Abstract

The Eastern Afromontane cloud forests occur as geographically distinct mountain exclaves. The conditions of these forests range from large to small and from fairly intact to strongly degraded. For this study, we sampled individuals of the forest bird species, the Montane White-eye Zosterops poliogaster from 16 sites and four mountain archipelagos. We analysed 12 polymorphic microsatellites and three phenotypic traits, and calculated Species Distribution Models (SDMs) to project past distributions and predict potential future range shifts under a scenario of climate warming. We found well-supported genetic and morphologic clusters corresponding to the mountain ranges where populations were sampled, with 43% of all alleles being restricted to single mountains. Our data suggest that large-scale and long-term geographic isolation on mountain islands caused genetically and morphologically distinct population clusters in Z. poliogaster. However, major genetic and biometric splits were not correlated to the geographic distances among populations. This heterogeneous pattern can be explained by past climatic shifts, as highlighted by our SDM projections. Anthropogenically fragmented populations showed lower genetic diversity and a lower mean body mass, possibly in response to suboptimal habitat conditions. On the basis of these findings and the results from our SDM analysis we predict further loss of genotypic and phenotypic uniqueness in the wake of climate change, due to the contraction of the species' climatic niche and subsequent decline in population size.