducted ophiolite on Earth and therefore a key example to study obduction and early subduction dynamics. All Western Turkish ophiolite fragments are considered as part of the same Neotethyan branch resulting of a long-lived continental subduction (or underthrusting). Synchronous (ca. $\sim$ 93 Ma) metamorphic sole formation and preservation at the base of most of the Turkish ophiolite fragments support this single event and place a strong constraint on the age of subduction initiation. Metamorphic soles are indeed generally considered to have formed during the early and hot subduction zone at 25 $\pm$ 10 km depths and welded to the overriding oceanic lithosphere. In Western Turkey however (as for most places worldwide) a systematic study of the pressure-temperature conditions with modern thermobarometric tools is generally lacking, and fundamental mechanisms of formation or accretion to the upper plate are poorly (if at all) constrained. We herein reappraise Western Turkish metamorphic soles focusing on the following points and issues: (i) detailed structures of metamorphic sole and other subduction derived units, petrological evolution and refined pressure-temperature conditions; peak pressure-temperature conditions of metamorphic sole were estimated using garnet, clinopyroxene, amphibole and plagioclase as the peak paragenesis at 10.5 $\pm$ 2 kbar and 800 $\pm$ 50°C based on pseudosections using the Theriak/Domino package (ii) the rather unique (and enigmatic) blueschist facies overprint found in places was investigated in terms of structural position and pressure-temperature conditions. Conditions of overprint were estimated around 12 kbar and 425 °C from the presence of glaucophane, lawsonite, jadeite and garnet overgrowing the amphibolite-facies assemblage. This field-based study provides clues to mechanisms of metamorphic sole underplating related to (early) subduction dynamics and cooling and providing, in addition, constraints on the nature of the ophiolite nappe in Western Anatolia.