GAYANA Gayana (2025) vol. 89, No. 2, 177-181

SHORT COMMUNICATION

The northernmost record of *Dromiciops bozinovici* in the Radal Siete Tazas National Park (Maule Region)

El registro más septentrional de *Dromiciops bozinovici* en el Parque Nacional Radal Siete Tazas (Región del Maule)

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ABSTRACT

The recent species-level status of *D. bozinovici* (monito de Pancho) highlights the urgent need to gather information on its natural history. The species is endemic to Central Chile, a region heavily affected by silviculture and forest fragmentation. We report the northernmost record of the species from Radal Siete Tazas National Park (Maule Region) and discuss major anthropogenic threats, including forest fires, exotic fauna, and intense tourism pressure, which endanger this northernmost known population of "monitos de Pancho".

Keywords: Chile, live capture traps, monito de Pancho, wildlife population.

RESUMEN

El reciente estatus de *D. bozinovici* (monito de Pancho) a nivel de especie resalta la necesidad urgente de recopilar información sobre su historia natural. La especie es endémica de Chile Central, una región fuertemente afectada por la silvicultura y fragmentación de los bosques. Reportamos el registro más septentrional en el Parque Nacional Radal Siete Tazas (Región del Maule) y discutimos las principales amenazas antropogénicas, incluyendo incendios forestales, fauna exótica y una intensa presión turística, que ponen en peligro a esta población más septentrional conocida de monitos de Pancho.

Palabras clave: Chile, monito de Pancho, población de fauna silvestre, trampas de captura viva.

The genus *Dromiciops* Thomas is the only extant representative of the order Microbiotheria and classically has been considered a monotypic genus with *Dromiciops gliroides* being its unique species distributed between the coastal and Andean zone of Chile and Argentina, between 35° S and 43° S (Gurovich *et al.* 2015; Martin 2010; Mejías *et al.* 2021; Oda *et al.* 2019). However, recent molecular studies have established that *Dromiciops* is composed of two allopatric species that diverged 3 million years ago and that currently are latitudinally separated: the new species *D. bozinovici* ("monito de Pancho") from 35° to 39° S and *D. gliroides* from 39° to 43° S (D' Elía *et al.* 2016; Quintero-Galvis *et al.* 2021, 2022). The recent status at the species level of *D. bozinovici* makes it necessary and urgent to gather information on its natural

history to propose effective conservation plans, as complete distribution is in Central Chile, a region characterized by a large number of native and endemic species of flora and fauna that are threatened by silvicultural expansion and highly fragmented forests (Alaniz *et al.* 2016; Ormazabal 1993; Smith-Ramírez 2004; Echeverria *et al.* 2006). Consequently, the vulnerability and loss of the native landscapes have led to Central Chile having one of the world's highest rates (20% of species) of extinction risk of native mammals (Gaulke *et al.* 2019) and consequently Central Chile is a priority conservation area worldwide (Myers *et al.* 2000; Mittermeier *et al.* 2011). Therefore, the situation of *D. bozinovici* is very critical, and Quintero-Galvis *et al.* (2022) proposed that this species should be considered an endangered species in the IUCN. As a significant contribution to the knowledge of its natural history, here we report the northernmost record of the *D. bozinovici* distribution based on the direct observation and capture in the Radal Siete Tazas National Park (RSTNP).

