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Editors: Anthony B. Rylands and Ernesto Rodríguez Luna
PSG Chairman: Russell A. Mittermeier
PSG Deputy Chairman: William R. Konstant

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Articles

El Comercio de Primates en La República Argentina

En la Argentina habitan cuatro especies de primates (Olrog y Lucero, 1981): el mirikiná (*Aotus azarae*), el carayá (*Alouatta caraya*), el aullador rojo (*Alouatta fusca*) y el caí (*Cebus apella*), las que - al igual que otras especies - enfrentan problemas de conservación, por modificación de hábitat, caza, captura y comercio (Colillas, en Mack y Mittermeier, 1984; Mittermeier y Cheney, 1987; Travi, 1985).

A nivel mundial, se estimó en 40,000 los monos comercializados anualmente (O. Menghi y J. S. Villalba-Macias, com. pers.). El comercio que afecta a los primates en la Argentina no es de tal magnitud, pero reviste importancia. Puede ser analizado desde dos planos: el comercio interno y el comercio internacional. Cabe aclarar que las leyes provinciales y nacionales protegen a todos los primates que habitan el país, vedando su caza o captura en todo su territorio. Sin embargo, existe un comercio importante, tanto de especies autóctonas como exóticas en todo el país, incluso en la Provincia de Tierra del Fuego.

Por ello, se analizó ese comercio en el mercado de mascotas y souvenirs, como así el número de ejemplares cautivos en colecciones zoológicas vivas y laboratorios de la Argentina, con el fin de cuantificar su magnitud o importancia. Se compiló información sobre el comercio de primates en la Argentina entre 1988-1993. En dicho periodo se detectaron en el mercado ilegal 20 especies de monos (3 autóctonas de Argentina e 17 exóticas) y un total de 798 individuos en todo el pais (211 de ellos fueron decomisados por las autoridades gubernamentales). Las especies más ofertadas fueron *Saimiri sciureus* (40,2%), *Callithrix jacchus* (29,5%), *Alouatta caraya* (8,1%), *Cebus apella* (7,7%), *Ateles paniscus* (3%) y otros (11,5%). Los valores en que son ofrecidos ilegalmente oscilan entre US$150 - 2.000, dependiendo de la edad,

Cuadro 1. Especies ofertadas ilegalmente, nombres comerciales usuales, valores y cantidades máximas traficadas entre 1988 y 1993. Según Bertonatti (obs. pers.), Eiffel (inf. inéd.), Gonzalez (inf. inéd.) y Silva Croome, en prep.). Nombre comercial = registrado en comercios de Argentina. Precio = valor promedio y unitario en US$ en Argentina (1993). Un signo de interrogación significa que se ignora el valor. CM = cantidad máxima de animales registradas en una misma operación ilegal, entre 1988 y 1993. En negrita figuran aquellos que fueron intervenidos por la justicia (decomisados e interdictos). CD = cantidad total de animales decomisados e interdictados por la Dirección de Fauna y Flora Silvestres entre 1990 y 1993. Se incluyen 95 saimiríes y 5 titi leones decomisados por Gendarmería Nacional en 1993. CT = cantidad total de animales registrados en distintas operaciones comerciales entre 1988 y 1993.

Especie	Nombre comercial	Precio	CM	CD	CT
Autóctonas					
Aotus azarae	Mirikiná, mono lechuza venezolano, mono de noche, mono nocturno, mono lechuza	350	3		10
Cebus apella	Capuchino, caí, titi, capuchino común, copete negro	250	20	15	62
Alouatta caraya	Carayá, mono aullador negro	150	9[1]	7	65
Exóticas					
Cebus albifrons	Capuchino de frente blanca	250	1		2
Callicebus moloch	Sahuí de cara blanca, titi	?	1		1
Cebuella pygmaea	Titi enano o pigmeo	250	2		6
Callithrix jacchus	Titi pincel, común o de penachos blancos	150	150	10	236
Callithrix penicillata	Titi pincel negro o de penachos negros	180	2		14
Callithrix geoffroyi	Titi de cara blanca	250	2		4
Leontopithecus chrysomelas	Titi leon	2.000	**5**	7	13
Saguinus mystax	Tamarino de mostachos	500	2		2
Saguinus fuscicollis	Tamarino marrón	400	1		1
Ateles paniscus	Mono araña, mono araña negro	300	**3**	8	24
Ateles belzebuth	Mono araña, marimondo	?	2		5
Lagothrix lagotricha	Barrigudo, lanudo, mono de Humboldt	800	4		12
Saimiri sciureus	Mono ardilla, saimiri boliviano, macaco calavera	345	**95**	161	321
Cercopithecus aethiops	Griveta, cercopiteco	?	1		1
Macaca mulatta	Macaco	?	1	1	1
Pan troglodytes	Chimpancé	2.000	**2**	4	4
Sin identificar	Monos		2		24
Totales				**211**	**798**

[1] Se tomó conocimiento de un cargamento de 80 individuos en un depósito clandestino de la Provincia de Buenos Aires, que nunca pudo ser confirmado.

Cover photograph by Russell A. Mittermeier: *Cacajao calvus*, the bald uakari (see page 40).

estado sanitario y lugar de venta. Se han detectado cargamentos de 50 Saimiri sciureus, 80 *Alouatta caraya* y 250 *Callithrix jacchus*. El conjunto de animales decomisados por las autoridades fue de 111, es decir el 16% (ver Cuadro 1) del total detectado en el mercado ilegal.

Paralelamente, a lo cargo de un año (1/1/92 - 1/1/93) se relevaron 245 comercios de venta de animales de la Ciudad de Buenos Aires (37%) y de la Provincia de Buenos Aires (63%). Los datos que se tomaron fueron: especie ofertada, número de indivíduos, nombre comercial, precio, estado sanitario de los mismos y presunto origen.

El 16% de los mismos ofertaron ilegalmente 64 monos de al menos cinco especies (Cuadro 2). Las más ofertados resultaron ser: *Saimiri* spp. (26,3%), *A. caraya* (26,3%), *C. jacchus* (13,8%), *C. apella* (9,7%), *Ateles* spp. (5,5%) y otras (6,9%). La diferencia de abundancia de individuos por especie en los distintos períodos pueden deberse a subobservación de las especies de pequeño tamaño en malas condiciones y/o a la situación del mercado.

Además de animales vivos, se constató la venta de artesanías (llaveros) realizadas con extremidades de *A. caraya* y *Aotus azarae*, a US$2,5 en la Provincia de Corrientes (Contreras, 1990a, 1990b; Salas, 1990; Villa, 1990), como así también ejemplares taxidermizados de la primera de ellas en anticuarios (a US$100-200). También en 1980, se importaron 100 pieles de colobos (*Colobus polykomos*) (Broad *et al.*, 1988).

Cuadro 2. Número de primates ofertados en la Ciudad de Buenso Aires y en la Privincia de Buenos Aires (Argentina). Período de un año: 01/92 - 01/93. CF = número de individuos observados en 15 comercios de la Ciudad de Buenos Aires. BA = número de individuos observados en 25 comercios de la Provincia de Buenos Aires.

Especies	%	CF	BA	Total
Saimiri spp.	26,38	15	4	19
Alouatta caraya	26,38	14	5	19
Callithrix jacchus	13,88	3	4	7
Cebus apella	9,72	5	5	10
Ateles spp.	5,55	3	1	4
No identificados	6,94	4	1	5
Total	**100**	**44**	**20**	**64**

Por otra parte, se relevaron 20 zoológicos públicos y privados, coleccionistas particulares, estaciones de cria e institutos primatológicos o de investigación médica del país (Cuadro 3). En su conjunto mantienen 691

Cuadro 3. Ejemplares cautivos en Argentina (año 1993).

Especie	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	Total
Alouatta caraya	10	-	6	4	7	6	1	2	3	8	-	-	30	-	6	8	3	**94**
Cebus apella	13	6	11	10	5	11	5	18	5	8	-	78	-	10	5	-	9	**194**
Aotus azarae	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	**3**
Saimiri sciureus	9	29	1	-	-	-	1	-	-	5	-	144	-	-	9	-	-	**198**
Ateles paniscus	1	1	-	-	-	3	-	-	-	5	4	-	-	-	-	-	2	**16**
Ateles belzebuth	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**
Callithrix jacchus	7	-	3	-	-	6	-	-	-	3	37	-	-	-	-	-	-	**56**
Leontopithecus chrysomelas	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	**2**
Lagothrix lagotricha	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	**3**
Papio hamadryas	-	3	4	40	-	-	-	-	-	-	-	-	-	-	-	-	-	**47**
Papio h. anubis	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	**6**
Papio h. cynocephalus	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Cercopithecus diana	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7**
Cercopithecus aethiops	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**
Erythrocebus patas	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Macaca mulatta	14	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	**17**
Pan troglodytes	2	2	3	17	-	4	-	-	-	-	-	-	-	-	-	-	-	**28**
Subtotal	**69**	**43**	**34**	**71**	**15**	**31**	**10**	**20**	**8**	**45**	**41**	**222**	**30**	**10**	**20**	**8**	**14**	**691**

Localidad relevada y fecha del muestro. A = Zoológico de Buenos Aires (06.06.93); B = Zoológico de La Plata (Provincia de Buenos Aires) (06.06.93); C = Zoológico de Córdoba (20.06.93); D = Zoológico de Mendoza (26.06.93); E = Zoológico de Roque Sáenz Peña , Chaco (03.12.92); F = Zoológico Mundo Animal, Provincia de Buenos Aires (18.07.93); G = Parque Argentino de Fauna Autóctona, Hurlingham, Provincia de Buenos Aires (17.06.93); H = Zoo Bal Park, Montecarlo, Provincia de Misiones (17.07.93); I = Reserva Guaycolec, Provincia de Formosa (25.06.93); J = Colección de Raúl Portal, Provincia de Buenos Aires (21.07.93); L = Centro Argentino de Primates (CAPRIM), Corrientes (02.03.93); Instituto de Neurobiologia (21.07.93); N = CEMIC (26.06.93); O = Estación de Cría de Animales Silvestres - ECAS, Provincia de Buenos Aires (09.06.93); P = Museo de Ciencias Naturales Ruiz de Montoya, Posadas, Provincia de Misiones (21.07.93); Q = Varios institutos que poseen menos de 10 individuos y no reproducen a ninguna de las especies: Hosteria El Cazador, Provincia de Buenos Aires, 1 *C. apella* (12.07.93); Zoo de Bahia Blanca, Provincia de Buenos Aires, 2 *C. apella* (01.07.93); Estación Experimental "La Esmeralda", Provincia de Santa Fé, 2 *C. apella*, 2 *Ateles* y 2 *A. caraya* (03.02.93); Hosteria Yacyretá, Ituzaingo, Provincia de Corrientes, 4 *C. apella* y 1 *A. caraya* (02.08.93).

individuos de al menos 17 especies, concentrándose el 80% de los ejemplares en sólo cinco lugares (zoológicos de Buenos Aires, La Plata, Córdoba y Mendoza y lo Centro Argentino de Primates - CAPRIM). Sólo seis especies son reproducidas con cierta regularidad y en algunos lugares: *Alouatta caraya*, *Cebus apella*, *Saimiri sciureus*, *Callithrix jacchus*, *Papio hamadryas* y *Pan troglodytes* (E. & E. Esparrach, M. M. Gentil y A. Ruiz, com.pers.).

Curiosamente, el 80% de los individuos cautivos en los establecimientos monitoreados pertenecen a las mismas seis especies que representan el 90% de la oferta comercial. Esta correlación directa entre el número de individuos de las especies más ofertadas con los de las cautivas se ve fuertemente influenciada porque las autoridades derivan los animales decomisados de los comercios a los principales zoológicos del país.

No caben dudas que el problema de conservación más grave para los primates es la destrucción de hábitats naturales y, en particular, los bosques y selvas primarias de las Provincias de Misiones Chaco, Corrientes, Formosa, Salta, Jujuy y Tucumán. No obstante, la captura comercial puede ser un factor agravante para las especies en situación más delicada. En algunas especies, se evidencia un comercio ilegal significativo, en muchos casos, abastecido por contrabandos desde otros países de Sudamérica (principalmente Bolivia, Brasil y Paraguay).

Finalmente, se recomienda dar continuidad a la investigación del estado poblacional de las cuatro especies autóctonas, optimizar el manejo de los planteles cautivos, mejorar los controles administrativos, monitorear su comercio, analizar los riesgos y beneficios de las liberaciones de monos, fortalecer las áreas protegidas (incluyendo la elaboración de planes de manejo), aplicar la legislación, realizar campañas educativas que desalienten el comercio de primates como mascotas, mejorar la información brindada en zoológicos, y optimizar el uso de los planteles cautivos.

Claudio Bertonatti, Fundación Vida Silvestre Argentina, Departamento de Conservación, Defensa 245, (1065) Buenos Aires, Argentina.

Bibliografia

Broad, S., Luxmoore, R. y Jenkins, M. (eds.) 1988. *Significant trade in wildlife: a review of selected species in CITES Appendix II, Vol.1. Mammals*: 14-39. CITES, Cambridge, U.K.

Contreras, A. O. 1990a. Manitos de mirikiná. *Diario Epoca*, Corrientes (14/8):5.

Contreras, A. O. 1990b. Gorilas en la niebla en Corrientes. *Diario El Litoral*, Corrientes (12/8): 29.

Eiffel, C. H. Información inédita. Recopilación de datos sobre monos mantenidos comom mascotes (1993-1994). 5pp.

Gonzalez, F. Información inédita. Especies silvestres protegidas ofertadas comercialmente (1994). Fundación Vida Silvestre Argentina (FVSA), Buenos Aires. 32pp.

Mack, D. y Mittermeier, R. A. 1984. *The Primate Trade, Vol. 1. Legislation, Trade and Captive Breeding*. Traffic USA y World Conservation Union (IUCN), Washington, D.C. 185pp.

Mittermeier, R. A. y Cheney, D. L. 1987. La conservación de los primates y sus hábitats. *Bol. Primatol. Arg.* 5(1-2): 28-64.

Olrog, C.C. y Lucero, M.M. 1981. *Guia de los Mamiferos Argentinos*. Fundación Miguel Lillo, San Miguel de Tucumán.

Salas, A. A. 1990. Amemonos. Ame-monos. *Diario El Litoral*, Corrientes (3/8): 4.

Silva Croome, M. En preparación. Recopilación de datos sobre tráfico de fauna (1994). Dirección de Fauna y Flora Silvestres, Buenos Aires.

Travi, B. L. 1985. Agentes infecciosos en primates. *Bol. Primatol. Arg.* 3(2): 41-49.

Villa, H. J. 1990. Colgantes macabros. *Diario Epoca*, Corrientes (14/8): 4.

SITUACION DE POBLACIONES DE *ALOUATTA PALLIATA* (MONO AULLADOR) EN DOS LOCALIDADES DEL ESTADO DE VERACRUZ, MEXICO

La República Mexicana cuenta con una gran diversidad biológica debido a su localización en el continente americano; por un lado, la influencia biótica de la región neártica y por otro, de la región neotropical, aunado a las diferencias altitudinales, hace posible la existencia de una gran variedad de ecosistemas.

En esta variedad se encuentran los ecosistemas tropicales que, como ocurre en otras partes del mundo, están siendo exterminados de una forma acelerada. En el Estado de Veracruz, México, la destrucción de los ecosistemas tropicales se debe principalmente a la apertura de áreas para agricultura y ganadería; así, las masas de selva continua se convierten en pequeños fragmentos donde muchos grupos de primates luchan por sobrevivir.

Frente a este problemas, un grupo de investigadores de la Universidad Veracruzana empezamos a interesarnos por conocer la situación en que se encontraban las poblaciones de primates que habitan el Estado, para crear alternativas de conservación. Los estudios primatológicos en la Universidad inician a principios de la década de los ochenta, sin embargo, fue en 1988 cuando se inician las visitas a la zona del presente estudio, encontrando grupos

de monos que corrían un grave peligro, ya que para preparar los terrenos de cultivo los campesinos tradicionalmente incendian la zona y en muchas ocasiones el fuego alcanza los fragmentos habitados por monos y otros animales silvestres. A raíz de estas visitas, se consideró necesario translocar un pequeño grupo de monos aulladores a un área protegida (Rodríguez-Luna *et al.*, 1993).

En México existen tres especies de primates, dos de mono aullador (*Alouatta palliata* y *A. pigra*) y una de mono araña (*Ateles geoffroyi*, con dos subespecies: *A. g. vellerosus* y *A. g. yucatanensis*); éstas se distribuyen hacia el sur y sureste del país. Para el Estado de Veracruz se reporta la existencia de *A.palliata* y *A.g.vellerosus* (*v.* Hall, 1981).

El mono aullador de manto (*A.palliata mexicana*) es de complexión robusta a diferencia del mono araña, cuyo cuerpo es muy delgado y con largas extremidades. El aullador es conocido localmente como saraguato o mono zambo; la longitud del cuerpo es de 560-950 mm y de la cola 500-900 mm. Tiene cola prensil que funciona como mecanismo de soporte durante la locomoción y el forrajeo. Posee un gran hueso hioideo que le permite una potente vocalización, de ahí el nombre de mono aullador. Habita los bosques húmedos y nublados; se alimenta principalmente de hojas jóvenes y frutos maduros. Las tropas se componen de 8 a 20 individuos con 2 a 4 veces más hembras que machos, moviéndose aproximadamente 500 m al día. No presentan estacionalidad reproductiva y los nacimientos ocurren a lo largo del año (Neville *et al.*, 1988).

En México, los organismos gubernamentales encargados de la regulamentación en el manejo de fauna silvestre son la Secretaría de Desarrollo Social y la Secretaría de Agricultura y Recursos Hidráulicos; éstos colocan al mono aullador "en peligro de extinción" por lo que su caza y captura se encuentra prohibida (México, SEDESOL, 1994).

De acuerdo al criterio de la IUCN - Unión para la Conservación Mundial (Versión 2.2., Mace y Stuart, 1994) se ha clasificado al mono aullador de manto (*Alouatta palliata mexicana*) en la categoria "Vulnerable" (IUCN-WCU/SSC en prep.). En tanto, la Convención sobre el Comercio Internacional de Especies en Peligro de Fauna y Flora Silvestre (CITES), lo coloca en al Apéndice I (Burton y Pearson, 1987) con las especies amenazadas de extinción por el comercio que de ellas se realiza.

Con el propósito de evaluar el impacto de la fragmentación del hábitat sobre grupos de monos aulladores, en zonas bajas e inundables, se hizo un reconocimiento de campo. Es necesario destacar que la deforestación en zonas bajas es mayor que en zonas montañosas, sin embargo, en este caso se trata de áreas inundables, lo cual ha permitido la permanencia de los grupos de monos.

Area de Estudio

La zona de estudio se encuentra en el sur del Estado de Veracruz, México. Se localiza entre los 95°10'-95°12' longitud oeste y 17°59'-18°00', latitud norte con una altitud sobre el nivel del mar que va de los 10 a los 50 m (Fig.1).

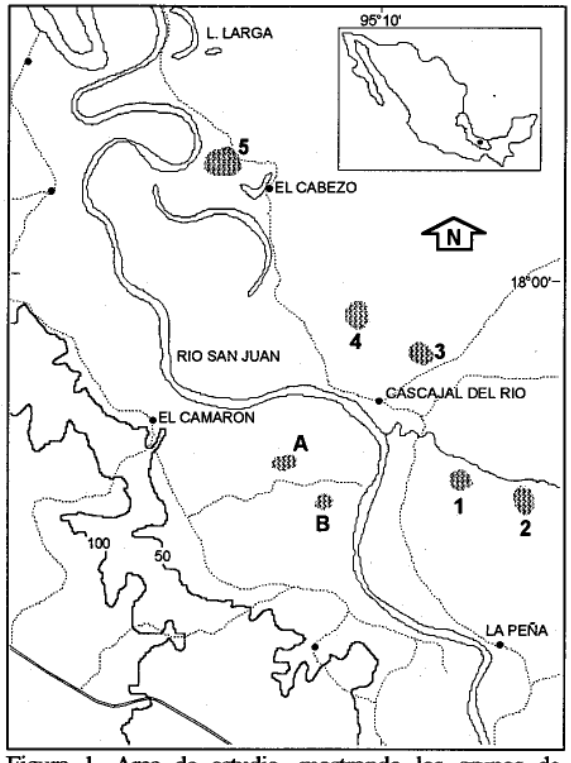

Figura 1. Area de estudio, mostrando los grupos de monos (*v.* Tabla 1 y 2).

Esta área se encuentra enclavada en la cuenca hidrológica del río San Juan Evangelista. En la época de lluvias el río se desborda, dejando una zona inundada de un metro de altura en promedio. El período de "seca" se presenta en los meses de marzo a junio que es cuando se aprovechan estas áreas para la roza, tumba y quema (preparación del terreno para la siembra de pasto). El clima es cálido y caracterizado como AWZ; con una temperatura promedio anual de 26.3° C y con una máxima extrema de 39° C en el mes de Mayo, una precipitación media anual de 1500 mm (Soto y García, 1989).

