Geophysical Research Abstracts
Vol. 13, EGU2011-13053, 2011
EGU General Assembly 2011

Progressive Magmatism in Western Anatolia (Turkey)

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In the Aegean region, complex geodynamic processes including subduction, continent continent collision, and back-arc extension occurred from the Eocene to the present time. In NW Anatolia (Turkey), the products of these events are widely exposed. Especially, Eocene and Miocene granites along the northern border of the Menderes Massif demonstrate prominent geologic features associated with these complex geodynamic events. In order to see whole progressive magmatic evolution of the Western Anatolia and to understand its tectono-magmatic position in the Aegean region, during and after the collision of the Anatolide-Tauride platform with the Sakarya Continent, magmatic associations from Eocene to Miocene time were examined and gathered together by detailed mapping, geochemical, isotopic and geochronological studies.

According to our new results, the Eocene and Miocene granites are shallow seated bodies (4-7 km), granite-granodiorite and monzogranite in composition, and are I-type, calc-alkaline in nature. Their Sr-Nd-Pb-O isotopes are in line with derivation from lower-to middle crustal source lithology. It can be demonstrated that mantle to crustal assimilation during the magma generation played an important role. Within the emplacement natures and isotopic results of the Western Anatolian magmatic associations, considerable limitations are put forward regarding to previously suggested extensional related emplacement models. The magmatic associations in Western Anatolia were formed in two distinct separated phases; the first and the earliest phase resulted in progressive magmatism and formed the intrusive suites of the Western Anatolia during the Eocene- Miocene time long before the main extension phase started. The late phase is mostly associated with the extensional regime.