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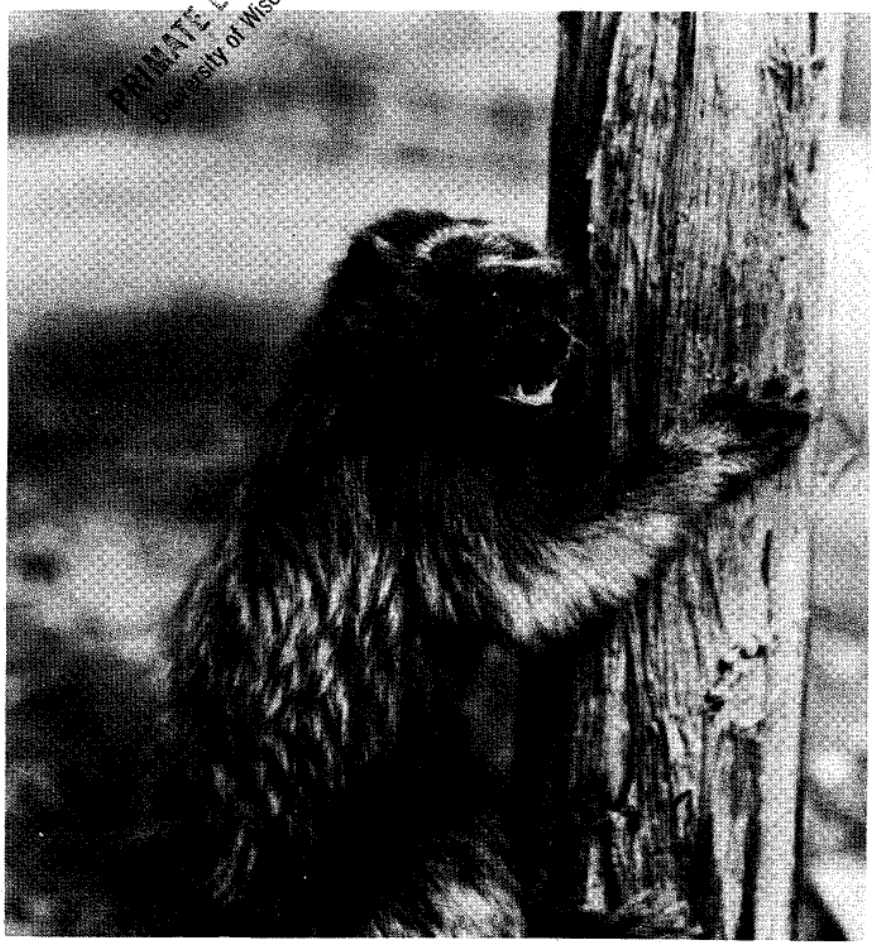

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Erratum

In the first article of *Neotropical Primates* 3(4), December 1995, the name and address of the author was unfortunately omitted. The author was **Thomas J. Masterson** of the Department of Biology, James Madison University, Harrisonburg, Virginia 22807, USA.

The correct citation for this article is as follows:

Masterson, T. J. 1995. Morphological relationships between the Ka'apor capuchin (*Cebus kaapori* Queiroz,1992) and other male *Cebus* crania: a preliminary report. *Neotropical Primates* 3(4): 165-169.

The editors apologize for this error.

Articles

Distribucion Geografica de *Saguinus tripartitus* en la Amazonia del Peru

Introducción

En la medida que las colleciones de especímenes, pieles, osamentas y otras abarquen mayores extensiones de la Amazonia, el área de distribución geográfica referido por otros autores para los primates, en algunos casos, no reflejan la realidad. Antes de 1990, el área comprendida entre la márgen izquierda del río Ucayali y el curso inferior del río Huallaga fue considerada como parte de la distribución de *Saguinus mystax* (*v.* Hershkovitz, 1977, p.695). Posteriormente, Soini y Soini (1990) constató *in situ* la ausencia de la especie. Caso similar ocurrió con *Aotus vociferans*, cuya distribución de acuerdo al mapa de Hershkovitz (1983) también comprendía la márgen izquierda del río Marañón entre los ríos Tigre y Pastaza; sin embargo, Aquino y Encarnación (1988) constatan que aquella es habitada solo por *A. nancymae*.

En relación a la distribución de *S. tripartitus*, Hershkovitz (1977, p.658) considera como área de distribución la cuenca del río Napo, por el lado izquierdo desde la línea fronteriza con el Ecuador, aguas abajo hasta la confluencia con el río Amazonas y, por el lado derecho hasta la confluencia con el río Curaray. Thorington (1988), además de validar la especie, sostiene que habita en simpatria con *S. fuscicollis lagonotus* únicamente el lado derecho del río Napo hasta la confluencia con el río Amazonas. Ambos autores basan su interpretación en los especímenes de museo colectadas por Carlos Olalla e hijos en los años 1925 y 1926. En los comentarios de Thorington (1988) no se precisa la márgen del río donde estarían, realmente, las localidades de colecta que le motivaron su propuesta de área de distribución.

La confusión suscitada por las fuentes citadas nos motivó a intensificar las exploraciones y los registros que iniciamos desde 1978 por la cuenca del río Putumayo y 1983 por el río Napo hasta la confluencia con el río Aguarico. El principal objetivo fue el inventario de primates que habitan en el nororiente peruano, que incluyó la colecta de especímenes de museo como material de referencia. El material biológico se encuentra depositado en el Centro de Investigaciones Veterinarias Tropicales y de Altura de la Universidad Nacional Mayor de San Marcos con sede en Iquitos. El análisis detallado de nuestros registros nos permite definir el área de distribución para esta especie.

Areas Explorados

Comprenden las áreas entre los ríos Napo-Putumayo, Napo-Curaray y márgen izquierda del río Amazonas (Fig. 1). Estas áreas según la terminologia utilizada por Encarnación (1993) corresponden a los bosques inundables o de bajial y bosques de colina o de altura, respectivamente. La áreas exploradas en los ríos Mazán, Yanayacu, Tamboryacu y Curaray en el Napo, Atacuari, Peruaté, Apayacu y Ampiyacu en el Amazonas, corresponden a los bosques inundables o de bajial; mientras que los ríos Tacsha, Curaray, curso superior del Tamboryacu, Aushiri, Santa Maria y Aguarico en el Napo y cabecera del Yuvineto en la cuenca del río Putumayo, a los bosques ribereños y de colina o altura.

Localidades de Registro y Colecta

Desde 1978 a 1993 fueron registrados 16 grupos de *S. tripartitus* habiendo colectado tres especímenes y una mascota para estudios de sistemática. Catorce de los grupos fueron observados en la cuenca del río Napo y dos en el Putumayo. En el Napo, ocho grupos fueron observados en la márgen derecha del curso superior del río Napo, desde Pantoja hasta la confluencia con el río Curaray y seis en la márgen izquierda del río Curaray. En el Putumayo, en la única exploración realizada, fueron observados dos grupos en el río Yuvineto. Las localidades que corresponden a los registros y colectas están contenidas en el Cuadro 1. En las otras áreas exploradas entre los ríos Napo y Putumayo, con excepción de *S. tripartitus*, fue registrado y colectado

Cover photograph by F. Medem: the silvery-brown bare-face tamarin, *Saguinus leucopus* (see page 13).

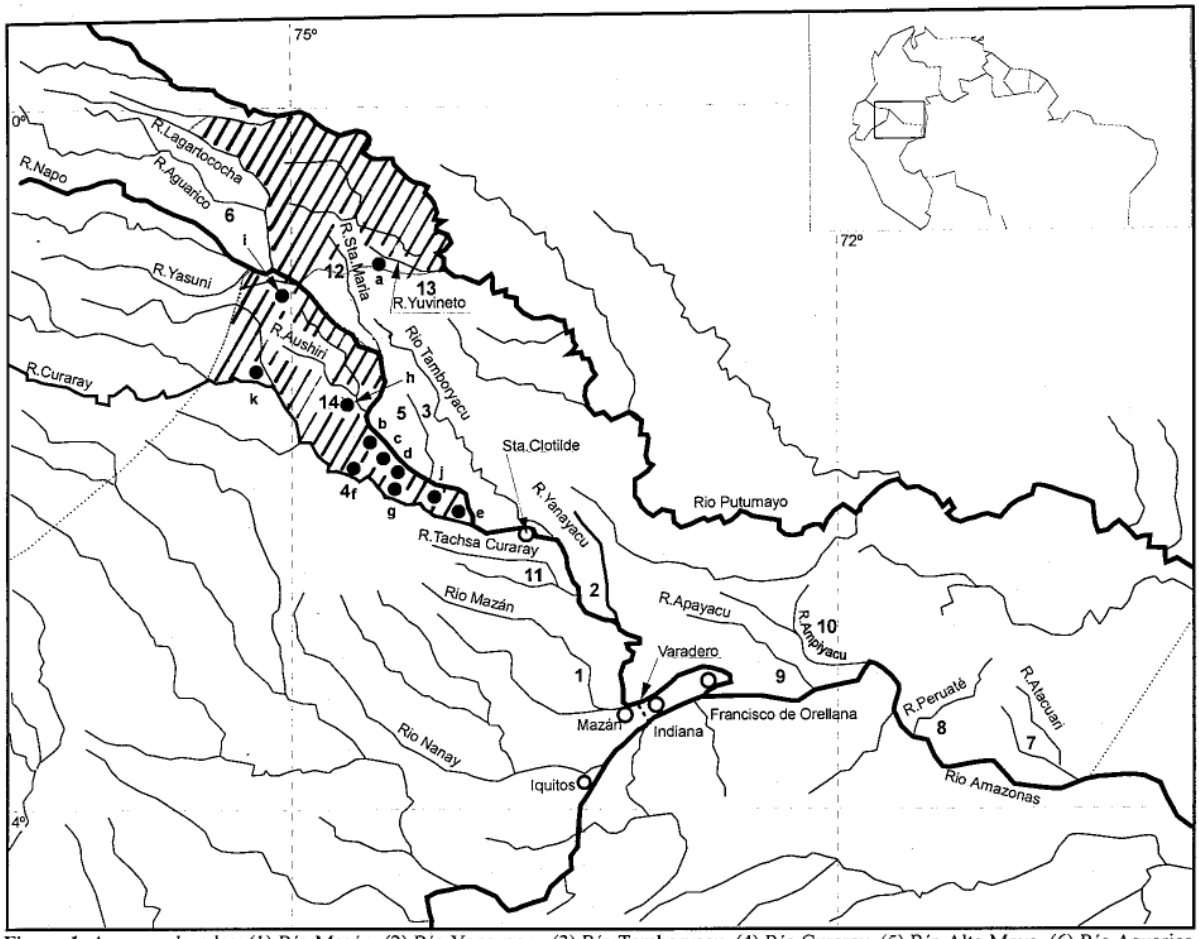

Figura 1. Areas exploradas: (1) Río Mazán, (2) Rio Yanayacu,, (3) Río Tamboryacu, (4) Río Curaray, (5) Río Alto Mayo, (6) Río Aguarico, (7) Río Atacuari, (8) Río Peruaté, (9) Río Apayacu, (10) Río Ampiyacu, (11) Río Tacsha Curaray, (12) Río Santa María, (13) Río Yuvineto y (14) Río Aushiri. Localidades de registro de *Saguinus tripartitus*: (a) Bellavista, (b, c, d) Puerto Elvira, (e) San Rafael, (f) Correviento, (g) Soledad, (h) Aushiri, (i) Tempestad, (j) Ingano y (k) Puerto Arica.

Saguinus nigricollis nigricollis y en la márgen derecha del río Napo desde Pantoja hasta la confluencia con el río Amazonas *S. fuscicollis lagonotus* y *S. nigricollis graellsi*.

Interpretación de la Distribución Geográfica

Basados en nuestros registros, la distribución geográfica de *S. tripartitus* en el Perú, corresponde al curso superior de ambas márgenes del río Napo y Putumayo. En la márgen izquierda, desde la línea fronteriza con Ecuador y Colombia hacia el suroriente, hasta la cabecera del río Santa Maria en el Napo y río Yuvineto en el márgen derecha del río Putumayo, y por la margen derecha desde la línea fronteriza con Ecuador hasta la confluencia con el río Curaray (Fig. 1), coincidiendo con Hershkovitz (1977, p.658), Albúja (1994) y parcialmente con Thorington (1988).

Discusión

La distribución asumida por Hershkovitz (1977, p. 658) y Thorington (1988) está basada en las colecciones de pieles por Carlos Olalla e hijos. Una das localidades de colecta que genera discrepancia y confusión es Puerto Indiana, localidad situada en la ribera izquierda del río Amazonas y aproximadamente a 40 km al norte de la ciudad de Iquitos. Allí, Olalla e hijos entre 1925 y 1926, habrían colectado siete pieles de *S. tripartitus*.

El resultado de nuestras intensas exploraciones hacia los bosques contiguos de Puerto Indiana, Francisco de Orellana, este último situado en la orilla del río Napo y cerca a la confluencia con el río Amazonas, y Mazán, en la ribera derecha del río Napo , fue el contacto con varios grupos de *S. fuscicollis lagonotus* y *S. nigricollis*, pero con ninguno de *S. tripartitus*. Además, Mazán es una pequeña ciudad que desde hace más de 20 años permite unir el río Amazonas por un camino o "varadero" de sólo 35 minutos un poco más arriba de Indiana (Fig. 1). Para confirmar nuestros resultados, a los moradores mas antiguos de esas localidades les mostramos una piel preservada y una mascota, preguntándoles sí conocian individuos similares por los alrededores; las respuestas

Cuadro 1. Registro cronológico de grupos observados y especímenes colectados de *Saguinus tripartitus* en la Amazonia peruana.

Fecha	Localidad	Ubicación geográfica	No. Grupos	Especímenes coletados
Ago. 1978	Bellavista Río Putumayo	02°02'S 74°33'O	2	-
Ene. 1983	Pto. Elvira Río Napo	02°02'S 74°32'O	1	-
Feb. 1983	San Rafael Río Curaray	02°22'S 74°08'O	3	1
Feb. 1983	Correviento Río Curaray	02°15'S 73°32'O	1	-
Feb. 1983	Soledad Río Curaray	02°17'S 74°25'O	2	-
Dic. 1983	Aushiri Río Napo	02°14'S 74°44'O	1	1
Nov. 1989	Pto. Elvira Río Napo	02°02'S 74°32'O	2	-
Dic. 1989	Tempestad Río Napo	01°15'S 74°52'O	1	-
Dic. 1991	Ingano Río Napo	02°08'S 74°11'O	2	1[1]
Ago. 1992	Pto. Elvira Río Napo	02°02'S 74°32'O	1	1
Ago. 1992	Puesto Arica	01°28'S 75°12'O	-	1[1]

[1] Mascota, macho infante

fueron negativas. Algunos manifestaron que por primera vez veían un especímen con esos colores de pelaje, otros aseguraron haber observado entre los ríos Napo y Curaray. Los registros tomados y las respuestas recebidas nos conducen a plantear las siguientes interrogantes: Podria haberse extinguido la especie en el lado derecho del río Napo desde la confluencia con el río Curaray hasta la confluencia con el río Amazonas, incluyendo Mazán, Indiana y Francisco de Orellana, en un tiempo relativamente corto? De ser así, Cómo se explica la presencia de las otras especies de tamaño pequeño? Lo anterior demuestra que Carlos Olalla e hijos no han registrado las localidades correctamente. Por otro lado, ellos fueron colectores masivos de pieles, que en su afán por lograr mayor cantidad y diversidad, algunas veces, habrian adquirido de los cazadores, quienes proporcionaron procedencia errada. Rolando Aquino ha experimentado un suceso similar cuando exploraba en el río Pastaza. Allí, un cazador le ofreció una piel de *Aotus nancymae* señalando como procedencia la márgen derecha, cuando na realidad corresponde a la margen izquierda.

Entre los factores que habrían ocasionado la extinción local están la caza y la destrucción del hábitat. En la Amazonia existe una alta presión de caza, pero su incidencia es mayor en los primates de tamaño grande y mediano por el alto costo de los pertrechos; de modo que *S. tripartitus*, con peso menor de 400 g queda excluido del uso como fuente de proteina animal. La deforestación con fines agropecuarios tradicionales en el área, no tiene rango de comparación como en la selva alta, donde el bosque fue arrasado. No obstante, en los bosques remanentes y bosquetes aún viven algunas especies de mamíferos arborícolas, por ejemplo, en el Alto Mayo y el Huallaga Central, se halla *S. fuscicollis leucogenys* que incursionan en las chacras y cultivos con frutales, y duermen en los pequeños manchales de bosques remanentes. También en la selva baja, las más altas densidades de callitrícidos se hallan en la periferia de las chacras y purmas con frutales (Heltne y Encarnación, 1990). En consecuencia, los callitrícidos en general se adaptan mejor en los bosques secundarios, "purmas" y cultivo de frutales, donde existe alta disponibilidad de alimentos, que garantiza la supervivencia de ese taxón. Por analogia, en las áreas circundantes a las localidades asentadas en el lado derecho del río Napo, entre ellas Santa Clotilde, Mazán y Francisco de Orellana, así como en Puerto Indiana, asentada en el lado izquierdo del río Amazonas, hemos registrado únicamente *S. fuscicollis lagonotus* y *S. nigricollis*. Con esas fundamentaciones se descarta toda posibilidad de extinción local.