Dos áreas fueron muestreadas: rancho "El Camarón" perteneciente al municipio de San Juan Evangelista y el poblado de El Cascajal y Cabezo, municipio de Acayucan. Estas zonas se encuentran divididas por el río San Juan, con una anchura de 70 m. La primera corresponde a una

proprieded privada donde se encuentra establecido un rancho ganadero y la segunda pertenece a un ejido donde el área está fraccionada y repartida entre varias personas. Los pequeños fragmentos de vegetación existentes en esta planicie pertenecen a una selva mediana subperennifolia, con una comunidad de palmas coyoleras de la especie *Scheelea liebmanii*.

Metodología

La ubicación de la zona de estudio se realizó con la ayuda de mapas de escala 1:50.000 (México, INEGI, 1985) y con fotografías aéreas. Con el propósito de detectar grupos de primates, se hicieron recorridos a lo largo del río San Juan y en los arroyos afluentes a éste, en algunas ocasiones fue necesario utilizar una lancha: el aullido de los monos durante las manañas y por las tardes, facilitó su localización.

Una vez localizados los grupos de monos, se registró el número y estado de salud de los individuos, clases de edad-sexo, y condiciones del hábitat para lo cual se utilizaron binoculares 8 x 40. Para poder registrar el mayor número de individuos, fue necesario golpear el tronco de las palmas con un pedazo de madera para que los monos salieran de su resguardo entre las hojas. Algunos animales fueron identificados individualmente por la presencia de manchas blancas en las manos, patas y cola combinando estas características con las propias de su sexo y edad.

También se visitaron los poblados cercanos, para obtener información acerca de las actividades agrícolas y ganaderas que influyen sobre la permanencia de los monos.

Resultados

El trabajo se realizó durante 1993, en dos localidades. En la primera, rancho "El Camarón", se reconocieron 32 individuos de *A.palliata*, fraccionados en dos grupos, a los que denominamos A y B (Tabla 1). El Grupo A de la primera zona de estudio habita un islote de 1.5 ha, en tanto que el Grupo B está localizado a 500 m de distancia en un fragmento de 0.5 ha; en este sitio se encontró un individuo (macho adulto) de *Ateles geoffroyi*. La segunda, situada al otro lado de río San Juan, abarcando El Cascajal y Cabezo, se registraron 5 Grupos de monos, *A.palliata*, con un total de 62 individuos, en fragmentos de vegetación que suman una área de 12 ha (Fig. 1, Tabla 2).

En ambas zonas, los animales viven refugiados en la parte central de las palmas, de donde obtienen parte de su alimento, complementándolo con hojas y frutos de algunos árboles del género *Ficus*, por lo que en estas zonas su dieta está restringida a unas cuantas especies.

Tabla 1. Composición de los grupos del rancho "El Camarón".

	M	H	J	I
Grupo A	6	11	6	4
Grupo B	1	4	0	0
Total	7	15	6	4

Tabla 2. Composición de los grupos de El Cascajal y Cabezo.

	M	H	J	I
Grupo I	3	5	2	2
Grupo II	2	6	1	1
Grupo III	2	5	1	3
Grupo IV	1	3	0	0
Grupo V	6	9	6	4
Total	14	28	10	10

El total de monos aulladores observados fue de 94 individuos para toda la zona de estudio; considerando este dato encontramos que el 68.1% corresponde a la categoría de adultos, el 17% a juveniles y el 14.9% a infantes. Analizando los datos de individuos adultos vemos que la proporción de sexos para la primera zona es de 2.14 hembras por macho. Sumando las áreas ocupadas por ambos grupos (A y B), la densidad es de 16 individuos/ha, dentro de los fragmentos. Para la segunda zona, la proporción de sexos es de 2 hembras por macho; considerando el área habitada por los monos, la densidad es de 5.16 individuos/ha.

Discusión

En condiciones de hábitat continuo, la densidad poblacional para la especie se ha reportado entre 0.16 a 1.1 individuos/ha (Milton, 1985) en distintas partes de su rango de distribución; sin embargo, para algunas condiciones de hábitat perturbado (Baldwin y Baldwin, 1976, citado por Crockett y Eisenberg, 1987) se ha reportado hasta 10.4 individuos/ha. La densidad poblacional relativamente alta dentro de estos fragmentos muestra esta tendencia; sin embrago, es preciso destacar que el área donde se encuentran estos fragmentos está severamente deforestada, por lo cual, el número de individuos parece poco significativo si se considera toda esta área.

El origen de esta situación es el resultado de la presión ejercida por los asentamientos humanos. Las necesidades apremientes de las personas que habitan esta zona han ido transformado lo que antes era una zona inundable con vegetación primaria, donde los monos satisfacían sus requerimientos, a zonas de ganadería y agricultura. Una muestra de lo anterior se presenta en la época de secas donde cada año grandes extensiones de la zona son incendiadas para preparar los terrenos de cultivo; durante

esta actividad, los primates tienden a refugiarse en árboles y arbustos cercanos a las márgenes del río, muriendo algunos en la travesía o calcinados. Sin embargo, otro problema importante al que se enfrentan actualmente estos grupos de animales, es la creación de una autopista que unirá la región sur con el centro del país.

Conclusión

A lo largo de los últimos diez años, el ritmo de transformacion de los ecosistemas tropicales se ha incrementado en forma alarmante, sin que hasta el momento sea posible frenar esta tendencia. El aumento en el proceso de ganaderización en el trópico mexicano se debe, en la mayoría de los casos, al otorgamiento de créditos que el gobierno brinada a los campesinos quienes, por falta de asesoramiento, practican la ganadería extensiva.

En caso de que no se tomen medidas urgentes como la planificación de programas de desarrollo del país en base a estudios de impacto ambiental, regulación en el uso del suelo y la protección de áreas conservadas que existen en los terrenso de ejidatarios y pequeños propietarios, los fragmentos de selva utilizados como refugio por las poblaciones de primates, desaparecerán en un futuro cercano.

En conclusión, y debido al iminente peligro en que se encuentran, la solución para la supervivencia de estos grupos de monos es realizar programas de conservacion inmediatos, como la translocación hacia áreas protegidas.

F. García-Orduña y **D. Canales-Espinosa**, Instituto de Neuroetología, Universidad Veracruzana, Apartado Postal 566, C.P.91000 Xalapa. Veracruz, México.

Bibliografía

Burton, A. J. y Pearson B. 1987. *The Collins Guide to the Rare Mammals of the World.* The Stephen Greene Press, Lexington, Massachusetts. 68pp.

Crockett, C. M. y Eisenberg, J. F. 1987. Howlers: variation in group size and demography, En: *Primate Societies*, B. B. Smuts, R. N. Cheney, R. N. Seyfarth, R. W. Wrangham y T. T. Struhsaker (eds.), pp. 54-68. The University of Chicago Press, Chicago.

Hall, E. R. 1981. *The Mammals of North America, Vol. 1.* Wiley Interscience Publications, New York. 269pp.

Mace, G. y Stuart, S. 1994. Draft IUCN Red List Categories, Version 2.2. *Species* 21-22: 13-26.

México, INEGI. 1985. *Carta Topográfica.* San Juan Evangelista, E15C13. Instituto Nacional de Estadística Geografía e Informática (INEGI), México, D.F.

México, SEDESOL. 1994. Norma Oficial Mexicana NOM-059-ECOL-1994 que determina las especies y subespecies de Flora y Fauna Silvestres terrestres y acuáticas raras en peligro de extinción, raras o sujetas a protección especial y que establece especificaciones para su protección. *Diário Oficial de la Federación, Tomo CDLXXXVIII, No. 10.* Secretaria de Desarrollo Social (SEDESOL), México, D.F.

Milton, K. 1985. Dietary quality and demographic regulation in a howler monkey population. En: *The Ecology of a Tropical Forest: Seasonal Rhythms and Long-Term Changes*, E. G. Leigh, Jr., A. S. Rand y D. M. Windsor (eds.), pp.273-289. Smithsonian Institution Press, Washington, D.C.

Neville, M. K., Glander, K. E., Braza, F. y Rylands, A. B. 1988. The howling monkeys, genus *Alouatta.* En: *Ecology and Behavior of Neotropical Primates, Vol. 2.* R. A. Mittermeier, A. B. Rylands, A. F. Coimbra-Filho y G. A. B. da Fonseca (eds.), pp.349-453. World Wildlife Fund, Washington, D.C.

Rodríguez-Luna, E., García-Orduña, F. y Canales-Espinosa, D. 1993. Translocación del mono aullador *Alouatta palliata*: una alternativa conservacionista. En: *Estudios Primatológicos en México, Vol.1.* A. Estrada, E. Rodríguez-Luna, R. López-Wilchis y R. Coates-Estrada (eds.), pp.129-177. Universidad Veracruzana., Veracruz, México.

Soto, E. M. y García, E. 1989. *Atlas Climático del Estado de Veracruz.* Instituto de Ecología, A.C., México. 125pp.

CONSERVACION DE *CACAJAO CALVUS UCAYALII* EN LA AMAZONIA PERUANA

En el Perú, *Cacajao calvus* está representada por la subespecie *ucayalii* (Hershkovitz, 1987), con distribución geográfica al lado derecho de los ríos Ucayali y Amazonas (Hershkovitz, 1987; Aquino, 1988). Entre los primates que habitan los bosques amazónicos, es uno de los menos estudiados, por ser el único que cuenta con una área domiciliar muy grande, por lo tanto difícil de contactar. La información hasta ahora disponible como la de Bartecki y Heymann (1987), Aquino (1988) y Heymann (1989, 1990), están referidas a algunos aspectos ecológicos y de conducta, resultado de encuentros circunstanciales y no de estudios con metodologia y área definida.

Aquí se presenta un resúmen de los avances obtenidos durante los estudios de campo, conducidos desde Junio de 1993 a Junio de 1994, en el área de influencia de la Reserva Comunal Tamshiyacu-Tahuayo, situado al sureste de Iquitos, aproximadamente a 4°23'S y 72°55'O y, entre Julio y Agosto de 1994 en la cuenca del río Yavarí, situado al este de Iquitos, aproximadamente a 4°30'S y 71°43'O (Fig. 1). En ambas, la actividad de caza es frecuente e incluye a los primates de tamaño grande y mediano, entre ellos *C. calvus ucayalii*, cuya presión de

caza es mayor en el área de influencia de la Reserva Comunal Tamshiyacu-Tahuayo.

El comportamiento diferente a las otras especies, el tamaño de manada que en ocasiones sobrepasan los 120 individuos, las vocalizaciones inconfundibles, la abundancia de restos de frutos al pie del árbol alimenticio, el área domiciliar muy grande y la frecuente asociación con otros primates, fueron las caracteristicas tomadas en cuenta para la búsqueda de estos primates. Desde el primer encuentro ocurrido en Julio de 1993, el tiempo de duración de sus actividades y el uso de los estratos del bosque fueron registrados en una libreta de campo para el copiado en una ficha elaborada para estos fines. Tres fueron las categorías básicas establecidas en el patrón de actividades: a) locomoción; b) alimentación; y c) descanso.

Cuando el grupo era muy grande, no todos los individuos realizaban la misma actividad, de modo que se anotaron la actividad cumplida por el mayor número de ellos. Durante el período de avance de los estudios fueron acumulados 5,748 minutos de observación. El tiempo de observación cuando hubo el encuentro varió desde 35 minutos a 480 minutos. No obstante, en dos oportunidades fueron observados desde que abandonaron sus árboles de dormir hasta su instalación en nuevos árboles al anochecer, cuyo tiempo de actividad y seguimiento fue de 735 minutos en Julio de 1993 y 745 minutos en Febrero de 1994.

La colecta de frutos y semillas fue simultáneo al registro de actividades. Los restos de frutos caídos en el piso, luego de verificar la parte comida, fueron colocados en bolsa plástica y rotulados con numeración correlativa que correspondía a un registro cronológico anotado en la libreta de campo. Para la tipificación de los bosques y las formaciones vegetales que conforman el hábitat, he recurrido a la clave establecida por Encarnación (1985, 1993).

C. calvus ucayalii habita los bosques de altura y de bajial (Aquino, 1988). En la Reserva Comunal Tamshiyacu-Tahuayo, el hábitat está compuesto por formaciones vegetales denominados: a) bosque de terraza, cuyo suelo arcilloso o areno-arcilloso y con fisiografia en terraza y planicie, está poblado por árboles mayores de 30 m de alto, de copa cerrada, entre los que destacan *Couepia* sp., *Vantanea* sp., *Pouteria* spp. y *Eschweilera* spp., los que algunas veces están entretejidos por bejucos gigantes que actúan como soportes; b) bosque de colina, cuyo suelo areno-arcilloso de tipo rojizo o grisáceo y fisiografia muy ondulada y colinosa, con cimas y pendientes que convergen en quebradas y riachuelos, esta poblado por árboles que alcanzan entre 18 a 30 m de alto, como *Iriartea* sp., *Jessenia bataua*, *Astrocaryum* sp., *Quararibea* sp., y otros; c) varillal, cuyo suelo cubierto por una delgada capa de arena está poblado de vegetación heliófila y esclerófila densa, los árboles delgados y rectos de hasta 20 m de alto están conformados por anonáceas, dillenáceas y otros; y d) palmal alto o aguajal de altura, cuyo suelo húmico y areno-arcilloso hidrometamórfico, está poblado principalmente por palmeras de 25 a 35 m de alto, como *Mauritia flexuosa*, *Euterpe* sp., *Iriartea exorrhiza*, entre otros. En el Yavarí, ademas de las formaciones vegetales mencionadas, el hábitat también lo componen extensos aguajales, donde la comunidad de *Mauritia flexuosa* es dominante y alcanza entre 30 a 35 m de alto. Precisamente el mayor número de grupos fueron observados en este tipo de formación vegetal.

Desde Junio de 1993 a Agosto de 1994 he contactado con *C.c.ucayalii* en 23 oportunidades, 19 ocurrieron en la Reserva Comunal Tamshiyacu-Tahuayo y probablemente correspondieron a grupos de una misma manada. El tamaño por cada encuentro varió desde 7 a 120 individuos. Por la variación sustancial durante los conteos repetidos por cada encuentro, es muy probable que se trató de grupos y subgrupos, con excepción del registro y conteo en Febrero de 1994, que fue de aproximadamente 120 individuos, cifra que estaría muy cercana al tamaño de una manada completa (Aquino, 1988). La formación de subgrupos parece ocurrir con cierta frecuencia, este

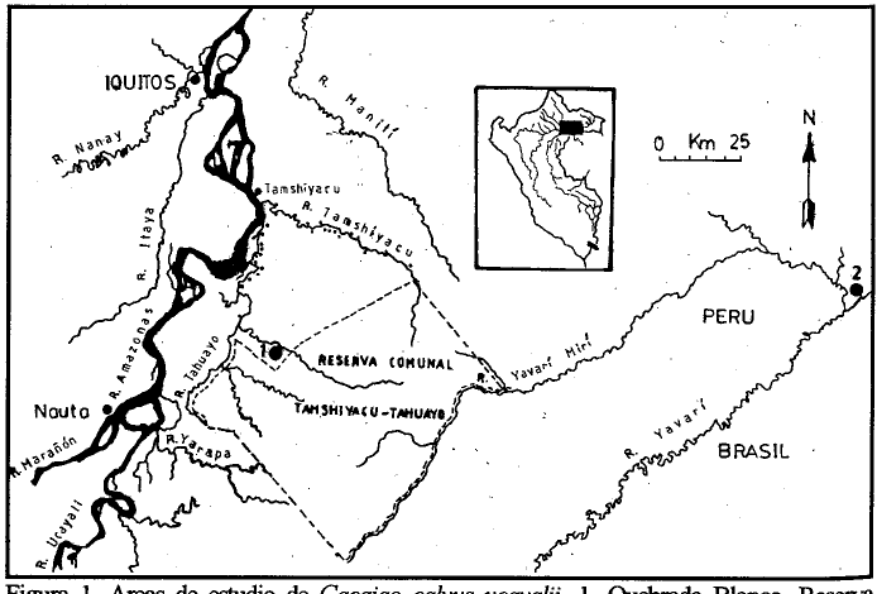

Figura 1. Areas de estudio de *Cacajao calvus ucayalii*. 1. Quebrada Blanco, Reserva Comunal Tamshiyacu-Tahuayo. 2. Agua negra, río Yavarí.

hecho estaría relacionado entre otros factores con el tamaño y composición de la manada, tamaño del área domiciliar, disponibilidad de recursos alimenticios, disponibilidad de árboles para el descanso o sueño y frecuente asociación con otros especies de primates.

Aún no ha sido posible determinar el área domiciliar de la manada en estudio. No obstante, con seguridad es mayor a los 150 km^2 , cifra que supera enormemente a la determinada para *C. c. calvus* que osciló entre 500 a 600 ha (Ayres, 1986).

Los análisis preliminares muestran que *C. c. ucayalii* empleó mayor tiempo en locomoción (57%) que en descanso y alimentación (22% y 21%, respectivamente). El tiempo de alimentación desde que arribaron al árbol con frutos hasta su retirada estuvo en función a la disponibilidad de frutos y el tamaño del grupo o subgrupo, habiendo registrado un máximo de 35 minutos. El tiempo de descanso varió entre cinco a 160 minutos y casi siempre lo hicieron en más de tres árboles y a alturas que fluctuaron entre 20 a 35 m.

C. c. ucayalii comparte el hábitat con otras 11 especies de primates de hábito diurno. De ellos, frecuentemente acostumbran asociarse con *Lagothrix lagotricha* (51.22%), *Saimiri sciureus* (37.0%) y ocasionalmente y por tiempo muy corto con *Cebus albifrons* y *C. apella*, lo cual coincide con el reportado por Aquino (1988). Considerando una marcada competitividad por las plantas alimenticias entre estas especies, la función o finalidad de estas asociaciones todavía no son claras, aún cuando uno de ellas serías la protección de sus predatores.

Hasta el presente, la dieta fue enfatizada al consumo de frutos, siendo las semillas la parte más utilizada (51%) seguido del mesocarpio (26%). También consumieron en menor proporción el arilo y ocasionalmente yemas tiernas de plantas epífitas, entre ellas de bromeliáceas y ciclantáceas. De las aproximadamente 50 especies registradas, las más importantes por su mayor frecuencia de consumo y mayor periodicidad de fructificación figuran *Couma macrocarpa*, *Schistostemon* spp., *Eschweilera* spp., *Mauritia flexuosa* y *Pouteria* spp.

C. c. ucayalii, especie incluida en el Apéndice I del CITES y considerada en peligro de extinción por Resolución Ministerial No. 1082-90-AG, no está protegida en ninguna de las actuales unidades de conservación, salvo la Reserva Comunal Tamshiyacu-Tahuayo (aún no reconocida por el Gobierno Central). Como toda fauna arborícola, la población de *C. c. ucayalii* responde al estado de integridad del bosque donde ellos habitan. Los requerimentos de tierras cultivadas fomentan deforestaciones intensivas y aceleradas, afectando en gran medida a los primates de tamaño grande y mediano, entre ellos *C. c. ucayalii*, cuyo hábitat está reduciéndose drásticamente. Otros factores que contribuyen al decremento de la población de este primate son: a) la caza, para sustituir el consumo de los mamíferos de tamaño grande que proporcionan mejores beneficios económicos cuando son comercializados en los mercados; y b) la cosecha de frutos silvestres para beneficio económico, mediante métodos destructivos de corte y tumba del árbol, de especies como *Mauritia flexuosa*, *Couma macrocarpa*, *Rhigospira quadrangularis* y *Parahancornia peruviana*, que constituyen importantes recursos alimenticios para estos primates.

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Rolando Aquino, Centro de Investigaciones Veterinarios Tropicales y de Altura, Universidad Mayor de San Marco, Lima, y Sociedad Peruana de Primatologia, Apartado 575, Iquitos, Perú.

Referencias

Aquino, R. 1988. Preliminary survey on the population densities of *Cacajao calvus ucayalii*. *Primate Conservation* (9): 24-26.

Ayres, M. 1986. The conservation status of the white uakari. *Primate Conservation* (7): 22-26.

Bartecki, U. y Heymann, E.W. 1987. Sightings of red uakaris *Cacajao calvus rubicundus* at the río Blanco, Peruvian Amazonia. *Primate Conservation* (8): 34-36.

Encarnación, F. 1985. Introducción a la flora y vegetación de la Amazonia Peruana: estado actual de los estudios y ensayo de una clave de determinación de las formaciones vegetales en la llanura amazónica. *Candollea* (40): 237-252.

Encarnación, F. 1993. El bosque y las formaciones vegetales en la llanura amazónica del Perú. *Alma Mater* (6): 95-114.

Hershkovitz, P. 1987. Uakaris, New World monkeys of the genus *Cacajao* (Cebidae, Platyrrhini): a preliminary taxonomic review with the description of a new subspecies. *Am. J. Primatol.* 12(1): 1-57.

Heymann, E.W. 1989. Observaciones preliminares del mono huapo rojo, *Cacajao calvus ucayalii* (Primates: Platyrrhini), en el río Blanco, Amazonia peruana. *Medio Ambiente* (10): 113-117.

Heymann, E.W. 1990. Further field notes on red uakaris, *Cacajao calvus ucayalii* from the quebrada Blanco, Amazonian Peru. *Primate Conservation* (11): 7-8.

