

Age and provenance of detrital zircons from a sandstone turbidite of the Late Triassic-Early Jurassic Küre Complex, Central Pontides, N Turkey

Özge Karşlıoğlu¹, Timur Ustaömer¹, Alastair H.F. Robertson², Irena Peytcheva³

¹ İstanbul Üniversitesi, Jeoloji Bölümü, Avcılar 34320, İstanbul, Turkey (E-mail: jeozge@istanbul.edu.tr)

² University of Edinburgh, School of GeoSciences, Edinburgh EH9 3JW, U.K.

³ Bulgarian Academy of Sciences, Geological Institute, 1113 Sofia, Bulgaria

The Küre Complex is a structurally thickened wedge of siliciclastic sandstone turbidites, shales and minor carbonate sediments (~*Akgöl Flysch*) that are interleaved with tectonic slices and blocks of a dismembered ophiolite. Rare palaeontological data (e.g. pelagic bivalves and ammonoids) suggest a Late Triassic-Early Jurassic age for the Küre basin sediments, coeval with the better dated Tauric Complex in the Crimea. The Küre Complex is interpreted as a marginal basin that formed adjacent to the southern margin of Eurasia. The Küre basin was bounded to the south by a thick pile of mainly basic-intermediate composition meta-volcanics and volcanogenic sediments (Çangaldağ Complex) that is interpreted as a Late Palaeozoic-Early Mesozoic magmatic arc founded on oceanic crust and Devrekani Metamorphics (a continental fragment of presumably Precambrian age) to the S.

In this study we report the preliminary results of LA-ICP-MS U-Pb dating of detrital zircons from one sample of siliciclastic sedimentary rock of the Küre Complex. These were collected from the inferred southern margin of the Küre basin, close to the Çangaldağ Complex. The separated zircons are dominantly pink, although brown and colourless varieties also occur. CL images and Th/U ratios indicate that igneous zircons predominate. A total of 154 spot analyses were carried out on 90 zircon separates, of which 104 are 90-110% concordant. The source ages range from 178 Ma to 2543 Ma. The most prominent zircon population (40% of whole data) is dated at 270 Ma (Late Permian) to 202 Ma (latest Triassic). Less pronounced populations occur at 275-285 Ma, 300-307 Ma, 380-395 Ma and 440-430 Ma. Notably, Cadomian-aged zircons (550-600 Ma) which form the most prominent zircon population in Palaeozoic and older sediments/meta-sediments of many of the Turkish crustal blocks (i.e. İstanbul terrane, Central Sakarya Basement, Pular Metamorphics, E Taurides) is completely absent from the sample studied, as are Mesoproterozoic-aged zircons. However, a few Palaeoproterozoic- and Neoproterozoic-aged zircons are present. The zircon populations dated at 275-285 Ma and 300-307 Ma overlap with the reported crystallisation ages of the Deliktaş and Sivrikaya granitoids that intrude the Devrekani Metamorphics. Four zircon grains dated at ~500 Ma could also correspond to the reported intrusion age of the Büyükçay metabasics. However, there is no obvious source for the 380-395 Ma (Givetian-Frasnian) and 440-430 Ma (Llandovery) zircon populations in the nearby crustal blocks. Meta-granitic intrusions of 395-401 Ma are, however, known from the Sakarya Zone in the Biga Peninsula and from 430 Ma-aged metagabbroic intrusions in the N Caucasus.

Zircons dated as Late Permian-Late Triassic cluster into four time intervals separated by short time intervals that could record hiatuses in magmatism. The oldest interval is dated at 270-255 Ma (Late Permian). No igneous activity is recorded during 251-245 Ma (Scythian). Magmatism is recorded during 242-239 Ma (Anisian), 234-225 Ma (Ladinian-Carnian) and 218-205 Ma (Carnian-Norian).

We envisage the Çangaldağ magmatic arc as the most likely source for the Late Permian-Late Triassic zircon population in the sample studied. Our ongoing dating program in the region will test this hypothesis.

Keywords: Küre Complex; Sandstone; U-Pb dating; Central Pontides