Articles

THE MOST ENIGMATIC MONKEY IN THE BOLIVIAN RAIN FOREST - *CALLIMICO GOELDII*

Anita Christen

Introduction

Goeldi's monkey (*Callimico goeldii*) is one of the most enigmatic primates in the Amazon basin. In spite of its large distribution, from southern Colombia in the north, over eastern Peru and south-western Brazil to north-western Bolivia in the south (Hershkovitz, 1977), little is known of its present-day distribution or behavioural ecology in the wild. The only recent sightings are documented from the Pando Department in north-western Bolivia. The Pando is part of the upper Amazon basin, and covers an area of about 63,000 km². It has a very low human population density of about 0.9 inhabitants per km². The forests, mostly seasonally dry tropical rain forest, are exploited for Brazil nuts, sorva gum, and rubber. Annual rainfall is 1600-1900 mm and the mean annual temperature is 24.7°C (Montes de Oca, 1989). For a more detailed description of the region see Christen and Geissmann (1994).

Field Surveys

During two surveys, in February-July, 1991 and July-December, 1996, 18 localities in the Pando were visited and explored specifically to locate *Callimico goeldii*. In the 1996 survey, Goeldi's monkeys were found around the locality of Virazon, Río Acre, on the frontier with Brazil, and about six to nine hours by boat from Cobija. A rudimentary camp site was set up there, and we carried out daily surveys along 6 km of seringa trails (paths of the rubber tappers) as well as 4-5 km of new trails cut by us, from August 23 to December 13, 1996 (Fig. 1). The seringa trails were walked for 6-7 hours each day in search of Goeldi's monkey groups (Fig. 1). Vegetation analyses were carried out in two areas where *Callimico* was observed most frequently. All trees with a diameter of more than 5 cm were recorded and identified (Table 4, Fig. 2).

Results

The home range of the main study group overlapped the home ranges of at least two groups of saddleback tamarins, *S. fuscicollis*. Red-bellied tamarins, *S. labiatus*, on the other hand were rarely observed in the area. The main *Callimico* study group was occasionally observed eating in the same or neighbouring trees with *S. fuscicollis*, but after feeding, the two groups separated and travelled alone. Agonistic behaviour was observed among *S. fuscicollis* group members, but never between *S. fuscicollis* and *Callimico*.

On August 25, I recorded a possibly pregnant female sitting quietly on a branch, 3-5 m high (Fig. 1: point 4), and a month later, on September 26, a female was seen carrying a very small infant while sitting on a tree at a height of about 6-8 m in a nest-like entanglement of branches. The female and two other group members were sitting together and grooming each other and their own tails, and the impression was gained that the infant had just been born. The other group members were climbing, jumping and sitting around nearby, in an area covering about 15 x 20 m. The group was observed at this location several times (Fig. 1: point 5), and a few weeks later, a second female was also seen carrying an infant. There was just one, easily recognised, adult male in the group. On November 5, when the infants were about 6 weeks old and measured about 12-15 cm, head-to-tail, they were still being carried. On November 23, the infants were seen running about and climbing on their own. One infant was also present in a neighbouring group, and on occasion when the four adults saw me, they ran away and left their two-month old infant behind in spite of its distress calls.

Other primate species were also seen with new born infants at this time. On 1 October new-born infants were observed in groups of *Saguinus fuscicollis, Saimiri boliviensis* and *Pithecia irrorata*.

Towards the end of November, there were more fruits in the home range, and on one occasion it was possible to follow the main study group from 06:00 in the morning until mid-day (Fig. 1: points 32 + 33). During that 6-hour period, they travelled a distance of about 1 km. Table 1 summarises the behavioural activities of the study group seen each time it was sighted, and Table 2 shows the habitat and substrate preferences of the main study group.

Despite the similarity of their long calls, saddleback tama-

Table 1: The behaviours and activities of the main study group on first being sighted.

Behaviour/activity	No of sightings
Calling (spontaneous)	7
Grooming	4
Foraging and eating[1]	10
Running, climbing, leaping	25
Resting	5
Calling (reply to playback)	3
Flight	4
Tongue clicking	4
Staring at observer	3

[1] mushroom (species not identified) (1), grasshopper (1), fruits of *Cecropia* sp., *Theobroma cacao, Eschweilera coriacea* and "capela de cuchilla" species not identified (8).

Table 2: Habitat and substrate preferences of the main study group.

