

MESOZOIC AND CENOZOIC ACCRETIONARY EVENTS IN THE COLOMBIAN ANDES

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INTRODUCTION

New results have been obtained recently (Desmet, 1995; Estrada, 1995; Toussaint and Restrepo, 1994, in print) about the tectonics, geochemistry and the paleomagnetism of the Western part of Colombia. They confirm that the Northern Andes are composed of a mosaic of alloctonous Terranes accreted to the Amazonian Craton (Fig. 1).

This information allows to determine the geodynamic settings of the terranes with oceanic crust, diverse types of sutures and the several accretion ages.

THE SITUATION AT THE BEGINNING OF THE MESOZOIC

At the beginning of the Mesozoic, Eastern Colombia was formed by the collage of a continental terrane (The Chibcha Terrane) to the Llanos Orientales which are part of the Amazonian Craton.

However, at that time, no terrane of Western Colombia was accretioned, being possible that the Tahami Terrane with continental crust, was localized South of its actual position.

Its possible that during the Triassic and Jurassic situation, various terranes at present time located in Central America (Chortis and Maya Terranes) were situated West of the Eastern Colombia. These Terranes were separated from South America Plate at late Jurassic.

FORMATION AND ACCRETION OF THE OCEANIC TERRANES.

During the Cretaceous was when the formation of the terranes with oceanic basement started. Above a oceanic crust of which are some ophiolites, a great quantity of Plateaux basalts were poured out. These basalts show an ecuatorial paleolatitud (Estrada, 1995). This volcanism is attributed at the beginning of the Hot Spot activity of the Galapagos Islands. In other regions of the ocean, it also formed some volcano-sedimentary sequences of Insular Arcs (Desmet, 1995).

During Early Cretaceous, a oceanic Terrane (Calima Terrane) was amalgamated by means of ophiolitic suture with eastern vergency to a continental Terrane that was located South of its actual position (Tahami Terrane). The tectonic characteristics of this amalgamation are marked by an important overthrusting and by a metamorphism of medium and high pressure.

The Composite Calima-Tahami Terrane was united to the Eastern Colombia at Late Cretaceous period by means of the dextral Otu-Pericos fault. This movement is directly related with the movement in the same direction of the Caribbean Plate in relation to South America.

The Cauca-Romeral fault system is not a cretaceous suture; it is a dextral wrench system which disperses terranes that was previously joined. These dispersion movements continued during all the Cenozoic Era.

During the Miocene period, two oceanic terranes (Gorgona and Cuna Terranes) was accreted to the Andean Block. The last collision was marked by an overthrusting with eastern vergency and by some ultrabasic rocks. The collision of the Cuna Terrane had an effect in all the Colombian Andes and permitted the formation of the Eastern Cordillera.

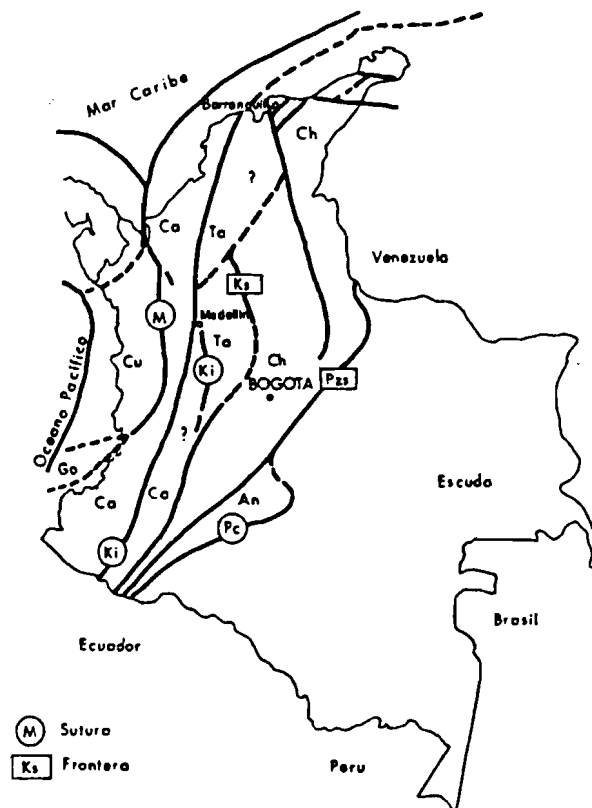


Fig. 1: Schematic map of the main terranes of Colombia according to Toussaint and Restrepo (1988 and 1994).

An: Andaqui Terrane, Ch: Chibcha Terrane, Ta: Tahami Terrane, Ca: Calima Terrane, Go: Gorgona Terrane, Cu: Cuna Terrane. PC: Precambrian suture, Pzs: late Paleozoic boundary fault, Ki: Early Cretaceous suture, Ks: Late Cretaceous boundary, M: Miocene suture.

In the present time, the Colombian Andes are located between three great plates which converge to it. The actual instability of this zone is a consequence of this situation.

The Cuna Terrane is affected by a dispersion fault which overthrusts the Panama Terrane over the Colombian Andes. This dispersion is marked by an important seismic node. Another fault, the dextral striking Guaicaramo fault, produces the dispersion of the Colombian Andes in relation to the South American Plate.

CONCLUSIONS

This results show that the geodynamic processes that permit the formation of the Northern Andes are different from those who had influence in the Central Andes. With this course, the formation of this part of the Andes is similar to the western margin of North America.

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