

## HM207 Diversity and niche separation in tarantula species in Cusuco Park, Honduras

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This topic seeks to develop greater understanding of the tarantula-like spiders in the montane cloud-forest reserve of Cusuco National Park. There has been very little study of Honduran spiders to date, and much un-characterized biodiversity awaits discovery. Worldwide, there are fifteen families of tarantula-like spiders (within the infraorder Mygalomorphae), five of which have been confirmed for Honduras from Cusuco park, from previous collections, and other families are also plausibly to be found there. At least two species of tarantulas (family Theraphosidae) also known from Cusuco, but further study is needed to understand how and why these species coexist in sympatry, and how these and various other tarantula-like spiders interact. Further studies on food preferences, optimum microhabitat, and possible antagonistic interactions provide possible field projects. It is useful to conduct such projects on tarantulas and their close allies due to their high potential value as effective bioindicators of habitat quality, ecosystem health, and late stage plant succession. In most species of mygalomorph spiders, the burrowing females show strong site fidelity, while males actively move in search of females. The location of female burrows can be particularly informative about niche preferences. A variety of projects can be developed using mygalomorph spiders, but priority will be given to projects looking to understand species diversity, taxonomy and factors that promote coexistence. Studies can also be developed that aim to better understand ecological preferences of various species.

As with many other organisms, the biodiversity of spiders (Araneae) in Central America is impressive, reflecting the confluence of lineages from the Nearctic of North America and the Neotropics of South America and the Caribbean. While many species of Central American spiders are well described, others certainly await discovery and description; particularly from Honduras and Nicaragua, where comparatively little studies have been conducted. In Honduras, five of the fifteen families of tarantula-like spiders (Mygalomorphae) are confirmed to exist in Cusuco National Park, namely families Theraphosidae, Barychelidae, Dipluridae, Paratropidae, and Ctenezidae, but additional study is required to understand aspects of their behaviour, ecology and habitat preferences. Most mygalomorph spiders are sedentary burrowers. The location of burrows can be indicative of favourable microclimates, and species distribution is often closely related to a particular habitat, dominant vegetation and/or underlying soil type. In Cusuco Park, mygalomorph spiders may be partitioned by various biotic and abiotic factors, and it remains to be clarified how different types may coexist in a given geographic area.

In Cusuco park, there are two known species of tarantula family (Theraphosidae), both likely in the genus *Citharacanthus*, but both presumed species poorly known since their original descriptions. It would be useful to better understand how these two closely related species are able to co-exist, and whether they are partitioned by different ecological preferences, such as prey type, or just other pre- or post-zygotic isolating recognition mechanisms. Other smaller tarantula-like families are also found in Cusuco and it would be valuable to understand how these are able to co-exist alongside juvenile tarantulas, which appear to be major competitors. Members of these other families are also sedentary burrowers, and again likely to be useful indicators of microclimates, but both the ecology and taxonomy of these remain to be elucidated. Project work on any of the mygalomorphs would necessarily involve some

taxonomic analyses to determine species identify and phylogenetic placement among near relatives.

Studies with both an ecological and taxonomic focus can be conducted on any Honduran mygalomorph families, subject to collection of additional specimens in the field. White light searching at night is the easiest method to locate female burrows, the locations of which may then used to establish the locations of pitfall traps to capture free wandering males. Comparisons can be made of the success of different sized pitfall traps and evaluation of various layouts of traps for their utility in capturing mygalomorph spiders. When mature specimens of both sexes are found alive, experiments can be conducted on various courtship or mating rituals to provide important behavioural data,

### **Suggested reading**

Coddington, J.A. (2005). Phylogeny and Classification of Spiders. In D. Ubick, P. Paquin, P. E. Cushing, and V. Roth (eds.) Spiders of North America: an identification manual, American Arachnological Society. 377 pages. Ch. 2, pp. 18-24.

Dippenaar-Schoeman. (2002). Baboon and Trapdoor spiders of Southern Africa: An identification manual. Plant Protection Research Institute. Handbook 13. Agricultural Research Council. Pretoria.

Goloboff, P.A. (1993) A reanalysis of Mygalomorph spider families. *American Museum Novitates*, 3056: 1-32.

Hedin, M.C. & J.E. Bond. (2006). Molecular phylogenetics of the spider infraorder Mygalomorphae using nuclear rDNA genes (18S and 28S): Conflict and agreement with the current system of classification. *Molecular Phylogenetics & Evolution*, 41: 454-471,

Machour-M'Rabet, S. M., Henaut, Y., Sepulveda, A., Rojo, R., Calme, S. & Geissen, V. (2007) Soil preference and burrow structure of an endangered tarantula, *Brachypelma vagans* (Mygalomorphae : Theraphosidae). *Journal of Natural History*, **41**, 1025- 1033.

Raven, R.J. (1985). The spider infraorder Mygalomorphae: Cladistics and systematics. *Bulletin of the American Museum of Natural History* 182:1-180

Schmidt, G. and D. Weinmann. (1996). Eine weitere Citharacanthus-species aus Guatemala Citharacanthus livingstoni sp. n. (Araneida: Theraphosidae: Theraphosinane). *Arachnologische Magazin*. 4:1-11.

Uetz, G.W. and J.D. Unzicker. (1976). Pitfall trapping in ecological studies of wandering spiders. *Journal of Arachnology*. 3:101-111.

Valerio, C.E. (1986). Mygalomorph spiders in the Barychelidae (Araneae) from Costa Rica. *Journal of Arachnology*. 14: 93-99

Yanez, M. & Floater, G. (2000) Spatial distribution and habitat preference of the endangered tarantula, *Brachypelma klaasi* (Araneae : Theraphosidae) in Mexico. *Biodiversity and Conservation*, **9**, 795-810.

Yanez, M., Locht, A. & Macias-Ordonez, R. (1999) Courtship and mating behavior of *Brachypelma klaasi* (Araneae, Theraphosidae). *Journal of Arachnology*, **27**, 165- 170.