

## References

- Eisenberg, J. F. and Redford, K. H. 1999. *Mammals of the Neotropics*, Vol. 3, *The Central Neotropics: Ecuador, Peru, Bolivia, Brazil*. The University of Chicago Press, Chicago.
- Nowak, R. M. 1991. *Walker's Mammals of the World*. Vol. 1. The Johns Hopkins University Press, Baltimore.

## Diurnal Rest Sites of Translocated Lesser Anteaters (*Tamandua tetradactyla*) in the Cerrado of Brazil

Flávio H. G. Rodrigues

*Associação para Conservação dos Carnívoros Neotropicais – Pró-Carnívoros and Departamento de Zoologia, Universidade de Brasília, Brasília. Address: SQN 412, Bloco K, Apt. 305, 70.867-110 Brasília, DF, Brazil.*

Jader S. Marinho-Filho

*Departamento de Zoologia, Instituto de Biologia, Universidade de Brasília, 70.910-900 Brasília, DF, Brazil. E-mail: <jmarinho@unb.br>.*

The lesser anteater *Tamandua tetradactyla* (L. 1758) inhabits South America from the eastern side of the Andes to northern Argentina and Uruguay, occupying both open and forested areas. Most of the information on this species' ecology and behavior refers to its diet and foraging behavior (Lubin *et al.*, 1977; Montgomery and Lubin, 1977; Lubin and Montgomery, 1981; Montgomery, 1985a, 1985b), and little is known about other aspects of their biology (Montgomery, 1985b; Rodrigues *et al.*, 2001).

We studied eight lesser anteaters captured by the Fauna Rescue Operation at the hydroelectric reservoir of Serra da Mesa, Minaçu, Goiás, Brazil (13°49'49"S, 48°19'18"W) (Rodrigues *et al.*, 2001), formed by the Rios Bagagem, Tocantinzinho and Maranhão, first-order tributaries of the Rio Tocantins. The vegetation of the region is typical of the Cerrado, a Neotropical savanna (Eiten, 1972). The lake was full in late 1998, flooding an area of 178,000 ha in seven municipalities. The animals were translocated to areas along the border of the reservoir and tracked by radio telemetry. The radios were attached to harnesses, which were firmly fitted to the anteater, in such a way as not to interfere with the animals' movements.

The measurements from some of the captured animals are presented in Table 1. There are few data on lesser anteater measurements, and published information is based on few individuals. The measurements of the Serra da Mesa anteaters are, in general, smaller than those reported by other authors (Wetzel, 1985; Eisenberg and Redford, 1999; Emmons and Feer, 1997), but within recorded variation.

After being released, the animals were located as often as possible, during the day, by following the signal until reaching the animal and the diurnal rest site was noted. Lesser anteaters are cited in the literature as passing their inactive hours in tree cavities or burrows in the ground, made by other animals (Emmons and Feer, 1997; Redford and Eisenberg, 1992). Montgomery (1985b) found that lesser anteaters rest as much in trees as they do on the ground, but also recorded

TABLE 1. Biometric data of lesser anteaters, *Tamandua tetradactyla*, in the Serra da Mesa region, Goiás, Brazil.

Date	Sex and Number	Total length (cm)	Tail (cm)	Ear (cm)	Hind foot (cm)	Head (cm)	Weight (g)
08-19-97	F2	105.0	48.2	5.0	8.9	16.0	4,630
10-24-97	F4	84.0	37.2	4.2	7.5	12.0	2,540
10-24-97	M2	93.0	41.5	4.9	8.6	14.0	4,015
11-20-97	F5	94.5	40.0	4.2	9.0	13.3	3,665
01-28-98	M3	98.8	41.5	4.5	9.5	13.5	5,740

---

that individuals were captured mainly in palms (*Copernicia tectorum*) and other trees, when they were sleeping. We found a lesser anteater active during the day only once. Every time we found inactive anteaters (n = 19), they were on the ground, generally in armadillo (*Euphractus sexcinctus*) burrows (n = 17), 35.3% of which were in termite mounds, 17.6% in ant nests and the rest (47%) simply on the ground. One shelter was in a cavity in the ground, between rocks, and once an anteater was found sleeping close to a termite mound, unsheltered. In two termite mound shelters, there were signs that the anteater had enlarged the burrow. One anteater was found in the same burrow for three consecutive days, apparently not having left it during this period.

