

# Multi-marker DNA metabarcoding reveals spatial and sexual variation in the diet of a scarce woodland bird.

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February 22, 2023

## Abstract

Avian diet can be affected by site-specific variables, such as habitat, as well as intrinsic factors such as sex. This can lead to dietary niche separation, which reduces competition between individuals, as well as impacting how well avian species can adapt to environmental variation. Estimating dietary niche separation is challenging, due largely to difficulties in accurately identifying food taxa consumed. Consequently, there is limited knowledge of the diets of woodland bird species, many of which are undergoing serious population declines. Here, we show the effectiveness of multi-marker faecal metabarcoding to provide in-depth dietary analysis of a declining passerine, the Hawfinch (*Coccothraustes coccothraustes*). We collected faecal samples from (n=262) UK Hawfinches prior to, and during the breeding seasons in 2016-2019. We detected 49 and 90 plant and invertebrate taxa, respectively. We found Hawfinch diet varied spatially, as well as between sexes, indicating broad dietary plasticity and the ability of Hawfinches to utilise multiple resources within their foraging environments.

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