



HONDURAS DISSERTATION/THESIS PROJECT

HO18 Evolution and ecology of feeding and trophic morphology of Neotropical snakes

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The montane tropics of the western Hemisphere are a hotspot of biodiversity for both flora and fauna. One of the outstanding questions in ecology and evolutionary biology is how this diversity can evolve and persist. In particular, taxonomic groups with constrained morphology are predicted to have limited ability to partition resources to permit coexistence. Snakes are an excellent example of morphologically and ecologically conserved animals, with all snakes limbless and obligate predators of both invertebrate and vertebrate prey. Despite this morphological and ecological conservatism, snakes are a species-rich lineage that is especially diverse in the montane tropics.

Students taking this option will study the morphological and ecological diversity of snakes occurring in Cusuco National Park, northwestern Honduras. Data collection will involve working closely with an expert herpetologist trained in snake handling techniques to find, identify and study neotropical snakes, and will utilize several survey techniques.

Most data will be sourced from the long-term visual encounter surveys which utilize the existing transect network in Cusuco. These surveys involve walking these pre-set transects in the morning, and occasionally at night, at a slow, steady pace and actively searching for snakes and other herpetofauna. Data from this project will also be sourced from our nocturnal stream surveys, our pitfall trapping surveys, and opportunistic snake encounters made in the course of the season.

Four broad kinds of snakes will be present in the database sourced from this surveywork; 1) vipers, 2) leaf-litter dwelling/fossorial species, 3) diurnally active and cursorial snakes and 4) specialist nocturnal species. For all species within these guilds, we will measure 1) body size and morphology, 2) trophic morphology (e.g., head dimensions), 3) ecology (diet, habitat type, thermal ecology and 4) parturition status (gravidity, number of eggs or neonates).

The ultimate goal of this project is to develop an understanding of the drivers of morphological and ecological diversity of snakes in the tropics. To achieve this, students can examine all of the above-listed variables, or choose to specialize in a more in-depth question examining just one or two of these potentially important drivers.

Recommended Reading

Colston, T.J., Costa, G.C. & Vitt, L.J. (2010) Snake diets and the deep history hypothesis. *Biological Journal of the Linnean Society*, 101: 476-486.

- França, F.G.R. & da Silva Braz, V. (2013) Diversity, activity patterns, and habitat use of the snake fauna of Chapada dos Veadeiros National Park in Central Brazil. *Biota Neotropica*, 13.
- França, F.G.R., Mesquita, D.O., Nogueira, C.C. & Araújo, A.F.B. (2008) Phylogeny and Ecology Determine Morphological Structure in a Snake Assemblage in the Central Brazilian Cerrado. *Copeia*, 2008: 23-38.
- Rodrigues, J.B., Alves Gama, S.C., Filho, G.A.P., França, F.G.R. (2015) Composition and Ecological Aspects of a Snake Assemblage on the Savanna Enclave of the Atlantic Forest of the Guaribas Biological Reserve in Northeastern Brazil. *South American Journal of Herpetology*, 10: 157-164.
- Sampaio, I.L.R., Santos, C.P., França, R.C., Pedrosa, I.M.M.C., Solé, M. & França, F.G.R. (2018) Ecological diversity of a snake assemblage from the Atlantic Forest at the south coast of Paraíba, northeast Brazil. *Zookeys*, 787: 107–125.