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Palaeocene to Oligocene Foraminifera from the Azuero Peninsula (Panama): The timing of seamount formation, accretion and forearc overlap, along the Mid-American Margin

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Larger benthic and planktonic Foraminifera recovered from limestones and debris flows in the Azuero Peninsula (Panama) allow to date the formation of accreted seamounts, the time of their docking along the Mid-American convergent margin, as well as the diachronous onset of forearc sequences on accreted terranes.

Interflow pelagic to offshore limestones from the Hoya Seamount Unit: Paleocene-early Eocene ages are indicated by *Morozovella*-type planktonic foraminifera and small *Amphistegina* spp. An early Eocene age is indicated by the association of *Discocyclina barkeri*, *Pseudophragmina* sp., *Euconoloides* sp. cf. *E. wellsi* and *Amphistegina undecima* (Pl.1 Figs.1-4). Calcarenites interbedded with lava flows of the Punta Blanca seamount Unit reveal an early to middle Eocene age by the presence of *Pseudophragmina ancoensis* and *Orthophragmina* sp. (Pl.1 Figs.7-8). These findings document synchronous Late Palaeocene to early-middle Eocene volcanic construction and carbonate sedimentation in at least two Pacific seamounts, that outcrop in the SW-corner of the Azuero Peninsula.

Middle to late Eocene ages are indicated by rich assemblages of Larger Benthic Foraminifera both in tectonic mélanges that overlie the seamount sequences, as well as at the base of the unconformably overlapping Tonosi forearc-sequence. *Discocyclina* sp. and *Lepidocyclina polylepidina* (Pl.1 Figs. 5-6). suggest a middle Eocene age maximum age for the debris flows found in tectonic mélanges that formed during accretion of the seamounts. *Pseudophragminides* ssp., *Asterocyclina* in the older, paralic facies and abundant *Lepidocyclina* spp., and rare *Operculinoides* sp. (Pl.1 Fig. 9)., in the younger pure carbonate facies suggest a middle to late Eocene age for the unconformable onset of the Tonosi forearc sediments in SW-Azuero.

Oligocene ages are determined from shallow water limestones at the base of Tonosi in central Azuero documenting the progressive onlap of this fore-arc sequence onto the Late Cretaceous plateau and arc "basement". At least two distinct facies are characterized by: 1. abundant flat *Nummulites* spp. (Pl.1 Figs.10-11) and 2. by dominant large Oligocene *Lepidocyclina* spp. (Pl.1 Figs.12-13).

