

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

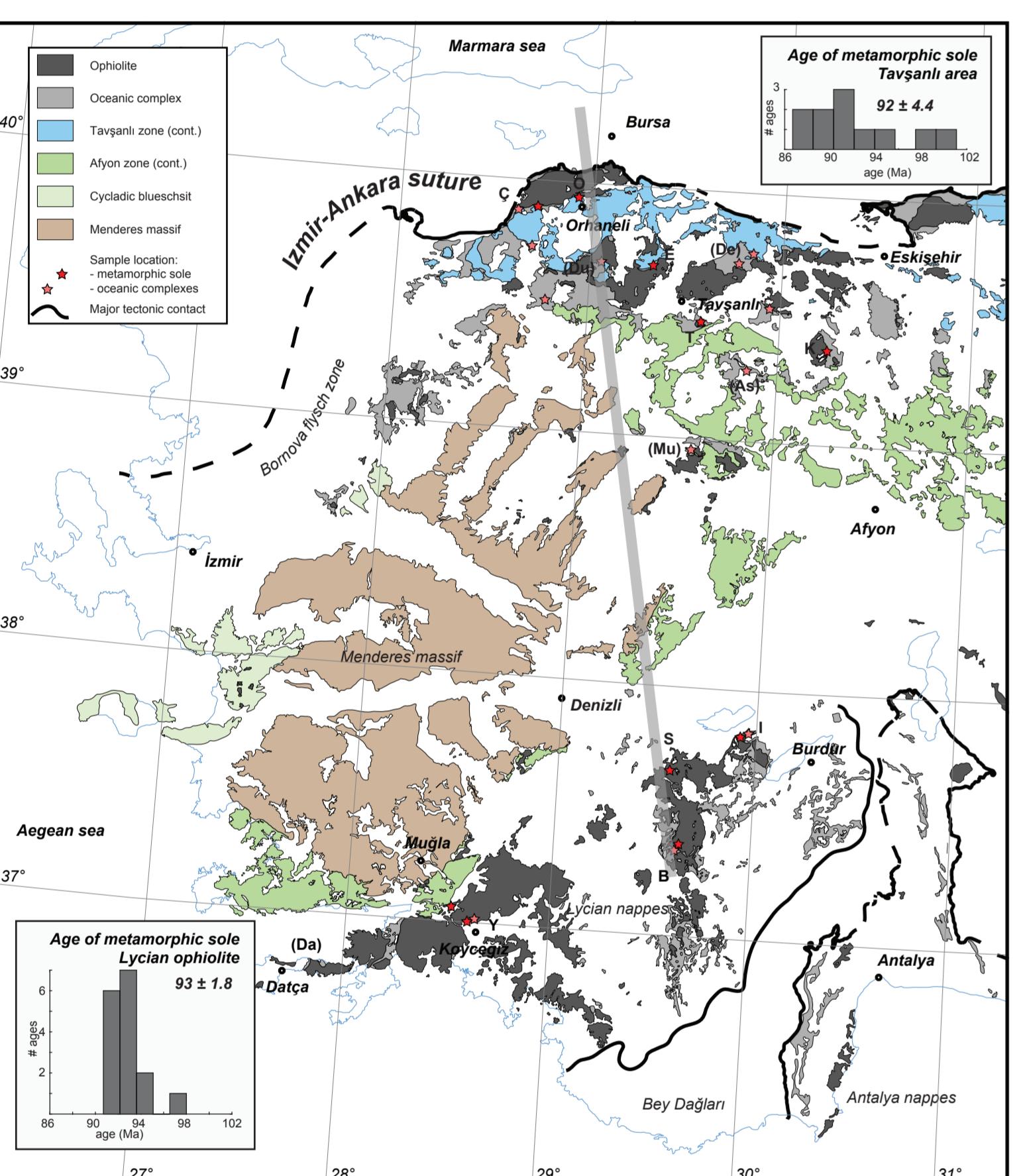
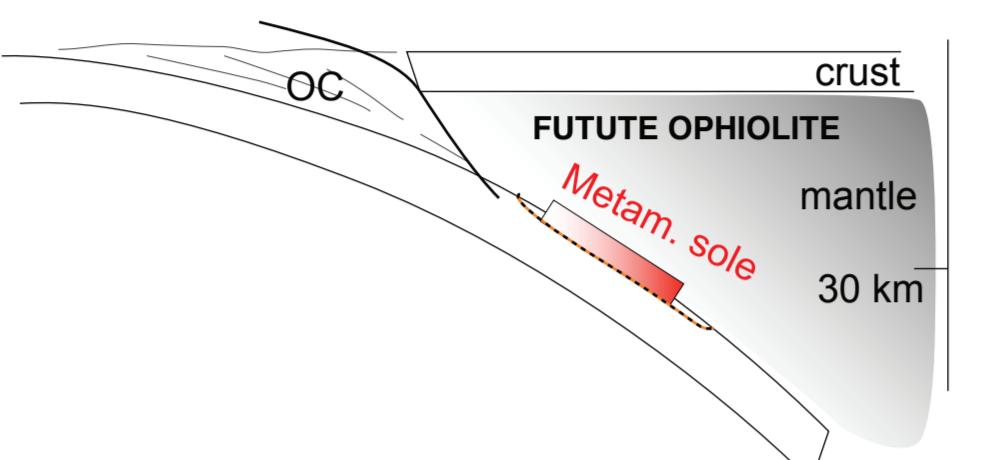
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1. Introduction & geological setting

