

A preliminary study of the macroinvertebrate fauna of freshwater habitats in Maludam National Park, Sarawak

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SUMMARY

Macroinvertebrates are diverse and widespread, and they play important ecological roles in aquatic ecosystems; yet little is known about the macroinvertebrate fauna of the peat swamp forests of Borneo. In light of this knowledge gap, we present a preliminary species list of macroinvertebrates in the peat swamp forest of Maludam National Park, Sarawak, Malaysia. Macroinvertebrates were sampled between April 2011 and November 2014 from three stations on the Maludam River, which flows through the National Park. In total, 3,257 individual macroinvertebrates were examined, representing 37 morpho-species from 20 families and eight orders. Of the total number of individuals captured, 51 % were aquatic beetles (Order Coleoptera), 26 % were aquatic bugs (Hemiptera), 10 % were dragonflies (Odonata), 5 % were flies (Diptera) and 4 % were mayflies (Ephemeroptera). Other orders contributed less than 5 % of the total. The dominant species was the whirligig beetle *Dineutus unidentatus* (36 % of all individuals caught) which may, thus, be a stenotopic habitat specialist. Despite the harsh environmental conditions of Maludam, where aquatic habitats are acidic and low in dissolved oxygen, the area was found to be inhabited by a diverse macroinvertebrate fauna which is likely to contribute to maintaining the important ecosystem services that the peat swamp forest provides.

KEY WORDS: aquatic ecosystem, biodiversity, macroinvertebrates, tropical peat swamp forest

INTRODUCTION

Freshwater peat swamp forest is a waterlogged habitat which is characterised by low nutrient availability and highly acidic water with low dissolved oxygen content (UNDP 2006). It is regarded as a unique ecosystem that is home to many rare and endemic species (Posa *et al.* 2011). Whereas the flora and vertebrate fauna of freshwater peatlands in Borneo have been substantially studied, little is known about the diversity and distribution of macroinvertebrates in this unique environment (Yule 2010, Posa *et al.* 2011).

Macroinvertebrates are important components of freshwater peat swamp ecosystems, with roles in predator-prey relationships and as processors of organic materials (Yule & Yong 2004). They are often used to assess stream quality because of their sensitivity to environmental changes (Karr & Chu 1999, Che Salmah *et al.* 2007). Tropical freshwater habitats host numerous endemic macroinvertebrates, of which many taxa remained undescribed (Mattson *et al.* 1999, Jacobsen *et al.* 2008). The macroinvertebrates of Malaysia are still poorly known and few new species have been described in the last few decades, especially from peat swamp

habitats (Morse *et al.* 2007). According to Yule (2010), many aquatic invertebrate species that are restricted to freshwater peat swamps are at risk of extinction because these habitats are vanishing rapidly due to drainage, logging and conversion to agriculture.

In light of this importance and vulnerability, plus the limited published information on freshwater peat swamp macroinvertebrates within the Southeast Asia region, we provide here preliminary documentation on the species composition of the macroinvertebrate community found in the protected freshwater peat swamp forest in Maludam National Park (Sarawak, Malaysia). Our data build on previous Odonata surveys conducted in the area by Dow *et al.* (2015). Thus, we aim to enhance knowledge about the faunal diversity of this habitat and help stimulate further in-depth studies of peat swamp macroinvertebrates in the region.

METHODS

Study area

Maludam National Park is located in the Betong Division of Sarawak. It covers an area of 43,147 ha