Habitat	No of sightings
River edge forest	35
Disturbed forest	6
River edge forest with palm trees	5
Height above ground(m)	
1-4	5
5-9	27
11-15	7
Substrate diameter (m)	
0.10-0.14	18
0.15-0.19	10
>0.20	10

Cover photograph by Alice Guimarães: Buffy-headed marmoset, *Callithrix flaviceps*, at the Caratinga Biological Station, Minas Gerais, Brazil.

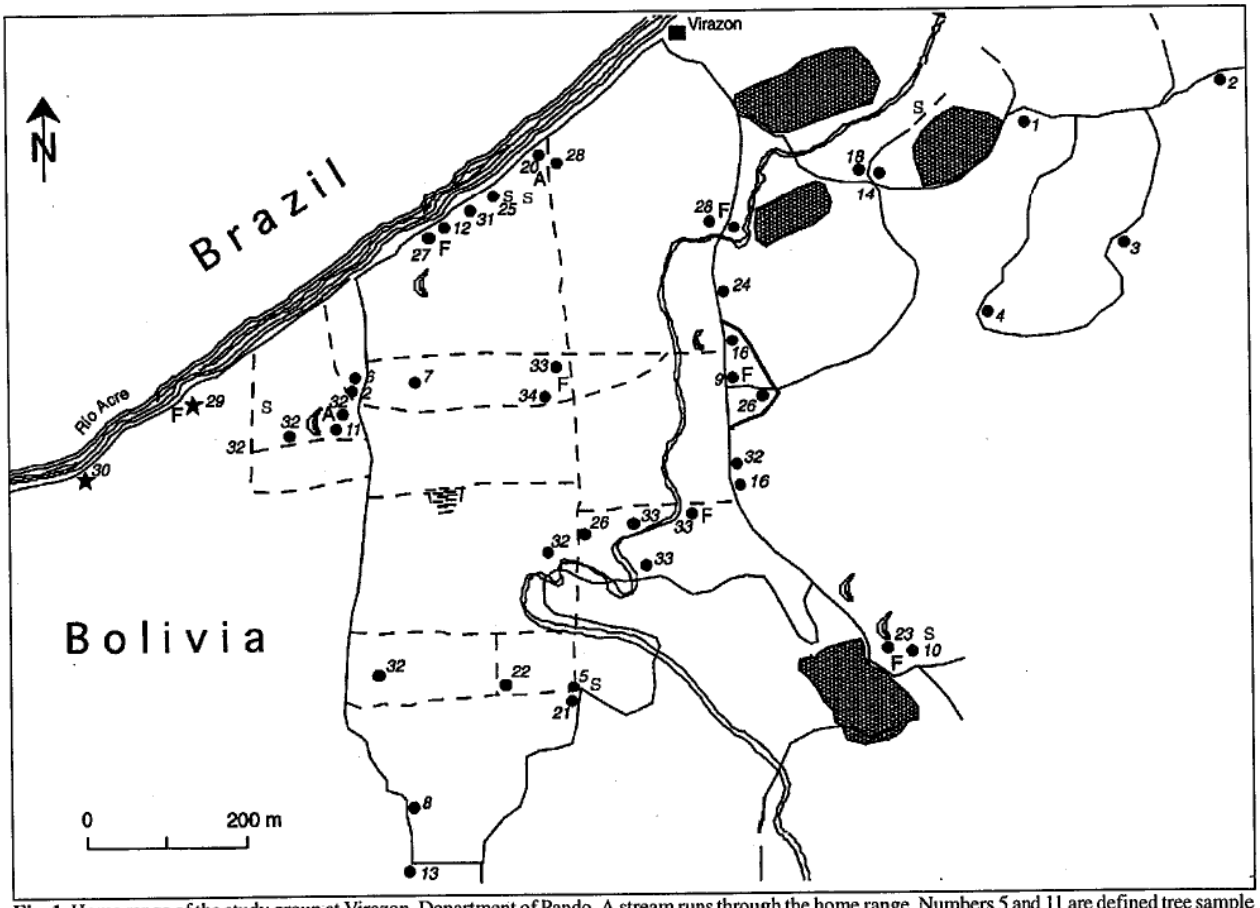

Fig. 1. Home range of the study group at Virazon, Department of Pando. A stream runs through the home range. Numbers 5 and 11 are defined tree sample areas. Hatched plots are "chacos" (agricultural plantings). Symbols: numbered circles = sightings of Goeldi's monkey, group 8; asterisks = sightings of Goeldi's monkey group 4; lines = already existing seringa trails; dotted lines paths marked and cut during the 1996 survey; S: possible sleeping sites; bananas = bunches of banana used as bait. Virazon = camp site.

rins and Goeldi's monkey appeared to differ in several aspects of their behaviour (Table 3). The trees identified in sample areas 5 and 11 are listed in Table 4. Sample area 5 (Fig. 2, area 5) was close to a bamboo patch. Visibility was poor. It contained trees with heights of 4-25 m (two emergents with big crowns were about 30 to 40 m tall). Sample area 11 (Fig. 2, area 11) contained trees of 4-30 m height, lianas, few bamboos and several fruit trees. Visibility was fair to excellent, with no dense ground vegetation. *Callimico* often met *Saguinus fuscicollis* in this area.