– how can metamorphic soles be preserved along a 200 kilometre-long transect parallel to ophiolite transport in regard to the short-lived event they supposedly represent (cf Oman)?

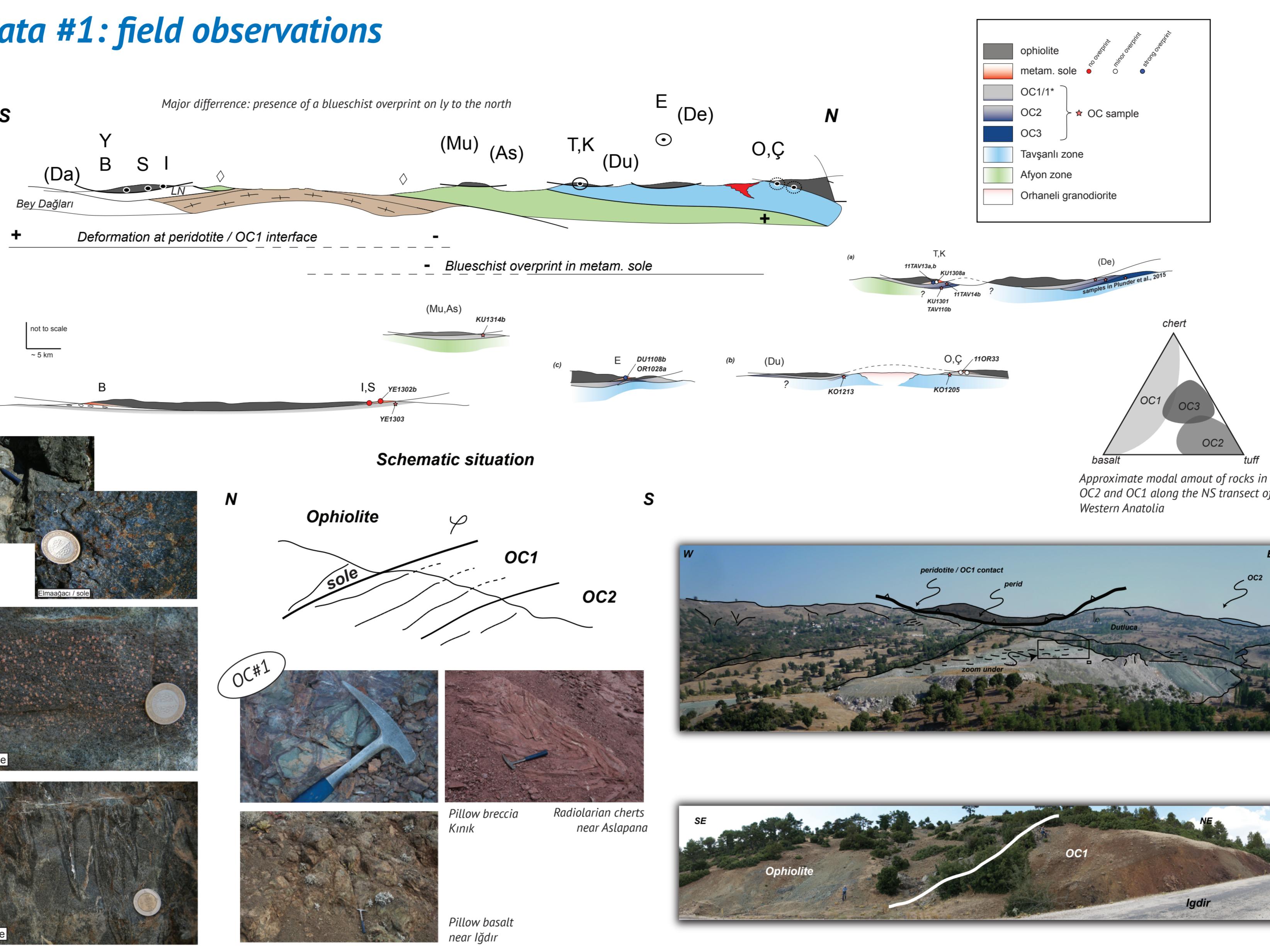
– how can the blueschist overprint observed in several metamorphic sole locations (unlike for Oman) be found in the same structural position and supposedly of the same age?

