

Mammalia, Rodentia, Sigmodontinae, *Irenomys tarsalis* (Philippi, 1900) and *Geoxus valdivianus* (Philippi, 1858): Significant ecological range extension

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ABSTRACT: We present the first records of the Chilean tree mouse (*Irenomys tarsalis*) and Valdivian long-clawed mouse (*Geoxus valdivianus*) in non-native forestry plantations. Despite being characterized as forest species, specimens of *I. tarsalis* and *G. valdivianus* were captured within a 30-year-old *Pinus contorta* plantation in Coyhaique National Reserve. These records show our limited understanding of this fauna and suggest the need for further surveys and monitoring, including disturbed habitats.

The mammal fauna of Chile is one of the best known in the Neotropics. Nonetheless, new taxa and distribution records are often reported, suggesting that the diversity and distribution of Chilean mammals is still not completely known (e.g., Patterson 1992; Hutterer 1994; Kelt and Gallardo 1994; Saavedra and Simonetti 2001; D'Elía *et al.* 2006). The rodent species of Chilean Patagonia includes widely distributed sigmodontines such as *Abrothrix longipilis* (Waterhouse, 1837), *Abrothrix olivaceus* (Waterhouse, 1837), *Loxodontomys micropus* (Waterhouse, 1837), and *Oligoryzomys longicaudatus* (Bennett, 1832); while, other species in southern Patagonia, such as *Irenomys tarsalis* (Philippi, 1900) and *Ctenomys coyahuquensis* Kelt and Gallardo, 1994, have a more restricted distribution.

The Chilean tree mouse *Irenomys tarsalis* is a sigmodontine rodent endemic to the Andean forests and forest-steppe ecotones of southern Chile and Argentina (Kelt 1993). It is a relatively rare element in the fauna of southern Chile and adjacent areas of Argentina (Osgood 1943; Meserve *et al.* 1988, 1991; Patterson *et al.* 1989, 1990; Kelt *et al.* 1999). As is common for rare species, the limits of the tree mouse's geographic and ecological ranges are poorly documented (Kelt *et al.* 2008). Since its original description, knowledge on *Irenomys tarsalis* is limited to information on its distribution (e.g., Pardiñas *et al.* 2004), some aspects of its natural history (e.g. Pearson 1983; Kelt 1993, 1994; Saavedra and Simonetti 2000), its chromosome characterization (Ojeda *et al.*, 2004) and its controversial phylogenetic position (e.g. Smith and Patton 1999; D'Elía 2003). Kelt (1993) summarized the knowledge of this species and reported its occurrence from Chillán in the Ñuble Province (Bio Bio Region) to Chile Chico in the south of the Aysén Region. Later, Saavedra and Simonetti (2000) documented an apparently isolated population in Los Queules National Reserve, thereby extending its known distribution around 200 km to the north. Finally, in the compilation of Argentine records by

Pardiñas *et al.* (2004), the known distribution in Argentina was extended both northward and southward. Kelt (1994, 1996) indicated that *I. tarsalis* is usually found in wooded habitats, and Figueroa *et al.* (2001) indicated that this species is strictly associated with dense, humid forest environments. In Aysén, it is distributed specifically in the boreal and humid ecoregions.

Even less is known about *Geoxus valdivianus* (Philippi, 1858). The information on this species is limited to a scattered data on its distribution and habitat use (e.g. Figueroa *et al.* 2001; Saavedra and Simonetti 2001; 2003; 2005; Lobos *et al.* 2005; Elgueta *et al.* 2006) and recently preliminary information on its pattern of geographic variation was provided by Lessa *et al.* (2010). In Chile, it occurs between the provinces of Ñuble and Magallanes (Reise and Venegas 1987; Redford and Eisenberg 1992). *Geoxus valdivianus* inhabits dense forests, although it is occasionally dispersed in mallin habitats (low-lying Patagonian wetlands) along forest edges. This species inhabits thick brushwood habitats near Coyhaique Alto, in the eastern part of the Aysén Region (Kelt 1994; Figueroa *et al.* 2001).

This note provides new records of *Irenomys tarsalis* and *Geoxus valdivianus* in an uncharacteristic ecological habitat for these species. Thus, we believe that this observation deserves recognition in the literature.

The study area is located 5 km north of the city of Coyhaique (Aysén Region, Chile) on a ~30-year-old forestry plantation of *Pinus contorta* (Dougl. ex Loud) in the Coyhaique National Reserve (44°70' S, 72°08' W) (Figure 1). The plantation is about 1 km away from the nearest native forest remnant, which has been affected by the installation of a camping area in the reserve. The nearest forest and regrowth area for *lenga* [*Nothofagus pumilio* (Poepp et Endl.) Krasser] free of anthropogenic influence is some 2.5 km from the plantation. Despite the isolated presence of native trees belonging to the families Poaceae, Grossulariaceae, Berberidaceae, and Apiaceae, the

terrain has almost no native undergrowth stratum (Figure 2).

