

Coastline reconstruction and location of stone quarries in the context of the Archaic sanctuary on Despotiko Island (Aegean)

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Despotiko is a small, presently uninhabited island, southeast of Antiparos in the central Aegean with a surface of almost 8 km². At present the only natural occurrences of fresh water on the island during the summer are two small water seeps in the northwest part of the island. The first geological mapping of the island has been carried out by Αναστασόπουλου (1963). Tectonically, Despotiko, Antiparos and Paros, belong to the Attic-Cycladic Crystalline of the Central Hellenides, a stack of metamorphic tectonic nappes, mainly comprising variable types of gneiss, schist, marble and amphibolite, and tectonic slices of unmetamorphosed sediments on top, separated by low-angle normal faults from the metamorphic units below. Structurally, Despotiko is characterized by foliation surfaces dipping quite uniformly towards the southwest at shallow angles, with stretching lineations plunging in the same direction. Folds have been observed rarely; usually they are isoclinal folds with fold axes parallel to the stretching lineation. The metamorphic rocks are cut by steep, northwest-southeast trending brittle faults, some of them showing displacements of several hundred meters.

Submerged archaeological structures at the sea bottom of the Órmos Despotiko (Morrison, 1968), a Classical marble inscription from the sanctuary (Κουράγιος, 2009) and partly submerged agriculture trenches at the east coast Despotiko, indicate that the relative sea-level in this area was some 3 m lower during the Early Bronze Age and still more than 1 m lower during Classical time (Draganits, 2009). These values are comparable with other recent sea-level reconstructions on other islands of the Cyclades (Lambeck & Purcell 2005, Evelpidou et al. 2009, Desruelles et al. 2009,

Kapsimalis et al. 2009, Poulos et al. 2009). Neglecting possible vertical tectonic movements and by means of the present sea floor bathymetric configuration the sea level reconstruction would imply the existence of an isthmus between Despotiko, Kimitiri and Antiparos linking the islands at least until Classical time. The existence of an isthmus would not only have altered the communication paths between the two islands, but Despotiko Bay would also have been even better protected from northwest winds than at present. Despotiko is situated almost exactly in the centre of the Cyclades (as defined nowadays), more so than Delos. This advantageous location, combined with a spacious and protected bay, may explain its former importance as stepping-stone in the Aegean Sea (Broodbank 2000, Kourayos 2006). Obviously, more geomorphologic studies and dating of archaeological remains on the sea floor are essential for a more accurate reconstruction of the local relative sea-level rise.

The Archaic sanctuary is situated on a gently northeast dipping slope in the northeast part of Despotiko, in range of sight of the Órmos Despotiko. Since 1997 large parts of this important sanctuary have been excavated during several excavation campaigns. The sanctuary consists of a main building (building A) with 5 rooms, which is situated on the west side of a rectangular court with several more buildings on the north side. Additional buildings exist towards the northeast, closer to the coast. Most of the buildings date to the Archaic and Classical periods, although finds from later periods witness activities in this area also during later times. Southeast of the building A several buildings small, irregular rooms with inferior masonry quality and abundant re-used archaic/classical building stones are from the medieval period (Κουράγιος, 2009).

In building A of the archaic sanctuary six different lithologies have been recognized in the building stones. So far no samples have been taken from the building stones, therefore their lithological description is based on macroscopic inspection of in situ stones, aided by a pocket lens (10 x magnifications) and a grain size comparison chart and as long as they are not supported by additional analyses like thin-section inspection, bulk chemistry, isotopic composition, etc., which obviously demand the use of samples from the building stones, they remain preliminary. (i) Medium grained white calcite marble with thin, rose-coloured dolomite marble layers (marble 1), (ii) coarse, white calcite marble (marble 2), (iii) white mylonitic gneiss and (iv) grey granite gneiss represent the most important

lithologies, while (v) dark grey banded calcite marble and (vi) yellowish calcarenite (“lithos poros”) have been found only rarely (Draganits, 2009).

The ashlar eastern façade of building A is exclusively made of marble 1, which is also commonly used rough or variably dressed for all other walls. The large and very well finished thresholds are solely made of marble 2. Partly dressed or rough white gneiss is used for the inner side of the buildings eastern wall as well as for most other walls and represents by far the most common foundation stone. A detailed geological map of Despotiko at the scale of 1:5,000 has been produced and provides essential information about the distribution of different rock types on the island. With exception of marble 2 all rock types of the building stones in building A of the sanctuary can be found on Despotiko and therefore theoretically could originate from the island. Possible local provenance of at least some building stones is further supported by more than 12 (presently undated) quarries located in distances between 400 to 1200 m around the sanctuary: white gneiss (8), dark grey calcite marble (1), white calcite marble resembling marble 1 (2 clusters), dolomite marble (1) and calcarenite (1). The location of the quarries improves our insights into ancient exploitation of local stone resources on a Cycladic island and contributes to the recognition and preservation of this kind of underrated cultural heritage (Kokkorou-Alevras et al. 2009, Abu-Jaber et al. 2009).

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