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OWL MONKEY VOCALIZATIONS AT THE PRIMATE RESEARCH INSTITUTE, INUYAMA

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Introduction

Quantitative evaluations of vocalizations of nocturnally active owl monkeys (*Aotus* species) have been attempted only twice (Andrew, 1963; Moynihan, 1964). Andrew (1963) identified four call types (twitter-trill, sharp call, boom and squeak) in two captive individuals, and Moynihan (1964) identified six call types (low trill, gulp, grunt complex, moan, scream and hoot) in a quasi-wild simulation. These two reports record the study subjects as belonging to *Aotus trivirgatus* species and pre-date the current revision of *Aotus* genus into nine species (Hershkovitz, 1983; Ford, 1994). Their subjects would now be classified as *A. lemurinus griseimembra*, ranging from Colombia to east and extreme northeastern Venezuela, as described by Ford (1994). As such, they are representative of the gray-necked group, distributed in the regions north of Amazon River. It is unknown whether the other clade of owl monkeys, the red-necked species group also produces identical call types. The objective of this study was to identify the call types produced by members of captive *A. azarae*, a species that belongs to the red-necked group distributed in the regions south of Amazon River (Ford, 1994). Preliminary results of this study have appeared in abstract format (Sri Kantha *et al.*, 2004).

Methods

Subjects and maintenance

The subjects of this study were 16 owl monkeys (12 *A. azarae* pure breeds and 4 *Aotus* hybrids of red-necked types) reared at the Kyoto University's Primate Research Institute (PRI) facility. All, excluding one founder member from Bolivia, were captive born and have been studied since

2002 as previously reported (Sri Kantha and Suzuki, 2006; Suzuki and Sri Kantha, 2006; Sri Kantha *et al.*, 2007). All experiments were carried out following approval from the Research Committee of the Institute, and according to the Primate Research Institute's Guidelines for the Care and Use of Laboratory Primates.

Acoustic Analysis of Vocalization Behavior

Under the premise that the vocalizations of dark-active owl monkeys have to be studied in the dark without distraction to the study subjects, we avoided using vision-enhancing goggles or other supporting aids to identify the individual monkeys eliciting the vocal notes. As such, the group vocalization behavior of 16 monkeys in the colony room was studied in two installments.

(A). *Pilot observations*: Pilot observations were made by one or two researchers, standing quietly in the colony room for 60–120 min during the dark phase for one session to, (a) distinguish the call type sounds, and (b) to allow the monkeys to become habituated to the researchers and the recording equipment. Two hundred and forty hours were spent on this installment.

(B). *Sampling observations for acoustic analysis*: Sampling observations were carried out in four sessions on separate days. The length of each session varied between 60 min and 240 min. Spontaneously elicited calls of the colony members as a group during dark cycle were recorded by digital audiotape recorder (Sony TCD-D100) connected to a hand-held microphone (Sony ECM-672) by *ad libitum* sampling with minimum interference. During recording, the two researchers and the recording equipment were stationary and the recording distance varied between 0.5 m (proximal cage) and 6.0 m (distal cages). Scream vocalizations were also elicited and recorded in one member, in response to the threat of trapping by net, during the light cycle (Moynihan, 1964). Sound spectrograms of vocal repertoires were analyzed by Multi Speech Signal Analysis Workstation Model 3700 ver. 2.21 (Kay Elemetrics Corp.), as described previously (Koda, 2004), to

quantify frequency and duration of calls. On the basis of these two acoustic parameters, a cluster analysis was carried out to identify the different call types. For conformity, we adhered to the call type terminology introduced previously for owl monkeys by Moynihan (1964). Data collection began in October 2002 and ended in April 2004.

Results

From the recorded and analyzed vocal repertoire of the owl monkey colony we distinguished six categories of acoustic call types. Table 1 shows the six categories of calls elicited during a 60 min recording session. Four call types, the sneeze grunt, low trill, gulp and moan (in the increasing order of mean duration, from 50 to 410 msec.) were recorded in the dark period spontaneously without any threat stimulus. Among these four call types, the moan call with the longest mean duration (410 msec.) had the lowest bandwidth range of 140–300 Hz (Fig. 1). The mean duration of the other three call types varied only by 4 msec.; their bandwidths ranged between 1,580 and 5,800 Hz. During the recording period, low trill was the most frequent and sneeze grunt was the least frequent call. We also elicited two categories of scream call (short scream and long scream) from one *Aotus* hybrid female by threat induction due to net capture under light conditions. As shown in Fig. 1, the bandwidth range of short scream (980–3,300 Hz) and long scream (2,800–5,800 Hz) varied markedly, and the difference in mean duration between the two screams was only 70 msec.

