

cattle, both species which normally occur in high densities in the Pantanal, are frequent prey items in jaguars' diet, what may reflect an opportunistic behavior. To fully understand the feeding patterns of jaguars, it is important that we simultaneously collect data on the abundance of their prey. Only then we can make inferences about jaguar selectivity of prey and opportunistic behavior.

**90 MANDIBLE SHAPE IN MARSUPIAL AND PLACENTAL CARNIVOROUS MAMMALS: MORPHOLOGICAL COMPARATIVE STUDY USING GEOMETRIC MORPHOMETRY**

Turazzini, Guillermo F., Ercoli, Marcos D. & Prevosti, Francisco J.

Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" - CONICET, Av. Ángel Gallardo 470 - C1405DJR - Buenos Aires, Argentina; elcaluche@hotmail.com

Several authors had studied skull and mandible shape in carnivorous mammals showing the convergence between different marsupials and eutherians (i.e. Carnivora). In this work we analyzed the mandible shape using 2D geometric morphometry. Using this method we explored the relationship between shape, size and phylogeny. We analyzed almost 560 specimens, covering most of the genera of the terrestrial Carnivora and a wide sample of marsupials. We used 29 landmarks and semilandmarks to describe the mandible in a lateral view. The observed shape variation had ecological and phylogenetic components. For example, omnivorous species had low scores on the second PCA axis, with strong mandibles and large talonid in the carnassials, while hypercarnivores were concentrated with high scores on the PCA axes 1 and 2, having short mandibles and reduced talonids. On the other hand, most of the Carnivora families formed clusters indicating some kind of phylogenetic constraint. Marsupials overlapped with hypercarnivore and mesocarnivore placentals, especially of the Canidae and Felidae families, and presented less variation than Carnivora. There is a significant variation due to the allometry factor, however this factor explained less than 5% of total variation, where the largest species had shorter and stronger mandibles, with anteriorly displaced carnassials.

**91 MOONLIGHT AVOIDANCE BY BIPEDAL, BUT NOT QUADRUPEDAL, RODENTS IN SANDY AND OPEN HABITATS OF THE GREAT BASIN DESERT**

Upham, Nathan S. & Hafner, John C.

Committee on Evolutionary Biology, University of Chicago, Chicago, IL 60637, USA; nsupham@uchicago.edu

Rodents make foraging decisions by balancing energetic and reproductive demands with predator avoidance. To identify variations in the risk of predation, nocturnal rodents may use moonlight as an indirect cue of risk from predators. Moonlight avoidance behaviors have been observed in many nocturnal rodent species and are widely generalized to small mammals. However, in no previous study has moonlight avoidance been evaluated in a systematic fashion in a naturally-occurring community over several seasons. Here, a study in natural habitats was performed where the effects of moonlight on the activity patterns of desert rodents were examined in 62 study sites across the Great Basin Desert of western North America from 1999 to 2006. Rodent activity is examined by live-trapping exclusively in sandy and open habitats throughout the Great Basin, using the presence of the sand-obligate kangaroo mouse (*Microdipodops*) as a habitat-indicator taxon. The activity patterns of this desert rodent community are assessed on 69 nights with clear skies (10,758 trapnights) and examined in relation to corresponding values of moon phase and moon brightness to assess the frequency of moonlight avoidance. No relationship is found overall between the activity levels of the rodent community and moonlight. Only bipedal rodents, but not quadrupedal rodents, display significant moonlight avoidance patterns overall and during waxing moon phases. Quantile regression analyses further indicate that the optimum activity of bipedal rodents occurs at significantly lower moon brightness values than that of quadrupedal rodents. Additionally, bipedal rodents are only found to avoid moonlight during the summer season, and not during spring or autumn. Thus, moonlight avoidance may be an over-generalized phenomenon that actually occurs only in certain species and under specific circumstances. These results are discussed in the context of moonlight as a cue of predation risk, as well as the hypothesized antipredator adaptations of bipedal rodents.

