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Articles

SPECIES STATUS OF THE COLOMBIAN SPIDER MONKEY, *ATELES BELZEBUTH HYBRIDUS*

Andrew C. Collins

The species status among various groups of spider monkeys (*Ateles*) was recently determined by comparison of mitochondrial and nuclear DNA variation (Collins and Dubach, in prep. a, c). The traditional pelage-based taxonomy of *Ateles*, as proposed by Kellogg and Goldman (1944), and used by most researchers since that time, was demonstrated to have little or no correlation to the actual genetic relationships among the various species and subspecies of spider monkeys (Collins and Dubach, in prep. a). Overall, the conclusions of Collins and Dubach (in prep. a, b, c), which supported four species of spider monkeys (*A. paniscus*, *A. belzebuth*, *A. hybridus* and *A. geoffroyi*), were very similar to those reached by Froehlich *et al.* (1991), with one important exception. (See Figure 1 for distribution and constitution of *Ateles* species.)

This brief communication focuses on that exception, which composed one of the four primary clades discovered by Collins and Dubach (in prep. a) on examination of mitochondrial DNA variation. This clade contained genetic haplotypes referred to previously as *A. belzebuth hybridus* (Kellogg and Goldman, 1944; Konstant *et al.*, 1985; Groves, 1989). *A. b. hybridus* occurs primarily along the Río Magdalena valley of Colombia, with isolated populations in northeastern Colombia and the mountainous regions of northwestern Venezuela around Lake Maracaibo (Kellogg and Goldman, 1944; Hernández-Camacho and Cooper, 1976; Norconk *et al.*, 1996) (Fig. 1).

Investigation of the genetic variation among all *Ateles* haplotypes found no support to group haplotypes described as *A. b. hybridus* with other haplotypes previously classified as *A. belzebuth* based on pelage (Collins and Dubach, in prep. a, c). Genetic investigations (Collins and Dubach, in prep. a, c) also differed from the taxonomy supported by Froehlich *et al.* (1991) by removing *A. b. hybridus* from a clade also containing *A. geoffroyi* and *A. fusciceps*. Froehlich *et al.* (1991) support uniting all trans-Andean forms in one species with various subspecies. Collins and Dubach (in prep. a, c) propose that *A. b. hybridus* is a separate species, *A. hybridus*. Thus, *A. hybridus*, represents the former subspecies *A. b. hybridus* of Kellogg and Goldman (1944), Konstant *et al.* (1985) and Groves (1989) and *A. g. hybridus* of Froehlich *et al.* (1991).

The suggestion that *A. hybridus* is a separate species may have important implications for the conservation of this primate. *A. hybridus* is listed as endangered by Mittermeier *et al.* (1989) and Rylands *et al.* (1997). The IUCN identifies endangered species/subspecies as those with a 20% chance of extinction in the wild in 20 years or five of its generations. *A. hybridus* is threatened by both hunting

pressure and habitat fragmentation throughout its present distribution. *Ateles* are found primarily in the top canopy layers of low, humid, primary, evergreen, never-flooded, rain-forest at elevations below 800 meters (Hernández-Camacho and Cooper, 1976; Van Roosmalen, 1980; Madden and Albuja, 1987). They are large frugivores with large home range requirements (Milton, 1981). Thus, small isolated forest fragments can rarely support populations of this primate. The combination of habitat destruction, hunting pressure, and a long inter-birth interval can result in small fragmented populations. This seems to represent the present status of *A. hybridus* in Colombia (Hernández-Camacho and Cooper, 1976; Hernández-Camacho and Defler, 1989; Rylands *et al.*, 1997). Uncorrected, the probability that this particular primate will survive in small isolated forest fragments is believed to be very low (Collins and Dubach, in prep. b).

Genetic and Biogeographical Evidence of Species Status

At present the Eastern Cordillera of the northern range of the Andes in Colombia (Haffer, 1987) combined with the Llanos Savannas of Colombia and Venezuela effectively prevent genetic exchange between *A. hybridus* and *A. b. belzebuth* (van der Hammen, 1982; Froehlich *et al.*, 1991; Norconk *et al.*, 1996). The western cordillera of the Andes and the Río Cauca are possible barriers to present day gene flow between *A. geoffroyi* (*fusciceps*) and *A. hybridus*.

Phylogenetic analysis of mitochondrial (Collins and Dubach, in prep. a) and nuclear DNA (Collins and Dubach, in prep. c) suggests *A. hybridus* forms a monophyletic group without clear ties to any other spider monkey clades (Collins and Dubach, in prep. a). *A. b. hybridus* haplotypes always group together, with high bootstrap support ranging from 92% -100% in parsimony and distance based analyses of mitochondrial regions (Collins and Dubach, in prep. a). The combined phylogenetic analyses for the mitochondrial DNA regions investigated reflect a variety of different, inconsistent relationships between the *A. hybridus* clade and the other primary clades among the various phylogenies. Genetic distances between *A. hybridus* and all other spider monkey populations are the highest observed in the mitochondrial DNA analysis (Collins and Dubach, in prep. a). Thus, no clear relationship of *A. hybridus* populations to any other *Ateles* populations are evident.

Limited nuclear DNA evidence produces a phylogeny which unites haplotypes of *A. hybridus* with 62%-66% bootstrap support (Collins and Dubach, in prep. c). Twenty-one percent of the total variation in the nuclear data set occurs between these haplotypes and those of *A. g. robustus*. Thus, limited evidence exists for the union of these two species as suggested by Froehlich *et al.* (1991), instead supporting *A. hybridus* as a distinct species (Collins and Dubach, in prep.). Based on the current findings, *A. hybridus* appears to constitute a separate species of *Ateles*.

Gene flow between parapatric populations of *A. g. robustus* and *A. hybridus* along the northern reaches of the Río Cauca

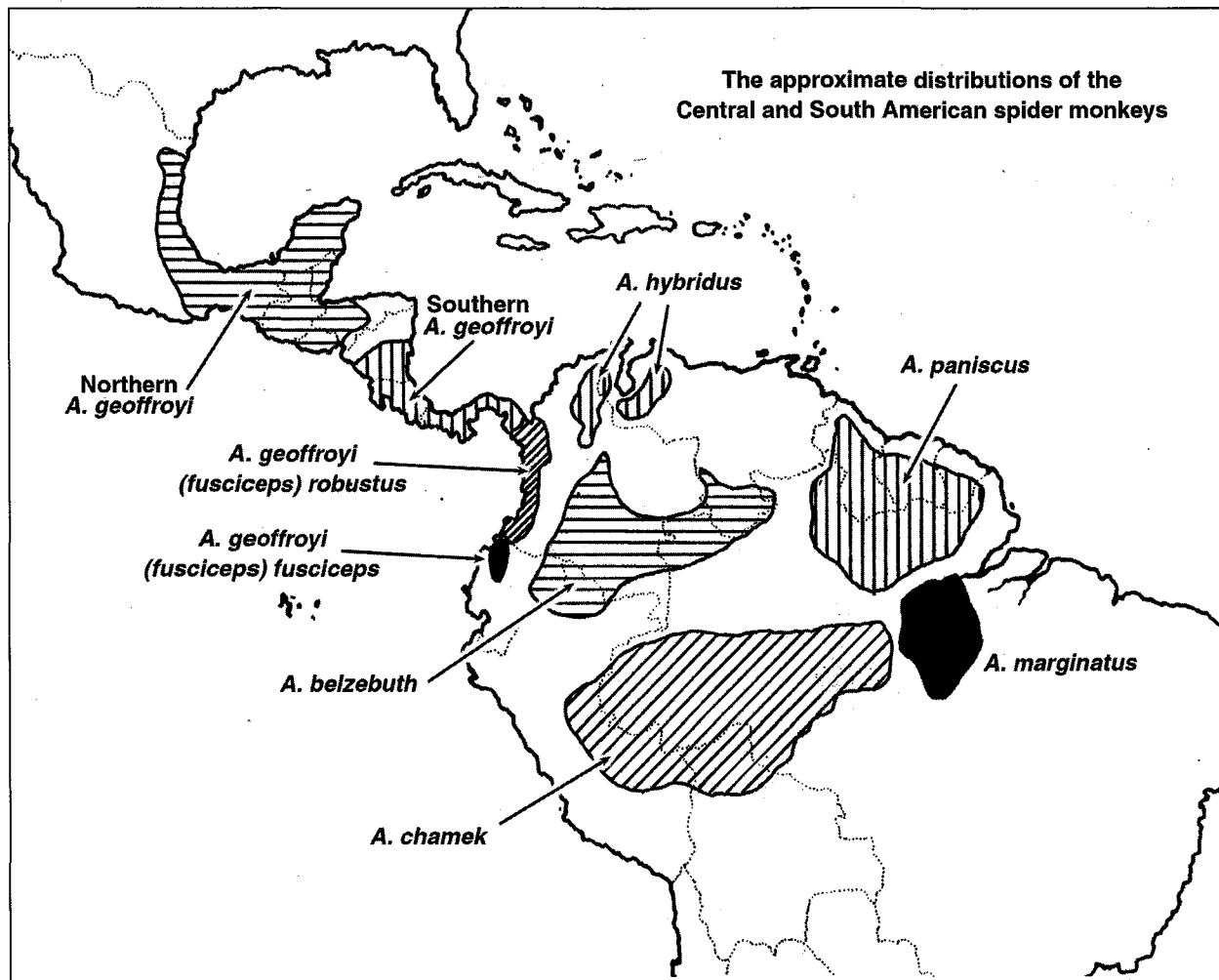


Figure 1. The approximate distributions of the Central and South American spider monkeys, *Ateles*. Map by Stephen D. Nash.

does not seem to occur, even though no obvious geological barriers exist in this region at the present time. A comparison with the taxonomic boundaries of two other primates, *Alouatta seniculus* and *A. palliata*, delineated from one another in this same area (Rowe, 1996) supports the distinction between *A. hybridus* and *A. g. robustus*, as well.

A discussion of biogeographic processes which may have created this species, and which have exerted pressure on all spider monkey populations, are provided in detail by Collins and Dubach (in prep. b). It would appear that the ancestors to *A. hybridus* and *A. geoffroyi* crossed the eastern cordillera of the Andes prior to the complete end of uplift of the chain during the late Pliocene, approximately 3 mya (van der Hammen, 1982; Haffer, 1987; Collins and Dubach, in prep. b). Local molecular clock calculations for all trans-Andean *Ateles* species' last common ancestor of 3.1 mya corroborates this hypothesis (Collins and Dubach in prep. b). Since that time *A. hybridus* has been isolated from *A. belzebuth* through uplift of the eastern cordillera of the Andes and by the Llanos Savannas of Colombia and Venezuela (van der Hammen, 1982; Haffer, 1987).

Spider monkeys apparently migrated into the Isthmus of Panama, and *A. hybridus* has been secondarily isolated from Central American and Choco populations by continued

uplift of the western cordillera of the Andes and ecological fluctuations in habitat during the Pleistocene (Collins and Dubach, in prep. b). All *A. hybridus* haplotypes share a last common ancestor 1.4 mya, during the early Pleistocene. It appears there were marked periods of very dry and very wet climates in the middle and upper Magdalena valley during the Pleistocene (van der Hammen, 1982; Haffer, 1987). The lower valley appears to have fluctuated between forest savanna types during drier phases and inundated "floating meadows" during the interstitial periods (van der Hammen, 1982). It is, thus, possible that spider monkeys, with a preference for unflooded, primary forest, may have been pushed back and forth, up and down the valley in response to changing Pleistocene biomes, which effectively kept them isolated from genetic exchange with other spider monkeys (Collins and Dubach, in prep. b).

Conclusions

With a limited geographic distribution, habitat fragmentation, and hunting pressure all acting against this group of spider monkeys, the suggestion that they represent a separate species presents a new challenge to their conservation. Rylands *et al.* (1997) identify eight possible protected areas where *A. hybridus* is thought to occur, but its existence has been confirmed in only three (Rylands *et*

al., 1997). Many of these protected areas are found outside of the traditionally recognized range of *A. hybridus*. Additionally, large areas of available habitat and many spider monkeys will likely be lost with completion of the Urrea II dam on the Río San Jorge in Colombia (Rylands *et al.*, 1997). The conclusions from the phylogenetic and biogeographic investigations of *Ateles* (Collins and Dubach, in prep. a, b, c) should be used in conjunction with the proposed new species status of this population of spider monkeys (Collins and Dubach, in prep. a, c) to direct increased attention to conservation efforts aimed at protecting this Neotropical primate.

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NEW OBSERVATIONS ON *CEBUS KAAPORI* QUEIROZ, 1992, IN EASTERN BRAZILIAN AMAZONIA

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Cebus kaapori is a new species of untufted capuchin monkey recently described by Queiroz (1992). It is similar to *Cebus olivaceus*, and data from molecular studies indicate that this new form is differentiated from *C. olivaceus* at no

more than the subspecific level (Harada and Ferrari, 1996). *C. kaapori* has one of the smallest geographical ranges of an Amazonian cebid primate, being restricted to the border of the Amazonian lowland high forest to the north-east and south-east in the state of Maranhão and the Rio Tocantins to the west in the state of Pará (Queiroz, 1992; Lopes and Ferrari, 1996). Recently, Silva Júnior and Cerqueira (1998) enlarged the known geographical distribution of this species, describing new sites in the east of its range.

The fact that *C. kaapori* inhabits the region with the highest human population density and the highest level of deforestation and habitat degradation in Amazonia, and that it naturally occurs at low population densities, resulted in *C. kaapori* being considered one of the most threatened of all Amazonian primates (Lopes and Ferrari, 1996). Here we report on a study carried out at the Fazenda Cauaxi (FC) (3°45'32"S, 48°10'06"W), in Paragominas, northeastern Pará, in eastern Brazilian Amazonia. This area has an average temperature of 28°C and a mean annual rainfall of 2200 mm. In June 1997 a quantitative census of mammals was conducted in a plot of 100 ha of primary forest. This plot is surrounded by patches of primary forest and logged areas with different histories and intensities. We used Line Transect Methods (NRC, 1981; Brockelman and Ali, 1987) to evaluate the density of *C. kaapori* in the area, but here we used the number of individuals sighted per km (encounter rate) to compare sites.

A total of 71 km was walked between 6:00-12:00 and 16:00-18:00 at a mean speed of about 1 km/h. Thirteen species of mammals were observed in the area, involving 39 sightings, 20 of which were of primates. The average number of groups or individuals observed was 5.49/10 km walked for all mammals and 2.82/10 km for primates. The diurnal primate community was composed of *Alouatta belzebul belzebul*, *Chiropotes satanas satanas*, *Saguinus midas niger*, *Cebus apella* and *Cebus kaapori*. In general, the density of primate species at FC is very similar to data available from others studies in this region (Carvalho Jr. and Pinto, in prep.).

At FC, *Cebus kaapori* was sighted seven times in 71 km censused (0.99/10 km walked). At the Gurupí Biological Reserve (GBR) (3°25'S, 47°20'W), state of Maranhão, Lopes (1993) observed this species three times in 480 km censused (0.06/10 km walked). The groups observed at both sites (FC and GBR) showed the same pattern of social organization. At FC observations included: on two occasions, a solitary individual, twice two individuals, and three times in association with *C. satanas*. At GBR: a solitary individual twice, once two individuals, and once in association with *C. satanas* (Lopes, 1993). The composition of these mixed groups ranged from one to seven individuals of *C. kaapori* and seven to nine of *C. satanas* at FC, and five *C. kaapori* and more than 20 individuals of *C. satanas* at GBR (Lopes, 1993).

The data presented here confirm that *C. kaapori* naturally occurs in low population densities, but at least in FC, the abundance of the species was higher than for any other

previous study reported. These higher densities may be reflecting differences in both the structure and composition of the vegetation and the hunting pressure of the sites. At FC, hunting is banned and there are no humans living in the area within a 30 km radius. On the other hand, the presence of the closely-related *C. apella* at this site may influence the abundance of *C. kaapori* through inter-specific competition. Preliminary data in adjacent plots shows that the abundance of *C. kaapori* is inversely related to the presence and abundance of *C. apella*, and also that the species is not tolerant to high intensity logging (Carvalho, Jr. and Pinto, in prep.).

There is only one area in eastern Amazonia that is protected by federal law: the Gurupí Biological Reserve. This entire region has many threatened species, but due to intense deforestation, hunting pressure and lack of protected areas, we consider that *C. kaapori* may be the first species to become extinct in the Brazilian Amazon if a conservation plan is not initiated in the region.

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POPULATION AND CONSERVATION STATUS OF THE BLACK-AND-GOLD HOWLER MONKEYS, *ALOUATTA CARAYA*, ALONG THE RÍO RIACHUELO, ARGENTINA

Govindasamy Agoramoorthy
Ragna Lohmann

Introduction

The black-and-gold howler monkey, *Alouatta caraya*, is one of the six living species of howlers, and occurs in northern Argentina, Paraguay, southern Brazil and eastern Bolivia (Wolfheim, 1983; Rowe, 1996). It is one of the two species of *Alouatta*, along with *A. guariba* (= *A. fusca*), which exhibits sexual dichromatism. The male is black and the female is yellowish brown. They are commonly called black howler monkeys, but the name black-and-gold howler monkey is appropriate due to its appearance and to avoid confusion with *A. pigra* of Central America (Rowe, 1996). Little is known about the population dynamics, social behavior and ecology of the black-and-gold howlers when compared to the well-studied red howlers (*A. seniculus*)

and mantled howlers (*A. palliata*). Between May and August 1997, several black-and-gold howler groups were surveyed in forest patches along the Río Riachuelo in the state of Corrientes, Argentina. A total of 24 social groups were surveyed in different forest patches: Caprim, Tacuaral, Lab. 1, Lab. 4, Lab. 5, Medialuna, Sanchez, and Earthwatch. Data on social interactions were also collected for several groups. One solitary adult female who recently emigrated from her native troop was also followed for several days to record her activity patterns. We also evaluate the conservation problems of this species in the gallery forest habitats along the Río Riachuelo, Argentina.

