

A new genus and two new, rare freshwater mussel (Bivalvia: Unionidae) species endemic to Borneo are threatened by ongoing habitat destruction

ABSTRACT

Most of the Bornean endemic freshwater mussel (Unionida) species known to date have not been recorded by science for the past 50 years or more, owing to a lack of research effort and presumed population losses. This study assessed current patterns and recent changes in the diversity and distribution of freshwater mussels in north-eastern Borneo. Physical surveys and interviews were conducted at 24 sites, and anecdotal evidence for current or historical presence of mussels was collected for a further 13 sites. Native species, i.e. *Schepmania* sp. and *Khairuloconcha sahanae* gen. & sp. nov., were only found in one small stream of the Kinabatangan River basin within the Gomantong Forest Reserve, whereas the non-native *Sinanodonta* cf. *woodiana* was common across the study area. Molecular phylogenetics (five genes) of the native taxa, including comparative material from West Kalimantan and Sarawak, revealed: (i) the presence of a new genus with two new, rare species: *Khairuloconcha lunbawangorum* sp. nov. in the Limbang River basin and *K. sahanae* in the Kinabatangan River basin; (ii) that *Khairuloconcha* and *Ctenodesma* form the Bornean endemic tribe *Ctenodesmini* trib. nov.; and (iii) that *Schepmania* represents another Bornean endemic tribe *Schepmaniini* trib. nov. Both *Khairuloconcha* gen. nov. species are known from a single stream each and are apparently restricted to forest stream habitats where they occur at very low densities. *Schepmania* appears to have a severely contracted range in the Kinabatangan and adjacent basins. We urgently call for full protection of the currently known sites of *K. lunbawangorum* and *K. sahanae*, and development of an action plan to save the Bornean freshwater mussel fauna.