

FEEDING BY *DIDELPHIS ALBIVENTRIS* ON TREE GUM IN THE NORTHEASTERN ATLANTIC FOREST OF BRAZIL

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White-eared opossums, *Didelphis albiventris* (Didelphidae, Marsupialia) are widely distributed in Brazil (Emmons and Feer, 1997), and are very common in the urban region of the State of Pernambuco. Most available information on the biology of this species in Brazil comes from studies conducted in patches of forests in the southern part of the country (e.g., Cáceres, 2000; Cáceres and Monteiro-Filho, 2001), and little is known of its biology in highly-modified environments although the species appears to be well adapted to urban habitats (Aléssio, unpub. data)

Based on mark-recapture studies it has been shown that white-eared opossums present a very generalist feeding habit, and that the inclusion of a variety of food items appear to be opportunistic (Eisenberg, 1989; Rodriguez and Barqué, 1992; Santori et al., 1995; Leite et al., 1996; Malcolm, 1997; Carvalho et al., 1999; Cáceres and Monteiro-Filho, 2001; Cáceres, 2002).

Another species of mammals that has adapted well to live in patchy environments where semi natural and urban habitats mingle in north-east-

ern Brazil is the Tufted-eared marmoset *Callithrix jacchus*, Callithrichidae, Primates (Alonso and Langguth, 1989; Mendes Pontes and Monteiro da Cruz, 1995; Roda and Mendes Pontes, 1998); this species is sympatric with the white-eared opossums and shows a fairly similar diet composed of fruits, insects, invertebrates, and small vertebrates (e.g., Stevenson and Rylands, 1988; Alonso and Langguth, 1989).

Tufted-eared marmosets have developed the ability to actively exploit the exudates of a number of tree species by scratching off tree trunks and thus inducing the flow of tree gum; especially in the dry season this activity may take more than 70% of their foraging time (Fonseca and Lacher, 1984; Rylands, 1984; Silva and Monteiro da Cruz, 1993). Alonso and Langguth (1989) have also showed that Tufted-eared marmosets usually scratch the tree trunk at dusk and return to feed on the gum exudates in the first hours of the following morning.

In this study we show for the first time that White-eared opossums (*Didelphis albiventris*)

may directly benefit from Tufted-eared marmosets' gominivory by opportunistically feeding on their gum sources.

The study was carried out at Dois Irmãos Ecological Reserve, which comprises a fragment of 387 ha of the highly-threatened Atlantic forest located in an urban area at 07°55'43"-08°09'17"S and 34°52'05"-35°00'59"W (Weber and Rezende, 1998). Dois Irmãos has a wet season from March to September and a dry season from October to February (Mendes Pontes and Monteiro da Cruz, 1995), mean monthly temperature around 23°C, and rainfall around 2 460 mm (Coutinho et al., 1998).

Two male White-eared opossums (M1, M2) were radio-tagged and monitored between September and December 2002, using the 'homing in on the animal' technique (White and Garrott, 1990). Both animals were followed in observational periods divided in two bouts (i.e., between 18:00 and 00:00 hs, and between 00:00 hs and 06:00 hs) as in Julien-Laferriere (1993); observations here reported were recorded ad libitum (Altmann, 1974). M1 has been followed for 14 bouts and M2, for 6 bouts. Plant material was identified and is currently deposited in the collections of the Herbarium of the Federal University of Pernambuco, Brazil.

On September 25th of 2002, male M1 was located at 19:45 hs, when it was recorded resting for about 30 min, 5 m above the ground. It then travelled for about 8 min, until 20:23 hs when it descended to the forest floor and moved some 2 m towards a *Tapirira guianensis* tree (Anacardiaceae). It climbed up the tree trunk to about 2 m, and started to lick small white gumballs jellified inside the holes of the tree trunk (n=2); this activity took 5 min. The holes had the strong smell of the characteristic scent marking of Tufted-eared marmosets (Stevenson and Rylands, 1988; Scanlon et al., 1989), and were distributed all over the tree trunk (n=19) covering a total area of 3 014 cm² (mean length 2.9±1.45 cm and mean width 1.4±0.22 cm). A second feeding bout was recorded at 22:30 hs on another *T. guianensis* by the same male, M1. It again reached the tree from the forest floor, and climbed 5 m when it started licking the gumballs (n=4); an activity which took 9

min. The area with feeding holes totalled 300 cm² (mean length of 2.6±1.2 cm and mean width of 1.6±0.32 cm; n=17).

The Atlantic rainforest of North-eastern Brazil is now formed by a highly fragmented landscape, surrounded by a matrix of sugar-cane plantation (Brown and Brown, 1992; Dean, 1995). The remaining mammal community inhabiting these forest fragments will have to be able to cope with serious environmental disturbances, such as considerable food fluctuations (Scanlon et al., 1989; Mendes Pontes and Monteiro da Cruz, 1995; Monteiro da Cruz, 1998). In this context, the key variable determining the survival and long-term maintenance of these communities is the availability and quality of alternative food sources.

White-eared opossums and Tufted-eared marmosets seem to fit this requirement, as they have very broad feeding habits (Stevenson and Rylands, 1988; Alonso and Langguth, 1989). Even more, Tufted-eared marmosets have the ability to exploit tree exudates (Maier et al., 1982; Scanlon et al., 1989), what was thought to be their exclusive niche in the Atlantic rainforest of North-eastern Brazil. White-eared opossums now appear to benefit from this behavior (Maier et al., 1982). To date, it appears white-eared opossums are the only nocturnal forest dwellers to exploit it, gaining access to this readily available, highly nutritious resource even before the Tufted-eared marmosets.

Since *T. guianensis*, along with many other trees species in the Northeastern Atlantic forest provide abundant exudates all year around (Scanlon et al., 1989; Mendes Pontes and Monteiro da Cruz, 1995), this may contribute to the comparatively higher abundance of these two species of mammals in the highly fragmented Atlantic forest. According to Mendes Pontes and Monteiro da Cruz (1995) the use of the resource core area rich in gum trees by the Tufted-eared marmosets at Dois Irmãos forest reached its peak in September –the beginning of the dry season– and when fruiting is at a minimum; this is also the time of the year when we made the observations reported herein.

The great adaptability of *D. albiventris* to highly degraded areas, and urban forest fragments, may pose a serious threat to Tufted-eared marmosets and other Callitrichids, which exploit gum sources. Future studies should be able to compare pristine with highly-disturbed forest fragments, to see if this behavior would be a counter-strategy to survive the ever dwindling Atlantic forest, or part of their normal feeding strategies, as well as should assess its impact on the common marmosets populations.

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