

The abundance and species richness of insectivorous birds in relation to arthropods assemblages along a distance gradient from secondary forest into oil palm plantation in SALCRA, Sarawak

VIVIAN SOON^{1*}, JAYASILAN MOHD-AZLAN¹, BETTY COPA AMIT²
& ANDREW ALEK TUEN¹

Abstract : Predation by insectivorous birds is naturally considered as an important biological pest control in oil palm plantations. The abundance and species richness of insectivorous birds and their arthropod preys were examined along a distance gradient from secondary forest into the oil palm plantation at SALCRA Stenggang Oil Palm Estate in Bau, Sarawak between March to August 2020. The point count survey (total effort of 600 minutes), recorded 318 insectivorous birds representing 35 species from 18 families. Pitfall traps and sticky traps (total effort of 300 trap nights) collectively recorded the highest arthropod count in secondary forests. The results suggested that the decline in the abundance and diversity of insectivorous birds are mostly due to the increasing distance from the forest edge, while it diminishes the predation pressure on arthropod prey. The increase in insectivorous birds has a negative effect on arthropod abundance at secondary forests and forest edge, but not within the interior of oil palm plantations. This study proposed retaining natural forest found within and surrounding the oil palm plantation, as this is imperative for the ecological biodiversity to naturally spill over the predator movement into the oil palm plantation for the provision of important ecosystem services.

Keywords: Avian diversity, insectivore, natural predator, oil palm plantation, predator-prey interaction

INTRODUCTION

Oil palm (*Elaeis guineensis*) is one of the most rapidly expanding agriculture crops in the tropics, especially in Malaysia and Indonesia. Despite the economic benefits it has brought to the respective countries, oil palm plantations have significantly degraded the environment by transforming dense forest landscapes into greatly simplified vegetation structures. Oil palm cultivation in Sarawak has expanded from 14,091 ha in 1975 to a staggering 1.61 million ha in 2021, representing 27.3% of the total oil palm planted area in Malaysia (Malaysian Palm Oil Board, 2022). This change in land use has drastically diminished the bird biodiversity (Davison, 2022) and concomitantly, compromised the provision of valuable ecosystem services such as pest control, pollination, nutrient cycling and climate regulation (Classen *et al.*, 2014).

Birds are one of the top predators of arthropod communities, consuming a wide array of arthropods from terrestrial, aquatic to aerial environments (Whelan *et al.*, 2008). They are effective in controlling agricultural pests, especially coleopteran (Mansor *et al.*, 2018) and lepidopteran (Desmier de Chenon and Susanto, 2006) populations which are some of the main pests found thriving in oil palm plantations. Removal of this predator often leads to an increase in herbivory rate, plant damage, and subsequently a reduction in crop yields (Koh, 2008; Böhm *et al.*, 2011). The use of natural predators in the suppression of arthropod populations could help reduce reliance on chemical control and delay the evolution of pesticide resistance in arthropod pests.

¹Institute of Biodiversity and Environmental Conservation

²Malaysian Palm Oil Board, No. 6, Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor

*Corresponding author: soonvivan@gmail.com