Survey sites

The survey sites included a number of forest patches along the Río Riachuelo, situated south of the Tropic of Capricorn (27° 30' S and 58° 41' W). The mean annual temperature in this area is 21.7°C (with extremes of 44.4°C and 1.1°C). Rains occur throughout the year but decrease from June to August. The vegetation is a mosaic of forest and clear-cut areas dominated by pastures following the cutting of the semi-deciduous forest dominated by *Schinopsis balansae*, *Astronium balansae* and *Tabebuia avellanadae*. Patches of dense tall forest around 15 m in height and ranging from one to 10 ha in size remain on some flat hillocks and along the creeks and banks of the Río Riachuelo. These areas contain trees of the above mentioned species as well as *Ficus enormis*, *Phytolacca dioica*, *Enterolobium contortisiliquum*, *Gleditsia amorphoides* and a common exotic species, *Melia azedarach*. Most of these tree species and several other vine species are important food sources for the black howlers (Rumiz *et al.*, 1986).

Table 1. Population status and troop composition of black-and-gold howlers surveyed in different forest patches around the Río Riachuelo, Argentina (Subad. = subadult, Juv. = juvenile, M = male, F = female).

#	Group name	Adult M	Adult F	Subad. M	Subad. F	Juv. M	Juv. F	Infant	Total
1	Caprim A	-	1	-	-	1	2	-	4
2	Caprim B	1	1	-	-	1	-	-	3
3	Tacuaral A	2	3	-	-	2	1	1	9
4	Tacuaral B	1	1	1	1	-	1	-	5
5	Lab4 A	1	3	-	1	-	-	-	5
6	Lab4 B	3	3	-	1	-	-	-	7
7	Lab4 C	1	4	-	-	1	1	1	8
8	Ponton U	1	1	-	-	1	1	-	4
9	Lab5 A	1	5	1	1	1	-	3	12
10	Lab5 B	4	3	-	-	-	-	3	10
11	Benite	1	2	-	-	-	-	2	5
12	Corrales	1	2	-	-	1	-	-	4
13	Medialuna A	3	2	-	-	-	1	1	7
14	Medialuna B	1	1	-	-	-	-	-	2
15	Lab1 A	2	2	-	1	2	2	-	9
16	Lab1 B	1	2	-	-	-	1	-	4
17	Sanchez 1	2	1	1	-	1	-	1	6
18	Sanchez 2	3	4	-	2	2	-	1	12
19	Sanchez 3	4	3	2	-	-	3	-	12
20	Earthwatch 1	3	2	1	-	1	1	-	8
21	Earthwatch 2	2	3	1	-	1	2	2	12
22	Earthwatch 3	1	1	1	-	-	1	-	4
23	Earthwatch 4	1	3	-	-	-	3	1	8
24	Earthwatch 5	1	4	-	-	2	1	3	11
	TOTAL	41	58	8	7	17	21	19	171

Population Status

Black-and-gold howler groups were located either by their vocalizations or by thoroughly searching different parts of the forest patches. After contacting each group, we recorded information on the size and age-sex composition, using methods previously described by Rumiz (1990). A total of 24 groups were monitored and the total number of black-and-gold howlers encountered during this study was 171 individuals (Table 1). Thirteen of 24 groups were "one-male groups", with one sexually mature male, while the remaining 10 groups were "multi-male groups", with two or more adult males. One group evidently lacked an adult male (Caprim A). Group size fell below five individuals in seven groups, while the remaining 17 had five or more individuals (Table 1). Group size ranged from 2 to 12 ($n = 24$), and the mean group size was 7.1 (± 3.2). The adult male to female sex ratio was 1:1.4. The black-and-gold howler demographic data presented in this report are similar to earlier studies on the same population (Rumiz, 1990; DeLuycker, 1995).

The Solitary Female

A solitary female who had recently dispersed from her group was seen near the Caprim A forest patch from 5-15 June, 1997. During this time, she was in a forest patch of 0.5 ha and moved around 3-5 trees for foraging and resting. She disappeared on 16 June but was seen again between 1 and 4 July near the neighboring Caprim B forest patch and between 13 and 17 July in the Tacuaral B forest patch. During this time, she was seen to approach the Caprim B and Tacuaral B troops, but was unable to immigrate. This pattern of female dispersal in black-and-gold howlers is similar to the dispersal patterns described for red howlers (Sekulic, 1982; Agoramoorthy, 1994; Agoramoorthy and Rudran, 1992, 1993, 1995).

Conservation Status

Howler groups occur in a number of isolated forest patches along the Río Riachuelo, both on government land and on privately-owned cattle ranches. Most of the forest patches that harbor wild howlers have been heavily degraded due to on-going deforestation, man-made fires and cattle ranching activities. They are also hunted. We collected two dead howlers during the census, evidently victims of hunting. There, the howlers are considered to be common and the local people are completely unaware of any need to protect them. Blood samples collected from the howlers were found positive for yellow fever (J. C. Ruiz, pers. comm.), but the rate of infection and mortality in the population are not clearly known and require further investigation. It will be important for the local government to protect the forest patches along the Río Riachuelo from further degradation, and environmental education programs are essential to inform the ranch owners and the local communities along the river of the importance of conserving the black-and-gold howlers and their gallery forest habitats. There is considerable potential for ecotourism centered on the howlers to provide revenue for the local government, the

ranchers and the local communities. Community-based conservation education and ecotourism would certainly benefit both the people and howlers in this area.

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PRELIMINARY OBSERVATIONS ON THE SONGO SONGO (DUSKY TITI MONKEY, *CALLICEBUS MOLOCH*) OF NORTHEASTERN ECUADOR

Dionisios Youlatos
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A recent article on the distribution, and the taxonomic and conservation status of New World primates (Rylands *et al.*, 1995) presented a table listing the primate fauna of Ecuador. According to these authors, only one species of titi monkey is present in Ecuadorian Amazonia: *Callicebus cupreus discolor*. However, Albuja's (1991) inventory of the mammals of Ecuador reported the presence of two *Callicebus* species. *C. moloch*, the dusky titi monkey or songo songo and *C. torquatus*, the yellow-handed titi monkey or cotoncillo. According to Ulloa (1988) and de la Torre *et al.* (1995) the latter species is found in the Cuyabeno Faunal Production Reserve, situated in the northeastern part of Ecuador, north of Río Aguarico, near the Colombian border. *C. moloch*, on the other hand, inhabits the area south of Río Napo, and is found in the Yasuní National Park, in northeastern Ecuador, near the Peruvian border. In this report, we present some preliminary data on *C. moloch* in the Yasuní National Park, Ecuador.

Dusky titis at Yasuní are found in both flooded gallery forest, as well as lowland *terra firma* forests. The preliminary observations we present here come from a site (00°42'01" S, 76°28'05" W) situated at km 47 of the Pompeya Sur-Iro road of Maxus Ecuador Inc., within the park. It is a 350 ha site of undisturbed *terra firma* lowland hilly forest, a research site found and established by Drs. A. DiFiore and P.S. Rodman of the University of California at Davis. All observations are based on first sightings: habitat, behavior, height where the animal was seen, and group size and sex-age class identification when possible. The animals were followed for as long as possible in order to obtain positional (20-second intervals) and feeding data. The total number of encounters was 24 from December 1995 until September 1996.

Dusky titis were found primarily in liana forest, high forest, and treefall edges (33.3%, 20.8%, 20.8%, respectively). In 62.5% of the encounters, the animals were found below 10m. In Peru, *C. torquatus* used preferably the *varillal alto seco* more or less corresponding to Yasuní's high forest, where it used forest layers between 15m and 25m (Kinzey, 1977). The majority of encounters (90%) involved only two groups of three and four individuals respectively. The first group was composed of an adult male, adult female and a juvenile of unidentified sex. The second group included an adult male, an adult female, a subadult male, and a juvenile of unidentified sex. This is in agreement with previous findings where *Callicebus* live in monogamous, highly territorial groups along with their offspring (Mason, 1968).

Locomotion when traveling was dominated by quadrupedal walking and bounding (54%, n= 325 instants). Clambering

across multiple supports and leaping between small supports in the tree crown peripheries were equally represented (18%). Leaping from and to single vertical supports was rare. Kinzey (1977) also found that quadrupedalism and leaping between terminal branches were the two most frequently used locomotor modes for *C. torquatus*.

Dusky titis appear to be predominantly herbivorous, feeding equally on ripe fruit and young leaves (43% and 39% respectively, n = 23 feeding bouts). Foraging for fruit occurred mostly on the terminal branches of trees varying in height between 10m and 23m. Frequent postures for the acquisition and processing of those fruits were sitting and quadrupedal standing. The young leaves consumed belonged to understorey lianas, acquired by vertical clinging, and seated postures. Terborgh (1983) suggested for titis that, since liana leaves show a continuous growth in contrast with tree leaves, these animals would prefer them as temporary ubiquitous protein sources to supplement their diet.

The dusky titis were found to forage for insects in 13% (of 23 feeding bouts recorded). Kinzey and Gentry (1979) and Terborgh (1983) who studied the same species in different sites in Peru reported similar diets but with very low percentages of insectivory. We believe that the high percentage of insectivory in Yasuní is primarily due to the small feeding bout sample. However, more investigation is required, since *C. torquatus*, which seems to prefer poor soil habitats, supplements its frugivorous diet with arthropods rather than leaves. Apparently arthropods seem to be abundant and to retain stable populations in such habitats, and therefore comprise a year-round protein source for titis (Kinzey and Gentry, 1979). The Yasuní National Park is reported to have soils which are even poorer than the normally nutrient limited tropical soils (Foster, undated). They are grayish brown rather than the common lateritic type of most tropical lowlands, and have a low pH, and a high concentration of aluminium (J. Torres, pers. comm.). This might be related to the relatively high percentage of insectivory in *C. moloch* in our observations, than in habitats with much richer soils of brown clayey latosol (Kinzey and Gentry, 1979).

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PREDATORY BEHAVIOUR BY A RED HOWLER MONKEY (*ALOUATTA SENICULUS*) ON GREEN IGUANAS (*IGUANA IGUANA*)

*Benoît de Thoisy
Thierry Parc*

We report here on our observations of the predatory behavior of a red howler, free-ranging on a 56-ha forested island (4°53'N, 52°10'W), the Îlet-La-Mère, offshore from Cayenne, French Guiana. The island vegetation can be characterized as an old secondary forest with dominance of *Spondias mombin* (Anacardiaceae), *Astrocaryum vulgare* and *Desmoncus orthacanthos* (Arecaceae), *Cecropia obtusa* (Cecropiaceae), *Gustavia augusta* (Lecythidaceae), *Guarea guidonia* (Meliaceae), *Inga nuda*

(Mimosaceae), *Virola sebifera* (Myristicaceae), *Alibertia edulis* (Rubiaceae) and *Pouteria guianensis* (Sapotaceae) (M. Nugent, unpubl. data). The Pasteur Institute of French Guiana was established there 15 years ago as a squirrel monkey (*Saimiri sciureus*) breeding colony for use in malaria research programs (de Thoisy and Contamin, 1998). One hundred and twenty squirrel monkeys are held in captivity and approximately 180 are free-ranging, released as from end of the 1970's. A single male red howler monkey is also present on the island (no howlers occur there otherwise). Unfortunately, there is little information about the history of this howler. Its mother was killed by hunters and it was hand-reared and was released on the island in the early 1980's when presumed already adult (C. Roussillon, pers. comm.). It is today free-ranging, completely independent and apparently healthy.

Predatory behaviour on green iguanas by this male howler has been recorded opportunistically on 12 occasions between 1991 and 1997. Ten of these events occurred at the end of the dry season (October to December). The howler would hunt the iguanas along large branches of old mango trees present in a small part of the island where the howler is often found. On two occasions the prey was pursued on the ground. As a rule the howler would spot the iguana motionless in the sunlight, move slowly forward, and then suddenly rush upon its prey. In nine of the 12 attacks, the howler failed. Twice, however, it succeeded in catching young individuals (body length approx. 25 cm), and then proceeded to eat the hind legs and the base of the tail, without killing them first. On another occasion, the howler caught an adult (body length approx. 40 cm) by the tail that then broke; the iguana escaped and the howler ate the part of the tail remaining in its hands.

Insectivory is not rare among cebids, and predation of vertebrates has been recorded in *Cebus* spp. and *Saimiri* spp. (for example, Newcomer and de Farcy, 1985; Boinski and Timm, 1986; Clarke, 1987; Fedigan, 1990; Galetti, 1990; Souza *et al.*, 1997; pers. obs.). Howlers on the other hand, are considered to be strictly folivorous-frugivorous by all authors (Crockett and Eisenberg, 1987; Neville *et al.*, 1988; Julliot and Sabatier, 1993). None of the numerous long-term studies on *Alouatta* species have described predatory behaviours, except nestling predation by a juvenile *Alouatta palliata* observed by Sue Boinski (pers. comm.). Insect fragments can be regularly found in feces (pers. obs), but may be an accidental consumption when eating fruits, leaves or flowers (Dunn, 1970).

Hypotheses to account for this exceptional hunting of lizards are speculative indeed. The capture of vertebrates appears to be largely opportunistic in most of the Cebidae (Clarke, 1987). This hunting activity could be a play behaviour, and may be initiated by the proximity of the free-ranging squirrel monkeys that regularly pursue small-sized lizards (pers. obs.). A penchant for the taste of meat, possibly acquired during its time in captivity, may have induced these repeated acts. Finally, the hunting and consumption of the iguanas could be adaptive behaviour arising from the need for

proteins. Red howlers are quite opportunistic in their diets in disturbed habitat (de Thoisy and Richard-Hansen, 1997). Plant diversity is low on the island: only 28 ligneous species are common on the island (M. Nugent, unpub. data), and just six of them are among the 195 species constituting the diet of howlers in their natural habitats on the mainland, none of which are included amongst the 40 species most regularly consumed (Julliot and Sabatier, 1993). Hunting was observed mainly during the dry season, when fruits are scarce on the island. Meat-eating by blue monkeys (*Cercopithecus mitis*) has also been reported during the driest seasons and has been interpreted as an important protein contribution to its diet (Fairgrieve, 1997).

Although the unusual history of this howler complicates any conclusion about this behaviour, the repeated successful predation of iguanas is significant. Howlers are generally peaceful "opportunistic folivore-frugivores" (Julliot and Sabatier, 1993). Nonetheless, they are capable of showing considerable aggression (Crockett and Pope, 1988), and at times show unexpected behaviours (see Richard-Hansen *et al.*, 1998), and occasionally resort to unusual food items (de Thoisy and Richard-Hansen, 1997).

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ADOPTION OF A YOUNG JUVENILE IN BLACK HOWLER MONKEYS (*ALOUATTA PIGRA*)

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Introduction

Infant adoptions have been reported in several non-human primate species (Thierry and Anderson, 1986). Permanent infant adoption may be a selfish behaviour of the adoptive mother to practice mothering skills (Lancaster, 1971) or it may also be altruistic and explicable by kin-selection theory (West-Eberhard, 1975). It is hard to explain all reported adoptions by these two theories, but in all cases it serves to aid the survival of a lost or abandoned infant. In this study a small juvenile female black howler monkey (*Alouatta pigra*) was adopted by a mother suckling her own small juvenile. Despite aggression from two males the orphan survived and remained in the troop. This paper describes the process of the adoption and discusses its implications.

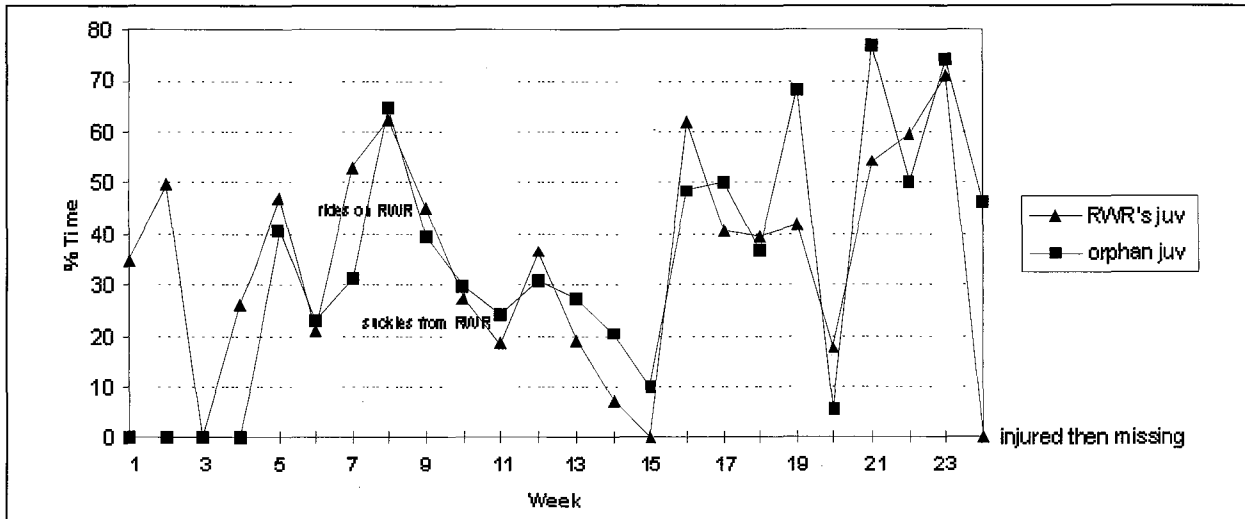


Figure 1. Percentage of time the orphan and rwr's daughter spent near or touching rwr female.

