



Deformation patterns on Kythnos, Western Cyclades; ongoing work

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Kythnos lies between Kea and Serifos in the Western Cyclades; on the former island, top-SSW directed D2 extensional deformation has essentially fully overprinted the top-SW HP D1 deformation whilst, on the latter, the D2 reworking is restricted to a very narrow zone directly underlying the West Cycladic Detachment System. Kythnos shows an intermediate degree of reworking, with a gradual change in stretching lineation orientation from dominantly SW-directed in the north of the island to SSW-directed in the south, where the Western Cycladic Detachment System is exposed, although the gradient in lineation directions is neither smooth nor perfect. Further, at a single outcrop, in both domains, there is a tendency (but not a rule) for stretching directions within pelitic rocks (which are parallel to contemporary crenulations) to have a more southerly azimuth than that observed in quartz-rich rocks, both metasedimentary and concordant/discordant veins. The opposite has not been observed. The map of de Smeth (1975) shows two marble horizons; a lower blue-grey marble (BGM) with minor amounts of muscovite/quartz and an upper yellow-brown marble (YBM) with large amounts of muscovite/quartz; these are separated by pelites. On the east side of southern Kythnos, the BGM is thick (perhaps > 10 m in places) and is clearly overlain by pelitic schists and then the YBM, the last forming the structurally highest part of the central-southern part of the island. However, NE of Aghios Dimitrios, (S. Kythnos) good exposures clearly show that the BGM thins from west to east and eventually, at the west coast NW of Ag. Dimitrios, it becomes a thin layer of carbonate within yellow quartz mylonites; essentially it is YBM, although de Smeth mapped this still as BGM. Some 3.5 km further north, however, de Smeth mapped exactly the same high-strain lithology as YBM. This band of high strain rocks (YBM) crops-out intermittently along the west side of the island and is likely a continuation of the footwall part of the exposed West Cycladic Detachment System in the extreme SW of the island. The cause of the change from BGM in the east to YBM in the west is enigmatic. A primary sedimentary variation is unlikely, as it is parallel to the stretching direction; syn-tectonic dissolution seems more likely, but implies a massive fluid flow through the rocks.

The confusion between BGM and YBM is seen elsewhere, with, for example, the map showing BGM changing to YBM across a normal fault, with little apparent offset of the marble boundary. Clearly, the map of de Smeth (1975), although very good in general, needs careful reworking. More important, it is potentially obscuring significant large-scale structures by mapping the same marble as two different lithostratigraphic units.

Work is ongoing in the area.