The burrows used by anteaters were  $20.4 \pm 4.1$  cm in height and  $18.7 \pm 1.9$  cm wide (n = 6). On the six occasions we found anteaters sheltered in armadillo burrows on termite mounds, they were partially exposed and easily visible to predators, but when they were sheltered in holes in the ground or in ant nests, they were more difficult to detect. Armadillos make holes at the base of termite nests, to feed and shelter. Feeding holes are superficial, more common and easier to find. Anteaters were protected more against predators in deep holes than in superficial ones, and the high frequency they were found in burrows on termite mounds can be related to the higher availability of feeding holes of armadillos. Due to the lack of large trees and hollow logs in the Cerrado, armadillos can play an important role in the refuge ecology of many vertebrates in this biome, supplying shelters for lesser anteaters and other animals. The over-hunting of armadillos, which seemingly occurs in most of the Cerrado, may have some influence over shelter availability for anteater populations as well as for other vertebrates.

#### Acknowledgements

This study was financed by Furnas Centrais Eléctricas S.A. and Serra da Mesa Energia S.A. The monitored animals were generously provided by the Fauna Rescue Operation of Serra da Mesa,

coordinated by Dr. Nelson Jorge da Silva Jr. We thank Raimundo Henriques for helpful comments on the manuscript. We also thank Adriani Hass, Hamilton Garbogini Santos, Eurípedes Brito and all those who helped with fieldwork. The Brazil Science Council (Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq) provided financial support to JMF (Proc. 300591/86-1).

#### References

- Alho, C. J. R. 1988. Maneje com cuidado – frágil. *Ciência Hoje* 46: 40-47.
- Eiten, G. 1972. The Cerrado vegetation of Brazil. *Bot. Rev.* 38: 201-341.
- Eisenberg, J. F. and Redford, K. H. 1999. *Mammals of the Neotropics*, Vol. 3, *The Central Neotropics: Ecuador, Peru, Bolivia, Brazil*. The University of Chicago Press, Chicago.
- Emmons, L. H. and Feer, F. 1997. *Neotropical Rainforest Mammals: A Field Guide*. 2<sup>nd</sup> edition. The University of Chicago Press, Chicago.
- Lubin, Y. D. and Montgomery, G. G. 1981. Defenses of *Nasutitermes* termites (Isoptera, Termitidae) against tamandua anteaters (Edentata, Myrmecophagidae). *Biotropica* 13: 66-76.
- Lubin, Y. D., Montgomery, G. G. and Young, O. P. 1977. Food resources of anteaters (Edentata: Myrmecophagidae) I. A year's census of arboreal ants and termites on Barro Colorado Island, Panama Canal Zone. *Biotropica* 9: 26-34.
- Montgomery, G. G. and Lubin, Y. D. 1977. Prey influences on movements of neotropical anteaters. In: *Proceedings of the 1975 Predator Symposium*, Phillips, R. L. and Jonkel, C. (eds.), pp.103-131. Montana Forest and Conservation Experiment Station, University of Montana, Missoula.
- Montgomery, G. G. 1985a. Impact of vermilinguas (*Cyclopes*, *Tamandua*: Xenarthra = Edentata) on arboreal ant populations. In: *The Evolution and Ecology of Armadillos, Sloths, and Vermilinguas*, G. G. Montgomery (ed.), pp.351-363. Smithsonian Institution Press, Washington, DC.