THE POTENTIAL FOR METACOMMUNITY EFFECTS UPON HOWLER MONKEYS

Darwin (1859) formulated the principle of "competitive exclusion" to explain the potential for coexistence between two species. In its present terms, the principle states that "...if there is no differentiation between the realized niches of two competing species, or if such differentiation is precluded by the limitations of the habitat, then one species will eliminate or exclude the other." (Begon and Mortimer, 1986). Theoretical (De Bruyn, 1980) and empirical (Connell, 1961) work has investigated the parameters of this principle, descriptions and formulations of which depend on the existence of interspecific competition for limiting resources, such as food or space.

When species are excluded by competition, "competitive release" may occur, that is, the expansion of a species' range when a competitor is eliminated (see Begon and Mortimer, 1986). In a similar fashion, changes in the distribution and abundance of a species may occur as a result of local (metapopulation) or regional (metacommunity) colonization and extinction of given species within a community (Valone and Brown, 1995; Harrison, 1994). Nee and May (1992) investigated metacommunity ("secondary") effects with a model for two competing species while decreasing the amount of

Table 1. Interspecific interactions at feeding sites by mantled howler monkeys, *Alouatta palliata* Gray. Percentages = % total sample of 27 genera.

Class, specific example(s), and common names	Focal tree species, where identified, and notes
Insecta (15%)	
Centris aethyctera, anthophorid bees	*Andira inermis* in flower producing nectar; bees interfere with howler feeding; howlers may delay feeding until after diurnal pollination peak; bees displace monkeys.
Xylocopa spp. , carpenter bees	*Gliricidia sepum* in flower; bees decrease average feeding rate of monkeys; bees interfere with howler feeding.
Trigona fulviventris, stingless bees	Tree in flower, nectar visible; bees interfere with howler feeding.
Pseudomyrmex ferruginea, acacia ants	*Acacia cornigera*. Ants and juvenile howlers eating leaves; ants displace howlers by biting or attempting to bite.
Reptilia (7%)	
Iguana iguana, *Ctenosaura similis*, iguanas	*Licania arborea*, *Spondias* spp., *Ficus ovalis*, *Enterolobium cyclocarpum*, and *Cordia alliodora*; primarily feeding on fruit; coexistence?
Aves (67%)	
Cathartes aura, *Caracara plancus*, vultures	Female howlers emit appeasement calls to vultures; vultures displace feeding young and adult female monkeys.
Buteo magnirostris, *Spizastur melanoleucus*, hawks	Hawks displace howlers and some birds (e.g., jays) from feeding sites.
Herpetotheres cachinnans, falcons	Falcons interfere with howler feeding; howlers vocalize toward falcons.
Jabiru mycteris, storks	Low flying bird, triggers coordinated howls by male howlers; storks interfere with howler feeding.
Brotogeris jubularis, *Aratinga canicularis*, parrots	In fruiting tree; interspecific feeding associations.
Eugenes fulgens, hummingbirds	*Tabebuia neochrysantha* in flower; interspecific feeding association.
Trogon spp., trogons	In fruiting tree; interspecific feeding associations
Eumomota superciliosa, *Motmotus lessoni*, motmots	*Simarouba glauca* in fruit; birds pick fruit then leave tree to feed; motmots avoid howlers.
Rhampastos spp., toucans	*Ficus ovalis* in fruit; mutual interference in context of feeding associations.
Campephilus guatemalensis, *Dryocopus lineatus*, woodpeckers	Bird calls sound like howler barks; howlers may flush insects eaten by woodpeckers; competition for space.
Chiroxiphia linearis, manakins	Feeding in fruit tree; coexistence.
Cyanocorax spp., crows, jays	*Andira inermis*, *Anacardium excelsum*, *Muntingia calabura*; howlers may displace jays, howlers may flush insects.
Campylorhynchus rufinucha, acacia wrens	*Simarouba glauca* in fruit; howlers flush insects; interspecific feeding association.
Mammalia (11%)	
Coendou mexicanum, *Dasyprocta punctata*, rodents	*Anacardium excelsum* in fruit; commensals beneath feeding tree.
Sciurus spp., squirrels	*Ficus ovalis* in fruit; howlers displace squirrels; interspecific feeding association among howlers, ctenosaurs, parrots, trogons, jays, and squirrels.

available habitat ("patch removal"). They found that patch removal may decrease the distribution and abundance of the superior competitor, while increasing the distribution and abundance (in time and space) of the inferior competitor. Of particular importance to students of conservation biology is the finding that patch removal can effect changes in the makeup of communities in remaining inhabited patches even if these very patches have experienced no "intrinsic" changes of their own. This process is reminiscent of the "butterfly effect" in chaos theory whereby small perturbations may lead to large effects at a distant point in space or time. Metacommunity effects, then, are expected to be nonlinear and may be difficult to predict. For this reason they deserve particular attention from conservation biologists.

Mantled howler monkeys (*Alouatta palliata* Gray) belong to frugivore and herbivore guilds throughout their wide distribution in Meso- and South America. In this note I provide evidence of interspecific interactions between howlers and 27 other genera recorded at Hacienda La Pacifica, Cañas, Guanacaste, Costa Rica. *Ad libitum* methods of observation were employed in addition to the "focal tree" observational method (Jones, 1983), in which a single tree upon which howlers were known to feed, generally a tree in peak flower, fruit, or leaf flush, was observed and the interactions of all animal species recorded. Feeding rates were counted as number of mouthfulls per minute.

Table 1 presents a summary of notes on interactions between howler monkeys and individuals of 27 genera. Most of these responses took place when both howlers and one or more species were feeding or attempting to feed, usually on new leaves, fruit, or flowers; plant tissues preferred by howlers (Glander, 1981) and available primarily during the dry season, which is from November to April (see Frankie *et al.*, 1974). Observations occurred more frequently in riparian habitat than in deciduous habitat (Frankie *et al.*, 1974) during the dry season (2×2, $p \leq 0.2$, $\chi^2 = 5.5$., $df = 1$). The presence of clumped resources of high quality favors grouping tendencies, intra and interspecifically (see Pulliam and Caraco, 1978), and Table 1 shows 15 of 27 (56%) genera apparently showing feeding associations with howlers.

Observations of pairwise displacements (interference) between howlers and contraspecifics show that howlers are frequently subordinate to species with whom they divide space, food, and time (e.g., bees). Such interactions may effectively keep howler numbers in check. Related to this, howlers appear to compete directly for space with eight (30%) species (e.g., iguanas). Such potential costs may translate into decreased feeding rates with a consequently increased chance of mortality or decreased reproductive success (Schoener, 1971).

Since environmental heterogeneity, such as patchily distributed food, may increase costs to reproduction and survival, switching to alternative behaviors such as those presented in Table 1, may be favored to avoid the costs of aggression. In particular, monkeys may switch to non-damaging responses (e.g. pairwise supplantation or interspecific feeding associations) as a function of variations in feeding rates, and the particular alternative behavior observed is expected to be a function of animal species, food type and quality, feeding group size, tree size and density, as well as feeding rates (see Schoener, 1971).

Such events govern interspecific relations within patches and may be perturbed by between patch (regional) disturbances (e.g., patch removal), including extinction. As Nee and May (1992) point out, as patch extinction rate increases, the number of coexisting species does not change in a straightforward manner. The effect upon mantled howlers of the extinction of anthophorid bees 15 km away, for example, could produce no change in population size, a decrease and possible extinction, or an increase in population size. Such unpredictability injects a degree of uncertainty or stochasticity into attempts to quantify the viability parameters of populations.

If metacommunity effects can lead to the persistance or increase of inferior competitors, what traits of mantled howlers may yield higher dispersal rates, lower patch extinction rates, or less clumping in time and space compared to the species to which they are subordinate? Mantled howlers may exhibit higher colonization rates than certain of their superiors who demonstrate greater habitat specificity. Like most primates, howlers tolerate a broad range of habitats. Further, extinction rates may be lower for howlers whose dispersion in time and space is less clumped than, for example, some birds and insects.

On the other hand, howlers may be especially vulnerable to extinction because of their membership in the frugivore guild (see Terborgh, 1986). For howlers at La Pacifica, feeding rates for fruit are more variable than for new leaves or flowers ($p \leq 0.05$, $\chi^2 = 7.11$, $df = 2$), and higher variations in feeding rates are found in patchier deciduous habitat ($p \leq 0.01$, $\chi^2 = 6.77$, $df = 1$). These observations suggest that fruit is more highly dispersed for howlers than new leaves or flowers, possibly contributing to the likelihood of inreased extinction if greater heterogeneity is correlated with increased stochasticity.

Previous reports have documented interspecific associations by howler monkeys (Glander, 1979; Rockwood and Glander, 1979; Young, 1982), but none has analyzed these groups for their significance to regional colonization and extinction. Nee and May (1992) show that competitively inferior species, such as mantled howlers and many other primate species in certain regimes, will increase in number relative to competitively

superior species where rate of colonization relative to patch extinction rate of the inferior is greater than that of the superior competitor or where the dispersion of subordinates is less clumped than that of superiors. This counterintuitive result underlines the power of modeling to identify those data (e.g., dispersal and extinction rates) required to maximize the persistence of primates in communities, and introduces a concept, the metacommunity, "secondary" to metapopulation dynamics (Valone and Brown, 1995; Harrison, 1994) which are appropriately the major focus of primate conservation biology.

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Clara B. Jones, Institute of Animal Behavior, Rutgers University - Newark, 101 Warren Street, Newark, New Jersey 07102, U.S.A.

References

Begon, M. and Mortimer, M. 1986. *Population Biology: A Unified Study of Animals and Plants*. Sinauer Associates, Inc., Sunderland, Massachusetts.

Connell, J. H. 1961. The influence of interspecific competition and other factors on the distribution of the barnacle *Chthamalus stellatus*. *Ecology* 42: 710-713.

Darwin, C. R. 1859. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. John Murray, London.

De Bruyn, G. J. 1980. Coexistence of competitors: a simulation model. *Netherlands J. Zool.* 30: 345-368.

Frankie, G. W., Baker, H. G. and Opler, P. A. 1974. Comparative phenological studies of trees in tropical wet and dry forests in the lowlands of Costa Rica. *J. Ecol.* 62: 881-919.

Glander, K. E. 1979. Feeding associations between howling monkeys and basilisk lizards. *Biotropica* 11: 23-236.

Glander, K. E. 1981. Feeding patterns in mantled howling monkeys. In: *Foraging Behavior: Ecological and Psychological Aproaches*, A. Kamil and T. Sargent (eds.), pp.231-258. Garland Press, New York.

Harrison, S. 1994. Metapopulations and conservation. In: *Large-Scale Ecology and Conservation Biology*, P. J. Edwards, R. M. May and N. R. Webb (eds.), pp.111-128. Blackwell Scientific Publications, Oxford.

Jones, C. B. 1983. Do howler monkeys feed preferentially upon legume flowers at flower-opening time? *Brenesia* 21: 41-46.

Nee, S. and May, R. M. 1992. Dynamics of metapopulations: habitat destruction and comparative coexistence. *J. Anim. Ecol.* 61 37-40.

Pulliam, H. R. and Caraco, T. 1978. Living in groups: is there an optimal group size? In: *Behavioural Ecology: An Evolutionary Approach*, J. R. Krebs and N. B.Davies (eds.), pp. 122-147. Sinauer Associates, Inc., Sunderland Massachusetts.

Rockwood, L. L. and Glander, K. E. 1979. Howling monkeys and leaf-cutting ants: comparative foraging in a tropical deciduous forest. *Biotropica* 11: 1-10.

Schoener, .W. 1971. Theory of feeding strategies. *Ann. Rev. Ecol. Syst.* 2: 36-404.

Terborgh, J. 1986. Keystone plant resources in the tropical forest. In: *Conservation Biology:: the Science of Scarcity and Diversity*, M.E.Soulé (ed.), pp.330-344. Sinauer Associates, Inc., Sunderland, Massachusetts.

Valone, R. G. and Brown, J. H. 1995. Effects of competition, colonization, and extinction on rodent species diversity. *Science* 267: 880-883.

Young, O. P. 1982. Aggressive interaction between howler monkeys and turkey vultures: the need to thermoregulate behaviorally. *Biotropica* 14: 228-231.

DIFFERING RESPONSES TO A PREDATOR (*EIRA BARBARA*) BY *ALOUATTA* AND *CEBUS*

Here I report on an observation of mantled howling monkeys (*Alouatta palliata*) and white-faced capuchins (*Cebus capucinus*) responding to a predator, a tayra (*Eira barbara*). The observation occurred on Barro Colorado Island, Republic of Panama, during an investigation into the feeding ecology of white-faced capuchins.

On 23 September 1993, while following one of the habituated capuchin study groups (see Phillips, 1994, for a detailed description of the troops), I heard loud aggressive vocalizations from capuchins and howlers. Individual capuchins traveled toward the direction of the vocalizations. I followed them, and approximately 30 seconds later came across a tayra surrounded by five capuchins and three howlers. The howlers were clustered high in the trees; the capuchins were in the understorey, close to the tayra. All were directing threats and vocalizations to the tayra, which was on a fallen tree, approximately 2 m off the ground. One adult male capuchin approached the tayra, leaning toward it while directing threats and vocalizing. After 1.5 minutes of reciprocated threats and lunges, the tayra retreated towards the ground. The adult male capuchin followed, continuing to direct threats and lunges. At all times the capuchin maintained a distance of 2-3 m. After retreating, the tayra made no aggressive response, and continued moving away from the group. Once the tayra had left the area, the howlers and some of the capuchins remained

stationary on branches, while others foraged for invertebrates. Most were vigilant and scanned the area frequently, giving alarm calls. After several minutes had passed, the capuchins traveled in the opposite direction to that of the tayra, and resumed their typical activity of foraging and traveling. The howlers remained in the area. Three other incidents involving predator detection and response by capuchins were observed during 280 observation hours. All involved only *Cebus* - no defensive interactions among species were observed.

As reported previously (Boinski, 1988; Chapman, 1986) and supported by the present observation, adult male *C. capucinus* play an active role in group defense. Although the study troop contained two adult males, only one was observed to directly defend the group and approach the predator. A second adult male directed vocalizations and threats from a distance of approximately 3 m. Female white-faced capuchins generally do not become involved in group defense situations (Fedigan, 1993). In the present observation, an adult female carrying an infant was present, vocalizing and directing threats to the tayra. She remained 3-5 m away from the tayra throughout.

This observation illustrates the differing strategies employed by howlers and capuchins when confronting a potential predator. Whereas *Cebus* responses (particularly the adult male's) were active and directed towards the predator, the howlers remained high in emergent trees, vocalizing loudly. Julliot (1994) reported similar behavior by howlers in response to a crested eagle (*Morphnus guianensis*).

Kim Phillips, Departments of Psychology and Biology, Hiram College, Hiram, Ohio 44234, USA.

References

Boinski S. 1988. Use of a club by a wild white-faced capuchin (*Cebus capucinus*) to attack a venomous snake (*Bothrops asper*). *Am. J. Primatol.* 14: 177-179.

Chapman, C.A. 1986. *Boa constrictor* predation and group response in white faced *Cebus* monkeys. *Biotropica* 18: 171-172.

Fedigan, L.M. 1993. Sex differences and intersexual relations in adult white-faced capuchins (*Cebus capucinus*). *Int. J. Primatol.* 14: 853-877.

Julliot, C. 1994. Predation of a young spider monkey (*Ateles paniscus*) by a crested eagle (*Morphnus guianensis*). *Folia Primatol.* 63:75-77.

Phillips, K.A. 1994. Resource distribution and sociality in white-faced capuchins, *Cebus capucinus*. Unpublished Ph.D. thesis, The University of Georgia, Athens.

On the Occurrence of Parasites in Free-Ranging Callitrichids

From April 1994 to February 1995, 46 individuals of three species of callitrichids (25 black-chinned emperor tamarins, *Saguinus imperator imperator*; 19 saddleback tamarins, *Saguinus fuscicollis weddelli*; and two pygmy marmosets, *Cebuella pygmaea*) were captured in a so-called "*Saguinus* trap" (Encarnación *et al.*, 1990). The study site, the Zoobotanical Park of the Federal University of Acre (9°56'30" - 9°57'19"S, 67°52'08" - 67°53'00"W; 155 m above sea level, area 100 ha), Rio Branco, Acre, Brazil, is characterized by the presence of secondary forests in different successional stages (Calegaro-Marques and Bicca-Marques, 1994). Fecal samples were collected whenever available in order to analyze the presence of ova from gastrointestinal parasites using the Willis method (Matos and Matos, 1981).

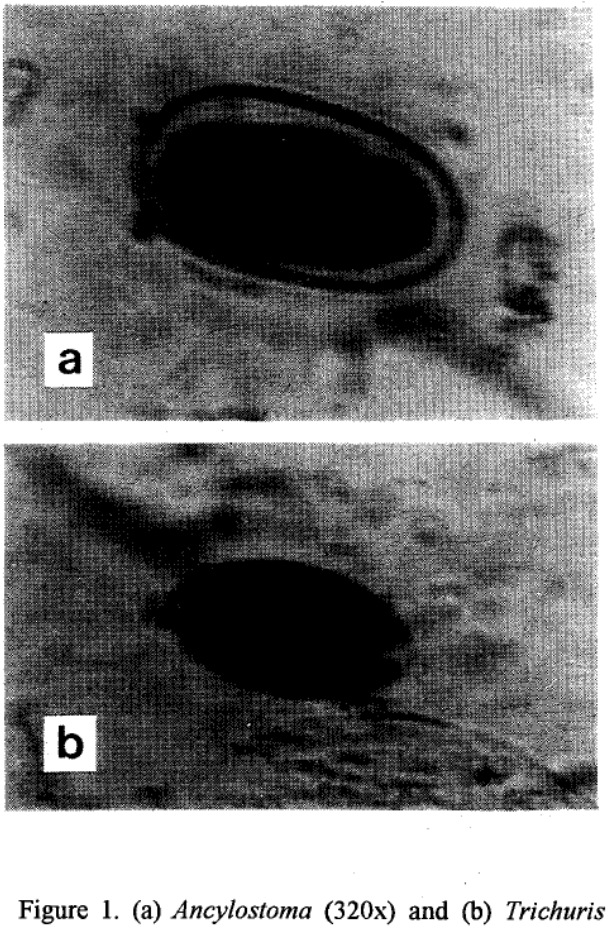

Figure 1. (a) *Ancylostoma* (320x) and (b) *Trichuris* (128x) ova found in *Saguinus fuscicollis weddelli* fecal samples.

Fourteen samples were examined and three nematode genera were found: *Ancylostoma* (Fig. 1a) and *Trichostrongylus*, Strongylidea, and *Trichuris* (Fig. 1b), Trichuridea (Table 1). Three *S. f. weddelli* infested with *Ancylostoma* sp. presented yellow cutaneous papules of about 2-4 mm in diameter in the abdominal region, which may be related a similar infection in cats and dogs (Freitas, 1977). These papules were found in just one *S. i. imperator*, but no fecal sample was examined for this individual. Another *S. i. imperator* naturally eliminated an adult male acanthocephalan parasite: *Prosthenorchis* (Fig. 2), Gigantorhynchidea.

Table 1. Occurrence of nematoid ova in the fecal samples examined in three callitrichid species.

Species	No.of Samples	No (%) of Positive Samples			No.(%) of Negative Samples
		Ancylostoma	*Trichostrongylus*	*Trichurus*	
S. f. weddelli	7	5 (71)	-	1 (14)	2 (29)
S. i. imperator	6	-	1 (17)	-	5 (83)
C. pygmaea	1	-	-	-	1 (100)

Infection with these parasites can be oral (all genera) or through the skin during lactation and pregnancy in the case of *Ancylostoma* (Freitas, 1977). The higher infection of *Ancylostoma* in *S. f. weddelli* when compared to *S. i. imperator* may be related to the species' behavior. *S. f. weddelli* at the study site use mainly the lower strata of the forest, from 0 to 10 m (Azevedo *et al.*, 1994), often going to the ground. On the ground it may be more vulnerable to infectious larvae that actively penetrate through the skin. The occurrence of the parasitic nematodes in this callitrichid community may be related to the relatively intense use of the Park by humans in at least some of the areas. Natural infection of callitrichids by acanthocephalans seems to occur through ingestion of insect prey, the probable intermediate hosts (Hershkovitz, 1977).

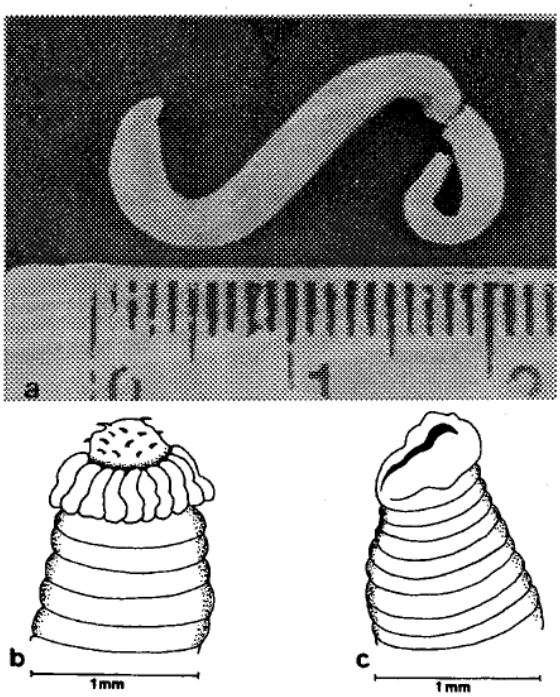

Figure 2. (a) An adult male *Prosthenorchis*, which was naturally eliminated by a *Saguinus imperator imperator*, and details of its (b) anterior and (c) posterior regions.

