

## DIET OF PASSERINE BIRDS FROM DIFFERENT HABITAT TYPES IN SARAWAK, BORNEO

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### ABSTRACT

Studies on wildlife food resources are important, providing insights into why certain species are abundant while others are not. This is based on the premise that wildlife are attracted to a particular habitat due to abundance of food resources. Small passerine birds inhabit different habitat types in Borneo, but the contribution of diet to this success is seldom investigated. This study aims to determine the diet of the passerine birds in six different habitat types, agro-, secondary, logged, primary, limestone forest and oil palm plantation. 253 individuals from 34 species of passerine birds were captured. Sources for dietary analyses comprised 149 regurgitated, 85 faecal and 33 stomach content samples, which were subsequently examined for prey items. Fifteen orders of prey items were identified, of which 14, 11, 8, 7, 6 and 3 were associated with agro-, secondary, logged, primary, limestone forest and oil palm plantation, respectively. Coleoptera were found eaten by 40% of the birds, followed by Hymenoptera (25%), Arachnidae (9.7%) and Orthoptera (7.5%). Regurgitated samples yielded 15 individuals of intact prey items whereby stomach content and faecal sample had one each. This study showed that Coleoptera are important food for small passerine birds inhabiting different habitats in Sarawak, Borneo.

**Key words:** Passerine birds, diet, agroforest, secondary forest, logged forest, primary forest, limestone forest, oil palm plantation

### INTRODUCTION

Bornean avifauna community is made up of 674 species from 20 orders (Lepage, 2017). Passeriformes, with 298 species, is the largest order of Bornean birds. They occupy a wide range of habitats that vary in altitude and disturbance level, from undisturbed montane forests, to heavily disturbed lowland forests, urbanised area or plantation (Myers, 2009; Zakaria & Rajpar, 2010; Achondo *et al.*, 2011; Phillipps & Phillipps, 2014). Their occupation of this wide range of habitat is probably associated with the availability of food resources. Thus, dietary studies can provide clues to their resilience and success.

In the lowlands, the existence of different habitats are due to anthropogenic activities (Barlow *et al.*, 2006). For example, logged-over forest due to logging, secondary forest resulting from shifting cultivation and oil palm plantation established by

private companies and government agencies. These different habitats offer different resources to the resident population of avifauna. Monotypic habitats, such as oil palm plantations, may offer less resources compared to habitats which are more complex, such as primary forests.

The diet of birds has been studied via observations on foraging (Mohd-Azlan *et al.*, 2014; Mansor *et al.*, 2015; Styring *et al.*, 2016), inspection of the faecal samples (Ralph *et al.*, 1985; Chaves & Alves, 2013), analysis of the stomach contents (Ballarini *et al.*, 2013; Amit *et al.*, 2015), stomach flushing (Moorman *et al.*, 2007; Fijn *et al.*, 2012) and examination of regurgitated samples (Poulin *et al.*, 1994; Sherry *et al.*, 2016). Observational techniques are more appropriate for large-bodied water birds as they are easier to detect in open space habitats (Liordos, 2010), but difficult to be detected in the forest due to their often small body size, and amongst thick foliage (Blake & Loiselle, 2001; Zakaria & Rajpar, 2010).

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