

## 20th Meeting of the Italian Primatological Association

Bussolengo, April 10–13, 2011

Editors: Caterina Spiezio, Lara Fistarol, Bussolengo, Italy

Primates: Biodiversity and Conservation

### Oral Communications

#### Stress and Play Fluctuation in Wild *Lemur catta*

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*Key Words:* Ring-tailed lemurs · Anxiety · Indicator · Scratching · Playful activity · Madagascar

Strepsirhines have been neglected in the study of animal play. Yet, data from a wide array of primate taxa are needed to understand role, functions and social determinants of play. We investigated play behaviour in wild ring-tailed lemurs (*Lemur catta*) at the Berenty Reserve (Madagascar) where two other sympatric lemur species, and potential resource competitors, live (*Propithecus verreauxi* and *Eulemur fulvus*). We followed two groups of ring-tailed lemurs (9 and 16 individuals) from November 2006 to February 2007. We evaluated play fluctuation during possible stressful conditions, such as the presence of neighbour groups of conspecifics (C), and the presence of groups of other lemur species (NC). We considered the absence of any other group (A) as the control condition. We first verified whether the presence of other groups did increase stress levels in the study groups. Stress levels were measured via scratching, which previous studies have shown to be a reliable indicator of anxiety in human and non-human primates. Scratching rates in the study animals were higher in the presence of other groups (C+NC) compared to when other groups were absent (A). Overall play rates were highest when other groups were nearby. In presence of NC groups, play rates decreased as NC groups approached the study groups. Instead, when only C groups were in sight, play rates increased as the distance between the study groups and other conspecifics decreased. Moreover, play was highest during extra-group aggressive encounters (involving C groups) whereas it was suppressed during intra-group fights. Our results suggest that play fluctuates in response to different stressful conditions and may be used as a mechanism to cope with anxiety.

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## Quantitative Description of the Indri's Vocal Repertoire

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*Key Words:* Strepsirhine primates · Vocal behaviour · Acoustic structure · Ambient noise

Acoustic repertoire is characterized by sex, age and context specificity. We quantitatively investigated the vocal repertoire of ten groups of wild indris inhabiting the Andasibe-Mantadia National Park and the Mitsinjo Station Forestière in Madagascar to increase knowledge of this specificity. We considered a sample of 1,670 vocalizations belonging to 28 individuals recorded in the field from September to December between 2004 and 2008. We distinguished 8 vocal types other than the song: roar, honk, hum, long tonal call, short tonal call, kiss, wheeze and grunt. Two of them, long tonal call and short tonal call, had never been described before. Discriminant function analyses supported the qualitative classification of vocalization groups, which correctly classified each vocal unit to its own type with a percentage of 96.4% and 96.0% for the cross-validated function. We found that indris have discrete call types in their vocal repertoire, distinguishable by ear and from analysis of the spectrograms. Some utterances were used only in particular behavioural contexts (e.g. roars and honks in alarm contexts, or long and short tonal calls in physical fights), and by individuals of specific age, whereas others were emitted under a range of situations (e.g. hums). The frequency span of all calls, except alarm calls and the song, overlapped the most prominent peaks of ambient noise, suggesting they cannot be used for long distance communication. Alarm calls showed relatively wide ranges of prominent frequency bands, and include spectral areas in which the ambient noise level is lowest. The song showed a large frequency span of prominent bands, including high-frequency regions with low amplitudes in the noise spectra. This suggests that the design of the indri song is optimised to avoid masking by ambient noise.

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## Vocal Repertoire Investigation of *Eulemur mongoz* in Madagascar and Comoros

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*Key Words:* Mongoose lemurs · Vocalization · Communication · Lemur conservation · Acoustics analysis · Behaviour

Implications of human activities for species conservation are dramatically important. Deforestation and hunting are the main menaces in both Comoros and Madagascar. In Comoros, domestication and poaching are also reducing the number of mongoose lemurs in the wild. The study of vocal behaviour can reveal important aspects of how and why individuals within a species communicate in relation to ecological and social factors. We focused on vocal communication in mongoose lemurs (*Eulemur mongoz*) in Madagascar and Comoros. We sampled wild groups in 3 locations in Madagascar (Mariarano, Bombetoka, Antsilahiza) and at 2 sites in Comoros (Bambao M'tsanga, Anjouan; Tsembéhou, Anjouan), and in captivity in Europe, Madagascar and Comoros. We visually categorized vocalizations by spectrogram investigation and by ear, took note of their behavioural context, and investigated whether mongoose lemur vocal-