



Timing of subduction processes in Eastern Anatolia

R. Oberhänsli (1), O. Candan (2), E. Koralay (2), R. Bousquet (3), and A. Okay (4)

(1) Universität Potsdam, Institut für Erd- & Umweltwissenschaften, Potsdam, Germany (roob@geo.uni-potsdam.de), (2) Department of Geological Engineering, Dokuz Eylül Üniversitesi İzmir, Turkey, (3) Géosciences Rennes, France, (4) Eurasia Institute of Earth Sciences, Istanbul Technical University, Turkey

A new occurrence of eclogites was found in the Kesandere valley in the eastern most part of the Bitlis complex. These high pressure relics occur within the Bitlis basement rocks. These new findings complement eclogites from its central part at Mt. Gablor (Okay et al., 1985) south of Muş. There, kyanite-eclogites occur within garnet mica schists and gneisses. P-T estimates have been reported with temperatures between 600° and 650°C at 1.0 to 2.0 GPa. A correlation to the Menderes Massif and a Pan African age was suggested (Okay et al., 1985). The eclogites from Kesandere differ from the one described by Okay et al. (1985) at Mt Gablor as far as their lithologic association and protolith are concerned. P-T conditions for these eclogites have been estimated by the use of DOMINO (De Capitani and Brown, 1987). Pressures range between 19 and 24 kb while temperatures range between 480 and 540 °C. These P-T conditions are somewhat colder than those estimated by Okay et al. (1985) for the Gablor mountains further to the west of the Bitlis complex. ³⁹Ar/⁴⁰Ar in situ laser ablation age determination of Fe,Mg-carpholite and blue amphibole bearing metasedimentary cover rocks of the Bitlis complex (Oberhänsli et al., 2010,2011) gave 79-74 Ma for the peak metamorphic assemblage Fe,Mg-carpholite-chlorite-phengite and 74- 71 Ma for the retrograde assemblage chloritoid-chlorite-phengite-kyanite. Leaving a short time span for the exhumation from ca. 35 to 20 km depth that can be interpreted to exhumation rates between 3 to 2 mm/a. New U/Pb age data on zircon from the eclogites, subducted to ca 60 km, gave ca. 85 Ma for the magmatic cores. No age relevant data could be retrieved from the small metamorphic rims on the zircon grains. This leaves only a very short time span of minimum 5 to 6 Ma for subduction of the mafic rocks. Thus the rate of subduction was in the range of 12 to 10 mm/a. Due to immediate and again rapid exhumation one can conclude that the mid ocean ridge where the basalts were produced was close to the subduction trench.