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Francisco G. de Araújo Santos, Júlio César Bicca-Marques, Cláudia Calegaro-Marques, Elvira M.P. de Farias and **Maria Aparecida de O. Azevedo**, Departamento de Ciências da Natureza, and Parque Zoobotânico, Universidade Federal do Acre, 69915-900 Rio Branco, Acre, Brasil.

References

Azevedo, M.A.O., Bicca-Marques, J.C. and Calegaro-Marques, C. 1994. Levantamento das populações de primatas diurnos do Parque Zoobotânico, Rio Branco - AC. Paper presented at 1ª Jornada Nacional de Iniciação Científica and 46ª Reunião Anual da Sociedade Brasileira para o Progresso da Ciência (SBPC), Vitória, Espírito Santo. 17-22 July, 1994.

Calegaro-Marques, C. and Bicca-Marques, J.C. 1994. Ecology and social relations of the black-chinned emperor tamarin. *Neotropical Primates* 2(2):20-21.

Encarnación, F., Moya, L., Soini, P., Tapia, J. and Aquino, R. 1990. La captura de Callitrichidae (*Saguinus* y *Cebuella*) en la Amazonia Peruana. In: *La Primatologia en el Perú*, N.E.Castro-Rodríguez (ed.). pp.45-56. Proyecto Peruano de Primatologia, Iquitos.

Freitas, M.G. 1977. *Helmintologia Veterinária.* 3rd Edition. Rabelo & Brasil Ltda., Belo Horizonte.

Hershkovitz, P. 1977. *Living New World Monkeys (Platyrrhini), With an Introduction to the Primates, Vol.1.* University of Chicago Press, Chicago.

Matos, M.S. and Matos, P.F. 1981. *Laboratório Clínico Médico Veterinário*. Arco-Iris, Salvador.

UPDATING THE KNOWN DISTRIBUTION OF THE PYGMY MARMOSET (*CEBUELLA PYGMAEA*) IN THE STATE OF ACRE, BRAZIL

In a recent review, Rylands *et al.* (1993) stated that the exact distribution of the pygmy marmoset, *Cebuella pygmaea*, is not well known. Available data suggest that, in Brazil, the species is confined to the west of the Rios Purús and Japurá (Fig. 1a), although its presence in northern Bolivia indicates that it should occur in parts of eastern Acre (Rylands *et al.*, 1993).

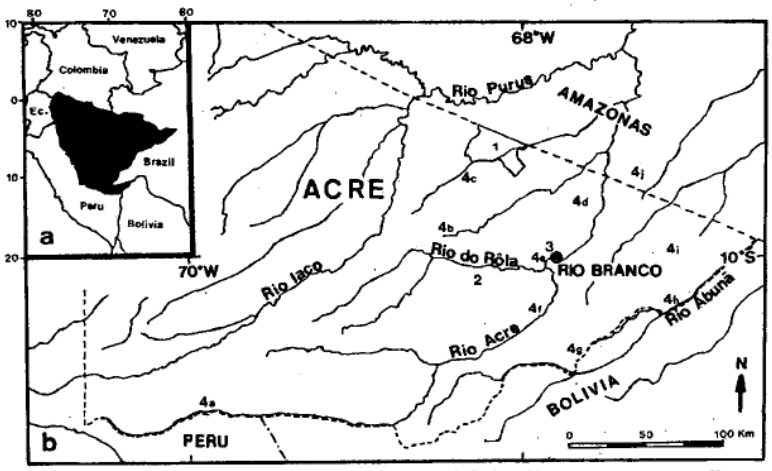

Figure 1. Map showing the (a) distribution of *Cebuella pygmaea* according to Rylands *et al.* (1993) and (b) localities reported in this paper: (1) Antimari State Forest, (2) Rio do Rôla basin, (3) Zoobotanical Park of the Federal University of Acre, (4) the localities cited in Fernandes (1990), as follows; (4a) headwaters of the Rio Acre in the Rio Acre Indigenous Area, (4b) AC-90 highway, (4c) and (4i) localities on the BR-364 highway, (4d) AC-10 highway, (4e) city of Rio Branco, (4f) Rio Acre, (4g) and (4j) localities on the BR-317 highway, and (4h) AC-40 highway.

Recent field surveys in the state of Acre have found the species inhabiting the region between the Rios Iaco and Acre: the Antimari State Forest (Calouro *et al.*, 1991), Rio do Rôla basin (Brazil, IMAC, 1993), and the Zoobotanical Park of the Federal University of Acre (Azevedo *et al.*, 1994; Santos *et al.*, 1995) (Fig. 1b). The Antimari State Forest (9°01'15"- 9°11'41" S, 68°00'19" - 68°01'45" W; 250-300 m above sea level) is a reserve of mainly primary forest of 66,168 ha in size, located in the municipalities of Bujari and Sena Madureira, and crossed by the Rio Antimari, a tributary of the Rio Acre (Calouro *et al.*, 1991; Brazil, FUNTAC, 1987). The Riozinho do Rôla basin (10° - 11° S, 68° - 69° W; 216-260 m above sea level) (Brazil, IMAC, 1993) covers an area of approximately 780,000 ha in the municipalities of Rio Branco and Xapuri. This region is covered by open tropical rainforest with a predominance of bamboos, lianas and palms (Brazil, IMAC, 1993). The Zoobotanical Park (9°56'30" - 9°57'19" S, 67°52"08" - 67°53'00" W; 155 m above sea level) is a forest fragment of 100 ha in size, located in the suburbs of the city of Rio Branco. The vegetation there is composed mainly of secondary forest in different successional stages (Calegaro-Marques and Bicca-Marques, 1994). While carrying out a survey of the captive primates in the city of Rio Branco, Fernandes (1990) received information on the occurrence of *Cebuella* in several places within the area between the Rio Iaco, a right bank tributary of the Rio Purús and the Rio Abunã, a left bank tributary of the Rio Madeira.

Although some caution should be exercised in drawing conclusions from Fernandes' (1990) data, they are also included in Figure 1b. We believe, however, that the range of *Cebuella* may be even wider than reported here, and that the Rio Madeira is the limit to its distribution in the east. The Rio Madeira is also the western limit to the range of the Amazonian *Callithrix*, and may, therefore, delimit the distributions of the two specialized gummivore marmosets, which according to Ferrari (1993) may be at least parapatric.

Júlio César Bicca-Marques and **Cláudia Calegaro-Marques**, Departamento de Ciências da Natureza and Parque Zoobotânico, Universidade Federal do Acre, 69915-900 Rio Branco, Acre, Brazil.

References

Azevedo, M.A.O., Bicca-Marques, J.C. and Calegaro-Marques, C. 1994. Levantamento das populações de primatas diurnos do Parque Zoobotânico, Rio Branco - AC. Paper presented at 1ª Jornada Nacional de Iniciação Científica and 46ª Reunião Anual da Sociedade Brasileira para o Progresso da Ciência (SBPC), Vitória, Espírito Santo. 17-22 July, 1994.

Brazil, FUNTAC. 1987. Relatório do Projeto PD94/90 (ITTO). Fundação de Tecnologia do Estado do Acre (FUNTAC), Rio Branco.

Brazil, IMAC. 1993. Relatório da Caracterização Preliminar da Bacia Hidrográfica do Riozinho do Rôla. Unpublished report, Instituto de Meio Ambiente do Acre (IMAC), Rio Branco.

Calegaro-Marques, C. and Bicca-Marques, J.C. 1994. Ecology and social relations of the black-chinned emperor tamarin. *Neotropical Primates* 2(2):20-21.

Calouro, A.M., Medeiros, M. and Diógenes, M.B. 1991. Estudos de Fauna na Floresta Estadual do Antimari. Unpublished report, Fundacão de Tecnologia do Estado do Acre (FUNTAC), Rio Branco.

Fernandes, M.C.A.G. 1990. Distribuição de Primatas Não-Humanos no Estado do Acre e Vizinhanças: Um Estudo Preliminar. Unpublished undergraduate thesis, Universidade Federal do Acre, Rio Branco.

Ferrari, S.F. 1993. Ecological differentiation in the Callitrichidae. In: *Marmosets and Tamarins: Systematics, Behaviour, and Ecology*, A. B. Rylands (ed.), pp.314-328. Oxford University Press, Oxford.

Rylands, A.B., Coimbra-Filho, A.F. and Mittermeier, R.A. 1993. Systematics, geographic distribution, and some notes on the conservation status of the Callitrichidae. In: *Marmosets and Tamarins: Systematics, Behaviour, and Ecology*, A. B. Rylands (ed.), pp.11-77. Oxford University Press, Oxford.

Santos, F.G.A., Bicca-Marques, J.C., Calegaro-Marques, C., Farias, E.M.P. and Azevedo, M.A.O. 1995. On the occurrence of parasites in free-ranging callitrichids. *Neotropical Primates* 3(2): 46-47.

News

CAMP PARA PRIMATES MEXICANOS Y PHVA PARA *ALOUATTA PALLIATA MEXICANA*

Introducción

Bajo la coordinación de Susie Ellis y Phil Miller por parte del Grupo Especialista en Conservación en Cautiverio (CBSG por sus siglas en inglés) y de Ernesto Rodríguez-Luna, Co-vice presidente del PSG, Sección Neotropical, y la colaboración de Liliana Cortés-Ortiz (asistente editorial del *Neotropical Primates*) así como de otros membros de la Asociación Mexicana de Primatología (AMP) y de la Asociación de Zoológicos, Criaderos y Acuarios de la República Mexicana (AZCARM), se celebró un CAMP (Taller de Conservación, Evaluación y Mejo Planificado) para los primates mexicanos. En esta misma ocasión se desarrollo un PHVA (Taller de Evaluación de Viabilidad de Población y Hábitat) para *Alouatta palliata mexicana*. Ambos talleres se verificaron en la ciudad de Puebla, México, del 27 de febrero al 4 de marzo de 1995. La organización general del evento, donde simultáneamente se celebró un CAMP para los felinos mexicanos, tuvo como responsable a Amy Camacho, presidenta de la AZCARM y directora del Zoológico African Safari. En esta reunión el Dr. Ulysses Seal, presidente de CBSG, brindó una plática acerca de la labor y tipo de trabajo que realiza este Grupo.

La reunión de especialistas permitió un profundo análisis de la situación de las poblaciones silvestres de monos, en el que todos participaron desde distintas perpectivas, aportando recomendaciones para el estudio y la acción conservacionista. De estos talleres surgieron ideas generales para futuros trabajos conjuntos. Próximamente el CBSG distribuirá ampliamente los documentos derivados de los talleres, a fin de someterlos a la consideración crítica de otros colegas. A continuación se presentan algunas de las ideas desarrolladas durante la reunión.

CAMP para primates mexicanos

El principal objetivo de los talleres CAMP es determinar el nivel de riesgo en que se encuentran los integrantes de un taxón, bajo consideración de un grupo de especialistas. Los informes CAMP proporcionan un marco global para manejo intensivo en el medio silvestre y en cautiverio.

En este taller fue analizada la situación de los monos araña, *Ateles geoffroyi vellerosus* y *A. g. yucatanensis*, así como de los monos aulladores, *Alouatta palliata mexicana* y *A. pigra*.

Una conclusión general para los taxa estudiados es relativa a la acelerada desaparición de su hábitat, el cual se ha reducido a un 10% de su extensión original. El principal motivo para la transformación del hábitat, bosques tropicales, ha sido la necesidad de abrir áreas para la agricultura y la ganadería, como exigencia de una población humana en continuo crecimiento.

La fragmentación del hábitat parece afectar más dramáticamente a las poblaciones de monos araña, las cuales desaparecen rápidamente; en comparación, el mono aullador de manto (*A. palliata mexicana*) aparenta tolerar más la perturbación humana y se le encuentra en reducidos fragmentos de vegetación. Se ha reportado que el aullador negro no es tan tolerante.

De acuerdo a la estimación de números poblacionales y de hábitat disponible para los cuatro taxa, las dos subespecies de mono araña en México acusan un grave riesgo de desaparición (Vulnerable), así como el mono aullador de manto. El caso del aullador negro no es tan crítico (Riesgo Bajo), aún cuando merece atención. Sin duda, el factor más agravante para las poblaciones de monos es la desaparición del hábitat. Sin embargo, la caza y captura de animales es otro factor que debe considerarse, ya que constituye una amenaza importante, particularmente en regiones donde el hábitat se encuentra fragmentado. El tráfico de monos se pratica de manera generalizada en el sur de México, sin que existan medidas efectivas para controlarlo. El destino de los animales sobreviventes a este comercio ilegal es el convertirse en mascotas, que terminan donadas a zoológicos o instituciones públicas.

Se tiene registro de un considerable número de colonias de monos araña en instituciones mexicanas, sin embargo, su identidad taxonómica es desconocida en la mayoría de los casos; por lo que existe la posibilidad de hibridismo y no pueden ser consideradas para acciones conservacionistas, a no ser como elementos para programas educativos. En tanto, los monos aulladores rara vez son mantenidos en cuativerio, dada la dificultad

de su manejo. Al respecto, no se recomienda iniciar programas en cautiverio para contribuir genética o demográficamente a la conservación de estos taxa, aunque se sugiere aprovechar los recursos existentes, principalmente para investigacíon.

Al final del taller se hicieron recomendaciones para el estudio y desarrollo de acciones conservacionistas en favor de los primates mexicanos. Se destacó la necesidad de realizar más trabajo de campo que genere información relevante para el diseño de estrategias y tácticas conservacionistas. Al mismo tiempo, se enfatizó la importancia de asegurar la permanecia de poblaciones silvestres de monos en áreas naturales declaradas como protegidas y en aquellas que aún no lo son, pero que podrían sumarse a esta condición para la conservación *in situ*.

PHVA para *Alouatta palliata mexicana*

El principal objetivo de los talleres PHVA es la evaluación de especies (o subespecies) en su estado actual, así como bajo diferentes escenarios ecológicos probables, donde se consideran amenazas y estrategias de manejo. En estos ejercicios se utiliza información biológica del taxón, y particularmente datos demográficos y genéticos de las poblaciones. Al mismo tiempo se valoran los factores ambientales que influyen sobre las poblaciones.

Una característica importante de estos talleres es el poder obtener información de los expertos que aún no esté lista para ser publicada, pero que puede ser de gran importancia para comprender la situación del taxón. Esta información aportará las bases para construir simulaciones de las poblaciones, a través de un modelo que permita el análisis de efectos determinísticos y estocásticos, así como de las interacciones entre factores genéticos, demográficos, ambientales y catastróficos, que determinan la dinámica de la población y su riesgo de extinción. El modelo pretende simular la biología de la especie, tal como se conoce actualmente y aportar la base para discutir alternativas de manejo.

Durante este taller, para estimar el riesgo en posibles escenarios ecológicos, se utilizó un modelo de simulación (VORTEX, versión 7.0) y se identificaron factores críticos para el decremento de las poblaciones. Asimismo, se consideraron algunas alternativas de manejo que podrían mejorar la situación del primate. Se reconoció que para esta evaluación se dispusó de datos de desigual calidad, siendo necesario realizar suposiciones. Por tanto, muchas de las conclusiones y recomendaciones deberán ser consideradas críticamente conforme se disponga de mejor información.

Dada la acelerada perturbación, fragmentación y pérdida del hábitat de este mono, es necesario desarrollar un programa de estudio y conservación que asegure su permanencia como parte del patrimonio natural de México.

A continuación se presenta un resumen de las recomendaciones para el estudio y conservación de *Alouatta palliata mexicana*:

Estudios: a) taxonomía, b) distribución, c) ocupación de distintos tipos de hábitat, d) densidad poblacional y estimación de ámbito hogareño en distintas condiciones ambientales, e) cambios en la organización social en relación a variación ambiental; f) crecimiento poblacional (tasas de natalidad y mortalidad), g) migración entre poblaciones, h) cambios en las estrategias de forrajeo, i) efectos de la fragmentación sobre poblaciones silvestres y j) estudios sobre caza, captura y comercialización de animales.

Acciones conservacionistas: 1) Mejorar manejo en áreas naturales protegidas: protección legal, vigilancia, monitoreo de poblaciones, restauración ecológica, desarrollo de programas educativos, reintroducción y/o suplementaciones (sólo en condiciones especiales y bajo estrictas medidas de seguridad) y vinculación (instituciones de investigación, dependencias gubernamentales, asentamientos humanos locales) para desarrollo de programas; 2) Establecer nuevas áreas naturales protegidas: prospección de áreas candidatas con poblaciones silvestres de monos, identificación y planteamiento de áreas apropriadas para conservación, propuesta de plan de manejo y todos los citados para el punto anterior; 3) Desarrollar un programa de translocaciones (programa piloto): análisis de factibilidad (poblaciones y área de liberación), captura, transporte, evaluación clínica, manejo en cautiverio, liberación y monitoreo; 4) Manejo de metapoblación en hábitat fragmentado: identificación de áreas fragmentadas, translocaciones, monitoreo y manejo de población viable; 5) Control y reducción de tráfico: formulación de norma jurídica apropiada, vigilancia efectiva en áreas silvestres, vigilancia efectiva en zonas rurales y urbanas donde se realiza la comercialización, mecanismo apropiado para la formulación de denuncias, consigranciones y decomisos, penalización debidamente tipificada para los traficantes, campaña educativa para impedir el tráfico y canalización de animales decomisados; 6) Educación: desarrollo de programas para lograr una actividad favorable y de colaboración hacia la conservación de los primates, utilizando diferentes medios masivos de comunicación y implementación de programas educativos en los zoológicos; 7) Colaboración interinstitucional: sociedades científicas, instituciones educativas y zoológicos, dependencias gubernamentales, sectores de la sociedad civil y organismos internacionales dedicados a la conservación; y 8) Incluir las estrategias de conservación de los primates en programas de conservación regionales:

promoción de alternativas de desarrollo sustentable y hacer copartícipes de los programas a los habitantes locales.

En este taller participaron 38 personas de 17 instituciones, que contribuyeron con su experiencia y entusiasmo. El borrador del informe de este taller será distribuido por el CBSG en fecha próxima, esperando como respuesta los comentarios de otros colegas, a fin de perfeccionar el análisis y las recomendaciones en favor de este taxón.

Para mayor información pueden contactar con: Susie Ellis y Phil Miller, CBSG, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124, USA, Tel: 1 (612) 431 9325, Fax: 1 (612) 432 2757, e-mail: cbsg@epx.cis.umn.edu, o con Ernesto Rodríguez-Luna y Liliana Cortés, Instituto de Neuroetología, Universidad Veracruzana, A.P.566, C.P. 91000, Xalapa, Veracruz, México, Tel. y Fax: 52 (28) 12-5748, e-mail: saraguat@speedy. coacade.uv.mx.

Resource Distribution and Sociality in White-faced Capuchins, *Cebus capucinus*

White-faced capuchins (*Cebus capucinus*) at Barro Colorado Island, Panama, appear to have a flexible foraging strategy. Typically, foraging party size is small and individuals feed dispersed from one another. When seasonal fruiting of large volume trees occurs, the majority of the group forages simultaneously. As *C. capucinus* do not display a rigorous dominance structure and there are few indications that individuals or coalitions monopolize food patches, individuals were expected to display scramble strategies instead of high frequencies of contest competition. Foraging party size (simultaneous foragers), the total number of animals to feed successively, and the diameter at breast height (DBH) of fruit trees used, were recorded in two habituated troops. Individuals in each group spent a substantial amount of time (65% and 48% of foraging time for each group) foraging in a party size of one. Monkeys predominantly foraged alone in small trees (0 - 20 cm DBH), successively in medium trees (21-60 cm DBH), and simultaneously in large trees (>51 cm DBH). Small trees were used more frequently than all other size classes. In medium-sized trees, although fruit was plentiful, space was limited. *Cebus* foraged successively in these trees. In large volume trees, space and fruit were abundant and several individuals fed together. As the DBH of fruiting trees increased, the average foraging party size increased exponentially. *Cebus capucinus* at Barro Colorado modify their foraging party size to adapt to seasonal patterns of fruit production.

Data was also collected on rates of aggressive interactions in clumped and dispersed resource contexts. Individual fruiting trees with separate crowns were considered separate food patches, and the distribution of fruit within a tree was classified as occurring in clumps or dispersed evenly throughout the tree. Insects were considered dispersed resources. The overall rates of resource-based aggression and affiliation were low (aggression: 0.86 events per hour); affiliation: 1.66 events per hour). Although the majority of foraging bouts (82%) occurred on dispersed resources, aggressive and affiliative interactions were significantly more likely to occur in clumped resource contexts than in dispersed resource contexts. Females performed more affiliative behavior than males. However, females were not shown to associate preferentially with other females. Males and females did not differ in the rate of aggression performed, and no sex difference for recipient was detected for either male or female targets of aggression. The combination of low rates of affiliative and aggressive interactions, the predominant use of dispersed resources, and weak social relations lead to the conclusion that scramble competition prevails, and association patterns are individualistic.

