The most effective pollinator principle applies to new invasive pollinators

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Abstract

G. L. Stebbins' most effective pollinator principle states that when pollinators are not limiting, plants are expected to specialize and adapt to the most abundant and effective pollinator species available. In this study, we quantify the effectiveness of bees, hummingbirds and hawkmoths in a Chilean population of Erythranthe lutea (Phrymaceae), and examine whether flower traits are subject to pollinator-mediated selection by the most effective pollinator species during two consecutive years. Unlike most species in the pollinator community, the visitation rate of the recently arrived Bombus terrestris did not change substantially between years, which together with its high and stable pollen delivery to flower stigmas made this species the most important in the pollinator assemblage, followed by the solitary bee Centris nigerrima. Flower traits were under significant selection in the direction expected for short-tongue bees, suggesting that E. lutea is in the initial steps of adaptation to the highly effective exotic bumblebee. Our results illustrate the applicability of Stebbins' principle for new invasive pollinators, and stress their importance in driving flower adaptation of native plant species, a critical issue in the face of biotic exchange and homogenization.

Palabras clave

Palabras clave de autor: Stebbins' principle; invasive pollinator; pollinator-mediated selection; visitation rate; pollinator effectiveness
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