Rarity in Chilean forest birds: which ecological and life-history traits matter?

Hernán L. Cofre, Katrin Böhning-Gaese, Pablo A. Marquet

Abstract

While it is a truism that species rarity is non-randomly distributed across regions, habitats, and taxa, there is little consensus on which factors are the best predictors of low abundances and restricted geographical ranges. In this study, we evaluate the effects of ecological and life-history traits, as well as phylogeny, on rarity in the abundance and distribution of land birds inhabiting forest habitats in the Mediterranean and temperate regions of Chile. We use data on abundance collected at 16 sites and data on latitudinal distribution obtained from a literature compilation. Statistical analyses were based on multiple regression and multivariate models. We used Signed Mantel test to analyse the relationship between species ecological and life-history traits and rarity, taking into account the effect of phylogenetic relatedness. We found that rarity, in terms of distribution, is associated with a low investment in reproduction, non-migratory status, and degree of habitat specialization. These ecological and life-history traits, in association with forest loss due to climatic changes and human impacts, may explain the narrow distribution of most endemic forest birds species. Rarity in abundance, on the other hand, is more difficult to explain. However, the fact that large species with an insectivorous diet showed low density in the assemblages studied suggests that abundance is mostly regulated by energy (resource) requirements and availability. Finally, our study shows that there is no phylogenetic influence in the observed patterns.