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The Güira de Jauco amphibolite complex (eastern Cuba). A record of early Campanian collision in the Caribbean plate.

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Petrological, geochemical and regional geological arguments suggest that the Güira de Jauco amphibolite complex (eastern Cuba) constitutes the metamorphic sole of the huge Cretaceous back-arc related Mayarí-Baracoa ophiolite belt and, hence, this complex is of major interest for deciphering the deficiently known intra-oceanic orogenic history of the Caribbean belt. The amphibolites have subalkaline low- to medium-K basaltic compositions. Chondrite-normalized REE patterns, ranging from flat LREE-depleted to slightly LREE-enriched patterns, and discrimination geochemical diagrams suggest N- to E-MORB protoliths. The peak mineral assemblages are formed by plagioclase (Xab=0.50-0.80), calcic amphibole (pargasite-edenite), titanite, ±epidote, ±quartz, ±diposide, ±garnet (Xalm = 0.45-0.48, Xgrs = 0.41-0.47), typical of epidote amphibolite facies. Retrograde albite, actinolite, clinozoisite, and chlorite record greenschist facies overprint. Peak P-T estimations are 650-750 ºC and 7-10 kbar, corresponding to an apparent geothermal gradient of 25ºC/km. 40Ar/39Ar step-heating dating of hornblende from three samples yielded ages of 76.6±2 Ma, 78.4±2 Ma and 80.7±7.5 Ma. These arguments, the strong syn-metamorphic deformation of the complex, and stratigraphic data of the eastern Cuba volcanic arc indicating lack of activity at (roughly) Mid-Campanian age indicate onset of collision and ophiolite obduction towards the NE in the back-arc environment of the region shortly before 80 Ma (early Campanian), i.e. more than 10 Myr before subduction/collision/accretion of platform- and arc-derived high-pressure metamorphic units took place in the leading edge of the Caribbean plate (Guatemala, Cuba and Dominican Republic) in response to arc-continent collision (from 70 Ma to Eocene). Such early Campanian age of onset of oceanic tectonic shortening can hardly be related to subduction/collision of the thick oceanic Caribbean lithosphere with the Caribbean arc, for no geochemical signature of plateau basaltic crust has been identified in the Güira de Jauco complex and associated ophiolites. Instead, we suggest a long lived late Cretaceous-Tertiary orogenic activity in the leading edge of the plate.