**92 MOVEMENTS AND HABITAT USE BY *ARTIBEUS LITURATUS* AND *CAROLLIA PERSPICILLATA* IN THE ATLANTIC FOREST, BRAZIL**

Gledson Vigiano Bianconi; Sandra Bos Mikich & Ariovaldo P. Cruz Neto

Programa de Pós-graduação em Ciências Biológicas - Zoologia, UNESP Rio Claro - SP, Brazil; bianconi@terra.com.br

Despite many evidences on the role of frugivorous phyllostomids in the maintenance and recovery of Neotropical ecosystems, very little is known on how these bats survive, interact and move in fragmented forests. Using mark/recapture and radiotelemetry techniques we investigated habitat use and movements of *Artibeus lituratus* (A.I.) and *Carollia perspicillata* (C.p.) in fragments isolated by agricultural fields in the Atlantic forest of south Brazil. The main hypothesis, based on the availability of food, is that C.p. has more restricted foraging areas and higher habitat fidelity, while A.I. has lower habitat fidelity, larger foraging areas and use different forest fragments. We also proposed that independently of the foraging pattern, the agropecuary matrix does not represent a barrier to the movements of these species. We banded 1302 A.I. and 501 C.p. between 2002 and 2008, and radio-monitored 16 individuals of each species in two sessions (Aug-Oct/2007 and Mar-Apr/2008). The results revealed high mobility of these species, both inside and between the forest remnants, with simultaneous use of different habitat attributes (e.g. fragments, matrix, and artificial structures). Radiotelemetry did not support the hypothesis that C.p. had restricted foraging areas; however the higher fidelity to some habitats, particularly riparian areas, was confirmed by several recaptures obtained in the same site of the first capture, with an increase in habitat use directly related to fruit density. On the other hand, the hypothesis that A.I. had low fidelity to the fragments and large foraging areas was largely corroborated. So, the use of fragmented ecosystems by these phyllostomids seems to be the result of an equation involving roosts and foraging opportunities. In spite of being a harsh environment, the agropecuary matrix does not seem to

inhibit the movement of these seed dispersing bat species what it is important for restoration strategies based on zoochorous dispersal.

**93 NATURAL HISTORY OF TERRESTRIAL SMALL MAMMALS (DIDELPHIMORPHIA AND RODENTIA) FROM PARQUE NACIONAL LIHUE CALEL, LA PAMPA PROVINCE, ARGENTINA**

Teta, Pablo; Pereira, Javier A.; Fracassi, Natalia; Bisceglia, Silvina; Rouaux, Julia; Gaspero, Pablo; Perrig, Paula; Callicó Fortunato, Roberta G.; de Tommaso, Daniela C.; Muschetto, Emiliano; Brun, Anahi & Serrano, Soledad

Museo Argentino de Ciencias Naturales «Bernardino Rivadavia», Avenida Ángel Gallardo 470, (C1405DJR) Buenos Aires, Argentina; anthea@yahoo.com.ar

We studied the terrestrial small mammal (< 500 g) assemblages from Parque Nacional Lihue Calel (37°57'S, 65°33'W, La Pampa Province, Argentina) and surrounding areas using trapping data (11,720 traps/nights), field observations and analysis of owl pellet and felid and canid feces samples. The study area is included within the Pampean subdistrict of the Northern district of the Monte Desert. The landscape displays a mosaic of creosote bush of the genus *Larrea*, mixed shrub patches, grasslands and rocky outcrops. Field work was conducted during 2003-2008. Information about habitat, ecology, reproduction, and population structure is provided for the didelphid marsupials *Lesodelphys halli* and *Thylamys pallidior*, the cricetid rodents *Akodon azarae*, *Akodon molinae*, *Calomys musculus*, *Eligmodontia typus*, *Graomys griseoflavus*, *Oligoryzomys longicaudatus*, and *Reithrodontomys auritus*, and the caviomorph rodents *Ctenomys* cf. *C. azarae*, *Galea musteloides*, *Microcavia australis*, and *Tympanoctomys barrerae*. In addition, we compared the studied assemblage with others small mammal communities in arid and semi-arid areas of Argentina.