Methods

A stable howler monkey troop, known as Y-troop, was studied at the Community Baboon Sanctuary (CBS) in rural Belize, Central America. The study site is an area of secondary growth riverine forest and new *milpa* (small, temporary farmed plots) supporting at least nine troops ranging in size from two to 14 individuals. Y-troop consisted of nine individuals at the start of the study period: two adult males, a subadult male which left the troop part way through the study, three adult females, two juvenile females, and a juvenile male. All the juveniles were approximately 13-16 months old.

The animals in the troop were identified by sex, size and age along with coloured ankle discs as follows: rM = red male, lM = lime male, saM = sub adult male, rwrF = red white red female, lF = lime female, umF = unmarked female, sj = small juvenile and mj = medium juvenile. The troops at Bermudian Landing, within the Community Baboon Sanctuary, have been studied since 1985. Regular censuses have taken place and the ages and kinship of the younger animals are known (R. H. Horwich, unpublished). Scan samples, recording activity and proximity, were taken every 15 minutes. Proximity data was recorded as follows: 'touching' (in physical contact), 'near' (within 6 feet), or 'distant' (further than 6 feet). At each scan, proximity data for all individuals near or touching each animal, as was the identity of any individuals near or touching, was recorded. For each individual, the number of 'near', 'touching', 'distant' and 'not visible' scans was totalled each week, multiplied by 100, and divided by the weekly total number of scans, to provide a percentage of total time spent in each proximity category in relation to all other members of the troop. *Ad libitum* notes were also taken throughout the periods of observation, covering these and other behaviours, such as aggression, travel, suckling.

Observations of the troop took place between September 1996 and October 1997. This paper covers the period from 5 February to 4 September 1997 inclusive: the period covering the first sighting of the orphan juvenile female until the

injury and subsequent disappearance of the adoptive mother's small juvenile female. A total of 1,121 scan samples, covering over 269 contact hours, were taken in this period.

Results

A foreign young juvenile female was initially seen with Y-troop between 5-7 February, 1997. She was not seen again until 18 March when she then remained with the troop. Aggressive behaviour towards the orphan was exhibited by Lime male (the subordinate adult male) on 6 February, and by the sub-adult male on 18 March, the day of her reappearance, and again on 4 and 14 April. However, when the orphan screamed and was aggressive towards L male, he retreated and no physical contact took place. The subadult male, in contrast, bit her, despite her screaming aggressive defence, and she continued to show concern toward the subadult male whenever he was nearby. No other troop members interfered in any instances of aggressive behaviour toward the orphan.

The female rwrF had a daughter, still suckling, of similar size to the orphan. The orphan began following rwrF and her daughter almost immediately when she rejoined the troop in March; within five weeks of her first appearance and 17 days after her second appearance the orphan was observed riding on rwrF. Two days later, she was seen suckling from rwrF. Both juveniles were in the process of being weaned. The adult female would push both off or move away when either approached; there appeared to be no distinction in her treatment of her daughter and the orphan at these times.

RwrF showed no aggression toward the orphan during her integration into the troop, and the time taken to be adopted by rwrF appeared to be a function of the orphan's behaviour rather than that of the adult female. The orphan seemed to be the initiator of contact between herself and rwrF. On most occasions of suckling, rwrF's daughter would be the first to suckle and the orphan would then join in. This was especially true during the earlier stages of the adoption. RwrF was not observed encouraging the orphan to ride or

suckle. If the orphan fell behind when the troop was moving and she started to make distress calls, rwrF would not return for her. RwrF would often leave her own daughter behind as well, although she was seen to return for her on at least two occasions, and on one occasion appeared to go and search for her when she had been separated from the troop for over an hour.

Figure 1 shows the percentage of scan observations each week that the two juveniles spent either near or touching rwrF. Percentages were used because of the different numbers of observations during the weeks of the study. It should be noted that the adopted female was not observed with the troop in Weeks 2 and 3. Within a week of her reappearance in the troop the orphan closely matched the patterns of rwrF's daughter in terms of the time spent near or touching rwrF. The orphan interacted infrequently with the other adult females in the troop. She was sometimes near other members of the troop during resting periods but she did not appear to seek out other adult females. On one occasion she was observed resting with and grooming the unmarked female. The orphan was seen to initiate play with the two medium-sized juveniles on one occasion and the medium-sized juvenile male initiated play with her once.

After the initial aggression shown by Lime male no other instances of aggression by him toward the orphan were observed, and the orphan was seen sleeping in contact with him when rwrF was absent from the troop. The orphan stayed close to rwrF when travelling, often closer than the daughter, who was observed lagging behind, calling and being helped by other adult females. RwrF did not usually return for her daughter when she gave distress calls; rwr female had shown a similar lack of response to her daughter prior to the orphan's arrival. She allowed the orphan to suckle at six weeks from the first sighting (19 days after her return to troop). Both juveniles suckled at the same time on nearly all occasions once the orphan began suckling.

On the morning of 4 September both juveniles were observed with the troop, and were in good health. A rainstorm prevented further observations until the afternoon when it was noted that the daughter was unable to use one leg. Over the next three days the daughter was unable to move quickly and consequently could not follow the troop. She did not call and was not carried. When the troop returned to the same tree she attempted to climb to her mother but was unable to do so and again did not call. Over the next two days she was observed feeding occasionally on leaves and flowers but appeared to become increasingly weak. On 7 September, she was missing and was presumed dead. The orphan remained close to and continued to suckle from rwrF.

Discussion

Black howler monkeys (*Alouatta pigra*) live in troops of 2-16 individuals, averaging eight. A troop is composed of one or two adult males, a number of adult females and their juveniles. Female howlers have typically been observed

carrying and caring for infants and small juveniles other than their own and all members of the troop have some contact and interactions with infants (Horwich and Gebhard, 1986).

There have been reports of adoptions in *Alouatta palliata* and *A. seniculus* but no previous reports of such behaviour in *A. pigra*. In *A. palliata*, when a mother was lost, infants and juveniles were observed initiating care from other females in the group (Clarke and Glander, 1981). Clarke and Glander also observed the short term adoption of an infant from a subgroup, and adoption of a foreign juvenile male. *A. palliata* live in much larger groups than *A. pigra*; the large groups divide into subgroups, the sub groups come together and separate, and infants have been adopted between sub groups (Clarke and Glander, 1981). In this population of *A. pigra* the troops are smaller and subgrouping, if it occurs, is not obvious. Territorial behaviour is exhibited by all adults and subadults in the troop. It involves chases and physical aggression, as well as howling. When a troop is chased all individuals are chased and may be grabbed and bitten if close enough. Infanticide and bite injuries have been observed during troop take-over (Horwich *et al.*, in prep.). Solitary animals and neighbouring troops which come within a troop's territory will be chased if noticed.

In *A. seniculus*, adoptions have been seen between kin (grandmother and grandchild) and also from another troop by a nulliparous female (Agoramoorthy and Rudran, 1992). This last adoption was of an injured infant abandoned after a male invasion of its troop. Izawa reports the adoption of a related newborn infant after the loss of the mother's own infant (Izawa, 1989). The mother lost her own infant possibly after attack by a foreign male, and she then adopted her sister's newborn infant.

The adoption of orphans from within the same troop or from subgroups of the troop may be a genetic mechanism to preserve the genes of the family (kin selection theory). Adoption of an orphan from outside the troop is harder to explain, particularly where territory is vigorously defended and infanticide and injuries have been seen to occur.

This adoption does not obviously fit the theory of females learning mothering skills. The adult female in question had already raised a number of infants. Presumably the nursing of a second juvenile put a further strain on her own resources and could have had a detrimental effect on her own daughter. Also during this time, over 90% of Y-troop's home range was cleared by bulldozer. The troop already appeared to be less fit than other local troops, the juveniles were much smaller than juveniles of similar age in other parts of the Community Baboon Sanctuary and females had longer than expected inter-birth intervals, presumably due to a lack of resources.

There is some chance that the orphan was related to rwrF. We do not have any definitive evidence for the origin of the orphan but it seems likely that she was from a small

unmarked troop that borders Y-troop to the north. This troop has not been studied but has been observed occasionally. It appears that an adult female disappeared from this troop. Additionally the orphan was first observed with Y-troop in a border area between the two troops. If the orphan did come from this troop then there is some possibility that the mother was known to Y-troop or even possibly the offspring or related to some troop members. This might explain the adoption on the basis of kin selection.

It is also possible that the troops in CBS are closely related and developed from a relatively small founder population (James *et al.*, 1997). However, other behaviour towards neighbouring troops and solitary animals indicates that territorial considerations take precedence over kinship. It was therefore surprising that a juvenile from a foreign troop was allowed within Y-troop's territory and adopted by a member.

The persistence and assertiveness shown by the adopted juvenile perhaps overcame the initial aggression exhibited by two of the males. She appeared to have initiated care behaviour and received it even at the probable detriment to the adoptive mother and the mother's own offspring. The behaviour of the adopted juvenile appeared to be a very important component of the adoption. The adopted female actively tried to stay close to rwrF. RwrF did not appear so much to encourage the adopted female as to tolerate her. This could be a genetically maladaptive trait of the mother (Dawkins, 1976).

It is perhaps possible that by allowing small juveniles into a stable population promotes some genetic diversity within the group. Immigrations into troops appear to occur infrequently for females, and males must often take-over a troop, with the consequent risk of severe injury, to enter it (Brockett, pers. comm.; Horwich, 1995). However, it remains to be seen if the juvenile will act as a daughter and leave when she becomes a sub-adult, as is the usual case with the offspring of the males.

Re-Attachment or Regressive Periods

Although normal, age-related re-attachment periods have been noted in a variety of primates and other mammals (Horwich, 1974, 1989) there have only been indications of such developmental periods in the wild. Such periods occur in recurring cycles throughout individuals' lives. In wild black howlers, re-attachment has been noted in association with a second period of infant transfers at 7-11 weeks of age, when the infants were carried by other females and in one case spent time on a male as well (Horwich and Gebhard, 1986). This association supports the hypothesis that infant transfer behaviour as well as re-attachment behaviours may function in adoption for the survival of the infant in the event of its mother's death (Horwich and Manski, 1975). Regressive behaviour on the part of a juvenile, facilitating its adoption by a female outside of its troop gives stronger support that it plays an important role in infant survival. Dolhinow and DeMay (1982) support this view, noting that

a potential advantage to colobine infants having multiple caregivers is that they might be more likely to acquire care from others in the group in the event of the loss of their mother. They noted further that such adoptions were initiated and maintained by the infant, as occurred in this study. Since infant transfer and multiple caregivers have been observed in howler monkeys as well, the howlers are probably showing the same pattern in their adoptions as the colobine monkeys.

Regressive periods and accompanying behaviours on the part of the infant seem to play a role in other primate and howler species at about the same age (2-3 months). It has been noted in captive *Colobus guereza* (see Horwich and Wurman, 1978), and patas monkeys (Chism, 1978). Data from mantled howlers in the field showed a slight increase in mother-infant contact at 11-13 weeks and very clear increases at six months and a year (Clarke, 1982; Horwich and Gebhard, 1986). We feel that this is a case where the infant being in a regressive period in synchrony with a similar age step-sibling facilitated the adoption by the stepmother.

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Eric C. Schneider and **L. Frances Hunter**, 29 Dingley Court, Peterborough, Cambridgeshire PE3 7AP, UK, and **Robert H. Horwich**, Community Conservation Consultants/Howlers Forever, Inc. RD1, Box 96, Gays Mills, WI 54631, USA. *Reprint requests to Robert H. Horwich.*

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BLACK HOWLER MONKEY (*ALOUATTA PIGRA*) REINTRODUCTION PROGRAM: POPULATION CENSUS AND HABITAT ASSESSMENT

Bruce Clark
Robin C. Brockett

Introduction

The Belize Forest Department has shown an interest in the reintroduction of confiscated howlers acquired via the illegal pet trade. This is a foundation project with far-reaching ramifications. A potential release site was identified as the Monkey Bay National Park (17°16'N, 88°32'W), Belize District, Belize, Central America where howlers are known to have occurred in the past. Monkey Bay National Park (MBNP) is a protected site of 911 ha. Government permits are necessary for entry. It is bordered to the north by the Monkey Bay Wildlife Sanctuary (BSWS), a 433-ha, privately-endowed property held in trust as a nature preserve. MBNP is bordered to the south by the large Manatee Forest Reserve which restricts access and encroachment.

The black howler monkey, *Alouatta pigra*, is a flagship species for Belize, representing the country's internationally-recognized, self-sustaining conservation

practices (Horwich, 1994). This species is considered "Lower risk" by the World Conservation Union (IUCN) (Rylands *et al.*, 1995; IUCN, 1996). However, Groombridge (1993) considered that *A. pigra* was possibly threatened and that there was insufficient data to determine their current population trends. The habitat and range of *A. pigra* is shrinking rapidly, especially in Mexico where it is not protected (Horwich and Johnson, 1986).

Howlers and spider monkeys, *A. geoffroyi*, ranged throughout the Monkey Bay region until a 1958 yellow fever epidemic and hurricanes in 1961 and 1978 decimated primate populations locally (Mahler and Wotkyns, 1995). Information from landowners gleaned during this study indicated that spider monkeys were last observed in 1993, and recent periodic sightings of howlers were claimed within Tiger Sandy Bay, a privately-owned citrus plantation bordering the east boundary of MBNP. In the late 1970's a howler family existed just east of Tiger Sandy Bay. This group was eventually shot, however, by locals (R. Foster and C. Farnetti-Foster, pers. comm. 1998). Tiger Sandy Bay's owner does not allow hunting on this property but it may well occur. The owner of MBWS heard howlers within MBNP until 1983 (M. Miller and J. Brown., pers. comm. 1998). A long-term local resident reported hearing howler vocalizations in the recent past (S. Young, pers. comm 1998).

Methods

Trail-cutting and mapping within MBNP was carried out from 12-19 April 1998. Bruce Clark coordinated field activities and Robin Brockett supervised the systematic mapping of the trail system (see Fig. 1). A total of 4,650 m of trails were cleared, tagged at approximately 20 m intervals and subsequently mapped. Care was taken, as topography permitted, to stratify the habitat forest types to estimate the extent of their occurrence within the study area as has been suggested in previous studies (Chapman *et al.*, 1988; NRC, 1981).

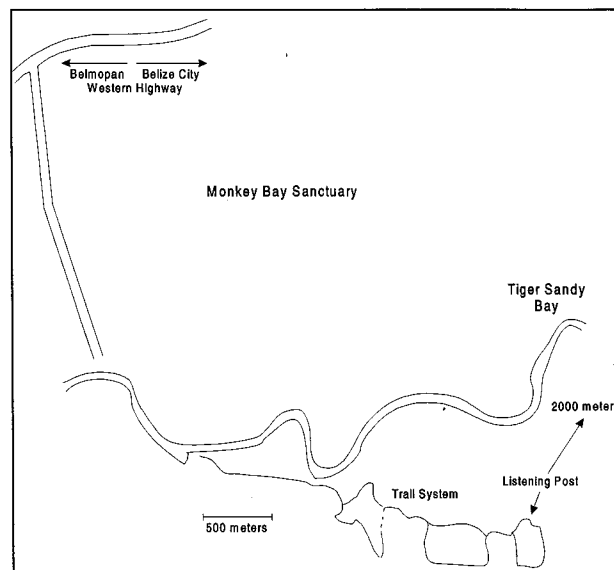


Figure 1. Trail systems within the study area and eventual release site at the Monkey Bay National Park, Belize.

A habitat survey and population census was carried out from 2-9 June 1998. Black howlers and spider monkeys were the target species. The census was carried out by the two authors and counted on the assistance of six Kansas City-based university workstudy students and Oscar Habet, Curator of the Belize Zoo. Ms. Brockett is a long-term resident in MBWS. A fruiting tree and forest structure survey was completed by Hector Mai, a Forest Guard of the Conservation Division, Belize Department of Forestry.

A total of 80 hours were spent quietly walking the trail systems, pausing about every 20 meters to watch and listen. Surveys included all times of the day, but with an emphasis on early mornings and late afternoons. Black howler monkeys are most likely to be inactive in the heat of the day (R. C. Brockett, pers. obs.). Walks were scheduled in a preplanned random pattern of either outgoing or incoming and through various habitats. Night camping was conducted deep within MBNP in order to maintain two continuous morning and evening listening posts. A two-hour evening vigil was conducted on the highest point within the surrounding landscape where an unobstructed view in all directions could be observed with binoculars. A late evening and early morning visit to Tiger Sandy Bay was conducted to listen for howler vocalizations known to have been in the area in the past. Brockett also carried out a canoe survey along the Sibun River - MBNP boundary one morning when howlers are known to be most active. In February 1998, Lighthawk, a volunteer pilot natural systems assessment organization, conducted a light plane aerial survey of MBNP. No deforestation within MBNP nor the Manatee Forest Reserve was observed.

