



INSTITUTIONEN FÖR BIOLOGI OCH MILJÖVETENSKAP

**Origin, evolution and biodiversity of the
Neotropical herpetofauna:
Patterns and processes of the world's richest and
most threatened biota**

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ABSTRACT

The biological diversity of tropical America (the Neotropics) is astonishing. However, even among terrestrial vertebrates, most biogeographical patterns are not fully described nor understood, especially for many Neotropical reptiles and amphibians (the herpetofauna). To understand the evolutionary processes that gave rise to this incredible diversity, it is necessary to map the geographical distribution of multiple species. Furthermore, biogeographical analyses that integrate phylogenetic information provide the means to disentangle the roles of geography and environment in shaping biodiversity patterns. Herpetofaunal groups are very diverse in the region, occupying a wide range of habitats and niches, making them key organisms to understanding the origins of Neotropical biodiversity. My goal in this thesis is to understand biogeographical patterns and processes underlying this diversity. For this, I aim to: (1) provide novel taxonomic assignments and mapping of the distribution of snakes in the region, (2) test the role of geographical and environmental distances in the patterns of phylogenetic regionalization in reptiles and amphibians in the Cerrado savannas, (3) map endemism patterns for all Neotropical snakes, (4) investigate the origins and assembly of Neotropical savannas, and (5) apply biodiversity indices to guide conservation. The results indicate that in the Cerrado savannas, geography and environment affect the distribution of reptile and amphibian lineages in different ways, resulting in distinct patterns of phylogenetic regionalization. Also, biodiversity patterns in the Cerrado region were shaped in the context of a much more recent appearance of savanna ecosystems in comparison to tropical forests, as shown from several lines of evidence. The main contribution of this thesis is the mapping of narrowly distributed snake diversity in Central America, the Andean mountains, the Caribbean Islands, and the Atlantic Forest. The topographical complexity of these regions is the main predictor of both ancient and recent endemism. By describing diversity patterns of the Neotropical herpetofauna, I hope to contribute to the understanding of critical biogeographical patterns and processes underlying one of the world's richest biotas.

Keywords

Amazonia, Cerrado, phylogenetic endemism, phylogenetic turnover, integrative taxonomy, biodiversity indices.