Discussion

Andrew (1963) identified four call types (twitter-trill, sharp call, boom and squeak) in two captive grey-necked owl monkeys. Moynihan (1964) identified six call types (low trill, gulp, grunt complex, moan, scream and hoot) in captive grey-necked owl monkeys. We were able to confirm the presence of five of the six specific call types, excluding hoot, reported by Moynihan (1964) in the 12 red-necked owl monkey subjects. Considering the restraints of captivity, we acknowledge that not all call types of red-necked owl monkeys may have been elicited during our recording. For example, we did not record the short sequence pure tone hoots, audible to humans in the night at a distance of 500 meters, as reported in the descriptive records of naturalists (Moynihan, 1964). The frequency range of nocturnally active *Aotus* monkey (140–5,800 Hz) vocalizations are narrow compared to the determined frequency range of vocalizations of other diurnally active, small-framed Platyrrhine monkeys such as *Cebuella pygmaea* (800–14,000 Hz), *Callithrix* spp. (500–14,800 Hz), *Saguinus* spp. (1,150–10,400 Hz) and *Saimiri* spp. (500–11,250 Hz), as tabulated by Hauser (1993). However, the frequency ranges of owl monkeys (this study, Moynihan 1964) are identical to that of diurnally active, large-framed Platyrrhini such as *Cebus* spp. (500–6,500 Hz) and *Ateles* spp. (200–3,800 Hz), as reviewed by Hauser (1993).

Table 1. Categories and acoustic properties of Owl monkeys calls.

Call Category	Mean Values of Acoustic Properties	
	Duration (sec)	Bandwidth (Hz)
Moan ¹	0.41	140–300
Long scream ²	0.26	2,800–5,800
Gulp ¹	0.054	1,800–5,800
Low trill ¹	0.052	2,000–3,100
Short scream ²	0.19	980–3,300
Sneeze grunt ¹	0.050	1,580–3,310

¹ Based on a representative 1-hour recording period in dark phase. Thirty-nine calls were recorded and distinguished.

² Specifically elicited from a female hybrid individual by threat induction due to net capture, under light phase.