Results and Discussion

If black howler monkeys occur in this area the population is sparse as no howlers were seen or heard. Anecdotal observations indicated a conspicuous lack of feeding fruit litter, and no howler feces were found. Based on the fruiting tree and forest structure survey, resources appeared to be adequate to support howlers, being similar to those for the Community Baboon Sanctuary (Silver *et al.*, 1998), an area supporting a large population of *A. pigra* although not as extensive or diverse. MBNP is believed to be an excellent reintroduction site because intraspecific competition would not complicate the process. Additionally, MBNP is relatively secure from illegal hunting. A young male-female pair is currently being held in a pre-release station at MBWS, maintained by Robin Brockett. These animals were provided by the Belize Forest Department. Preparations are underway for pre-release training following accepted standards (AZA Reintroduction Advisory Group, 1992; IUCN/SSC Reintroduction Specialist Group, 1998) and repatriation is expected to occur in early June 1999. The pre-release station consists of a 100 m solar-powered, 1 m-high electric mesh fence surrounding several native fruit and canopy trees. This cluster of trees and scrub is isolated within an 'island' surrounded by mowed grass. The site is located within MBWS. Ms. Brockett provisions them daily with native browse and fruits.

Questions remain concerning the long-term development of a viable self-sustaining genetic population at this site and at what point is the program determined to be a success? The authors maintain an immediate and long-range view of the problem. The salvaging of animals from certain death within the pet trade is unarguably a goal, but with effective survival training, these animals can become founders for a new and genetically diverse population. It is believed that natural migration processes would eventually bring animals back into this area, and a reintroduction is merely hastening the process. Additional howlers from the pet trade are already known to exist, and are likely to be available in the near future. If after rehabilitation, these animals survive at least one year, this will be considered a primary success, although reproduction is the final goal. Ms. Brockett is documenting behavior during pre-release training and intends to track the animals once released.

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- form (Type 1) entails an individual, almost always an adult female, sitting still in a normal, non-ritualized, position in a given direction in an apparent solicitation to other group members to follow. The second form (Type 2, Figure 1) is a ritualized posture described in the present note. It is similar to carnivore pointing behavior described by Morris (1986), Ewer (1973), and others (e.g., Shaler, 1895; Scott and Fuller, 1965; Arkwright, 1902; Whitman, 1899; Rine, 1973).
- As described for pointing dogs and wolves by Morris (1986), "The behavior of the pointer on a hunt seems highly artificial, but it is not. When wolves first scent a prey, the leading members of the pack freeze in their tracks and point themselves rigidly in the direction of the scent. There is a pause, until they have all fixated on the odor of the prey, and then they begin the next phase of their hunting operation. It is this wolf-pause that the pointer is performing. The only thing that is strange about the dog example is the way the animal extends the 'frozen moment'." (pp.67).
- I have observed the "frozen moment" in mantled howlers on nine occasions in riparian habitat at Hacienda La Pacifica, Cañas, Guanacaste, Costa Rica. All occurrences took place between 5-7 August 1976 (n= 3) and between 21 February and 10 March 1977 (n= 6). Adult females exhibited Type 2 pointing eight times, a young male, once. In all instances, animals appeared to be searching for food, and changes in direction occurred in group movement, sometimes leading to the formation of subgroups when non-posturing individuals followed females pointing in different directions. Positions of non-posturing individuals often shifted from subgroup to subgroup as they appeared to "decide" which pointer to follow. Males and females generally vocalized continuously during this process which was reminiscent of avian "information centres" described by Ward and Zahavi (1973).
- Ewer (1973) suggested that "vegetarian species" (such as mantled howlers) may be responsive to plant, especially flower, odors, suggesting a relationship between olfactory

POINTING BEHAVIOR IN MANTLED HOWLING MONKEYS, *ALOUATTA PALLIATA*

Clara B. Jones

Stereotyped and ritualized action patterns may produce visual signals oriented to potential receivers (Bradbury and Vehrencamp, 1998). These postures may transmit information to conspecifics and may exhibit "typical intensity" whereby the posture appears "unambiguous" and varies little within and between (closely related) species (Eibl-Eibesfeldt, 1970). Visual signals, thus, tend to be highly conservative evolutionarily (Bradbury and Vehrencamp, 1998).

In this note I report ritualized "pointing" behavior in mantled howler monkeys (*Alouatta palliata* Gray). Pointing in mantled howlers occurs in two forms during foraging. One

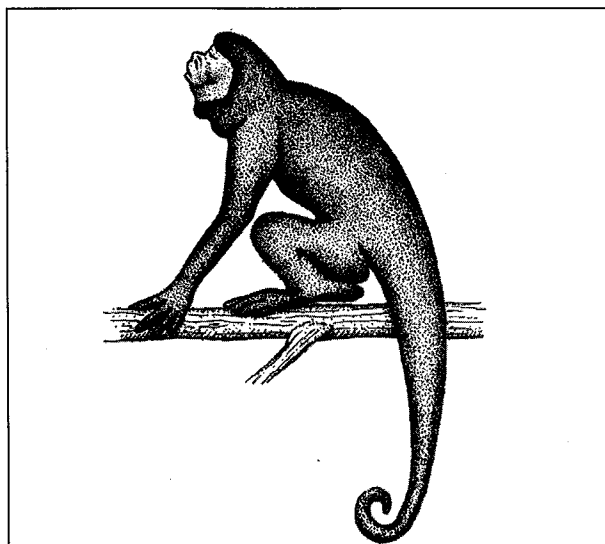


Figure 1. Approximate representation of the ritualized pointing posture (Type 2, see text) of an adult female mantled howler.

sensitivity and "mode of life". In her opinion, the ritualized pointing posture originated from the animal's tendency to extend its neck to smell. Arkwright (1902) makes the intriguing suggestion that hunting by smell may select for "spreading nostrils", a diagnostic trait of New World monkeys.

Ewer also stresses that ritualized pointing in wolves is a silent posture that may occur in association with a "group ceremony", similar to the "greeting ceremony" seen in African hunting dogs. Glander (1975) has described the "greeting ceremony" in mantled howlers, and the "information centre" noted above may be similar in form and function to the wolf and hunting dog ceremonies discussed by Ewer. Such apparent similarities in behavior may represent convergent mammalian patterns.

Discussing pointing dogs, Scott and Fuller (1965) point out that the tendency to crouch is primitive in mammals and make the interesting suggestion that ritualized pointing represents "selection to restrain attack". This view may be generalized to the idea that ritualized pointing indicates a restraint on selfish behavior and the tendency to forage solitarily for maximum individual gain. Social foraging has been described in howlers (Milton, 1980; Glander, 1975; Jones, 1996), and howlers are noted for their communal and non-aggressive tendencies (e.g., Wilson, 1975).

The behavior described in this note is consistent with Milton's (1980) conclusion that foraging in howlers is "goal directed". The pattern of decision-making leading individuals to follow different pointers (both Type 1 and Type 2) to alternative feeding sources may explain patterns of subgrouping and differential assortment of group members. These patterns of behavior and the vocalizations accompanying them require systematic study in the future.

Acknowledgments: I thank David Gaines for drawing Figure 1. I also appreciate the assistance of the staffs of the Museum of Comparative Zoology (Harvard University), the Monmouth (NJ) University Library, and the Plainfield (NJ) Public Library in obtaining references for this note.

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ADAPTATION TO NATURAL FOOD RESOURCES BY SEMI-FREE COMMON MARMOSETS (*CALLITHRIX JACCHUS*): PRELIMINARY RESULTS

Hartmut Rothe

In 1995, the colony of common marmosets of the Institute of Zoology and Anthropology, University of Göttingen, moved from an air-conditioned and artificially illuminated laboratory to a 6.3 ha outdoor enclosure in the vicinity of Göttingen, Lower Saxony (51°27'N, 10°03'E). A detailed description of the enclosure and the new buildings has been given elsewhere (Rothe, 1996; Rothe *et al.*, 1997). All our marmosets were born in captivity (5th to 8th filial generation). Before their removal to the open-air enclosure the animals had no contact with predators and were not forced to search for food.

From April to July 1995, the marmosets acclimated to the new surroundings and to the Middle European climate (Köppen and Geiger, 1961). During this time each group was housed in a wooden hut (2.7 x 2.7 x 2.4 m) with roofed veranda 1.3 x 2.7 x 2.4 m and adjacent wire-mesh cage (1.3 x 1.3 x 2.6 m). The animals were fed twice daily (details in Ahlborn and Rothe, in press). In July 1995 the marmosets were allowed access to the open-air enclosure. Each social group had a home-range of about 1.0 ha during the first year, and from 1996 it increased to c. 2 ha (details in Ahlborn and Rothe, 1997; Behet and Rothe, in review; Suchi and Rothe, 1999). The animals are fed regularly twice a day; the feeding sites are spread throughout the home-range, including the hut-cage-complex. Depending on the weather, the animals remain in the enclosure until mid-November. During the winter they are again confined to the hut-cage-complex. The data were taken *ad libitum* (Martin and Bateson, 1986).

Preying on Animals

During the first year in their new habitat the marmosets,

Table 1. List of prey items of semi-free common marmosets (*Callithrix jacchus*).

Prey/Year	1995	1996	1997	1998
Gastropoda	Pulmonata (Arionidae)	Pulmonata (Arionidae)	Pulmonata (Arionidae)	Pulmonata (Arionidae)
Chelate		Lumbricida (<i>Lumbricus</i>)	Lumbricida (<i>Lumbricus</i>)	Lumbricida (<i>Lumbricus</i>)
Arachnida			Opiliones	Opiliones, Araneae
Insecta	Hymenoptera (<i>Apis</i> , <i>Vespa</i> , <i>Bombus</i>) ³	Isopoda (<i>Porcellio</i>)	Isopoda (<i>Porcellio</i>)	Isopoda (<i>Porcellio</i>)
	Lepidoptera (Satyridae; imagines and caterpillars)	Hemiptera (<i>Philaenus</i>) ²	Chilopoda ¹ (<i>Geophilus</i>)	Chilopoda ¹ (<i>Geophilus</i>)
	Diptera (Muscidae)	Hymenoptera (<i>Apis</i> ³ , <i>Vespa</i> ³ , <i>Bombus</i> ³ ; Formicidae (Pupae))	Hemiptera (<i>Philaenus</i>) ²	Hemiptera (<i>Philaenus</i>) ²
		Coleoptera (Carabidae, Coccinellidae)	Dermaptera (<i>Forficula</i>) ²	Dermaptera (<i>Forficula</i>) ²
		Lepidoptera (imagines and caterpillars: Totricidae, Pyralidae, Pieridae, Nymphalidae, Geometridae, Satyridae, Lycaenidae)	Saltatoria (<i>Tettigonia</i> , <i>Gryllus</i>)	Saltatoria (<i>Tettigonia</i> , <i>Gryllus</i>)
		Diptera (Culicidae, Scatopsidae, Bombyliidae, Dolichopodidae, Syrphidae, Muscidae)	Planipennia (<i>Chrysopa</i>) Hymenoptera (<i>Apis</i> ³ , <i>Vespa</i> ³ , <i>Bombus</i> ³ ; Formicidae (Pupae), Cynipidae, Ichneumonidae)	Planipennia (<i>Chrysopa</i>) Hymenoptera (<i>Apis</i> ³ , <i>Vespa</i> ³ , <i>Bombus</i> ³ , <i>Polistes</i> ; Formicidae (Pupae), Cynipidae, Ichneumonidae)
			Coleoptera (Carabidae, Phalacridae, Coccinellidae, Elateridae, Cerambycidae, Chrysomelidae, Curculionidae)	Coleoptera (Carabidae, Phalacridae, Coccinellidae, Elateridae, Cerambycidae, Chrysomelidae, Curculionidae)
			Lepidoptera (imagines and caterpillars: Totricidae, Pyralidae, Pterophoridae, Lasiocampidae, Noctuida, Arctiidae, Notodontidae (only caterpillars), Pieridae, Nymphalidae, Geometridae, Satyridae, Lycaenidae)	Lepidoptera (imagines and caterpillars: Totricidae, Pyralidae, Pterophoridae, Lasiocampidae, Noctuida e Arctiidae, Notodontidae (only caterpillars), Pieridae, Nymphalidae, Geometridae, Satyridae, Lycaenidae)
			Diptera (Culicidae, Scatopsidae, Tabanidae, Bombyliidae, Dolichopodidae, Syrphidae, Muscidae)	Diptera (Culicidae, Scatopsidae, Tabanidae, Bombyliidae, Dolichopodidae, Syrphidae, Muscidae)
Aves			Oscines (<i>Emberiza</i> , <i>Motacilla</i> , <i>Erithacus</i>)	Oscines (<i>Emberiza</i> , <i>Motacilla</i> , <i>Erithacus</i>)
Mammalia	Rodentia (<i>Arvicola</i>)	Rodentia (<i>Arvicola</i>)	Rodentia (<i>Arvicola</i>)	Rodentia (<i>Arvicola</i>)

¹ Caught but not eaten.

² Caught and manipulated but seldom eaten.

³ Chased, seldom caught, never eaten.

especially the alpha-animals, seldom tried to catch insects, spiders or snails (c. 0.4-0.5% of their daily activity), and only every fourth attempt of the animals to catch animal prey was successful. Furthermore, the behaviour was evidently rather more playful or exploratory than aimed at getting food. Since 1996, however, the marmosets have increased substantially the amount and the variety of their prey. Prey-catching was no longer playful, but obviously goal-oriented and quite effective. The marmosets were "hunting" very successfully, even during slight rain or cool weather, when prey would be resting, immobile on the

underside of the branches or leaves or on the grass blades and other herbs from where they were skilfully grabbed and eaten. Very often the marmosets would systematically turn over the leaves of linden, maple and alder trees, and were seen to eat the caterpillars of a number of species of Lepidoptera. Several animals have 'specialised' in searching on the ground in the tall grass by "combing" the tussocks, whereas others have been observed stripping the prey with one or both hands from flowers (e.g., the umbels of tansy)- or from grass blades.



Figure 1. Remains of *Erithacus* caught and partially eaten by the marmosets

The majority of the animal prey are insects, but they have frequently been seen to eat spiders, young snails (*Arion*), and worms (*Lumbricus terrestris*), and sometimes small voles (*Arvicola*), and birds (especially *Erithacus*) (Fig. 1, Table 1). Unfortunately, we have not seen how they catch the birds and the voles. Since 1997, animal prey, most especially Gastropoda, Diptera and Lepidoptera (mostly imagines and caterpillars of *Vanessa urticae*, *Inachis io*, and *Gonopteryx rhamnii*) has come to comprise a substantial portion of the daily food of the marmosets when they have access to the outdoor enclosure (May to November).

Exudate-feeding

Exudate-feeding was not observed during the first season (1995), but since 1996 all marmosets except for the infants have been seen to spend much time each day gnawing and licking on the trunk and twigs of linden and maple trees (Fig. 2). Lime trees are preferred, maple trees are gouged less often, and birch trees are generally avoided. The marks were regularly checked and deepened during the entire season. Very often these holes were besieged by insects, especially by flies and hover flies, which were then caught by the marmosets.

Foraging on Plants (Flowers, Leaves, Buds)

In 1995 and 1996 the marmosets were not seen to gnaw at, or forage on, plants, i.e. flowers, buds, leaves, twigs. Since the Summer of 1997, however, they regularly and very intensively suckle and chew on the blossoms of trefoil,



Figure 2. Linden tree with sap-holes cut by the marmosets

vetch, deadnettle, rape, willow-herb, linden and maple trees; they also chew the leaves of linden, robinia and alder trees, of trefoil, dandelion, orach, tansy, speed well, camomile, different kinds of knotgrass and grass, fresh fruits of linden and maple trees, and shepherd's purse as well as the infructescences of grass, plantain, linden and maple trees. Apparently the animals do not really eat these items but only chew and crush the material. It is quite possible, however, that they swallow some particles or the exudates of the plants. Since the marmosets do not chew on all plants which are growing in their home range, it may be assumed that they select the plants for such as their taste or nutritive value.

Conclusion

It was evident from the *ad libitum* observations that the laboratory-born marmosets were still learning about the natural food sources available to them through the first one or two summer seasons after their release to the new habitat. We believe that an increase in the diversity of their home range would be accompanied by a corresponding increase in the use of natural food resources due to (1) greater locomotor activity and energy demands and (2) an expanded knowledge of the edible animal and plant foods available to them.

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which combined localities in Pará, Brazil with the Río Orinoco in Venezuela, led us to investigate the nomenclatural history of the howling monkeys of the region. To our surprise, we discovered that the type specimen of *straminea* in the Museum National d'Histoire Naturelle, Paris, had been reclassified as a female of the sexually dichromatic species *A. caraya* by Isidore Saint Hilaire in 1851. Elliott (1913) had likewise described the holotype as a female specimen of *A. caraya*. Cabrera (1957), in his classic catalogue of the South American mammals, and Carvalho (1965), who listed the mammals collected by Alexandre Rodrigues Ferreira and taken by Geoffroy Saint Hilaire from the Lisbon Museum in 1808 following Napoleon's conquest of Portugal, were both aware that Isidore Saint Hilaire (1851; Rode, 1938) and Elliot (1913) had identified the holotype as a female *A. caraya*, but discarded it as improbable! At our request, Drs. Laurent Granjon and Michel Tranier, mammalogists at the Museum National d'Histoire Naturelle, kindly examined the type, and Dr. Colin P. Groves, Professor at The Australian National University, Canberra, later photographed it. Although in poor condition, the mounted holotype is undoubtedly a female *A. caraya*. This renders the name *straminea* a junior synonym of *caraya*, and therefore not available for the red howlers. Further research into the systematics of the red howlers from northern South America is necessary to establish the true name for those in the northeastern Amazon and Venezuela. A number of names will need to be considered, including such as *Mycetes auratus* Gray, 1845 and *M. laniger* Gray, 1845.

