



Short Communication

First DNA metabarcoding diet assessment on the critically endangered Tricolour Langur, *Presbytis chrysomelas cruciger*

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Abstract

Presbytis chrysomelas cruciger or also known as the Tricolour langur—is rare, endemic to Sarawak and Kalimantan in Borneo and classified as a critically endangered subspecies. The current *P. c. cruciger* population size is uncertain because the numbers are continuously decreasing. At present, there is no comprehensive scientific report on *P. c. cruciger* in Sarawak, although this subspecies is known to inhabit Maludam area. Recent first sighting of *P. c. cruciger* in Jemoreng Sarawak presents a research opportunity to study its feeding from a molecular ecology perspective. Herein, we report the first findings on the dietary intake of *P. c. cruciger* using a high-throughput DNA metabarcoding approach. We emphasise the diet intake of *P. c. cruciger* from Jemoreng Protected Forest in Sarawak using DNA metabarcoding of the trnL region. Preliminary findings revealed 11 amplicon sequence variants (ASV) classified into one phylum, four classes, four orders, four families, three genera and three plant species. *Fibraurea tinctoria* (akar kuning; Family Menispermaceae), *Poikilospermum suaveolens* (akar jangkang; Family Urticaceae) and *Litchi chinensis* (lychee; Family Sapindaceae) were the three main plant species that were

consumed by *P. c. cruciger*. Understanding the dietary intake of *P. c. cruciger* is of paramount importance for their conservation and management of the habitat areas where their population resides.

Keywords

Malaysian Borneo, primate, diet, conservation, metabarcoding, critically endangered subspecies

Introduction

The genus *Presbytis* is a diverse primate from the Old World Monkey (Meyer et al. 2011), with the largest number of species amongst the subfamily Colobinae (Family: Cercopithecidae) (Roos et al. 2014). There are five species of *Presbytis* recorded in Sarawak and *Presbytis chrysomelas* is a unique species endemic to Borneo (Md-Zain et al. 2022, Noor-Faezah et al. 2023, Nur-Aizatul et al. 2024). There are two subspecies of *P. chrysomelas* — *P. c. cruciger* and *P. c. chrysomelas* (Roos et al. 2014); both of these subspecies have a distinct colour morphology (Groves 2001, Ampeng et al. 2024); however, historical records of mixed-troops of both subspecies suggest that their variation should be considered as colour variants rather than different subspecies (Phillipps and Phillipps 2018). Unlike *P. c. chrysomelas* with two colour variations (black and white) (Ampeng 2003), *P. c. cruciger* has three colour variations: head, shoulders, sides of the abdomen, thigh and calves have red–orange hair; hair on its cheeks, under its chest and abdomen are white; and arms, hands, feet and lines on the back are black (Rifqi et al. 2019, Ampeng et al. 2024).

P. c. cruciger is endemic to Sarawak and Kalimantan, along with its sister taxon, *P. c. chrysomelas* and has been sighted in Maludam (Sarawak) and Danau Sentarum (Kalimantan) (Phillipps and Phillipps 2018, Rifqi et al. 2019, Santoso et al. 2023a, Santoso et al. 2023b). Although its distribution is confined to Maludam, no comprehensive scientific information is available. Recently, Ampeng et al. (2024) made an important discovery about the first sighting of *P. c. cruciger* in Jemoreng Protected Forest, Sarawak. This is the first scientific discovery to describe the presence of *P. c. cruciger* in Sarawak in detail. According to Nijman et al. (2020), it is a rare primate, accounting for < 5% of the primate historical distribution. Based on the International Union for Conservation of Nature's Red list category, *P. c. cruciger* has been classified as a critically endangered subspecies (IUCN 2024). Its population size has decreased by ~ 80% over the past 30 years (Nijman et al. 2020). The increasing land conversion into oil palm plantations has become a major threat to the survival of *P. c. cruciger* (Nijman et al. 2020). *P. c. cruciger* is one of the most neglected transboundary primates in Sarawak and Kalimantan (Md-Zain 2019, Ampeng et al. 2024).

Considering the possible extinction of this subspecies, it is essential to take immediate action and adopt relevant measures to protect its survival. Furthermore, there is a lack of