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SHORT COMMUNICATION

First evidence of the use of cavities excavated by the Magellanic woodpecker (*Campephilus magellanicus*) by Pancho's monito del monte (*Dromiciops bozinovici*)

Primera evidencia del uso de cavidades excavadas por el carpintero negro (*Campephilus magellanicus*) por parte del monito del monte de Pancho (*Dromiciops bozinovici*)

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ABSTRACT

We report the first record of the use of cavities excavated by the Magellanic woodpecker (*Campephilus magellanicus*) by Pancho's monito del monte (*Dromiciops bozinovici*), a marsupial endemic to the temperate forests of South America described for the Coastal Mountain Range of Nahuelbuta, Chile. An abandoned nest was found in a living *Nothofagus dombeyi* tree, occupied by one adult and two *D. bozinovici* juveniles. This record confirms *D. bozinovici* as a secondary cavity user and highlights the Magellanic woodpecker key role as a primary excavator promoting biodiversity in southern temperate forests.

Keywords: ecosystem engineering, secondary cavity users, temperate forests.

RESUMEN

Reportamos el primer registro del uso de cavidades excavadas por carpintero negro (*Campephilus magellanicus*) por parte del monito del monte de Pancho (*Dromiciops bozinovici*), marsupial endémico de los bosques templados de Sudamérica, descrito para la Cordillera de la Costa de Nahuelbuta, Chile. Se encontró un nido abandonado en un árbol de *Nothofagus* vivo, ocupado por un adulto y dos juveniles de *D. bozinovici*. Este registro confirma a esta especie como usuario secundario y destaca el papel de carpintero negro como excavador primario clave para la biodiversidad del bosque templado austral.

Palabras clave: bosques templados, ingeniería ecosistémica, usuarios secundarios de cavidades.

Woodpeckers play a pivotal role in forest ecosystems as primary cavity excavators, whose cavities are used by a variety of vertebrate species, usually referred to as secondary cavity users (Bednarz *et al.* 2004; Ouellet-Lapointe *et al.* 2012; Pakkala *et al.* 2018). Cavities built by woodpeckers acquire significant ecological value in ecosystems that support low diversity of primary cavity excavator species, as demonstrated in temperate forests of southern South America (Alaniz *et al.* 2024). In these forests, the large Magellanic woodpecker (*Campephilus magellanicus*) actively constructs large cavities for nesting and roosting (Short 1970; Ojeda 2004). Although Magellanic woodpecker cavities are thought to serve a wide range of bird and mammal species (Alaniz *et al.* 2024), current literature has identified a few bird species as potential users

of Magellanic woodpecker cavities, including parakeets and owls (Altamirano *et al.* 2012, 2017; Diaz & Kitzberger 2013). Southern temperate forests support a diverse guild of secondary cavity users, some of which have been anecdotally observed using decayed (unexcavated) cavities of a size comparable to those constructed by Magellanic woodpeckers, including small mammals (*e.g.*, bats, rodents and opossums) and lizards (Ibarra *et al.* 2014; Demangel 2016; Altamirano *et al.* 2017; Novoa *et al.* 2019; Ossa *et al.* 2020). Thus, the identification of species that use the cavities constructed by Magellanic woodpeckers may contribute to the knowledge of the role of these woodpeckers as ecosystem engineers.

The Pancho's monito del monte (*Dromiciops bozinovici*) is one of the few marsupial species endemic to southern temperate forests. Currently classified as "Near Threatened" (NT) by the International Union for Conservation of Nature (IUCN), it is a secondary cavity user in these forests. Although this species has not yet been formally recognized by IUCN, recent studies have provided genetic and phylogeographic evidence that distinguishes *D. bozinovici* from the monito del monte (*D. gliroides*) (D'Elía *et al.* 2016; Quintero-Galvis *et al.* 2021, 2022, 2024). Previous studies have described the monito del monte using decaying cavities for breeding or roosting (Vergara *et al.* 2024, 2025). This species selects microhabitats for shelter during its daytime rest and exhibits overwintering torpor to avoid the low temperatures and winter conditions characteristic of southern temperate forests (Fontúrbel *et al.* 2014; Cortés *et al.* 2014; Vázquez *et al.* 2018, 2021). The monito del monte nests in decaying tree cavities and is often found in groups of up to five individuals (Kelt & Martínez 1989). Although the loss of cavities is a major obstacle to the conservation of this threatened species (Fontúrbel & Jiménez 2011), the use of cavities excavated by primary cavity excavators remains poorly understood. Previous studies have documented the use of small cavities constructed by the small primary cavity excavators *Veniliornis lignarius* and *Pygarrhichas albogularis* by the monito del monte (Vázquez *et al.* 2020). However, the use of large cavities made by Magellanic woodpeckers by the monito del monte is unknown. In this study, we report for the first time the use of an abandoned nesting cavity of Magellanic woodpeckers by the monito del monte.