**94 ON THE STABILITY OF A TWO PREDATORS ONE PREY SYSTEM: A NON-ADDITIVE APPROACH**

Morales-Duque, Andrés Ricardo; Martínez-Martínez, Marco Vinicio & Pérez-Torres, Jairo

Laboratorio de Ecología Funcional, Unidad de Ecología y Sistemática (UNESIS), Departamento de Biología, Facultad de Ciencias, Pontificia Universidad Javeriana. Cra. 7 No. 43-82 Bogotá, Colombia, Sur América; jaiperez@javeriana.edu.co

In nature, very few organisms are prey of exclusively one type of predator generating a multipredator effect on prey populations. Theoretical approximations that have studied this type of interactions have assumed predators functional responses as separate events (additive) neglecting the interaction among predators. A two predators-one prey model was developed. We propose a new theoretical approximation that represents these systems more realistically than those multi-species models based on the classical Lotka-Volterra equation. The model incorporates a non-additive combination of predators' functional responses on prey mortality and describes the dynamics of the three populations. The equilibrium and stability analysis showed the existence of eight equilibrium points from which only five have biological relevance. The equilibrium points that involved two populations presented a density-dependent Lotka-Volterra behavior (Leslie 1948). The three populations' coexistence point showed a stable behavior which is consistent to what is found in nature and opposite to what has been found with additive approximations. The non-additive combination of the predators' functional responses showed to be a stabilizing factor for the system. The model will be useful to complement empirical work done about the effects of multiple predation on a common prey and might be helpful for taking decisions on conservation issues.

**95 PHYLOGEOGRAPHIC STRUCTURE OF THE SUBTERRANEAN TUCO-TUCO *CTENOMYS TALARUM* (RODENTIA: CTENOMYIDAE).**

Cutrer, A.P., Mora, M.S., Lessa, E.P., Vassallo, A.I. & D'Anatro, A.

Laboratorio de Ecofisiología, Universidad Nacional de Mar del Plata, Buenos Aires, Argentina; msmora@mdp.edu.ar

We examined the phylogeography of the South American subterranean rodent *Ctenomys talarum* (Talas tucú-tucú) using mitochondrial DNA (mtDNA) control region (D-loop) sequences. We 1) assessed the genetic relationship among different populations of *C. talarum* in the Buenos Aires Province, Argentina, across the entire distributional range of the species and 2) analyzed how habitat history has affected the geographic genetic structure and demographic stability of these populations. The analysis comprised mitochondrial sequences (420 bp.) of 213 individuals distributed in 15 different populations along the coast from Magdalena to Pehuén Cò localities (more than 900 km apart), and in the "Sierra de la Ventana" system. The results of the minimum spanning tree and AMOVAs showed high genetic subdivision and a strong phylogeographic pattern among populations of *C. talarum*. A complex network of haplotypes (most of which have restricted distributions) was obtained, as well as a bimodal mismatch distribution and a high portion of genetic variation attributable to differences among regions. Furthermore, pairwise *F<sub>ST</sub>* values showed significant population differentiation among all populations studied. Nevertheless, there were shared haplotypes in populations separated by distances greater than 300 km. The overall pattern is similar to that expected under the isolation-by-distance or the stepping-stone models. Major rivers in the area appear to be associated with strong genetic differentiation in this species. In sum, the current populations of *C. talarum* appear to be relicts of a more extended historical distribution along the Argentinean pampas, with possible local extinctions of some inland populations of this species (e.g. in the sierras of Tandilia). These historical extinctions, however, seem not to have erased the signature of long-term stability and geographic structure of this species along the coastal and inland distribution ranges.