A reconstruction of the Cycladic Blueschist Domain (Cyclades, Greece)

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The birth and death of oceanic areas have often proved to involve contemporaneous destruction of previously created and evolved oceanic domains and the initiation of new ones in back-arc areas. As a result, several and often competing geodynamic processes, have been taking place at the same time, thus creating a complex tectonostratigraphy.

The Attic-Cycladic Crystalline Complex (ACCC), in the Aegean Sea (Greece), the outcome of the formation and destruction of Paleotethyan and Tethyan oceanic domains, is one such case. Four major units have been identified in the ACCC. These are from top to bottom, the complex Upper Cycladic Nappe, the Cycladic Blueschist Unit, the pre-alpine Cycladic Basement, and the Basal Unit. The present-day configuration has resulted from an Eocene stage of subduction and metamorphism under blueschist to eclogite facies and an Oligocene-Miocene exhumation and metamorphic core complex formation, through a combination of contractional and extensional mechanisms. Original relations between these four units have been obscured from the Cenozoic tectonometamorphic processes and several conflicting views have been expressed in the literature, regarding the nature of the Cycladic Blueschist domain, the relation between the Cycladic Blueschist Unit and the Cycladic Basement.

In this paper, we make a reconstruction of the domain, from which the Cycladic Blueschist Unit originated, based on a synthesis of structural, tectonostratigraphic, geochemical, and geochronological data. Through this reconstruction, we attempt to reconcile existing controversies and differences of views in the literature and to highlight the major structures that controlled the main features and geological evolution of this remarkable area.