The study was conducted in Nahuelbuta National Park, a protected area located in the coastal mountains of south-central Chile (37.8°S, 73.03°W; Fig. 1a) on January 14, 1999. In this area, we searched for nesting sites of Magellanic woodpeckers. These surveys were carried out as part of an effort to monitor active nests of Magellanic woodpeckers in this protected area. Five people walked along 400-500 m long transects from 10:00 in the morning until 19:00 in the evening. When a Magellanic woodpecker cavity was found, we checked whether it was occupied by the woodpecker as an active nesting or roosting site, but also whether it was occupied by secondary cavity users. Once found, we characterized the habitat and made film recordings. The internal examination of the cavity was filmed using a portable camera (Sony Video 8 SteadyShot XR Handycam Vision CCD-TRV215). The 8 mm video was converted to an mp4 file for editing purposes and is provided.

We found an abandoned Magellanic woodpecker cavity in a living *Nothofagus dombeyi* tree located in the Coastal Range, 1247 m above sea level in the middle of the southern summer. The hollow tree was relatively thin, 16 m tall and located in a mixed *Araucaria araucana-Nothofagus dombeyi* forest stand. Handmade spurs, ropes and a Petzl 8003 integral harness were used to access the woodpecker cavity. Cavity measurements were made with metal tape. The entrance to the cavity was oval, 18 cm high, 10 cm wide and located in a 29 cm diameter section of the trunk 11 m above the ground (Fig. 1b). The depth of the cavity was 33 cm, and the orientation of the entrance was 35° NE (Fig. 1b). Inside the cavity we found one adult and two juveniles of the monito del monte (Fig. 1b, Supplementary Material Video S1; https://doi.org/10.6084/m9.figshare.28385744.v1). Although these individuals were not sexed, they corresponded to the description of the social groups of this species. They were likely in a resting state rather than in torpor, as they reacted quickly during the cavity measurement and, as a consequence of the disturbance, abandoned it immediately. At the bottom of the cavity, we found a nest made of bird feathers and moss (Fig. 1b).

This finding confirms that the monito del monte is a secondary user of cavities excavated by the Magellanic woodpecker. We suggest that these cavities offer safer conditions than nests located under the understory vegetation, as noted by Fortúrbel *et al.* (2022), in addition to providing larger microhabitats for nest construction compared to the sites created by small primary cavity excavators. This feature could be key for species that require more stable and protected refuges in the temperate forests of southern Chile. This observation was made during the Niña event of 1998–1999, years characterized by cold and wet conditions. Thus, tree cavities during the summer of a cold year could offer better thermal conditions than those offered by bamboo nests.

