



## **Petrology and petrogenesis of syn-extensional granitoids in the Menderes metamorphic core complex, western Turkey - geodynamic implications for Aegean extension**

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Western Turkey, which forms the eastern part of the Aegean region, was subjected to continental extension that led to the formation of metamorphic core complexes and associated syn-extensional granitoids. This study deals with the syn-extensional Alaçamdağ, Salihli, Turgutlu, Koyunoba, and Eğrigöz granitoids in the Menderes metamorphic core complex (MMCC). Geochemical data have been used to classify these granitoids, to determine their geochemical characteristics, and to estimate the possible source regions and tectonic environment of magma generation and emplacement. We have also attempted to correlate the geochemical features and geodynamic setting of the syn-extensional granitoids in the MMCC with those of the granitoids in the Cycladic metamorphic core complex. Syn-extensional granitoids have granitic and granodioritic compositions and contain mafic microgranular enclaves (MMEs) of monzonitic-monzodioritic composition. They show transitional metaluminous/peraluminous, high-K, calc-alkaline and I type character. SiO<sub>2</sub> versus major element plots consistently show regular distribution patterns and negative correlation for Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO, CaO, Na<sub>2</sub>O, TiO<sub>2</sub>, P<sub>2</sub>O<sub>5</sub>, Sr, Y, Nb, Zr, but positive correlation for K<sub>2</sub>O, Ba, Rb, Th. All intrusive rocks display enrichment in large ion lithophile elements (LILE) and light rare earth elements (LREE) compare to high field strength elements (HFSE) and have high (87Sr/86Sr)<sub>i</sub> and low εNd(t) ratios. Syn-extensional granitoids of western Turkey appear to be associated with interactions between coeval crustal-derived felsic magma and enriched subcontinental lithospheric mantle-derived mafic magmas during crustal extension. It can be also noted that the magmas that produced the granitoids and the mafic microgranular enclaves have typical subduction signatures. Syn-extensional granitoids of western Turkey are geochemically similar to post collisional Aegean granitoids that was presumed to have formed within a back-arc environment. Retreat of the Hellenic/Aegean subduction zone seems to play a major role for development of extensive metamorphic core complexes and associated syn-extensional granitoids in the Aegean region.

**Key words:** Syn-extensional granitoids; mafic microgranular enclaves; hybrid magma; Sr–Nd isotopes; enriched subcontinental lithospheric mantle; lower crust; Back-arc extension