

Two-stage Uplift of Granite-Gneiss-Migmatite Complex (GGMC) of Çataldağ Core Complex (Western Anatolia, Turkey): the role of detachment faults on uplift processes

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The most recently identified core complex of western Anatolia (Turkey), the Çataldağ Core Complex (ÇCC) consists of a granite-gneiss-migmatite complex (GGMC) representing deep crustal rocks of NW Turkey and a shallow level granodioritic body (ÇG: Çataldağ granodiorite). The GGMC is Latest Eocene-Early Oligocene and ÇG is Early Miocene in age, and both were exhumed in the footwall of the Çataldağ Detachment Fault Zone (ÇDFZ) in the Early Miocene. On the basis of correlation of age data and the closure temperatures of zircon, monazite, muscovite, biotite and K-feldspar, the T-time history of GGMC reveals that GGMC has experienced at least two stages of cooling and uplift, from 33.8 to 30.1 Ma and 21.3 to 20.7 Ma. In stage I, from 33.8 to 30.1 Ma, the cooling rate of GGMC was relatively slow (35°C/my) however cooling rate increase dramatically to $\geq 500^{\circ}\text{C}/\text{my}$ in stage II between 21.3 and 20.7 Ma. T-time history also indicate that GGMC was elevated to the final location in at least 8-13 My according to the monazite and zircon and mica ages obtained from the same rock. Rapid slab rollback at the Hellenic trench at ca. 23 Ma may have increased extension rates leading to the development of detachment faults (i.e. ÇDFZ), core complexes and associated syn-extensional granitoids in Western Anatolia and the Aegean extensional province.