In the context of a study of prey availability for a research in community ecology of mammalian carnivores realized in RSTNP in Maule Region (Fig. 1a), we sighted three individuals of the "monito de Pancho" perched on branches of the native vegetation in the night (between 21:00 pm and 00:00 pm) (Figs. 2a, 2b) and then, the next day captured an individual at the same point (35°28' S, 70°59' W; 1122 m a.s.l.) using live capture traps baited with banana (Figs. 2c, 2d) in 26th January (summer) 2024. The area corresponds to a *Nothofagus* Forest (*N. alpina* and *N. dombeyii*) with abundant presence of *Lomatia dentata* and *Aristotelia chilensis*. For the capture, we have a permit granted by the "Servicio Agrícola y Ganadero" of Chile (SAG; resolutions 6887/2022 and 420/2024). Although capture efforts, with two capture lines of 160 Sherman traps scattered on the ground and among trees, were made during the previous seasons (winter, autumn, and spring 2023), no individuals of "monito de Pancho" were captured. This is consistent with the reported increase in its activity in summer (Kelt & Martínez 1989; Aizen 2003; Fontúrbel *et al.* 2014), which is associated with the fruiting season of abundant plants in the area such as *Tristerix sp.*, *Ribes trilobum*, and *Aristotelia chilensis*. The captured individual was a juvenile female (Figs. 2c, 2d) with a thin tail, measuring 8 mm at its base, reflecting the low availability of fat in its body due to the time of year. The individual was released back into the same tree where it was captured.

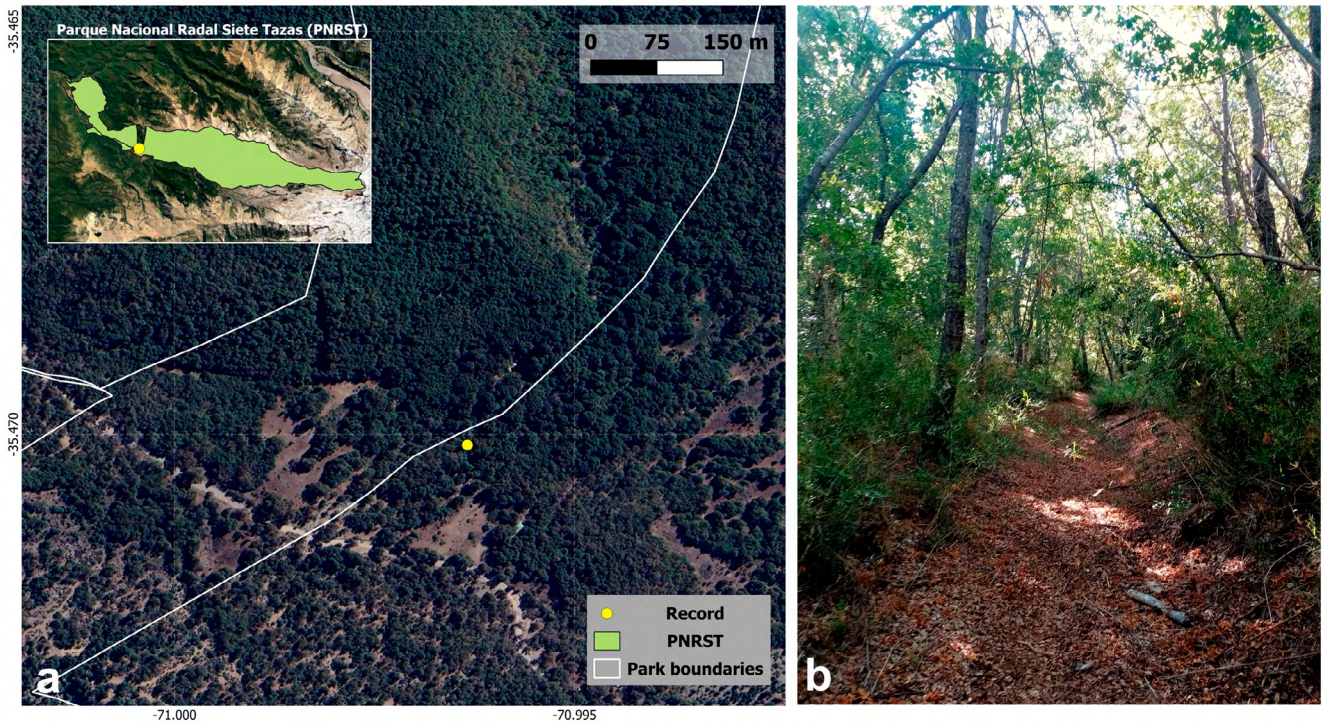

Figure 1. a) Location of the study area and records of "monito de Pancho" individuals. b) view of the capture zone. / a) Ubicación del área de estudio y registros de individuos de "monito de Pancho". b) Vista de la zona de captura.

