

Carrion consumption by *Dasyprocta leporina* (RODENTIA: DASYPROCTIDAE) and a review of meat use by agoutis

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Abstract

The consumption of the carrion of a tapiti by a reintroduced female *Dasyprocta leporina* was observed in the wild. Herein, besides describing this event, we reviewed other evidence of vertebrate consumption by agoutis. Most of the studies describing this behaviour have been carried out in captivity. The preyed animals included birds and small rodents, which were sometimes killed by agoutis. This pattern suggests that this is not an anomalous behaviour for the genus, reflecting its omnivorous habits. This behaviour can be a physiologically sound feeding strategy, so new studies should focus on the temporal variation in the consumption of this resource, possibly related to food scarcity periods or to reproductive seasons, when the need for high-quality food tends to increase.

Keywords: diet, Rodentia, zoophagy, carrion.

Consumo de carniça por *Dasyprocta leporina* (RODENTIA: DASYPROCTIDAE) e uma revisão do uso de carne por cutias

Resumo

Foi observado na natureza o consumo da carniça de um tapiti (*Sylvilagus brasiliensis*) por uma fêmea reintroduzida da cutia *Dasyprocta leporina*. Neste estudo, além da descrição desse evento, é feita uma revisão de outras evidências de consumo de vertebrados por cutias. A maioria dos estudos que descreveram esse comportamento foi realizada em cativeiro. Os animais predados incluíram aves e pequenos roedores, que foram mortos pelas cutias em algumas ocasiões. Esse padrão sugere que esse não é um comportamento anômalo para o gênero, refletindo seus hábitos onívoros. Esse comportamento pode trazer vantagens fisiológicas para esses animais, de forma que novos estudos devem focar na variação temporal do uso desse recurso, relacionando-o com períodos de escassez e com a estação reprodutiva dos animais, onde a necessidade de alimentos de alta qualidade energética pode ser maior.

Palavras-chaves: dieta, Rodentia, zoofagia, carniça.

1. Introduction

Agoutis (*Dasyprocta* spp.) are caviomorph rodents widely distributed in the neotropics (Emmons and Feer, 1997). Species are usually described as granivorous but despite their diet being based mainly on fruits and seeds, it is supplemented by leaves, roots, fungi and even small invertebrates (Henry, 1999; Silviu and Fragoso, 2003; Dubost and Henry, 2006). Meat consumption by agoutis, nevertheless, is still poorly documented.

Dasyprocta leporina (Linnaeus 1758), also known as red-rumped agouti, occurs in Venezuela, Guyana and the east part of Brazil. The species is present in primary and

secondary forests, and even in plantations, usually associated with streams (Emmons and Feer, 1997; Reis et al., 2006). Animals weigh 3-6 kg and head and body length varies from 49 to 64 cm (Dubost and Henry, 2006).

Herein we describe the zoophagic behaviour of one adult reintroduced female *D. leporina* observed in the Tijuca Nacional Park (TNP), Rio de Janeiro state, Brazil, and review other evidences of meat consumption by agoutis. In this paper we have the goal of communicate an unusual and poorly documented event and contextualise it with the related scientific knowledge.

2. Material and Methods

2.1 Field observation of carrion consumption

The observation was carried out at the TNP, located in Rio de Janeiro city (22°55'–23°00' S, 43°11'–43°19' W), RJ, Brazil. The Park is the largest urban forest in the world, encompassing 3,953 ha. Altitude ranges from 80 to 1,021 m. The vegetation is composed of typical Atlantic Rain Forest formation with some exotic species (especially *Artocarpus heterophyllus* and *Eucalyptus* spp.) introduced into the area during a reforestation programme carried out at the end of the nineteenth century (ICMBio, 2008). The climate is tropical with rainy summers and dry winters. Annual mean precipitation is about 2800 mm and the mean temperatures vary between 18°C and 22°C (ICMBio, 2008).

The agouti *D. leporina* was recently reintroduced at TNP through a soft-release programme (Cid, 2011). Individuals came from a semi-captive population that lives in a municipal Park at the centre of Rio de Janeiro city (locally known as Campo de Santana, 15.5 ha), with daily food provisioning by the staff of Fundação Parques e Jardins. During the adaptation period (mean \pm sd = 30.37 \pm 20.35 days) the reintroduced animals were kept in a fenced pen where they received food supplementation consisting of commercially available fruits and vegetables mixed with fruits and seeds from the forest itself. After release, food was kept outside the fence until the animals became independent from the supplementation, which happened after 15 days approximately. All reintroduced animals were equipped with radio collars for radiotracking using the modified “homing in on the animal” method (Lira et al., 2007). They were daily or weekly monitored depending on time after release. A one-year monitoring of the tracked animals revealed that fruits and seeds from the forest were the main items consumed (Cid, 2011).

2.2. Review of meat use by *Dasyprocta* spp.

The review of meat use by agoutis, either in captivity or in the wild, was based in studies found on the Web of Science (1945–present) database and through crossed-cited references. Keywords used in the search were *Dasyprocta* AND diet.

