the relationships between males and females of different species and their movements. We recorded a total of 774 individuals of *Podarcis bocagei* (339 females and 435 males), of which 236 were marked, and 243 individuals of *Podarcis hispanica* (126 females and 117 males), of which 72 were marked. Preliminary results showed movements among distant walls and overlapping of female home ranges with the home ranges of several males.

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## Analysis of the morphological evolution of mantellid frogs from Madagascar (Mantellidae): a possible case of adaptive radiation

The rapid diversification of species from a single ancestor is usually associated with adaptive radiation. The anuran family Mantellidae, with more than 200 species and endemic to Madagascar and the Comoroan island of Mayotte may represent one of those examples. In this project, morphological, molecular and statistical approaches were used to investigate the ecology, the evolution and the systematics of this family of frogs. Almost complete information about larval morphology, molecular phylogeny and ecological characteristics was available for mantellid frogs. Specific adult morphology data and comparative studies including phylogeny, morphology and ecology were missing. The aim of this thesis was to assemble a dataset for the adult morphological characters (Munich Zoological Collection) and to test through a comparative analysis the following questions: (1) Are morphological changes in adult and larval stages coupled? (2) Is there a correlation between evolutionary rate changes in adult and larval morphology? (3) In a phylogenetic framework, is there a correlation between adult morphology and ecological parameters that would characterize the evolution of the Mantellidae as an adaptive radiation? The results showed uncoupled morphological changes between adult and tadpole morphology, despite the probable correlation between the rates of change for adults and tadpoles. The correlation between ecological variables and morphology on adults, suggest a preliminary evidence for adaptive radiation in the family Mantellidae.

**M. Barata, S. Carranza & D.J. Harris**

## Extreme genetic diversity in *Atlantolacerta andreanskyi*: another mountain cryptic species complex?

*Atlantolacerta andreanskyi* is a very enigmatic lacertid lizard that, according to the most recent molecular analyses, may belong to the tribe Eremiadini. It is a mountain specialist, restricted to areas above 2500 m of the High Atlas Mountains of Morocco with apparently no connection between the different populations. In this respect, the situation in *A. andreanskyi* is similar to an archipelago, with the different "islands" being represented by mountaintops. As a result of this scenario, a very high level of genetic differentiation is expected between the different populations, although it is not clear how the Pleistocenic glacial cycles might have affected this species. In fact, the relatively large and apparently disjunctive range of *A. andreanskyi*

with populations occurring on isolated mountains suggests it may not be a single species. In order to test these hypothesis 137 specimens of *A. andreanskyi* were sampled from 5 different populations across the distribution range of the species (431 Km). A total of 2 gene fragments from mitochondrial DNA (12S, ND4) and 5 gene fragments from nuclear DNA (Pdc, Acm4, Cmos, Rag1, MC1R) were amplified. The results of the molecular analyses clearly show that all the populations analyzed present a very high level of genetic differentiation for the mitochondrial markers used and are also differentiated at the nuclear level. The taxonomic, biogeographic and evolutionary implications of these findings are discussed.

**A.M. Bauer, M.P. Heinicke & T.R. Jackman**

## Phylogenetic relationships of the *Gekko* and *Gehyra* groups of geckos (Squamata: Gekkota: Gekkonidae)

The "*Gekko* group" has traditionally has included the arboreal and rupicolous Asian and Pacific gekkonid genera *Gehyra, Hemiphyllodactylus, Gekko, Lepidodactylus, Luperosaurus, Perochirus, Ptychozoon,* and *Pseudogekko.* Using multiple nuclear and mitochondrial genes, we show that these genera do not form a monophyletic group, but rather fall into two well-supported clades. The *Gekko* clade includes the diverse genera *Gekko* and *Lepidodactylus* as well as the gliding geckos, *Ptychozoon*, which are nested within the genus *Gekko*, and *Psuedogekko* and *Luperosaurus*, which are nested within *Lepidodactylus*. The close relationship of *Luperosaurus* to *Lepidodactylus* from Vanuatu and the Solomon Islands is particularly surprising given the superficial similarity of *Luperosaurus* to both the genus *Gekko* and *Ptychozoon*. Several geographically coherent species groups are evident in the genus *Gekko*. Previously morphologically-defined groups within *Lepidodactylus* are not recovered. The other "*Gekko* group" genera constitute a separate clade with *Gehyra* (35 species) as sister to *Hemiphyllodactylus* and *Perochirus* as sister to this pair. Within *Gehyra*, three geographically discrete clades are recovered, respectively concentrated in Asia, the Pacific islands, and Australia. Ancestral area analyses suggest that *Gehyra* originated in Asia, with a single colonization of Australia occurring in the mid-Cenozoic. This date places the time of *Gehyra* colonization prior to those of other Australian gekkonid geckos, but after the near-endemic pygopodoid geckos, a Gondwanan relictual group.

**J. Bourke, W. Böhme & T.C.M. Bakker**

## Sexual dimorphism in Darwin's frogs (*Rhinoderma darwinii*)

Most anurans exhibit some type of sexual difference in morphology or coloration that allows males and females to be readily distinguished, but in many cases, the functional significance of these differences is not well understood. We studied Darwin's frogs and found variation in body size, microhabitat use, dorsal pattern and body coloration within and between sexes. Males showed a higher variability than females, which were mainly brown and of the most common pattern. Males also exhibited exclusive patterns (complete green and stained) and colour (green). Furthermore, males showed differences in microhabitat use, dorsal pattern and