



The dynamic Neogene history of northern South America and its role in shaping the Present landscape and biodiversity of Amazonia

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The Neogene is a period of global change comprising uplift of mountain ranges (Andes, Himalaya, Alps), sea level fluctuations and climate change. On land these processes were of paramount importance in shaping our Present geography and drainage basins which subsequently influenced biotic composition and distribution patterns.

Amazonia, one of the greatest green arteries of our world, mostly took its current shape during the Miocene and Pliocene. In this paper we will review the Neogene geological history of northern South America and refer to the key events that influenced geography, environment, and species evolution in Amazonia.

These events were: the uplift of the Eastern Cordillera (Andes), reactivation of the sedimentary basins in and around the Amazon Craton, marine incursions, and a seasonal climate. Together these processes caused changes in drainage systems and the development of a large wetland system which -during the Late Miocene- evolved into the Amazon transcontinental river system.

The Miocene mega-wetland was an ideal environment that prompted species radiation (in particular of invertebrates) and adaptation of marine taxa (from the Caribbean) to fresh water environments. However, during the Late Miocene increased Andean uplift caused onset of the Amazon River and -at the same time- closure of the Amazonia-Caribbean connection. This resulted in a reduction of the wetland and virtual extinction of the invertebrate fauna. But at the same time the new geographic configuration resulted in allopatric speciation in the newly formed drainage basins.

The result of this multidisciplinary review suggests that Present Amazonia is the sum of a dynamic past in which the role of the Neogene history cannot be underestimated. Therefore the Miocene and Pliocene geological history should be taken into account in models that aim to explain Present species composition and distribution patterns.

This synthesis is the result of a collective effort by a large group of scientists from different disciplines and nationalities who have gathered in the 'Amazonia book project'*. This book has as purpose to evaluate Amazonia in the light of geological evidence and discuss the significance of these new insights for future Amazonian research.

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