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First report of Vesper rat, *Nyctomys sumicrasti* (Rodentia: Muridae) feeding on Palm fruits

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The vesper rat, *Nyctomys sumicrasti,* de Saussure 1860, is a medium-sized arboreal rodent of tawny pelage with white underparts (Goodwin 1946). This sigmodontine species is known to thrive on fruit, seeds, flowers and leaves (Emmons 1997, Timm and Vriesendorp 2003). As the genus name suggests, the vesper rat is a primarily nocturnal feeder (Birkenholz & Wirtz 1965).

On the nights of 14, 16, and 18 December 2008, a total of three vesper rats were observed and photographed eating the fruits of *Bactris glandulosa* var. *baileyana* (H.E. Moore) de Nevers, near Rio Piro (8˚24'.3954"N, 83˚20'14.028"W, 20 m a.s.l.) at the Osa Biodiversity Center, Osa Peninsula, Costa Rica. The palm, estimated at 4 m in height was bearing fruits (Figure 1A-B) in a 30 year old secondary forest.

Having no common name, *Bactris glandulosa* var. *baileyana* is found in lowland and montane forests of Costa Rica and Panama (Henderson 2000), and stands 1.5-5 m tall with spiny stems (de Nevers *et al.* 1996). Leaves are almost regularly pinnate, leaflets linear or lanceolate, spreading in different planes or sometimes on the same plane. Inflorescences are borne among or below the leaves, branched to one order and covered by a boat-shaped peduncular wooly bract. The fruits are orange to red with a thin pulpy mesocarp (Baumgartner *et al.* 2001).

All three rats were observed stationed in the palm with fruits varying in color from yellow to orange in their mouths. We did not observe any of the vesper rats holding or eating leaf material and no chewed leaves were seen in the discarded remains directly beneath the feeding site, which did include fruit skins, rat droppings, and seeds (Figure 1C-D). Abundant skins and seeds on the ground indicate the rats ingested only the pulp of the fruit. Additionally, no partially eaten fruits were found, suggesting the vesper rats were not overly selective once they had started eating. No other species were seen foraging in or around the palm during several sequential morning and nighttime visits.

The vesper rats were later identified (Timm com. pers. 2009) as one adult breeding male missing approximately 5 mm from the tip of its tail, one adult female missing most of its tail from very near the base, and one subadult, slightly lighter and more gray in coloring with an intact tail.

The first vesper rat observed and photographed was the subadult of undetermined sex (Figure 1E). The rat was discovered by headlamp on 14 December between 22:00–23:59. It was perched on the petiole of a lower frond approximately 3 m above the forest floor, eating a yellow palm fruit. The rat stopped chewing as we approached and remained still in the artificial light for the subsequent period of observation, a duration of 3-5 minutes. This behavior of freezing in a spotlight is previously reported (Reid 1997). Two nights later, 16 December between 22:00–23:59, a pair of *Nyctomys sumicrasti* were found in the same palm tree. A photograph showing genitalia confirmed one adult female missing most of its tail (Figure 1F) and one adult male (Figure 2C). On the evening of 18 December (19:30–20:30) we returned to the location and again observed two vesper rats eating fruits from the palm tree. The female was easily identified by its amputated tail; we could not confirm whether the male was the same. Feeding observations and photography lasted 15-20 minutes.

Looking back through photographs, we discovered another vesper rat that was inadvertently documented eating the fruit of *Elaeis oleifera,* American oil palm on 24 June 2008 at 22:16

near a local swamp (8˚24'.724"N, 83˚20'14.780"W, 31 m above sea level) located approximately 1.45 km from the aforementioned *Bactris glandulosa* var. *baileyana* (Fig 1G). Lack of data about vesper rat home range limits our conclusions about the possible relationships between individuals at both sights.

Elaeis oleifera (Kunth) Cortes (previously *E. melanococca*) is found in Central and South American tropics from Honduras to Brazil (Hartley 1977). This stem solitary palm can grow up to 6 m long, but not exceeding 2 m in height, since most of its stem is creeping over the ground. Leaves are 3-8 m long, regularly pinnate with the leaflets orientated in the same plane. Inflorescences are borne among the leaves, forming a unisexual cone with each individual producing inflorescences of different sexes alternating. Fruits are yellow to red, 2.5-3 X 1.8-2 cm. This palm prefers flooding soil along rivers and in swamps typically associated with *Rhaphia* (Quesada *et al.* 1997, Baumgartner *et al.* 2001).

Nyctomys sumicrasti ranges from S. Jalisco and S. Veracruz, Mexico south through Central America to Central Panama, except on the Yucatan Peninsula where the smaller Yucatan vesper rat resides (Wilson and Reeder 1993). Inhabiting low montane forests and evergreen lowlands, old secondary and riparian forests, and semi-deciduous forests to 1600 m elevation, the species is a well distributed, yet still considered uncommon.

Wild vesper rats are reported to eat the hard fruits of the false evergreen needle bush, *Jacquinia pungens* (Ceballos 1990), as well as figs, seeds, fruit of madders, borage (*Cordia diversifolia*) and moths. They have even been observed eating the leaves of *Daphnopsis americana*, a poisonous tree of the family Thymelaeaceae. To our knowledge, this is the first report of vesper rat (*N. sumicrasti*) feeding on palm fruits. Given time, more information is sure to be revealed about this species' unique life history and the fullness of its dietary complexity.

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Fig. 1: Fruit count diminished from the night of 18 December (1A) to the following morning, 19 December (1B). 1C. Litter directly beneath feeding area of vesper rats includes fruit skins and rat droppings. 1D. Fruit seeds piled together suggests a clearly defined feeding station in the palm. 1E. Subadult *Nyctomys sumicrasti holds* a yellow palm fruit (14 December). 1F. Adult female vesper rat (short tail) rat holds a seed from *Bactris glandulosa* var. baileyana. Male can be seen above, also eating (18 December). 1G. A break in the terminal tail hairs of the adult male rat (18 December) suggests a portion of the tail is missing. 1H. *Nyctomys sumicrasti* perched on the petiole of an American oil palm *Elaeis oleifera*, holding the large orange fruit of the same palm (24 June).