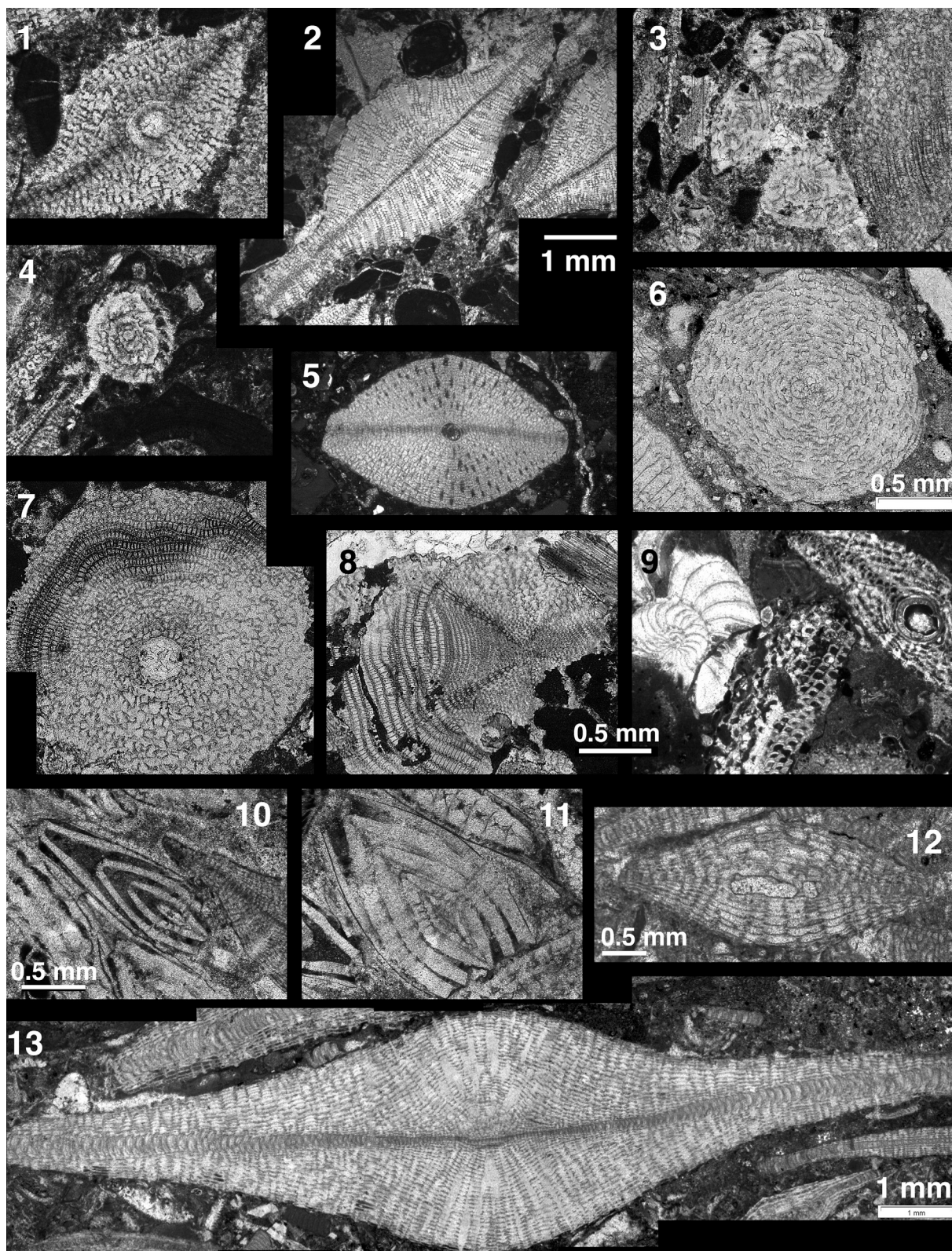


Plate 1. 1-4, lower Eocene larger benthic Foraminifera, inland outcrop (DB07-010b, Rio Pavo) Hoya Seamount Unit, Azuero, Panama. Scale bar = 1 mm. 1. *Discocyclina barkeri*, 2. *Pseudophragmina* sp., 3. *Euconoloides* sp. cf. *E. wellsi* and *Amphistegina undecima*, 4. *Amphistegina undecima*. 5-6, middle Eocene, debris flow matrix, Covachon beach (POB06-20). 5. *Discocyclina* sp., scale as for 1-4, 6. *Lepidocyclina polylepida*. 7-8, lower-middle Eocene forms from calcarenite (DB07-037b, Rio Horcones) interlava, Punta Blanca Seamount, S-Azuero. 7. *Pseudophragmina ancoensis*, 8. *Orthophragmina* sp. 9. *Lepidocyclina* sp. and *Operculinoides* sp. (POB06-022 W of Punta Blanca). Middle-Upper Eocene shallow water limestone at base of Tonosi overlap sequence. 10-13, Oligocene, shallow water limestones associated with the base of Tonosi forearc sequence, central Azuero. 10. *Nummulites panamensis* and *Discocyclina* sp. (AL026, Rio Guerita), 11. *Nummulites dia* (AL026, Rio Guerita), 12. *Lepidocyclina tournoueri* and 13. *Lepidocyclina undosa* (both AL031, Rio Guerra).