

## SCIENTIFIC NOTE

Feeding behaviour of the bat *Phyllostomus hastatus* (Pallas 1767) in jackfruit *Artocarpus heterophyllus* Lamarck (Moraceae), in Ilha Grande, Rio de Janeiro State, Brazil

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**Abstract.** *Artocarpus heterophyllus* fruit is the largest tree fruit, weighing up to 36 kg and was introduced in Brazil during the XVIII century. During a mammalian diversity research developed at Ilha Grande at least five *Phyllostomus hastatus* bats were observed eating jackfruit. Jackfruit availability is high almost all year long at Ilha Grande and it is possible that *P. hastatus* restricts the use of this fruit during low availability periods of other food resources. Although seed carrying was not observed, the disperser role of *P. hastatus* on *A. heterophyllus* can not be neglected.

**Key words:** exotic species, diet, jackfruit, *Phyllostomus hastatus*.

**Resumo.** *Artocarpus heterophyllus* apresenta o maior fruto existente, com peso de até 36 kg e foi introduzida no Brasil durante o século XVIII. Durante uma pesquisa sobre diversidade de mamíferos desenvolvida na Ilha Grande, pelo menos cinco morcegos *Phyllostomus hastatus* foram observados se alimentando de jaca. A jaqueira tem alta disponibilidade de frutos durante grande parte do ano na Ilha Grande, e é possível que *P. hastatus* restrinja o uso desta fruta durante períodos de baixa disponibilidade de outros recursos alimentares. Embora o transporte de sementes não tenha sido observado, o papel de *P. hastatus* como dispersor de sementes de *A. heterophyllus* não pode ser negligenciado.

**Palavras-chave:** espécie exótica, dieta, jaca, *Phyllostomus hastatus*

*Phyllostomus hastatus* is one of the largest bats in Brazil, weighing more than 100 g. This species has the most diverse diet already known, eating on flowers, nectar, fruits, small vertebrates and arthropods (GARDNER, 1977; SANTOS *et al.*, 2003; OPREA *et al.*, 2006).

Most frugivores Phyllostomidae bats, such as *P. hastatus*, shows similar feeding behavior. Individuals remove the fruit, carry it to feeding roosts and manipulate it with the help on the nails of the first hand fingers, to obtain small pieces. The size of the fruit can limit the use by fruit bats. Thus, the

nutritional value must cover the cost of foraging to feeding area, carrying them to a feeding roost and return to diurnal roost, and bats must select fruits that fit well into their mouth (DUMONT & O'NEILL, 2004). Bigger fruits are also consumed, but usually piece by piece, with the bat sitting over the fruit (e.g. JIMBO & SCHWASSMANN, 1967).

Feeding experiments in captive bats show that feeding behaviour varies significantly with fruit hardness both within and between frugivorous species (DUMONT, 1999). Fig-eating fruit bats, as

*Artibeus jamaicensis* Leach, 1821 and *Dermanura phaeotis* Miller, 1902 are behaviorally specialized for feeding on relatively hard fruits. In contrast, understory fruit bats, such as *Carollia perspicillata* (Linnaeus, 1758), must be restricted to soft fruits (DUMONT, 1999). Hardness and size of fruits limit the use by Phyllostomid bats to small and medium size fruits. No observations of feeding behaviour of extra large fruits are available until now for Phyllostomid bats.

Jackfruit, *Artocarpus heterophyllus*, is a species of tree of the Moraceae Family, native to Southeastern India and Sri Lanka (CHAVES *et al.*, 1967; FERRÃO, 1993). In its native habitat, jackfruit is typical of advanced successional stages and is observed in the understory tropical humid forests (KHAN, 2004). *Artocarpus heterophyllus* fruit is the largest tree fruit, weighing up to 36 kg. One tree can produce up to 100 fruits per year. The average seed size and weight are 1.5 cm and 14 g, respectively. Monkeys, rodents and wild pigs are known to be native dispersers of the seeds (KHAN, 2004).

Jackfruit was introduced in Brazil during the XVIII century and nowadays its distribution encompasses almost all the Brazilian territory (LORENZI *et al.*, 2006). It colonizes forests, edges and open areas associated with anthropomorphic environments (ABREU *et al.*, 2003; ABREU, 2005). In Rio de Janeiro State, jackfruit can be found inside most of the conservation units, such as, Tijuca National Park, Pedra Branca State Park, Poço das Antas Reserve, União Biological Reserve and Tinguá Biological Reserve and Ilha Grande State Park.

During a mammalian diversity research developed at Ilha Grande (23° 10' 33,5" S; 44° 12' 27,8" W), Rio de Janeiro State, Brazil, it was observed an unusual feeding behaviour by *P. hastatus*. In September 08<sup>th</sup> 2006, at least five bats approached to a mature jackfruit (5 m height) and chewed the fruit shell, until they were able to enter the fruit (Fig.1). More than one bat was observed removing the shell at the same time, and pieces of the shell could be found fallen near the tree.

The bats entered the hole, one by one, and ate the soft parts. Intense activity was observed, suggesting a group feeding behavior (as described for this species by WILKINSON, 1995). No seed carrying was observed.

Jackfruit availability is high almost all year long at



Foto: Daniel Santana Lorenzo Raices

Figure 1. Photo showing *Phyllostomus hastatus* approaching the jackfruit. The arrow shows the hole made on the shell with a bat inside the fruit.

Ilha Grande (D.S. RAICES, unpublished data). Although *P. hastatus* is one of the most generalist bats (FABIÁN *et al.*, 2007), it is possible that *P. hastatus* restricts the use of this fruit during low availability periods of other food resources. Other species of bats change their main feeding plant species in periods of scarcity (e.g. MELLO *et al.*, 2004). Being the second species in size in neotropical region, *P. hastatus*, could be the sole bat species able to open the jackfruit and therefore eat it when the fruit is still hanged on the trunk. Although seed carrying was not observed, the disperser role of *P. hastatus* on *A. heterophyllus* can not be neglected.

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