



HONDURAS DISSERTATION/THESIS PROJECT

HO14 Investigation into the effectiveness of two survey methods for monitoring cloud forest herpetofauna

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Determining ecological trends in any taxa is dependent on long-term monitoring. Such monitoring programmes need to be supported by robust methodologists that are capable of detecting most species of their target taxa in a given ecosystem. Such standardized survey techniques exist for most vertebrate groups, but their effectiveness can differ greatly on large spatial scales due to the large community structure variability that exists between ecosystems. Despite the importance of selecting effective methodologies for long-term monitoring programmes, surprisingly little research has been completed which evaluates the effectiveness of these standard methodologies in tropical ecosystems, and in certain types of tropical forest. This includes Mesoamerican cloud forests, where methodological research is virtually non-existent for many taxa.

Herpetofauna (reptiles and amphibians) are a group that have been particularly neglected by methodological research in the past, both in tropical forests generally and in cloud forests specifically. Numerous standardised survey techniques have been developed for monitoring this group, including pit-fall trapping, sweep transects, nocturnal river searches, and timed plot searches, with generalized assumptions of their relative effectiveness for surveying different herpetofaunal subgroups having been published. However, herpetofauna are a highly speciose, complex group of organisms that possess high ecological variability. Species can inhabit any strata of the ecosystem, from canopy-dwellers to fossorial species restricted to leaf-litter microhabitats. They may be terrestrial or aquatic, diurnal or nocturnal, and occupy a wide range of feeding guilds and trophic levels. The composition of herpetofaunal traits also varies enormously between tropical ecosystems, and tropical montane cloud forests might not be expected to possess a herpetofauna community structure that is comparable to the lowland sites where most methodological trials have been completed. This may have highly important implications for the effectiveness of different survey methods in these forests, but to date this remains entirely unassessed.

Cusuco National Park has an extremely rich herpetofaunal diversity totalling more than 100 reptile and amphibian species. Students taking this option will examine the relative effectiveness of two of the most common standardized herpetofaunal survey protocols – sweep transects and pit-fall trapping - in describing the community of the Park by comparing the results of these surveys to species on the overall Park inventory (which is based on 12 years of work in Cusuco and can be considered a good approximation of the 'true' herpetofaunal diversity of the study site). Students will then recommend which methodology, or combination of methodologies in particular ratios, should be best employed by long-term monitoring programmes in order to most effectively and efficiently survey the endemic-rich herpetofaunal community of Cusuco National Park.

Recommended Reading

Gillespie, G., Howard, S., Lockie, D., Scroggie, M. & Boeady (2005) Herpetofaunal richness and community structure of offshore islands of Sulawesi, Indonesia. *Biotropica* 37: 279-290.

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- Ribeiro-Júnior, M.A., Gardner, T.A. & Ávila-Pires, T.C.S. (2008) Evaluating the Effectiveness of Herpetofaunal Sampling Techniques across a Gradient of Habitat Change in a Tropical Forest Landscape. *Journal of Herpetology* 42, 733-749.
- Sung, Y., Karraker, N.E. & Hau, B.C.H. (2011) Evaluation of the Effectiveness of Three Survey Methods For Sampling Terrestrial Herpetofauna In South China. *Herpetological Conservation and Biology* 6: 479-489.