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Emplacement and uplift of shallow-seated granitoids in extensional coupled with compressional setting: the Eğrigöz granite, western Turkey

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Syn-extensional granitoids associated with metamorphic core complexes (MCC) are commonly considered to have been emplaced as diapirs into the footwall rocks beneath the detachment faults. However, role of high-angle shear zones during detachment faulting and their relationship with intruding granitoids were poorly understood. A series of granitoid exposures occur along the northern rim of the Menderes Massif which are spatially and temporally associated with extensional shear zones and low-angle normal faults. However, emplacement mode of granitoids and contribution of shear zones to their uplift history are not fully constrained. Therefore, we provide kinematic analysis of faults at the contact of the Early Miocene Eğrigöz granite in order to better understand the emplacement and uplift history in an extensional setting. The Eğrigöz granite is a shallow seated body, emplaced at depth of about 10 km and characterized by holocrystalline to porphyritic granites locally surrounded by leucogranites along the marginal parts. Northern margin of the Eğrigöz granite is bordered by at least 20 km long, NE-trending strike-slip shear zone, consisting of sericite- and quartz-rich ultramylonites overprinted by brittle faults. Microstructural studies on the fault rocks indicate a sinistral displacement defined by asymmetrical quartz porphyroclasts and recrystallized quartz ribbons. Eastern contact of the granite body was delineated by a series of NW-and NE-trending normal and oblique-slip faults restricted to the skarniferous contact zone, suggesting their synchronous development with the intrusive events. Western contact is intrusive into the basement metamorphic rocks without significant deformation. Kinematic analysis of faults suggests a dominant NE-SW-directed extension coupled with NW-directed compression, which is consistent with regional tectonic configuration. A series of NE-trending fold axes within the basement metamorphic units also confirm the presence of compressional forces. Uplift of the Eğrigöz granite appears to have been mainly accommodated by high-angle shear zones coupled with minor erosional processes rather than low-angle detachment faulting as previously suggested.