Turning to the brown howlers of the Atlantic forest, the controversy lies in the validity of two names given in the same year: *Simia guariba* Humboldt, 1812 and *Stentor fuscus* Geoffroy Saint Hilaire, 1812. When discussing *Simia straminea* Humboldt 1812, Carvalho (1965) doubted Isidore Saint Hilaire's identification of the holotype as a female *A. caraya* and indicated that the specimen might be an *A. fusca*! It is not, but this led us to check on the history of the nomenclature of this species as well. It was Hershkovitz (1963, p.397) who claimed that, although predating *Stentor fuscus* Saint-Hilaire, 1812 by two months (as related by Thomas, 1913), *Simia guariba* Humboldt, 1812 is a primary homonym of Saint-Hilaire's (1806) *guariba*, which Hershkovitz (1963), therefore, regarded as a junior objective synonym of *Alouatta belzebul* (Linnaeus, 1766). However, unlike "*simia belzebuth*" and "*simia seniculus*", the name *guariba* is not mentioned binominally by Saint-Hilaire (1806), who was evidently proposing it only as a vernacular name with which to distinguish the howler, *Alouatta belzebul*, from the spider monkey, *Ateles belzebuth*. We concluded, therefore, that *Simia guariba* Humboldt, 1812 does not have an available senior homonym, and Hill (1962) and Hirsch *et al.* (1991), following Cabrera (1957), were correct in employing it as the species name for the Atlantic forest brown howling monkey. *Stentor fuscus* Saint-Hilaire, 1812 is a junior synonym. The correct name for the Atlantic forest brown howling monkey is *Alouatta guariba* (Humboldt, 1812).

News

THE SCIENTIFIC NAMES OF THE HOWLING MONKEYS, *ALOUATTA*, FROM THE GUIANAS AND THE ATLANTIC FOREST

An article published recently by Rylands and Brandon-Jones (1998) examined the correct scientific name for the red howling monkey occurring in the northeastern Amazon in Brazil, Venezuela and the Guianas, as well as that of the brown howling monkey from the Atlantic forest in Brazil and northern Argentina. The investigation arose from confusion over the identity of the red howlers either side of the Rio Trombetas, north of the Rio Amazonas in Brazil. Lima *et al.* (1990), Lima and Seuánez (1989, 1991) and Bonvicino *et al.* (1995) had concluded that the howlers either side of this river were distinct and indicated that *A. seniculus stramineus* occurred to the west, whereas *A. s. macconnelli*, a form described by Elliot (1910) from the coast of Guyana, occurred on the east side. Vassart *et al.* (1996) subsequently referred to the red howler in French Guiana as *A. s. macconnelli*. This information contradicted the long-standing recognition of the subspecific name of *stramineus* (meaning 'straw-coloured') as the howler occurring in the Guianas (see Husson, 1957, 1978). Meanwhile, Sampaio *et al.* (1996) and Figueiredo *et al.* (1998) had argued that the two forms either side of the Rio Trombetas were *not* separable even at the subspecific level.

This confusion, along with a contradictory type locality ascribed to *Simia straminea* Humboldt, 1812 by Hill (1962),

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ATLANTIC FOREST MARMOSETS - SPECIES AND HYBRIDS

Fabiano Rodrigues de Melo completed his Master's degree at the Federal University of Viçosa (UFV), Minas Gerais, Brazil, in March 1999, with a thesis entitled "Molecular characterization of *Callithrix aurita*, *C. flaviceps*, *C. geoffroyi* and their probable hybrids (Primates, Callitrichinae)". His supervisor was Dr. Lúcio Antônio de Oliveira Campos and he was co-supervised by Dr. Jorge Abdala Dergam dos Santos (UFV) and Dr. Sérgio Lucena Mendes (Museu de Biologia Mello Leitão, Espírito Santo). The research was supported by the Brazilian Higher Education Authority (CAPES), the Fundação Boticário de Proteção à Natureza, and the Margot Marsh Biodiversity Foundation. The following is a summary of the thesis:

The systematics of some of the marmoset species, genus *Callithrix* (Jacchus Group) is still the subject of discussion. Three of the species, *C. aurita*, *C. flaviceps* and *C. geoffroyi*, overlap in parts of their geographic distributions in the states of Minas Gerais and Espírito Santo in the south-east of Brazil, and there is evidence of hybrid forms in the contact zones. Although *C. flaviceps* and *C. geoffroyi* are now

recognized as good species, the high degree of intraspecific variation in *C. aurita* phenotypes has resulted in the description of subspecies in the past and some confusion as to the possible occurrence and extent of hybrids, especially with the closely related form *C. flaviceps*. DNA was extracted from skin (from the ear) and amplified by RAPD (random amplified polymorphic DNA) by means of the polymerase chain reaction (PCR) in order to characterize the genetic variability of both wild and captive individuals of these marmosets and their probable hybrids. Data was also obtained on some aspects of their external morphology and pelage. Seven diagnostic alleles were obtained for the three species. At least one of them was present in all of the hybrids, and as such, supported the existence of intermediate genotypic patterns for the hybrid forms. The results refuted the existence of two *C. aurita* subspecies. High within-population variability in pelage color patterns, and the relative consistency of the phenetic group formed by *C. aurita* militates against consideration of any subspecific grouping. In general, the hybrids presented highly individual color patterns and varying degrees of introgression. In the genetic analysis, hybrids between *aurita* and *flaviceps* were grouped with pure *C. flaviceps* despite showing phenotypes closer to that of typical *C. aurita*. Hybrids between *C. flaviceps* and *C. geoffroyi*, on the other hand, showed distances and intermediacy consistent with their intermediate phenotypes. Multivariate statistics examining the external morphological parameters measured showed that they were not sufficient to separate the hybrid forms from their parent species.

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NEW WORLD PRIMATE TAXON ADVISORY GROUP PREPARES UPDATED REGIONAL COLLECTION PLAN

The New World Primate TAG of the American Zoo and Aquarium Association (AZA) has focused on compiling an up-to-date regional collection plan and restructuring the TAG itself over the past year. The newest edition of the plan will be submitted to the Wildlife Conservation Management Committee (WCMC) of the AZA, later this year for approval. Distribution of the plan will follow. The regional collection plan covers all the New World primates, making recommendations for the North American collections based on their status in the wild, current population in captivity, space availability, husbandry concerns, and founder availability, as well as other issues.

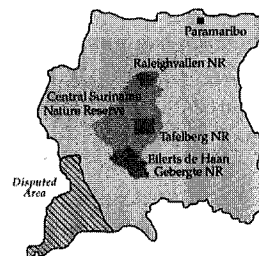
A five-year research and conservation plan will be included in the regional collection plan when it is published.

The restructuring of the TAG is in accordance with guidelines from AZA. Dr. Anne Baker of the Burnet Park Zoo will be stepping down as Co-Chair. Dr. Andy Baker of the Philadelphia Zoo will continue as TAG chair. Ken Kaemmerer of the Dallas Zoo is the Vice-Chair, and Cathleen Cox from Los Angeles Zoo is the Secretary. A steering committee of nine people was elected earlier this year from institutional representatives willing to participate. Each zoo was asked to name an institutional representative to the TAG.

Along with the new structure of the NWPTAG will come new responsibilities. Review and approval of new and existing studbooks and SSPs, applications, and changes will be done by the TAG instead of the WCMC in the near future. Procedures for oversight of the studbooks and SSPs as well as other issues of research, conservation, education and husbandry are being developed. Highlights of TAG activities over the past year include: the completion of *The Callitrichid Husbandry Manual*, a change in the taxonomic classifications within the genus *Ateles*, and an increase in requests for *Saimiri* and *Cebus* for exhibit.

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THE CENTRAL SURINAME NATURE RESERVE



The Central Suriname Nature Reserve comprises more than 1.6 million ha of primary tropical forest in the upper Coppename River of west central Suriname. It forms a corridor linking the three most important protected areas in central Suriname: the Voltzberg Raleighvallen Nature

Reserve (established in 1961, expanded in 1986, c.78,000 ha) in the north, and the Tafelberg (established in 1996, c.140,000 ha) and Eilerts de Haan Gerbergte (established in 1996, c.220,000 ha) Nature Reserves in the central and southern portions of the corridor. The area effectively protects the watershed of one of Suriname's most important river systems, the Coppename River.

Conservation International (CI), instrumental in the creation of this reserve, are working in close collaboration with the Government of Suriname to make this historic reserve a reality, a task which requires a high level of involvement by both parties. A conservation trust fund will be set up to ensure long-term financing for the Central Suriname Natural Reserve and other protected areas in Suriname, to endow the protected areas network, and allow the country to engage in other conservation-based development activities. The Nature Protection Division of the Suriname Forest

Service, the Foundation for Nature Preservation in Suriname (STINASU), and CI will develop a comprehensive management plan for the reserve, building on basic information about the biological resources, existing legislative and institutional capacity, and economic development prospects. Very little is known of the area, and field surveys and research will be carried out in collaboration with CI, with particular emphasis on biological inventories and field surveys in critical ecological sites and environmental areas and potential use zones. The final management plan will include appropriate strategies for resource management and protection, human use, scientific research and monitoring, awareness-raising and administration. CI will also provide financial support for the development of a research station at Raleighvallen Nature Reserve.

The creation of the Central Suriname Nature Reserve will be a cornerstone of Suriname's commitment to conservation-based development. The country has tremendous ecotourism potential, and in fact was one of the first countries to carry out successful rain forest tourism in the 1970s. The new Reserve should help the country to reestablish this sector and tap into the rapidly growing international nature tourism market, which is currently estimated at US\$2 billion. Several of Suriname's neighbors have already been successful in developing nature-based ecotourism, notably Costa Rica and Belize. Besides the protection of one of Suriname's most important river basins, major economic benefits to be tapped include the sustainable use of non-timber forest products, community artisanry and bioprospecting. The Reserve also has the potential to bring significant economic benefits through carbon sequestration.

CI has been active in Suriname since 1991. CI-Suriname's initiatives include: Geographic Information System (GIS) projects that document and map natural resource use by the Saramaka communities north of the Brokopondo Lake and the Tirio community of Kawmalasemutu in southwestern Suriname; protected areas management contributing towards the rehabilitation of the Voltzberg-Raleighvallen Nature Reserve and Brownsberg Nature Park; ethnobotanical projects that include the International Cooperative Biodiversity Groups (ICBG) Bioprospecting Program, an initiative with the Saramaka people that identifies and screens tropical plants for potential medicinal uses on an international scale; economic development projects seeking to promote economic alternatives to destructive forest practices; and policy development projects that include participation on the National Environmental Council, as well as active involvement in the development of the National Biodiversity Strategy, the National Strategy for Rural Sustainable Development and the Amazon Cooperation Treaty (ACT).

The Central Suriname Nature Reserve is an important precedent in protecting large blocks of undisturbed tropical wilderness. But it is only the first step. The challenge for CI and its partners is to continue these efforts to protect the

ecological viability of the world's last remaining tropical wilderness areas. To meet this challenge, CI will create the Tropical Wilderness Protection Fund (TWPF) to help finance major conservation corridors in the Earth's major tropical wilderness areas. Implementing the TWPF will require further refinement of conservation priorities through assessment of the scope of threat to these areas, incorporation of economic assessments that will highlight areas where conservation can best compete with more destructive land uses, estimates of carbon sequestration potential, appraisal of potential funding sources and current investment climates, further biological assessments of unknown areas, and institutional assessments of the feasibility of wilderness protection in key countries.

The primates protected in the Central Suriname Nature Reserve include *Saguinus midas midas*, *Saimiri sciureus sciureus*, *Cebus apella*, *Cebus olivaceus*, *Pithecia pithecia pithecia*, *Chiropotes satanas chiropotes*, *Alouatta seniculus*, and *Ateles paniscus*.

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RESERVA DA BIOSFERA DA MATA ATLÂNTICA - PRÊMIO MURIQUI



A Reserva da Biosfera da Mata Atlântica foi reconhecida pelo Programa MaB - Man and Biosphere da UNESCO em 1991, por solicitação do governo brasileiro. Esta Reserva é contida entre os paralelos 2° de latitude Norte e 33° de latitude Sul, que envolve áreas remanescentes de mata Atlântica em 14 estados entre o Ceará e o Rio Grande do Sul, e abarca 5 dos 8 mil quilômetros da costa marítima brasileira. Estende-se por um número de aproximadamente 1.000 municípios e abrange cerca de 290.000 km² do território nacional. Nesta Reserva governos se juntam para trabalhar para sua conservação e pela melhoria da qualidade de vida das populações que vivem em sua área de influência. A universidade e os centros de pesquisa com trabalhos voltados à mata Atlântica desenvolvem programas para estudá-la, conhecer sua biodiversidade, saber de se sua convivência equilibrada com suas comunidades tradicionais e dos seus mecanismos de auto-regeneração. Governos, universidades e centros de pesquisa desenvolvem e detalham as tecnologias para recuperar suas áreas degradadas ou proteger as que se apresentam conservadas.

O órgão máximo, ao qual cabe estabelecer as diretrizes para os trabalhos de implantação da Reserva, é o *Conselho Nacional da Reserva da Biosfera da Mata Atlântica*. Este Conselho concebe seu Plano de Ação e realiza sua avaliação

periódica. Sua constituição é parietária. São 36 membros: 18 governamentais e 18 não-governamentais. Dos 18 membros governamentais, quatro representam o Governo Federal e quatorze representam os estados que compõem a Reserva. Dos não-governamentais, seis representam a Região Nordeste, seis a Sudeste e seis a Sul. Cada região indica para representá-la dois cientistas, dois ambientalistas e dois líderes das suas comunidades de moradores. Os *Comitês Estaduais de Implantação* são a instância de apoio e articulação junto aos órgãos dos Governos Federal, Estaduais e Municipais, que atuam na implantação da Reserva em cada estado. Apoiam e articulam a participação de cientistas, ambientalistas e moradores nos trabalhos das instituições oficiais. O *Plano de Ação* da Reserva de baseia no obra do Almirante Ibsen de Gusmão Câmara (Câmara, 1991, 1996) e funciona em dois níveis de atividades: Nacional (o Plano de Ação da Reserva propriamente dito) e Estadual (os Planos Estaduais de Ação). Sua definição se dá por discussões e decisões que contam com a colaboração de seis Grupos Temáticos: Áreas protegidas; Espécies, Educação ambiental; Planejamento ambiental e desenvolvimento sustentável, Qualidade ambiental, que inclui aspectos geoambientais e recuperação de áreas degradadas; e Legislação. Esses grupos são abertos a todos os cientistas interessados e ligados ao tema, com trabalhos na área abrangida pela Reserva. O *Consórcio Mata Atlântica* é o órgão governamental de apoio ao Sistema de Gestão da Reserva. Exerce por delegação o papel da Secretaria Executiva do Conselho, atuando quando solicitado no apoio aos Comitês Estaduais, articulando os trabalhos dos órgãos federais e estaduais para a implantação da Reserva em cada estado, assegurando a compatibilização das atuações sugeridas pelos Grupos Temáticos ao Plano de Ação. As diretrizes para as atividades do Consórcio são estabelecidos por seu Conselho de Secretários. Este Conselho é composto pelos Secretários de Meio Ambiente dos quatorze estados consorciados e pelo Presidente do Ibama, representando o Governo Federal. O Consórcio conta também com o trabalho de dois assessores técnicos em cada estado e dois junto ao Governo Federal, indicados pelos Secretários de Meio Ambiente dos estados e pela Presidência do Ibama.

Foram definidos *Áreas Piloto* em cada estado, que tem por finalidade priorizar a realização de experimentos para buscar as melhores formas de manejar a flora, a fauna e as áreas de produção sustentada dos recursos naturais, bem como o incremento e a recuperação da biodiversidade e dos processos de conservação. São as seguintes áreas: *Ceará* - Serra do Maranguape/Aratanha e Serra do Baturité; *Rio Grande do Norte* - Mata da Estrela e o Parque Estadual das Dunas do Natal; *Paraíba* - Litoral Norte e Mato do Pau Ferro; *Pernambuco* - Complexo Itamaracá/Itapissuma/Igarassu e Serra dos Cavalos que inclui o Parque Ecológico João Vasconcellos Sobrinho; *Alagoas* - Mata do Quebrangulo (AL/PE) e Mata do Murici; *Sergipe* - Mata do Crato e Vale do Rio Real; *Bahia* - Parque Metropolitano do Pirajá, região da Reserva Biológica de Una e região do Parque Nacional de Monte Pascoal; *Minas Gerais* - Parque Estadual do Rio Doce, Municípios de Ouro Preto e Tiradentes, Estação Ecológica

do Papagaio; *Espírito Santo* - Parque Estadual de Itaúnas, região da Reserva Biológica de Sooretama e Reserva Florestal de Duas Bocas; *Rio de Janeiro* - Parque Estadual do Desengano, Reserva Ecológica do Joatinga, Estação Ecológica de Ribeirão das Lages, região do Parque Nacional do Itatiaia, Parque Estadual da Serra Grande, Reserva Ecológica da Praia do Sul, APA de Marambaia e Jacarepeia; *São Paulo* - Picinguaba, região abrangida pelo Cinturão Verde de São Paulo e municípios de Apiaí, Iporanga, Eldorado, Jacupiranga e Cananéia; *Paraná* - Municípios de Guaraqueçaba e Antonina; *Santa Catarina* - Reserva de Patrimônio Nacional de Volta Velha, Rio Julio, Morro do Baú e Parque Estadual da Serra do Tabuleiro; *Rio Grande do Sul* - Região da Reserva Biológica da Serra Geral, Vales do Maquiné e das Três Forquilhas e município de Silveira Martins.