This study comprised a PhD. thesis for the University of Georgia, Athens. It was supervised by Dr Irwin S. Bernstein, and supported in part by the University of Georgia.

Kim A. Phillips, Departments of Psychology and Biology, Hiram College, Hiram, Ohio 44234, USA.

Reference

Phillips, K. A. 1994. Resource Distribution and Sociality in White-Faced Capuchins, *Cebus capucinus*. Unpublished Ph.D. dissertation University of Georgia, Athens.

Ecology and Feeding Behavior of Masked Titi Monkeys

Klaus-Heinrich Müller, research assistant at the German Primate Center (DPZ), Göttingen, Germany, completed his doctoral thesis 'Ecology and Feeding Behavior of Masked Titi Monkeys (*Callicebus personatus melanochir*, Cebidae, Primates) in the Atlantic Rain Forest of Eastern Brazil" in May 1995 at the University of Berlin. The research was supervised by Prof. Dr. H. -J Kuhn, and made possible through collaboration between the Rio de Janeiro Primate Center (CPRJ/FEEMA), Director Dr. Alcides Pissinatti, and the German Primate Center, Director Prof. Dr. H. -J. Kuhn. It was supported by the Deutscher Akademischer Austauschdienst (DAAD) and the Deutsche Forschungsgemeinschaft (DFG). The following is a summary of the thesis:

A short term study of six complete days, published by Kinzey and Becker (1983), was the first attempt to collect data on *Callicebus personatus*. The aim of the thesis was to obtain further data on the ecology of masked titis through a long-term study. The research was carried out in a forest area of about 100 ha, located in the Lemos Maia Experimental Station (CEPLAC) near the town of Una in southern Bahia. The project was started in June 1991. Due to the difficulty of following the masked titis, radio-telemetry was used in order to locate the groups for habituation. After chemical immobilization, a transmitter was attached to one of the group members. The animals then became habituated after six weeks. Details of the methods involved in capture and radio-tracking were reported by Müller (1994). Between October 1992 and September 1993, two groups of titi monkeys were observed during 101 days. The total observation time was 1030 hours.

Masked titis are active for an average of 10 hours and 12 minutes during the day, with a maximum of 11 hours and three minutes (March) and a minimum of 8 hours and 40 minutes (July). Budgets for the principal activities are shown in the table.

Activity	Duration	%
Locomotion	3 h 24 min.	32.1
Feeding	2 h 48 min	27.1
Resting	3 h 54 min.	40.0
Playing	6 min.	0.8

Masked titis are predominantly frugivorous: 76.6% of the diet consisted of fruits, 17.2% leaves. Other components included flowers, buds, stems, insects and soil, totalling 1.8% of the diet. A seasonal difference in food intake was observed: during the warm season, a greater proportion of the diet consisted of fruits, whereas this was true for leaves in the cooler season. Fruits and leaves of 11 species eaten by the titis comprised 60% of the diet. This contrasts with the information available for other *Callicebus* species, where three to six plant species took up 60% of the diet. Masked titis are as such more eclectic feeders.

The distance between food patches used during the day averaged 109 m. In addition, 81.6% of the trees used by the monkeys had a crown diameter of less than 10 m. The relatively long food patch distance compared with other primates, and the large number of small-crowned trees used, would indicate that nutritional resources are small and uniformly dispersed in their habitat. This might indicate why *Callicebus personatus* form small family groups. Furthermore, as discussed in the thesis, it might explain their monogamous mating system.

The project was continued, beginning in October 1993, by two DPZ doctoral students under the supervision of myself and Dr Alcides Pissinatti. The focus of their study includes aspects of optimal foraging strategies and their social behavior. It will continue until July 1995. Other primatologists interested in studying these animals for a Master's or Doctoral degree should contact Dr Müller or Dr Pissinatti.

Klaus-Heinrich Müller, Abteilung Ökologie, Deutsches Primatenzentrum (DPZ), Kellnerweg 4, D-37007 Göttingen, Germany, and **Alcides Pissinatti**, Centro de Primatologia do Rio de Janeiro (CPRJ/FEEMA), Rua Fonseca Teles 121, Sala 1624, São Cristóvão, 20940 Rio de Janeiro, Rio de Janeiro, Brazil.

References

Kinzey, W. G. and Becker, M. 1983. Activity pattern of the masked titi monkey, *Callicebus personatus*. *Primates* 24(3): 337-343.

Müller, K. -H. 1994. Capture and radio-telemetry of masked titi monkeys, *Callicebus personatus melanochir*. *Neotropical Primates* 2(4): 7-8.

Müller, K. -H. 1995. Langzeitstudie zur Ökologie von schwarzköpfigen Springaffen (*Callicebus personatus melanochir*, Cebidae, Primates) im atlantischen Küstenregenwald Ostbrasiliens. University of Berlin, Berlin.

CYTOGENETIC STUDIES IN THE FAMILY ALOUATTINAE

Alouatta is the single genus within the subfamily Alouattinae of the Neotropical family Cebidae (Napier and Napier 1967). The six species currently recognized by most authorities have a widespread distribution from southern Mexico to northern Argentina (Wolfheim, 1983; Crockett, 1986).

Although previous karyological studies of this genus are scarce, many interesting rearrangements have been reported, with inter- and intraspecific chromosomal variations detected. Five species have been analyzed for their karyotypes, and the diploid number ranged from 43 in *A. seniculus* to 54 in *A. palliata*. Different translocations have been reported in four of the five species analyzed: *A. palliata* (*v.* Ma *et al.*, 1975), *A. belzebul* (*v.* Armada *et al.*, 1987), *A. seniculus* (*v.*Yunis *et al.*, 1976; Minezawa *et al.*, 1985; Lima and Seuánez, 1992), and *A. fusca* (*v.* Koiffmann, 1977). Studies of the *A. caraya* karyotype have shown a constant diploid number of 52, and translocations or other rearrangements have not been found to date (Mudry *et al.*, 1992).

Due to these facts and the confused taxonomic relationships within this group, research into the chromosomal and phylogenetic relationships of the

Alouattinae is being carried out for the four species occurring in Brazil: *A. seniculus*, *A. belzebul*, *A. fusca*, and *A. caraya*. Blood samples were collected from individuals in a number of institutions: the Centro de Primatologia do Rio de Janeiro (CPRJ/FEEMA); the Fundação Rio-Zoo, Rio de Janeiro; Itaipú Binacional, Foz do Iguaçu, Paraná; Passeio Público de Curitiba, Paraná; the Centro Nacional de Primatas, Belém; the Museu Paraense Emílio Goeldi, Belém; and the Centro Argentino de Primatologia (CAPRIM), Corrientes, Argentina.

The research involves the cytogenetic characterization of the four species through banding techniques (G, C, and NOR). Using the data in conjunction with that previously published, a model will be proposed of the chromosomal evolution of the genus leading to the karyotypic variation observed today, which will clarify the phylogenetic relationships within the subfamily.

The research is part of a Master's thesis for the postgraduate course in genetics of the Federal University of Paraná, Curitiba, supervised by Dr. Ives J. Sbalqueiro in collaboration with Prof. Margarida M. C. Lima (Federal University of Pará). It is supported by the Federal University of Pará, the Federal University of Paraná, and the Brazil Science Council (CNPq).

Edivaldo H. Corrêa de Oliveira, Caixa Postal 19095, 81531-990 Curitiba, Paraná, Brazil.

References

Armada, J.L.A., Barroso, C.M.L., Lima, M.M.C., Muniz, J.A.P.C. and Seuánez, H.N. 1987. Chromosome studies in *Alouatta belzebul*. *Am. J. Primatol.* 13: 283-296.

Crockett, C.M. 1986. Diet, dimorphism and demography: perspectives from howlers to hominids. In: *Primate Models for the Evolution of Human Behavior*, W.G.Kinzey (ed.), pp.115-135. State University of New York Press, New York.

Koiffmann, C.P. 1977. Variabilidade cromossômica na familia Cebidae. Unpublished Ph.D. dissertation, University of São Paulo, São Paulo.

Lima, M.M.C. and Seuánez, H.N. 1991. Chromosome studies in the red howler monkey, *Alouatta seniculus stramineus* (Platyrrhini, Primates): description of an X1X1X2X2/X1X2Y sex chromosome systems and karyological comparisons with other subspecies. *Cytogenet. Cell Genet.* 57: 151-156.

Ma, N.S.F., Jones, T.C., Thorington Jr, R.W., Miller, A. and Morgan, L. 1975. Y-autosome translocation in the howler monkey (*Alouatta palliata*). *J. Med. Primatol.*, 4: 299-307.

Minezawa, M., Harada, M., Jordan, O.C. and Borda, C.J.V. 1985. Cytogenetics of Bolivian endemic red howler monkeys (*Alouatta seniculus sara*): accessory chromosomes and Y-autosome translocation related numerical variations. *Kyoto Univ. Overseas Res. Rep. of New World Monkeys* 5: 7-16.

Mudry, M.P., Zunino, G.E., Slavutsky, I. and Delprat, A. 1992. Cariotipo, fenotipo y caracteristicas poblacionales del mono aullador negro (*Alouatta caraya*) de la Argentina. *Bol. Primatol. Latinoamericano* 3(1): 1-10.

Napier, J.R. and Napier, P.H. 1967. *A Handbook of Living Primates*. Academic Press, London.

Wolfheim, J.H. 1983. *Primates of the World: Distribution, Abundance and Conservation*. University of Washington Press, Seattle.

Yunis, E.J., Torres de Caballero, O.M. and Ramirez, C. 1976. Chromosomal variations in *Alouatta seniculus seniculus*. *Folia Primatol.* 25: 215-224.

RIO NEGRO STATE PARK: A NEW PROTECTED AREA IN THE BRAZILIAN AMAZON

The Rio Negro State Park, *c.* 436,042 ha, was decreed by the Governor of the State of Amazonas in April 1995 (State Decree No. 16.497 / 2 April 1995). It is located on both sides of the Rio Negro, north-west of Manaus, in the

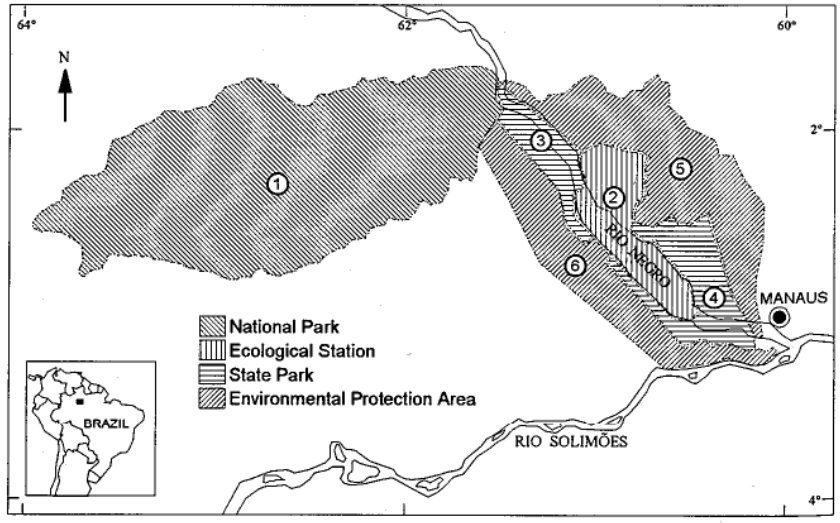

Figure 1. Map showing the location of: 1) Jaú National Park, 2) Anavilhanas Ecological Station, 3) Rio Negro State Park, northern sector, 4) Rio Negro State Park, southern sector, 5) Left Bank of the Rio Negro Environmental Protection Area, and 6) Right Bank of the Rio Negro Environmental Protection Area.

municipalities of Manaus, Novo Airão, Iranduba, and Manacapuru. The Park is divided into two sectors, taking in parts of both banks of the Rio Negro (Fig. 1). The northern part (*Setor Norte*) covers approximately 178,620 ha, and the southern part (*Setor Sul*) approximately 257,422 ha.

Of particular interest was the simultaneous creation of two Environmental Protection Areas (APA) surrounding the two sectors of the State Park: Left Bank of the Rio Negro (740,757 ha) and the Right Bank of the Rio Negro (554,334 ha) (State Decree 16.498 / 2 April 1995). These will act as buffer zones for the State Park. The State Park itself completely surrounds the Anavilhanas Ecological Station (Federal) of 350,018 ha, and the northern sector of the Park and the APA of the Right Bank of the Rio Negro are contiguous with the Jaú National Park, the largest Park in Amazonia, of 2,270,000 ha, and covering the large majority of the Rio Jaú basin. This complex of protected areas covers a remarkable 3,056,060 ha, with a further 1,259,091 ha of Environmental Protection Areas. It represents, as such, the second largest continuous area of parks and reserves in the Amazon basin (and the entire South American continent). First place is taken by the Pico de Neblina National Park of 2,200,000 ha (Brazil), contiguous with the Serrania La Neblina National Park (Venezuela) of 1,360,000 ha.

The primates with distributions on the left bank of the Rio Negro include: *Saguinus midas midas, Saimiri sciureus sciureus, Aotus trivirgatus, Cebus apella apella, Cebus nigrivittatus, Pithecia pithecia chrysocephala, Chiropotes satanas chiropotes, Alouatta seniculus*, and *Ateles paniscus*. Those with distributions on the right bank of the Rio Negro include: *Saimiri sciureus cassiquiarensis, Aotus vociferans, Callicebus torquatus torquatus* (lower Rio Negro near its mouth), *C. t. lugens* (to the north of *C. t. torquatus* and upper Rio Negro, west of the Rio Branco), *Cebus apella apella, Cebus albifrons, Pithecia pithecia lotichiusi, Cacajao melanocephalus ouakary* and *Alouatta seniculus*. No tamarin is known for the western part of the basin of lower Rio Negro, but the possibility remains that *Saguinus inustus* may extend its range to the region.

The Editors are grateful to Rosana Subirá and the Fundação Floresta Amazônica, Manaus, for supplying information on the Rio Negro State Park.

PRIORITY AREAS FOR CONSERVATION IN THE ATLANTIC FOREST OF NORTH-EAST BRAZIL

A workshop on "Priority Areas for the Conservation of Biodiversity in the Atlantic Forest of North-East Brazil" was held in Recife, Pernambuco, from the 6th to 10th of December 1993. It was organized by Conservation International do Brasil, Belo Horizonte, the Fundação Biodiversitas, Belo Horizonte, and the Sociedade Nordestina de Ecologia, Recife. A number of IUCN/SSC Primate Specialist Group Neotropical Section members took an active part in this Workshop, examining particularly the remaining populations of 11 species and subspecies of primates which occur in the area under consideration; the entire Atlantic forest and associated ecosystems north of the Rio Doce in the state of Espírito Santo. Mapping of the priority areas and the elaboration of subsidiary thematic maps was carried out by the Biodiversity Conservation Data Center (CDCB) of the Fundação Biodiversitas, using the Conservation International Geographic Information System (CISIG). A complete report on the methodology and conclusions of the workshop is currently being finalized by Roberto Cavalcanti, University of Brasília, and Conservation International do Brasil.

A double-sided map showing the priority areas was published recently - *Prioridades para Conservação da Biodiversidade da Mata Atlântica do Nordeste* - Scale 1:2,500,000, 1995. It was produced by Christopher B. Rodstrom, Ludmilla Aguiar, and Ricardo Machado at the Department of Science and Planning of Conservation International, Washington, D. C. The priority areas identified were grouped into five sub-regions: as follows: Rio Doce to Jequitinhonha (26 areas); Southern Bahia and the Recôncavo (11 areas); Northern Bahia and Sergipe (7 areas); *Zona da Mata* (43 areas); Inland *Brejos* of the states of Ceará and Piauí (18 areas). Each area is ranked according to its estimated or known biological importance. Besides the principal map of the final areas decided upon by the Workshop participants, there are a number of subsidiary maps as follows: 1) Demography, 2) Forest fragments and vegetation types, 3) Localities of scientific inventories, 4) Forest remnants, 5) Priority Areas for a) aquatic environments, b) plants, c) insects, d) reptiles and amphibians, e) birds, and f) mammals, and analytical maps concerning 6) Human pressure on natural environments in the region, and 7) Overlap of the areas identified by the different working groups. The data and maps can also be accessed through Internet, deposited at the Base de Dados Tropical of the Fundação André Tosello, Campinas, São Paulo (http://www.bdt.org.br/mata.atlantica/ workmata/).

This exercise will be repeated in the near future for the southern and southeastern Atlantic forest, south from the Rio Doce, and together these Workshops will provide an important basis for the elaboration of conservation action and research in the Atlantic forest. For more information on the Workshop, please contact Gustavo Fonseca or Roberto Cavalacanti (CI Brasil), Ilmar Santos (Fundação Biodiversitas) or Ricardo Braga (SNE).

Gustavo A. B. da Fonseca, **Roberto Cavalcanti**, Conservation International do Brasil, Avenida Antônio Abrahão Caram 820/302, 31275-000 Belo Horizonte, Minas Gerais, **Ilmar B. Santos**, Fundação Biodiversitas, Avenida Contorno 9155, 11° Andar, Prado, 30110-130 Belo Horizonte, Minas Gerais, and **Ricardo Braga**, Sociedade Nordestina de Ecologia, Rua Pessoa de Melo 355, Madalena, 50610-220 Recife, Pernambuco, Brazil.

MEETING OF THE INTERNATIONAL COMMITTEES FOR LION TAMARINS

The International Management Committees for the four species of lion tamarins, *Leontopithecus rosalia*, *L. chrysomelas*, *L. chrysopygus*, and *L. caissara*, held their annual meeting in the town of Guaraqueçaba, Paraná, Brazil, from the 31 May to 1 June 1995. The meeting was organized by Maria Iolita Bampi, Head of the Fauna Division of the Wildlife Department of the Brazilian Institute of the Environment and Renewable Natural Resources (Ibama), and hosted by Guadalupe Vivekananda, Director of the Superagui National Park. Numerous issues were discussed regarding the captive management, conservation, environmental education and research programs for the species. Captive management of the golden lion tamarin, *L. rosalia*, and the golden-headed lion tamarin, *L. chrysomelas*, has been extremely successful, and now involves restrictions on breeding. The number of zoos holding the black lion tamarin has increased, with animals now in the Rio de Janeiro Primate Center (CPRJ/FEEMA), the São Paulo Zoo, and the Brasília Zoo, in Brazil, and the Kreefeld Zoo, Magdeburg Zoo, and Central Park Zoo, overseas. The total captive population for this species was reported at 82 (40.39.3). *L. caissara* continues without a breeding program, although the need for one was emphasized at the meetings. Regarding reserves, measures were discussed for the establishment of a second fully protected area for *L. rosalia*, at the Fazenda União, Rio de Janeiro, at present receiving translocated groups *of L. rosalia* (see Kierulff and Oliveira, 1994). The Fazenda is currently owned by the Federal Railway Company (RFFSA) and contains a very well-preserved area of 2,368 ha of lowland forest. The main concern for this area involves the future prospects of privatization, and as such the uncertain future of the present agreement with the RFFSA for its protection. Saturnino Neto de Sousa, Director of the Una Biological Reserve, the only protected area for *L. chrysomelas*, reported on the situation regarding squatters. He has done a remarkable job, in collaboration with World Wildlife Fund - US, in removing squatters and occupants from the Reserve, with only seven families remaining of 84 in the past (all in the northwestern section of the Reserve). Considerable funds are required, however, for the indemnities due to these families. Guadalupe Vivekananda, Director of the Superagui National Park, also reported on the situation concerning measures for the management and protection of the Park, and the problems she is facing regarding such aspects as the necessary redefinition of the Parks boundaries, and conflict with the National Indian Foundation (FUNAI) arguing for the placement of Indian Reserves within the Park (see Câmara, 1994; Vivekananda, 1994). Research proposals were presented for *L. rosalia* (a study of territoriality by a student from the University of Maryland, supervised by James Dietz), *L. chrysomelas* (a study of polyspecific associations with *Callithrix kuhli*, also by a doctoral student at the University of Maryland, supervised by James Dietz) and for *L. caissara*, the ecology and behavior of which is as yet unstudied (a behavioral-ecological study by Claudio Valladares-Padua, University of Brasília). It was decided that the 1996 meeting would include a Population and Habitat Viability Analysis (PHVA) Workshop, six years on from the first lion tamarin PVA workshop held in Belo Horizonte in June 1990. It will be hosted by Suzana Padua, coordinator of the environmental education program for the black lion tamarin, and Duratex, S.A., owner of the Fazenda Rio Claro, Lençois Paulista, São Paulo.

References

Câmara, I. de G. 1994. Conservation status of the black-faced lion tamarin, *Leontopithecus caissara*. *Neotropical Primates* 2(suppl.): 50-51.

