

TITLE

UNRAVELLING THE FORMATION OF THE CYCLADIC BLUESCHIST UNIT AND BASEMENT
IN THE SOUTHERN CYCLADES, GREECE

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ABSTRACT

Sikinos and Ios islands, located in the Southern Cyclades, are part of a metamorphic core complex system that exposes subduction-related metamorphic rocks in the highly-extended back-arc region of the Hellenic subduction zone. The units exposed on the islands are the Mesozoic metasedimentary rocks of the Cycladic Blueschist Unit (CBU) and Paleozoic ortho- and paragneisses of the Crystalline Basement Unit (CB). The nature of the contact between the CBU and CB has been variably described as either an extensional shear zone or a subduction-related thrust that was reactivated as an extensional top-to-the-N detachment. This study employed zircon U/Pb geochronometry to constrain, the crystallization ages of the CB on Sikinos island, the Maximum Deposition Ages (MDA) of the metasedimentary units, and the detrital provenance of these rocks. These data allow to establish of a stratigraphic framework for the CBU and CB, elucidate the nature of the contact, and shed light on the subduction processes and pre-subduction paleogeography. The results reveal that (1) the CB is composed of early Paleozoic metasedimentary rocks intruded by Carboniferous granites, (2) the CB is unconformably overlain by Permian and Mesozoic metasedimentary rocks of the CBU, (3) the CBU stratigraphy is decipherable and its deposition spans from Permian to Late Cretaceous. This chronostratigraphic framework is also supported by the detrital zircon provenance U-Pb record that provides an additional stratigraphic fingerprint. These relationships in Sikinos demonstrate a nearly continuous stratigraphic record from the CB into the CBU and argue for a depositional contact and against both a subduction or extension-related structural juxtaposition of the CBU and the CB. However, the same stratigraphic constraints exhibit old-over-young relationships in NE Sikinos and Ios, supporting structural repetition by thrust imbrication of the CBU slivers as a result of underplating during subduction in the Paleogene.



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