– how can one account for the (so far poorly described) diversity of variably metamorphosed oceanic units (often called oceanic mélanges) also found below the ophiolites, which are representing an accretionary complex formed during the subduction?

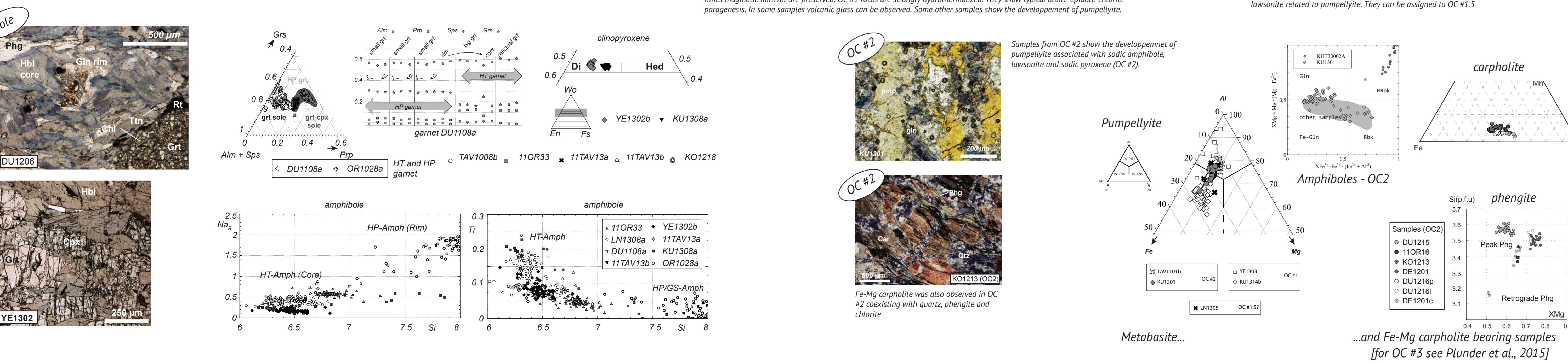


During Cretaceous times, the convergence between the Anatolide Tauride block (following the movement of Africa) and Eurasia lead to the closure of a branch of the Neotethyan ocean and to ophiolite obduction. Since the classical paper of Şengör and Yilmaz, (1981) it is widely assumed that all western Anatolian ophiolites are derived from the same Tethyan realm (northern branch of Neotethys), leading to a variety of similarly looking palaeogeographic reconstructions. Their common origin, however, is not well established: the absence of crustal sequences in both regions hinders correlations, the geographic distribution only allows the association of the northern ophiolites in one group and the southern in another.