O Prêmio Muriqui foi instituído em 1993 pelo Conselho Nacional da Reserva da Biosfera da Mata Atlântica, em sua 2ª Reunião realizada em Domingos Martins, Espírito Santo. Tem o objetivo de incentivar ações que contribuam para a implantação desta Reserva, Apenas dois prêmios são outorgados anualmente pelo Conselho a pessoas físicas e entidades públicas e privadas, nacionais ou internacionais que tenham se destacado, por suas atividades em benefício da Proteção da Biodiversidade, do Desenvolvimento Sustentável ou do Conhecimento Científico da Mata Atlântica. Excepcionalmente, por razões especiais, três prêmios no máximo podem ser atribuídos no mesmo ano. Esta homenagem é constituída de uma estatueta de bronze e de um diploma que é entregue em cerimônia festiva, aos benfeitores desta ecossistema. Os premiados são escolhidos através de voto nas reuniões ordinárias anuais do Conselho Nacional da Reserva da Biosfera da Mata Atlântica.

As seguintes instituições e personalidades já receberam o Prêmio Muriqui: **1993** - Ecologista *Roberto Lange* (in memorian), ativo conservacionista paranaense, que lutou intensamente em defesa da Mata Atlântica, e foi relator do processo de tombamento da Serra do Mar no Estado do Paraná; a *Sociedade Nordestina de Ecologia - SNE* por sua atuação como coordenadora dos trabalhos de elaboração da proposta da Reserva da Biosfera da Mata Atlântica nos estados do Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas e Sergipe; a *Fundação Brasileira para Conservação da Natureza (FBCN)*, que durante anos foi a única fundação ambientalista a atuar no panorama político brasileiro, tendo participado ativamente de inúmeras e históricas atividades e batalhas em defesa da mata Atlântica. **1994** - *Adelmar F. Coimbra Filho*, fundador do Centro de Primatologia do Rio de Janeiro (CPRJ/FEEMA), eminente biólogo, membro da Academia Brasileira de Ciências, autor de muitos trabalhos sobre a fauna e flora da mata Atlântica, representante do Brasil em eventos científicos internacionais e grande incentivador da Reserva da Biosfera; e o *Projeto Centro Peixe-Boi/IBAMA*, pelos grandes esforços realizados na identificação de soluções e em sua aplicação na conservação e recuperação dessa importante espécie, e também pelos promissores resultados já alcançados. **1995** - *Sebastião Salles de Sá* (in memorian), coordenador do Projeto Mata

Atlântica e Presidente do Conselho de Cultura no Estado, pelo muito que fez, com seu trabalho incansável e ações importantes pela criação da Reserva da Biosfera da Mata Atlântica; *Miguel Serediuk Milano*, Engenheiro Florestal, mestre e doutor em Ciências Florestais, Professor da Universidade Federal do Paraná, autor de mais de 40 trabalhos técnico-científicos, criador do Parque Nacional da Serra Geral, Rio Grande do Sul, e Diretor da Fundação O Boticário para a Proteção à Natureza; e o *Projeto Centro TAMAR/IBAMA*, pioneiro no desenvolvimento de um projeto de grande relevância para a proteção das tartarugas marinhas que se encontravam extremamente ameaçadas e pelo grande sucesso alcançado na execução dessa tarefa de forma sustentada. **1996** - *Almirante Ibsen de Gusmão Câmara*, Emérito ambientalista, participante do Conselho de várias ONGs ambientalistas brasileiras, representante do movimento ambiental brasileiro em diversas ocasiões no exterior, e autor do *Plano de Ação para a Mata Atlântica* (Câmara, 1991, 1996), um dos mais expressivos documentos já publicados sobre a conservação deste ecossistema; e a *Associação Gaúcha de Proteção ao Ambiente Natural - AGAPAN*, ONG brasileira, que desde 1971 luta pela defesa da mata Atlântica tendo participado ativamente de seu processo de tombamento no Rio Grande do Sul, e membro do Comitê Gaúcho da Reserva da Biosfera. **1997** - *Russell A. Mittermeier*, Ecologista, professor e primatólogo, chefe do Grupo de Especialistas em Primatas (UICN/CSE/PSG), um dos principais defensores do meio ambiente no cenário internacional, foi vice-presidente do WWF-US, e Presidente da Conservation International desde 1983, e é um grande incentivador da Reserva da Biosfera da Mata Atlântica; e a *Secretaria do Meio Ambiente do Estado de São Paulo* que, além dos trabalhos em áreas de mata Atlântica no estado, tem assumido uma postura de liderança na defesa dos remanescentes de mata Atlântica a nível nacional e sempre proporcionou apoio físico e material, bem como funcionários para os trabalhos da Reserva da Biosfera. **1998** - *Denise Marçal Rambaldi*, Engenheira Florestal, trabalhou pela implantação do Parque Florestal Ibitipoca, coordenou e supervisionou a implantação do Parque Municipal Eurico Figueiredo em Conselheiro Lafayete, Minas Gerais, em 1989 foi contratada pelo Programa de Conservação do Mico-Leão-Dourado do National Zoological Park, Smithsonian Institution, como Coordenadora do Projeto de Educação Ambiental, e em 1994 assumiu a Diretoria Executiva da Associação Mico-Leão-Dourado (AMLD), no Rio de Janeiro; e a *Fundação SOS Mata Atlântica*, primeira entidade ambientalista não-governamental a desenvolver uma campanha nacional em defesa da mata Atlântica. Tornou-se entidade referencial, dada a importância e qualidade de seus trabalhos como o *Atlas da Mata Atlântica* que publica periodicamente.

Para maiores informações: Conselho Nacional da Reserva da Biosfera da Mata Atlântica, Rua do Horto 931, Instituto Florestal, 02377-000 São Paulo, São Paulo, Brasil, Fax: (011) 204 8067, e-mail: <cnrbma@uol.com.br>. Web site: <http://www.unicamp.br/nipe/rbma>.

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THE AMAZON CENTER FOR ENVIRONMENTAL EDUCATION AND RESEARCH

The Amazon Center for Environmental Education and Research (ACEER) is a nonprofit education and research facility situated in 250,000 acres of primary tropical rainforest in the upper Amazon Basin of Peru, District of Loreto. The facility is available for short and long-term tropical research studies. Applications are continuously reviewed by the ACEER Foundation's Scientific Advisory Board. For more information: Dr. Stephen L. Timme, Sperry Herbarium - Biology, Pittsburg State University, Pittsburg, Kansas 66762-7752, USA, Tel: (316) 235-4740, Fax: (316) 235-4194, e-mail: <slt@pittstate.edu>. WWW: <www.erri.psu.edu/web/aceer.htm>. From *Tropinet* 10(1), March 1999.

SAINT EUGÈNE RESEARCH STATION, MUSÉUM NATIONAL D'HISTOIRE NATURELLE, FRENCH GUIANA

The Saint Eugène Research Station was founded in 1993 by the Museum National d'Histoire Naturelle (MNHN) with a grant from the Electricité de France (EDF). It is located upstream the Courcibo river (a tributary of the Sinnamary river), approximately 2½ hours by speed boat from the Petit Saut Dam (50 km from the city of Kourou at the base of the Centre Spatial Guyanais - CSG). It was set up just months before most of the region was flooded due to the construction of the dam. The lake is 36,500 ha with a mean depth of 10-11 m, and a maximum depth of 35 m. Approximately 10,500 ha of islands were formed in 1994-1995 during the inundation of the forest. This station is devoted to the study of the consequences of forest fragmentation with water as a matrix between fragments.

The core area of the Station consists of a large peninsula of about 1,500 ha connected to the mainland by a corridor several hundred meters wide, and of 110 islands ranging from 0.1 to 78 ha. The research area is part of the EDF

concession, and is protected from hunting by national guards. Apart from clearing and casual logging nearby previous goldminer camps along the river (now flooded), no extensive logging occurred before or after flooding, and the forest is considered old and mature. Several networks of trails have been established at 100-m intervals on some large islands, at 500-m intervals on others, and at 500-m intervals on the large peninsula. Two 1-ha permanent plots have been mapped and all trees greater than 10 cm in dbh were tagged, inventoried and identified. One is on the large peninsula and the other on a 28-ha island. The forest is rich in Lecythidaceae and Leguminosae, and the fauna, at least on the mainland, is complete and rich with six species of primates and large terrestrial ungulates and felids. Populations of vertebrates (reptiles, birds, rodents, marsupials, bats, primates and ungulates) have been studied since the beginning of the fragmentation processes. Along with the long-term survey of fauna and flora, the goal of the Saint Eugène Fragmentation Program (SEFP) is to investigate animal-plant relationships in collaboration with other European and international institutions. Studies are currently being developed in other areas as well, such as invertebrate-soil relationships (dung beetles, termites).

The housing facilities are rustic (i.e. hammocks rather than beds). The station is equipped with three main rooms with wooden floors, metal roofs, a generator, refrigerator, water pump, shower and running water, allowing up to 10 persons to live for extended periods of time. Food and necessities can be purchased easily from Kourou, and routinely brought to the station. Currently, the station is open twice a year, during the wet (March-June) and the dry season (October-December) depending on usage.

For more information: Dr. Pierre-Michel Forget (topic: Botany and animal-plant relationships), Lab. Ecologie Générale, Museum National d'Histoire Naturelle (MNHN), 4 avenue du Petit Château, F-91800, Brunoy, e-mail: <forget@mnhn.fr>, or Dr. Jean-Marc Pons (topic: Zoology). Lab. Mammifères et Oiseaux, Museum National d'Histoire Naturelle (MNHN), 55 rue de Buffon, F-75005 Paris, France, e-mail: <pons@mnhn.fr>. From: *Tropinet* 10(1): March 1999.

JERSEY ZOO - THE DURRELL WILDLIFE CONSERVATION TRUST



The Jersey Zoo, founded by the author and naturalist, the late Gerald Durrell, celebrated its 40th anniversary on 26th March 1999. Registered as a charity in 1963, the Jersey Wildlife Preservation Trust (JWPT) manages species recovery programmes in a number of regions throughout the world, and the Jersey Zoo serves as the centre for breeding, research and professional training and fundraising. Veterinary, pathology, nutrition, and public education services offer special expertise to conservation programmes in the zoo and overseas. On the event of its 40th anniversary, the name of the Trust was changed to

honour its founder. It is now the Durrell Wildlife Conservation Trust. The announcement was made at the opening of "First Impressions", the new £1.2 million multi-species animal enclosure, by His Excellency The Lieutenant-Governor of Jersey, General Sir Michael Wilkes. On this occasion, the Trust's Honorary Director, Dr. Lee Durrell, also unveiled a larger-than-life size bronze sculpture of Gerald Durrell in the landscaped forecourt of the exhibit.

Besides receiving the Senior Biology and Conservation Award of the American Society of Primatologists in 1997 (see *Neotropical Primates*, 5(3): 82-83, 1997), PSG Member and Director of the Jersey Zoo, Jeremy J. C. Mallinson, was recently presented with the Heini Hediger Award (October 1998), given for outstanding and dedicated service to the zoo community by the International Union of Directors of Zoological Gardens and Aquariums.

MARGOT MARSH BIODIVERSITY FOUNDATION - GRANTS AWARDED 1998-1999



The Margot Marsh Biodiversity Fund, a charitable foundation dedicated exclusively to primate conservation, was created in 1996. The mission of the Fund is "to contribute to global biodiversity conservation by providing strategically targeted, catalytic support for the conservation of endangered nonhuman primates and their natural habitats" (see *Neotropical Primates* 4(2): 65-66, June 1996; 6(1): 23-24, March 1997).

In 1998, *Neotropical Primates* received a major grant through IUCN-US from the Margot Marsh Biodiversity Foundation, covering the costs of printing and distributing four issues to over 950 addresses worldwide. We are pleased to announce that a further grant has been awarded for 1999, mediated by the Los Angeles Zoo, and as editors, Anthony Rylands and Ernesto Rodríguez-Luna, and on behalf of all who receive this newsletter free-of-charge, we express our most sincere gratitude for the continuing support of the Foundation in this venture.

The Primate Action Fund provided support for seven projects in 1998 for research on and the conservation of Neotropical primates: Translocation of white-faced capuchins to Pedras Blancas National Park, Costa Rica - Suzanne Chacon, Nature Restoration Foundation; Status of populations and habitats of the Central American squirrel monkey in Panama - Ariel Rodrigo Rodríguez-Vargas, Programa Regional en Manejo de Fauna Silvestre (Costa Rica); Preparation of the *Primates of Colombia* (Conservation International Tropical Field Guide Series) - Thomas Defler, Fundación Natura-Reserva Caparú, Colombia; Seed dispersal by howler monkeys and other frugivorous vertebrates at Itapuá State Park, Rio Grande do Sul, Brazil - Ana Alice Biedzicki Marques, Universidade Federal de Minas Gerais; Rapid assessment of yellow-tailed woolly monkey populations in the Peruvian Andes - Asociación Peruana para la Conservación de la Naturaleza

(APECO); Distribution and feeding behavior of the black howler monkey in the Bocas de Polochic Wildlife Refuge, Guatemala - Claudia Lorena Quan Rodas, Idea Wild; Status of spider monkey populations in El Triunfo and La Sepultura Biological Reserves, Mexico - Alberto Anzures Dadda, Idea Wild. Five major grants were also awarded: Publication of the IUCN/SSC Primate Specialist Group Newsletter *Neotropical Primates* - IUCN-US; Development of a Primate Research Station at the Raleighvallen-Voltzberg Nature Reserve, Suriname - Cincinnati Zoo and Botanical Gardens; Relationship of reproductive function and suppression to social hierarchies in black-handed spider monkeys in Catemaco, Mexico and the potential of Genome Resource Banking for conservation - William Swanson, Cincinnati Zoo and Botanical Gardens; PHVA Workshop for Endangered Muriquis - IUCN/SSC Conservation Breeding Specialist Group; Conservation of Brazil's critically endangered lion tamarins - Brazil Fauna Interest Group/American Zoo and Aquarium Association.

For 1999, so far the following Primate Action Fund grants have been awarded in support of projects on Neotropical primates: Spider monkey conservation project at Madidi National Park - Joe Viera and collaborators, Conservation International, Bolivia; Search for a possible new species of woolly monkey, *Lagothrix* - Randy Borman, Cofan Survival Fund; Mycophagy by *Callimico* and primate surveys in the central and southwestern parts of the Pando, Bolivia - Amy Hanson, State University of New York (SUNY), Stony Brook; Effects of Amazonia wildfires on primates and other vertebrates - Carlos Peres, University of East Anglia, UK.

For further information on the Margot Marsh Biodiversity Foundation, please write to: Dr. William R. Konstant, c/o Conservation International, 2501 M Street NW, Suite 200 Washington, D. C. 20037, USA, Fax: 202 331-0570, e-mail: <b.konstant@conservation.org>.

FUNDAÇÃO O BOTICÁRIO DE PROTEÇÃO À NATUREZA - PROJETOS 1998-1999



Por intermédio de seu Programa de Incentivo à Conservação da Natureza, a Fundação o Boticário de Proteção à

Natureza aprovou 24 projetos no primeiro semestre de 1998 (receberam apoio a partir de agosto de 1998). Os projetos foram aprovados em três categorias: 1) Unidades de Conservação - 8 projetos; 2) Pesquisa e Proteção da Vida Silvestre - 13 projetos; 3) Áreas Verdes - 3 projetos. Mais 18 projetos foram aprovados no segundo semestre (apoiados a partir de janeiro de 1999): 1) Unidades de Conservação - 5 projetos; 2) Pesquisa e Proteção da Vida Silvestre - 9 projetos; 3) Áreas Verdes - 4 projetos. Essa segunda seleção incluiu, com recursos do convênio entre a Fundação e a John D. and Catherine T. MacArthur Foundation, o projeto "Levantamento das populações remanescentes e status

taxonômico do miquiqui, *Brachyteles arachnoides*, no estado do Rio de Janeiro" da Fundação Brasileira para a Conservação da Natureza (FBCN), Rio de Janeiro. Somam hoje 525 projetos de conservação, pesquisa e manejo apoiados pela Fundação Boticário.

No dia 11 de fevereiro de 1999, a Fundação celebrou um convênio com a Editora da Universidade Federal do Paraná. O convênio, que terá duração de cinco anos, visa a realização em conjunto de edições de obras em língua portuguesa sobre o tema "Conservação da natureza". A primeira ação deste convênio foi a parceria para a edição do livro *Saudade do Matão* de Teresa Urban, que relata a história do movimento conservacionista no Brasil, incluindo entrevistas com cinco das mais importantes figuras deste movimento (veja *Neotropical Primates* 7(1): 34, 1999).

Miguel Serediuk Milano, Diretor Técnico (e-mail: <miguelm@boticario.com.br>) e **Maria de Lourdes Nunes**, Coordenadora Técnica (e-mail: <malu@boticario.com.br>), Fundação O Boticário de Proteção à Natureza, Av. Rui Barbosa 3450, Afonso Pena, 83065-260 São José dos Pinhais, Paraná, Brasil, Tel: (041) 382 3456, Fax: (041) 382 4179.