Kierulff, M. C. M. and Oliveira, P. P. de. 1994. Habitat preservation and the translocation of threatened groups of golden lion tamarins, *Leontopithecus rosalia*. *Neotropical Primates* 2(suppl.): 15-18.

Vivekananda, G. 1994. The Superagui National Park, problems concerning the protection of the black-faced lion tamarin, *Leontopithecus caissara*. *Neotropical Primates* 2(suppl.): 56-57.

CURSO DE CAMPO EM PRIMATOLOGIA NA ESTAÇÃO CIENTÍFICA FERREIRA PENNA (MUSEU GOELDI), FLORESTA NACIONAL DE CAXIUANÃ, PARÁ

Parte da Floresta Nacional de Caxiuanã, situada ao leste do rio Xingú, a Estação Científica Ferreira Penna, de 34,000 ha, fica a um dia de barco ao oeste de Belém. Em novembro de 1994, a Estação sediou um curso de campo em primatologia, que faz parte do curriculo do Programa de Pós-Graduação em Ciências Biológicas da Universidade Federal do Pará (UFPA) e Museu Paraense Emílio Goeldi (MPEG). Além de abrigar pelo menos oito espécies de primatas, a Estação oferece excelentes instalações, inclusive laboratórios e uma sala de aula para 30 pessoas, equipada com projetores e máquina de vídeo (Massarani, 1995).

Um dos aspectos mais interessantes da Estação é a ocorrência (quase única) de sintopia entre *Callithrix* e *Saguinus*. Além das oito espécies confirmadas, existem também evidências da ocorrência na região de caiararas, *Cebus* sem tufos (Ferrari e Souza Jr., 1994), e coatás, *Ateles belzebuth marginatus* (Kellogg e Goldman, 1944), mas nenhum dos dois foi encontrado durante o curso, apesar dos esforços no campo.

Doze alunos de sete estados brasileiros (inclusive dois da Universidade Federal do Rio Grande do Sul) participaram do curso, que incluiu aulas práticas e teóricas, e seminários sobre assuntos como conservação, comportamento, ecologia e evolução. O segundo curso está marcado para o segundo semestre de 1995, e deverá incluir novos tópicos como genética (com Dr Horacio Schneider, UFPA), e possívelmente professores convidados de outras instituições. Espera-se oferecer um número limitado de vagas para alunos de outros programas de pós-graduácão, que devem entrar em contato conosco (de preferência através de correio eletrônico) para maiores informações.

Stephen F. Ferrari, Departamento de Genética, Universidade Federal do Pará, Caixa Postal 8607, 66075-150 Belém, Pará. Fax: (091) 229-9785, e-mail: ferrari@cuxiu.cbio.ufpa.br, and **Andrea P. F. Nunes**, Departamento de Zoologia, Museu Paraense Emílio Goeldi, Caixa Postal 399, 66040-170 Belém, Pará, Brasil.

References

Ferrari, S. F. e Souza, Jr., A. P. 1994. More untufted capuchins in southeastern Amazonia? *Neotropical Primates* 2(1): 9-10.

Kellogg, R. e Goldman, E. A. 1944. Review of the spider monkeys. *Proc. U. S. Nat. Mus.* 96: 1-45.

Massarani, L. 1995. Raio-X da Amazônia: Museu Goeldi instala nova unidade de pesquisa em plena selva. *Ciência Hoje* 18(106): 80-84.

BRAZILIAN CANOPIES

Several individuals in Brazil are preparing a directory of people working on canopy biology in Brazil. Researchers working in Brazil are invited to send their name, address, title, and a one-page description of their research activities, including a list of published papers, reports, and projects. The Directory will be sent to many universities in and outside of Brazil working on canopy biology. Please send information to Júlio César Voltolini, Departamento de Zoologia, Universidade de São Paulo, Caixa Postal 20520, 01452-990 São Paulo, São Paulo, Brazil, e-mail: jcvoltol@cat.cce.usp.br, or Daniela Kolhy Ferraz, Departamento de Ecologia Geral, Universidade de São Paulo, e-mail: dkferraz@cat.cce.usp.br. From *Biological Conservation Newsletter*, (142) March 1995. Smithsonian Institution, Department of Botany, National Museum of Natural History, Washington, D.C.

CENTER FOR THE STUDY OF NEOTROPICAL BIODIVERSITY

The Center for the Study of Neotropical Biodiversity (BIOCENTRO) is a new facility of the National Experimental University of the Western Llanos "Esquiel Zamora" (UNELLEZ). BIOCENTRO is located near the main entrance of the university campus at Mesa de Cavacas in Guanare, Venezuela and when completed will contain a museum building, and an exhibits and education building. Since its establishment in 1977, UNELLEZ has placed a strong emphasis on biological inventories and ecological studies. In 1983 the Natural History Museum was officially founded to include the Museum of Zoology, the Herbarium, and the Earth Science Museum with its Cartography and Satellite Imagery Laboratory.

As a center of higher learning, UNELLEZ has campuses in each of the four states that comprise the Western Llanos: Apure, Barinas, Cojedes and Portuguesa. The university has developed academic programs with both curricular and extra-curricular courses; a research program in both basic and applied sciences; and extension services to promote community involvement and the application of new technologies for the solution of local problems. Research at the Guanare campus is currently underway in three departments: Agronomy, Animal Science, and Conservation of Renewable Natural Resources. The latter department in particular has a wide scope of research, with priority given to the rational development of the country. In the Department of Renewable Natural Resources, the Museum of Zoology and the Herbarium have played a fundamental role in furthering research related to the collection, identification, and conservation of the fauna and flora for the entire country, and in particular the western llanos and the Amazon territory. The Museum of Zoology has over 34,000 catalogued entries of vertebrates and the herbarium has over 60,000 mounted plant specimens. Since current space is insufficient for these expanding collections, the construction of BIOCENTRO has been a priority for the university and for the development of the study of the natural sciences in Venezuela.

The principal objective of the BIOCENTRO is to permit investigators and students to work in a specifically designed facility that will be more conducive to productivity and attract more visiting scientists from Venezuela and international centers for the study of neotropical biodiversity. Another goal is to accommodate community involvement and environmental education

through museum exhibits, special courses and workshops, and an interpretive ecological trail on the wooded grounds. Thus the new center will provide areas for all three of the university's main activities: investigation, teaching and community extension.

The BIOCENTRO is currently under construction with contributions from several different national and international institutions. Only one-tenth of the total budget has been raised and the university welcomes contributions to make this center a reality. This project will create a regional, national and international center for the study of tropical biodiversity, and significantly promote research in Venezuela. For more information: Dr. Donald C. Taphorn, BIOCENTRO-UNELLEZ, Mesa de Cavacas, Guanare, Estado Portuguesa 3310, Venezuela; Tel: 057-68006; Fax: 057-511690, 68130 or 68156.

FFPS - A CHANGE OF NAME AND ADDRESS

The Fauna and Flora Preservation Society (FFPS) has changed its name to "Fauna and Flora International (FFI)". As explained by Dr Mark Rose, Director, the new name is a working title and does not reflect any change in the aims and objectives nor the charitable status of the Society. Previously housed with a generous landlord, the Royal Geographical Society, in London, the space restrictions have led to Fauna and Flora International moving to Cambridge. Besides solving the problem of space, the advantages of this move include the fact that a number of prestigious international conservation organizations are based there, and more are planning to move to the vicinity. In addition, the University is a vital source of the conservationists of tomorrow and will also provide a wide range of resource facilities. The new location for Fauna and Flora International is in the offices of the Forestry Authority. As from 1 June 1995 their address will be: Great Eastern House, Tenison Road, Cambridge CB1 2DT, England, UK. Tel: (01223) 461471, Fax: (01223) 461481.

Membership of Fauna and Flora International includes a subscription to the excellent wildlife conservation journal *Oryx*, and also a newsletter - *Fauna and Flora News*. Membership includes the following categories: *Standard* - £27; *Concessionary* (student, unwaged, senior citizen) - £15; *Supporter* (formerly Associate, does not include subscription to *Oryx*, see below) - £12; *Sponsor* (includes additional subscription for *Oryx* in developing countries) - £50; *Life* - £1000. The "Supporter" category is new. It provides for a proportion of the cost to sponsor additional subscriptions to individuals, libraries or appropriate institutions in developing countries where there is a shortage of foreign currency. Supporter members may nominate the country or institution they would like to support.

The Publications Manager of Fauna and Flora International is Dr Jacqui Morris. Manuscripts for publication in *Oryx*, and news items for *Fauna and Flora News*, can be sent to the Cambridge address above, or to Dr Jacqui Morris, Winkfield, Station Road, Plumpton Green, East Sussex BN7 3BU, UK. Tel./Fax: +44 1273 890859, e-mail: jacquim@pavilion.co.uk.

FUNDAÇÃO BIODIVERSITAS - CHANGE OF ADDRESS

The Fundação Biodiversitas, Director Ilmar B. Santos, will be moving its offices. As of 26th June 1995, their address is the following: Avenida Contorno 9155, 11° andar, 30110-130 Belo Horizonte, Minas Gerais, Brazil. Tel: (031) 291 9673, Fax: (031)291-7658.

TRAFFIC SUDAMERICA

As reported by Bobbie Jo Kelso, Information Officer of TRAFFIC International, after 10 years of valuable work, the South American branch of TRAFFIC, directed by Juan S. Villalba-Macías, and based in Montevideo, Uruguay, will unfortunately be closing down as from 1 July 1995. For more information contact: Bobbie Jo Kelso, Information Officer, TRAFFIC International, 219c Huntingdon Road, Cambridge CB3 OD1, UK. Fax: +44 1223 277427.

PRÓ BOCAINA/AMANKAY - GUIA DE FINANCIADORES

A Pró Bocaina e o Amankay estão lançando o *Support*, um guia de agências que financiam projetos nas áreas de meio ambiente, desenvolvimento, saúde e educação. entre outras. O guia contém fichas de cerca de 100 agências com todas as informações necessárias para solicitação de financiamento. Sem fins lucrativos, o Support deverá ser atualizado anualmente. Peça seu exemplar enviando cheque, nominal á Associação Pró Bocaina, no valor de R$17,00 á Associação Pró Bocaina, Caixa Postal 1, 12850-000 Bananal, São Paulo, Brasil. Favor enviar também nome completo, enedereço, CPF e telefone, necessários para cadastro e recibo. Maiores informações: (011) 814-6326 (Guida), ou (011) 816-4805 (Lia).

Primate Societies

SOCIEDADE BRASILEIRA DE PRIMATOLOGIA-VII CONGRESSO

O VII Congresso Brasileiro de Primatologia se realizará nos dias 23-28 de julho de 1995, na Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte. A programação do Congresso incluirá sessões de comunicações, paineis, mini-cursos, conferências e mesas-redondas. As sessões de comunicações incluem os seguintes temas: Uso de técnicas de DNA em sistemática e taxonomia de primatas; Comportamento reprodutivo em *Callithrix jacchus*; Comunicação vocal em primatas do Novo Mundo; Comportamento social em ambiente natural; Ecologia de primatas neotropicais (duas sessões); e Patologia em primatas neotropicais. Haverá também paineis: Taxonomia, genética, e evolução; Comportamento social em primatas neotropicais; Enriquecimento e manejo de primatas neotropicais; Cronobiologia em primates neotropicais; Aspectos da ecologia de primatas neotropicais; comportamento social em ambiente natural; e Patologia em primatas neotropicais. Prof. Milton Thiago de Mello será o homenageado do ano pelo SBPr. O Congresso promete ser um grande sucesso; mais de 100 inscrições e 92 resumos já foram recebidos! Contato: Secretaria do VII Congresso Brasileiro de Primatologia, Universidade Federal do Grande do Norte, Centro de Biociências, Setor de Psicobiologia, Caixa Postal 1511, 59072-970 Natal, Rio Grande do Norte, Brazil. Tel: 084 206 1147, Fax: 084 231 9587, e-mail: fximenes@ncc.ufm.br.

PRIMATE SOCIETY OF GREAT BRITAIN - FIELD STUDIES SUPPLEMENT

As reported in *Neotropical Primates* 2(2), June 1994, the Primate Society of Great Britain publishes a *Current Primate Field Studies Supplement* to their newsletter *Primate Eye*. The next issue (16th) of this survey will be published in 1996. This survey is extremely valuable not only as a data base for field studies but also in the analysis of trends worldwide. A simple form requesting information on ongoing or recently completed primate field studies and surveys was distributed with the last *Neotropical Primates* 3(1), March 1995. In order to make this survey as accurate, up-to-date, and complete as possible, we urge all field primatologists, teams and individuals, to provide information on their surveys and research projects by completing this form and sending it to the compiler, Julia M. Casperd, as soon as possible. In the past, field studies were included on the supposition that they were still continuing, even when up-dated information was lacking, and which resulted in some incorrect entries. This will not be the case for the future, and the listing will include *only* those studies for which information is received during this year. In South America, the single-page form can be obtained from Anthony B. Rylands, Conservation International, Avenida Antônio Abrahão Caram 820/302, Belo Horizonte 31275-000, Minas Gerais, Brazil. Fax: (031) 441-1795. Elsewhere, please write to: Julia M. Casperd, Editor PSGB *Current Primate Field Studies Supplement*, Church House, Pump Lane, Churton, Nr. Chester CH3 6LR, England, UK. The deadline for receipt of the form is January 1996.

PRIMATE SOCIETY OF GREAT BRITAIN - WINTER MEETING 1995

The Winter Meeting of the Primate Society of Great Britain (PSGB) will be dedicated to the 'Biology and Conservation of New World Primates". It is being organised by Hilary O. Box (University of Reading, England) and Hannah Buchanan-Smith (University of Stirling, Scotland), and will be held on 29 November 1995 at the Meeting Rooms of the Zoological Society of London, Regent's Park, London. The provisional program includes: Sex and reproduction in muriquis - K. B. Strier (University of Wisconsin); Goeldi's monkey and captive evidence for a monogamous social organisation: a psychobiological experiment in a phylogenetic context - C. R. Pryce (Universität Zürich-Irchel); Adaptability and variability in *Cebus* - E. Visalberghi (CNR, Rome) and D. Fragaszy (University of Georgia); Biology and Ecology of *Cacajao* - A. Barnett (University of Reading) and D. Brandon-Jones (British Museum of Natural History); Ecology and conservation of lion tamarins, *Leontopithecus* - A. B. Rylands (Universidade Federal de Minas Gerais, Brazil); Gender differences in foraging efficiency - studies with marmosets and tamarins - H. O. Box (University of Reading); Ecological and evolutionary considerations of mixed-species troops in the genus *Saguinus* - E. Heymann (Deutsches Primatenzentrum); Advantages of mixed-species tamarin groups: tests of hypotheses in captivity - H. Buchanan-Smith and S. Hardie (University of Stirling). The proceedings will be published in *Folia Primatologica*. Contact: Hilary O. Box, Department of Psychology, University of Reading, Reading RG6 2AL, Berkshire, UK. Tel: +44 1734 3185523 ext. 6668, Fax: +44 1734 316604, or Hannah Buchanan-Smith, Department of Psychology, University of Stirling, Stirling FK9 4LA, UK. Tel: +44 1786 467674, Fax: +44 1786 467641, e-mail: h.m.buchanan-smith@stirling.ac. uk.

A S I P S INTERNATIONAL PRIMATOLOGICAL SOCIETY AND AMERICAN SOCIETY OF PRIMATOLOGISTS

The 16th Congress of the International Primatological Society (IPS) and the 19th Conference of the American Society of Primatologists (ASP) will be held jointly from

11-16 August 1996 at the University of Wisconsin, Madison, hosted by the Wisconsin Regional Primate Research Center (WRPRC). John Hearn, Director of WRPRC, is the Congress Chairman. Melinda Carr is organizing the Abstracts, Steve Shelton is Chair of the Development Committee, Toni Ziegler is Chair of the Social Events Committee, Edith Chan, Coordinator for Information on the Congress, and David Abbott is Chair of the Scientific Program Committee, which includes Charles Snowdon (Behavior), Chris Coe (Biomedicine), Karen Strier (Ecology and Conservation) and Walter Leutenegger (Paleontology, Anatomy and Taxonomy). Deadlines for registration and abstracts will be 1 February 1996 - material must be recieved in Madison by this date. The provisional registration costs are US$150 for regular members of IPS and ASP, US$80.00 for student members, US$200 for non-members, and US$80 for guests. Registration includes the opening and closing receptions as well as the program and abstract booklets. After 1 February, all rates will increase by US$50. On-site registration may be more. Registration forms will be sent out in August 1995. If you are not a member of IPS or ASP, please consider joining now. Non-members who would like to be added to the mailing list for information on the Congress: please contact Edith Chan (address below). Abstract forms for free communications and for symposia will be circulated in August 1995. The closing date for free communication abstracts is 1 February 1996, and for symposia abstracts is 1 November 1995. Individuals may appear as first author on one submitted abstract, but as co-author on up to three additional abstracts. The Association of Primate Veterinarians will meet immediately after the Congress from 16-17 August 1996. For further information on the IPS/ASP Congress, please 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.

Recent Publications

BOOKS

The Information Continuum: Evolution of Social Information Transfer in Monkeys, Apes, and Hominids, by Barbara J. King, 1994, xii + 166pp. University of Washington Press, Seattle. Clothbound US$35.00, Paperback US$17.50. Drawing on research in biological anthropology, animal behavior, psychology, and archaeology, this book integrates findings from each of these fields into a synthetic view of the evolution of communication among primates. Available from: University of Washington Press, P.O.Box 50096, Seattle, WA 98145-5096, USA.

Conservation of Endangered Species in Captivity: An Interdisciplinary Approach, edited by Edward F. Gibbons, Jr., Barbara S. Durrant, and Jack Desmarest, 1994, 820pp. State University of New York Press, Ithaca. Hardcover US$99.50, Paperback US$34.95. A volume in the SUNY series in Endangered Species edited by Edward F. Gibbons, Jr. and Jack Desmarest. A multidsiciplinary approach, organized taxonomically and by scientific discipline. The seven taxonomic groups included are invertebrates, fish, reptiles and amphibians, birds, marine mammals, primates and other mammals. Within each taxonomic group, four scientific disciplines are explored: conservation, reproductive physiology, behavior, and captive design. To order: State University of New York Press, c/o CUP Services, P.O.Box 6525, Ithaca, NY 14851. Add US$3.00 handling, NY State Residents add 8% sales tax.

Tempo Passado: Mamíferos do Pleistoceno em Minas Gerais, by Cástor Cartelle, Federal University of Minas Gerais, 131pp. 1994. Acesita, Belo Horizonte. Price: US$75.00 (incl. postage and packing). This beautifully illustrated book, a limited edition, provides a review of the Pleistocene mammal fauna of the state of Minas Gerais in Brazil. The Foreword is by Prof. Aziz Nacib Ab'Sáber. It includes a summary of the lives of the principal paleontologists, notably Peter Wilhelm Lund, who have worked in Minas Gerais, descriptions of the principle sites, an introduction to the South American Pleistocene fauna, and descriptions and illustrations of the paleontological findings of mammals in Minas Gerais. These include such as *Protopithecus brasiliensis*. Available from: Fundação Biodiversitas, Avenida Contorno 9155, 11° Andar, Prado, 30110-130 Belo Horizonte, Minas Gerais, Brazil. Tel: (031) 291 9673, Fax: (031) 291 7658.

Lista Anotada de los Mamíferos Peruanos, by Victor Pacheco, Hernando de Macedo, Elena Vivar, César Ascorra, Rosa Arana-Cardó and Sergio Solari, *Occasional Papers in Conservation Biology No. 2*, February 1995, 35pp. Conservation International, Washington, D.C. In Spanish. An updated list of all terrestrial and aquatic (including marine) mammals known to occur in Peru. It indicates Peru as having the most species rich mammalian fauna in the Neotropical region, and third ranking in the world. The number of species is estimated at 460, including 32 primates. Most commonly used synonyms and common names are included. Includes new records for the country. Available from: Conservation International, Department of

Conservation Biology, 1015 18th Street, NW, Suite 1000, Washington, D.C. 20036, USA. Fax: 202 887 0193.

Investigación, Conservación y Desarrollo en Selvas Subtropicales de Montaña, editores Alejandro D. Brown y Héctor R. Grau, 1995. Laboratório de Investigaciones Ecológicas de las Yungas (L.I.E.Y), Tucumán. Este libro surge luego de un esfuerzo continuo de dos años que involucró la participación de más de 100 personas de al menos 30 instituciones municipales, provinciales, nacionales e internacionales y que representa el corolario final de la "I Reunión Regional sobre Selvas de Montañas" que tuvo lugar en Horco Molle, Tucumán, durante los dias 15 al 17 de abril de 1993. Adquisición: Alejandro Brown y Héctor Grau, Laboratório de Investigaciones Ecológicas de las Yungas (LIEY), Casilla de Correo 34, 4107 Yerba Buena, Tucumán, Argentina.

