



Blueshists and eclogites in southern Sifnos (Cyclades, Greece)

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Occurrences of high-pressure/low-temperature eclogite/blueshist facies rocks in the south-west of Sifnos, (Cyclades) are marked in the geological map by Davis (1966), but their geochemistry, petrology and structural position have never been investigated in detail. These occurrences at the Fikiada Bay are the focus of this study. The tectono-metamorphic evolution on Sifnos is characterized by a regional blueshist / eclogite facies metamorphism (M1) during the Eocene, followed by a regional Oligo–Miocene medium pressure overprint (M2). The investigated rocks from the Fikiada Bay area formed during M1 but were overprinted by a brittle / ductile M2 event.

Similar lithologies in the north of Sifnos have been described in detail by several authors and are comparable with the high-pressure rocks from Fikiadia in terms of mineralogy, petrography and metamorphic grade. Both high-pressure occurrences are found in a high lithostratigraphic position in the upper parts of the Sifnos marbles and are characterized by marbles with boudinaged lenses of dolomites.

The Fikiada occurrences consist of alternating garnet- rich dark blueshists with albite- ± carbonate- rich gneisses and interbedded eclogites. These lithologies are embedded in highly strained calcite marbles with boudinaged lenses of dolomites. The commonly observed stretching lineation strikes NE-SW and records a consistent shear sense towards NE.

The high-pressure rock assemblage is overprinted by brittle / ductile to brittle extensional structures. A conjugate system of high-angle brittle normal faults striking roughly NW-SE indicate NE-SW extension, which interact with low-angle, brittle / ductile shear zones. SCC'-type foliation and synthetic Riedel shear zones indicate a SW-directed shear sense consistent with the S-directed M2 event in the Western Cyclades.

All structures are cut by younger, several meters thick cataclastic strike- slip- fault zones associated with proto- to ultracataclastic fault core zones. The fault cores and the pervasively jointed processes zones are associated with dolomitization of the originally mylonitic calcite marbles. Late volcanic dykes with a thickness of less than 30 cm intruded into these brittle fault zones.

References:

Davis, E. N. (1966): Geological map of Greece, Siphnos, 1:50 000, Institute for Geology and subsurface research, mapped by Davis, E. N., Athens, 1966.