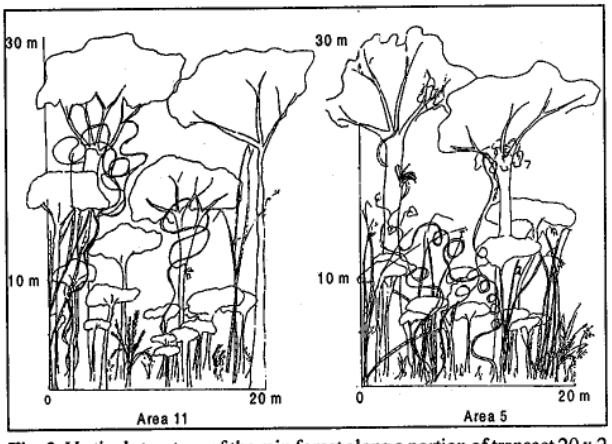

Fig. 2. Vertical structure of the rain forest along a portion of transect 20 x 2 m in Area 11 (left) and Area 5 (right).

Discussion

The main study group of 10 animals included two adult females, each carrying an infant and two juveniles of about the same age. This suggests that births in the study group occurred during the end of September and the beginning

Table 3: Some behavioural differences between saddleback tamarins (*Saguinus fuscicollis*) and Goeldi's monkeys (*Callimico goeldii*).

Variable	*Saguinus fuscicollis*	*Callimico goeldii*
Activity level	more active	less active
Inquisitive behaviour	curious	shy
Self-grooming	less frequent	frequent, especially tail grooming
Descent	head first	mostly tail first (like cebids), occasionally head first
Foraging	with frequent vocalisations	very quietly
Threat call	chatter with nose wrinkling	tongue-clicking
Long call	similar, shrill	similar, softer

Table 4: Plant species identified in sample areas 5 and 11, both habitats of *Callimico goeldii*.

Species - Area 5[1]	Family
Rollinia sp.	Annonaceae
Cordia goeldiana	Boraginaceae
Hevea brasiliensis	Euphorbiaceae
Hura crepitans	Euphorbiaceae
Bambusa sp.	Graminae
Unidentified	Lecythidaceae
Unidentified	Mimosaceae
Neea sp.	Nyctaginaceae
Capirona decorticans	Rubiaceae
Leonia racemosa	Violaceae
Rinoreocarpus ulei	Violaceae
Species - Area 11	
Aspidosperma ramiflorum	Apocynaceae
Philodendron sp.	Araceae
Terminalia amazonica	Combretaceae
Dyospyros melinoni	Ebenaceae
Sloanea sp.	Elaeocarpaceae
Bambusa sp.	Graminae
Rheedia achachairu	Guttiferae
Eschweilera albiflora	Lecythidaceae
Eschweilera coriacea	Lecythidaceae
Inga sp.	Mimosaceae
Batocarpus amazonicus	Moraceae
Castilla ulei	Moraceae
Cecropia sp.	Moraceae
Maquira coriacea	Moraceae
Neea sp.	Nyctaginaceae
Theobroma cacao	Sterculiaceae

[1]34 additional species in Area 5 remain unidentified.

of October. This agrees with the observations of Masataka (1981a): Two births, one in September and the other in October.

The status of *Callimico goeldii* is difficult to judge, although the evidence suggests that populations are declining in the Pando. During the surveys in 1991, no Goeldi's monkeys were found at Triunfo and Mucden (Christen, 1994; Christen and Geissmann, 1994), although they were sighted and studied there during earlier surveys (Buchanan-Smith, 1991; Izawa, 1979; Masataka, 1981a, 1981b; Pook and Pook, 1981, 1982). Similarly, during the 1996 survey, no Goeldi's monkeys were found in any of the five areas where I had observed them in 1991. Local people informed me that they chase adult Goeldi's monkeys away in order to capture their infants (see above). The infants are kept as pets or sold, but most of them die.

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Anita Christen, Anthropological Institute, Universität Zürich-Irchel, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland.

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