2. Data #1: field observations

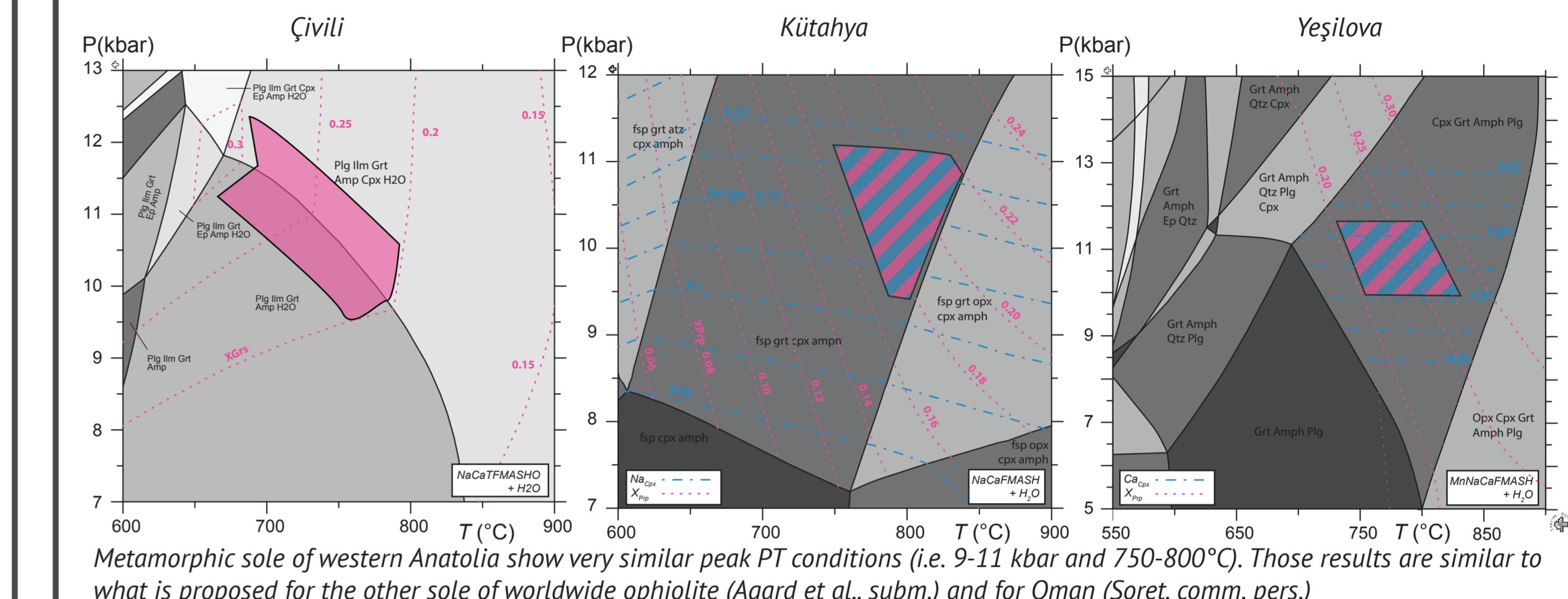


3. Data #2: petrology



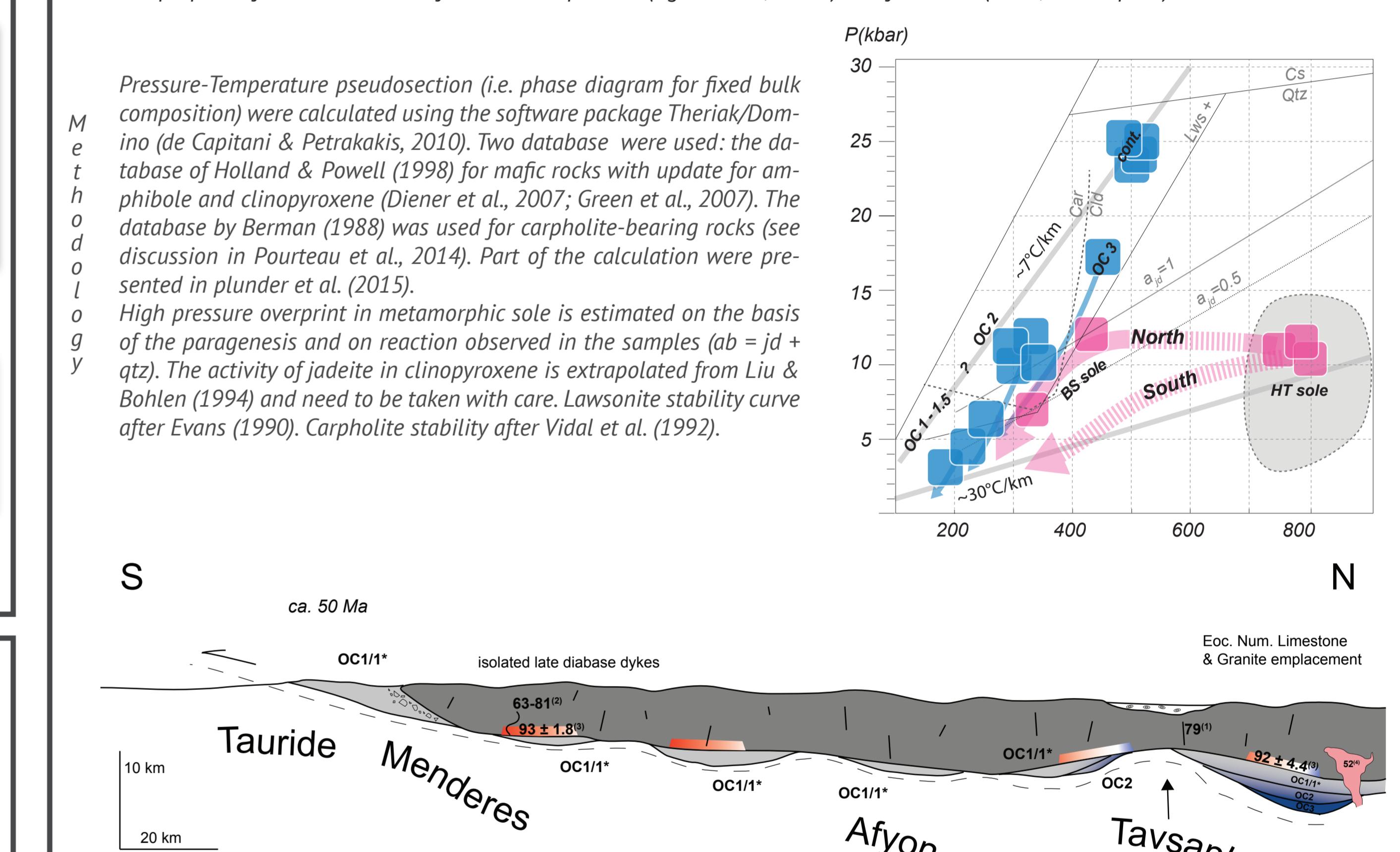
4. PT estimates

Incipient subduction: the metamorphic sole

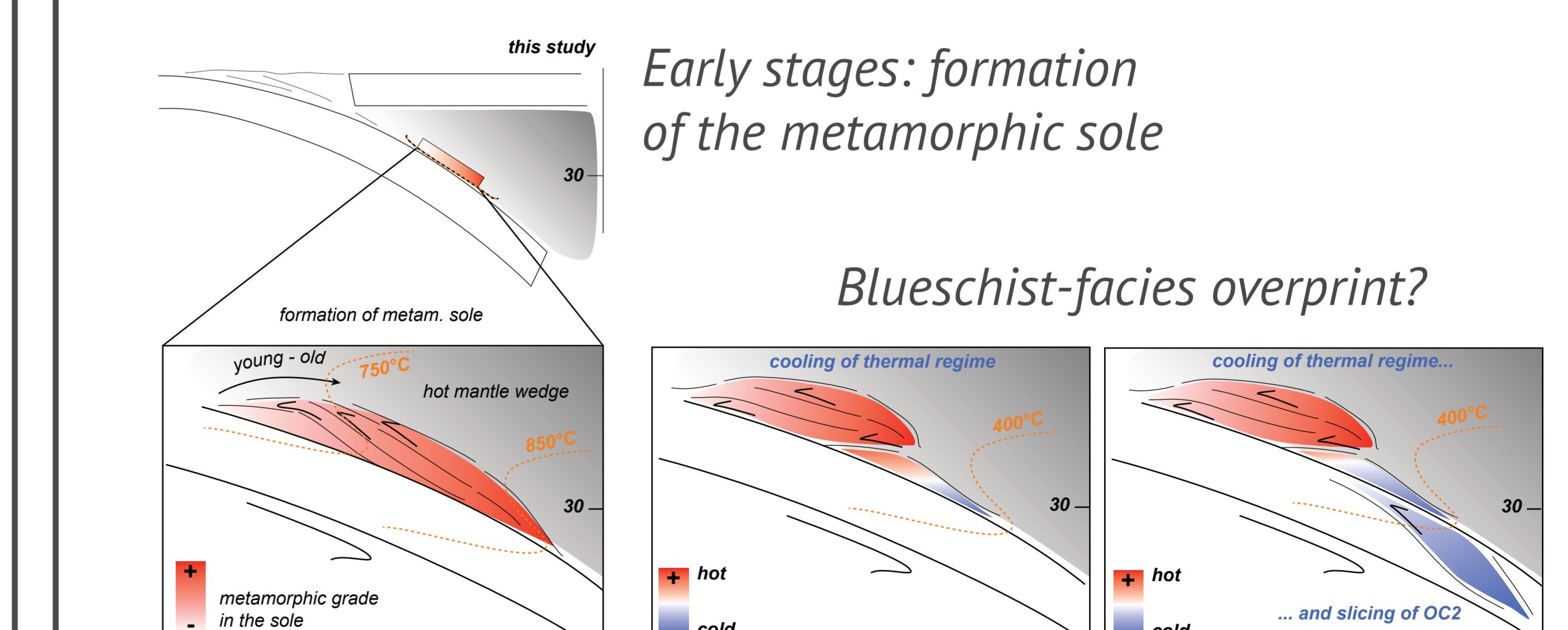


Pressure-Temperature pseudosection (i.e. phase diagram for fixed bulk composition) were calculated using the software package Theria/Domino (de Capitani & Petrakakis, 2010). Two database were used: the database of Holland & Powell (1998) for mafic rocks with update for amphibole and clinopyroxene (Diener et al., 2007; Green et al., 2007). The database by Berman (1988) was used for carpholite-bearing rocks (see discussion in Pouteau et al., 2014). Part of the calculation were presented in Plunder et al. (2015).

High pressure overprint in metamorphic sole is estimated on the basis of the paragenesis and on reaction observed in the samples ($ab = jd + qtz$). The activity of jadeite in clinopyroxene is extrapolated from Liu & Bohlen (1994) and need to be taken with care. Lawsonite stability curve after Evans (1990). Carpholite stability after Vidal et al. (1992).



5. Conclusions



Early stages: formation of the metamorphic sole

Blueschist-facies overprint?