3. Results

3.1 Field observation of carrion consumption

On March 26th 2010, we recorded a reintroduced female *D. leporina* eating the carrion of a tapiti *Sylvilagus brasiliensis* (Linnaeus 1758, Lagomorpha). The observation initiated about 13:30 h and lasted approximately one hour. When the observation started, the tapiti was already dead but almost intact, except for an opening at the stomach area and some dry blood on the head. During the observed event the agouti removed the carrion twice to places away from observers, located a few metres (<10 m) from its previous positions. To consume the meat the agouti adopted the same posture used for eating fruits and seeds: stopped, sat on its haunches and took the carrion into its

mouth with the front paws, ripping pieces off. When we approached to observe the tapiti for a second time, the agouti had eaten part of its internal organs and the hind legs. The observation ended when the agouti removed the carrion away from our view. We cannot ascertain if the agouti had killed the tapiti, but the presence of some dipteran larvae (about 5 mm long) indicates that it had been dead for at least some hours before the observation (Gruner et al., 2007).

3.2. Review of meat use by *Dasyprocta* spp.

Only three studies described the diet of *Dasyprocta* spp. in the wild; two of them quantified stomach contents (Henry, 1999; Dubost and Henry, 2006) while the other was based on field observations (Silvius and Fragoso, 2003). The main components of the diet were seeds, fruits, other plant parts and invertebrates. None of these studies reported vertebrate consumption.

Another five studies reported the use of some specific food items by agoutis. Silvius (2002) demonstrated a high consumption of bruchid larvae found inside palm seeds at nature. Four studies reported vertebrate consumption; three of them observed this behaviour in captivity or semi-captivity. The items consumed included raw and stew meat by *Dasyprocta punctata* (Linnaeus 1758) (Smythe, 1978), eggs, nestling and/or adults of domesticated birds (chicken, tinamou, goose and helmeted guinea fowl) eaten by *Dasyprocta azarae* (Lichtenstein, 1823) or hybrids of *D. azarae* x *D. leporina* (Monteiro-Filho et al., 1999; Marcondes-Machado, 2009). The killing of the offered animals was reported in all three studies. Additionally, in two of them, agoutis also killed and consumed other animals which invaded their enclosures, such as a turtle dove *Columbina talpacoti* (Temminck 1811) (Marcondes-Machado, 2009) and a painted spiny pocket mouse *Liomys pictus* (Thomas 1893) (Smythe, 1978). Monteiro-Filho et al. (1999) and Marcondes-Machado (2009) also described the consumption of domesticated passerine birds (great kiskadee, house sparrow, rufous-bellied thrush and the sayaca tanager) and the slaty-breasted wood-rail *Aramides saracura* (Spix, 1825) by *D. azarae*. In the only previous record of vertebrate use in the wild, Chaves and Durán (2003) reported the consumption of a small vertebrate, probably a rodent, by *D. punctata* in Costa Rica; the killing of the prey was not observed.

4. Discussion

Vertebrate consumption by agoutis is not a unique event. A few other observations have been recorded but most were from studies in captivity (Smythe, 1978; Monteiro-Filho et al., 1999; Marcondes-Machado, 2009).

The killing of small mammals and birds was confirmed just in captivity, where the aggressive behaviour of agoutis is possibly enhanced by the stress and by induced encounters with potential prey items. Nevertheless, the observations indicate that although agoutis are primarily granivorous, they have the ability for killing small vertebrates. Marcondes-

Machado (2009) suggested that this ability could imply in a risk for some ground-nesting birds in nature.

The consumption of carrion by the reintroduced agouti could also reflect its food habits in Campo de Santana, where animals have access to leftover food and garbage (personal observation). In fact, agoutis consume a high variety of food items in the nature, according with their seasonal availability, indicating great flexibility in these rodents' diet (Smythe, 1978; Silvius, 2002; Dubost and Henry, 2006). Landry (1970) had already reported that consumption of vertebrates is not an anomalous behaviour in rodents. Considering this, and the existence of other records of meat consumption by agoutis, we conclude that the use of animal food by *Dasyprocta* spp. is not an exception, but rather reflects their omnivore habits.

Carrion has been recognised as a high-quality resource with high assimilation efficiency (Wilson and Wolkovich, 2011). This material is already going through a process of cellular digestion, which favours the absorption of proteins and lipids by animals that do not have digestive tracts adapted to the consumption of fresh meat. In a study with agoutis in captivity, Smythe (1978) observed that these animals preferred cooked to raw meat. Thus, the consumption of carrion by non-carnivorous animals like agoutis can be a physiologically sound feeding strategy. More studies reporting agoutis' diet in nature are necessary for understanding the importance of vertebrate consumption for these animals. Potential focus should be given to the temporal variation in the consumption of this food resource, possibly related to food scarcity periods or to reproductive seasons, when the need for protein input tends to increase, especially for females.

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