LINCOLN PARK ZOO SCOTT NEOTROPIC FUND - PROJECTS 1999

Since 1986, Lincoln Park Zoo's Scott Neotropic Fund has supported more than 125 projects in 18 Latin American countries, dispensing more than US\$750,000. The following projects were recommended for support in 1999: Indigenous monitoring of wildlife harvests and biodiversity in Nicaragua's Bosawas Natural Reserve - Cheryl Asa, St. Louis Zoo, Anthony Stocks, Idaho State University & Paul Garber, University of Illinois, Urbana; Conservation and population assessment of mantled howler monkeys of Mobacho Volcano Nature Reserve and surrounding coffee plantations - Colleen McCann & Fred W. Koontz, Bronx Zoo; Viability of the endangered Darwin's fox (*Pseudalopex fulvipes*): Assessing ecological factors in the last mainland population (Chile) - Jaime E. Jimenez, Utah State University; Effects of habitat fragmentation on the bat assemblages in the south-eastern Brazilian Atlantic forest - Fernando A. S. Fernandez, Universidade Federal do Rio de Janeiro; Reconciling timber harvesting with forest conservation in the eastern Amazon (Brazil) - Mark Schultze, Pennsylvania State University; Natural history of the horned guan (*Oreophasis derbianus*) in Albores, Sierra de las Minas Biosphere Reserve, Guatemala - Omar Menez, Universidad de Valle de Guatemala; The creation of an urban tropical conservation area: The contribution of a herpetofaunal survey - Ana Cristina de Oliveira C. Duarte, Instituto Nacional de Pesquisas da Amazônia, Manaus. The following projects were renewed: Primate translocation as a tool for species preservation and community conservation in northwest Ecuador - Amy Galloway, Northern Michigan University; Strategies for the conservation of the jaguar

(*Panthera onca*) in Costa Rica; Biological corridors and buffer zones - Roberval Almeida, Universidad Nacional, Costa Rica; Baird's tapir ecology in a Costa Rican tropical rainforest - Charles R. Foerster, Universidad Nacional, Costa Rica; Are artificial burrow colonies useful to increase optimal nesting sites for Humboldt's penguins in Peru? - Rosana Paredes & Carlos B. Zavalaga, Punta San Juan, Peru; Long-term studies of forest fragmentation - Alejandro Estrada, Los Tuxtlas Biological Station, Mexico.

In 1999, the Lincoln Park Zoo will be launching a new fund, similar to the Scott Neotropic Fund, in support of projects in Africa, Asia and the Pacific. Application materials for this and the Scott Neotropic Fund are available by writing to: Steven D. Thompson, Director of Conservation and Science, Lincoln Park Zoo, P. O. Box 14903, Cannon Drive at Fullerton Parkway, Chicago, Illinois 60614, USA, Tel: 312 742 7765, Fax: 312 742 7220, e-mail: <steved@ix.netcom.com>.

THE LEAKEY FOUNDATION RAISES ITS AWARD AMOUNTS



The L. S. B. Leakey Foundation was formed to further research into human origins and behavior. Recent priorities

include research into the environments, archaeology, and human paleontology of the Miocene, Pliocene, and Pleistocene; the behavior, morphology, and ecology of the great apes and other primate species; and into the behavioral ecology of contemporary hunter-gatherers. Other areas of study have been funded on occasion.

The Leakey Foundation is pleased to announce an increase in funding levels for all grant award categories. Awards in the Special Research Grants category will be increased to US\$ 40,000 for senior scientists and post-doctoral students. Multiple year funding will also be considered. Special Research Grants focus on projects which involve substantial field research in paleoanthropology, archaeology, primatology and related disciplines. Awards in the General Research Grants category will be increased to \$20,000 for senior scientists and post-doctoral students and \$12,000 for graduate students. Grants are awarded twice annually: Application deadline 15 August for December notification; Application deadline 5 January for May notification.

Further details and updated application requirements are available from the office upon request, or through the Foundation's web site the beginning of July. Application forms will be available on-line as of July at: <www.leakeyfoundation.org>. For further information: The Leakey Foundation, P.O. Box 29346, Presidio Bldg., 1002A O'Reilly Ave., San Francisco, CA 94129, USA, Fax: (415) 561-4647, Tel: (415) 4646, e-mail: <grants@leakeyfoundation.org>.

PRIMATE CONSERVATION INC. - NEW ADDRESS

As of 1 June 1999, Primate Conservation Inc. has a new address. Please post all correspondence to: Noel Rowe, Primate Conservation Inc., 1411 Shannock Rd., Charlestown, Rhode Island 02813-3726, USA, Tel: +1 401 364-7140, e-mail: <nrowe@primate.org>. Web site: <http://www.primate.org>.

WORKSHOP: DESIGN OF BIODIVERSITY INVENTORIES AND USE OF INDICATOR GROUPS

A teaching workshop "Design of Biodiversity Inventories and Use of Indicator Groups" will be held from 25 November - 5 December 1999, at Villa de Leyva, Boyacá, Colombia. It will be offered by the Program in Biodiversity Inventories of the Humboldt Institute of the Universidad Nacional de Colombia. The objectives are to provide training to students and professionals in the design and direction of biological inventories and diversity in Neotropical countries. The course will be offered at the graduate level with credit arranged through the Universidad Nacional of Colombia. It will include both theoretical themes and their practical applications in acquiring field data, design and management of data bases, and statistical analysis, offered by an international group of scholars and researchers. Selection of participants will be merit-based; some financial support is available. Applications will be received from 1 March-30 June, with notification of acceptance in mid-August. The workshop coordinators are: Frederico Escobar S., Instituto Humboldt, Colombia, e-mail: <mibaena@cariari.ucr.ac.cr>, and Mario E. Favilla C., Instituto de Ecología, México, e-mail: <scarab@sun.ieco.conacyt.mx>. Web page: <www.humboldt.org.co>.

Primate Societies

PRIMATE SOCIETY OF GREAT BRITAIN - NAPIER MEMORIAL MEDAL



The Napier Memorial Medal was instituted by the Primate Society of Great Britain (PSGB) in memory of its founding President, Professor John Napier, following a bequest to the Society. The Medal is offered every two years to a young primatologist in order to provide encouragement through the public recognition of their work. The fourth Napier Medal was awarded to Nicola Koyama in 1997 for her PhD on reconciliation behaviour in Japanese macaques. Nominations for the 5th Napier Memorial Medal (to be awarded at the 1999 Winter Meeting, 1 December 1999) are invited on behalf of recent postgraduate students. To be eligible for consideration candidates must: 1) be either a British subject or a foreign national who has completed a PhD at a UK institution of higher education; 2) normally be under the age of 30 years on 1 December 1999 (older

applicants are considered in exceptional circumstances); 3) have submitted their thesis after June 1997. Candidates should normally be nominated by a member of the PSGB, but they may be nominated by their PhD supervisor even if he/she is not a member. The nomination should consist of a CV (including an abstract of the PhD thesis and full list of publications) and two letters of reference (one of which should normally be from the external examiner of the PhD). *The closing date for receipt of nominations is 1 August 1999*, and candidates may be asked to provide a copy of their PhD or published work for the selection committee. Nominations should be sent to: Dr. Phyllis C. Lee, Department of Biological Anthropology, Downing Street, Cambridge CB2 3DZ, UK.

PRIMATE FIELD STUDIES GLOBAL DATABASE



The Primate Society of Great Britain (PSGB) is compiling a millennium edition of their guide to primate field projects: *Current Primate Field Studies* (a supplement to their newsletter *Primate Eye*). For the first time, this guide will be compiled in collabora-

tion with the Wisconsin Regional Primate Research Centre (WRPRC), and will also be available electronically on the Field Studies section of the International Directory of Primatology website (<http://www.primate.wisc.edu/pin/idp/index.html>). This merger of PSGB and WRPRC field directories will establish a single comprehensive global database that will maximise accessibility and minimise redundancy for both users and contributors alike.

We invite all those who are currently carrying-out primate field studies, or who completed a field study during 1998-1999, to submit their project details to this scheme. Submissions can be made electronically or by hard copy. In the first instance, submissions can be made on the electronic form found on the International Directory of Primatology website (<http://www.primate.wisc.edu/pin/idp/idpqfield.html>). If submissions are made by hard copy (a form is enclosed with this journal to help facilitate this option), the following information should be included:

(1) Title of field study project, (2) Country and location, (3) Project start and end dates, (4) Research objectives, (5) Species studied (list latin names), (6) Other primate species found at site, (7) Positions for field workers/volunteers, (8) Sponsoring institutions, (9) Name of project director together with their institution, address, city, state/province (not abbreviated), mailing code, phone number, fax number, e-mail address and website address, (10) The names of other research personnel on the project (including the contact person for these project details; if same as director, please list as same), (11) Keywords that best describe the field study, and (12) Miscellaneous comments (optional).

Submissions by hard copy should be mailed to: Guy Cowlishaw, Institute of Zoology, Zoological Society of London, Regent's Park, London NW1 4RY, UK, e-mail: <guy.cowlishaw@ioz.ac.uk>.

Recent Publications

ESTACIÓN BIOLÓGICA CAHUANA, 1979-1994

A series of reports on the activities and research carried out through the US-AID/The Nature Conservancy (TNC) project "Employment and Natural Resources Sustainability in the Pacaya-Samiria National Reserve" have been compiled by the Fundación Peruana para la Conservación de la Naturaleza (FPCN), Iquitos, and the Centro de Datos para la Conservación of the Universidad Nacional Agraria La Molina. The Cahuana Biological Station on the Río Pacaya in the Pacaya-Samiria National Reserve in the Peruvian Amazon is the field site of long-term research by PSG member Pekka Soini (see *Primate Conservation* (7): 63-71, 1986). In Spanish, the *Reporte Pacaya-Samiria: Investigaciones en la Estación Biológica Cahuana, 1979-1994*, published in 1995, 435pp., includes extremely valuable ecological and demographic data on callitrichids, *Cebuella pygmaea*, *Saguinus fuscicollis* and *S. mystax*, the monk saki, *Pithecia monachus*, the woolly monkey (*Lagothrix lagothricha*), and the red howler (*Alouatta seniculus*), as well as information on the avifauna, capybaras, the Amazon manatee (*Trichechus inunguis*) and the turtles, especially the giant Amazon river turtle (*Podocnemis expansa*). It contains 41 separate reports (*Informes*) as follows: 1. Evaluación de fauna silvestre en la cuenca del río Pacaya, Abril 1978 - Octubre, 1979. 2. Estudio, reproducción y manejo de los quelonios del género *Podocnemis* (charapa, cupiso y taricaya) en la cuenca del Pacaya, río Pacaya, Loreto-Perú. 3. Informe de las actividades en la Estación Biológica Cahuana, Abril - Agosto, 1980. 4. Ecología y dinámica poblacional del pichico *Saguinus fuscicollis* (Primates, Callitrichidae). 5. Informe de las actividades en la Estación Biológica Cahuana, Enero - Diciembre, 1981. 6. Distribución geográfica y ecología poblacional de *Saguinus mystax* (Primates, Callitrichidae). 7. Informe de las actividades en la Estación Biológica Cahuana, períodos Enero-Abril y Junio-Agosto, 1982. 8. Informe de las actividades en la Estación Biológica Cahuana, Agosto - Noviembre, 1982. 9. Ecología reproductiva de la taricaya (*Podocnemis unifilis*) y sus implicaciones en el manejo de la especie. 10. Censos de fauna silvestre en la isla de Cahuana, Enero-Abril, 1983. 11. Ecología poblacional de los primates del género *Saguinus*. 12. Ensayos de incubación de huevos de los quelonios del género *Podocnemis* (charapa, taricaya y cupiso). 13. Ecología y situación de la charapa (*Podocnemis expansa*), 1984. 14. Estudio y conservación de la charapa (*Podocnemis expansa*), 1984. 15. Lista preliminar de los reptiles y mamíferos presentes en Cahuana, río Pacaya. 16. La avifauna de Pacaya: Inventario preliminar. 17. Características climáticas: Resumen de cinco años de registros de la temperatura, pluviosidad y fluviometría en Cahuana, río Pacaya. 18. Estudio e incubación de nidadas de la charapa (*Podocnemis expansa*), 1985. 19. Un resumen

comparativo de la ecología reproductiva de los quelonios acuáticos. 20. Informe preliminar de la ecología y dinámica poblacional del "choro" *Lagothrix lagotricha* (Primates). 21. Resumen comparativo de la ecología y dinámica poblacional e la familia Callitrichidae (Primates). 22. Estudio e incubación de los huevos de quelonios acuáticos, 1986. 23. La dieta del mono choro (*Lagothrix lagotricha*). 24. Desarrollo dentario y la estimación de la edad en *Cebuella pygmaea*, *Saguinus fuscicollis* y *Saguinus mystax* (Callitrichidae, Primates). 25. La dieta del mono huapo (*Pithecia monachus*). 26. Estudio y manejo de quelonios acuáticos, 1987. 27. El huapo (*Pithecia monachus*); dinámica poblacional y organización social. 28. Dinámica poblacional del ronsoco o capibara (*Hydrochaeris hydrochaeris*). 29. Ecología del ronsoco o capibara (*Hydrochaeris hydrochaeris*). 30. Estudio y manejo de quelonios acuáticos en 1988. 31. La avifauna de Pacaya: lista actualizada de especies y evaluación preliminar de la abundancia y preferencias de habitat. 32. Estudio y manejo de la charapa (*Podocnemis expansa*) en 1989. 33. Bioecología de la taricaya (*Podocnemis unifilis*): datos nuevos y actualizados. 34. Densidades poblacionales del ronsoco o capibara (*Hydrochaeris hydrochaeris*) y el desarrollo de um método de censo. 35. Evaluación preliminar de la vaca marina (*Trichechus inunguis*). 36. Ecología del coto mono (*Alouatta seniculus*). 37. Ecología de las aves acuáticas: Parte I. 38. Manejo de quelonios acuáticos, 1992. 39. Ecología de las aves acuáticas. Parte II: Desarrollo de um método de censo; ecología y abundancia de las garzas. 40. Investigación de la charapa (*Podocnemis expansa*) en 1993. 41. Evaluación, estudio y manejo de la charapa (*Podocnemis expansa*) en el río Pacaya en 1994. This compilation is available from: Fundación Peruana para la Conservación de la Naturaleza (FPCN), Apartado 449, Iquitos, Peru, Fax: +51 94 233 949. Information kindly supplied by Eckhard W. Heymann, Deutsches Primatenzentrum, Göttingen, Germany.

CAPTIVE CARE SYMPOSIUM: IPS '98

Short papers which were presented at the Captive Care Symposium held during the XVIIth Congress of the International Primatological Society (IPS), Antananarivo, Madagascar, 11 August 1998, have been published in volume 38(2), 1999, of the *Laboratory Primate Newsletter* (Editor Judith Schrier, Brown University, Rhode Island). The symposium was organized by Hilary O. Box, Interim Vice-President for Captive Care and Breeding of the IPS, and was centered on environmental conditions that stimulate natural patterns of behaviour, and the "performance" of captive breeding colonies. The following papers were published: Adaptation of captive-bred New World monkeys to a seminatural environment - M. T. Moore & A. T. C. Feistner, pp.18-19; Encouraging natural feeding behavior in captive *Varecia variegata variegata* - A. Britt, pp.19-20; Restocking of *Varecia variegata variegata*: the first six months - A. Britt, C. Welch & A. Katz, pp.20-22; Determinants of chimpanzee longevity in zoos - V.I. Landau, J. L. Grenfell, E. I. L. Metelovski & J. E. King, p.22;

Development of a new ring-tailed lemur (*Lemur catta*) exhibit at Edinburgh Zoo - G. Catlow, R. Clifford, L. Dickie & C. Wren, pp.22-23; Breeding vervet monkeys in a source country research facility - M. C. Mdhluli, J. V. Seier & C. Lambrechts, p.23; Research on laboratory animal domestication of cynomolgus monkeys (*M. fascicularis*) - Yang Shou Kai, p.23. *Laboratory Primate Newsletter* is published quarterly by the Schrier Research Laboratory, Box 1853, Psychology Department, Brown University, Rhode Island 02912, USA, Fax: +1 401 863 1300, e-mail: <primate@brown.edu>. Current and back issues are available on the World Wide Web at <http://www.brown.edu/Research/Primate>.

BOLETIM FBCN

The Fundação Brasileira para a Conservação da Natureza (FBCN), based in Rio de Janeiro, has published volume 25 (1998) of its bulletin. Publication of the *Boletim FBCN* had been interrupted since 1989 (volume 24). As pointed out in the presentation by PSG member Admiral Ibsen de Gusmão Câmara, it plays an important and unique role in publishing articles on conservation biology in Brasil, and its resurrection, which marks the Foundation's 40th Anniversary (founded on 28th August 1958 - the first Brazilian NGO of its kind), was generously sponsored by Russell Wid Coffin. Volume 25 includes important articles regarding the conservation of the fauna and flora of the Atlantic forest, especially in the state of Rio de Janeiro. Contents: Ensaios de repovoamento e reintrodução de três espécies regionais do gênero *Pyrrhura*, no Parque Nacional da Tijuca, RJ, Brasil (Psittacidae - Aves) - A. F. Coimbra-Filho & R. da Rocha e Silva, pp.11-25; Restingas fluminenses: Biodiversidade e preservação - D. S. D. de Araújo & N. C. Maciel, pp.27-51; Um resumo da situação: *Mimus saturninus* e *M. gilvus* no litoral sudeste brasileiro - M. M. Argel-de-Oliveira & J. F. Pacheco, pp.53-69; Validade dos parâmetros da IUCN em amostra regional - Há espécies de morcegos ameaçadas no município do Rio de Janeiro? - C. E. L. Esbérard, pp.71-86; O gênero *Neomarica* Sprague (Iridaceae), seu significado no combate á erosão em áreas sombreadas - A. F. Coimbra-Filho & H. F. Martins, pp.87-98; A juçara (*Euterpe edulis* Mart. - Palmae): Ensaios e apontamentos - A. F. Coimbra-Filho, R. da Rocha e Silva & A. R. da Silva, pp.99-117; Conservação da Família Vochysiaceae A. St. Hilaire no estado do Rio de Janeiro - M. C. Vianna & H. F. Martins, pp.119-128; The identification of giant petrels (Aves, Procellariidae) in South Atlantic - J. F. Voisin & D. M. Teixeira, pp. 129-133. For more information, and instructions for contributions to the *Boletim FBCN*, write to: Fundação Brasileira para a Conservação da Natureza (FBCN), Comissão Editorial, Rua Miranda Valverde 103, Botafogo, 22281-000 Rio de Janeiro, Rio de Janeiro, Brazil.

