

## **MN226 Microhabitats and niche partitioning in chameleons or skinks in Madagascar**

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Madagascar is home to some of the most diverse and unusual reptiles on the planet. Approximately 95% of all reptiles present in Madagascar are endemics i.e they are found nowhere else. With such high levels of endemism and diversity it is very important to understand how species interact with each other in this unique environment.

#### Option 1 – Niche partitioning in Chameleons.

There are two species of chameleon that are locally abundant at the Mahamavo study site, Angel's chameleon and Oustalet's chameleon. These species are closely related, both being members of the genus "*Furcifer*". These species have a large overlap in their distribution, and they provide an interesting and insightful view into the partitioning of resources between two similar species. Part of the Chameleon study will include implementing a 'mark-release-recapture' programme. This technique should reveal important results in the form of i) an estimate of the chameleon population size in the study area and ii) determining the extent of site fidelity in relation to roosting/hunting. A study such as this will provide us with a better idea of overall habitat use by chameleons, and enable us to answer questions such as; how big is an individual's territory, and how much of that territory does it use? Potentially one could also draw conclusions as to whether males allow females and juveniles into their territory.

A previous niche partitioning study was able to highlight the importance and potential value of establishing such a capture-mark-recapture programme. It also proved the effectiveness of a novel marking system designed specifically so to have as little effect on the marked chameleons as possible.

#### Option 2 – Niche partitioning and habitat use in Skinks.

Like the Chameleons, there are two closely-related species of skinks that occur sympatrically at the Mahamavo study site. These are *Trachylepis elegans* and *Trachylepis gravenhorstii*. From initial observations made during previous survey seasons it would seem that *Trachylepis elegans* prefers dry, open, savannah-like habitats whereas *Trachylepis gravenhorstii* seems to prefer the more secluded and sheltered life in the forest, dwelling in leaf litter primarily under the canopy. *T.elegans* is also found in areas of human-influenced habitat and does not seem to be adversely affected by anthropogenic habitat disturbance.

Unlike the Chameleon study where there is a previous study to build upon; the skink study will be the first of its kind at Mahamavo. This means that the focus will be slightly different.

The student will still be estimating population size; however they will be answering the critical question of whether the distribution of the two species in the different habitat types matches the hypothesis based on observational data. The student will also be developing a safe capturing technique, as these fast and alert animals can be challenging to catch to take the morphometric data that the study will require. Such techniques may include pit-fall trapping and drift fencing, and use of nets or artificial refugia.

In both projects, the students will also be encouraged to document the activity patterns and relevant and/or novel behaviours especially in relation to the diet of these species when and where possible.

### **Suggested Reading:**

- Carpenter, A. I. 2003. The ecology and exploitation of chameleons in Madagascar. Unpublished thesis, University of East Anglia, Norwich.
- Chase, J. M. and Leibold, M. A. 2003. Ecological niches: linking classical and contemporary approaches. University of Chicago Press.
- Glaw, F. and Vences, M. 2007. A Field guide to the amphibians and reptiles of Madagascar. Vences & Glaw Verlag Gbr 3rd edition.
- Goodman, B. A. 2007. Microhabitat separation and niche overlap among five assemblages of tropical skinks. *Australian Journal of Zoology* 55:15–27.
- Huey, R. B. and Pianka, E. R. 1977. Patterns of niche overlap among broadly sympatric versus narrowly sympatric Kalahari lizards (Scincidae: Mabuya). *Ecology*. 58:119-128.
- Kauffmann, J. (Publication date unknown). A behavioural and ecological study of three species of chameleon in Madagascar. Report to WWF Madagascar.  
[http://www.madadoc.mg/v00828\\_v160.pdf](http://www.madadoc.mg/v00828_v160.pdf)
- Manicom, C. and Schwartzkopf, L. 2011. Diet and prey selection of sympatric tropical skinks. *Austral Ecology*. 36 (5) 485-496
- Randrianantoandro, C., Razafimahatratra, B., Soazandry, M., Ratsimbazafy, J., Jenkins, R. K.B. 2010. Habitat use by chameleons in a deciduous forest in western Madagascar. *Amphibia-Reptilia*. 31(1) 27-35(9)
- Simberloff, D. 2004. Community ecology: is it time to move on? *American Naturalist*. 163: 787–799

Smith, E. P. and Zaret, T. M. 1982. Bias in estimating niche overlap. *Ecology* 63: 1248 –1253

Toft, C. A. 1985. Resource partitioning in amphibians and reptiles. *Copeia* 1985: 1–21

Vrcibradic, D. and Rocha, C. F. D. 1996. Ecological differences in tropical sympatric skinks (*Mabuya macrorhyncha* and *Mabuya agilis*) in southeastern Brazil. *Journal of Herpetology* 30:60-67