Figure 2. Individuals of "monito de Pancho" registered in PNRST. a) and b) photographs of the night record by Felipe Durán-Garcés. c) and d) individual captured. / Individuos de "monito de Pancho" registrados en el PNRST. a) y b) Fotografías del registro nocturno por Felipe Durán-Garcés. c) y d) Individuo capturado.

The presence of *D. bozinovici* in the PNRST extends 15 km north of the previous northernmost record reported in Reserva Nacional Altos de Lircay (RNAL; Mejías *et al.* 2021). While this record does not represent a significant expansion of the distribution range, it does provide essential information about recognizing the concrete threats affecting this vulnerable species in the northern portion of its fragmented distribution. A critical environmental factor that constantly threatens the "monitos de Pancho" population is the wildfires that occur at a higher frequency each summer in Central Chile. In the Maule region, the megafire of 2017 destroyed 252,556 hectares, equivalent to a third of the region's forest area (De la Barrera *et al.* 2017; Azócar de la Cruz *et al.* 2022). Also, the surrounding areas of the PNRST were affected by wildfires in 2020, burning more than 5000 Ha, and more than 40 Ha in 2022 (CONAF website). The consequences of the recent wildfires and their impact on this species at the park had been previously reported by the ranger team, which observed "monito de Pancho" individuals escaping down the river during the fire. Due to wildfires and urbanization surrounding the park, habitat loss and high levels of fragmentation pose a constant and substantial threat to "monito de Pancho" populations in their northern distribution. Recent evidence shows that *Dromiciops* is capable of inhabiting second-growth and degraded forests, even moving along forest edges. Still, radiotelemetry studies have shown that they are incapable of dispersing across non-forested habitats (Fonturbel *et al.* 2010). Therefore, wildfires can cause and exacerbate the isolation of these marginal populations in their northern distribution. Besides wildfires, other anthropogenic factors were identified at the park throughout the monitoring period. Free-roaming pets from houses inside the park, such as cats and dogs, and exotic species such as rats (*Rattus rattus*), were registered at the park as potential predators and disease transmitters for "monitos de Pancho" and other native species. Rats and domestic cats

have had particularly destructive effects on a broad range of worldwide native marsupial species. For example, in Australia, several species of small sized marsupials have declined or become extinct given the introduction of domestic cats (Atkinson 1985, Dickman 1996, Cortez & Torres-Fuentes 2021). Also, livestock related to "gauchos" who live in the park, such as cows and horses, were registered roaming and feeding near the capture point during the autumn and winter seasons. In addition to this, several native predators were photographed at the surrounding place of record as guiña *Leopardus guigna* and concon *Strix rufipes*.

Finally, the PNRST receives an average of 14,000 visitors per summer vacation period. Nevertheless, the summer of 2023 had the highest tourist influx, with 41,000 visitors recorded between December and January. At the end of 2024, the park received 73,000 visitors, bringing with them noise, garbage, pets, and contamination from trail-trekking and camping activities, despite the conservation efforts of the 14 park rangers (information provided by park staff). This suggests a lack of care and environmental awareness among visitors. We hope that with this new records, future research will include marginal populations of "monito de Pancho" that have not yet been identified. Since *Dromiciops* plays a key ecological role as seed disperser of fleshy fruit seeds (Amico *et al.* 2009; Vazquez *et al.* 2021a), its conservation should be a priority (Vazquez *et al.* 2021a). Specifically, *D. bozinovici* represents a conservation challenge given that this species is distributed in the most highly disturbed area in Chile (Echeverría *et al.* 2006).

ACKNOWLEDGEMENTS

The authors would like to thank the CONAF ranger team: Aldo Reyes, Daniel Medel, Benjamín Fuenzalida, and Javier Véliz, for their warm welcome to the park, advice, and constant help during field campaigns. We are grateful for the support of the FONDECYT project 1220998 and VRID220.113.100-INV, which financed the field campaign.

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Received: 11.08.2025
Accepted: 20.11.2025

Editor: Fulgencio Lisón