



## USE OF UNDERSTORY FOR FRUGIVORY BY *Thrichomys fosteri* (RODENTIA, ECHIMYIDAE)

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**Abstract:** *Thrichomys fosteri* (Rodentia, Echimyidae) is a terrestrial spiny rat displaying frugivorous/herbivorous diet. Then, why eventually this terrestrial species uses the understory? Here, we report two events of use of understory for fruit feeding by the spiny rat. Monthly from October 2015 through July 2016, we sampled three sites in one woodland savannah fragment in the Pantanal ecoregion. Each site was 1 km apart from each other, and present five camera traps on understory (1.5 m height) in front of different fruit plant species. With an effort of 350 camera trap-days, we recorded twice the punaré on branch of *Randia armata* (Rubiaceae) feeding on its fruits. Our results highlight a feeding behaviour on understory by the terrestrial spiny rat, which contribute to the understanding of the species' natural history as well as point out questions for further investigations.

**Keywords:** Pantanal wetland; punaré; *Randia armata*; understory camera traps; woodland savannah.

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The spiny rat species of genus *Thrichomys* comprise a morphologically and ecologically distinct group within the family Echimyidae (Rodentia). The genus is widely distributed across open vegetation in South America, occurring in different ecoregions from Caatinga, Cerrado, and Pantanal in Brazil to the Chaco of Bolivia and Paraguay (Pessôa *et al.* 2015).

In the most recent taxonomic compilation of the genus, four *Thrichomys* species were recognized by Pessôa *et al.* (2015): *T. apereoides*, *T. inermis*, *T.*

*laurentius*, and *T. pachyurus*, considering the *T. fosteri* as synonym of *T. pachyurus*. However, here we follow D'Elía & Myers (2014) which, based on karyological and molecular datasets, considered *T. fosteri* as a distinct Paraguayan *Thrichomys* species together with those of the neighbouring Brazilian state of Mato Grosso do Sul. The Paraguayan punaré *Thrichomys fosteri* is the most abundant rodent species of semi-deciduous and woodland savannah in the Pantanal wetlands of Brazil (Antunes 2009, Menezes *et al.* 2017), it is predominantly terrestrial

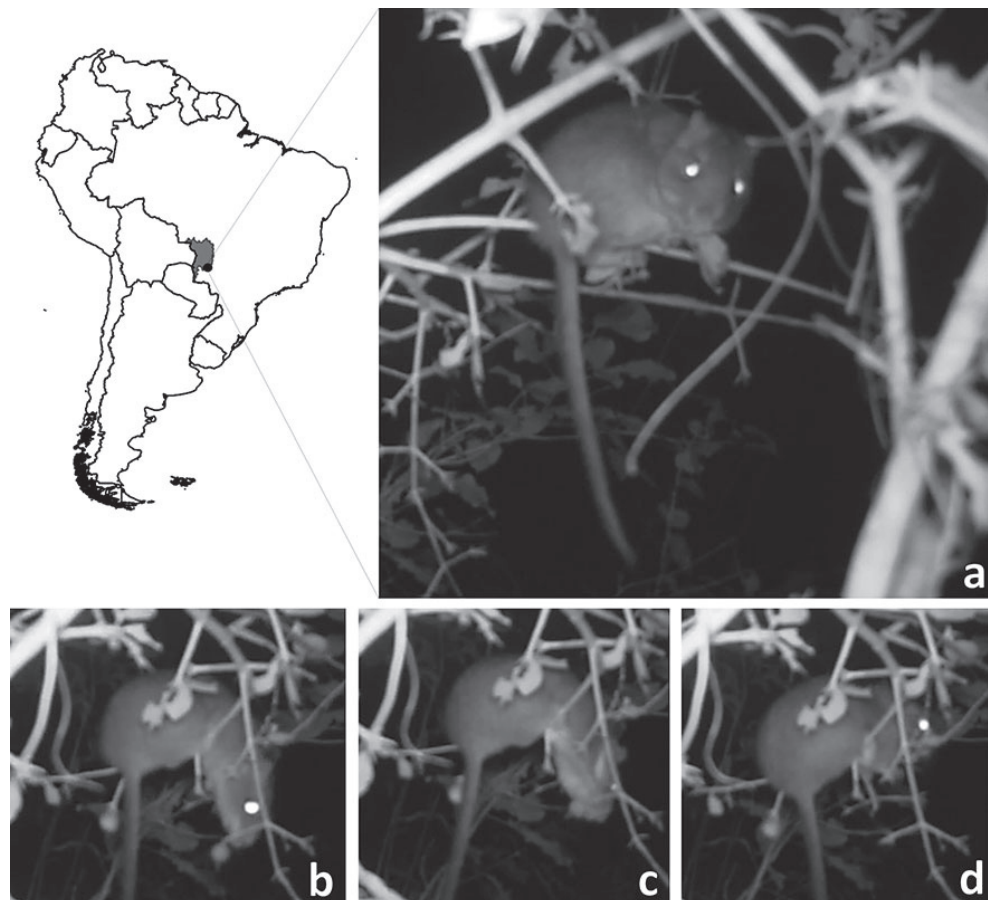
and a frugivorous/herbivorous species within Echimyidae family (Paglia *et al.* 2012). However, the punaré was already eventually captured on the understory (Lacher & Alho 1989, Pessôa *et al.* 2015), and arthropods appear to be an important food resource for this spiny rat (Antunes 2014).

