

## Macroinvertebrates of the Tributaries of Upper Baleh River, Sarawak

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### ABSTRACT

Studies on Baleh River with respect to aquatic fauna currently remains limited. Hence, this paper presents the species richness and composition of macroinvertebrates in 14 tributaries of Upper Baleh River in Kapit Division, Sarawak. A total of 1,154 individuals from 10 orders, 43 families and 66 genera of macroinvertebrates were collected. The highest number of macroinvertebrates was taken from Naah River (201 individuals) and the least from Ukit River (15 individuals). The order Ephemeroptera was the most abundant, with 45% of the total individuals caught, followed by Trichoptera (23%), Hemiptera (10%), and Coleoptera (9%). Three biological indices were used to measure the diversity of macroinvertebrates of which the values of the indices were low: Shannon diversity index (1.54–2.54), Shannon evenness index (0.33–0.89) and Margalef richness index (1.67–4.90). The composition of functional feeding groups varies between first and fourth order streams, which is possibly an indication of ecological effects of siltation due to logging activities in the area.

Keywords: diversity, macroinvertebrate, Upper Baleh River

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### INTRODUCTION

Macroinvertebrates are invertebrates characterised as being over 500 micron, and commonly inhabit sediments of freshwater ecosystem for the entire or part of their respective life cycle (Rosenberg & Resh, 1993). They include crustaceans, molluscs, annelids and aquatic insects. Macroinvertebrates constitute a majority of river biota and occupy a variety of microhabitats, such as rocks, logs, sediments, debris and aquatic plants (Aweng *et al.*, 2012). They perform important ecological functions, including material decomposition, nutrient cycling and the regulation of food webs through their role as consumers at intermediate trophic level (Wallace & Webster, 1996; Covich *et al.*, 1999). Most macroinvertebrates have long life spans and low mobility, in order to avoid disturbance and water pollution. Consequently, macroinvertebrates serve as good bioindicators of river health, by which, their presence or abundance may indicate

the changes of aquatic environment. In river biomonitoring, the macroinvertebrates are grouped into functional feeding groups based on the ways of the fauna utilise and process their foods (Merritt *et al.*, 2008). This approach had been widely used in biomonitoring of tropical river systems including Malaysia (Al-Shami *et al.*, 2013; Che Salmah *et al.*, 2013).

Rajang River is the longest river basin in Malaysia, with the total combined length of 565 km, and encompasses approximately 51,000 km<sup>2</sup> of catchment. One of the major tributaries of Rajang is Baleh River, originates from the Nieuwenhuis range in the Kalimantan-Sarawak border in the east. Baleh River plays important roles in the hydrological and biological functions in upper region of Rajang. The river is also important to the local communities living along the river for water transportation, and sources of water and food. The main threats to river systems in Asia are commonly from habitat degradation and pollution as resulting from logging, plantation, hydroelectric dam and heavy