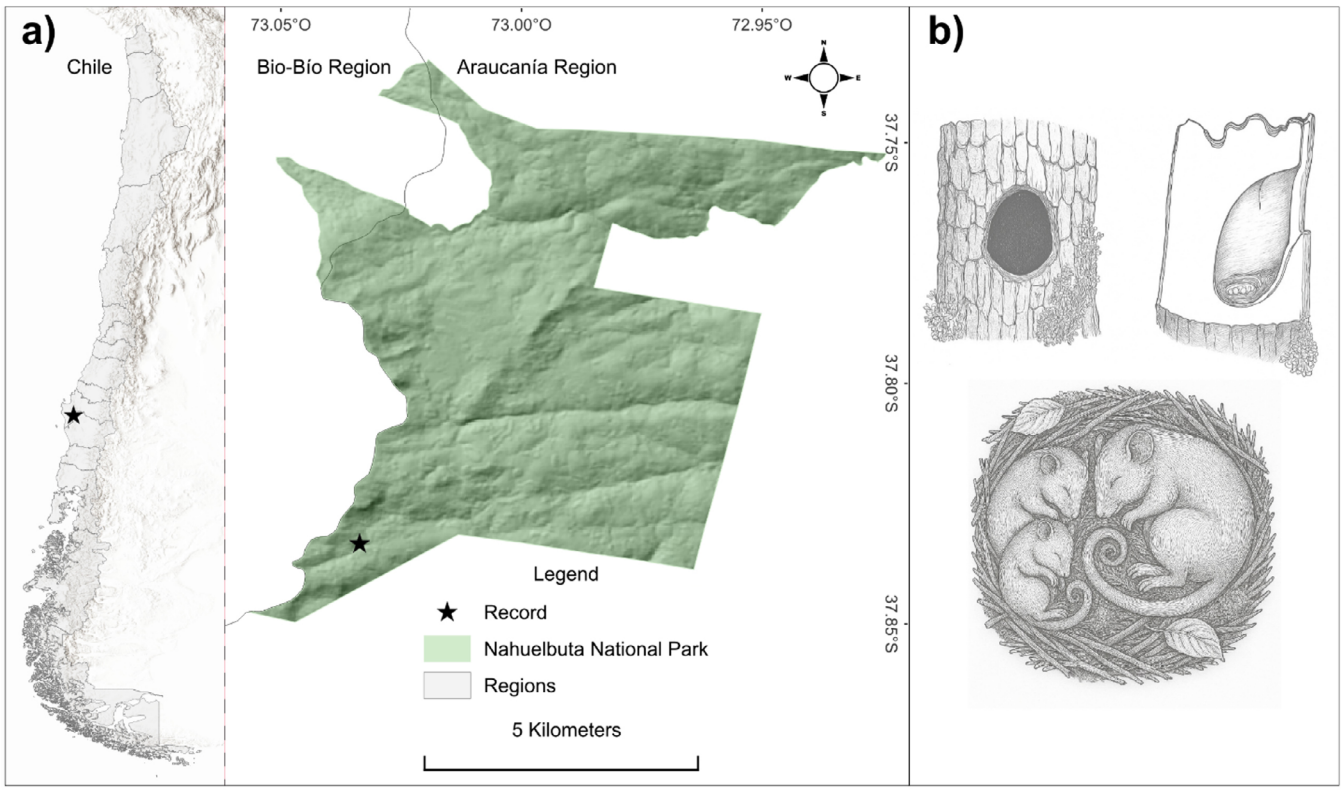

Figure 1. a) Spatial location of a Magellanic woodpecker nest, occupied by a social group of the monito del monte. b) Illustration of the cavity and the nest found inside, occupied by monito del monte. / a) Ubicación espacial del nido de carpintero negro ocupado por un grupo social de monito del monte. b) Ilustración de la cavidad y del nido encontrado en su interior, ocupado por monito del monte.

Previous studies have reported that some bird species use the Magellanic woodpecker's cavities as nesting sites, mainly medium-sized species such as *Pteroptochos tarnii*, *Enicognathus ferrugineus*, *Falco sparverius*, and *Strix rufipes* (Imberti 2005; Beaudoin & Ojeda 2011; Díaz & Kitzberger 2013; Alaniz *et al.* 2024). However, until now, no mammals had been observed using these cavities. Therefore, our observations not only expand the list of vertebrates that exploit these structures but also highlight their importance as essential habitat for a broader diversity of species.

The Magellanic woodpecker, as a large primary cavity excavator, plays a crucial role in conserving biodiversity in southern temperate forests. Its activity creates indispensable microhabitats for various species, strengthening the ecological structure of the ecosystem. Therefore, we consider its conservation vital to maintaining these ecological processes and their associated services.

Finally, we propose that future studies focus on analyzing the relationship between cavity availability and the population dynamics of the monito del monte, in order to better understand how these refuges influence its survival and reproduction within temperate forests.

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