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Research note

First description of the breeding nest of *Irenomys tarsalis*, a sigmodontine rodent endemic to southern Andean forests

Primera descripción del nido de *Irenomys tarsalis*, un roedor sigmodontino endémico de los bosques subandinos

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Abstract. The Chilean tree rat, *Irenomys tarsalis*, is a sigmodontine rodent endemic to the southern Andean forests. Very little is known about its habits. The aim of this work was to describe its breeding nest. A nest was located inside the hollow of a living Lenga Beech (*Nothofagus pumilio*) near Fontana Lake, Chubut province, Argentina. The nest was located 2 m above ground and inside an oval hollow, with 2 openings in the upper part and opposite to the main cavity entrance. The nest was built with a few feathers and lichens, dry and fine grass, pieces of small sticks, and scraped material from the internal side of the trunk. Two specimens of flea from the Rhopalopsyllidae family were recovered from the nest. This note allowed us to add new information on the breeding biology of one of the least known sigmodontines of the southern temperate rain forest and to the limited knowledge of sigmodontine rodents.

Key words: Chilean tree rat, nesting, *Nothofagus*, Patagonia, Argentina.

Resumen. La rata de los árboles, *Irenomys tarsalis*, es un sigmodontino endémico de los bosques subandinos y se sabe muy poco acerca de sus hábitos. El objetivo de este trabajo fue describir su nido. Éste se encontró en el interior de un hueco de una lenga (*Nothofagus pumilio*) en las proximidades del lago Fontana, provincia del Chubut, Argentina. El nido estaba situado 2 m por encima del suelo y dentro de un hueco de forma ovalada, con 2 aberturas en la parte superior y opuestas a la principal. El nido estaba formado por pocas plumasy líquenes, hierba seca y fina, trozos de palillos y material raspado de la superficie interna del tronco. La fauna de artrópodos hallada en el material del nido estuvo comprendida por 2 ejemplares de pulgas de la familia Rhopalopsyllidae. Esta nota permitió añadir nueva información sobre la biología de la reproducción de uno de los sigmodontinos menos conocidos del bosque templado de sudamérica y al conocimiento limitado sobre roedores sigmodontinos.

Palabras clave: rata de los árboles, nidificación, *Nothofagus*, Patagonia, Argentina.

The Chilean tree rat, *Irenomys tarsalis*(Philippi, 1900), is a sigmodontine rodent endemic to the Andean forests and forest-steppe ecotones of southern Chile and Argentina (Osgood, 1943; Pearson, 1983; Kelt, 1993; Pardiñas et al., 2004). It occurs in Chile from Chillán (Ñubleprovince, VII Region) to Puerto Ibáñez (General Carrera province, XI Region) and in Argentina from Neuquén province to Chubut province (Osgood, 1943; Kelt, 1993; Pardiñas et al., 2004). Knowledge of this species is scarce and limited to geographic distribution, phylogenetic position, and a few aspects of its natural history (Pearson, 1983, 1995; Kelt, 1993; Smith and Patton, 1999; Saavedra and Simonetti, 2000; Pardiñas et al., 2004; Kelt et al., 2008). This species has been considered rare or uncommon (Osgood, 1943; Patterson et al., 1990; Kelt et al., 1999), a status that may reflectits arboreal and trap-shy habits and, consequently, low capture success with traditional traps set in the ground (Meserve et al., 1991; Kelt, 1993). However, recent data taken from automatic camera traps in the temperate forests near the city of San Carlos de Bariloche (Río Negro province, Argentina), have shown

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that it is a common species in the arboreal stratum (Amico and Aizen, 2000). Furthermore, *I. tarsalis* has also been considered a species mostly associated with *Nothofagus* forests (Kelt, 1993; Pardiñas et al., 2004), although it has been captured in unusual habitats, such as ecotonal areas of shrubs and cypress (Pearson, 1983), a shrubby habitat along a stream in the North of Puerto Ibáñez and Lago General Carrera (Kelt et al., 2008), and in a *Pinus contorta* plantation in Coyhaique National Reserve (García et al., 2011), both in Argentina and Chile. Despite some novel data on its geographic distribution (Kelt et al., 2008; Martin, 2010; García et al., 2011), the general biology of this species (e.g., habits, behavior, breeding) still remains poorly known. The aim of this work was to describe for the first time the breeding nest of *I. tarsalis* and to report the arthropod fauna associated with it.

