

The tectono-sedimentary evolution of the Sivas ophiolite: Implications for pre to post-obduction processes in Anatolia

Etienne Legeay (1,3), Geoffroy Mohn (2), Jean-Paul Callot (1), Jean-Claude Ringenbach (3), Othmar Müntener (4), and Kaan Kavak (5)

(1) Laboratoire des Fluides Complexes et leurs Réservoirs, Université de Pau et Pays de l'Adour, Pau, France (etienne.legeay@univ-pau.fr), (2) Géosciences Environnement Cergy, Université de Cergy-Pontoise, Cergy-Pontoise, FRANCE, (3) Centre Scientifique et Technique Jean Feger, TOTAL, Pau, FRANCE, (4) Institut des Sciences de la Terre, Université de Lausanne, Lausanne, SWITZERLAND, (5) Department of Geological Engineering, Cumhuriyet university, Sivas, TURKEY

The Eastern Mediterranean in general and Turkey in particular preserve the remnants of several Neo-Tethysian oceanic basins consumed by north-dipping subductions during the Late Cretaceous prior to collision in the Paleogene. The Sivas basin, belonging to the Late Mesozoic to Cenozoic Central Anatolian basins, is located in a key position at the junction between 1) To the North, the Izmir-Ankara-Erzincan suture zone (IAESZ), 2) To the West, the Kırşehir block, 3) To the South, the Inner-Tauride suture zone (ITSZ). The obduction of ophiolite thrust sheets occurred during Campanian along the IAESZ, and ITSZ.

We focus our study on the southern boundary of the Sivas basin, where an ophiolite sequence is capped by Late Cretaceous to Paleocene post-obduction sediments. We present new field observations, new U-Pb zircon dating on magmatic rocks and geochemistry analyses to unravel the pre-obduction nature and origin of the ophiolitic basement and to describe the post-obduction tectono-sedimentary evolution.

The pre-obduction evolution show that: (i) the Southern Sivas ophiolite is characterized by highly serpentized peridotites, with minor magmatic intrusions, (ii) the top of the ophiolite is marked by detachment faulting with ophicalcites, (iii) the U-Pb zircon ages of the magmatic intrusions are constrained at ~ 90 Ma, (iv) geochemical data suggest a 'subduction signature' for the magmatic rocks. The, post-obduction evolution is characterized by the emplacement of Maastrichtian and Paleocene sediments carbonate platforms located on ophiolitic highs, associated to volcanoclastics turbidites in the trench northward in the Sivas Basin.

These results show that the southern Sivas ophiolite represents magma starved system sharing similarities with present-day (ultra-)slow-spreading systems. This ophiolite belongs to the ITSZ, in contrast to ophiolites located 40km northward from the IAESZ. To resolve the complex paleogeographic framework of East-Anatolia during the Cenozoic, we integrated information from ophiolite related sedimentary data and propose a new interpretation of the Eastern Anatolian paleogeography based on forearc basin geometry, consistent with the development of adjacent supra-ophiolitic basins (Ulukisla, Darendé and Hekimhan).