

ORIGINAL RESEARCH ARTICLE

Geographic distribution and associated flora of native and introduced bumble bees (*Bombus* spp.) in Chile



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Summary

In the present work, we update floral associations and geographical distribution for four species of *Bombus* present in Chile, two native (*B. dahlbomii* and *B. funebris*) and two introduced species (*B. terrestris* and *B. ruderatus*). We also examine possible associations among native or introduced bees with native or introduced plant species. We found a significant non-random plant association among non-native bumble bee species and non-native plant species. Because of the distributional overlap between *B. dahlbomii* with the two non-native bee species, it is likely that *B. dahlbomii* interacts with these non-native bees.

Distribución geográfica y flora asociada de abejorros nativos (*Bombus* spp) e introducidos en Chile

Resumen

En este trabajo actualizamos las asociaciones florales y la distribución geográfica de las cuatro especies de *Bombus* presentes en Chile, dos especies nativas (*B. dahlbomii* y *B. funebris*) y dos especies introducidas (*B. terrestris* y *B. ruderatus*). Examinamos las posibles asociaciones entre abejas nativas o introducidas con las especies nativas o introducidas de plantas. Encontramos una asociación significativa no aleatoria entre especies de abejorros introducidos con especies de plantas introducidas. El solapamiento de la distribución de *B. dahlbomii* con los abejorros introducidos es probable que se produzca por la relación entre estas especies.

Keywords: *Bombus*, associated flora, distribution, Chile

Introduction

Bumble bees (*Bombus* spp.) are a genus of polylectic bees of the family Apidae, distributed worldwide, principally in temperate areas of North America and Eurasia (Michener, 2007). For the Neotropics, a total of 42 - 43 species have been recorded in a great variety of habitats, ranging in altitude from sea level to about 4400 m in the Andes (Williams, 1998; Abrahamovich and Díaz, 2002, Moure *et al.*, 2007). *Bombus* bees are important pollinators in natural and agricultural ecosystems, depending upon pollen and nectar from a great variety of plants (Traveset, 1999; Abrahamovich *et al.*, 2001; Aizen *et al.*, 2002; Morales and Aizen 2004; Smith-Ramírez *et al.*, 2005). Preliminary

understanding of the relationship between *Bombus* species and the plants they exploit begins with simple observations of visitations and feeding behaviour (Abrahamovich *et al.*, 2001), which we attempt to summarize here for *Bombus* in Chile.

Bumble bees have also been introduced into many countries to provide a pollination service for commercial crops. In new environments, introduce *Bombus* may threaten populations of native pollinators by transporting diseases and competing with natives for food resources and nest sites (Free, 1993; Delaplane and Mayer, 2000; Stout and Goulson, 2002; Goulson and Hanley, 2004; Goulson, 2003; Goulson, 2004; Morales, 2007). In addition, deliberate introductions often turn into invasions with negative impacts on native