SCIENTIFIC COMMUNICATION

First record on the use of leaves of *Solanum lycocarpum* (Solanaceae) and fruits of *Emmotum nitens* (Icacinacea) by *Platyrrhinus lineatus* (E. Geoffroy) (Chiroptera, Phyllostomidae) in the Brazilian Cerrado

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ABSTRACT. During May, June and July of 2004, the feeding habits of *Platyrrhinus lineatus* (E. Geoffroy, 1810) were investigated. Each morning food remains (dry oral pellets, seeds, feces and partly eaten foods) were collected in two day roosts sites located inside the main building at Embrapa Cerrados. Fruits *of Emmotum nitens* (Benth.) Miers (1852) and leaves of *Solanum lycocarpum* S. Hil. (1833) were items consumed by *P. lineatus.* Independent of plant and bat distribution area, the use of *Solanum* leaves by *P. lineatus* appears to be common.
KEY WORDS. Cerradão, folivory, Microchiroptera.

RESUMO. **Primeiro registro do uso de folhas de *Solanum lycocarpum* (Solanaceae) e de frutos de *Emmotum nitens* (Icacinacea) por *Platyrrhinus lineatus* (E. Geoffroy) (Chiroptera, Phyllostomidae) no Cerrado brasileiro.** Durante os meses de maio, junho e julho de 2004, os hábitos alimentares de *Platyrrhinus lineatus* (E. Geoffroy, 1810) foram investigados. Toda manhã os restos alimentares (pelotas de matéria seca, sementes, fezes e itens parcialmente comidos) foram coletados em dois abrigos diurnos localizados dentro das dependências da Embrapa Cerrados. Além de frutos de *Emmotum nitens* (Benth.) Miers (1852), folhas de *Solanum lycocarpum* S. Hil. (1833) foram consumidas por *P. lineatus*. Independentemente da área de distribuição, da planta ou do morcego, o uso de folhas de espécies do gênero *Solanum* por *P. lineatus* parece ser comum.
PALAVRAS CHAVE. Cerradão, folivoria, Microchiroptera.

Solanum lycocarpum is known as "lobeira" or "wolf fruit" because it comprises up to 50% of the diet for *Chrysocyon brachyurus* (Illiger, 1811), the maned-wolf (Dietz 1984). *Solanum lycocarpum* is one of the most common plants found in the Brazilian Cerrado, and occurs in the states of São Paulo, Minas Gerais, Goiás, Mato Grosso and Tocantins, as well as in the Federal District. It is a fast growing shrub reaching five meters, with simple, alternate, lanceolate and coriaceous leaves. Full-size ripening fruits, weighting 300-750g, emerge in December, which coincides with the first rains, and reaches peak production in February/March (Lorenzi 1998). Animals as well as human consume the fruits. Cattle have the habit of eating the leaves and fruits, while pigs eat only the fruits (Macedo *et al*. 1978). Humans consume fresh fruits or jams and jellies, and in popular medicine, the fruits are used in the treatment of diabetes (Almeida *et al*. 1998). It is also economically important because its fruits contain solasidin, precursory chemical substance of steroids used in the production of medicines such as anabolic steroid, contraceptives and anti-inflammatories (Corrêa *et al*. 2000).

Emmotum nitens is a medicinal plant very common in "cerradão", one of the most threatened phytophysiognomies of the Cerrado biome. *Emmotum nitens* occurs in the states of Pernambuco, Bahia, Tocantins, Goiás, Minas Gerais, Mato Grosso and Mato Grosso do Sul (Lorenzi 1998), as well as in the Federal District. It reaches 6 to10 meters, and its fruits are small, green and have only one seed. Mature fruits occur from September to December and are very appreciate by frugivorous bats and other animals (Lorenzi 1998). *Emmotum nitens* extracts present some degree of activity against all bacterial strains, including *Escherichia coli* Escherich, 1885 (Alves *et al*. 2000).

It is well known that bat species eat a variety of different foods, which may include fruit, pollen, nectar, leaves, insects, small vertebrates and blood (Gardner *et al*. 1977). Frugivorous bat species also eat insects and leaves to complement their diet. Fruits, in general, provide an energy-rich diet for phytophagous bats but most are low in protein. In contrast, leaves consumed by bats have a relatively high nitrogen-rich (protein) content (see Dumont 2003). The high concentrations of protein and calcium in leaves supports the hypothesis that folivory

is energetically more advantageous than ingestion of large amounts of low protein fruit, or the active pursuit of insects, important dietary sources for plant-visiting bat (Elangovan *et al*. 2001, Tan *et al*. 1998).

Herein, the feeding habits of *Platyrrhinus lineatus* in the Cerrado biome, observed in May, June and July of 2004, in the main building at Embrapa Cerrados (15º37'42"S, 47º22'15"W), are related. The building roosts a colony of 11 *P. lineatus* bats that use two different day roosts. These day roosts have been observed since the year of 2001, and no other bat species was seeing using these roosts or even in this part of the building. Usually six or five bats are using each roost site. Every morning food remains (dry oral pellets, seeds, feces and partly eaten foods) were collected at these two sites, and the bats were seeing hanging upon the remains. Besides fruits *of Emmotum nitens,* leaves of *Solanum lycocarpum* were found in the food remains of *P. lineatus*. A bat removes leaves from trees during flight, transport fruits and leaves to feeding roosts where it extract soluble contents and expels fibrous spats beneath day and feeding roosts. Similar to the short-nosed fruit bat, *Cynopterus sphinx* (Vahl, 1797), *P. lineatus* probably consume fruits mostly upon emergence from roosts and feeds on leaves later in the night. Temporal differences in nightly foraging behavior help sustain flight activity throughout the night (Elangovan *et al*. 2001).

Since the availability of fruits and flowers is seasonal, bat food items vary over the seasons and in addition to feeding on fruits they also feed on leaves which may be energetically more advantageous than frugivory during certain periods of the year (Rajan *et al*. 1999). Macedo *et al*. (1978) noticed that in the pastures of the Cerrado cattle ate leaves of Solanum especially during the dry period of the year. Zortéa (1996) observed folivory in *P. lineatus* in two different species of Solanum in the Atlantic rainforest, during the dry (May-August) period. A similar result was found here. Although leaves were not observed in these feeding roosts in 2003, this year (2004) they were very common during May, June and July, the initial months of the dry period. Although I have no direct evidence that male or female *P. lineatus* eat leaves it can be also suggested that liquid fractions derived from leaves may provide females with an important source of protein, especially during periods of pregnancy and lactation as suggested by Kunz & Diaz (1995) for *Artibeus jamaicensis* Leach, 1821.

Folivory, once thought to be rare among plant-visiting bats, may in fact be quite common and widespread, especially among species that feed largely on fruits that are low in protein (Kunz & Dias 1995). The use of *Solanum* species by *P. lineatus* in the Atlantic rainforest (Zortéa 1996), and now *S. lycocarpum* in the Cerrado, suggests that independent of bat and plant distribution area, the use of Solanum leaves by this species seems to be common.

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