



12<sup>th</sup> International Mammalogical Congress

*Advances in mammalogy  
in a changing world*

Perth, Western Australia  
9<sup>th</sup> – 14<sup>th</sup> July 2017



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**ABSTRACT BOOK**

## Human-macaque encounters in Ifrane National Park, Morocco: Behavioural coping strategies of the Barbary macaque (*Macaca sylvanus*)

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Wild animals in human-dominated landscapes are exposed to a range of human activities that can alter their fitness and behaviour. Many disturbance studies focus on a single stimulus, and little is known about whether different stimuli differentially affect animal responses. Encounters with shepherds/foragers, dogs, and/or tourists all have the potential to disturb primates that inhabit areas in close proximity to humans. To understand the effects of specific disturbance types on primate behaviour, we quantified the escape, affiliative, and self-directed behaviours of fifty individuals from five wild Barbary macaque (*Macaca sylvanus*) groups in Ifrane National Park, Morocco, before, during, and after five classes of disturbance. Using generalised linear mixed models we identified two broadly consistent 'response profiles'; the first in association with encounters that involved dogs, and the second with encounters that involved provisioning by humans. Encounters with tourists that did not involve provisioning elicited no significant changes in our measures of coping behaviour; however, macaques made extensive use of escape behaviours both during and after all other types of encounter. Affiliative behaviours either increased or decreased depending on encounter type, and self-directed behaviours increased in association with human provisioning and lone dog encounters. Encounters with both dogs and (provisioning) humans seem to induce stress. In the first instance because macaques experience the threat of predation, and in the second because of increased intragroup competition and increased proximity to humans. Our results highlight the importance of examining wildlife responses to multiple disturbance types when evaluating the conservation implications of human-wildlife encounters.

## Climatic, landscape and anthropogenic drivers of habitat suitability for a neotropical ecosystem engineer

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Biodiversity persistence and distribution throughout space and time are affected by increasing rates of environmental change induced by anthropogenic disturbance. We used a niche modeling approach to investigate the contribution of climate, landscape and anthropogenic disturbance as predictors of habitat suitability for the white-lipped peccary (WLP), a species that is primarily forest-dependent. WLP is the only large-herd-living Neotropical ungulate, and has been historically extirpated by over-hunting in many regions of South America, which may cause habitat alterations and cascading biodiversity loss. WLP occupancy data were reviewed for four biomes across Brazil, Atlantic forest, Cerrado, Amazonia and Pantanal. Three algorithms and two different ensemble modelling techniques were used to model the effects of six bioclimatic, five landscape and two anthropogenic predictors. Model results reflect the current conservation status of populations of this species across the biomes, and predictors had different responses in explaining habitat suitability due to a long history of land use, habitat loss, habitat fragmentation and hunting, all of which affect WLP populations in those regions. Detecting suitable areas both in terms of climate and landscape structure will be critical in defining ecological corridors and optimizing the role of protected areas for the conservation of WLP. The better comprehension of the habitat suitability of this species can also help predict how impacts of habitat loss will affect other medium and large-sized mammals at varying spatial scales.

## Distress calls in wild-living neonate Mongolian gazelles (*Procapra gutturosa*): Relationship with an open habitat, antipredatory strategy, vocal anatomy and testosterone

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In neonate ruminants, the acoustic structure of vocalizations might depend on sex, vocal anatomy, hormonal profiles, body mass and on environmental factors. In neonate Mongolian gazelles *Procapra gutturosa*, hand-captured in the Daurian steppes at the Russian-Mongolian border, we spectrographically analysed vocalizations and measured body mass of 22 (6 male, 16 female) individuals. For 20 (5 male, 15 female) of these individuals, serum testosterone levels were also analysed. In addition, we measured relevant dimensions of the vocal apparatus (larynx, vocal folds, vocal tract) in one stillborn male Mongolian gazelle

specimen. Neonate vocalizations of either sex were high in maximum fundamental frequency (800-900 Hz), but the beginning and minimum fundamental frequencies were significantly lower in males than in females. Body mass was larger in males than in females. The levels of serum testosterone were marginally higher in males and did not correlate with the acoustics or body mass. We discuss that the high-frequency calls of neonate Mongolian gazelles are more typical for closed-habitat neonate ruminants, whereas other open-habitat neonate ruminants (goitred gazelle *Gazella subgutturosa*, saiga antelope *Saiga tatarica* and reindeer *Rangifer tarandus*) neonates produce low-frequency (< 200 Hz) distress calls. The proximate cause for the high fundamental frequency of distress calls of neonate Mongolian gazelles is their very short, atypical vocal folds (4 mm) compared to the 7 mm vocal folds of neonate goitred gazelles, producing distress calls as low as 120 Hz. The study was supported by the Russian Science Foundation, grant 14-14-00237.

