

# POLLINATOR EFFECTIVENESS IN THE MIXED-POLLINATION SYSTEM OF A NEOTROPICAL PROTEACEAE, *OREOCALLIS GRANDIFLORA* by Santiago Cárdenas, Juan D. Cárdenas, Boris O. Landázuri, Gabriela Mogrovejo, Francisco J. Neira, Antonio M. Crespo, Nils Breitbart, Matthias Schleuning, Boris A. Tinoco

Pollination is a key interaction for maintaining ecological functionality in biodiverse ecosystems like the tropical Andes. When a plant is visited and seemingly pollinated by a diverse community of animals, we can better understand their unique roles by comparing their contribution to pollination.

*O. grandiflora* is an Andean shrub ideally suited to study pollination effectiveness among different pollinators. It is visited by hummingbirds during the day, and by night, by bats and mice.

We used a series of field experiments to compare the pollination effectiveness of these two pollinator groups when they visit flowers of *O. grandiflora* to feed on its nectar. We measured the number of times a pollinator visits the flower in an hour and the number of pollen grains it deposits. We also applied four different pollination treatments to flowers of *O. grandiflora*: diurnal pollination, nocturnal pollination, self-pollination and naturally occurring pollination. We then compared the amount of fruits and seeds that resulted from each treatment.

Hummingbirds visited more flowers than nocturnal mammals but deposited less pollen, while nocturnal mammals deposited more pollen yet visited less flowers. Moreover, seed and fruit production were higher when hummingbirds and bats were allowed to work together instead of on their own.

We found that while hummingbirds and nocturnal mammals were able to successfully pollinate flowers on their own, their combined contribution resulted in higher pollination effectiveness. This finding underscores the importance of biodiversity for the maintenance of ecosystem functions in susceptible regions like the tropical Andes.



*O. grandiflora* inflorescence. By Pedro Machado.