Conclusiones

S. tripartitus habita, en simpatria, en la márgen izquierda del río Napo y derecha del Putumayo, con *S. nigricollis nigricollis*; y en la derecha del río Napo con *S. nigricollis graellsi* y *S. fuscicollis lagonotus*. La distribución de *S. tripartitus* comprende las cuencas de los ríos Napo y Putumayo, desde la linea fronteriza con Ecuador y Colombia hasta la cabecera del río Santa María y río Yuvineto y la confluencia del río Curaray. La márgen derecho de los ríos Curaray y Napo hasta la confluencia con el río Amazonas, incluyendo Puerto Indiana, está habitada por *S. nigricollis graellsi* y *S. fuscicollis lagonotus*; mientrasque la márgen izquierda del río Napo, desde el curso medio del río Santa Maria hacia al sureste, y la márgen derecha del río Putumayo, desde el sur del río Yuvineto hasta el río Amazonas, es habitada por *S. nigricollis nigricollis*.

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The Early Development of Behavior and Independence in Howler Monkeys, *Alouatta palliata mexicana*

Introduction

The growth of independence and the development of behavior in howler monkeys, *Alouatta palliata mexicana*, during the first few weeks of life has received relatively little attention to date. While several studies have been conducted on other subspecies of howler monkeys (Carpenter, 1934; Altmann, 1959 and Baldwin and Baldwin, 1973, 1978, concerning *Alouatta palliata palliata* in Panama; Mack, 1979 and Neville, 1972 concerning *Alouatta seniculus* in Venezuela; and Glander, 1975 and Clarke, 1990 concerning *Alouatta palliata palliata* in Costa Rica), only two studies have been conducted on *Alouatta palliata mexicana*, (Cabrera-Rojas, 1993; Serio-Silva and Rodríguez-Luna, 1994), and only the second of these reports has been published.

Both the studies on *Alouatta palliata mexicana* were conducted on a habituated troop of howler monkeys which were translocated to the Agaltepec Island, Catemaco, Veracruz, Mexico, in a program conducted by the Parque de la Flora y Fauna Silvestre Tropical of the Universidad Veracruzana, in 1988 and 1989, when nine individuals were introduced into this habitat (Rodríguez-Luna *et al.*, 1993). The program has been successful and the group numbers continue to grow steadily. The island offers good conditions for the observation of these primates, which are now completely habituated to the presence of human observers.

The objective of this research was to observe all the behaviors exhibited by the infant and of its social interactions with other group members, with the aim of establishing when and how the infant becomes progressively more independent of the mother in the first few weeks of its life.

Methods

Study Site: Field work was conducted on the Agaltepec Island (18° 27' - 18° 28' N and 95° 02' - 95° 3' W; altitude 360-390 m), Lake Catemaco, Veracruz, Mexico. The island covers approximately 10 ha (83,719 m²). All the trees with a diameter at chest height of more than 30 cm have been numbered and identified (López-Galindo, in press), making identification of the vegetation ingested and of the established feeding routes of the monkeys easy to record. The vegetation of the island consists of patches of semi-evergreen tropical forest, gallery forest, secondary growth, pastures and shoreline vegetation. There are a series of paths running around the island making the location of the primates simpler; combined with the fact that the sides of the island are steep and the canopy level low, and it is possible for the observer to get close to the subjects during observations.

The climate is warm and humid, and there is a rainy season between July and January, with most rain falling between August and October (5%-10% of the winter rain). The local annual precipitation is 4500 mm and the mean annual temperature is 24°C , with a maximum of 36.5°C and a minimum of 11°C (Acosta *et al.*, unpubl.; Serio-Silva, 1992).

Subjects: At the time of this study there were approximately 40 individuals on the island. They were in the process of dividing into groups but were still nearly always found in close proximity to one another. Individuals could be identified by their natural markings or by colored collars used to mark half of the eight females first translocated to the island along with one male in 1988 and 1989. The infants could be recognized by their close proximity to the mother.

Two individuals were born just before and one during the study period. The oldest two infants were born on approximately 10 August, Infant-a (female) and Infant-b (male), and the third, Infant-c (male) was born on approximately the 16 September, 1995.

Procedures: The study period took place between 16

August and 20 October, comprising 11 weeks of data collection and approximately 200 hours of observations, and covered only the wettest months of the wet season. Most observations could be taken with the naked eye but, when necessary, Bushnell 7x35 binoculars were used.

Daily observation covered 10 hours, between 08:00 hrs and 18:00 hrs, although most observations were taken in the morning. They consisted of *ad libitum* and focal sampling. Focal samples lasted 5 hrs, and the focal individuals were observed for equal sessions each week. The "Observer Program" in a handheld computer (Psion Organizer II, Model LZ64) was used to collect the data. The observations were recorded onto a specific schedule, which included locomotion, rest, feeding, play, and social interactions with other members of the group. In addition to data recorded within these categories, supplementary notes were taken using the notebook in the program and by hand.

Results

Locomotion on the Mother: During the first weeks of life, locomotion is almost entirely on the mother, and during the first three weeks the infant is almost exclusively carried ventrally. The mother has long hair on her sides and ventral surface which enables the infant to maintain a firm grip on her when resting and traveling. This effectively allows the mother to move with relatively little care, and mothers were observed moving rapidly and jumping large distances during troop movements even with very young infants. With increasing age, the infants become increasingly more aware of their surroundings, and correspondingly by the fourth week of age they begin to spend more time traveling on the mother's side and back, which affords them a better view. By the fourth week their prehensile tails have become more functional and they begin to use them to ensure a better grip, for example, wrapping them around the mother's leg. By the eighth and ninth week of life, during any major troop movements the infants were observed traveling on the mother's tail. By this age the infant's tails are large and strong enough to wrap around the base of the mother's and from this position they can sit up and observe their surroundings more effectively than in any other position. When traveling small distances, for example, when the mother is feeding and the infant is off her back, when she begins to move the infant will grab onto her wherever it can, usually her back and may shift its position to the mother's tail if she begins to travel for any long distance.

Independent Locomotion: The first time that an infant was observed out of contact with the mother, traveling independently, was at 5 weeks of age. At first this independent travel was tentative, the infant exploring only the environment around the mother and always within reach of her. By 7 weeks of age the infants were frequently observed to travel independently when the mother was feeding. This independent travel was of an exploratory nature and consisted of a "rubber-ball" pattern of frequent leaving and returning. It tended to occur only when the mother was feeding, and the infants always returned to the mother when she began to move, or they were retrieved by the mother before she accompanied any major troop movements. During 8-11 weeks of age, independent travel increased progressively, the infants moving greater and greater distances from the mother and spending more time away from her before returning. In the seventh week of life independent locomotion comprised 16.8% of the individual's time budget but was always observed within 1 m of the mother. By the eleventh week independent travel increased to 34.4% of the infant's time budget, when the furthest distance traveled was between 5-10 m from the mother. This behavior reflected the physiological changes that occurred in the infant because with time the infants became progressively larger, stronger and more capable of traveling on their own.

Interestingly, there existed a significant difference in the behavior of the individuals. One infant spent far more time traveling independently. Infant-a spent 45.5% of time in independent locomotion in the eleventh week compared to only 27.0% by Infant-b, climbing off the mother as soon as she remained still for more than a few seconds and exploring greater distances from the mother for longer periods of time. Correspondingly the behavior of this infant's mother included aspects not observed in the other. On several occasions this mother was observed to increase her interindividual distance from the infant, Infant-a, by moving in the opposite direction when it was traveling independently and she was also observed to push it away from her on several occasions.

Mother-infant movements were often coordinated by the mother giving a stereotyped "present-neck" posture, to which the infant responded by climbing onto her. She may also start to move off very slowly, allowing the infant to return to her and grasp onto her wherever it could before she gained speed and started to move more rapidly.

Rest: During the first three weeks of life the infant spends most of its time resting ventrally on the mother. By the fourth week, with an increasing awareness of the environment comes an increase in the amount of time spent resting dorsally, as opposed to ventrally, affording the infant a better view of its surroundings. With an increasing interest in its surroundings comes a corresponding decrease in the amount of time spent

resting, particularly from the seventh week of age when the infant begins to start exploring more and more during independent locomotion. For example, 49% of the time was spent resting on the mother during week 5, but by week 7 this decreased to 28.5%.

Feeding: Infants nursed from the mothers throughout the study period. The mother's nipples are generally 3-4 cm long, which allows the infants to suckle from several different positions on the mother's body, but usually this was from her ventral side. From three weeks of age the infants were observed "mouthing" leaves.

The earliest observation of independent feeding occurred at the beginning of the fourth week of life. The infant was observed eating mature leaves of *Bursera simaruba*. Independent feeding continued to increase with increasing age, particularly from the seventh (A0 - 0.1%) to the eleventh (A0 - 1.5%) week, corresponding with the increase in independent locomotion at this time. The infants generally fed on the same vegetation, simultaneously with the mother. Exploratory feeding began in the tenth and eleventh weeks.

Exploration: Some exploration of the environment was noted from the first week of life. As mentioned previously, the infant begins to become significantly more aware and interested in its surroundings by the third and the beginning of the fourth week of life and it is at this time that exploration increases significantly. Exploration usually began with the infant clambering around on the mother's body, particularly on her back, testing its motor skills, which become greater with age and corresponding physiological changes in size and strength. By the fourth week the infant begins to explore the external environment by touching and pulling nearby leaves and branches and by "mouthing" leaves. This behavior increases significantly into the fifth and sixth weeks of life.

By five weeks of age the infant begins to travel independently of the mother, constituting its first truly independent exploration of the external environment. This exploratory behavior increases with time. The mother may encourage this behavior by resting or feeding near to small branches, which offer an easier environment for the infant to explore.

Play with Other Individuals: This was first observed in the eleventh week (3.6% of time) and tended to substitute time spent exploring the environment alone. The infants were seen to initiate play themselves, but more frequently other individuals initiated this behavior, which generally involved chasing and being chased, as well as prodding and tickling. This behavior was observed most frequently with juveniles, generally a group of them. Play was also observed to occur with adult females and with the mother. These play bouts were not rough and did not exceed more than 10 minutes.

Social Interactions - Frequency: The presence of a new infant in a troop of howler monkeys presents a great attraction, and correspondingly the mother and infant are frequently approached by juveniles, males and in particular females who stare intently, sniff, lick and, if possible, physically examine the infant. These females are commonly termed "aunts". Interestingly there existed differences in the amount of social interactions received by each infant, some receiving many more contacts than others.

Social Interactions - Type: Nearly all interactions were of an affiliative nature and resulted from interest or desire to care for the infant on the part of the interactors. No injurious interactions were observed in this study. The infants were removed from their mothers, or voluntarily left, in three different ways, namely: they were kidnapped, taken or they were transferred. Kidnapping was observed only once. Infant-b was forcibly removed from the mother by another female, in the sixth week of it's life. Throughout the period of this kidnap, which lasted about 5 minutes, it emitted desperate vocalizations. The mother closely followed the kidnapper baring her teeth and emitting aggressive vocalizations at her. She forcibly tried to retrieve her infant throughout this period. When the kidnapper eventually gave up the infant, the mother grasped it firmly to her ventral surface before moving off to a safe distance and examining it.

Infants were taken by other individuals, this behavior being observed from the first week of life in the most recently born infant, Infant-c. However, on the whole, this phenomenon was not common. This was chiefly because the mother was observed to be protective of her infant, often not allowing other individuals to touch it for very long, and successfully preventing other individuals from taking it by holding it protectively in a ventral position or turning her back on interactors. This was particularly obvious when adult males approached the infants. Transfers became progressively more frequent with time, generally not occurring frequently until the ninth week. This behavior usually occurred in response to a "present neck" posture by the interactor. (By the ninth week of its life the infant's coat had changed from a light gray coloring to the characteristic dark brown of the adult's coat).

Social Interactions - Responsiveness of the Infant: During the first three weeks of life the infant is generally noncommittal to interactions with other group members. Negative reactions were generally not noted, except in cases when another individual tried to remove the infant

for example, in the case of the kidnapping. During the seventh week of life the infants start to become more positive to social interactions. By the seventh week they also started to become emissors of social interactions, actively reaching out for certain individuals within close range. This behavior continued to increase with increasing age. During the ninth, tenth and eleventh weeks the infants were reacting positively to nearly all interactions and transfers were fairly common.

Social Interactions - Interactors: The interactors encompassed all group members, but by far the most common were adult females, including other mothers with infants. Often a second female was observed traveling in convoy with a mother and sitting close by her whenever she stopped to rest, and when the female would frequently try to touch the infant or display a "present-neck" posture to it. Social interactions with the infant tended to occur at periods when the troop was either resting or feeding. They thus often occurred when several individuals were near the mother. However it was observed that group members interacted with an infant individually or simultaneously with another individual, but generally not in groups.

Conclusions

The pattern of the development of behavior and of the growth of independence in howler monkey infants found during this short study corresponds well with the two other studies carried out on the group of howlers on the Agaltepec Island (Sério-Silva and Rodríguez-Luna, 1992; Cabrera-Rojas, 1993), as well as other studies of the behavioral development of howler monkeys in different study sites (for example, Clarke, 1990). The infant's behavior and dependence develops gradually with time and is positively correlated with physiological changes, such as increase in size and strength which allows it to explore its environment more and more; a feature which goes hand-in-hand with an increase in the desire of the individual to do so and in the encouragement of this behavior by the mother and other group members.

The most obvious changes that occur within the group with the presence of a new member is that the new infant presents a powerful attraction which stimulates many social interactions. Clarke (1990) has previously suggested that predictions of behavior relating to this phenomenon cannot be based on inclusive fitness, and that interactions with infants do not function to bond social groups because howler monkeys leave their natal group as juveniles or young adults and migrate to new groups, and thus share little or no genetic material by descent with other adults within their group. However, the study site of Agaltepec Island represents a very special case because the monkeys are confined to the island. The original eight females and one male make up the entire genetic stock of this group of primates, and therefore the majority of this group, which now numbers approximately 40 individuals, does share genetic material. Similarly, at present these howler monkeys cannot migrate to other groups when older, therefore suggestions that interactions with infants can be explained by increasing inclusive fitness or functioning to bond the social group are appropriate in this case.

This study has revealed some important observations not recorded in previous studies of this species. In particular, the age observed for the first ingestion of solid food (leaves of *Bursera simaruba*) by an infant in this study, namely at the beginning of the fourth week of life, is earlier than had been previously observed. The age reported for the first instances of the "rubber ball" pattern of frequent leaving and returning to the mother are similarly earlier than previously documented. Compared to the previous report of the subspecies, *Alouatta palliata mexicana*, the observations of increased positive responsiveness of individuals to other group members, shown by behaviors such as an increased rate of transfer and of play behavior were observed relatively early.

An important point that has come to light, that has possibly not been investigated in any depth in previous studies involving larger sample sizes, but is very apparent in a study such as this involving only a small sample, is that of individual differences between the infants. For example, between the two oldest infants who were the same age, some very apparent differences existed. Infant-a gained increasing independence much more quickly than her contemporary Infant-b. For example Infant-a ingested solid foods much earlier, was much more responsive to social interactions, spent proportionally more time in independent travel (during which it also traveled further), and was observed playing more often.

There are several reasons to explain why these differences might have occurred. The first and most obvious is that these two individuals are of different sexes. Clarke (1990) suggests that major differences exist between the behavior of male and female howler infants. She found that females were generally more adventurous and reacted more positively to social interactions at an earlier age than did male howler monkey infants. Apart from sex differences, there are also several other reasons why differences might arise between individual infants. These most probably concern the mother. For example, differences might exist between the sociability or position in the social hierarchy of the mother which consequently affects the frequency of social interactions received by the infant. Differences may also occur between different

individual's mothering styles which either accelerate or decelerate the development of behavior and of independence in the infant. Further studies could easily address these possibilities.

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El Trafico De Monos Araña En México: El Estudio De Un Caso

Para los traficantes de fauna silvestre en México, el mono araña (*Ateles geoffroyi*) constituye uno de los elementos con mayor valor comercial, debido a su popularidad y demanda tanto a nivel nacional como internacional. Desafortunadamente para las poblaciones silvestres de este primate, los animales que son vendidos como mascotas continúan siendo extraídos de las selvas: los capturadores no se interesan por los adultos, pues resultan agresivos y en ocasiones peligrosos, en contraste, los infantes se muestran temerosos y sus mordidas no pueden causar un daño grave, además de ser más atractivos a los potenciales compradores; por lo tanto, estos pequeños son el objetivo final de la captura. La manera tradicional de obtener a estos infantes es matando con arma de fuego a madres que transportan a sus crías sobre el cuerpo. Los infantes son capturados y se convierten al poco tiempo en mascotas.

No obstante que *Ateles geoffroyi* es una especie declarada "en peligro de extinción" por el gobierno mexicano y exista una legislación que prohibe su caza y captura (SEDESOL, 1994), el tráfico continúa afectando la permanencia del mono araña en su hábitat natural (Rodríguez-Luna *et al.*, 1995).

A fin de evaluar el impacto de esta práctica ilegal, referiremos un caso reciente, suscitado en el Estado de Veracruz, que mereció atención internacional (IPPL, 1995). El 29 de mayo de 1995 fue interceptado un vehículo que transportaba ilegalmente animales de la vida silvestre (29 monos araña, *A. geoffroyi* y 2 cocodrilos, *Crocodylus moreleti*). La detención fue practicada por elementos de la Procuraduría General de la República (PGR) quienes consignaron a los tripulantes de la camioneta a la autoridad correspondiente (Agencia del Ministerio Público de Acayucan, Veracruz).

