

# **Sédimentation pélagique et détritique d'arc du Crétacé supérieur dans le nord – ouest du Costa Rica**

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## **Abstract**

The northwestern Costa Rica is located on the southwestern edge of the Caribbean Plate and corresponds to the limit between the Panama Microplate (western part of CLIP s.s.) and the Mesquito Composite Terrane (MCOT ; southern half of the Chortis Block s.l.). The western margin of the Panama Microplate shows the occurrence of several accreted Cretaceous – Lower Tertiary complexes of very variable tectonic origins.

Deep-water sequences of the studied area represent a collage of Mesozoic oceanic terranes that became assembled during the latest Cretaceous – Paleogene. The existence of five distinct complexes/terrane have been reported until today, from the south-east to the north-west : Manzanillo Terrane, Matambú Terrane, Nicoya Complex s.s, Santa Rosa Accretionary Complex and ultramafic Santa Elena nappe. The Santa Elena nappe represents the southernmost occurrence of MCOT – derived rocks, whereas the Nicoya Gulf area (Manzanillo Terrane) displays the northwesternmost occurrence of CLIP – derived outcrops. The assembled terranes are overlain by a middle Campanien – Paleogene overlap sequence recording near shore to pelagic carbonate sedimentation. This study focuses on the arc-derived siliceous sequences cropping out in the southeastern Nicoya Peninsula. The occurrence of the Berrugate Formation (Manzanillo Terrane) in this area is established for the first time by the present study and put an end to erroneous attribution of these outcrops to wrong formations (Loma Chumico and Sabana Grande ; Matambú Terrane). The proof of the affinity with the Berrugate Formation is based on : the lithostratigraphy established in the southeastern Nicoya Peninsula ; microfacies descriptions ; radiolarian dating ; geochemical analysis of detrital/tuffaceous rocks. The obtained results led to the conclusion that the southeastern Nicoya Peninsula outcrops represent the distal equivalents of the green siliceous turbidites of the Berrugate Formation, as it is defined in the Nicoya Gulf area. The sampled sections correspond to mudstones and tuffitic turbidites that indicate the proximity of an island arc during the Coniacien – Santonien.

The paleogeographic continuity between the southeastern Nicoya Peninsula and the Nicoya Gulf required the revision of the chronostratigraphic column and the terrane map of the northwestern Costa Rica, which led to the establishment of a new limit between Matambú and Manzanillo Terranes.

Furthermore, an accretion scenario is proposed for the studied terranes. It is centered on the mid – Campanien CLIP/MCOT collision, which may explain the observed northwestern Costa Rica terrane collage and some facies of the overlap sequence.

The primitive « Berrugate » arc represents the oldest island arc associated with the Panama Microplate. The primitive island arcs located further SE (Golfito, Azuero and « Morti ») developed during the Late Campanien – Paleocene. The chronology of primitive island arc development along the Panama Microplate suggests that the subduction beneath it started during the Turonian (?) – Coniacien, in its northwestern part (Berrugate arc). Then, the subduction zone progressively propagated further to the SE.