A nest of *I. tarsalis* was found in a *Nothofagus* forest on April 14th, 2013 during a field trip. Characteristics of the nest and tree nest were measured and recorded in the field and a female and 4 young of *I. tarsalis* were captured inside the nest. The nest was removed from the tree and analyzed in a laboratory to determine the fine material that composed it and the associated arthropod fauna. The identification of *I. tarsalis* specimens was based on the following combination of characters: large mouse with a tail much longer than the head and body (total length: 280 mm (270-326 mm), tail: 165 mm (162-196 mm); Kelt, 1993); large eyes; thick and soft pelage; grayish cinnamon rufousdorsum with fine dusky lines; long braincase and large interparietal; anterior surface of upper incisors with deep grooves; prismatic and deeply dissected molar teeth (Osgood, 1943; Hershkovitz, 1962; Kelt, 1993; Pearson, 1995). The 5 captured specimens were deposited at the Colección de Mamíferos del Centro Nacional Patagónico, Puerto Madryn, Chubut, Argentina.

The nest was located inside a hollow of a living Lenga Beech (*Nothofagus pumilio*) near Fontana Lake, Chubut province, Argentina (44º50'31.1" S, 71º38'14.8" W, 959 masl). In this area, the forest is mostly composed of Lenga (*N. pumilio*) and Antarctic Beech (*N. antarctica*). The tree nest was half tilted (Fig. 1A) with 53 cm of diameter at breast height (DBH). The nest was located 2 m above ground inside an oval entrance (Fig. 1B), with 2 openings in the upper part and opposite to the main opening. The entrance of the nest had the following measurements, major axis (measured from top to bottom of the entrance): 24 cm; minor axis (measured from side to side of the entrance and in the middle of it): 6 cm, while the depth of the nest was 17 cm (measured from the entrance to the inner part of the hole). The material that composed the nest was neatly ordered and composed of (from top to bottom): scarce feathers and lichens, dry and fine grass,

Figure 1. A, general view of the tree (*Nothofagus pumilio*) and surroundings where the breeding nest of *Irenomys tarsalis* was found; B, nest in frontal view (main opening) with the female inside.

and pieces of small sticks and scraped material from the internal side of the trunk. This nest seems to have been previously conditioned and used by some secondary cavity nesters (e.g., *Enicognathus ferrugineus*, Díaz and Kitzberger, 2013; *Turdus falcklandii*, Ojeda and Trejo, 2002) based on its general characteristics mentioned above. In the nest material were found 2 specimens of flea from the Rhopalopsyllidae family, which, since 2 species of the Rhopalopsyllidae family (*Ectinorus martini* Lewis, 1976 and *Tetrapsyllus* (*Tetrapsyllus*) *tantillus* Jordan and Rothschild, 1923), had been previously reported as parasites of this sigmodontine in the Argentinean Patagonia (Autino and Lareschi, 1998).

The tendency to nest in trees supports the notion of an association between *I. tarsalis* and *Nothofagus* forest. This connection could be reflected in the ability of this species to climb at high speed, "shinnying", as mentioned by Pearson (1983) and observed by the authors during field work. This skill is mainly attributed to the special development of palmar and plantar pads and a long and strong tail, with prehensile capacity. The pictures from camera traps taken near San Carlos de Bariloche (Amico and Aizen, 2000) corroborate its arboreal habits as well. Moreover, phylogenetic analyses showed that *I. tarsalis* constitutes, along with *Neotomys ebriosus* Thomas, 1894 (a species exclusive to northern central Andes) and *Euneomys chinchilloides* (Waterhouse, 1839; an Andean and Patagonian species) a small, unnamed clade associated with the central and southern Andes (Salazar-Bravo et al., 2013).

The knowledge ofsigmodontine rodent nesting in Argentina is limited, especially in natural habitats (e.g., Llanos, 1944; Massoia and Fornes, 1965; Mann-Fisher, 1978) and it is scarcer for those inhabiting Patagonia (Udrizar-Sauthier et al., 2010). With this note, we have added new information on the breeding biology of one of the least known sigmodontine rodent from the southern temperate rain forest.

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