Uno de los monos pereció inmediatamente después del decomiso; en tanto, los otros animales fueron remitidos por la Procuraduría Federal de Protección al Ambiente (PROFEPA) a un parque ecológico privado (Nanciyaga, en Catemaco, Veracruz) para su custodia temporal. Debido al estado de salud de los animales y a las condiciones de manejo a que fueron sometidos hasta ese momento, murieron otros 4 monos. Entonces fue requerida la intervención de los primatólogos de la Universidad Veracruzana (UV), que tienen su centro de trabajo a pocos kilómetros del "Parque Nanciyaga". Los monos fueron atendidos inicialmente en este parque, pero las condiciones de manejo no permitían su tratamiento adecuado. La PROFEPA decidió entonces otorgar los monos en custodia a la Universidad Veracruzana.

Los animales fueron trasladados a las instalaciones de la UV (Parque de la Flora y Fauna Silvestre Tropical), en la ciudad de Catemaco y se determinó su edad y estado de salud individualmente, encontrándose que la mayoría de los individuos presentaban lesiones físicas causadas durante la captura y el transporte, diarrea, deshidratación, anemia, contaminación por bacterias y hongos patógenos. Los más pequeños presentaron hipotermia por falta de la fuente normal de calor que proporciona la madre. Asimismo, se reconoció que el estrés fue una de las causas más importantes de deterioro en la salud de los animales, principalmente en aquellos con pocos días de nacidos, para los cuales, los efectos de la separación de su madre fue letal en la mayoría de los casos. En general, se calificó como crítico el estado de los animales.

Tabla 1. Monos araña otorgados en custodia a la Universidad Veracruzana

Categoría de edad	No. de individuos	Hembras	Machos
0-3 meses	5	3	2
4-6 meses	9	5	4
7-9 meses	5	2	3
10-12 meses	5	1	4

Los monos entregados a la UV se separaron en grupos de acuerdo a su edad (Tabla 1)

El tratamiento para los monos de corta edad consistió inicialmente, en rehidratación mediante el suministro de suero oral cada 3 horas en dosis de 5 ml; en los casos graves se utilizó solución salina fisiológica vía subcutánea en dosis de 10 ml/4 hrs. Durante la primera semana de tratamiento, se indicó una dieta para lactantes basada en leche sin lactosa (para disminuir la posibilidad de diarrea causada por el azúcar de la leche), cereal y agua. Al segundo día el agua utilizada para la leche fue sustituida por suero, para continuar con la rehidratación y disminuir las sesiones de manejo. En la segunda semana la leche sin lactosa se sustituyó por la fórmula láctea con hierro SMA y se le agregó un suplemento proteico (Sustagén); esta fórmula fue proporcionada cada 4 hrs. En los animales que evolucionaron satisfactoriamente se eliminó el suero de la dieta. Asimismo, de acuerdo a la sintomatología presentada, se utilizaron diferentes medicamentos: antibióticos contra bacterias Gram (-) y Gram (+) principalmente de acción prolongada, broncodilatadores, antimicóticos, antipiréticos, analgésicos, antidiarreicos, protectores de mucosa gástrica y reconstituyentes de flora bacteriana.

Debido a la dificultad para manejar a los animales de mayor talla, la rehidratación, cuando fue requerida, se realizó mediante el suministro de solución salina fisiológica vía subcutánea en dosis de 75 ml/12 hrs. La alimentación para este grupo de animales consistió en frutas variadas, proporcionadas tres veces por día. El procedimiento seguido en los tratamientos se basó en la sintomatología presentada y los medicamentos utilizados fueron los mismos que anteriormente se describieron para los lactantes.

No obstante la atención médica permanente, 12 animales fallecieron. Se realizaron necropsias y se encontró que las principales causas de muerte fueron: neumonías, septisemias hemorrágicas, gastroenteritis y micosis. Además, la separación de la madre en los animales con pocos días de nacidos fue un factor decisivo en las muertes debidas a desnutrición, depresión y en un caso, por broncoaspiración dada la dificultad para succionar adecuadamente la leche sustituta. Los agentes etiológicos causantes de la mayoría de las muertes fueron: *Pasteurella* spp., *Candida* spp. y *Aspergillus* spp.

Finalmente, se logró estabilizar el estado de los 12 animales restantes en las siguientes categorías de edad: 4 individuos de 4-6 meses, 4 de 7-9 meses y 4 de 10-12 meses; todos los monos de la categoría 0-3 meses habían

muerto. Posteriormente un mono de la categoría 7-9 meses murió por moniliasis provocada por *Candida albicans*.

Un grupo de 4 monos fue enviado a la reserva biológica del Parque de la Flora y Fauna Silvestre Tropical (instalaciones exteriores de la UV) situada a 8 km aproximadamente de la ciudad de Catemaco, y otro grupo quedó bajo cuidado más intensivo en la casa-albergue de los investigadores. Lamentablemente, esos 4 animales fueron robados de los encierros de cuarentena de la UV durante la noche; se hizo la denuncia correspondiente sin encontrar a ningún responsable, hasta la fecha. Este robo ejemplifica la falta de control sobre los traficantes de vida silvestre, quienes actúan libre e impunemente. Los 7 monos que se mantienen en las instalaciones de la UV han sido incorporados a un programa de investigación sobre desarrollo de la conducta. Del caso anterior podemos analizar los siguientes aspectos:

Efecto del tráfico sobre poblaciones silvestres

El impacto actual que la captura de monos tiene sobre las poblaciones silvestres es grave. No todos los animales sobreviven a la captura, algunos perecen al golpearse con el suelo o las ramas de los árboles donde fueron capturados, mientras que otros mueren al caer la madre encima de ellos. Por otra parte, para obtener a las crías, las madres regularmente son sacrificadas. Considerando éstas constituyen una parte importante de los individuos maduros (población efectiva) dentro de estos grupos y dado que las hembras de monos araña alcanzan la madurez sexual hasta aproximadamente los 6 años (Eisenberg, 1973; 1976) y que los intervalos entre nacimientos fluctúan entre 2 y 3 años (ver Milton, 1981); podemos pensar que la población que pudiera haber quedado en el área de captura (sesgada hacia clases de edad y sexo con proporciones distintas de las naturales) tardaría mucho tiempo en recuperarse. Esto agudiza la situación, ya crítica de las poblaciones silvestres de monos araña en México, que enfrentan una reducción y transformación aceleradas de las selvas donde viven.

Haciendo un cálculo conservador, consideramos que para poder obtener un grupo de monos araña infantes de 29 individuos, al menos perecieron otros 60 individuos entre la captura, el cautiverio temporal y el transporte; es decir, hubo una extirpación de aproximadamente 100 animales. Esta inferencia surge del siguiente razonamiento: los infantes capturados inicialmente debieron ser alrededor de 40 (tomando en cuenta la probabilidad de fallecimiento, debido al manejo inadecuado durante la captura y cautiverio temporal); con seguridad, por cada infante capturado se sacrificó a una hembra (por tanto, otros 40 animales); finalmente, con cierta confianza podemos estimar una pérdida de aproximadamente 20 animales más en los distintos grupos de monos que debieron ser afectados por los capturadores, conociendo su forma de operación. Este número se ha inferido de un solo caso de decomiso reportado. Hay que destacar que como éste se presentan varios casos similares, durante el año en México, y no todos son reportados.

Sistema de vigilancia gubernamental

Actualmente, para la conservación del patrimonio natural de México se ha establecido un sistema de coordinación entre dos dependencias cuyas competencias convergen en salvaguardar el interés de la nación, sus recursos naturales, su biodiversidad: PGR y PROFEPA. La PGR realiza vigilancia de caminos y carreteras reconocidos como ruta de tráfico de animales silvestres, así como operativos específicos hacia los sitios posibles de concentración de fauna; la PROFEPA recibe denuncias de tráfico o posesión ilegal de fauna silvestre y actúa en el decomiso de los mismos por medio de inspectores adscritos a ella. Asimismo, recibe los decomisos efectuados por la PGR y turna a las personas responsables al Ministerio Público Federal para que les sea aplicada la sanción correspondiente. Finalmente, otorga la custodia de los animales incautados a instituciones con capacidad de mantenimiento y manejo y elabora un reporte técnico del decomiso que es turnado a la SEMARNAP (Secretaría de Medio Ambiente, Recursos Naturales y Pesca).

En el caso reportado, se aprecia una adecuada coordinación entre la PGR y la PROFEPA; sin embargo, no siempre se actúa de manera integrada. Además, no todos los agentes responsables de la vigilancia de la PGR están bien preparados para la detección y canalización eficiente de estos contrabandos. Por ello, los traficantes esquivan los dispositivos de vigilancia y los animales decomisados no son atendidos oportunamente.

Aun cuando se han detectado algunos de los principales centros de acopio ilegal de animales, la acción de las autoridades gubernamentales no ha sido tan enérgica como cabría esperar. Parece necesario que los encargados de la vigilancia asuman un mayor compromiso con esta tarea, y que se diseñen campañas de vigilancia y decomiso más efectivas.

Para asegurar la eficiencia de este sistema gubernamental, se requiere la participación decidida de la sociedad civil, que a través de denuncias y exigiendo el cumplimiento de la ley podrá convertirse en un elemento clave para la protección de la vida silvestre

Manejo de animales decomisados

Es conveniente elaborar un protocolo de manejo para animales decomisados, que abarque desde el momento de la recepción, hasta que los animales se puedan considerar como aptos desde el punto de vista clínico. Debido a que los decomisos de monos araña son eventos que ocurren con alguna frecuencia en México, sería conveniente crear un acervo de información sobre los animales decomisados. Para ello sería indispensable crear una ficha de registro que orientara el tipo de datos a registrar. Estas fichas se integrarían en una base de datos que permitiera evaluar el tráfico con esta especie, las características y estado general de los monos decomisados, así como el manejo de los mismos por el personal de las dependencias encargadas. En estas fichas se recomienda que a cada animal se le asigne un código único que lo identifique en la base de datos, la cual deberá contener información colectada en tres fichas de registro:

a) *Ficha individual de registro (inventario)*:
Código de acceso; Nombre científico; Nombre común; Nombre asignado; Zona presunta de captura; Fecha aproximada de captura; Fecha de decomiso; Fecha de recepción; Número de animales decomisados; Características del transporte; Fórmula dental; Edad estimada; Peso y morfometría; Grupo de edad en que es colocado; Número de albergue; Huellas dactilares; Fotografía(s).

b) *Ficha de registro diaria*:
Cambio de albergue o encierro; Dieta; Salud animal; Calidad de las heces; Comportamiento; Adaptación al albergue o encierro.

c) *Registro médico*:
Anestesia; Parasitología; Rayos x; Patología clínica (Hematología y química sanguínea, Examen general de orina y función renal, Aislamiento e identificación bacteriológica, Virología, Micología); Tratamientos; Histopatología.

Al momento de recibir a los animales es necesario implementar una serie de acciones que nos ayuden a resolver los problemas inmediatos y los que se pudieran presentar a largo plazo:

a) *Registro de datos individuales*:
Como primer paso se obtienen y registran todos los datos incluidos en la ficha individual de registro. Se debe colocar algún tipo de marca que identifique individualmente a cada animal, esta puede ser una característica o deformación física permanente, o bien, por depilaciones, decoloraciones, collares, bandas, pulseras y/o tatuajes.

b) *Agrupación de animales de acuerdo a categorías de edad:*
Una vez que se calcula la edad aproximada por medio de la fórmula dentaria, se alojan juntos los de edades próximas. Esto facilitará el manejo posterior, principalmente en cuanto a alimentación corresponde.

c) *Inspección física:*
Cada animal debe ser objeto de una inspección física minuciosa, que incluya: lesiones o heridas, constantes fisiológicas, calidad de pelo y piel, características de mucosas visibles, característica y cantidad de exudados de orificios naturales y auscultación de aparatos respiratorio y digestivo.

d) *Exámenes de laboratorio*:
Antes de indicar cualquier tratamiento, es importante realizar estudios sistemáticos de laboratorio para cada animal (parasitología, frotis, aislamiento e identificación bacteriológica, virología, micología, hematología y química sanguínea, general de orina y función renal), aun cuando no presenten sintomatología.

e) *Aplicación de tratamientos preventivos:*
Inmediatamente después de obtener las muestras biológicas para los exámenes de laboratorio, se recomienda iniciar los tratamientos específicos de acuerdo a la sintomatología presentada por los animales. En el caso de animales asintomáticos es recomendable utilizar tratamientos preventivos, ya que el sistema de transporte que se utiliza durante el tráfico (muchos individuos juntos en jaulas pequeñas) es un factor determinante para la alta morbilidad. Estos tratamientos deben ser principalmente antibacterianos y antimicóticos, utilizando siempre medicamentos de amplio espectro y acción prolongada.

f) *Uso de incubadora:*
Todos los animales menores de sesenta días de edad, deberán ser colocados en incubadora, pues la falta de la madre provoca hipotermia que en muchos casos puede desencadenar la muerte de los individuos.

g) *Alimentación:*
El tráfico de primates ocupa, en la mayoría de los casos, sólo infantes y juveniles. Para el caso de monos araña el fin del periodo de lactancia se ha reportado entre 18 y 23 meses (Eisenberg, 1973; Milton, 1981), por ello la mayor parte de los animales que son decomisados necesitan aún de la leche materna. Es necesario elaborar dietas específicas para cada categoría de edad en que son agrupados los animales. Se recomienda iniciar con sustitutos de leche sin lactosa para todos los individuos de corta edad y posteriormente administrar fórmulas lácteas con hierro de diferentes etapas (de acuerdo con la edad); esta fórmula debe ser mezclada con suplementos proteicos y cereal y diluida en agua. Para la dieta de animales mayores de 6 meses de edad se debe aumentar la concentración de la mezcla antes mencionada y complementar con frutas variadas.

h) *Alojamiento:*

Los albergues donde estos animales vayan a ser alojados, deberán ser suficientemente grandes y estar enriquecidos con estructuras que permitan el desarrollo de un amplio repertorio de actividades que normalmente ocurren en condiciones naturales (desplazamiento, refugio, alimentación, juego). Del mismo modo, se deben evitar sitios o materiales que permitan la propagación o introducción de agentes patógenos.

i) *Necropsias:*

Lamentablemente para muchos de estos animales, la muerte es irremediable, debido principalmente a las condiciones de captura, transporte y manejo previas al decomiso y a la falta de la madre. Por lo tanto, se recomienda efectuar la necropsia y estudios histopatológicos correspondientes a cada uno de los animales muertos, ya que los hallazgos realizados serán de gran valor para el manejo futuro de los animales.

j) *Monitoreo de animales:*

Es importante realizar un chequeo sistemático de los animales manejados, puesto que es la única forma de constatar la evolución clínica deseada. Por lo tanto, se recomienda realizar todos los exámenes de laboratorio, peso y morfometría, cada 2 meses.

Destino de animales capturados

Organismos internacionales preocupados por este tipo de situaciones han elaborado una serie de recomendaciones que marcan posibles destinos para los animales que han sido confiscados: eutanasia; uso del cuerpo o sus partes para investigación; cautiverio en el país de origen o en el extranjero para crear o fortalecer programas educativos y establecer colonias reproductivas; liberación al medio natural. Cada una de estas opciones tiene implicaciones negativas, y deberían considerarse críticamente para cada caso particular (Harcourt, 1987).

Probablemente, la liberación de animales a su ambiente natural es la acción que parecería más adecuada a quienes están en contra del tráfico y en favor de la persistencia de las poblaciones silvestres. Sin embargo, no siempre es la acción más recomendable, ya que depende en gran medida de los requerimientos naturales de la especie en cuestión, del tiempo en que los animales hayan permanecido en cautiverio, de la condición de salud, de la disponibilidad del hábitat, de la protección efectiva que puedan tener estos animales reintroducidos y de otras consideraciones particulares, para que sea factible y exitosa una acción como ésta; si no es bien planeada, puede repercutir negativamente en las poblaciones silvestres que aún existen.

Estado de la especie

De acuerdo a la Lista Roja de Especies en Peligro de la Unión Mundial para la Conservación-IUCN (Groombridge, 1993) *Ateles geoffroyi* se encuentra en la categoría "Vulnerable". Con base en datos disponibles se estimó que *A. g. vellerosus* podría colocarse en Riesgo Bajo, mientras que *A. g. yucatanensis* como "Vulnerable" (Rylands *et al* 1995). En una reunión reciente sobre Conservación, Evaluación y Manejo Planificado (CAMP) para los primates mexicanos, se detectó que estas dos subespecies que se encuentran en México debían pertenecer a la categoría "Vulnerable" (Rodríguez-Luna *et al.*, 1995). Aunado a ésto, considerando la desaparición de *A. g. vellerosus* en el Volcán de San Martín Tuxtla, Veracruz (García-Orduña y Gómez-Marín, en prensa) y el fuerte impacto que aún tiene el tráfico sobre las poblaciones silvestres, es factible pensar en una recategorización a corto plazo, hacia un nivel de mayor riesgo.

