

A review of the freshwater crabs (Decapoda: Brachyura) of Borneo

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Abstract : An update on the freshwater crab fauna of Borneo (Potamidae, Gecarcinucidae and Sesarmidae) is presented here based on literature and current data. A total of 106 species in 17 genera and three families of freshwater crabs in Borneo are known. Most species are endemic to the island, with some species restricted to unique habitats such as limestone caves and mountainous terrains. This current list does not reflect Borneo's true crab diversity because many remote areas have not been explored. Compared to Sarawak, the crab fauna in other regions of Borneo is relatively less studied. While there has been some progress in the taxonomic studies of Bornean freshwater crabs, there is a lack of studies on their ecology and biology. This data is crucial for prioritizing habitat protection and conservation efforts of the Bornean freshwater crabs.

INTRODUCTION

Primary freshwater crabs comprised of all brachyuran crustaceans that live entirely in freshwater habitats and have no phylogenetic lineage with their marine sisters (Yeo *et al.*, 2008; Klaus *et al.*, 2009). They also include semiterrestrial crab species, which live on land but require freshwater source for survival (Ng, 1988; Yeo *et al.*, 2008). The development of primary freshwater crabs have completely abbreviated, with young crabs hatching from large eggs, and can complete their life cycle without migrating to the sea. The five families of primary freshwater crabs that have been recognized were Potamidae, Gecarcinucidae, Potamonautidae, Pseudothelphusidae, and Trichodactylidae, with the former two families occurred in Borneo. Some crabs in the genera Sesarmidae and Hymenosomatidae are also freshwater inhabitants, but most members do not have abbreviated developments (Ng, 1988; Cumberlidge, 1999; Ng *et al.*, 2004) and have no phylogenetic relationship with primary freshwater crabs. These crabs belong to secondary freshwater crabs that need to return to the marine environment to complete their life cycle (Yeo *et al.*, 2008). It is worthy to note that several of these genera have large eggs and practice semi- or completely abbreviated development and do not need to return to the sea at all. This paper includes all freshwater crab groups which do not need to return to the sea for reproduction.

Among decapod crustaceans, freshwater crabs are highly diverse. There are more than 1,300 species of brachyurans from five families, which equals to one-fifth of the total number of described species worldwide (Cumberlidge *et al.*, 2009; Ng *et al.*, 2008). Freshwater crabs occur across all continents and are extremely diverse in the tropical region, but absent in the Pacific islands and Antarctica region (Yeo *et al.*, 2008). The level of endemism among freshwater crabs is high due to their poor dispersal ability, low fecundity, and the fragmented nature of freshwater habitats (Ng and Rodriguez, 1995; Yeo *et al.*, 2008; Cumberlidge *et al.*, 2009). Due to their low tolerance to saltwater of a natural barrier, the value of freshwater crabs as zoogeographical indicators has now been widely acknowledged by carcinologists (Ng and Rodriguez, 1995; Cumberlidge *et al.*, 2009).