Geophysical Research Abstracts, Vol. 7, 00783, 2005
SRef-ID: 1607-7962/gra/EGU05-A-00783

Is the Horst between Gördes and Demirci Basins (Northern Menderes Massif, Southwest Turkey) a Gnessic Dome?

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Gneiss domes are common constituents of orogenic core zones and occur worldwide in orogens with various sizes and ages. Having an elongated shape aligned parallel to the trend of the orogen, they are characterized by a core of migmatites/plutons surrounded by high-grade metasedimentary rocks.

The rocks of the northern Menderes Massif on the horst between Gördes and Demirci basins resemble a typical gneiss dome stratigraphy. There, the area is represented by a core of migmatites and pegmatoid domes surrounded by high-grade schists and orthogneisses. The pegmatiods occur as a large elongate dome with a diameter of several kilometers; the long axis is aligned parallel to the local mineral stretching lineation. In this regard, the rocks of the horst between Gördes and Demirci basins resemble, by definition, a typical gneiss dome. Neogene sedimentary rocks unconformably cover the metamorphics.

The tectono-metamorphic history of the Menderes Massif - one of the largest core complexes in the world - involves an Eocene regional metamorphism, termed the main Menderes metamorphism (MMM), at upper-amphibolite facies. Subsequent exhumation of the metamorphics occurred along presently low-angle normal faults in the lower plate of which the metamorphics have suffered from first ductile (? greenschist facies conditions), then brittle deformation during a crustal-scale N-S extension. Synchronous sedimentation in the upper plate produced the Miocene clastics and lacustrine sediments. It is therefore speculated that the partial anatexis during the latest stages of the MMM was the main mechanism for the formation of migmatites, and that the pegmatoid domes intruded either (i) during and/or after very late increments

of this metamorphism or (i) during the early increments of the N-S continental extension. However, there is need to test this hypothesis through geochronological and thermochronological ages, which forms the subject of our recent reasearch.

Keywords: Gneiss dome, core complex, Menderes Massif, southwest Turkey