INSTITUTO PAU BRASIL

The Instituto Pau Brasil de Historia Natural, founded in 1998 and based in Arujá, São Paulo, has begun a publication

series - *Publicações Avulsos do Instituto Pau Brasil de História Natural*, ISSN 1516-4926. The first, in Portuguese, is a monograph entitled "Potencial da Educação Ambiental nos Zoológicos Brasileiros", by Ana Lúcia Ramos Auricchio, 46pp., March 1999. For more information: Paulo Auricchio, President, Instituto Pau Brasil de História Natural, Caixa Postal 282, 07400-970 Arujá, São Paulo, Brazil, Tel: +55 (0)11 9607 4510, Fax: +55 (0)11 4655-2731.

BOOKS

Primate Sexuality: Comparative Studies of the Prosimians, Monkeys, Apes and Human Beings, by Alan Dixson, 1998, 656pp., 81 halftones, 333 line figures. Oxford University Press, Oxford. ISBN 0 19 8501183-8 (hardback), 0 19 850182-X (paperback). Prices: £80.00/US\$140.00 (hardback), £32.50/US\$60.00 (paperback). Primate Sexuality is a uniquely comprehensive synthesis of our knowledge about the sexual behaviour of primates. Alan Dixson reviews and integrates both the evolutionary biology and the physiological basis of sexual behaviour across the whole spectrum of primates, from prosimians to humans. No other book written on the subject of primate sexuality has the comparative breadth or technical depth of this outstanding volume, drawing on and collating work from over 2,000 references, and illustrated throughout with hundreds of drawings and original figures. *Contents*: Darwin and friends; Primate classification and evolution; Mating systems; Mating tactics and reproductive success; Sexual behaviour and sexual response; Sociosexual behaviour and homosexuality; Sexual selection and sexually dimorphic traits; Sperm competition; Sexual selection and genitalic evolution; Sexual differentiation of the brain and behaviour; The ovarian cycle and sexual behaviour; The neuroendocrine regulation of sexual behaviour in the adult female; Hormones and sexual behaviour in the adult male; Socioendocrinology and sexual behaviour. *To order*: US - payment in dollars, credit card hotline +1-800-451-7556 (credit card orders only) 9am-5pm, or Fax: +1 919 677 1303; Rest of the World - payment in sterling, credit card hotline +44 (0)1536 454534, or Fax: +44 (0) 1536 454518. For enquiries, call, +1 919 677 0977. Web site: <www.oup.co.uk>, <www.oup-usa.org>.

The Mammals of Paracou, French Guiana: A Neotropical Lowland Rainforest Fauna. Part 1: Bats, by Nancy B. Simmons and Robert S. Voss, 1998. Bulletin of the American Museum of Natural History. 237pp. A most significant, thorough, and scholarly contribution to our understanding of mammalian diversity and distributions in Amazonia. Based on fieldwork from 1991 to 1994. Information: Dr. Nancy B. Simmons, Associate Curator, Department of Mammalogy, American Museum of Natural History, Central Park West at 79th St., New York, NY 10024, USA, Tel: (212) 769-5483, Fax: (212) 769-5239, e-mail: <simmons@amnh.org>. WWW: <http://research.amnh.org/mammalogy/simmons.html>.

A Field Guide to Medicinal and Useful Plants of the Upper Amazon, by J. L. Castner, S. L. Timme and J.A. Duke, 1998. Feline Press, Gainesville, 160pp. 240 color photos. Price: US\$38. ISBN 0-96251159-7-8. This book is the first photograph-oriented color guide that treats the medicinal plants found in the Amazon Basin. Written in terms that a layperson can understand. An informative and concise description of the uses and identification of over 120 species of plants is provided. To order: Feline Press, P.O. Box 7219, Gainesville, FL 32605, USA, e-mail: <jlcastner@aol.com>.

Sampling and Statistical Methods for Behavioral Ecologists, by Jonathan Bart, Michael A. Fligner and William I. Notz, 1998, 352pp. Cambridge University Press, Cambridge. ISBN 0 521 45095 0 (hardback), 0 521 45705 X (paperback). Price: £47.50 (hardback), £17.95 (paperback). Behavioral ecology research raises special statistical problems that are generally not covered in introductory statistics courses. This book bridges the gap, exploring the techniques that have the greatest relevance to field biologists, pinpointing common statistical pitfalls and how to avoid them. Available from: Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, UK, Tel: +44 (0)1223 32558 to order direct or using your credit card, Fax: +44 (0)1223 325152. For further information: Giulia Williams, e-mail: science@cup.cam.ac.uk. Web site: <http://www.cup.cam.ac.uk>.

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Meetings

III Congreso de la Asociación Primatológica Española (APE), 20-22 September 1999, Universidad Autónoma de Barcelona, Spain. Inaugural lecture to be given by Professor Adriaan Kortlandt "Protohominid behaviour in primates". Plenary lectures include: Montse Garcia "Aplicación de los estudios citogenéticos en primates a la patología genética humana"; Dr. R. Stanyon "Evolución genética y especiación en primates"; Dr. J. Sabater Pi "La cultura en los primates no humanos"; Dr. Turbón "Adaptación y comportamiento de los primeros homínidos". Contact: Secretaria del Departamento de Biología Celular e Fisiología, Facultad de Ciencias, Universidad Autónoma de Barcelona, 08193 Barcelona, Spain, Fax: 93 581 2295, e-mail: <jvea@psi.ub.es>.

Primateology and Anthropology Into the Third Millennium, 10-12 October 1999, Anthropological Institute and Museum, Zürich. A Centenary Congress for the Institute (1899-1999). Fifty-two invited speakers, including a number of guest speakers as well as past and present members of the Institute, will provide a broad-ranging overview of past and present research in biological anthropology. The congress programme, for which the official language is English, is

STUDBOOK

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- Daudt-Grativol, A. 1999. Effects of forest fragmentation on the genetic variability of golden lion tamarins (*Leontopithecus rosalia*). *Master's Abstracts* 37(1): 187. To order: #AAD13-90840. University Microfilms, Inc., Ann Arbor, MI 48106.
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divided into six sessions: 1. Primatology and Anthropology; 2. Hominid Evolution; 3. Primate Behaviour; 4. Primate Senses, Physiology and Behaviour; 5. Genetics, Molecular Evolution, and Conservation; 6. Reproductive Biology. For further information: Ms. Jenny Pastorini, Anthropologisches Institut und Museum, Universität Zürich-Irchel, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland, Tel: +41 1 635 5447 or 635 5411, e-mail: <jenny@aim.unizh.ch>.

Asociación Mexicana de Primatología - Simposio Nacional, 6-9 Septiembre de 1999, Catemaco, Veracruz, México. Tema general "Investigación y Conservación de Primates Neotropicales". Mayor información: Dr. Jorge Martínez, Depto. de Filosofía, UAM-Iztapalapa, Apdo. Postal 55-536, 09340 México, D. F. Tel: (5) 724 47 85, Fax: (5) 724 4778, e-mail: <amp@xanum.uam.mx>.

IV Congreso de Manejo de Fauna Amazonica, 4 al 8 de octubre de 1999, Asunción, Paraguay. Este importante evento, iniciado en 1992, resume en breves días los resultados de todos los esfuerzos aplicados en pos de la conservación de la fauna de toda la región amazonica. En esta oportunidad se fortalecera la pluriparticipación, la discusión de estrategias y la elaboración de planes de acción apuntando a una conservación protagonizada por los pobladores rurales, beneficiarios directos de un uso sostenible del recurso faunístico. La organización de este evento es el resultado de un esfuerzo conjunto entre la Oficina CITES-Py, La Gobernación del Departamento Central y la organización ambientalista Fundación Moises Bertoni para la Conservación de la Naturaleza. Misión: Trabajar en forma pluriparticipativa y en acción coordinada para la optimización de las políticas de uso, técnicas y estrategias de manejo de la vida silvestre amazonica para fomentar el desarrollo socio-económico sostenible y la conservación de la naturaleza. Los trabajos serán recibidos hasta el 1 de marzo de 1999. Se podrán enviar por correo electrónico, o en impresión en papel blanco tamaño carta con una copia archivada en diskette. Únicamente se recibirán los siguientes formatos: WP5.1, Microsoft Word 6.0 o textos en ASCII (DOS IBM). Invitación a eventos: La comisión organizadora desearía recibir propuestas para la organización de simposios, talleres, cursos, mesas redondas y otras reuniones relacionadas a la temática propuesta para el Congreso. Los interesados en organizar o en participar de algunos de estos eventos pueden comunicarse con el Comité Organizador. Inscripciones: Hasta el 31 de marzo de 1999, estudiantes: US\$30, profesionales: US\$60; Hasta el 30 de setiembre de 1999, estudiantes: US\$50, profesionales: US\$100; Inscripciones tardías (durante el Congreso), estudiantes: US\$60, profesionales: US\$120. Los idiomas oficiales del Congreso serán Español y Portugués, no se harán servicios de traducción simultánea. Comisión Organizadora, IV Congreso de Manejo de Fauna Amazonica, Fundación Moises Bertoni, C.C. 714, Asunción, Paraguay, Tel: (595-21) 608 740, 600 855, Fax: (595-21) 608 741m, e-mail: <congreso@fmbert.una.py>. Visitenos en internet (a partir de julio): <www.mbertoni.org.py>.

Primate Society of Great Britain - Millenium Meeting, 1 April 2000, Flett Lecture Theatre, British Museum (Natural History), London. The theme of the meeting is "Primates: Our past, their future". It will be a public understanding of science/primatology event, and will be associated with the Natural History Museum's two-week millenium celebration. Speakers will include Mike Bruford (Institute of Zoology), Robin Dunbar (University of Liverpool), John Fleagle (SUNY at Stony Brook), Phyllis Lee (University of Cambridge), and Steve Mithen (University of Reading). For more information, please contact: Dr. Mark Collard, Department of Anthropology, University College London, Gower Street, London WC1E 6BT, UK, Tel: +44 (0)171 380 7842, Fax: +44 (0)171 380 7728, e-mail: <m.collard@ucl.ac.uk>.

1999 Annual Meeting of the IUCN/SSC Conservation Breeding Specialist Group (CBSG), 14-17 October 1999, National Zoological Gardens of South Africa, Warmbaths, Pretoria, Director Willie Labuschagne. For further information: Sarita Cronjé or Anso Malherbe, Conference Coordinator's Office, National Zoological Gardens of South Africa, P. O. Box 754, Pretoria 0001, South Africa, Tel: +27 12 328 6020, +27 12 328 3265, Fax: +27 12 323 4540, e-mail: <zologic@cis.co.za>, or <wlab@mweb.co.za>.

Primate Society of Great Britain Winter Meeting 1999, 1 December 1999, The Zoological Society of London, London. The theme will be "Mating and Social Systems of Old World Monkeys". Suggestions for speakers and offers of posters are very welcome. Please contact: Dr. Caroline Ross or Mairi Macleod, School of Life Sciences, Roehampton Institute London, West Hill, London SW15 3SN, UK, Tel: +44 181 392 3561, Fax: +44 181 392 3527, e-mail: <c.ross@roehampton.ac.uk> or <m.macleod@roehampton.ac.uk>.

Association for the Study of Animal Behaviour Winter Meeting, 2-3 December 1999, Zoological Society of London, London. The theme is "Evolution of Mind". Please contact: Dr. Karen McComb, Experimental Psychology, School of Biological Sciences, University of Sussex, Falmer, Brighton BN1 9QG, UK, Fax; +44 (0)1273 678611, e-mail: <karenm@biols.susx.ac.uk>.

Primate Socioecology: The Role of Life Histories, 14-17 December 1999, The German Primate Center (DPZ), Göttingen. An international conference on primate socioecology. The focus of this meeting (2nd "Göttinger Freilandtage") will be on life history variation among primates. Invited speakers will examine causes of variation in life history traits and explore the consequences of this variation for behavioral and reproductive strategies. An additional goal is to better characterize unique aspects of primate life histories and illuminate general principles through comparison with other mammals. Submissions for relevant oral (15 min) and poster contributions are invited. The conference is also open to guests without presentations. The deadline for submission of abstracts wishing to be considered for spoken papers or posters is August 1, 1999. Guests must also register in advance by October 1, 1999. Additional details available from Peter

Kappeler, e-mail: <pkappel@gwdg.de>, or the conference secretariat, e-mail: <gft@www.dpz.gwdg.de>, and the conference web site: <http://www.dpz.gwdg.de/freiland.htm>.

2000

XXIII Congresso Brasileiro de Zoologia, 13-18 February 2000, Instituto de Biociências, Universidade Federal do Mato Grosso, Cuiabá, Mato Grosso, Brazil. Theme "Zoologia no III Milênio". Numerous round tables and mini-courses. Deadline for abstracts: 30th September 1999. For further information: Comissão Organizadora do XXIII CBZ, Departamento de Biologia/Zoologia, Instituto de Biociências, Universidade Federal do Mato Grosso, Av. Fernando Corrêa da Costa, 78060-900 Cuiabá, Mato Grosso, Brazil, Tel/Fax: +55 (0)65 615 8870, e-mail: <cbz2000@cgi.ufmt.br>.

2000 Workshop of the European Marmoset Research Group (EMRG), 2-5 April 2000, Paris. Exact venue to be announced. The theme will be "Marmosets and Tamarins in Biological and Biomedical Research". Paper sessions and roundtable discussion sessions will be held on the following topics: Behaviour, Conservation, Ecology, Genetics, Immunology, Laboratory Management, Neurobiology, Pharmacology, Reproductive Biology, Toxicology. Further announcements will be made on the Primate Info Net. For more information, please contact Dr. Christopher Pryce, Behavioural Biology Laboratory, Swiss Federal Institute of Technology, Schorenstrasse 16, CH-8603 Schwerzenbach, Switzerland, Tel +41 1 825 7386, Tel +41 1 825 7416 (Secretariat), Fax +41 1 825 7417, e-mail <pryce@toxi.biol.ethz.ch>, or Dr. Christian Schnell <christian.schnell@pharma.Novartis.com>.

Association for the Study of Animal Behaviour General Meeting, 17-19 April 2000, University of Sheffield, UK. Please contact: Dr. M. Siva-Jothy, Department of Animal and Plant Sciences, University of Sheffield, Sheffield S10 2UQ, e-mail: <m.siva-jothy@sheffield.ac.uk>.

2001

XVIIIth Congress of the International Primatological Society, 7-12 January 2001, Adelaide, Australia. Hosted by the Australasian Primate Society, President Mr. John Lemon, Western Plains Zoo, Dubbo, NSW. Theme: "Primates in the New Millennium". Mr. Graeme Crook is Chairman of the Organizing Committee. *Symposia* - Participants wishing to register a symposium title must submit a 200 word abstract by 31 July 1999. E-mail to Carla Litchfield <aclitch@terra.net.au>. Titles of accepted symposia will be published on the webpage from August 1999. *Papers* - An abstract of 100 words is required. E-mail to Carla Litchfield <aclitch@terra.net.au>. Closing date for first call for papers: 31 January 2000. Closing date for second call for papers: 31 May 2000. A final list of papers will be published on the Internet by 30 June 2000. For more information, and to be put onto the Congress Organizer's mailing list, write to: Conventions Worldwide, PO Box 44, Rundle Mall, SA 5000,

Australia, Tel: +61 8 8363 0068, Fax: +61 8 8363 0354, e-mail: <satconv@camtech.net.au>, sending your postal address, telephone, fax and e-mail address.

Contributions

We would be most grateful if you could send us information on projects, research groups, events (congresses, symposia, and workshops), recent publications, activities of primatological societies and NGOs, news items or opinions of recent events and suchlike. Manuscripts should be double-spaced and accompanied by the text in diskette for PC compatible text-editors (MS-Word, Wordperfect, Wordstar). Articles, not exceeding six pages, can include small black-and-white photographs, high quality figures, and high quality maps, tables and references, but please keep them to a minimum.

Please send contributions to: **ANTHONY RYLANDS**, c/o Conservation International do Brasil, Avenida Antônio Abrahão Caram 820/302, 31275-000 Belo Horizonte, Minas Gerais, Brazil, Tel/Fax: +55 (31) 441-1795 or **ERNESTO RODRÍGUEZ-LUNA**, Instituto de Neuroetología, Universidad Veracruzana, Apartado Postal 566, Xalapa, Veracruz 91000, México, Fax: 52 (28) 12-5748.

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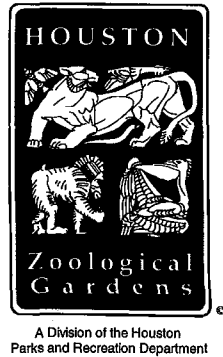
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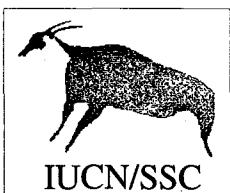
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