



Defining the tectonostratigraphy of the central Attica Peninsula, Greece, using detrital zircon geochronology

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New U-Pb detrital zircon geochronology from Hymittos mountain, Attica Peninsula, Greece, was collected in order to supplement preliminary regional data and resolve the local tectonostratigraphy of the West Cycladic Detachment System. The Attic-Cycladic Complex exposed on the Greek mainland and the Cycladic Islands is characterized by the HP-LT rocks of the Cycladic Blueschist Unit (CBU). The CBU underwent HP conditions during Eocene subduction and was overprinted by greenschist-facies metamorphism during Oligo-Miocene syn- and post-orogenic exhumation. The overprinting relationships complicate investigating the pre-Miocene history of these rocks. U-Pb detrital zircon geochronology circumvents this overprint and allows for correlation of tectonostratigraphic units within the local Attica peninsula and throughout the central Aegean.

A local tectonostratigraphy for Hymittos has been identified consisting of three units separated by a pair of major low-angle, ductile-brittle faults. The uppermost calc-phyllites of the Alepovouni unit possess a quartz-muscovite-calcite \pm epidote \pm chlorite assemblage. In places these phyllites are underlain by the low-grade, calcitic Alepovouni marble. The main lithotype of the middle unit is the Kaissariani calc-schist, with a quartz-calcite-muscovite-chlorite-chloritoid mineral assemblage. Underlying the Kaissariani calc-schist is the calcitic Lower Marble, described as having varying degrees of mylonitization. The lowest unit is comprised of the variably-dolomitic Pynari marble and the Triassic quartz-muscovite-calcite-chloritoid Vari schist. Notably the Vari schist exposed on Hymittos does not include metavolcanics as is commonly observed to the southeast in the Lavrion District. Overlying and commonly intercalated with the Vari schist are calcitic marbles which frequently exhibit a mylonitic foliation. The faults separating the three tectonostratigraphic units exhibit top-to-S/SW shear senses as indicated by flanking folds, sigmoid, and SCC' fabrics in the schists of the middle and lower units.

To thoroughly classify the tectonostratigraphy of Hymittos, metasedimentary samples were dated from the northern, central and southern regions of the mountain to fully investigate the detrital zircon record of the Attic-Cycladic Complex in the central peninsula. Preliminary geochronology on Alepovouni, Kaissariani and Vari samples has identified two discrete U-Pb detrital zircon age populations. The Alepovouni Unit contains a dominant probable Alpine age signature, with Triassic, Devonian, Ordovician, and Neoproterozoic age populations. In contrast, the Kaissariani Unit and Vari schist have an inferred Pan-African signature defined by a main age population straddling the Paleozoic-Proterozoic boundary, and secondary populations in the Triassic and Mesoproterozoic. These discrete zircon age populations are separated by the uppermost major fault. Similarities between zircon age populations of the Kaissariani and Vari units indicate that branches of the lower detachment within the CBU do not separate markedly different rock packages. Comparison between the current detrital zircon data for Hymittos and the Lavrion District to the southeast suggests that a coherent regional tectonostratigraphy may be defined for the greater Attica peninsula. In light of this, the U-Pb detrital zircon geochronology data from this study will allow for further correlation of samples between less-studied lithotypes on the Attica Peninsula and lithotypes from the Cyclades.