



Geochronology of the basement of the Central Pontides, NW Turkey: a confirmation of Eurasian origin

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The Central Pontide orogenic belt of Turkey consists of pre-Late Jurassic tectonostratigraphic terranes, which include remnants of two Palaeotethyan oceanic basins, separated by a continental sliver (Devrekani metamorphics unit) and an oceanic arc⁽¹⁾. The Central Pontides include well preserved areas where the Early Cretaceous juxtaposition of the Western Pontides and the Eastern Pontides can be observed. The basement (Devrekani metamorphics unit) of the Central Pontides is exposed (in the Devrekani area), as a fault-bound tectonic window between the Küre complex to the north and the Çangaldağ arc complex to the south. During Palaeozoic-Mesozoic⁽²⁾, this units were soaked with mafic to felsic magmas, the Kastamonu granitoid belt. The Devrekani metamorphic unit is inferred to have rifted from the south Eurasian margin, to form a sliver within the Palaeotethys⁽¹⁾. The Devrekani unit is comprised of gneisses, amphibolites and metacarbonates, overlain by limestones and red basal conglomerates.

We present the first U-Pb and Pb-Pb zircon ages complimented by Sr-Nd-O whole-rock data for the Devrekani metamorphics unit exposed in the Musa valley, Devrekani area and Büyükçay valley, Sivrikaya area. The samples are metaluminous I-type to peraluminous S-type (ASI= 0.58-2.20) in composition, consistent with an origin from basaltic to felsic precursors. The isotope data: Sr_i (0.704 to 0.712), $\epsilon Nd_{(t)}$ (-1.4 to 6.8) and $\delta^{18}O_{whole-rock}$ values (8-12 ‰), indicate a continental arc setting and material contribution from mantle and crustal sources. Chondrite-normalized (cn) REE plot show fractionated patterns ($[La/Yb]_{cn}=6.4-27.6$) and negative Eu anomalies ($Eu^*/Eu=0.62-0.96$). Furthermore, samples have distinct troughs in the HFSE (Ba, Nb, Ti), consistent with those of arc rocks.

Zircon geochronology indicates that the rocks were formed during the Palaeozoic

Variscan magmatic events between 540 and 300 Ma. Late Variscan and Mesozoic ages (and Pb loss episodes) obtained from U-Pb and Pb-Pb zircon analyses; reflect regional metamorphism and magmatic growth of zircon during the Palaeozoic-Mesozoic⁽²⁾. Xenocryst ages in the range of 1.2 - 2.1 Ga indicate the presence of Proterozoic material. Our data suggest that the basement of the Central Pontides was a component of the Variscan orogenic belt.

References

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