The effects of vegetation cover on the structure of bird communities in a hyperarid desert

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Abstract. The hyperarid deserts of Wadi Araba, SW Jordan, include a variety of habitats ranging from barren alluvial fans and sand dunes to arid acacia savannahs and salt marshes. The diversity of resident birds was highest in acacia stands growing on alluvial fans and stone plains. Although open sand dune habitats have a distinct bird community contributing to the overall diversity, the local diversity within these habitats is relatively small. In habitats with both rocky and sandy substrates, species richness, avian abundance and the diversity of feeding guilds increased locally with the density of shrubs and/or trees. Additionally, avian diversity was related to vertical structure and linked to the mean height of shrubs and trees. Ephemeral annual cover had no general effect on the diversity of the native bird community. Shrub and tree cover appear to be reliable habitat cues used by many bird species when choosing their breeding habitats, as the presence of shrubs and trees increases the diversity of food resources and of secure nesting sites.

Kurzfassung. Die hyperaride Wüste des Wadi Araba, SW-Jordanien, beinhaltet eine Vielfalt an natürlichen Habitaten. Akazienbestände auf felsigen und steinigen Böden wiesen die höchste Vogeldiversität auf. Sanddünen beinhalteten ihre eigenen Vogelgesellschaften, obwohl die lokale Diversität relative niedrig war. Sowohl in felsigen als auch in sandigen Gebieten stieg die Anzahl der Arten, die Abundanzen aller Arten und der Gilden mit zunehmender Strauch- und Baumdichte. Eine Korrelation wurde auch zwischen mittlerer Baum- bzw. Strauchhöhe, die auf vertikale Strukturierung hindeutet, und Vogeldiversität nachgewiesen. Die ephemere, annuelle Vegetation hatte keinen Einfluss auf die Diversität der Vogelgemeinschaft. Die Dichte and Struktur der perennierenden Vegetation werden als wichtige Faktoren bei der Habitatwahl vieler Vogelarten vermutet.

Key words. Bird communities, diversity, hyperarid desert, Wadi Araba, Jordan.

Introduction

Bird community structure can be influenced by a variety of factors at different spatial scales (WIENS & ROTTENBERRY 1981). Recent studies in the arid deserts of Saudi Arabia have reported spatial and temporal variations in the abundance and diversity of resident and migratory birds (NEWTON & NEWTON 1997, VAN HEEZIK & SEDDON 1999). These reports have indicated that, at a local scale, structural complexity of vegetation might be the principal factor affecting bird diversity in arid areas. Further studies in North American deserts have shown that avian diversity usually rises along a scale of increasing habitat complexity, due to an increase of the variety of available nest sites and food niches (TOMOFF 1974).

The structure of resident/breeding bird communities in the natural desert landscapes of Jordan, as well as other parts of the world, has generally received little attention. Most studies in the deserts of Asia and North Africa have focused on the distribution of bird species

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