NOTA CIENTIFICA

The occurrence of *Pachytullbergia scabra* (Collembola: Pachytullbergiidae) on *Pseudocyphellaria granulata* (lichenized Ascomycota)

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La presencia de *Pachytullbergia scabra* (Collembola: Pachytullbergiidae) sobre *Pseudocyphellaria granulata* (Ascomycota liquenizados)

■ **RESUMEN.** El colémbolo *Pachytullbergia scabra* Bonet (Pachytullbergiidae), previamente registrada en América austral como habitante de la superficie de la corteza de *Nothofagus dombeyi* (Mirb.) Oerst., fue coleccionada sobre la especie liquénica *Pseudocyphellaria granulata* (C. Bab.) Malme. Éste es el primer registro de una asociación artrópodo-líquen en los bosques templado-fríos de la Argentina.

PALABRAS CLAVE. Collembola. *Pachytullbergia scabra*. *Pseudocyphellaria granulata*. Ascomycota liquenizados. *Nothofagus*. Patagonia

■ **ABSTRACT.** The springtail species *Pachytullbergia scabra* Bonet (Pachytullbergiidae), previously recorded in austral America inhabiting the surfaces of *Nothofagus dombeyi* (Mirb.) Oerst. bark, has been collected growing on the epiphytic lichen species *Pseudocyphellaria granulata* (C. Bab.) Malme. This is the first record of an arthropod-lichen association in the cool temperate forest of Argentina.

KEY WORDS. Collembola. *Pachytullbergia scabra*. *Pseudocyphellaria granulata*. Lichenized Ascomycota. *Nothofagus* forest. Patagonia

There are some reports on arthropods-lichen interactions from different parts of the world (Salmon, 1962; Weber, 1974; Gilbert 1976; Gerson & Seaward, 1977; Wessels *et al.*, 1979; Seaward, 1988; Prinzing & Wirtz 1997; Materna, 2000; Aptroot & Berg 2004; Lalley *et al*. 2006). However, until now there had been no such records for the southern South America region. We report here the first record of an arthropod-lichen association in the cool temperate forest of Argentina.

Deciduous and/or evergreen trees of the genus *Nothofagus* dominate the southwestern Argentine forests in Patagonia. The lichen flora of these forests is predominantly epiphytic. To date, there is only one ecological report on Collembola sheltering

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in lichens growing on rocks in a *Nothofagus pumilio* forest in Chile (Covarrubias *et al.*, 1988).

During our preliminary collection trips in July (winter) and December (summer) 2006, lichens of different growth forms were collected in a *Nothofagus dombeyi* (Mirb.) Oerst. (coihue) forest at Lago Escondido, Nahuel Huapi National Park (Río Negro Province, Argentina), to study lichen-arthropod associations. Lichen thalli were collected at six sites on solitary or fallen trunks of *N. dombeyi* at heights 0.20-1.50 m above the ground. In the laboratory, the microfauna associated with collected lichens was extracted with a Berlesse-Tullgren funnel under artificial illumination (incandescent light bulb, 40W). Subsequently, the animals were sorted by species and transferred to 70% alcohol.

The collembolan *Pachytullbergia scabra* Bonet (Collembola: Pachytullbergiidae) was present on the epiphytic corticolous thalli of the lichen species *Pseudocyphellaria granulata* (C. Bab.) Malme. Mean density of this collembolan species 7 individuals per thallus (max. 12 individuals per thallus, ca. 1 individual per cm^2). Bark samples taken next to the lichens rendered no *P. scabra* specimens.

This is the first record of such an arthropod-lichen association from *Nothofagus* forests in Argentina. This infrequent collembolan species is known only from a few localities in moist and shaded habitats in southwest Patagonian temperate forest. *Pachytullbergia scabra* was recorded previously by Cassagnau and Rapopot (1962) at Nahuel Huapi National Park, and also at Los Alerces National Park (Chubut Province), in both cases inhabiting the surface of *Nothofagus dombeyi* bark. Other records of this species can be found in the Checklist of the Collembola of the World (Ballinger *et al.*, 1996-2006).

Since identifiable remains of lichens (green photobionts or hyphae) could not be observed from our initial observation of the stomach contents of *Pachytullbergia scabra*, we believe *P. scabra* does not feed on thalli of *Pseudocyphellaria granulata*. Rather, we suggest thalli may provide shelter from extreme environmental conditions and predators and foraging grounds for gathering associated microorganisms and organic matter. In fact, lichens are known to be used by collembolans as shelter from climatic extremes in many regions (Salmon, 1962; Leinaas & Sømmes 1984; Seaward, 1988).

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