

Elevation has contrasting effects on avian and mammalian nest traits in the Andean temperate mountains

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Abstract

Nest building is a widespread breeding strategy across taxa. Nest composition and structure can play a critical role in the breeding success and/or adult survival of nest-building vertebrates. Although nest traits are expected to vary adaptively across elevational gradients, few studies address this relationship. We studied the variation in nest traits (composition and structure) across elevation for two taxa with two different functions in the Andean temperate forests of southern Chile: a bird (*Aphrastura spinicauda*, Furnariidae, 170 breeding nests) and a marsupial mammal (*Dromiciops gliroides*, Microbiotheriidae, 91 winter torpor nests). For *A. spinicauda*, we further assessed how nest traits influenced clutch size and hatching success. Both species used fewer types of nest materials (items) with increasing elevation, and a greater proportion of leaves were used in highland compared to lowland forests. *Aphrastura spinicauda* used feathers and hair, and *D. gliroides* used bryophytes more frequently in lowland forests. The mass and volume of nests decreased with increasing elevation for *A. spinicauda* and increased for *D. gliroides*. Nest traits had subsequent fitness consequences for *A. spinicauda*, such that: (i) greater cup volume and depth were associated with larger clutch sizes, (ii) more items used during nest building were linked to improved clutch size at high elevation only, and (iii) nest wall thickness was negatively associated with hatching success. Thus, in temperate mountain ecosystems, elevation may be an important factor influencing nest-building behaviour for cavity-using vertebrates. However, the direction of the elevational effects may vary among taxa and nest functions in these ecosystems.

Keywords

Altitude; Austral; Opossum breeding; Chile; Thorn; Tailed; Rayadito