Recomendaciones

- Identificar las áreas donde se practica la extracción constante de fauna silvestre, particularmente de especies amenazadas
- Implementar un sistema de vigilancia efectivo, por parte de las autoridades correspondientes, reforzado en los sitios donde puede existir saqueo intenso y en todos los caminos que provengan de éstos, para detectar a tiempo el tráfico de vida silvestre.
- Aplicar medidas penales más enérgicas a quienes sean identificados como parte de la cadena de tráfico de estas especies: capturadores, intermediarios, vendedores.
- Realizar programas de concientización civil, que tengan un fuerte impacto (por ejemplo a través de los medios masivos de comunicación) sobre quienes pretendan mantener a los animales silvestres como mascotas, exhortándoles a adoptar únicamente especies domésticas.
- Establecer centros regionales de rehabilitación, en estrecha colaboración con las dependencias gubernamentales pertinentes, en donde se reciba y se trabaje con los animales confiscados. En este centro se deberán desarrollar programas para mejorar la condición de salud de los animales, para integrar grupos adecuados, en cuanto a clases de edad y sexo (en caso de que la especie lo amerite) y desarrollar y aplicar protocolos de rehabilitación que preparen a los animales para vivir nuevamente en las condiciones naturales de su especie, considerándose la liberación de los animales en áreas naturales protegidas, siempre y cuando las condiciones ecológicas y de protección del área de liberación sean las adecuadas. Se debe reconocer que aún falta investigación que aporte elementos que hagan viable un programa para esta

especie.

- En caso de no existir un centro como el descrito anteriormente, establecer convenios entre las entidades gubernamentales encargadas de los decomisos y las instituciones que cuenten con personal calificado para desarrollar este tipo de trabajo, o que pudieran hacer un uso adecuado de estos animales para investigación.
- Es indispensable el establecimiento de convenios formales de colaboración entre las dependencias gubernamentales y los centros o instituciones de investigación que recibirán a los animales decomisados, que estipulen con claridad compromisos y responsabilidades. En este sentido, se debe reconocer las limitaciones operativas de las instituciones para manejar a estos animales, debido a restricciones de índole técnica y económica.
- Capacitar a las personas encargadas de hacer los decomisos a través de seminarios y talleres. Asimismo, se debe preparar a quienes se encargan de aplicar la ley sobre los infractores, para que sean capaces de identificar especies que se encuentren en peligro de extinción y valorar la importancia que tiene el tráfico en la reducción de poblaciones silvestres. De esta forma, podrán calificar adecuadamente los delitos cometidos.

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Evaluacion del Estado de Dos Poblaciones de *Saguinus leucopus* para Determinar Areas Potenciales de Conservacion en Un Sector del Valle del Magdalena Medio, Colombia.

Saguinus leucopus es una especie endémica de Colombia considerada en peligro de extinción (CITES Apéndice I; UICN - "Vulnerable", *v.* Rylands *et al.*, 1995). Su distribución geográfica (Figura 1) es la más restringida del género (Hernández-Camacho y Cooper, 1975; Hernández-Camacho y Defler, 1983; Emmons y Feer, 1990) y aún no se conoce con exactitud el verdadero límite sur de su distribución (Hernández-Camacho, com. pers.).

Su área de distribución se encuentra bastante alterada por la deforestación, debido a la ganadería extensiva, la agricultura y la apertura de la autopista Medellín-Bogotá; y se considera una "área muy crítica" (Andrade 1990), pues los hábitats naturales han sido fuertemente afectados por la actividad humana, transformándolos en fragmentos e islas de bosque; que reducen en forma alarmante el hábitat de *S. leucopus*. A esta problemática se suma el tráfico ilegal que se realiza con la especie, pues es bastante atractiva como mascota.

Desafortunadamente *S. leucopus* no se encuentra protegida en ninguna reserva o parque nacional y los estudios poblacionales son escasos. Con el fin de proponer un área potencial para la conservación de este

primate se evaluaron los fragmentos de bosque denominados "Arizona" y "San Antonio" en los municipios de La Dorada y Samaná (Departamento de Caldas y Antioquia) (Figura 2) para estimar densidades poblacionales y hacer una descripción de los hábitats disponibles para *S. leucopus.*

El fragmento de "Arizona" posee una extensión de 79.8 ha y presenta tres tipos de vegetación; *bosque primario:* con alturas hasta de 40 m, diámetros > de 50 cm y al menos cinco estratos; *bosque secundario maduro:* con alturas hasta de 25 m, diámetros entre 5 y 20 cm y cuatro estratos; *bosque secundario de dos años*: con alturas promedio de 7.5 m, diámetros < de 10 cm y dos estratos. En este fragmento se encontraron cinco especies de primates: *S. leucopus, Aotus lemurinus, Cebus albifrons, Alouatta seniculus* y *Ateles belzebuth brunneus*; subespecie endémica y con el mismo rango de distribución de *S. leucopus* (Hernández-Camacho y Defler, 1983). Dentro de esta área se localizaron cuatro grupos de *S. leucopus,* con una densidad de 2.2 grupos/ km² y 7 individuos/km² (Tabla 1).

El fragmento de "San Antonio" posee una extensión de 196 ha, presenta cuatro tipos de vegetación; *bosque primario*: con alturas hasta de 40 m, diámetros entre 15 y 45 cm y cuatro estratos; *bosque maduro con abundancia de palmas:* con una altura promedio de 20 m, diámetros entre 15 y 45 cm, cinco estratos; *bosque secundario maduro*: con alturas hasta de 20 m, diámetros entre 5 y 15 cm y cinco estratos; *bosque secundario de cuatro años*: con altura promedio de 10 m, diámetros entre 5 y 10 cm y tres estratos, este tipo de bosque corresponde a franjas de borde y lugares dentro del fragmento en proceso de regeneración. Dentro de esta área sólo se observó *A. seniculus.* Se encontraron 11 grupos de *S. leucopus* con densidades de 0.7 grupos/ km² y 2.5 individuos/km² (Tabla 1).

Para hacer una evaluación cualitativa de la utilización del hábitat por *S. leucopus* se seleccionaron dos hábitats: bosque no intervenido y bosque intervenido, que corresponden a bosque primario, bosque maduro con abundancia de palmas, bosque secundario maduro y bosques secundarios de dos y cuatro años, respectivamente.

Se observó que *S. leucopus* utilizó todos los hábitats establecidos y que existen diferencias altamente significativas entre la utilización de los dos tipos de hábitat ($G = 31.4$, $gl = 1$, $p < 0.001$), encontrándose que utilizó más el bosque primario.

Tabla 1. Densidades de *Saguinus leucopus* en los dos fragmentos evaluados.

Sector	Area del fragmento	Grupos/km²	Ind./km²
Arizona	0.79 km²	2.2	7.0
San Antonio	19.60 km²	0.7	2.5

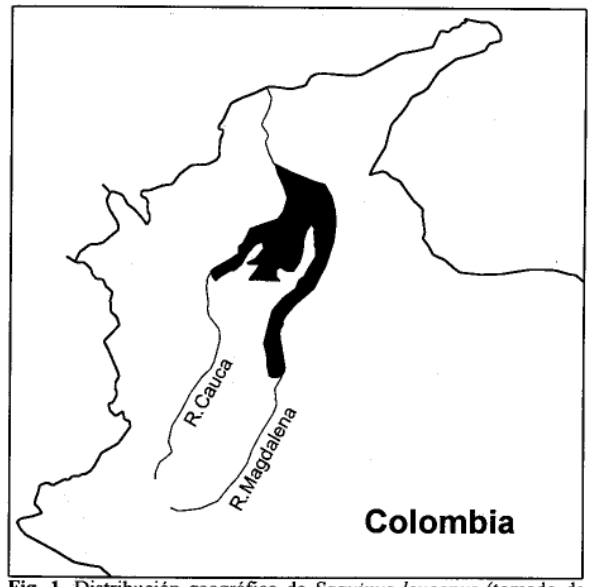

Fig. 1. Distribución geográfica de *Saguinus leucopus* (tomado de Hernández-Camacho y Cooper, 1976.

Los fragmentos de bosque que actualmente habita *S. leucopus*, se encuentran en su mayoría con algún grado de intervención; es posible que esta especie responda satisfactoriamente, sólo temporalmente, a hábitats con vegetación secundaria. Según las observaciones realizadas durante este estudio se concluye que ésta es una especie que utiliza diferentes tipos de hábitat; bosque primario y bosque secundario con diferentes años de regeneración, utilizando con preferencia el bosque primario. Hasta ahora se ha considerado a las especies de este género capaces de sobrevivir en bosques secundarios e inclusive en los que están bastante degradados, lo que ha dirigido los planes de conservación de las especies a la protección de zonas boscosas degradadas. Este estudio plantea que las poblaciones de *S. leucopus* necesitan bosques poco intervenidos para asegurar su sobrevivencia a largo plazo.

Como conclusiones generales en cuanto a la potencialidad de los fragmentos evaluados para la protección de *S. leucopus,* los dos son apropiados para la conservación de esta especie, opinión tomada con base en dos parámetros:

1. Las características ecológicas de esta especie con áreas de acción pequeñas, tamaño corporal pequeño, grupos familiares, utilización de diferentes tipos de hábitat, dietas poco especializadas y por las densidades encontradas.

2. Las características de los fragmentos evaluados como el tamaño estimado, los tipos de vegetación, la existencia

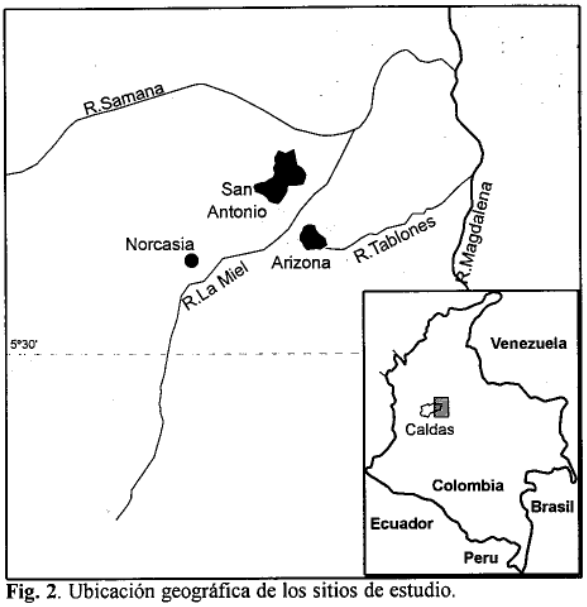

Fig. 2. Ubicación geográfica de los sitios de estudio.

de corredores que los comunican con fragmentos más pequeños facilitando el intercambio de individuos de *S. leucopus* entre poblaciones (factor fundamental en el mantenimiento de la variabilidad genética de la especie) parecen ser suficientemente adecuadas para sostener las poblaciones encontradas.

Lo anteriormente mencionado se complementa con el estudio de fotointerpretación del Municipio de La Dorada y nororiente del Municipio de Samaná, donde no existen otros fragmentos de igual tamaño y con las mismas condiciones, razón importante, a escala municipal, para conservar estos bosques. La existencia de poblaciones de otros mamíferos como *Ateles belzebuth brunneus*, *Cebus albifrons*, *Agouti paca*, *Dasyprocta* spp., *Felis* spp. (tigrillo), *Eira barbara*, *Atelocynus* cf. *microtis* entre otros, requiere de acciones de conservación urgentes como la ampliación de los parches de bosque y de los corredores de migración, además disminuir la presión ejercida por actividades humanas como la deforestación, la caza y la minería que actualmente ejercen gran presión sobre los últimos fragmentos de bosque encontrados en esta zona. El Valle del Magdalena es una zona de gran importancia biogeográfica, en él se encuentra localizado el refugio pleistocénico del Carare, actualmente no existen zonas protegidas y la presión ejercida por las actividades humanas reducen aceleradamente a un tamaño crítico los últimos fragmentos de bosque existentes, provocando a mediano plazo la extirpación de especies y para el peor de los casos la extinción de especies endémicas como *S. leucopus*.

Finalmente hay que destacar que es urgente realizar un análisis detallado sobre lo que permanece del área original de distribución de *S. leucopus* y a partir de la teoría de la fragmentacíon establecer más acertadamente la viabilidad de los fragmentos de bosque y de las poblaciones de *S. leucopus* que en ellos aún subsisten.

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Some Observations on Primates in Paraguay

Although anecdotal recordings of primates in Paraguay have dated as far back as 80 years (Bertoni, 1914), the study of primate ecology and conservation was barely initiated fifteen years ago within this country. Most synecological studies were done by Jody Stallings (1984), who did an extensive amount of work in the Chaco. In 1982, Stallings and Mittermeier added a fifth species, the black-tailed marmoset (*Callithrix melanura*), to the country's nonhuman primate assemblage. Similar to the ranges of the night monkey (*Aotus azarae*) and dusky titi (*Callicebus moloch*), *Callithrix* is restricted to the Chaco (Stallings *et al.*, 1989), the region lying

west of the Paraguay River. While studying hunting patterns of Ache Indians, Hill and Hawkes (1983) collected data on brown capuchins (*Cebus apella*), the only Paraguayan primate restricted to the more tropical orient (east of the Paraguay River). The southern black howler monkey (*Alouatta caraya*) is the fifth species, common to both biomes of Paraguay.

The primary objective of the study described here was to obtain baseline information on the status and abundance of the five primate species in Paraguay subsequent to the earlier work of Stallings and others in the 1980's. Field work was carried out during 1989/1990. Anecdotal information on distribution, ecology, and behavior is included in the species accounts.

Methods

Data were collected from August 1989 to August 1990 using three methods: 1) walking along transects or through areas of varying extent to log recordings of primate groups seen; 2) interviewing locals and biologists familiar with the primates occurring within their geographic area; 3) driving along road transects of varying lengths to log recordings of wild primates seen. More surveys were done in the morning and during daylight hours than during the night; nocturnal surveys may have been unnecessary, as the only nocturnal species (*Aotus*) was detected during the day.

Departamento Boqueron, Paraguay (Chaco) was surveyed from September 1989 - August 1990. The I'guasu region (Paraná, Brazil and Misiones, Argentina) was surveyed in late January/early February 1990. The Curuguaty region of Departamento Canindeyu, Paraguay (Orient) was surveyed in early May 1990. The northern Paraguayan Chaco and southeastern Santa Cruz, Bolivia were surveyed in early July 1990.

Figure 1 shows the localities and regions mentioned in the text. New localities were identified by overlaying a reduction of Figure 1 onto the maps in Redford and Eisenberg (1992). Range increases comprised those localities beyond the previously documented distributions within the Chaco, as determined by the enclosed polygon of known localities.

Habitats

Habitats have been described elsewhere (e.g., Stallings *et al.*, 1989), but a brief description is provided as follows. The lower Chaco is primarily a vast palm savannah; historically a large body of water, and certain areas are still seasonally inundated. There is a cline from the middle Chaco to the upper Chaco: a low degree of stratification, dense and thorny foliage, and low canopy height in the middle Chaco to more stratified vegetation, a greater abundance of broadleaf species, and a higher canopy in the upper Chaco (Brooks, 1992).

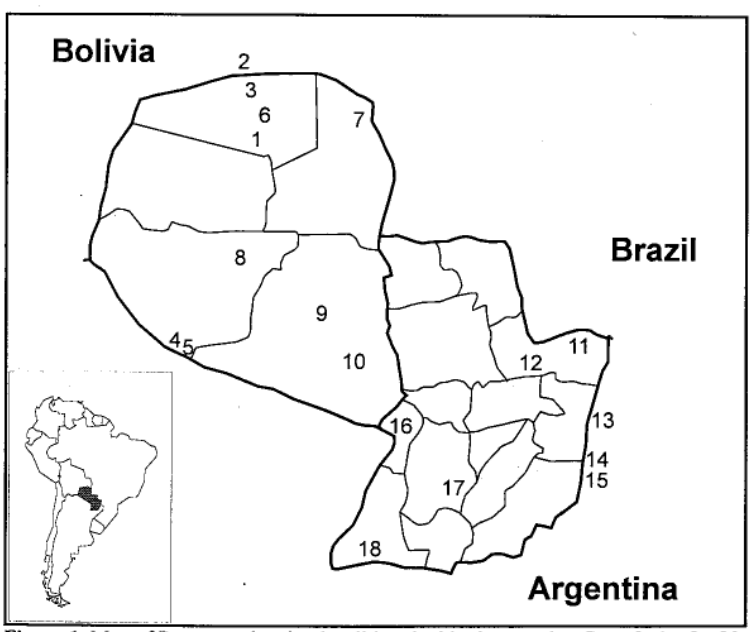

Figure 1. Map of Paraguay showing localities cited in the text. 1 - Cerro León; 2 - 30 Km South of Cerro San Miguel/Pt. 6; 3 - Est. San José; 4 - Est. Madregadta; 5 - Est. Ferrér; 6 - Agua Dulce; 7 - Bahía Negra; 8 - Northeastern Boquerón; 9 - Ruta trans-Chaco and Río Monte Lindo; 10 - Lower palm Chaco; 11 - M'baracayú Region; 12 - Curuguatí; 13 - I'taipu Dam; 14 - Paraná, Brasíl; 15 - Misiones, Argentina; 16 - Outskirts of Asuncíon; 17 - Y'bicuí National Park; 18 - South of Pilar.

