

HO15 Variation in cloud forest small mammal populations between different forest types and habitat strata

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Cusuco National Park supports a highly diverse community of small mammals; a result of being located in the tropics, possessing a complex heterogenous habitat located along a strong altitudinal gradient, and due to the Mesoamerican biodiversity 'hotspot' possessing an unusual overlap of mammals associated with both the Nearctic and Neotropical faunal zones. This community consists of groups including rodents (rats, mice, and squirrels), insectivores (shrews), and marsupials (Opossums). As with most cloud forest ecosystems, the ecology of most of these small mammal species remains poorly explored, with virtually no data having been published on their habitat associations and relative abundance within different altitudinal zones. Very little research has also been completed on how best to survey Mesoamerican cloud forest small mammal communities, and how effective various standardized survey methods are at detecting various taxonomic groups and feeding guilds.

Students taking this option will examine the influence forest type, altitude, and disturbance levels have on the diversity and community structure of small mammals within the Park. Surveys will employ a combination of Sherman traps and cage traps located at ground level, with the possibility of also employing traps at various levels of the canopy (which will be winched into place using ground-based canopy access methods), which will be placed in arrays adjacent to a sub-section of the habitat survey plots that are surveyed annually in Cusuco. This will allow for a direct comparison of small mammal community data with habitat structure data, enabling students to perform robust quantitative analysis to determine the key factors influencing small mammal communities within the Park. As an additional output, students will also, if desired, be able to examine how effective Sherman traps, cage traps, and canopy traps are at surveying the small mammal community of Cusuco National Park, by comparing the results of their trapping 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' small mammal 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 small mammal community of Cusuco National Park.

Suggested reading:

Dueser RD & Shugart Jr HH. (1978). Microhabitats in a forest floor small mammal fauna. *Ecology* 59 (1): 89-98.

Eccard JA & Ylönen H. (2003). Interspecific competition in small rodents: from populations to individuals. *Evolution and Ecology* **17**: 423-440.

Lambert TD, Malcolm JR, Zimmerman BL. (2005) Variation in Small Mammal Species Richness by Trap Height and Trap Type in Southeastern Amazonia. *Journal of Mammalogy* 86: 982–990.

Malcolm JR (1991) Comparative Abundances of Neotropical Small Mammals by Trap Height. *Journal of Mammalogy* **72**: 188-192.

Simonetti, J.A. (1989) Microhabitat use by small mammals in central Chile. *Oikos*, 56:309-318.