

Abstract

Each species has specific adaptations to its environment, and since environmental parameters reveal geographic trends, it is reasonable to expect the existence of geographic trends in species characteristics as well. The aim of this study has been to evaluate the effect of environmental conditions on geographic variability of functional traits of European birds. I have analysed the effect of temperature, precipitation, productivity, altitude and habitat type (forest, open habitats, bush, settlements, wetlands) on clutch size, number of clutches per breeding season, egg size, incubation length, age of maturity, body mass, wing, tail, bill and tarsus length. I have used data from the European breeding bird atlas, so that I have calculated mean values of all the traits for quadrats 50x50 km, and then related them to environmental characteristics using OLS and GLS. Clutch size increases with temperature, whereas the number of clutches decreases with it, indicating possible trade-off between clutch size and the number of clutches, whose result is determined by the length of breeding season. Egg size decreases with temperature, possibly due to higher survival of large eggs (and consequently juveniles) in cold regions. Incubation length increases with both temperature and environmental productivity, probably because it is advantageous to make the incubation as short as possible in cold regions with short breeding season. Body mass is related to the fluctuation of food provision; birds are bigger in fluctuating environment, probably because they are better able to survive harsh periods. Wing length is related to the type of migration; long-distance migrants have relatively longer wings, so that there is also a latitudinal trend in wing length. Geographical patterns in tail, bill and tarsus length are much less pronounced and quite complex, depending mostly on feeding strategies. Habitat types explain relatively low proportion of variability in functional traits, probably due to rough habitat categorization. Geographical patterns in functional traits often differ between (altricial) passerines and (often precocial) non-passerines, indicating different response to environmental gradients in birds with different breeding strategies.