

## Larger benthic foraminifera from the Azuero Peninsula (SW-Panama) define Eocene accretionary events and an arc gap along the trailing edge of the Caribbean Plate

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The Azuero Plateau, the trailing edge of The Caribbean Large Igneous Province (CLIP), is overlain by ribbon-cherts dated by radiolarians as Coniacian-Santonian. Proto-arc dikes crosscut the Azuero Plateau and the unconformably overlying Upper Cretaceous sediments. The latter consist of hemipelagic carbonates, the Ocu Formation (Fm.), and of volcanoclastics, the Quebrada Quema Fm., both dated by globotunoids as Late Campanian to Maastrichtian. Upper Cretaceous larger benthic foraminifera and rudist fragments were reported by early workers in the Ocu area, suggesting the presence of carbonate shoals on early arc volcanic edifices. A recently published crystallization <sup>238</sup>U/<sup>206</sup>Pb-age of zircons dates the oldest (Cerro Montuoso) batholith of W-central Azuero as 66.4 ± 0.3 Ma (latest Maastrichtian).

The Azuero Plateau is bounded towards the SW by the Azuero-Soná Fault Zone and the adjacent Azuero Subduction Mélange that contains fragments of oceanic seamounts dated by globotunoids as early Maastrichtian.

The Azuero Accretionary Complex occupies the SW-corner of the Azuero Peninsula. It is principally composed of two well-preserved oceanic seamounts. The Hoya seamount to the W is made of intrusives, subaerial and submarine lava flows with interbedded carbonates. Pelagic carbonates yielded *Morozovella* sp. indicate a late Paleocene – early Eocene age. Shallow water carbonates yielded the association of *Neodiscocyclina barkeri*, I sp., *Euconoloides* sp. cf. *E. wellsi* and *Amphistegina undecima*, indicating an early Eocene age.

The Punta Blanca Seamount to the E is characterized by a several km thick sequence of submarine/subaerial basaltic lava flows regularly interbedded with carbonates. Most shallow water facies only contain rhodophytes and bivalve bioclasts. Only one calcarenite yielded *Pseudophragmina anconensis* and *Orthophragmina* sp. suggesting an early-middle Eocene age.

The Covachón Fm. is the first overlap sequence in which chaotic deposits with up to 50 m sized blocks document the accretion of the seamounts. LBF collected from several localities indicate a middle Eocene age of the accretionary events. These resulted in a shutdown of the arc between 49 and 36 Ma (late Ypresian – earliest Priabonian), reflected by a lack of <sup>238</sup>U/<sup>206</sup>Pb zircon ages from intrusives. Covachón facies range from distal volcanoclastic turbidites to chaotic megabreccias and up to nearshore conglomerates, documenting fast tectonic uplift.

At Puerto Escondido, a stratigraphic base of the Covachón Fm., is formed by cross-bedded detrital limestones resting unconformably on seamount basalts. They contain winnowed small LBF: *Euconoloides* sp., *Amphistegina grimsdalei*, *A. praegrimsdalei* and *Pseudophragmina* sp. suggesting a Middle Eocene age. In the chaotic facies at Covachón Beach the matrix of the debris flows yielded *Asterocyclina* spp., *Neodiscocyclina marginata*, *Lepidocyclina* spp. and *Polylepidina* sp. suggesting a Middle Eocene maximum age. Detrital zircons from the turbiditic facies yielded a 42 Ma minimum age (late Lutetian).

The Tonosí Fm. represents a several 100 m thick deepening upwards forearc series that ranges from paralic to turbiditic facies of late Eocene to Oligocene age. Its base onlaps time-transgressive on older formations and basements documenting progressive drowning of the Azuero Arc Complex. The youngest zircons of the upper Tonosí yielded <sup>238</sup>U/<sup>206</sup>Pb ages around 36 Ma (Priabonian). The Río Pedregal paralic facies include well rounded polymict conglomerates and encroach unconformably on accreted seamount rocks and deformed packages of Covachón Fm. The conglomerates contain pavements of large oysters (*Pycodonte* sp.) and a detrital matrix with abundant large *Lepidocyclina* spp., pseudophragminids spp. and *Asterocyclina* spp. indicating a late Eocene age.

The Guerita River exposes herringbone cross-bedded bioclastic limestones, unconformably overlying the Upper Cretaceous Rio Quema Fm. They are made of abundant *Operculinoides* spp., suggesting an Oligocene age. Another inland outcrop is rich in large *Lepidocyclina* spp., among them *L. tournoueri* and *L. undosa* with an Oligocene age.