Les terrains accrétés du Costa Rica : évolution tectonostratigraphique de la marge continentale de la plaque caraïbe

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Detailed mapping of the southern Pacific coast of Costa Rica, together with stratigraphic, biostratigraphic, paleomagnetic studies, and preliminary geochemical data, allowed to subdivide this region into four distinct tectonostratigraphic units: the Golfito Terrane, the Burica Terrane, the Rincón Block and The Osa-Caño Accretionary Complex. The paleomagnetic study extented to whole of Costa Rica and western Panama, along with a compilation of new and old data, allowed to define two more units: the Chorotega Terrane and the Nicoya Terrane, subdividing the Central America isthmus into a total of six distinct units.

The Chorotega Terrane constitutes most of the southern Middle American Landbridge and represent the western edge of the Caribbean Plate since the Late Cretaceous. The other terranes have originated outboard in the Paleopacific and were brought into contact with the Chorotega Terrane by plate convergence. They are considered as exotic terranes. The Nicoya Terrane comprises the Santa Elena Peninsula and most of the outer Nicoya Peninsula. The Nicoya Terrane includes the Nicoya Complex (sensu stricto) and should therefore be regarded as a composite terrane. The Golfito Terrane forms the Golfito region and extends into Panama to the Azuero Peninsula. It is composed of a basaltic basement overlain by Upper Cretaceous volcano-sedimentary series (Golfito Formation), in turn overlain by volcaniclastic series (Quebrada Achiote Formation) recording the Paleocene accretion of the terrane. The terrane is thought to have formed a marginal plateau of the Caribbean plate, transported northward by strike-slip along the rim of the Caribbean Plate. The Rincón Block forms the Osa peninsula isthmus. It is composed of a thick pile of Late Cretaceous to Eocene oceanic basalts, and represents a piece of island arc (Chorotega ?) tectonically incorporated to the collage of exotic terranes. The Burica Terrane forms the Burica Peninsula. Late Cretaceous oceanic basalts form the basement of the terrane, unconformably overlain by Paleocene sediments partly derived from an intraoceanic platform mounted on an oceanic seamount. The terrane is thought to represent an accreted, structurally high, portion of an intraoceanic primitive island arc. The outer Osa Peninsula and the Caño Island are part of the Osa-Caño Accretionary Complex, a mélange-type complex, characterised by strongly deformed turbidites, hemipelagic and pelagic sediments. The complex includes blocks of reworked shallow water Eocene limestones, as well as Late Cretaceous to Miocene exotic blocks (basalts and associated pelagic sediments), incorporated to the complex by offscraping of the subducting plate. Three units were defined within the complex, which are the San Pedrillo Unit, the Cabo Matapalo Unit and the Salsipuedes Unit.

The paleomagnetic data for the Chorotega Terrane indicate an origin close to its present latitude and no significant rotation relative to South America since Late Cretaceous time. The paleomagnetic data obtained from the Nicoya Terrane imply a low southerly Late Cretaceous paleolatitude and almost no rotation relative to the Chorotega Terrane. The Nicoya Terrane was about 16° of latitude south relative to the Chorotega Terrane in Late Cretaceous times. The paleomagnetic data from the Golfito Terrane indicate a Late Cretaceous equatorial paleolatitude and counter clockwise rotation of about 60° relative to the Chorotega Terrane. Similar paleomagnetic data were obtained from the Azuero Peninsula in southwestern Panama. The paleomagnetic data from the Burica Terrane indicate a low northerly latitude in the Paleocene and a counter clockwise rotation of nearly 90° relative to the Chorotega Terrane.