

The diversity of resident Passerine bird in the East Yunnan-Guizhou Plateau is closely related to plant species richness, vertical altitude difference and habitat area

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Abstract

East Yunnan-Guizhou Plateau is rich in biodiversity in China. Complex geographical and climatic conditions, and rich bird resources made this area an ideal system for studying the spatial distribution mechanism and influencing factors of birds, which were still unknown. Bird community data from 37 sites in this region were collected, including 505 bird species and 164 species of resident passerine bird analyzed. The taxonomic diversity, phylogenetic diversity, functional diversity, and community structure index were calculated. Redundancy analysis (RDA), ordinary least square (OLS), and structural equation model (SEM), were used to explore the relationship between bird diversity index and 12 environmental factors used to describe the habitat conditions of birds. Results indicated that the vascular plant species richness, habitat area, and vertical altitude difference were the three most critical factors affecting bird diversity. The phylogenetic structure of bird community was dispersed in west and clustered in east, and significantly related to latitude, habitat area, and vertical altitude difference. The functional structure was dispersed in all sites, and significantly related to mean annual precipitation and longitude. This suggest that the distribution pattern of bird diversity was caused by the comprehensive action of various habitat factors which were mainly related to food availability and habitat heterogeneity. Considering the protection of birds in this area, it is necessary to continuously promote the construction of nature reserve system proposed by the Chinese government, and pay attention to the protection of urban green space such as campus and urban parks, to maintain the area and integrity of bird habitat, while only a high plant species and area is not enough, improving the habitat heterogeneity is of great significance.

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