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## Evolution of sexual dimorphism in musteloid crania

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The remarkable uneven diversity in both species richness and phenotypes represent one of the more perplexing evolutionary patterns across the Tree of Life. Although an increasing number of researchers have begun to understand what drives uneven diversity between species, few researchers have examined how differences within single species can affect these broad scale evolutionary patterns. One source of variation lies in the difference between the sexes. The primary goal of this research is to build upon evolutionary theory by examining how sex differences contribute to species and phenotypic diversity. Here, we use musteloids (badgers, otters, raccoons, skunks and weasels) as a model to examine the effects of sexual dimorphism (SD) on cranial disparity at the macroevolutionary scale. Musteloids are a taxonomically rich and phenotypically disparate clade whose lineages exhibit uneven patterns of diversity. We used 3D geometric morphometrics to quantify cranial size and shape. We then quantified the rates of cranial disparity through time in males and females separately and pooled together (species means) to test the hypothesis that incorporating sex enhances the pattern of adaptive radiation. A rate shift in cranial evolution is predicted to occur just after the onset of the Mid-Miocene Climate Transition when using the pooled male and female dataset. Second, we examined an ecological basis for sexual dimorphism by testing the hypothesis that the degree of carnivory corresponds with the evolution of sexual dimorphism in cranial shape and size across Musteloidea. Hypercarnivorous musteloids are predicted to exhibit the highest degree of cranial SD.

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## Diversity of alarm calls across species of Ruminantia

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Alarm calls in response to potential danger are widespread among mammals. We conduct a detailed analysis of alarm call acoustic structure in wild-living giraffe (*Giraffa camelopardalis*), sambar deer (*Rusa unicolor*) and Indian muntjac (*Muntiacus vaginalis*), and describe their vocal behaviour while mobbing people. Giraffe alarm calls represented broadband hisses of duration 0.24-1.04 s and the peak frequency at 0.69 Hz. Sambar alarm calls represented tonal barks with arc-shaped structure, the maximum fundamental frequency 0.98 kHz and the depth of frequency modulation 0.34 kHz. Muntjac alarm calls had much weaker frequency modulation, a maximum fundamental frequency 0.66 kHz and the depth of frequency modulation 0.10 kHz. Comparative data (our own and literature) suggest that ruminants have a few types of alarm calls. In giraffes, waterbucks, impala, Siberian musk deer, goitred gazelles and Western turs, the hiss, hiss-whistle and snort alarm calls are produced through the nose with an aerodynamic whistle mechanism. In sambar deer, Indian muntjacs, white-tailed gnu, greater kudu, red deer and sika deer, the bark alarm calls are produced through the open mouth and display a clear fundamental frequency. In the springbok and klipspringer, the fundamental frequencies along the aerodynamic whistle are presented. No evident relation between nasal or oral emission of the calls and animal taxonomy or habitat can be found. This suggests Ruminantia as a good model taxon for investigating the role of acoustic diversity in vigilance and alarm communication, in addition to the traditional model groups, birds, primates and ground-dwelling sciurids. Supported by RSF grant 14-14-00237 and RFBR grant 15-04-06241.

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## Preliminary study of plantain squirrel (*Callosciurus notatus*) phylogeography in Southeast Asia

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Divergence patterns among some *Callosciurus* squirrel species are affected by geographic isolation by Southeast Asia's huge rivers. Currently, divergence by rivers is found within *C. prevostii*, occurring widely in Sundaland. Therefore, there may be similar biogeographical effects on *Callosciurus* species sympatric with *C. prevostii*. To test this hypothesis, we examined phylogeographical characteristics of *C. notatus* based on mitochondrial cytochrome *b* gene sequences. This squirrel is widely