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Middle Cretaceous to Oligocene rise of the Middle American landbridge - documented by south-eastwards younging shallow water carbonates

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Basements of Southern Central America are oceanic in origin, including the southern half of the classical "Chortis Block" formed by subduction/accretion mélanges named Mesquito Composite Oceanic Terrane (MCOT). The rise of these oceanic basements into the photic zone and eventual emergence was controlled by convergent, collision tectonics, and/or arc development. In this context, shallow carbonate palaeo-environments were short-lived and formed not only on uplifted basements and arcs, but also on (now accreted) volcanic edifices of Pacific oceanic seamounts.

From Northern Nicaragua (NW) to Eastern Panama (SE) we observe a systematic younging of the first shallow water carbonate facies encroaching on basements and/or older deep-water formations:

In the Siuna area (NE-Nicaragua) Aptian-Albian shallow water limestones dated by rudists and *Orbitolina texana* rest unconformably on the Jurassic/Early Cretaceous Siuna Serpentinite Mélange, part of the MCOT. In N-Costa Rica, the assembly of several terranes (Santa Elena Ultramafic Unit, Nicoya Complex s. s., Matambu and Manzanillo Terranes) is overlapped by Late Campanian-Maastrichtian shallow water facies dated by rudists and Larger Foraminifera, such as *Pseudorbitoides rutteni, Pseudorbitoides israelski, Sulcoperculina* sp. and *Sulcoperculina globosa*. Reworked Campanian-Maastrichtian shallow water material including Larger Foraminifera was found in the Herradura Promontory (central Pacific coast of Costa Rica). It could be derived from an accreted seamount.

No shallow carbonates are known so far from the early Palaeocene.

The Tempisque Basin (N-Costa Rica) hosts the Barra Honda carbonate Platform (originally >900 km2) dated as late Palaeocene (Thanetian) by planktonic Foraminifera, ^{87}Sr / ^{86}Sr ratios and *Ranikothalia* spp. Other late Palaeocene shallow carbonates documented in S-Costa Rica/W-Panama (Quepos, Burica) are interpreted as insular carbonate shoals (atolls?) on now accreted seamounts.

To the SE of the S-Nicoya fault line (Central Costa Rica) Late Cretaceous oceanic plateaus may represent actual outcrops of the trailing edge of the Caribbean Large Igneous Province (CLIP). These include the SE corner of the Herradura Promontory (Costa Rica) and the Azuero Plateau cropping out in Coiba, Sona and Azuero (Panama). CLIP formation triggered a new, E-dipping subduction zone and Campanian-Maastrichtian arc initiation on the CLIP edge. By middle to late Eocene times this Middle American Arc and forearc areas reached the photic zone leading to widespread formation of carbonate banks/ramps. They are dated by many Larger Foraminifera of the genera *Amphistegina, Asterocyclina, Discocyclina, Euconoloides, Eofabiania, Fabiania, Gypsina, Helicolepidina, Heterostegina, , Lepidocyclina, Linderina, Neodiscocyclina, Nummulites, Operculina, Orthophragmina, Polylepidina, Proporocyclina,* and *Sphareogypsina*.

The first shallow carbonates that encroach on arc/forearc basements in Panama are dated as Late Eocene in Azuero and the Canal Basin and as Oligocene, dated by *Lepidocyclina miraflorensis, L. giraudi, L. canellei* around the Chucunaque Basin of Eastern Panama.

Progressive shallowing of the trailing edge of the Caribbean plate from NW (middle/Late Cretaceous) to SE (Late Eocene-Oligocene) implies a growing restriction of the Atlantic – Caribbean – Pacific seaway that must have affected global circulation patterns, to be considered in palaeo-oceanographic/palaeo-climatic models of the Late Cretaceous –Tertiary.