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

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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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