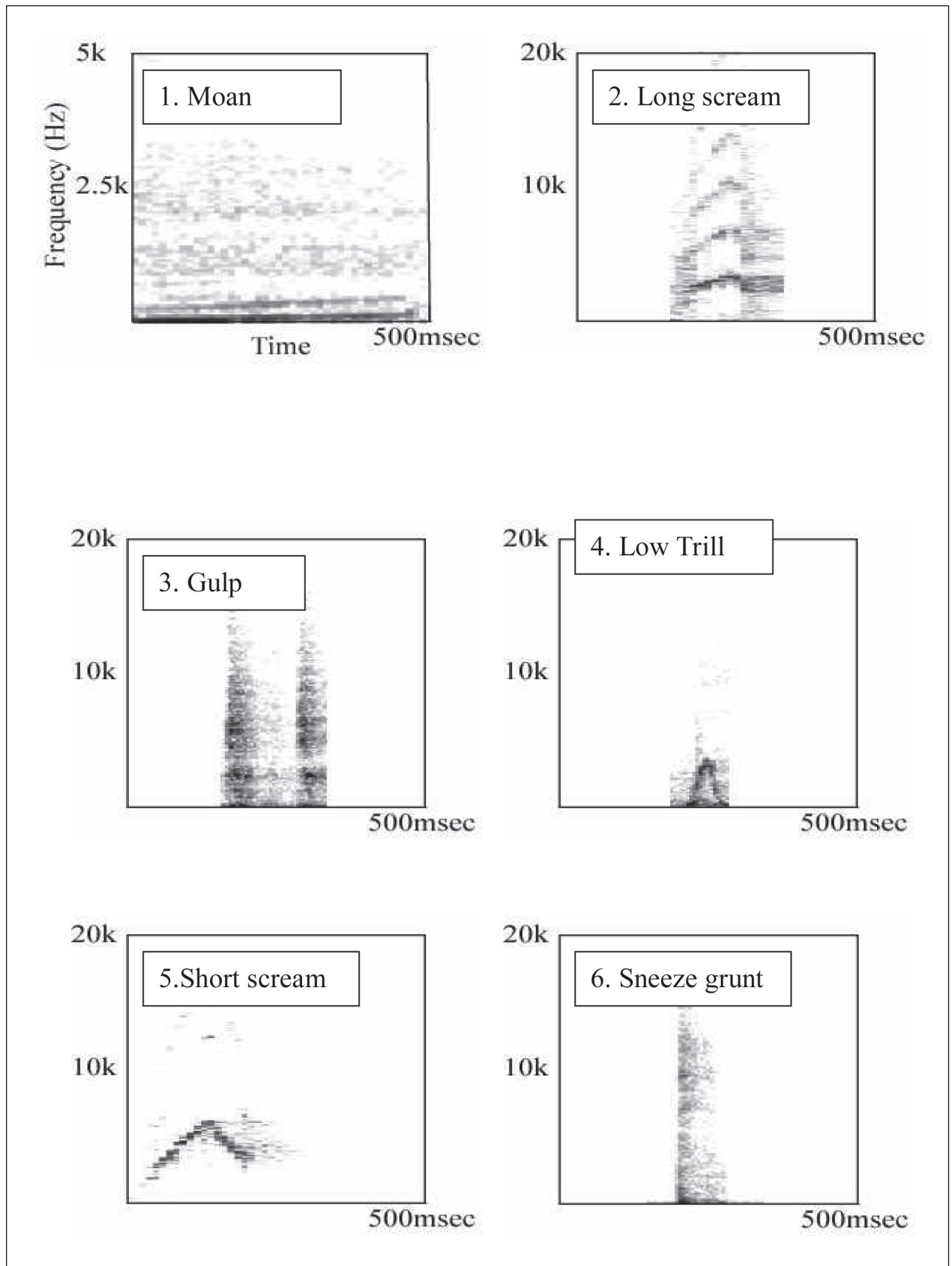


Figure 1. Representative sound spectrograms of six call categories of *Aotus azarae* monkeys. In all six frames, X-axis indicates time (mil-lisec.) and Y-axis indicates frequency (kHz).

In sum, with respect to frequency bandwidth and call duration, we have confirmed the six categories of calls reported for captive gray-necked *Aotus* recorded in Panama, in captive-born individuals of red-necked *Aotus* of Bolivian origin. The practical necessity of collecting acoustic data of owl monkeys in the dark somewhat hinders the precision of assembled data due to difficulty identifying the subjects generating the calls. As such, the reported vocalization data of owl monkeys in this study as well as earlier reports of Andrew (1963) and Moynihan (1964) need additional confirmation from carefully controlled playback studies (Byrne, 1982).

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NEWS

MANEJO COMUNITARIO DE LA CACERÍA DE SUBSISTENCIA EN LACHUÁ, GUATEMALA

La cacería de animales silvestres para consumo doméstico forma parte de la identidad de muchas comunidades indígenas del área rural de Guatemala. En la ecoregión Lachuá habitan 55 comunidades Maya-Q'eqchi' que poseen prácticas tradicionales de aprovechamiento de recursos, como es la cacería. En el año 2000, la Escuela de Biología de la Universidad de San Carlos de Guatemala inició un estudio de caracterización de la cacería de subsistencia en las comunidades aledañas al Parque Nacional Laguna Lachuá. En el 2004, un equipo transdisciplinario empezó a promover esfuerzos participativos y consensuados, orientados al manejo comunitario de la cacería de subsistencia; y desarrolló el Programa de Educación Ambiental Bilingüe Participativo, el cual se está implementando actualmente. Este proyecto está siendo construido y planificado con autoridades, líderes y organizaciones de 21 comunidades locales, organizaciones gubernamentales y ONGs que trabajan en la ecoregión Lachuá, constituyendo un fuerte vínculo entre la conservación de la vida silvestre y el conocimiento tradicional y cosmovisión Maya-Q'eqchi'. Para mayor información visitar www.orcondeco.org, o comunicarse con Marleny Rosales marleny.rosales@gmail.com

CAPTIVE CARE AND CONSERVATION OF CALLITRICHIDS AND LEMURS

Durrell's International Training Centre (ITC), in conjunction with the Mammal Department are running the course Captive Care and Conservation of Callitrichids and Lemurs. The course will be based at the ITC at Durrell's headquarters on the island of Jersey, British Channel Islands, from September 28th–October 2nd, 2009. The main topics will include: Planning your captive collection: making the link to the wild; Enclosure design, stress management and nutrition; Population management for controlled breeding programmes; Past, present and future for callitrichid and lemur conservation, and the role of zoos. For further details contact Catherine Burrows at catherine.burrows@durrell.org

THE MOHAMED BIN ZAYED SPECIES CONSERVATION FUND

The Mohamed bin Zayed Species Conservation Fund is a significant philanthropic endowment established to provide targeted grants to individual species conservation initiatives, to recognize leaders in the field of species conservation, and to elevate the importance of species in the broader conservation debate. The fund's reach is truly global, and its species interest is non-discriminatory. It is open to