The Orient is more mesic and tropical than the Chaco, which harbors more xeric forest. The southwestern Orient is more typical of a seasonally inundated area. Near the Río Paraná, eastern Paraguay and adjacent Brazil and Argentina are extensions of what once formed the vast, continuous tract of South Atlantic rain forest. There are reports that woolly spider monkeys (*Brachyteles*) inhabited this area 25 years ago (K. Benirschke, pers. comm.). Further west in the interior of the Paraguayan Orient, wet and dry seasons are more defined than in the rain forest adjacent to the Paraná river basin.

Black-tailed Marmoset (*Callithrix melanura*)

Stallings and Mittermeier (1982) first described the occurrence of this species in Paraguay. Marmosets were reported to be rare in the Defensores del Chaco National Park, not occurring south of Cerro Leon (southern park boundary),

and increasing in abundance north of Agua Dulce (northern park boundary) (S. González, pers. comm.). *Callithrix* occurs in sympatry with *Callicebus* and *Aotus* at Estancia San José (Sr. Insua, pers. comm.), which is further north, along the Bolivian border. Reports indicate that population densities increase towards the Bahia Negra region, immediately west of the Río Paraguay, which comprises the southwestern Pantanal. Most likely, this species dispersed westward into the Chaco along tributaries of the Río Paraguay. Although these reports are not necessarily bona-fide they provide an idea of the distribution of this species, which is naturally restricted to the northeastern portion of the Chaco.

Night Monkey (*Aotus azarae*)

This species inhabits areas in the lower palm savannah (P. Scharf, pers. comm.). *Aotus* is relatively scarce in Departamento Boqueron, where maximum density estimates are 1 ind./15 km² (F. Colman, pers. comm.). The major threat in the central Chaco is habitat destruction for cattle ranching. Gaps between edges of fragmented forest are increasing to the point where adjacent forest plots may be too far apart for the monkeys to disperse. The absence of dispersal corridors in the dry Chaco, where riverine gallery forest is lacking, results in isolated populations. In the northern Chaco where development is less extensive, populations appear to be stable.

A group of three individuals at Estancia San José increased the known range to the north in Paraguay (Brooks, 1993). This group comprised two adults (presumably male and female) and a single juvenile, seen foraging in the morning at 0820 hrs. Diurnal foraging has been previously documented for *Aotus* (Fernandes, 1993; Wright, 1983, 1985). The sky was completely overcast when the group was observed, which may have caused them to continue foraging through the morning from the previous night. Another possible explanation may involve metabolic constraints. The group was observed in early July during the Paraguayan winter, when the average temperature is approximately 20°C. It may be more energetically efficient for the monkeys to be active during the day. Theories regarding how *Aotus* became nocturnally-active are: 1) to avoid predation by large diurnal raptors and 2) to avoid direct interspecific competition with larger cebids (Wright, 1985). In regions such as the Chaco however, where large diurnal raptors are rare, competing species of cebids are absent, and great-horned owls (*Bubo virginianus*) (a nocturnal predator large enough to predate upon *Aotus*) are present, night monkeys may shift back to diurnal foraging (Wright, 1985). In agreement with Wright's hypothesis, the largest sympatric diurnal raptor observed at Estancia San José was a savannah hawk (*Heterospizias meridionalis*), possibly not large enough to be a predator of night monkeys, although only two days were spent there and rarer species may have been undetected. The largest sympatric cebid was *Callicebus*, which would not be considered a direct competitor, being no larger than *Aotus*. Great horned owls were not encountered at Estancia San José, but one individual was heard 30 km west at Point 6.

Upon encountering the group of night monkeys, the male was about 40 m from the female and juvenile. The male fled immediately. Locomotor skills of the juvenile were not yet well-developed, and it clung to an intersection of branches where it hid for several minutes before going deeper into the forest. During the time the juvenile was hiding, the female piloerected into an arch-posture (Wright, 1978) before fleeing.

Dusky Titi (*Callicebus moloch*)

Like *Callithrix*, the range of *Callicebus* is restricted to northeastern Paraguay albeit over a larger area (see Stallings *et al.*, 1989). Using conservative sample sizes, maximum densities of familial groups were estimated at 5 groups/km² at Cerro Leon, 2.5 groups/km² south of Cerro San Miguel, and 1 group/km² at Estancia San José. Stallings *et al.* (1989) provided an estimate of 6.2 groups/km² at Agua Dulce, which is near the center of the three aforementioned areas. Regrettably, time constraints precluded an opportunity to sample Agua Dulce. Stallings *et al.* (1989) indicated that the high density of *Callicebus* at Agua Dulce was due to the more botanically diverse and higher canopied vegetation of the region. In addition, our methods of estimating density may have differed. However, if the average density of Cerro Leon, Cerro San Miguel, and Estancia San José (2.83 groups/km²) is indicative of the present density at Agua Dulce, *Callicebus* may be below minimum population levels for stability.

The presence of *Callicebus* at Point Six increases the known range of localities in Paraguay to the north (Brooks, 1993), and perhaps to the east in Bolivia (Anderson *et al.*, 1993). Duet calling as described by Robinson (1977) was heard at 1020 hrs. at Cerro Leon, 0815 hrs. south of Cerro San Miguel, and 0730 hrs. at Estancia San Jose.

Brown Capuchin (*Cebus apella*)

At a study site approximately 40 km north of Curuguaty, Canindeyu, Hill and Hawkes (1983) compared shotgun versus bow hunting of Ache indians during 165 hunting days between March and July of 1980. Shotgun hunters called for a bow when hunting *Cebus*, killing 7.8 kg total at an average rate of 0.02 kg/man-hour of hunting.

This comprised only 1% of all game taken, the lowest mammalian biomass in the diet. In contrast, bow hunters killed 484.2 kg total, at an average rate of 0.14 kg/man-hour of hunting. This comprised 25.8% of all game taken, the highest species biomass in the diet.

The species exists locally in the Y'bicui National Park, and is abundant in the M'baracayu reserve (C. Yahnke, pers. comm.). However, a survey in the Curuguaty region of Departamento Canindeyu, just 40 km south of Hill and Hawkes' (1983) study site, revealed no evidence of the occurrence of *Cebus*, a mere ten years following their study. With the presence of a major military station in the area, hunting by soldiers is a major threat to all species. Another potential threat is logging. Although the surveys took place within tracts of primary rain forest, chainsaws could be heard. Thus, forest fragmentation and disturbance likely serve equally as threats. The majority of the Orient is experiencing a tremendous surge of development due to rapidly increasing human populations.

Brief surveys in the I'guasu region of Paraná, Brazil and Misiones, Argentina revealed no trace of *Cebus* either. The construction of the I'taipu dam on the Río Paraná, 30 km north of the I'guasu River, has most likely had a serious affect on *Cebus* populations, although the Itaipu captive breeding facility has been sucessfull in breeding individuals rescued from the flood (F. Carbonar, pers. comm.).

Southern Black Howler Monkey (*Alouatta caraya*)

Although prime howler monkey habitat was found in the I'guasu region of Paraná, Brazil and Misiones, Argentina, *Alouatta* were not encountered. However, howler monkeys were found in some prohibitive neighborhoods, where hunting would not be considered a threat, outlying the capital of Asunción (D. Espinoza, pers. comm.). Thus it appears that *Alouatta* are rare in areas where extensive human 'traffic' is consistent regardless of habitat type, but can apparently survive in secondary habitat as long as the area is expansive, naturally landscaped, and with at most minor hunting pressure. The species is said to be common along the lower Río Paraná, west of Encarnación and south of Pilar (P. Scharf, pers. comm.).

Alouatta is rare in the northern Chaco, where it is infrequently encountered (S. Gonzalez, pers. comm.). A female was reported in the southern Chaco at the interchange of the Ruta-Trans Chaco and the Río Monte Lindo (R. Brooks, pers. comm.) in early February. This species probably dispersed westward via riverine gallery forest into the lower Chaco from the Orient.

Conclusions

Primates of the Paraguayan region appear to be threatened in one area or another. Depending upon the species, these major threats include a naturally restricted range, habitat development for cattle ranching, expanding human populations, and human disturbance. Hope remains with recently increased interest in species conservation in Paraguay.

Future studies are recommended in order to obtain a better understanding of the status of the Paraguayan primates and the threats to their populations, specifically involving surveys using the same methods as those employed by Stallings *et al.* (1989). Areas of particular interest include Tte. Encisco, Agua Dulce, Chovoreca, and Y'bycui.

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Emigration of a Masked Titi Monkey (*Callicebus personatus*) from an Established Group, and the Foundation of a New Group

Introduction

The territorial behavior of primates is frequently associated with a monogamous or nuclear family pattern of social organization (Clutton-Brock and Harvey, 1977; Wittenberger and Tilson, 1980). In most cases such groups are composed of the adult pair, which is the reproductive unit, and their offspring of different ages, as is the case in titi monkeys.

The number of members in a titi monkey family varies from two, after group founding, up to six, before a group or individual separation occurs (Kinzey, 1981; Pinto *et al.*, 1993). Under normal conditions, an infant is born each year in a titi monkey family (Kinzey, 1981). As a result a subadult monkey has to leave his group every year or, after the founding a new group, within a four to five year period.

In this paper, I report on the separation of a subadult titi monkey from his family group as well as the founding of a new group. Two different models of emigration and group founding will be discussed: the gibbon- and the titi model. Finally, I will show that territorial shifting, in the sense of Easley and Kinzey (1986), is not the only way for monogamous primates to secure new territories for their offspring.

Methods and Study Site

The study site was a forest segment of about 100 ha at the Estação Experimental Lemos Maia (ESMAI), a scientific field station of the local Cocoa Cultivation Authority - CEPLAC. It is located Una, south Bahia, Brazil (15° 18' S, 39° 06' W). Details of the study site and vegetation types have been described elsewhere (Müller, 1995; Rylands, 1982).

Data were collected on the daily ranging pattern of two nuclear family groups *of Callicebus personatus melanochir.* Radio telemetry was used to accompany the groups (Müller, 1994). The first group (Group I) was observed between August 1992 and December 1992. Data on the behavior of the second group (Group II) were collected after the emigration and the founding of the new group in December 1992. The observations took place up to September 1993. Data were collected during 101 complete days by scan-sampling for ten seconds at five minutes intervals (Altmann, 1974). Measuring, mapping and calculation of the home range of Group I and II have been described by Müller (1995).

Results

At the beginning of 1992, Group I consisted of six animals: the adult pair, two subadults and two juveniles (Fig. 1). The adult male, a subadult and a juvenile subsequently disappeared, and the Group consisted of three animals when the study was begun. In December 1992, the subadult male of this group, which had a radio transmitter, emigrated. He founded a new group together with an adult female and her infant, which was called Group II. The emigration was not observed in detail, because observations were made only one day before and after the emigration of the subadult male. Before the male left his group he was evidently neither

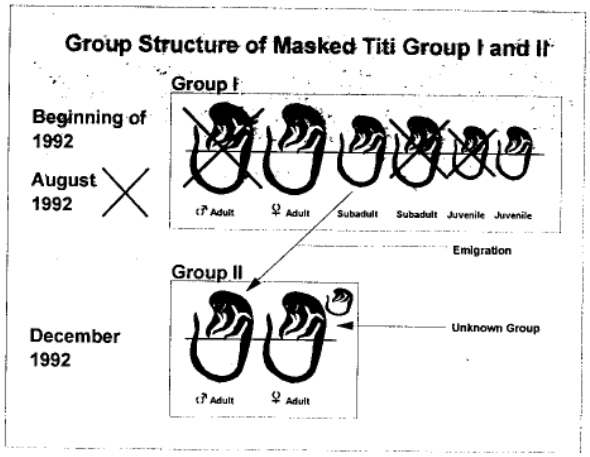
peripheralized nor showed or received aggressive behavior from the adult female of Group I. The separation of the female from her group was not observed, and her origin is unknown. The new group was founded in one day.

When emigration and group founding were complete, some behavioral changes occurred, which may have an important role in titi monkey group structure. Masked titis normally use the same trees for sleeping. During the four months of observations, Group I used a total of 22 different trees. The new Group II used only nine different sleeping trees. Two of them were used on 82% of the occasions when the sleeping site was recorded. Following the emigration of the subadult male, Group I no longer used the same sleeping trees as before. Furthermore Group II never used any of the sleeping trees of Group I, which were located within their territory. In addition, the male of Group II did not participate in caring for the infant (no carrying was observed). Only when the infant began independent locomotion did he start to play with it.

In January 1993, Group II used an area of 11 ha; 43% of which had been taken over from Group I. During February and March, they occupied a further 5 ha. By September 1993, Group II occupied an area of a little more than 24 hectares. By comparison: Group I used about 23 hectares. Seven hectares of the territory were taken from Group I. No contact or encounter between the groups was observed, and it is not known whether their ranges overlapped, although Group I was never seen in the area occupied by Group II.

Discussion

Although the monogamous mating system is uncommon in primates, lifestyles are remarkably similar among those which have this mating system (Hrdy, 1981). They are characterized by a group size that is always small. Maximum group size in *Callicebus* is six animals (Kinzey, 1981; Kinzey and Becker, 1983). What factors keep the group size in this narrow range? In gibbons, another well-studied monogamous primate, group size is regulated by the parents. On becoming adult. a subadult gibbon suffers same-sex aggression within the group, and he is subsequently chased away by his parents. The natal group prepares the territory for his offspring (Aldrich-Blake and Chivers, 1973; Tilson, 1981). In contrast to the gibbon model, group size in *Callicebus* is evidently regulated by the offspring. In the beginning of 1992, when our study group comprised six individuals, three members of the group disappeared. In December 1992, a subadult male left his natal group unexpectedly. Neither large group size nor limited



resources could be causes leading to this emigration because group size had been reduced beforehand. No aggression, peripheralization or other behavioral changes were observed prior to the subadult leaving his natal group. Therefore, we conclude the mature offspring, in this case, did not leave his natal group because of agonistic behavior from the parents. It would seem that intrinsic developmental changes in the offspring themselves are the reason, possibly through hormonal changes at subadulthood, leading to the needs to obtain a mate and a territory of its own. This could be an evolutionary successful mechanism to avoid incest. Furthermore, and in contrast to gibbons, the emigration and group founding observed were abrupt. Group founding was completed within one day and no reversal was recorded, as has been seen in gibbons (Tilson, 1981).

In a very detailed report, Easley and Kinzey (1986) demonstrated a territorial shift in a group of *C. torquatus* over a period of seven years. The areas used by the group at the beginning and end of the study were completely different and not overlapping. Unfortunately they did not observe emigration nor group founding of the mature offspring, which left the natal group during their study.

Complementary to the observations of Easley and Kinzey (1986), we have observed the emigration and establishment of a territory for the first time in *Callicebus*. Unfortunately, the duration of the study and the restricted area in which it was carried out, made it impossible to observe territorial shifting. Our observations indicate, however, that the preparation of a space for the mature offspring may involve another process, which would seem to involve a territorial stretching and retraction, as has been observed in siamang (Aldrich-Blake and Chivers, 1973). Prior to the departure of the mature offspring, the parent group defended a larger area, but subsequently gave over part of the territory. Unfortunately, we have no data on whether the natal group of the female also prepared a

part of the newly established territory.

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Relative Reproductive Success In The Mantled Howler Monkey: Implications For Conservation

Introduction

The structure of primate groups is thought to result from the tendency of females to select rich patches of food and that of males to select large aggregations of females (Wittenberger, 1980; Emlen and Oring, 1977). Because patch richness and the consequent number and quality of females may vary, the relative reproductive success (RRS) of females may also vary over space and time. Relative reproductive success is a population parameter, since it is one characteristic of demographic or life history traits describing sub-units of a species within and between environmental regimes (see Vehrencamp and Bradbury, 1984). RRS is important to the field of conservation biology since an increase in the variance of reproductive success in a population reduces effective population size (Primack, 1993). Information about RRS facilitates viability analysis of population fluctuations required for recovery from environmental perturbations.

Methods

This report analyzes relative reproductive success (RRS) of mantled howler monkeys (*Alouatta palliata* Gray) in two Central American forests as the mean number of juveniles plus infants (J + I) per female group size per site. This report uses data from several studies (Carpenter, 1934; Mittermeier, 1973; Thorington, 1975; Malmgren, 1979; Clarke *et al.*, 1986; Glander, 1980; Jones, unpubl., Table 1) at two research sites where mantled howler monkeys have been studied most intensively: Guanacaste (GTE), Costa Rica in a tropical dry forest environment (Heltne *et al.*,1975) (n= 51 groups) and Barro Colorado Island (BCI) in a semideciduous lowland tropical forest environment of Panama (Heltne *et al.*, 1975) (n= 73 groups). Mantled howler monkeys, large cebids distributed throughout the forests of Middle America and the Pacific coast of northern South America, are classified as endangered in the United States Endangered Species Act of 1991 (Groves, 1993).

Results and Discussion

Fecundity is thought to be related to group size (see Pulliam and Caraco, 1984; Terborgh and Janson, 1986; Wittenberger, 1980; Robinson, 1988). Results differ, however, depending on methods of calculation. Calculations of absolute values per group (i.e., the total number of juveniles and infants per group compared to the total number of adult females in a group) may exhibit

significant linear regressions. For the surveys used in the present analysis, 6 out of 7 show a significant positive correlation, with a mean correlation of +0.62 ($P \leq 0.05$) for the comparison just stated. Thus, within-group productivity appears directly related to group size.