Catálogo y Resumenes de Literatura no Publicada Vol. II - 1992, editado por Enrique Quesada and Nidia Durán, Universidad Nacional BIODOC, Centro de Documentación e Información, 112pp. Un catálogo compuesto por información de tesis, reportes de proyectos o de investigaciones y otros documentos que han tenido un tiraje muy reducido. Cada documento incluido en este catálogo presenta la cita bibliográfica y el número de acceso en BIODOC. Además contiene un índice por autor, título y palabra clave. Este Catálogo se realizó gracias a la colaboración de la Universidad Nacional y al Servicio de Peces y Vida Silvestre de los Estado Unidos (USFWS), Washington, D.C. Para más información dirigirse a la siguiente dirección: BIODOC, Centro de Documentación en Vida Silvestre, Universidad Nacional, Heredia, Costa Rica, America Central. Tel: 237 63 63 x 472 o al 2773-472, Fax: 237-7036.

Manejo de Reservas da la Biosfera en América Latina, preparado por Carmen Luz de la Maza, 1994, 115pp. Oficina Regional de la FAO para América Latina y el Caribe, Santiago, Chile. Basado en los resultados del Taller Internacional sobre el Manejo de Reservas de la Biosfera en América Latina, realizado en Valle del Bravo, México, entre el 18 y el 22 de noviembre de 1991, por encargo de la Oficina Regional de la FAO para América Latina y el Caribe, así como en actualizaciones posteriores y en bibliografia reciente sobre el tema. Adquisición: Kyran D. Thelen, Oficial Regional Forestal, Ofician Regional de la FAO para América Latina y el Caribe, Bandera 150, Pisos 7 al 10, Casilla 10095, Santiago, Chile. Tel: 6991005, Fax: (56-2) 696 1121-24.

Areas Silvestres Protegidas y Comunidades Locales en América Latina, preparado por Gozalo Oviedo Carrillo y Paola Sylva Charvet, 1994, 144pp. Oficina Regional de la FAO para América Latina y el Caribe, Santiago, Chile. Basado en los resultados del Taller Internacional sobre Areas Silvestres Protegidas y Comunidades Locales, realizado en la Reserva Monte Verde, Costa Rica, en octubre de 1989, en el que participaron técnicos de varios países de le region involucrados en actividades de manejo de áreas protegidas. Adquisición: Kyran D. Thelen, Oficial Regional Forestal, Ofician Regional de la FAO para América Latina y el Caribe, Bandera 150, Pisos 7 al 10, Casilla 10095, Santiago, Chile. Tel: 6991005, Fax: (56-2) 696 1121-24.

Reserva da Biosfera da Mata Atlântica MAB - UNESCO: A Questão Fundiária. Roteiro para Solução dos Problemas das Áreas Protegidas, by Inah Simonetti Guatara, José Pedro de Oliveira Costa, Fredmar Corrêa and Pedro Ubiratan Escorel de Azevedo, 31pp, 1994. Consórcio Mata Atlântica, Conselho Nacional de Reserva da Biosfera da Mata Atlântica, supported by the Instituto Florestal, São Paulo, Secretaria de Estado do Meio Ambiente, São Paulo, Conservation International, MAB - UNESCO, and the Universidade Estadual de Campinas. An analysis of the problems concerning land-ownership of the protected areas comprising the Atlantic forest Biosphere Reserve. An appendix includes a full listing of the protected areas, their date of decree and size. Available from: Consórcio Mata Atlântica, Av. 9 de Julho 4877 - 8° Andar, 01407-902 São Paulo, São Paulo, Brazil. Tel: (011) 853-5905, Fax: (011) 822-5468.

Extractivism in the Brazilian Amazon: Perspectives on Regional Development, edited by Miguel Clüsener-Godt and Ignacy Sachs, 88pp, 1994. *MAB Digest 18*, UNESCO, Paris. This review provides some varying perceptions and perspectives on extractivism and extractive reserves in the Brazilian Amazon, based on an international conference on environmentally sound development in the humid tropics, held in Manaus from 13-19 June 1992, hosted by the National Institute for Amazon Research (INPA), and organized by the Association of Amazon Universities (UNAMAZ), UNESCO Man and the Biosphere Program (MAB), and the Third World Academy of Sciences (TWAS). It includes the following chapters: Perceptions of extractivism: introduction and overview - Miguel Clüsener-Godt and Ignacy Sachs; Policies for the use of renewable natural resources: the Amazonian region and extractive activities - Mary Helena Allegretti; Plant extractivism in the Amazon: limitations and possibilities - Alfredo K. O. Homma; People and forest products in Central Amazonia: the multidisciplinary approach of extractivism. Available from: United Nations Educational, Scientific and Cultural Organisation

(UNESCO), 7 place de Fontenoy, 75352 Paris 07 SP, France.

ARTICLES

Anderson, J. R. and Henneman, M. -C. 1994. Solutions to a tool-use problem in a pair of *Cebus apella*. *Mammalia* 58(3): 351-361.

Anonymous. 1994. *Marmosets and Tamarins: Systematics, Behaviour, and Ecology* , edited by Anthony B.Rylands, 1993, Oxford University Press, Oxford. *Australian Primatology*, 9(2): 10-11. (Book review).

Anonymous. 1995. Cotton-top tamarins in trouble. *International Primate Protection League News* 22(1): 10-11.

Arbelle, J. E., Gacad, M. A., Spencer, C. A. and Adams, J. S. 1994. Absence of thyroid hormone resistance in vitamin D-resistant New World primates. *Am. J. Primatol.* 32: 215-222.

Bateson, P. 1994. The dynamics of parent-offspring relationships in mammals. *Trends in Ecology and Evolution* 9(10): 399-403.

Boinski, S. 1994. Affilation patterns among male Costa Rican squirrel monkeys. *Behaviour* 130(3-4): 191-209.

Boinski, S. and Mitchell, C. L. 1995. Wild squirrel monkey (*Saimiri sciureus*) "caregiver" calls: contexts and acoustic structure. *Am. J. Primatol.* 35: 129-137.

Borda, J. T., Perez Escala, S., Nuñez Vastos, V., Sanchez Negrette. M. 1993. Incidence of renal disease in *Cebus apella* (Primates, Cebidae). *Bol. Primatol. Latinoam.* 4(1): 1-4. (In Spanish).

Buchanan-Smith, H. 1994. Environmental enrichment in captive marmosets and tamarins. *Humane Innovations and Alternatives* 8: 559-564.

Byrne, G. and Suomi, S. J. 1995. Development of activity patterns, social interactions, and exploratory behavior in infant tufted capuchins (*Cebus apella*). *Am. J. Primatol.* 35: 255-270.

Chapman, C. A., Wrangham, R. W. and Chapman, L. J. 1994. Indices of habitat-wide fruit abundance in tropical forests. *Biotropica* 26(2): 160-171.

Chapman, C. A., Wrangham, R. W. and Chapman, L. J. 1995. Ecological constraints on group size: an analysis of spider monkey and chimpanzee subgroups. *Behav. Ecol. Sociobiol.* 36(1): 59-70.

Cheverud, J. M. 1995. Morphological integration in the saddle-back tamarin (*Saguinus fuscicollis*) cranium. *Am. Nat.* 145(1): 63-89.

Chiarello, A. G. 1995. Density and habitat use of primates at an Atlantic forest reserve of southeastern Brazil. *Rev. Brasil. Biol.* 55(1): 105-110.

Chiarello, A. G. 1995. Grooming in brown howler monkeys, *Alouatta fusca*. *Am. J. Primatol.* 35: 73-81.

Coes, C. L. and Levine, S. 1995. Diurnal and annual variation of adrenocortical activity in the squirrel monkey. *Am. J. Primatol.* 35(4): 283-292.

Constable, J. J., Packer, C., Collins, D. A. and Pusey, A. E. 1995. Nuclear DNA from primate dung. *Nature, Lond.* 373(6513): 393.

Cork, S. J. 1994. Digestive constraints on dietary scope in small and moderately-small mammals: how much do we really understand? In: *The Digestive System in Mammals: Food, Form, and Function*, D. J. Chivers and P. Langer (eds.), pp.337-369. Cambridge University Press, Cambridge.

Cui, K.-h. and Matthews, C. D. 1994. Anatomy of adult female common marmoset (*Callithrix jacchus*) reproductive system. *J. Anat.* 185(12): 565-576.

Dale, V., Pearson, S., Offerman, H. and O'Neill, R. 1994. Relating patterns of land-use change to faunal biodiversity in the central Amazon. *Conservation Biology* 8(4):1027-1036.

De Lillo, C. and Visalberghi, E. 1994. Transfer index and mediational learning in tufted capuchin (*Cebus apella*). *Int. J. Primatol.* 15(2); 275-287.

Defler, T. R. 1995. The time budget of a group of wild woolly monkeys (*Lagothrix lagotricha*). *Int. J. Primatol.*16(1): 107-120.

Digby, L. 1995. *Marmosets and Tamarins: Systematics, Behaviour and Ecology*. Edited by Anthony B. Rylands. Oxford: Oxford University Press (1993). Pp.xv+396. *Anim. Behav.*, 49(2): 560-561. (Book review).

Digby, L. J. and Ferrari, S. F. 1994. Multiple breeding females in free-ranging groups of *Callithrix jacchus*. *Int. J. Primatol.* 15(3): 389-397.

Dunbar, R. I. M. 1995. Primatology: the price of being at the top. *Nature, Lond.* 373(6509): 22-23.

Estrada, A. 1994. *Primates of the Americas. Strategies for Conservation and Sustained Use in Biomedical Research*, P. Arámbulo III, F. Encarnación, J. Estupiñán, H. Samamé, C. R. Watson, and R. E. Weller (eds.), Batelle Press, Columbus, Ohio. *Int. J. Primatol.*, 15(4): 649-650. (Book review).

Fajardo Patino, A. and de la Ossa, J. 1994. Preliminary census of primates in the protected forest reserve Serrania de Coraza-Montes de Maria, Sucre, Colombia. *Trianea* 5(5): 289-303.

Fernandes, M. E. B. 1994. Notes on the geographic distribution of howling monkeys in the Marajó archipelago, Pará, Brazil. *Int. J. Primatol.* 15(6): 919-926.

Ferrari, S. F. and Lopes, M. A. 1995. Comparison of gut proportions in four small-bodied Amazonian cebids. *Am. J. Primatol.* 35: 139-142.

Fleagle, J. G. 1994. Polyspecific associations: an anti-predator tactic? *Evol. Anthropol.* 3(2): 68. (Commentary of L. A. Isbell, *Evol. Anthropol.* 3(2): 61-71)

Fragaszy, D. M., Baer, J. and Adams-Curtis, L. 1994. Introduction and integration of strangers into captive groups of tufted capuchins (*Cebus apella*). *Int. J. Primatol.* 15(3): 399-420.

French, J. A. 1994. Neoconservation for Neotropical primates: the multinational apporach. *Am.J. Primatol.*, 32: 227-230. Review of *Primates of the Americas - Strategies for Conservation and Sustained Use in Biomedical Research*, P. Arámbulo III, F. Encarnación, J. Estupiñán, H. Samamé, C. R. Watson, and R. E. Weller (eds.), Batelle Press, Columbus.

Gallagher, J. International trade in endangered species reexamined by CITES convention. *Diversity* 10(4): 16-18.

Gil., G. and Heinonen, S. Sighting of the tufted capuchin (*Cebus apella*) in Formosa Province, Argentina. *Bol. Primatol. Latinoam.* 4(1): 15-17. (In Spanish).

Giudice, A. M. 1993. Social relations in a captive group black howler monkeys (*Alouatta caraya*). *Bol. Primatol. Latinoam.* 4(1): 19-23. (In Spanish)

Hearn, J. P. 1995. Marmosets and tamarins. In: *The Experimental Animal in Biomedical Research, Vol. II.*, B. E. Rollin, and M. L. Kesel (eds.), pp.483-493. CRC Press, Boca Raton.

Heistermann, M. and Hodges, J. K. 1995. Endocrine monitoring of the ovarian cycle and pregnancy in the saddle-back tamarin (*Saguinus fuscicollis*) by measurement of steroid conjugates in urine. *Am. J. Primatol.* 35(2): 117-127.

Helvacioglu, A., Aksel, S., Yeoman, R. R., Williams, L. E. and Abee, C. R. 1994. Age-related hormonal differences in cycling squirrel monkeys (*Saimiri boliviensis boliviensis*). *Am. J. Primatol.* 32(3): 207-213.

Hennessy, M. B., Mendoza, S. P., Mason, W. A. and Moberg, G. P. 1995. Endocrine sensitivity to novelty in squirrel monkeys and titi monkeys: species differences in characteristic modes of responding to the environment. *Physiol. Behav.* 57(2): 331-338.

Heyes, C. M. 1994. Social cognition in primates. In: *Animal Learning and Cognition*, N. J. Mackintosh (ed.), pp.281-305. Academic Press, San Diego.

Hill, D. A. and van Hooff, J. A. R. A. M. 1994. Affiliative relationships between males in groups of nonhuman primates: a summary. *Behaviour* 130(3-4): 143-149.

Hladik, C. M. and Chivers, D. J. 1994. Foods and the digestive system. In: *The Digestive System in Mammals: Food, Form, and Function*, D. J. Chivers and P. Langer (eds.), pp.65-73. Cambridge University Press, Cambridge.

Isbell, L. A. Predation on primates: ecological patterns and evolutionary consequences. *Evol. Anthropol.* 3(2): 61-71.

Janson, C. H. 1994. Sex roles in predator defense and vigilance. *Evol. Anthropol.* 3(2): 69. (Commentary of L.A.Isbell, *Evol. Anthropol.* 3(2): 61-71)

Julliot, C. 1994. Frugivory and seed dispersal by red howler monkeys: evolutionary aspect. *Révue d'Ecologie (Terre et Vie)* 49(4): 331-341.

King, F. A. and Yarborough, C. 1995. Nonhuman primates in research: a review of their crucial role. *Lab. Anim.* 24(1): 28-32.

Kobayashi, S. 1995. A phylogenetic study of titi monkeys, genus *Callicebus*, based on cranial measurements: I. Phyletic groups of *Callicebus*. *Primates* 36(1): 101-120.

Koenig, A. 1994. Group size, composition, and reproductive success in wild common marmosets (*Callithrix jacchus*). *Am. J. Primatol.* 35(4): 311-317.

Laska, M. 1994. Taste difference thresholds for sucrose in squirrel monkeys (*Saimiri sciureus*). *Folia Primatol.* 63: 144-148.

LeBlanc, D. 1994. Evolution, innate behavior, and single parent child-rearing in black tufted-ear marmosets (*Callithrix kuhli*) in captivity. *Animal Keeper's Forum* 21(1): 28-29.

Levey, D. J., Moermond, T. C. and Denslow, J. S. 1994. Frugivory: an overview. In: *La Selva: Ecology and Natural History of a Neotropical Rain Forest*, L. A. McDade, K. S. Bawa, H. A. Hespenheide and G. S.Hartshorn (eds.), pp.282-294. University of Chicago Press, Chicago.

Linn, G. S., Mase, D., Lafrancois, D., O'Keefe, R. T. and Lifshitz, K. 1995. Social and menstrual cycle phase influences on the behavior of group-housed *Cebus apella*. *Am. J. Primatol.* 35: 41-57.

Lowen, C. and Dunbar, R. I. M. 1994. Territory size and defendability in primates. *Behav. Ecol. Sociobiol.* 35(5): 347-354.

Lucas, P. W. Categorisation of food items relevant to oral processing. In: *The Digestive System in Mammals: Food, Form, and Function*, D.J.Chivers and P.Langer (eds.), pp.197-218. Cambridge University Press, Cambridge.

MacDonald, S. E., Pang, J. C. and Gibeault, S. 1994. Marmoset (*Callithrix jacchus jacchus*) spatial memory in a foraging task: win-stay versus win-shift strategies. *J. Comp. Psychol.* 108(4): 328-334.

Mace. G. M. 1994. Classifying threatened species: means and ends. *Phil. Trans. Roy. Soc. Lond.* B344: 91-97.

Mitchell, C. L. 1994. Migration alliances and coalitions among adult male South American squirrel monkeys (*Saimiri sciureus*). *Behaviour* 130(3-4): 169-190.

Newstrom, L. E., Frankie, G. W. and Baker, H. G. 1994. A new classification for plant phenology based on flowering patterns in lowland tropical rain forest trees at La Selva, Costa Rica. *Biotropica* 26(2): 141-159.

Paramo, P. F., Burgos, C. P. and Ceballos, A. 1994. Learning transfer of stimulus training in squirrel monkeys (*Saimiri sciureus*). *Rev. Latinoam. Psicol.* 26(3): 483-493. (In Spanish).

Patterson, B. D. 1994. Accumulating knowledge on the dimensions of biodiversity: systematic perspectives on Neotropical mammals. *Biodiversity Letters* 2: 79-86.

Pereira, M. E. 1994. *Biology, Rearing, and Care of Young Primates*, by James K. Kirkwood and Katherine Stathatos. Oxford University Press, Oxford, 1992. *Int. J. Primatol.*, 15(4): 645-648. (Book review).

Peres, C. and Terborgh, J. 1995. Amazonian nature reserves: an analysis of the defensibility status of existing conservation units and design criteria for the future. *Conservation Biology* 9(1): 34-46.

Phillips, K. A., Bernstein, I. S., Dettmer, E. L., Devermann, H. and Powers, M. 1994. Sexual behavior in brown capuchins (*Cebus apella*). *Int. J. Primatol.* 15(6): 907-917.

Polanco-Ochoa, R., Garcia, J. E. and Cadeña, A. 1994. Utilization of time and activity patterns of *Callicebus cupreus* (Primates, Cebidae) at La Macarena, Colombia. *Trianea* 5(5): 305-322. (In Spanish)

Pressey, R. and Logan, V. 1994. Level of geographical subdivision and its effects on assessments of reserve coverage: a review of regional studies. *Conservation Biology* 8(4): 1037-1046.

Resende, D. M. de, Pereira, L. H. and Lobo, A. 1994. Long-term patency of blood parasitism by *Trypanosoma minasense* and Microfilariae in *Callthrix penicillata* marmosets, trapped in the wild and maintained in captivity. *Mem. Inst. Oswaldo Cruz* 89(1): 123-125.

Rose, L. M. 1994. Sex differences in diet and foraging behavior in white-faced capuchins (*Cebus capucinus*). *Int. J. Primatol.* 15(1): 95-114.

Rose, L. M. and Fedigan, L. M. 1995. Vigilance in white-faced capuchins, *Cebus capucinus*, in Costa Rica. *Anim. Behav.* 49(1): 63-70.

Rosenbusch, J., Bellman, A. and Hodges, J. K. 199. Molecular properties and isolectric properties of pituitary and urinary gonadotrophins in callitrichid primates. *J. Reprod. Fert.* 102(2):493-500.

Schneider, M. P. C. Schneider, H., Sampaio, M. I. C., Carvalho-Filho, N. M., Encarnación, F., Montoya, E. and Salzano, F. M. 1995. Biochemical diversity and genetic distances in the Pitheciinae subfamily (Primates, Platyrrhini). *Primates* 36(1): 129-134.

Setoguchi, T. 1994. Owl monkey, *Aotus*, is a 'living fossil" among the higher primates, Anthropoidea. *Kaseki/Fossils* (56): 34-36. (Japanese with English summary).

Silva, J. L. and Strahl, S. D. 1994. Usos folclóricos de la fauna silvestre en nueve parques nacionales al norte de Venezuela. *Vida Silvestre Neotropical*, 3(2): 100-107.

Simmen, B. 1994. Taste discrimination and diet differentiation among New World primates. In: *The Digestive System in Mammals: Food, Form, and Function*, D. J. Chivers and P. Langer (eds.), pp.150-165. Cambridge University Press, Cambridge.

Stanyon, R., Tofanelli, S., Morescalchi, M. A., Agoramoorthy, G., Ryder, O. A. and Wienberg, J. 1995. Cytogenetic analysis shows extensive genomic rearrangements between red howler (*Alouatta seniculus*, Linnaeus) subspecies. *Am. J. Primatol.* 35:171-183.

Strier, K. B. 1994. Brotherhoods among atelins: kinship, affiliation, and competition. *Behaviour* 130(3-4): 151-167.

Strier, K. B. 1994. *Primate Behaviour, Information, Social Knowledge, and the Evolution of Culture*, by Duane Quiatt and Vernon Reynolds, Cambridge University Press, Cambridge, 1993. *Int. J. Primatol.*, 15(6): 949-951. (Book review).

Sussman, R. W. 1994. *Marmosets and Tamarins: Systematics, Behaviour, and Ecology.* Edited by Anthony B. Rylands, Oxford University Press, Oxford and New York. 1993. *Quart. Rev. Biol.* 69(4): 537-538. (Book review).

Thompson, S. D., Power, M. L., Rutledge, C. E. and Kleiman, D. G. 1994. Energy metabolism and thermoregulation in the golden lion tamarin (*Leontopithecus rosalia*). *Folia Primatol.* 63: 131-143.

Timm, R.M. 1994. Mammals. In: *La Selva: Ecology and Natural History of a Neotropical Rain Forest*, L. A. McDade, K. S. Bawa, H. A. Hespenheide and G. S.Hartshorn (eds.), pp.394-398. University of Chicago Press, Chicago.

