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Tectonic reconstruction of Cyprus reveals Late Miocene continental collision between Africa and Anatolia

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The extended northern margin of Africa is currently under-thrusting northward below Cyprus. The onset of this collision is poorly constrained, but is critical if we are to quantify continental under-thrusting and then evaluate what role collision may have played during spectacular recent uplift of Southern Turkey from ∼7Ma to present. Northern Cyprus contains the Upper Cretaceous to Miocene age North Cyprus basin that unconformably overlies and reworks a greenschist-facies metamorphosed passive margin sequence that exhumed in Late Cretaceous time to the sea floor. This sequence has been deformed into the Kyrenia fold-thrust belt. The structure of this belt is poorly constrained, but based on stratigraphic documentation of uplift and subsidence was previously proposed to have formed during Eocene and Late Miocene and younger stages. In this paper, we re-evaluate the stratigraphic evolution of northern Cyprus and document and balance the modern structure to test whether thrusting of Kyrenia with Turkey was entirely Miocene, or also Eocene in age. Our results demonstrate that basin formation after Late Cretaceous burial and exhumation We show that the early stages of formation of the North Cyprus basin, in Late Cretaceous to Paleogene time, were associated with emplacement of irregular, laterally discontinuous olistoliths – previously interpreted as post-sedimentary thrust slices, derived from underlying metamorphosed basement, as well as ophiolitic melange, and oceanic crust. The North Cyprus basin together with slices of underlying metasedimentary basement were deformed into the Kyrenia fold-thrust belt that records at least 15km of shortening as a result of ∼9-7 Ma thrusting. We find no evidence that stratigraphically documented Eocene uplift is associated with thrusting on Cyprus. When placed in a plate reconstruction, we suggest that the Kyrenia metamorphics are best interpreted to be part of the north African extended continental margin, with metamorphism and exhumation following upon Late Cretaceous Troodos ophiolite obduction. Eocene uplift is documented along the entire Arabian margin and may result from flexure or dynamic topography. We interpret the 9-7 Ma Kyrenia as the result of Africa-Anatolia collision. The African crust that is seismically imaged below the Tauride fold-thrust belt to the north then arrived in that location in the late Pleistocene and may have been responsible for the latest stages of Tauride uplift.