Table 2 exhibits relative reproductive success (RRS), a between-group analysis, for different sized female groups for the present sample. The number of females per group ranges from 2-15. RRS at Guanacaste (GTE) ranges from 0.55-1.00 (0.75±0.17) and at Barro Colorado Island (BCI) from 0.17-1.23 (0.92±0.29). There is no correlation between female group size and RRS at either location (r_s = -0.15 and +0.06 for GTE and BCI, respectively), suggesting that different groups with the same number of adult females are not similarly productive when different censuses are compared. Further, RRS does not differ overall between the two sites (Wilcoxon's Signed Ranks Test, $P>0.05$), possibly due to an optimal birth rate, death rate, and/or dispersal rate. Females in GTE, then, do as well as females at BCI, on average. The range in RRS, however, is significantly greater at BCI than at GTE ($P \leq 0.001, \chi^2 = 24.64$, df = 1), possibly reflecting greater carrying capacity at BCI, the wetter site. Further, coefficients of dispersion for RRS (0.22 and 0.21 for GTE and BCI, respectively) show that the frequency distributions of RRS at both sites are "repulsed" (more observations than expected at the center of each distribution) and that the standard deviation is less than one would expect by chance alone.

Modal female group size is eight for both GTE and BCI. The frequency distribution of female groups was compared between sites and the mean (±S.D.) number of females per group is significantly larger in GTE (8.38±3.24) than in BCI (7.10±2.58) (Randomization Test, T = 2.58, df = 121, $P \leq 0.01$), a result that might be accounted for by the higher degree of seasonality and consequent variance in resource patchiness in GTE (see, Heltne *et al.*, 1975), although both sites are characterized by relatively moderate levels of primary productivity (Whittaker, 1975). Howler populations, thus, appear to be limited by environmental potential, with greater potential for large group sizes in the more heterogeneous GTE forests (see Heltne *et al.*, 1975).

Table 1. Results of the author's counts of 11 howler groups at various locations throughout the Guanacaste Province, Costa Rica.

Group	Ad.males (n)	Ad.fem. (n)	Juv. (n)	Inf. (n)	Total (n)
A	2	7	4	1	14
B	2	6	3	2	13
C	2	8	3	2	15
D	2	9	4	3	18
E	2	6	4	4	16
F	3	9	3	1	16
G	3	14	12	2	31
H	3	13	6	5	27
I	4	11	5	2	22
J	5	14	8	6	33
K	6	15	12	2	35
Total	34	112	64	30	240

Table 2. Relative reproductive success (RRS) as a function of group size at two Central American howler monkey sites, Guanacaste (GTE), Costa Rica, and Barro Colorado Island (BCI), Panama. (f) = number of times a female group of a given size (n) occurred at BCI and at GTE. RRS calculated as mean (X) number of juveniles plus infants (J + I) per female group size per site (see Methods).

Females/ Group (n)	Mean J + I/Females/Group GTE		BCI	
	RRS	(f)	RRS	(f)
2	0.75	(2)	0.66	(3)
3	0.67	(1)	0.17	(2)
4	1.00	(2)	1.21	(7)
5	0.81	(4)	1.23	(7)
6	0.99	(4)	1.20	(11)
7	0.79	(6)	0.99	(10)
8	0.55	(10)	1.01	(15)
9	0.58	(8)	1.03	(8)
10	0.55	(2)	0.80	(4)
11	0.64	(1)	0.82	(1)
12	0.75	(1)	1.00	(2)
13	0.86	(5)	0.66	(2)
14	1.00	(2)	1.14	(1)
15	0.57	(2)	-	(0)

Extinction may occur where the rate of environmental fluctuation (heterogeneity) outweighs a population's ability to respond. Under these conditions, mortality may outweigh reproduction. Knowledge of the determinants of variation in howler RRS across habitats using the simple method presented in this note would permit a comparative viability analysis of populations as a function of environmental regime. Such an understanding would permit an assessment of a species' adaptation across ecological conditions emphasizing responses to habitat fragmentation, patchiness, or heterogeneity. Differential quantification of RRS across populations and microclimates could yield a robust level of prediction for estimating population viability and for generating workable conservation plans. This approach underlines the importance of careful censuses comparing source areas with disturbed and fragmented areas.

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The Muriqui in the Parque Estadual de Ibitipoca, Minas Gerais

The report of Martuscelli *et al.* (1994) recording 14 new localities for muriquis, *Brachyteles arachnoides*, inspired further efforts to locate additional areas where this endangered primate survives (Antonietto and Mendes, 1994; Câmara, 1995). Hirsch *et al.* (1994) recently surveyed the Parque Estadual de Ibitipoca, state of Minas Gerais, and recorded only three primate species: *Callicebus personatus, Alouatta fusca* and *Callithrix penicillata*. Although they did not observe capuchin monkeys, *Cebus apella*, this species had been recorded for the park previously (Drumond, 1987). Here we report on the occurrence in the park of the muriqui *Brachyteles arachnoides*, and provide further observations on the capuchin monkeys.

The Ibitipoca State Park (1,488 ha) is located in the Serra do Ibitipoca, municipality of Lima Duarte, Minas Gerais (21° 42'S; 43° 53'W) (Fig. 1). The park is comprised mainly of moorland vegetation (*campos de altitude*) and riverine forests. The forested area of the park can be classified as cloud forest, and the most common plant families are Rubiaceae, Lauraceae, and Myrtaceae (M. A. L. Fontes, unpubl. data). All the primates we observed in this study were in an 80 ha forest fragment in the center of the Park.

Brachyteles arachnoides: On 17 May 1995, at 1000 h, a female muriqui was observed on a forested slope at 1500 m altitude. It was apparently traveling with a group of three howler monkeys, *Alouatta fusca*. On 13 July 1995, at 1600 h, the same *Alouatta* group was found close to where it was first seen. The female muriqui was observed again. The group was composed of 6 to 8 howlers and the one muriqui. On 16 October 1995, a female muriqui was observed again in the same area. However, it was alone and we believe it was another individual judging by the marks on the face. Both muriquis were pink-faced, confirming the subspecies *B. a. hypoxanthus*. In addition, two tourists we interviewed confirmed the existence of "large white monkeys", which were possibly muriquis, inside the Park as well as in neighboring forest outside the area of the Park.

Cebus apella: On 14 July 1995, at 0830h, a group of eight capuchins was observed in the same area where we saw the muriquis (Fig. 2). On 6 September, at 0740 h, the same group was contacted for few minutes. On 7 September, at 1134h, one lone individual was observed in the same forest fragment.

Muriquis have a low density in large protected reserves (Pinto *et al,*. 1994; M. Galetti unpubl. data) and they are more sensitive to hunting than to forest fragmentation (see Lane, 1990). New localities of muriquis certainly add to their current distribution but, except in the Serra do Mar in São Paulo, their occurrence is restricted mainly to forest fragments. The known population of *Brachyteles arachnoides* is estimated to be approximately 700 monkeys (Martuscelli *et al.* 1994). However, if we consider *Brachyteles arachnoides hypoxanthus* as a distinct subspecies, or even species (see, for example, Rylands *et al.*, 1995), urgent plans are required to establish large protected areas for both (Mendes, 1995). Few areas support a viable metapopulation (mainly of *B. a. hypoxanthus*), and translocation programs must be a priority (Mendes and Chiarello, 1994).

In terms of conservation status, it would seem that *B. a. arachnoides* is better off than *B. a. hypoxanthus* because there is still plenty of suitable habitat in such localities as the Serra de Paranapiacaba in São Paulo (although hunting is still common),the stronghold of *B. a. arachnoides* (Martuscelli *et al.* 1994). We believe that there is a pressing need for a translocation program to save minute, isolated and probably doomed populations, similar to that being carried out by Kierulff and Oliveira (1994) with golden lion tamarins in Rio de Janeiro. However, first it is necessary to find a "safe" reserve where muriquis can be translocated and protected effectively. Nowadays most of the reserves in the Atlantic forest of Brazil are understaffed and poorly equipped to secure such protection.

Figure 1. The study site, the Parque Estadual de Ibitipoca, Minas Gerais.

More research is required to obtain a full understanding of the status of muriquis in the Parque Estadual de Ibitipoca, and to decide what is best for this isolated population. The presence of muriquis outside the Park, calls for a detailed study of the possibilities of including these neighboring forests by expanding the Park boundaries.

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News

Neotropical Primates Home Page

http://www.primate.wisc.edu/pin/newslett.html

Thanks to the collaboration of the staff of the library of the Wisconsin Regional Primate Research Center, Madison, as from Volume 3(4), December 1995, *Neotropical Primates* is now included amongst the newsletters available in the Primate Info Net (PIN) on the Internet World Wide Web. Unfortunately, the electronic edition will lack graphs, tables, maps and photographs due to the considerable investment required in terms of time for their independent formatting in HTML, but the texts of the articles and news items, and the listings of recent publications and meetings are all reproduced in their entirety. Thanks are due to Larry Jacobsen, Sue Carlson, Melinda Carr and Ray Hamel of the Wisconsin Regional Primate Center.

Other newsletters currently available in the WWW Primate Information Network include: *African Primates*, *Asian Primates*, *Australian Primatology*, *AWIC Newsletter*, *Chinese Primate Research and Conservation News*, *Clara Clarion*, *Gorilla Conservation Newsletter*, *IPPL Quarterly Newsletter*, *Laboratory Primate Newsletter*, *Laboratory Primate Newsletter archives*, *Old World Monkey TAG Newsletter*, *ONCenter* (Oregon Regional Primate Research Center), *Pan Africa News*, *Primate Library Report: Audio-Visual Acquisitions*, *PSYeta Newsletter* (July 1995) and the *Sulawesi Primate Newsletter*.

A Newsletter for Mexican Primatologists

The Universidad Veracruzana (Parque de la Flora y Fauna Silvestre Neotropical, Instituto de Neuroetología) have begun a newsletter *Hablando de Monos: Noticias sobre Primatología en México*, about the primate studies there, first begun in 1979. The first number (January-June 1995) includes, amongst other items, articles on illegal traffic in spider monkeys (Liliana Cortés Ortiz), biodiversity in the region of Los Tuxtlas (Jorge Morales Mávil), howling monkey conservation (Ernesto Rodríguez-Luna and Liliana Cortés Ortiz) and the Isla de los Changos colony of *Macaca arctoides*. The newsletter is produced with the support of the Patronato Pro-Universidad Veracruzana, A.C. Those interested in the primatological studies at the Universidad Veracruzana should write to: Parque de la Flora y Fauna Silvestre Tropical, Instituto de Neuroetología, Universidad Veracruzana, A. P. 566, C. P. 91000, Xalapa, Veracruz, México. Tel/Fax: (28) 12 57 48.

1994 Studbook for *Leontopithecus rosalia*

The 1994 studbook for the golden lion tamarin, *Leontopithecus rosalia*, has been published by Jonathan D. Ballou, National Zoological Park, Washington, D. C. It contains a complete historical chronology of the captive population, beginning with all registered captive animals alive on 1 January 1960 (when sufficient information on arrivals, births and deaths first became available). It encompasses all known events through 31 December 1994. The studbook includes information on animal identities and locations, sex, parentage, ownership, and genetic relationships. In addition, data are presented on juvenile's parental care experience, proven breeders, hand rearing, and evidence for diaphragmatic hernias or other medical conditions. The studbook contains two listings; 1) all specimens, alive on 31 December 1994, sorted by holding institution; and 2) a historical listing of all specimens as of 31 December 1994.

The number of living animals on December 31, 1994, was 484, with a 1.4% growth rate since 1992. The number of participating institutions was 130, and the number of founders 48, with two still alive. The number of founder genome equivalents was 13.56, and 96.3% of the expected heterozygosity has been retained. The age structure of the living population and the distribution of the mean kinship in animals of reproductive age were also analyzed.

Other reports available through the studbook keeper include the Husbandry Protocol for golden lion tamarins (in English and Portuguese) and a lion tamarin bibliography. Additional information on the captive population or the Golden Lion Tamarin Conservation Program can be obtained by contacting the studbook keeper directly.

Jonathan D. Ballou, Department of Zoological Research, National Zoological Park, Washington, D. C. 20008. Tel: (202) 673-4815, Fax: (202) 673-4686.

The German Primate Center, Göttingen

Prof. Dr. Hans-Jürg Kuhn who has been the scientific director of the German Primate Center (DPZ) since its founding in 1977 retired from the directorship on 29 February 1996. He was the principal force behind of the idea of a national primate center in Germany. The institute, with its primate keeping facilities, laboratories and offices, was built on the campus of the University of Göttingen during the period 1979 to 1984. The scientific work of the center comprises the departments of virology and immunology, reproductive biology, neurobiology and pathology, along with the research groups of ethology, biocommunication and experimental pathology. Currently there are about 200 people working at the DPZ, about 70 of whom are scientists. The Center keeps about 1,000 primates of ten species.

Prof. Dr. Hans-Jürg Kuhn was honored in a public ceremony on March 21. The new scientific director of the DPZ will be Prof. Dr. Gerhard Hunsmann. He was born in 1943 and carried out his PhD at the University of Würzburg in 1971. From 1971 to 1975 he worked as a post-doctoral scientist at the Max-Planck-Institut für Virusforschung in Tübingen, and from 1975-1978 he was head of a research group in the Max-Planck-Institut für Immunbiologie in Freiburg. From 1979 to 1983, he headed a research group at the Institut für Immunbiologie at the University of Freiburg. Prof. Dr. Gerhard Hunsmann has been head of the department of virology and immunology at the DPZ since 1983. His main interests are in AIDS-research, hepatitis and prion diseases. A new department of genetics is planned to enlarge the scientific scope of the Center.

Michael Lankeit, Administrative Director, Deutsches Primatenzentrum GmbH, Kellnerweg 4, D-37077 Göttingen, Germany.

Workshop Científico sobre a Mata Atlântica

Foi realizado nos dias 22 e 23 de janeiro, o *Workshop* Científico sobre a Mata Atlântica, cujo objetivo foi discutir os limites de abrangência da Mata Atlântica e as diretrizes para o estabelecimento de uma Política Nacional para a utilização e conservação deste bioma. O *Workshop* foi promovido pelas Secretarias de Estado de Meio Ambiente de Minas Gerais e São Paulo e por nove organizações não-governamentais ambientalistas, dentre elas a Conservation International do Brasil, Fundação Biodiversitas e o Conselho Nacional da Reserva da Biosfera da Mata Atlântica.

A região da Mata Atlântica é uma das áreas de maior biodiversidade no mundo, compreendendo as florestas ao longo do leste brasileiro. A área original da Mata Atlântica correspondia a 1,1 milhão de km^2, mas estima-se que já tenha perdido mais de 90% de sua cobertura. A região foi a primeira a ser colonizada no Brasil, e hoje concentra os maiores centros urbanos e industriais do país, o que a coloca entre as dez regiões mais ameaçadas do mundo.

Devido à inquestionável importância da Mata Atlântica, vários instrumentos legais para a normatização da sua exploração e conservação foram criados. Dentre estes se destacam: a Constituição Brasileira de 1988, que no capítulo que trata do meio ambiente, declara a Mata Atlântica como patrimônio nacional; e o Decreto 750/93, instrumento legal que dispõe sobre os limites e as normas de utilização e conservação deste bioma. Apesar da importância do Decreto 750/93, entende-se que a regulamentação do dispositivo constitucional sobre a Mata Atlântica deveria ocorrer sob a forma de Lei. A discussão sobre esta matéria acabou gerando polêmicas de ordem técnica, como a proposta governamental, encaminhada pelo Ministério do Meio Ambiente, na forma de minuta de Anteprojeto de Lei, estabelecendo novos limites e regulamentações de exploração para a Mata Atlântica. Se aprovada a proposta do governo, a Mata Atlântica passará a ser reconhecida legalmente como a Floresta Ombrófila Densa (a mata litorânea), excluindo-se as formações vegetacionais interioranas, o que reduz em cerca de 70% a abrangência do bioma.

Durante o *Workshop*, estiveram reunidos 40 especialistas de diferentes áreas temáticas - fauna, flora, aspectos geoambientais e políticas- legislação. Além de apontar importantes aspectos para o delineamento de uma Política Nacional para a Mata Atlântica, o encontro permitiu a convergência de informações capazes de sustentar o conceito da Mata Atlântica *sensu latu*, como um mosaico de tipologias vegetacionais integradas.

Sendo assim, foi sugerida a manutenção da área geográfica da Mata Atlântica com base no Mapa de Vegetação da Fundação Instituto Brasileiro de Geografia e Estatística (IBGE) de 1988, ou seja, abrangendo suas diversas tipologias: Floresta Ombrófila Densa, Ombrófila com Araucária, Florestas Estacional Decidual e Semidecidual, incluindo os ecossistemas associados como ilhas oceânicas, restingas, manguezais, florestas costeiras e campos de altitude.

Luiz Paulo de Souza Pinto, Conservation International do Brasil, Avenida Antônio Abrahão Caram 820/302, 31275-000 Belo Horizonte, Minas Gerais, Brazil.

