

NOTES

Seed dispersal by black lion tamarin, *Leontopithecus chrysopygus* (Primates, Callitrichidae), in southeastern Brazil

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Frugivores can contribute to seed dispersal by swallowing, regurgitating, defecating or burying seeds, and the passage of seeds through the digestive tract may break dormancy or increase germination (Fleming and Williams 1990; Howe and Smallwood 1982; Smythe 1970). Several papers related to vertebrates as agents of seed dispersal emphasize the importance of primates (e.g. Chapman 1989; Garber 1986; Howe 1980). This study describes the role of the black lion tamarin, *Leontopithecus chrysopygus* (Mikan, 1823) as a seed disperser in its natural habitats.

The data were obtained during a study of the black lion tamarin (Passos 1992) carried out at the Caetetus Ecological Station, in the municipalities of Gália and Alvinlândia, São Paulo, south-east Brazil (22°23'S, 49°49'W). The Station is an isolated patch (2178 ha) of semideciduous mesophytic forest. Faeces of monkeys were collected from January to May of 1989. The seeds found in the faeces were separated and put to germinate under natural conditions of light and temperature. Seeds from the same fruits species were collected as control and were put to germinate under the same conditions. The seeds of each plant were placed in separate plastic plates « gerbox » on filter paper, kept moist. Germination was followed for two months. The comparison between the rate of germination of the seeds found in faeces and the control was made by a chi-square test.

The black lion tamarins feed mainly on fruits occurring in the middle layers of the forest (Passos 1994), and prefer small ripe fleshy fruits. During the observation period, the faeces collected contained seeds of nine plant species (Table 1): *Inga striata* Benth (in January), *Rhamnidium elaeocarpum* Reiss (January), *Protium widgrenii* Engl. (January), *Ficus organensis* Mic. (January), *Ficus tomentella* (Miq.) Miq. (February), *Celtis pubescens* H.B. and K. (February to May), *Celtis iguanae* Sarg. (April), *Mendoncia velloziana* Mart. (February to May) and *Cordia ecalyculata* Vell. (April to May).

All species except *Ficus organensis* showed a higher percentage of germination for seeds found in the faeces than those in wild fruits. Four species (*Protium widgrenii*, *Cel-*

tis pubescens, *Mendoncia velloziana* and *Cordia ecalyculata*) had a germination rate significantly higher for seeds found in the faeces (Table 1). This seems to indicate that the passage through the monkey's digestive tract can facilitate germination of these seeds.

TABLE 1. – Germination test of seeds from fruits eaten by the black lion tamarins, *Leontopithecus chrysopygus* at Caetetus Ecological Station, southeastern Brazil.

Species	Plant Family	Faeces % (N)	Control % (N)	Chi-square Test (Yates)
<i>Celtis iguanae</i>	Ulmaceae	55.5 (18)	46.7 (15)	0.259 ns
<i>Celtis pubescens</i>	Ulmaceae	31.8 (170)	16.5 (170)	10.864**
<i>Cordia ecalyculata</i>	Boraginaceae	4.5 (22)	0.0 (11)	7.174*
<i>Ficus organensis</i>	Moraceae	71.4 (21)	71.4 (21)	
<i>Ficus tomentella</i>	Moraceae	90.0 (50)	86.0 (50)	0.379 ns
<i>Inga striata</i>	Mimosaceae	100.0 (13)	76.6 (47)	3.726 ns
<i>Mendoncia velloziana</i>	Mendonciaceae	16.7 (30)	0.0 (33)	5.974*
<i>Protium widgrenii</i>	Burseraceae	80.3 (76)	12.5 (12)	20.609**
<i>Rhamnidium elaeocarpum</i>	Rhamnaceae	93.5 (31)	91.8 (12)	0.047 ns

ns - not significant
 * - P < 0.05
 ** - P < 0.01

Observations on the viability of the seeds of *Tapirira guianensis* ingested by the related golden lion tamarins (*Leontopithecus rosalia*) indicated the possible role of this primate as a seed dispersal agent (Coimbra-Filho 1969). The results obtained here confirmed this role in black lion tamarins. The behavior of defecating after emerging from their shelter and the great mobility of these black lion tamarins monkeys (daily range of 1164 m and 3103 m, N = 20; Passos, unpublished data) cause the swallowed seeds to be spread over a large area.

Seed dispersal with increased germination rate has also been observed in many other primates including *Alouatta palliata* (Chapman 1989; Howe 1980), *A. fusca* (Figueiredo 1993), *Ateles geoffroyi* (Chapman 1989), *Cebus capucinus* (Chapman 1989; Howe 1980), and *Saguinus mystax* and *S. fuscicollis* (Garber 1986).

Primates are reported to strongly influence by seed dispersal the composition, distribution and regeneration patterns of the tropical forests (Garber 1986). This dispersal of seeds by the black lion tamarin is an important factor for its conservation within its natural habitat.

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