



Pleistocene sand ramp deposits in the Aegean (Cyclades, Greece)

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Yellowish calcarenite is found abundantly on Despotiko, a small, unpopulated island in the central Aegean. Up to several meters thick layers of this sandstone is found as discordant cover above greenschist to amphibolite grade metamorphic rocks of the Attic-Cycladic Crystalline of the Central Hellenides. In some cases reddish soil is found below the sandstone. The calcarenite preferably fills preexisting relief of the underlying crystalline, therefore the thickest occurrences are found in the intermittent creeks. The sandstone can be traced from below sea-level up to around 90 m altitudes with abundant occurrences, but is most common at the north and northwest coast of the island. Generally, the sandstone layers and the internal lamination are parallel or at shallow angles to the slopes of the underlying crystalline without forming any morphological terraces. In some cases continuous layers of the sandstone can be traced for more than 20 m altitude. Cross-bedding has been observed in very rare cases and dips steeply towards the SE.

The calcarenite (locally called "lithos poros") is strongly dominated by marine bioclasts (Corallinaceae, foraminifera, gastropod and bivalve fragments, etc.) with only minor siliciclastic components hardly exceeding 20%. The grains well-rounded and well-sorted with grain sizes range between medium sand to granule sizes. Based on the sandstone distribution in a high range of altitudes, sedimentary structures (e.g. pin-stripe lamination, high-angle cross bedding, rhizoliths, occurrence of terrestrial gastropod shells and correlation with almost identical sandstones in the Mediterranean) we conclude an aeolian origin and probably Pleistocene age of this sandstone. Horizons containing dm-sized, angular metamorphic clasts within well-rounded and well-sorted aeolian layers point to interaction of wind-blown and talus processes. Therefore these sediments are interpreted as sand ramps that formed during increased aeolian activity during the Pleistocene, compared to present conditions. Different settings are further supported by the scarcity, very small size, small grain size and dominance of siliciclastic grains of currently active sand dunes on Despotiko compared to the Pleistocene calcarenite.