

INITIAL SURVEY OF THE FRESHWATER BIVALVE FAUNA OF PENINSULAR MALAYSIA

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The freshwater bivalve fauna of peninsular Malaysia remains poorly known. This is particularly unfortunate, as pollution and changes in land-use are heavily impacting this imperilled faunal group. One major impact on the aquatic fauna is the expansion of the acreage of oil palm plantations and removal of tropical forest. Creeks and rivers become steep sided, flat bottomed canals to move the water off of oil palm plantations. Riparian buffers along these streams have been removed, altering the water temperature and organic input into the streams. This will have consequences for important ecosystem functions and services.

We undertook this survey, partially funded by the Mohamed bin Zayed Species Conservation Fund, during two weeks in February, 2015, to initiate the first of a series of planned surveys across Malaysia to determine the diversity and conservation status of the unionid bivalves. Two local students, Lye Hwei Mynn and Farah Najwa Mahadzir, of University of Nottingham, Malaysia Campus, Kuala Lumpur, participated in the trip as translators and to assist with collection of water quality data. We stayed at a variety of hotels and at the Kenyir Research Station, hosted by Dr. Sam Walton, University of Malaysia Terengganu. This trip covered ca. 3,500 km, visiting 61 sites, to assess the freshwater bivalve fauna and to collect environmental data. We collected in 8 of the 11 provinces of peninsular Malaysia. In total, 19 of 61 sites (31%) produced 8 species of Unionidae. Tissue snips were taken from all live collected specimens. Tissue snips were placed into vials with 100% ethyl alcohol for use in future research projects.

All live unionid specimens were photographed and a small sample retained and preserved in 100% ethyl alcohol as voucher specimens. All specimens retained as vouchers and tissue samples were initially deposited with the Museum of Zoology, University of Malaysia, Kuala Lumpur, Malaysia. A subset of preserved specimens deposited in Malaysia were donated to the Mollusk Collection, North Carolina Museum of Natural Sciences. Specimens such as those of *Rectidens*, *Contradens* and *Hyriopsis* are being used in a current higher level study of the relationships of the subfamilies and tribes of the Unionidae of Asia.

Other freshwater mollusks included a variety of shell forms of *Corbicula*, which were collected for planned genetic analyses and introduced Applesnails of the genus *Pomacea*. We also collected the native thiarid gastropods, *Brotia* sp. and *Tarebia granifera*, and some viviparid gastropods.

In Malaysia, we did not find freshwater mollusks sold in markets, so we talked to local people about where they had seen freshwater mussels and used the limited known historical collection data to help direct our initial collecting efforts. This is contrary to field work experience in Vietnam by one of the authors (AB), where collecting was aided by talking to women selling freshwater bivalves in the markets as food.

Data collected during this trip will form the basis for our initial assessment of the distribution of each species and a preliminary conservation assessment of these Malaysian species to update the IUCN conservation status.

In the near future, we plan to conduct freshwater bivalve surveys in the Malayan provinces of Sabah and Sarawak on the island of Borneo, to document the endemic unionid species.

Figure 1. Manuel Lopes-Lima collecting in the Pahang River in Pahang Province, holding our first specimen of *Hyriopsis bialatus*.



Figure 2. Ronaldo Sousa in a side channel of the Perak River, Perak Province, Malaysia, searching for specimens of *Contradens* and *Rectidens*.



Figure 3. An example of the impact of oil palm plantations on a small stream in central Malaysia.