Ecologia da Floresta Amazônica

"Ecologia da Floresta Amazônica, um curso intensivo em nível de pós-graduação, será realizado pela quarta vez no período de 13 de julho a 14 de agosto de 1996. O curso visa a capacitação de cientistas e pesquisadores para investigar e interpretar, em vários níveis, fenômenos ecológicos em contextos naturais e prever efeitos da intervenção humana, para fins de manejo e conservação. O curso segue o modelo da disciplina de pós graduação ministrada pela Organização para Estudos Tropicais (OET), "Biologia Tropical: uma Abordagem Ecológica", que com sua forte ênfase na problemática da biodiversidade tropical, além de ser um grande sucesso como iniciação à pesquisa de campo, ajudou a catalisar o mundialmente reconhecido programa de conservação, em conjunto com ecoturismo, atualmente praticado na Costa Rica.

O curso será oferecido pela OET - um consórcio de 55 instituições norte-americanas e centro-americanas promovendo cursos de campo em espanhol e em inglês desde 1962 - e os Programas de Ecologia da Universidade Estadual de Campinas (UNICAMP - com dezoitos anos de experiência em cursos de campo no Brasil) e do Instituto Nacional de Pesquisas da Amazônia (INPA). Estas instituições contam com a ajuda das infra-estruturas do INPA e do Projeto Dinâmica Biológica de Fragmentos Florestais (PDBFF), da Smithsonian Instituition.

Objetivos: o curso tem como objetivos gerais prover os seguintes tópicos: (1) a biodiversidade excepcional dos organismos da floresta Amazônica, (2) a heterogeneidade de habitats dentro das florestas úmidas incluindo das de terra firme, várzea e igapó, (3) a gama de metodologias empregadas para conduzir pesquisas ecológicas no ambiente tropical úmido, e (4) a aplicação dos métodos e princípios científicos em situações em que o conhecimento prévio e apoio logístico são mínimos.

Organização: o curso é realizado inteiramente no campo. Possui pesquisas diárias, com etapas de planejamento, coleta e análise de dados, e apresentacao vespertina dos resultados. Os alunos compartilham condições simples e rústicas nas bases principais do INPA (Reserva Ducke, Estação Experimental de Silvicultura Tropical, e os barcos) e do PDBFF. O curso culmina com um projeto individual de pesquisa de oito dias.

Inscrição: candidatos ao curso de qualquer país devem apresentar até 15 de abril de 1996 os seguintes itens: (1) Ficha de pré-inscrição padrão preenchida; (2) Carta de exposição de motivos, (3) Currículo atualizado (4) Histórico escolar de graduação, (6) Duas cartas de recomendação de professores ou profissionais de sua área de interesse (uma deve ser do orientador de tese, se tiver), (7) Esboços curtos de dois projetos alternativos para desenvolver num prazo de oito dias (com introdução e justificativa, hipóteses a serem avaliadas, metodologia, referências, e lista de materiais necessários, indicando aqueles que podem ser fornecidos pelo próprio aluno).

Seleção: o curso tem 20 vagas. preferência é dada para alunos com pelo menos um ano de pós-graduação em ecologia ou numa área relacionada de trabalho nos neotrópicos. Os alunos aceitos poderão se matricular como alunos especiais no Curso de Pós-Graduação da UNICAMP e receber 5 créditos (= 255 horas de atividades) acadêmicos. O curso será realizado em português.

Corpo docente: em 1996, os coordenadores são Dr. Renato Cintra, pesquisador em Ecologia Animal e Vegetal, Dra. Rita Mesquita, pesquisador em Ecologia vegetal, ambos da Coordenação em Ecologia do INPA, e vários professores convidados participarão por períodos variáveis.

Custos: o curso fornece alimentação, redes de dormir, alojamento e transporte local enquanto no campo. O curso também tenta providenciar a cada participante dos países neotropicais uma passagem aérea de ida e volta da cidade da instituição à qual o aluno está vinculado até Manaus. Durante os deslocamentos entre localidades ,gastos com alimentação e demais despesas serão da responsabilidade cada aluno. Cada participante deve levar consigo itens de uso pessoal, equipamentos e bibliografia especializados referentes a sua pesquisa individual e dinheiro para gastos pessoais (U$100,00, devem ser suficientes). No caso de alunos matriculando-se para créditos, a UNICAMP fornece, mediante pagamento de uma taxa nominal, um Histórico Escolar-Certificado após a conclusão da disciplina.

Coleções Biológicas: durante a disciplina, não será permitida a coleta de material biológico para terceiros, No caso de precisar coletar grupos específicos para fins de pesquisa, o aluno deve indicar o(s) grupo(s) de interesse e a natureza da pesquisa na correspondência e inscrição. Em qualquer caso, o aluno deve obter todas as autorizações exigidas pelo IBAMA para as coletas pretendidas. Nas reservas do INPA e do PDBFF é necessária também a permissão destas instituições.

Prazos: as inscrições devem ser postadas até o dia 15 de abril de 1996. A divulgação do resultado da seleção ocorrerá até o dia 15 de maio de 1996.

Endereço para correspondência: Dr. Claude Gascon, PDBFF/INPA, Coordenação de Pesquisas em Ecologia, Instituto Nacional de Pesquisas da Amazônia (INPA), Caixa Postal 478, 69011-970 Manaus, Amazonas, Brasil. Tel.:(092) 642 11 48; Fax: (092) 642 20 50; e-mail: pdbff@cr-am.rnp.br.

Population Viability Analysis - VORTEX Listserver

Dr. Robert Lacy announces the creation of a VORTEX e-mail discussion group (listserv). The VORTEX Listserv will facilitate the exchange of ideas, questions, answers, and suggestions among the many users of the VORTEX population modeling program. It was created because questions were frequently received about the use of VORTEX, as well as suggestions for changes from users. Often several people asked similar questions (the manual is a bit sparse on technical details), and it was assumed that many other people were facing similar problems without knowing how to obtain an answer. Helpful hints were also received from users about efficient ways to use the program. People are also using various versions of VORTEX (the most recent is Version 7.0), and with this listserv it will be possible to make announcements of updates, bug fixes, and suggestions. To sign up for the VORTEX Listserv, send an email message to: vortex-request@bio-3.bsd.uchicago.edu. The subject of the message should be just the word SUBSCRIBE. After signing up, it is possible to send messages to the list at: vortex@bio-3.bsd.uchicago.edu (note that this address is slightly different from the one to which the initial subscribe request is sent.). Messages will be distributed to everyone on the list. The list is unmoderated and open to anyone who wishes to participate. As list administrator, Robert Lacy will eliminate and permanently block any subscribers who send offensive messages, extraneous messages that would obviously be of no interest to VORTEX users, or advertisements for products (other than perhaps VORTEX add-ons and upgrades). Feel free to make suggestions about the listserv itself. Please send in questions, suggestions, reports of exciting applications of VORTEX, or anything which would be of particular interest to other VORTEX users, or simply sign up and passively watch the flow of ideas contributed by others. To unsubscribe, send a message with Subject: UNSUBSCRIBE to vortex-request@bio-3.bsd.uchicago .edu. Setting up this Listserve was possible due to the generous help of the Academic Computing Center of the University of Chicago Biological Sciences Division.

Robert C. Lacy, Department of Conservation Biology, Brookfield Zoo, Brookfield, Illinois 60513, USA.

Sophie Danforth Conservation Biology Fund

The Sophie Danforth Conservation Biology Fund was established by the Roger Williams Park Zoo and the Rhode Island Zoological Society to help protect the world's threatened wildlife. Each year grants are awarded to individuals or institutions working in conservation biology of up to US$1,000. Projects and programs that enhance biodiversity and maintain ecosystems receive the highest funding priority. Field studies, environmental education programs, development of techniques that can be used in a natural environment and captive propagation programs that stress an integrative and/or multidisciplinary approach to conservation are also appropriate. Proposals for single species preservation, initial surveys, or seed money for technique development are not appropriate. Recipients are required to acknowledge the Roger Williams Park Zoo and the Rhode Island Zoological Society in any publications that result from the project. Recipients must also submit a progress report which includes an update on the status of the project. This report is due one year after funding. Limit your application to the form supplied on request and a two page curriculum vitae. All proposals must be submitted by May 1 1996. Applications will be reviewed by a committee of zoo, zoo society, and outside advisors. Grants will be awarded in July 1996.

For further information and application forms for the Sophie Danforth Conservation Biology Fund, contact: Dr. Anne Savage, Director of Research , Roger Williams Park Zoo, Elmwood Avenue, Providence, Rhode Island 02905, USA. Tel: (401) 785-3510 x 335, Fax: (401) 941 - 3988, e-mail: bi599132@brownvm.brown.edu.

GEORGINA DASILVA SCHOLARSHIP FOR 1996

Donations collected in memory of Dr. Georgina Dasilva will make it possible to offer a grant of £1500 (approx. US$2250) for the academic year 1996-97. The recipient must: (a) be a citizen of a Third World country where primates occur and (b) be studying (or about to study) for a higher degree (MSc or PhD) in any subject relevant to the biology and conservation of primates at an institution of higher education in the United Kingdom. Courses within the general topics of zoology, biology, conservation biology, forestry, biological anthropology and related disciplines will be considered relevant at the discretion of the Committee.

The grant is not intended to cover the full costs of a degree course at a UK institution, but rather to supplement existing sources of funding so as to provide the recipient with additional opportunities to purchase books and/or equipment, to attend conferences or to facilitate the undertaking of a research project in connection with the degree.

Candidates who wish to be considered for the 1996 bursary should submit: 1) a full *Curriculum Vitae*, 2) a statement of not more than 500 words explaining how their proposed degree course will be relevant to the future of primate conservation in their country, 3) letters of recommendation from an academic sponsor in their higher education stating that the candidate has been accepted for a place on a higher degree course, and 4) a statement of their sources of funding for the course.

Applications should be sent to: Professor R. I. M. Dunbar, Georgina Dasilva Fund Committee, c/o Departament of Psychology, University of Liverpool, P.O. Box 147, Liverpool L69 3BX, England. Applications should be posted in time to be received in Liverpool *not later than 1 October 1996.* Faxed applications will not be accepted. Candidates will be notified of the results of their application via their UK sponsor as soon as possible thereafter.

THE L.S.B. LEAKEY FOUNDATION

The L. S. B. Leakey Foundation was formed to further research into human origins, behavior, and survival. Recent priorities have included research into the environments, archaeology, and human paleontology of the Miocene, Pliocene, and Pleistocene; into 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 related to human evolution have been funded occasionally.

The Foundation provides the following grants: General Research Grants; Special Research Grants including a Fellowship for Great Ape Research, a Fellowship for the Study of Foraging Peoples, and a Paleoanthropology Award; and the Franklin Mosher Baldwin Memorial Fellowships.

General Grants: For advanced pre-doctoral students as well as established scientists. Priority is normally given to the exploratory phases of promising new projects that most closely meet the stated purpose of the Foundation. Although the majority awarded to pre-doctoral students are between US$3,000-US$7,000, larger grants, especially to senior scientists, are also funded up to US$12,000. If a candidate is unsure that a project proposal falls within the Foundation's goals he should contact the office before applying (a month ahead). The most recent application forms should be used, available from the office. Six copies of the application and attachments should be sent to the Foundation's office by the stated deadline: 15 August or 2 January. Notification of status will be the beginning of December and the beginning of May, respectively.

Special Research Grants: For post-doctoral and senior scientists for the study of great apes, research into hunting and gathering, or multidisciplinary paleoanthropological research. Potentially these awards may be renewed for additional years. Applicants should submit the following by the 15 October deadline: a) a two-page statement of the research goals; b) an estimate of total budget requirement and the amount to be requested from the Leakey Foundation; and c) a projected schedule for data collection and analysis. Attach a curriculum vitae. Potential applicants may be asked to submit a full proposal for the 2 January deadline. Notification of status by mail is in the beginning of May. *Fellowship for Great Ape Research.* This special award promotes long-term research on the behavior and ecology of wild populations of great apes, especially if, in addition to the basic scientific goals of the project, the work contributes to the development of testing models of human evolution. Both continuing and new projects are considered. Strong preference is given to post-doctoral applicants prepared to make a long-term commitment to the study site. Usually one fellowship of up to US$20,000 is awarded annually. Successful candidates may apply for a second year by the 2 January deadline. *Fellowship for the Study of Foraging People.* Occasionally the Board of the Foundation awards a

fellowship of up to US$20,000 for one to two years of field expenses, to post-doctoral and senior scientists proposing research among contemporary foraging peoples. This grant may used to initiate research in a particular area or to continue a study already underway. Priority is given to research directed toward long-term, systematic behavioral observations and research which attempts to elucidate evolutionary theory or specific socioecological adaptations. Proposals are sought especially for urgent research which might not ordinarily be funded by other grant agencies. *Paleoanthropology Award.* This grant is intended for potentially long-term, multidisciplinary research programs which seek to recover the physical and/or cultural remains of early humans and their hominid ancestors. Usually awarded to senior scientists, these grants of up to US$20,000 per year, are potentially renewable for up to three years. Successful candidates can re-apply by the 2 January deadline.

Franklin Mosher Baldwin Memorial Fellowships: This fellowship is awarded to Africans who seek to complete an advanced degree in anthropology at a major institution. The award is limited to a two-year program of advanced training towards an M.A., Ph.D. or equivalent. Priority is given to students involved in disciplines related to human evolution. The fellowship is limited to US$8,500 per year for non-tuition expenses only, for a total of US$17,000. Successful candidates are eligible to apply for limited travel and/or summer research funds for up to an additional US$3,000. Additional dependent support is not considered. Deadline for application - 2 January, for academic year beginning the following fall. Notification in May.

For further information: The L. S. B. Leakey Foundation, 77 Jack London Square, Suite M, Oakland, California 94607-3750, USA. Tel: (510) 834-3636, Fax: (510) 834-3640.

Primate Societies

Primate Society of Great Britain - Field Studies Supplement

The Primate Society of Great Britain (PSGB), President Dr. Hilary Box, has published the 16th edition of the *Current Primate Field Studies Supplement* to the Society's newsletter, *Primate Eye* (supplement to No. 58, February 1996). Julia M. Casperd, University of Liverpool, compiled this publication which lists all current field studies by country, and includes the name of the field site, the species studied, the research team, the starting date of the project and its duration and status (planned, current and completed), the aims, and the correspondence and field addresses of the researchers involved.

As pointed out in the introduction, surprisingly the number of field studies registered dropped by more than 50%, from 307 to 144, since the 1994 issue of the supplement. Reasons for this are partially, however, due to sampling bias. The figures from the 1994 issue were artificially inflated due to the backlog of entries received from a mail shot in 1993. This is reflected in an increase in the number of current studies in the 1995 survey, 88% compared to 70% in the 1994 survey, and a reduction in completed projects from 24% of all entries in 1994 to 6% in 1995. A number of studies providing inadequate information were also left out.

The geographical distribution of the field projects was found to be fairly even. Africa, Asia and the Americas having the majority (27-31%) with the least in Madagascar (11%). Asia has most ongoing studies (73%), followed by Africa (66%), the Americas (68%) and Madagascar (50%). Conservation and ecology were the most frequent aims (37% of all studies), and behavioural ecology accounted for 28%. The Cercopithecidae are receiving the most attention (39% of all entries which specified actual species), followed by the Cebidae (26%). No field studies were listed for Daubentoniidae, Lorisidae, and Tarsiidae.

This survey also includes a breakdown of the different species currently being studied in each region in relation to their conservation status according to the *IUCN Red List of Threatened Animals*. Most field studies are being carried out on ubiquitous species that are not threatened, 12% deal with endangered species, 31% deal with vulnerable species. Only about one-third of all the studies focus on threatened species. Those in the Americas are, however, more oriented towards conservation, with current field research on 39% of the 38 New World primates listed as endangered, vulnerable, or insufficiently known.

Projects are listed for 14 countries in the Americas as follows: Argentina - 3, Belize, 2, Bolivia - 1, Brazil - 12, Colombia - 4, Costa Rica - 4, Ecuador - 1, French Guiana - 1, Mexico - 4, Panama - 1, Peru - 1, Puerto Rico - 1, Venezuela - 2, and West Indies (Grenada) - 1. This is undoubtedly still an understatement of the real extent of current field studies on New World primates (notably in Peru and Brazil).

This supplement is most valuable in assessing the status of field research efforts, especially in terms of conservation and the occurrence and status of primates in protected areas. Julia Casperd is to be congratulated

on this heroic job of winkling out the information and organising this survey, the accuracy of which depends solely on the willingness of field researchers to dedicate ten minutes of their time to supply the necessary information.

The next survey will be published in February 1998. *Please send information on your field projects, using the simple one-page form available from the addresses below.* The deadline for receiving forms for inclusion in the 1988 supplement is 1 December 1997. Copies of the 1995 edition of *Current Primate Field Studies* are available at the price of £5.00 each.

Julia M. Casperd, Department of Psychology, University of Liverpool, Eleanor Rathbone Building, Myrtle Street, P. O. Box 147, Liverpool L69 3BX, UK, or for the Americas, Anthony B. Rylands, Conservation International do Brasil, Avenida Antônio Abrahão Caram 820/302, 31275-000 Belo Horizonte, Minas Gerais, Brazil.