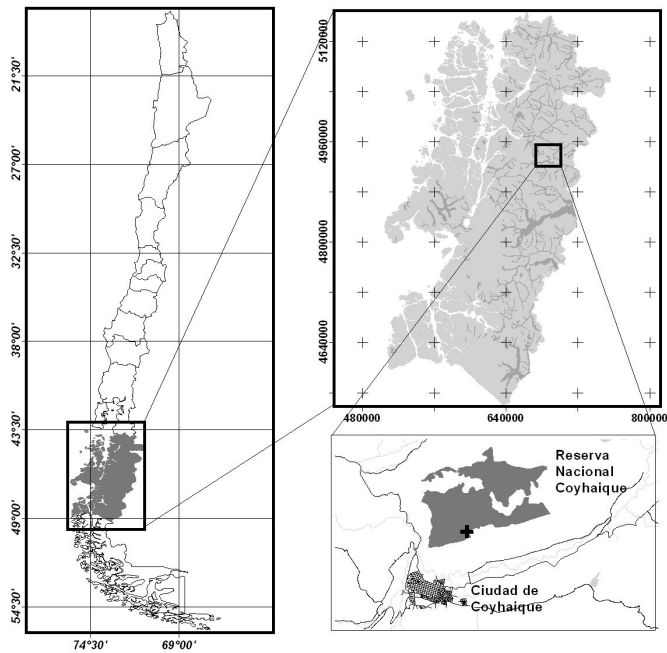


FIGURE 1. Location of the study area in the Coyhaique National Reserve, Aysén Region, Chile.

Field collection was done using 121 Sherman traps that were monitored for four consecutive nights in April and November 2008. All traps were placed on the ground. Manipulation of captured individuals followed the protocol of the American Society of Mammalogists (Gannon *et al.* 2007) and the collection permits issued by the Servicio Agrícola y Ganadero de Chile (SAG; Resolución exenta N° 29 of January, 2008). The work authorization in the Coyhaique National Reserve was granted by the Corporación Nacional Forestal (CONAF) of the Aysén Region. Collected specimens were deposited in the Museo de Zoología de la Universidad de Concepción, Chile and Colección de Mamíferos de la Universidad Austral de Chile, Valdivia, Chile.

We captured one specimen of *Geoxus valdivianus* and one of *Irenomys tarsalis* on a *Pinus contorta* forestry plantation, in April and November respectively. Both individuals were prepared as fluids and tissue samples (36183 MZUC - UCCC and 7141 IEEUACH; deposited in the Museo de Zoología de la Universidad de Concepción and in the Colección de Mamíferos de la Universidad Austral de Chile, Valdivia, respectively) and were adult animals based on size. This is an anomalous ecological habitat for these species. Other sigmodontines caught during this campaign include *Abrothrix longipilis*, *A. olivaceus*, and *Oligoryzomys longicaudatus*. All of these species had been previously recorded on forestry plantations (*e.g.*, Saavedra and Simonetti 2005; García and Ortiz unpublished data).

These records constitute the first documentation of *Irenomys tarsalis* and *Geoxus valdivianus* in this type of habitat dominated by an exotic species. In fact, in a report that extended the known distribution of *G. valdivianus* nearly 200 km northward, Saavedra and Simonetti (2001) pointed out that neither *Geoxus* nor *Irenomys* were caught in the grid of traps set up within a forestry plantation.

In line with our results, recently Kelt *et al.* (2008)

documented *I. tarsalis* in a shrubby habitat along a stream near the arid end of the transition from temperate rain forest to steppe in the Aysén Region; this was the first record of this species in such an environment, extending its ecological distribution to brushwood habitats.

Further studies are needed to clarify if in Aysén *Irenomys* and *Geoxus* are in fact, inhabiting pine plantations or if they just accidentally entered this habitat. The fact that our specimens were not juvenile seems to indicate that these specimens may not be dispersing individuals, which shows a greater ecological tolerance by these species than previously thought. Also, our records show that these species have high dispersal abilities since they were surveyed far from the closest forest patch.

In addition, the discovery of a specimen of *Irenomys tarsalis* and another of *Geoxus valdivianus* on a *Pinus contorta* forestry plantation helps broaden our understanding of the region's natural history. These records highlight our limited knowledge of this fauna and show the need to carry out additional field work and implement monitoring efforts that include disturbed and non-native habitats, which are dramatically increasing in area in Chile.



FIGURE 2. *Pinus contorta* plantation where the *Irenomys tarsalis* and *Geoxus valdivianus* specimens were found in Coyhaique National Reserve, Aysén.

ACKNOWLEDGMENTS: This work was financed by the projects Fondecyt 1070511, Fondecyt 11070157, and DIUC Semilla Patagonia 205.113.066 of the Universidad de Concepción. We thank the Servicio Agrícola y Ganadero (SAG) for the collecting permits and the Corporación Nacional Forestal (CONAF) of the Aysén Region for allowing us to work in the Coyhaique National Reserve. We also appreciate Guillermo Solar, and Víctor Carumilla Reserve Park Ranger, who provided excellent help and assistance during field work.

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RECEIVED: June 2010

LAST REVISED: November 2010

ACCEPTED: March 2011

PUBLISHED ONLINE: May 2011

EDITORIAL RESPONSIBILITY: Ana Paula Carmignotto