



Zircon ages, geochemistry and isotope systematics of the extension-related Devrekani intrusion, Kastamonu granitoid belt (Central Pontides, Turkey), and geodynamic interpretation

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The Middle Jurassic Devrekani pluton (DG) belong to the Kastamonu granitoid belt (KGB)⁽¹⁾, and intrudes the Late Palaeozoic-Mesozoic imbricated basement units^(2,3). The DG includes low-K tholeiitic and medium-K, calc-alkaline, metaluminous I-type (ASI= 0.73-0.94) hornblende-biotite diorites, quartz diorites and tonalites. Rocks have moderate $\epsilon\text{Nd}_{(t)}$ values (-0.8 to -2.2) and relatively low initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (0.7052-0.7063). These features combined with high Mg# (74-86) suggest an origin through partial melting of mafic lower crustal source rocks with additional input of mantle-derived material. In addition, samples have almost flat chondrite-normalized (cn) REE patterns ($[\text{La}/\text{Yb}]_{\text{cn}} = 2.6\text{-}14.0$), and positive Eu ($\text{Eu}/\text{Eu}^* = 1.04\text{-}2.22$) and Sr anomalies, as well as high Y, HREE and relatively low Ba abundances suggest plagioclase accumulation played an important role. Overall, geochemical and isotopic data indicate the existence of two magma sources for the rocks: a depleted source with low initial $\text{Sr}_{(i)}$ and $\epsilon\text{Nd}_{(t)}$ ratios, and low $\delta^{18}\text{O}$ values (7.2-8.2 ‰) for the diorites, and an enriched source with intermediate compositions for quartz diorites and tonalites.

U-Pb and Pb-Pb zircon ages range from 185-160 Ma with a cluster at 165 Ma. The Latest Palaeozoic-Earliest Mesozoic saw the opening of the Küre back-arc marginal basin⁽²⁾ and brief southward underthrusting beneath the recently imbricated Palaeozoic-Mesozoic arc massif^(2,3,4), and probably the emplacement of the granitoids in the S of the KGB (e.g. Devrekani and Asarcik⁽¹⁾ intrusions). It could be concluded that post-collisional extensional tectonics that started at ~ 190 Ma with regional metamorphism⁽¹⁾ was accompanied by granitoids emplacement and fast tectonic ex-

humation till 165-155 Ma. Therefore, regional metamorphism, pluton emplacement in the S of KGB, and exhumation can be interpreted as products of post-collisional lithospheric detachment of the subducted Palaeotethys oceanic lithosphere from the continental lithosphere during collision of Gondwana- and Eurasia-derived fragments.

References

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