Recent Publications

Special Issue of the *American Journal of Primatology*

Volume 38, Number 1, 1996, of the *American Journal of Primatology* was dedicated to the theme "Callitrichid Social Structure and Mating System: Evidence from Field Studies". It was guest-edited by Anne Savage (Roger Williams Park Zoo, Rhode Island) and Andrew J. Baker (Philadelphia Zoo, Philadelphia) and contains seven articles arising from a symposium held during the XIVth International Primatological Congress, Strasbourg, France, 16-21 August, 1992. Contents: Introduction. Callitrichid social structure and mating system: evidence from field studies - Anne Savage and Andrew J. Baker, pp.1-3; Habitat and the evolution of social and reproductive behavior in Callitrichidae - Anthony B. Rylands, pp.5-18; Wild *Callithrix* groups: stable extended families? - Stephen F. Ferrari and Leslie J. Digby, pp.19-27; Social and seasonal influences on reproductive biology in male moustached tamarins (*Saguinus mystax*) - Paul A. Garber, L. Moya, J. D. Pruetz and C. Ique, pp.29-46; Immigration in wild groups of golden lion tamarins (*Leontopithecus rosalia*) - Andrew J. Baker and James M. Dietz, pp.47-56; Saddle-back tamarin (*Saguinus fuscicollis*) reproductive strategies: evidence from a thirteeen-year study of a marked population - Anne W. Goldizen, J. Mendelson, M. van Vlaardingen and J. Terborgh, pp.57-83; Demography, group composition, and dispersal in wild cotton-top tamarin (*Saguinus oedipus*) groups - Anne Savage, L. H. Giraldo, L. H. Soto and C. T. Snowdon, pp.85-100; Social behavior of wild moustached tamarins, *Saguinus mystax*, at the Estación Biológica Quebrada Blanco, Peruvian Amazonia - Eckhard W. Heymann, pp.101-113.

A New Journal - *Ecotropica*

The German Society for Tropical Ecology, President K. E. Linsenmair, Theodor-Boveri-Institut für Biowissenschäften, Würzburg, has launched a new international journal called *Ecotropica*. The Managing Editor is Karl-L. Schuchmann, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. The journal will appear twice yearly (May/June, November/December). Three types of contribution are included: 1) Original papers, containing results of recent field work (laboratory research is only considered if it is strictly relevant to ecological questions); 2) Short communications, presenting aspects of completed work; 3) Reviews, providing a critical evaluation of important research areas. The editor plans to increase the thematic range in the future to include such as information on current research, and book reviews. Each volume of two issues will have approximately 200-300 pages. The first issue of Volume 1 (1995) has five articles and a short communication: An inventory of mammals observed at Panguana Biological Station, Amazonian Peru - R. Hutterer, M. Verhaagh, J. Diller and R. Podloucky; Tree species diversity of a premontane rain forest in the Cordillera de Tilaran, Costa Rica - I. Wattenberg and S.-W. Breckle; Rotifers (Rotifera) of Jamaican inland waters. A synopsis-W. Janetzky, W. Koste and E. Vareschi; Seed dispersal by frugivorous tree visitors in the Malagasy tree species *Commiphora guillaumini* - K. Böhning-Gaese, B. H. Gaese and S. B. Rabemanantsoa; Lycaenid butterflies and plants: hostplant relationships, tropical versus temperate - K. Fiedler; Predation on vertebrates in the Kirindy Forest, Western Madagascar - R. M. Rasoloarison, B. P. N. Rasolonandrasana, J. U. Ganzhorn and S. M. Goodman.

Neotropical primatologists are encouraged to submit articles. Any person interested in tropical ecology may become a member of the German Society for Tropical Ecology upon payment of dues. All members receive *Ecotropica*. Membership dues per calendar year are: Students (with verification of student status) DM40.- (US$29.00); Regular Members DM110.- (US$80.00); Libraries DM160.- (US$115.00). For more information please contact: Managing Editor - *Ecotropica*, Karl-L. Schuchmann, Zoologisches Forschungsinstitut und Museum A. Koenig, Ornithologie, Adenauerallee 160, D-53113 Bonn, Germany.

Books

Estudios Primatológicos en México, Volumen II, editado por Ernesto Rodríguez Luna, Lilian Cortés-Ortiz y Jorge Martínez Contreras. 1995, 191pp. Universidad Veracruzana, Veracruz, México. Este libro, publicado por la Universidad Veracruzana, surge del interés permanente de la Asociación Mexicana de Primatología por apoyar la investigación con primates en México y su correspondiente divulgación. En este volumen se reúnen 10 capítulos, agrupados en tres categorias: Estudios taxonómicos; Conservación de primates en México; y Estudios de comportamiento (etología y ecología de primates nativos y exóticos). Para adquirir un ejemplar comunicarse con: Asociación Mexicana de Primatología, A. P. 566, C. P. 91000, Xalapa, Veracruz, México. Tel/Fax: 52 (28) 12-5748, e-mail: saraguat@speedy.coacade.uv.mx.

Current Topics in Primate Vocal Communication, edited by E. Zimmerman, J. D. Newman and U. Jürgens, 1995, 286pp. ISBN 0 306-45064-X. Plenum Press, New York. Available from: Plenum Publishing Corporation, 233 Spring Street, New York, NY 10013-1578, USA.

Mamíferos Colombianos: Sus Nombres Comunes e Indigenas, by José Vicente Rodríguez-Mahecha, Jorge Ignácio Hernández-Camacho, Thomas Richard Defler, Michael Alberico, Roderic B. Mast, Russsell A. Mittermeier and Alberto Cadena, December 1995. 56pp. *Occasional Papers in Conservation Biology* No. 3. Conservation International, Washington, D. C. ISBN 1-881173-16-X. Produced in collaboration with the Fundación Mario Santo Domingo, Bogotá. This monograph compiles the available information on the vernacular names of the mammals of Colombia, listing a total of 560 distinct Spanish names used throughout the region, in addition to 1,300 indigenous names. It represents the first exercise undertaken in Colombia to assign a standardized Spanish name for each of the species considered so as to stimulate greater popular knowledge of these animals through the use of field guides and other publications oriented toward the creation of a higher conservation awareness among all Colombians. The 454 species, from 41 orders and 52 families, do not represent the full spectrum of Colombian mammal fauna, given that the authors have not included those species currently in the process of description. Colombia ranks fifth in mammalian biodiversity after Brasil, Mexico, Indonesia and Peru. Available from the Fundación Mario Santo Domingo, Transversal 6a. No. 27-10, Oficina 301, Santafé de Bogotá, Colombia. Tel/Fax: 57 91 3347264, e-mail: ci-colombia@conservation.org.

Oecologia Brasiliensis, Volume 2. Tópicos em Tratamento de Dados Biológicos, edited by Francisco de Assis Esteves (Editor-in-Chief), Pedro R. Peres Neto, Jena L. Valentin and Fernando Fernandez (Guest editors), 1995, 161pp. Programa de Pós-Graduação em Ecologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro. In Portuguese. Price RS$10.00. Contents: 1) Métodos para estimativas de parâmetros populacionais por capturas, marcação e recaptura - F. A. S. Fernandez; 2) Agrupamento e ordenação - J. L. Valentin; 3) Introdução e análises morfométricas - P. R. Peres-Neto; 4) Análises de séries temporais - R. Garber; 5) Modelos nulos e processos de aleatorização: algumas aplicações em ecologia de comunidades - E. T. Paes and P. B. Blinder; 6) Determinação de distribuições potenciais de espécies - R. Cerqueira. Available from: Programa de Pós-Graduação em Ecologia, Departamento de Ecologia, Instituto de Biologia, Centro de Ciências da Saúde, Bloco A, Sala A0-008, Cidade Universitária, Caixa Postal 68.020, Ilha do Fundão, 21941-540 Rio de Janeiro, Rio de Janeiro, Brazil. Tel/Fax: (021) 280-3308.

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Meetings

1996

65th Annual Meeting -American Association of Physical Anthropologists, 9-13 April, 1996. Sheraton Imperial Hotel and Convention Center, Research Triangle Park, North Carolina. Contact: Matt Cartmill. Tel: 109 190 684 02971, e-mail: matt_cartmill@baa.mc.duke.edu.

New World Primate Taxon Advisory Group, 19 May 1996. Denver, Colorado, USA. Focus: New World primate genetics. Contact: Jean Dubach, Brookfield Zoo, Department of Conservation Biology, Laboratory of Genetics, 3300 Golf Road, Brookfield, IL 60513, USA. Tel: 1 708 485-0263, ext. 502, Fax: 1 708 485 3532, e-mail: bzconbio@ix.netcom.com.

Changing Images of Primate Societies: The Role of Theory, Method, and Gender, 15-23 June 1996, Hotel Rosa dos Ventos, Teresópolis, Rio de Janeiro, Brazil. Supported by The Wenner-Gren Foundation for Anthropological Research, Inc., New York. Organized by Shirley C. Strum (University of California, San Diego) and Linda M. Fedigan (University of Alberta). Session topics: Primate studies: influence of theory, method, and gender; Comparative perspective: psychology, animal behavior, cultural anthropology, paleoanthropology, archeology; Larger context: science studies, feminism., and popular culture. For more information, please contact: Shirley C. Strum, at Tel: (619) 944-3453, Fax: (619) 944-2809/534-5946, or Linda M. Fedigan at Tel: (403) 492-5899, Fax: (403) 492-5273, e-mail: linda.fedigan@ualbert.ca, or Wenner-Gren Foundation, 220 Fifth Avenue, 16th Floor, New

York, NY 10001, USA, Tel: (212) 683-5000, Fax: (212) 683-9151.

12th Annual Meeting - Primate Society of Japan, 27-29 June, 1996. Osaka University Convention Center, Suita City, Osaka, Japan. Preregistration by 15 March; Abstracts by 15 April. Contact: PSJ Annual Meeting Organizing Committee, Tel: 81-6-879-8045, Fax: 81-6-879-8010, e-mail: naka@hus.osaka-u.ac.jp or machida@hus.osaka-u.ac.jp.

ASAB Summer Meeting - Individual Behaviour and Population Processes, 24-26 July 1996, University of East Anglia, Norwich, UK. Organized by W. Sutherland and J. Reynolds. The meeting will focus on the relationship between animal behaviour and population ecology, including the role of individual decisions in foraging, predator avoidance, territoriality, and breeding behavior in determining spatial patterns of habitat use and temporal changes in populations. Discussions on both empirical and and theoretical research.will contribute to provide a synthesis between animal behaviour and population biology with implications for management and conservation. Contact: Bill Sutherland or John Reynolds, School of Biological Sciences, University of East Anglia, Norwich NR4 7TJ, UK. Tel: 01603 592266, Fax: 01603 592250; e-mail: w.sutherland@uea.ac.uk or reynolds@uea.ac.uk.

XVIth Congress of the International Primatological Society & 19th Conference of the American Society of Primatologists, 11-16 August 1996, University of Wisconsin, Madison, hosted by the Wisconsin Regional Primate Research Center. Contact: Edith Chan, Coordinator/Information, Wisconsin Regional Primate Research Center, 1220 Capitol Court, Madison, Wisconsin 53715-1299, USA. Tel: (608) 263-3500, Fax: (608) 263 4031, e-mail: ipsasp-info@primate.wisc.edu.

Meeting of the Association of Primate Veterinarians, 16-17 August 1996, University of Wisconsin, Madison. Contact: Edith Chan, Coordinator/Information, Wisconsin Regional Primate Research Center, 1220 Capitol Court, Madison, Wisconsin 53715-1299, USA. Tel: (608) 263-3500, Fax: (608) 263 4031, e-mail: ipsasp-info@primate.wisc.edu.

Ecological Summit 96, 19-23 August 1996, Copenhagen, Denmark. Organized by Elsevier Science, Journal Editors Robert Costanza (*Ecological Economics*), Sven E. Jorgensen (*Ecological Modelling*), William J. Mitsch (*Ecological Engineering*) and David Rapport (*Ecosystem Health*). In collaboration with the International Society of Ecological Modelling, International Ecological Engineering Society, International Society of Ecosystem Health, International Society of Ecological Economics, SAS Institute Denmark, and International Lake Environmental Committee. For information contact: Ecological Summit 96, Conference Secretariat, Elsevier Science Ltd., The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK. Tel: +44 (0)1865 843643, Fax: +44 (0)1856 843958, e-mail: g.spear@elsevier.co.uk.

6th International Behavioural Ecology Congress, 29 September - 4 October 1966, Canberra, Australia. Details from: Andrew Cockburn, Division of Botany and Zoology, Australian National University, Canberra ACT 02000, Australia. Fax: 61 6249 5773, e-mail: andrew.cockburn@anu.edu.au.

I Congreso - Asociación Primatológica Española (APE) and European Workshop on Primate Research, October, 1996. Madrid, Spain . Contact: Fernando Colmenares, Departamento de. Psicobiologia, Faculdad de Psicologia, Universidad Compiutense de Madrid, 28223 Madrid, Spain. Tel: 1-3943073, Fax: 1-3943189, e-mail: pspsc06@sis.ucm.es.

III Congresso de Ecologia do Brasil, 6-11 October 1995, Centro de Convenções Ulysses Guimarães, Brasília. Deadline for submitting preliminary abstracts: 30 March 1996. Deadline for submitting final version of abstracts: 30 June 1996. Contact: Comissão Organizadora, III Congresso de Ecologia do Brasil, Departamento de Ecologia, Universidade de Brasília (UNB), Caixa Postal 04355, 70919-970 Brasília, D. F., Brasil. Tel: +55 (0)61 348-2326, 348-2592, & 348-2282, Fax: +55 (0)61 272-1497 & 273-4571. E.mail: congecol@guarany.cpd.unb.br.

68th IUCN Species Survival Commission - Full Meeting, 11-12 October 1996, Montreal, Canada. Theme: Communicating the value of the SSC - its worldwide presence, scientific knowledge, expert advice, and ongoing work, and its relevance to the conservation of biodiversity. Plenary sessions: SSC advice to intergovernmental boides; Biodiviersity conservation information system; SSC Specialist Group Reports. Round table discussion: SSC at the regional and country levels. Workshops: IUCN categories of threat; SSC communications strategy; Fund-raising strategies. Registration fee $25. For more information: World Conservation Congress Coordinator, IUCN, Rue Mauverney 28, 1196 Gland, Switzerland, Fax: + 41 22 999 0020.

IUCN World Conservation Congress, 13-23 October 1996, Montreal Conference Centre, Montreal, Canada. Four distinct parts: Special Members' Session (13-14 October) to consider revised statutes - accredited delegates of IUCN voting members; Members' Business

Session (15-16, 22-23 October) to discuss and approve IUCN's future strategy, programme and budget, elect the officers and Council of the Union, and debate and adopt resolutions and recommendations - invited observers may also attend; Open Session of Workshops (17-18, 20-21 October) under the overall theme of "Caring for the Earth" - open to the public; A major environmental exhibition - open to the public. 19 October set aside for excursions. Registration fee $50 if paid before 31 July 1996, $100 after that date. Contact: John Burke, Director of Communications, IUCN The World Conservation Union, 28 rue Mauverney, 1196 Gland Switzerland. Tel: +41 22 999 0123.

Measuring Behavior '96 - International Workshop on Methods and Techniques in Behavioral Research, 16-18 October 1996, Utrecht, The Netherlands. Registration fee: before 1 August 1996 is NLG 200 (students: NLG 50), after 1 August 1996 is NLG 300 (students: NLG 75). Submission of abstracts: Those who wish to present an oral paper, poster or demonstration should submit the title and abstract of their contribution. All submissions should be received before 1 May 1996. Notification of acceptance of abstracts - 1 July 1996. For program booklet and registration/abstract forms: Measuring Behavior '96, Workshop Secretariat, Attn: Rosan Nikkelen, P.O. Box 268, 6700 AG Wageningen, The Netherlands. Tel: +31 (0)317-497677, Fax: +31 (0)317-424496, e-mail: mb96@noldus.nl. (Information on the workshop is also available on the World Wide Web: http://www.diva.nl/noldus/mb96.html).

PSGB Winter Meeting 1996 - Social Learning among Mammals, 29-30 November 1996, Meeting Rooms. London Zoological Society, London. Organized by the Primate Society of Great Britain (PSGB), in association with the Mammal Society and the Zoological Society of London.

Biodiversity, Conservation and Management at the Beni Biosphere Reserve, Bolivia, 3-6 December 1996, La Paz, Bolivia. Organized by the Beni Biological Station, Bolivian Academy of Sciences, and the Smithsonian/MAB Biodiversity Program. The objective is to provide a complete overview of the last ten years of research on biodiversirty, conservation and management at the reserve. Papers and posters are requested. Proceedings will be published. For additional information, contact: Carmen Miranda, Academia Nacional de Ciencias de Bolivia, Av. 16 de Julio 1732, Casilla 5829, La Paz, Bolivia. Tel./Fax: (591-2) 350612, e-mail: cmiranda@ebb.bo, or Francisco Dallmeier, Smithsonian/MAB Biodiversity Program, 1100 Jefferson Drive SW, Suite 3123, Washington, D. C. 20560, USA. Tel: (202) 357 4793, Fax: (202) 786 2557, e-mail: icfgd@ic.si.edu.

Australian Primate Society Annual Meeting, 6-8 December 1996, Wellington Zoo, Wellington, New Zealand. Conference Organizer: Graeme Strachan, Wellington Zoo. Contact: Graeme Crook, CSIRO Division of Human Nutrition, Animal Services, Majors Road, O'Halloran Hill, South Australia 5158. Tel: +61 82980336, Fax: +61 83770004, e-mail: graemec@dhn.csiro.au.

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, figures, maps, tables and references, but please keep them to a minimum.

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