Timm, R. M. 1994. The mammal fauna. In: *La Selva: Ecology and Natural History of a Neotropical Rain Forest*, L. A. McDade, K. S. Bawa, H. A. Hespenheide and G. S.Hartshorn (eds.), pp.229-237. University of Chicago Press, Chicago.

Tomasello, M. and Call, J. 1994. Social cognition of monkeys and apes. *Yrbk. Phys. Anmthropol.* 37: 273-305.

Topping, D. L. 1995. *A Primate Model for the Study of Colitis and Colonic Carcinoma: The Cotton-top Tamarin* (Saguinus oedipus), edited by N. K. Clapp, CRC Press, 1993. *Austral. Primatol.* 9(3): 14-15. (Book review).

Ueno, Y. 1994. Responses to urine odor in the tufted capuchin (*Cebus apella*). *J. Ethol.* 12(2): 81-87.

Watt, S. L. 1994. Alloparental behavior in a captive group of spider monkeys (*Ateles geoffroyi*) at the Auckland Zoo. *Int. J. Primatol.* 15(1): 135-151.

Webley, G. E., Marsden, P. L. and Knight, P. G. 1994. Changes in plasma concentrations of immunoreactive inhibin progesterone, and bioactive gonadotrophin during pregnancy in the marmoset monkey. *Am. J. Primatol.* 32(3): 187-195.

Wechselberger, E. and Erkert, H. G. 1994. Characteristics of the light-induced phase-response of circadian activity rhythms in common marmosets, *Callithrix j. jacchus* (Primates-Cebidae). *Chronobiology International* 11(5): 275-284.

Westergaard, G. C. and Suomi, S. J. 1994. Aimed throwing of stones by tufted capuchin monkeys (*Cebus apella*). *Hum. Evol.* 9(4): 323-329.

Westergaard, G. C. 1994. The subsistence technology of capuchins. *Int. J. Primatol.* 15(6): 899-906.

Westergaard, G. C. and Hopkins, W. P. 1994. Theories of mind and self-recognition. *Am. Psychol.* 49(8): 761.

Westergaard, G. C. and Suomi, S. J. 1994. The use of probing tools by tufted capuchins (*Cebus apella*): evidence for increased right-hand preference with age. *Int. J. Primatol.* 15(4): 521-529.

Westergaard, G. C. and Suomi, S. J. 1994. Hierarchical complexity of combinatorial manipulation in capuchin monkeys (*Cebus apella*). *Am. J. Primatol.* 32(3): 171-176.

Whitehead, J. M. 1995. Vox Alouattinae: a preliminary survey of the acoustic characteristics of long-distance calls of howler monkeys. *Int. J. Primatol.* 16(1): 121-144.

Williams, P. H., Gaston, K. J. and Humphries, C. J. 1994. Do conservationists and molecular biologists value differences between organisms in the same way? *Biodiversity Letters* 2: 67-78.

Young Owl, M. 1994. A direct method for measurement of gross surface area of mammalian gastro-intestinal tracts. In: *The Digestive System in Mammals: Food, Form, and Function*, D. J.Chivers and P. Langer (eds.), pp.219-233. Cambridge University Press, Cambridge.

Young, T. P. 1994. The evolution of group size and the evolution of group living. *Evol. Anthropol.* 3(2): 64. (Commentary of L.A.Isbell, *Evol. Anthropol.* 3(2): 61-71.)

Young,, T. P. 1994. Predation risk, predation rate, and the effectiveness of anti-predator traits. *Evol. Anthropol.* 3(2): 67. (Commentary of L.A.Isbell, *Evol. Anthropol.* 3(2): 61-71)

Zuk, M. 1995. *Female Choices: Sexual Behaviour of Female Primates*, by M. F. Small, Cornell University Press, Ithaca, New York. 1993. *Anim.Behav.* 49(1): 271-272. (Book review).

Zunino, G. E. and Mudry M. D. 1993. Karyotype and morphology of *Cebus apella* (Primates, Cebidae) subspecies from Argentina. *Bol. Primatol. Latinoam.* 4(1): 9-13. (In Spanish).

In: *Current Primatology, Vol. I: Ecology and Evolution*, B. Thierry, J. R. Anderson, J. J. Roeder and N. Herrenschmidt (eds.). Université Louis Pasteur, Strasbourg. 1994.

Cant, J. G. H. Positional behavior of arboreal primates and habitat compliance. pp.187-193.

Christen, A. Goeldi's monkey, *Callimico goeldii*, in northern Bolivia. pp.73-78.

Eeley, H. A. C. A digital method for the analysis of primate range boundaries. pp.123-132.

Julliot, C. Diet diversity and habitat of howler monkeys. pp.67-71.

Peres, C. A. Plant resource use and partitioning in two tamarin species and woolly monkeys in an Amazonian terra firme forest. pp.57-66.

Simmen, B. The relationship between taste discrimination and dietary specialization in neotropical primates. pp.143-150.

Walker, S. E. Positional behavior and habitat compliance. pp.195-201.

Youlatis, D. and Gasc, J. P. A preliminary study of head-first descent of lianas in the red howler monkey, *Alouatta seniculus*, in a primary rain forest of French Guiana. pp.203-210.

In: *Current Primatology, Vol. II: Social Development, Learning and Behaviour*, J. J. Roeder, B. Thierry, J. R. Anderson and N. Herrenschmidt (eds). Université Louis Pasteur, Strasbourg. 1994.

Anaya-Huertas, C. Arenas-Frias, V. Mayagoitia, L. and Mondragon-Ceballos, R. 1994. Socialization patterns in a group of hand-reared spider monkeys. pp.303-307.

Anderson, J. R. and Marchal, P. Capuchin monkeys and confrontations with mirrors. pp.371-380.

Biben, M. Playback studies of social communication in the squirrel monkey (*Saimiri sciureus*). pp.207-213.

Box, H. O. Comparative perspectives in primate social learning: new lessons for old traditions. pp.321-327.

Brown, C. H. Ecological constraints for the evolution of primate vocalizations. pp.227-232.

Fragaszy, D.M. and Shaffer, D. R. Developmental foundations of social learning in humans and other primates. pp.329-338.

Koenig, A. Random scan: sentinels or sentinel system? A study in captive common marmosets (*Callithrix jacchus*). pp.69-76.

Mason, W.A., Geen, T. R., Lyons, D. M. and Mendoza, S. P. Socialization influences on responses to intruders, pp. 63-68.

Mendoza, S. P. and Mason, W. A. Constitution and context: the social modulation of temperament. pp.251-256.

Oberski, I. M. A method for the analysis of grooming reciprocation at the dyadic level. pp.175-183.

Serio-Silva, J. C. and Rodríguez-Luna, E. Howler monkey (*Alouatta palliata*) behavior during the first weeks of life. pp.309-313.

Whitehead, J. M. Acoustic correlates of internal states in free-ranging primates: the example of the mantled howling monkey *Alouatta palliata*. pp.221-226.

In: *Current Primatology, Vol. III: Behavioural Neuroscience, Physiology and Reproduction*, J. R. Anderson, J. J. Roeder, B. Thierry and N. Herrenschmidt (eds.), Université Louis Pasteur, Strasbourg. 1994.

Filion, C. M., Johnson, J. S. , Fragaszy, D. and Johnson, R. Studying cognition in tufted capuchins (*Cebus*

apella) using video-formatted testing paradigm. pp.111-117.

Limongelli, L., Sonetti, M. G. and Visalberghi, E. Hand preference of tufted capuchins (*Cebus apella*) in tool-using tasks. pp.9-15.

Vitale, A. Barbaro, V., Bartolini, P. and Visalberghi E. Effects of wearing a jacket on the behavior of socially housed tufted capuchins (*Cebus apella*). pp.279-284.

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ABSTRACTS

Abbott, D. H., Saltzman, W. Schultz-Darken, N. J. and Teresawa, E. 1994. Gonadotropin-releasing hormone (GnRH) release in ovariectomized female marmoset monkeys. Soc. *Neurosci. Abstr.* 20(Part 2): 942.

Izawa, K. 1994. Infanticide in red howler monkeys. *Reichorui Kenkyu / Primate Research* 10(2): 128.

Kobayashi, S. and Langguth, A. 1994. New titi monkey from Brazil. *Reichorui Kenkyu / Primate Research* 10(2): 128. (In Japanese)

Nakatsukasa, M., Takai, M. and Setoguchi, T. 1994. Postcrania of middle Miocene platyrrhine from La Venta, Colombia, South America. *Reichorui Kenkyu / Primate Research* 10(2): 165.

Oerke, A.-K., Einspanier, A. and Hodges, J. K. 1994. Follicular development and corpus luteum formations determined by ultrasonography in the marmoset monkey (*Callithrix jacchus*). *J. Reprod. Fert.* (suppl. 13): 11.

Phillips, K. A. 1995. Resource distribution and sociality in white-faced capuchins, *Cebus capucinus*. 1994. *Diss. Abstr. Int.* B55(9):4163. To order: #AAD95-04425, University Microfilms, Inc., Ann Arbor, MI 48106, USA.

Platt, M. L. 1995. Memory and feeding ecology in lion tamarins (*Leontopithecus rosalia*) and marmosets (*Callithrix kuhli*). 1994. *Diss. Abstr. Int.* A55(9): 2886. To order: #AAD95-03815, University Microfilms, Inc., Ann Arbor, MI 48106, USA.

Robinson, E. L. annd Fuller, C. A. 1995. Circadian rhythms of heat production, heat loss and body temperature in squirrel monkeys. *FASEB J.* 9(3): A357.

Takai, M. and Setoguchi, T. 1994. On the evolution of platyrrhine monkeys: the analysis of upper premolars' structure. *Reichorui Kenkyu / Primate Research* 10(2): 146.

In *American Journal of Physical Anthropology* (Suppl. 20). 1995.

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Meetings

1995 Annual Meeting of the Animal Behavior Society, 8-13 July 1995, University of Nebraska, Lincoln, Nebraska, USA. For further information: Dr A. L. Kamil, School of Biological Sciences, Manter Hall, University of Nebraska, Lincoln, NE 68588-0118, USA Tel: 402 472-9074, Fax: 402 472-2083, e-mail: ABS@niko.inl.edu.

ASAB Summer Meeting: Behavioural Mechanisms and Evolution, 12-14 July, 1995, Association for the Study of Animal Behaviour (ASAB), Leiden University, The Netherlands. Celebrating 60 years since the beginning of the career of Niko Tinbergen. The first ASAB Medal will be awarded to John Maynard Smith. The ASAB Annual General Meeting will be held on 13 July. Grants towards costs of attending the meeting are available to ASAB members (UK and overseas) who are registered for a higher degree or who have no access to normal funding sources. Registration forms must be returned to by 1st June 1995. Further information from: Carel ten Cate, Ethology, Institute of Evolutionary and Ecological Sciences, P.O.Box 9516, 2300 RA Leiden, Netherlands. Tel: 31-71-275001, Fax: 31-71-274900. A satellite workshop on 'Research in Zoos: from Behaviour to Sex Ratio Manipulation" will be held at the Rotterdam Zoo on the 15 July. Contact: Angela R. Glatston, Rotterdam Zoo, P.O.Box 532, 1000 AM Rotterdam. Tel: 31-10-4431410, Fax: 31-10-4431424.

VII Congresso Brasileiro de Primatologia, 23-28 de julho de 1995, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte. A programação do Congresso incluirá sessões de comunicações coordenadas, mini-cursos, paineis, conferências e mesas-redondas. Prazo para envio dos resumos: 15 de março de 1995. Contato: Secretaria do VII Congresso Brasileiro de Primatologia, Universidade Federal do Grande do Norte, Centro de Biociências, Setor de Psicobiologia, Caixa Postal 1511, 59072-970 Natal, Rio Grande do Norte, Brazil. Tel: 084 206 1147, Fax: 084 231 9587, e-mail: fximenes@ncc.ufrn.br.

24th International Ethological Congress, 10-17 August 1995, Honolulu, Hawaii. Sponsored by the University of Hawaii. Contact: Conference Secretariat, 800 N. W. Loop 410, Suite 150-S, San Antonio, TX 78216-5674, USA. Tel: (210) 341-8131, Fax: (210) 341-5252, e-mail: iec@zoogate.zoo.hawaii.edu.

2nd International Conference on Environmental Enrichment, 21-25 August 1995, Copenhagen Zoo, Denmark. The main topics will be environmental enrichment devices,, managing behavioral problems, and behavioral considerations in breeding and reintroduction programs. Contact: Bengt Holst, Copenhagen Zoo, Sdr Fasanvej 79, DK-2000 Frederiksberg, Denmark. Tel: (45) 36-30-25-55, Fax: (45) 36-44-24-55.

II Reunión sobre Selvas de Montaña, 21 al 24 de setiembre de 1995, Salta, Argentina, organizada por la Comisión Coordinadora de la Red Yungas integrada por las siguientes instituciones: Protección del Medio Ambiente de Tarija, Bolivia, Delegación Técnica Regional Noroeste de la Administración de Parques Nacionales, Salta, Laboratorio de Investigaciones Ecológicas de Yungas (LIEY), Tucumán, Proyecto GTZ Desarrollo Agroflorestal en Comunidades Rurales del Noroeste Argentina, Salta, y Universidad Nacional de Salta (UNSa), Salta. La reunión consistirá de conferencias, talleres y exposición de trabajos en paneles. El programa en principio incluye los siguientes temas: *Conferencias* - Vinculaciones sociales de las poblaciones de Yungas con otros pisos ecológicos; Impacto de la implementación de megaproyectos en las Yungas; Los bosques nublados del mundo; Problematica de la tenencia de la tierra en las Yungas; *Talleres* - Metodologias para el inventario de biodiversidad; Programa de investigación y manejo forestal; Desarollo binacional de la alta cuenca del río Bermejo - análisis de riesgos y ventajes; Estrategias para la implementación del área de conservación del al alta cuenca del Bermejo. La fecha limite para la presentación de resuménes es el 21 de julio de 1995. El costo de inscripción será de US$30 y US$10 para estudiantes. Los resuménes e inscripciones deberán ser enviados a: Administración de Parques Nacionales, España 366, 3er Piso, (4400) Salta, Argentina. Tel: 0054-87-310255, Fax: 0054-87-312683.

International Symposium on Primate Ontogeny, 10-15 September 1995, Congress Castle of Czech

Academy of Sciences, Trest, Czech Republic. Organized by the Primatological Group in Czech Republic of the Czech Anthropological Society, in cooperation with the Research Institute for Pharmacy and Biochemistry. The aim is to discuss primate ontogeny as an integral process to help the future development of an interdisciplinary approach, focussing on variability of growth and developmental processes. All topics from from traditional branches of primatology and morphology, growth, reproductive biology, ethology, genetic and molecular biology, physiology, ecology, or evolutionary primatology and anthropology are welcomed. Contact: Dr Marina Vancatová, VÚFB Konárovice, 28125 Konárovice, Czech Republic. Fax: 42 321 26246.

INTERNATIONAL CONFERENCE ON HABITAT FRAGMENTATION AND INFRASTRUCTURE AND THE ROLE OF ECOLOGICAL ENGINEERING, 17-21 September 1995, Holiday Inn, Maastricht, The Hague, Netherlands. In cooperation with The International Ecological Engineering Society (IFES) and The Ecological Society of the Netherlands and Belgium (NEVECOL). Contact: Congress Office ASD, P.O.Box 40, 2600 AA Delft, The Netherlands. Tel: +31 15 120234, Fax: +31 15 120250.

4TH CONGRESS OF THE GESELLSCHAFT FÜR PRIMATOLOGIE (GfP), 20-24 September 1995, Kassel, Germany. The main topic of the Congress will be the interaction between primatological field and laboratory research, for example, the application of laboratory-based physiological, endocrinological and genetic methods in primate field research. Papers and posters on any other primatological topics are welcome. For more information contact: Prof. Dr Christian Welker, Zoologie und Vergl. Anatomie, Primatenethologie, Universität Kassel, D-34109 Kassel, Germany. Fax: + 49 561 804 4604.

1995 ANNUAL MEETING OF THE CONSERVATION BREEDING SPECIALIST GROUP (CBSG/IUCN/ SSC), 28 September-1 October 1995, Zoological Society of Ireland, Dublin. Secretariat: 1995 Annual Meeting of the CBSG, c/o Conference Management Services, 26 Temple Lane, Dublin 2, Ireland.

III CONGRESO LATINOAMERICANO DE ECOLOGIA, 22-28 Octubre 1995, Universidad de Los Andes, Merida, Venezuela. Los resúmenes de los trabajos a ser presentados deben ser enviados antes del 30 de Julio de 1995 (Ponencia oral o de Cartel). Los idiomas oficiales: Español y Portugués. Se aceptarán ponencias en Inglés y Francés, esperándose contar con sistemas de traducción simultánea. Inscripciones: Hasta 30/12/94 - Profesionales US$70.00, Estudiantes de postgrado US$40.00, Estudiantes de pregrado US$30.00; Hasta 30/05/95 - Profesionales US$85.00, Estudiantes de postgrado US$55.00, Estudiantes de pregrado US$45.00; Al Congreso - Profesionales US$100.00, Estudiantes de postgrado US$70.00, Estudiantes de pregrado US$60.00. Informaciones: Dr Jaime E. Péfaur, Secretario Ejecutivo, III Congreso Latinoamericano de Ecologia, Facultad de Ciencias, Universidad de Los Andes, Merida, Venezuela 5101. Tel: (58)(74) 401305, Fax: (58)(74) 401286, e-mail: clae@ula.ve.

PRIMATE SOCIETY OF GREAT BRITAIN (PSGB) WINTER MEETING: BIOLOGY AND CONSERVATION OF NEW WORLD PRIMATES, 29 November 1995, The Zoological Society of London, London. Organised by Hilary O. Box and Hannah Buchanan-Smith. Contact: Hilary O. Box, Department of Psychology, University of Reading, Reading RG6 2AL, Berkshire, UK. Tel: +44 1734 318523 ext.6668, Fax: +44 1734 316604, or Hannah Buchanan-Smith, Department of Psychology, University of Stirling, Stirling FK9 4LA, UK. Tel: +44 1786 467674, Fax: +44 1786 467641, e-mail: h.m.buchanan-smith@stirling.ac. uk. (See 'Primate Societies').

ASAB WINTER MEETING: SPACE, THE FINAL FRONTIER, 30 November to 1 December 1995, Association for the Study of Animal Behaviour (ASAB), Zoological Society of London Meeting Rooms, Regent's Park, London, UK. The theme of this meeting will be spatial representation in animals, covering such topics as long-distance migration, navigation through familiar areas, 'cognitive maps', and the role of the hippocampus. Abstract submission by e-mail or ordinary mail by 7 July 1995 to: Sue Healy, Department of Psychology, University of Newcastle, Newcastle upon Tyne NE1 7RU, UK, Tel 0191-222-5056, Fax: 0191- 222-5622, e-mail: s.d..healy@ncl.ac. uk.

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ASAB GENERAL SPRING MEETING, 2-3 April 1996, Association for the Study of Animal Behaviour, Bolton Institute Primate Research Team, Bolton Institute, UK. Organized by Geoff Hosey and other members of the Primate Research Team. Offers of papers and posters invited, send title plus rough stetement of content. Further information: Marie Jacques, Primate Research Team, Division of Psychology and Biology, Bolton Institute, Deane Road, Bolton BL3 5AB, Lancashire, UK, Tel: 01204 528851, ext. 3145, Fax: 01204 399074, e-mail: mjl@bolton.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. (See 'Primate Societies').

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.

IUCN WORLD CONSERVATION CONGRESS, 14-23 October 1996, Montreal Conference Centre, Montreal, Canada. Contact: John Burke, Director of Communications, IUCN The World Conservation Union, 28 rue Mauverney, 1196 Gland Switzerland. Tel: +41 22 999 0123.

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, either in the form of manuscripts (double-spaced) or in diskettes 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.

Please send contributions to: **ANTHONY RYLANDS**, Departamento de Zoologia, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, 31270-901 Belo Horizonte, Brazil, Fax: (031) 441-1412, or c/o Conservation International, Avenida Antônio Abrahão Caram 820/302, Pampulha, 31275-000 Belo Horizonte, Minas Gerais, Brazil, Fax: (031)441-2582 or **ERNESTO RODRÍGUEZ LUNA**, Parque de La Flora y Fauna Silvestre Tropical, Universidad Veracruzana, Apartado Postal 566, Xalapa, Veracruz 91000, México, Fax: 52 (28) 12-5748.

LILIANA CORTÉS-ORTIZ (Universidad Veracruzana) and MIRIAM MENEZES LIMA (Conservation International, Belo Horizonte) provide invaluable editorial assistance. LUDMILLA AGUIAR, Conservation International - Brazil Program, Belo Horizonte (address above), is responsible for the distribution of *Neotropical Primates*. Please keep us informed of any address changes.

Correspondence, messages, and texts can be sent to
Anthony Rylands/Ludmilla Aguiar: cibrasil@ax.apc.org
Fundação Biodiversitas: cdcb@ax.apc.org

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NEOTROPICAL PRIMATES
Anthony Rylands/Ernesto Rodríguez Luna, Editors
Conservation International
Avenida Antônio Abrahão Caram 820/302
31275-000, Belo Horizonte
Minas Gerais, Brazil