- Montgomery, G. G. 1985b. Movements, foraging and food habits of the four extant species of Neotropical vermilinguas (Mammalia; Myrmecophagidae). In: *The Evolution and Ecology of Armadillos, Sloths, and Vermilinguas*, G. G. Montgomery (ed.), pp.365-377. Smithsonian Institution Press, Washington, DC.
- Redford, K. H. y Eisenberg, J. F. 1992. *Mammals of the Neotropics*, Vol. 2, *The Southern Cone: Chile, Argentina, Uruguay, Paraguay*. The University of Chicago Press, Chicago.
- Rodrigues, F. H. G., Marinho-Filho, J. S. and Santos, H. G. 2001. Home ranges of translocated lesser anteaters (*Tamandua tetradactyla*) in the Cerrado of Brazil. *Oryx* 35: 166-169.
- Wetzel, R. M. 1985. The identification and distribution of recent Xenarthra (Edentata). In: *The Evolution and Ecology of Armadillos, Sloths, and Vermilinguas*, G. G. Montgomery (ed.), pp.23-46. Smithsonian Institution Press, Washington, DC.

---

## The Yellow Armadillo, *Euphractus sexcinctus*, in the North/Northeastern Brazilian Coast

### Adriani Hass

Departamento de Zoologia, Instituto de Biologia, Universidade de Brasília, Brasília, DF. Address: SQN 412, Bloco K, Apto. 305, 70.867-110 Brasília, DF, Brazil.

### Flávio H. G. Rodrigues

Associação para Conservação dos Carnívoros Neotropicals – Pró-Carnívoros and Departamento de Zoologia, Universidade de Brasília, Brasília, DF. Address: SQN 412, Bloco K, Apto. 305, Brasília, 70.867-110, DF, Brazil.

### Tadeu G. de Oliveira

Associação para Conservação dos Carnívoros Neotropicals – Pró-Carnívoros and Departamento de Biologia, Universidade Estadual do Maranhão, São Luís, Maranhão. Address: Rua das Quaresmeiras, Qd-8, No. 14, 65076-270 São Luís, MA, Brazil.

The distribution of the yellow armadillo (*Euphractus sexcinctus*) was recently enlarged to include the state of Maranhão in northern Brazil (Silva-Júnior *et al.*, 2001). This species occupies distinct

biomes in South America, such as the Caatinga, Cerrado, Pantanal, Chaco, Atlantic Forest and, at least, the open savannas of the Amazon (Silva-Júnior and Nunes, 2001). The yellow armadillo habitat ranges from grasslands to forest borders (Silva-Júnior *et al.*, 2001; Olmos, 1995; Redford and Wetzel, 1985; Wetzel, 1985; Brooks, 1985; Emmons and Feer, 1997), but there is no consistent information on the use of tall forest and coastal areas (Silva-Júnior *et al.*, 2001). Here we describe records of *E. sexcinctus* in coastal areas of the state of Maranhão.

In April 1994, a female yellow armadillo was captured by fishermen at Cajual Island (02°26'S, 44°03'W), on the western coast of Maranhão, swimming in the sea, about 50 m from the coast. Cajual Island is about 6,000 ha and only 500 m from the coastline. The vegetation is composed mainly of mangroves, but restingas (scrub on coastal sand soils) and mud patches are also present. The yellow armadillo is quite omnivorous, eating insects and plant matter (Redford, 1985) as well as small rodents (Bezerra *et al.*, 2001). This broad diet makes possible its occupation of a wide range of habitats, and it is plausible that *E. sexcinctus* feeds on crabs at Cajual Island, an abundant resource there. Although we have no data on habitat use by the armadillos on the island, they probably mostly occupy the restinga habitat, because of the lack of vegetation on the mud patches where the armadillo would be very exposed. Mangroves are the dominant vegetation, and are flooded daily (the tidal range reaches 7 m, the largest in Brazil) and this habitat is not available for burrows and refuge, although it may be used to forage. Its swimming ability makes it possible for the yellow armadillo to colonize islands near the coast, and for dispersal between the various populations. This was the first record of the species at Cajual Island, and it is possible that this individual was even an initial colonizer.

Caju Island is off the eastern coast of Maranhão (02°47'S, 42°05'W) and is one of 80 islands in the Parnaíba Delta, the largest of the Americas. This 100-km<sup>2</sup> island is a private resort. It has a broad range of habitats, with mangroves (35%),