Differences in usage of ecological features are probably associated with the interaction of microhabitat variables such as food sources, nests or shelters, climate conditions and competition with other species affecting fine-scale spatial patterns of variation in small mammal population (Mohammadi 2010). In the Pantanal wetlands, understory cover increases patch use in *T. fosteri*, because this rodent seek shelter in bushes (caraguatá – *Bromelia balansae*; Poales, Bromeliaceae), adhering to global patterns (Menezes *et al.* 2017). But, why eventually this predominantly terrestrial spiny rat species uses the understory? Here, we report two events of use of understory for food gathering by the punaré *T. fosteri*, contributing to species' natural history.

Data collection was performed monthly

between October 2015 and July 2016, sampling in the dry and rainy period. The study was conducted on a woodland savannah in the Pantanal ecoregion (20°13'36" S; 55°51'49" W; datum WGS 84), in the municipality of Aquidauana, state of Mato Grosso do Sul, Brazil. Three sampling sites, 1 km apart from each other, were selected. We used five camera-traps per sampling site (Bushnell Trophy Cam) during seven days per month, which were placed in the understory (about 1.5 m) in front of different fruit plant species, for frugivory records. The recordings had 60 sec of duration, starting from the motion capture by the sensor of the camera, configured in high sensitivity, with intervals of 10 sec between each filming. There were 350 camera trap-days, with aim to registration of frugivorous birds, but we recorded two events, during night of 21 (21:12 h) and 23 (21:53 h) June 2016, of punaré on branch of *Randia armata* (Sw.) (Gentianales, Rubiaceae), feeding on its fruit (Figure 1).

Answering our initial question, in the case of the



**Figure 1.** *Thrichomys fosteri* (Rodentia, Echimyidae) on understory (a), catching and feeding *Randia armata*'s fruit (Gentianales, Rubiaceae) (b-d), in the Pantanal ecoregion in Southwestern Brazil.

present study, the eventually use of the understory by the predominantly terrestrial spiny rat species was to consume fruits of *R. armata*. *Randia armata* is a small shrub with a wide geographic distribution in Brazil (Carvalho 2003). In the study area, the species present extended fruiting (> 5 month according Newstrom *et al.* 1994), between November and July, with a peak of mature fruits in March (C. Aoki, unpublished data). This plant species has a fleshy global fruits and seeds wrapped in mucilage of viscous consistency which reaches a higher rate of germination after passage through the digestive tract of animals (Paulus 2005).

Arthropods appear to be an important food resource for this species (Antunes 2014, Antunes *et al.* 2016) but arthropod availability varies seasonally, with lower abundance during dry seasons (Santos-Filho *et al.* 2008). Both, field (Lessa & Costa 2009) and experimental laboratory data (Finotti *et al.* 2015) have evidenced that *Thrichomys* species have a wide food niche, consuming different items on a seasonal basis. This feature could explain the presence of this species in the understory and the consumption of *R. armata*'s fruit reported here.

The use of understory also can be a strategy of predation escape (Abreu *et al.* 2010). Further, vertical space use and microhabitat associations are part a synergetic mechanism to favor the small mammals' coexistence (Abreu & Oliveira 2014). In the Pantanal wetland, the punaré selects areas with high bromeliad cover and arthropod abundance, so, individuals tend to select areas with high escape cover and high food availability balanced by low intraspecific competition (Antunes *et al.* 2016). Further, the patch use by the punaré decreases with the distance to shrub, as would be expected if bushes were shelters (Menezes *et al.* 2017). Therefore, in a microhabitat scale, this "terrestrial" spiny rat apparently uses bushes, mainly bromeliad cover, as shelters and display anti-predatory behaviour.

In the present report, our observations revealed feeding behaviour on understory by the punaré, which contribute to the understanding of species' natural history as well as point out questions for further investigations, like as: i) Are there other factors influencing the eventual use of understory by the spiny rat? ii) Could the spiny rat exploiting the understory during dry season searching for food resource?

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