

Malaysia's unique freshwater mussels in danger

22 September 2016, by Josephine Dionisappu



Dr Ziertz examining the types of mussels she collected.
Credit: UNMC

Researchers in Malaysia revealed that Peninsular Malaysia hosts at least three rare mussel species, one of which (*Hyriopsis bialata*) is not found anywhere else on the planet. Another species (*Ensisidens ingallsianus*) may have already gone extinct.

In a ground-breaking study path-breaking for the Southeast Asian region, a research group led by The University of Nottingham Malaysia Campus (UNMC) revealed that Peninsular Malaysia hosts at least three rare mussel species, one of which (*Hyriopsis bialata*) is not found anywhere else on the planet. Another species (*Ensisidens ingallsianus*) may have already gone extinct. Most [native species](#) are severely threatened by ongoing nutrient pollution and acidification of freshwater habitats caused by atmospheric pollution, deforestation, oil-palm plantations and a lack of functioning wastewater treatment particularly in rural areas. As [mussels](#) are efficient filter-feeders and provide habitat for smaller organisms such as insect larvae, their loss can lead to algal blooms and further loss of aquatic biodiversity.

An international group of scientists; Dr John-James Wilson and Pei-Yin Ng from University of Malaya; Samuel Walton from Universiti Malaysia Terengganu; Dr Khairul Adha A. Rahim from Universiti Malaysia Sarawak; Dr Elsa Froufe and Manuel Lopes-Lima, Interdisciplinary Centre of

Marine and Environmental Research, Portugal; Professor Ronaldo Sousa from University of Minho, Portugal; Dr Arthur E. Bogan from North Carolina State Museum of Natural Sciences (USA); Dr Suzanne McGowan from The University of Nottingham UK and Dr Alexandra Zieritz from The University of Nottingham Malaysia Campus, who is leading this research, surveyed 155 localities across all states of Peninsular Malaysia for mussels and recorded their environmental requirements. The team spent a total of 30 days in the field, scouring the sandy and muddy beds of Malaysia's rivers and lakes for mussels simply using their hands. Environmental conditions at each location, such as water pH and oxygen concentration, were also recorded. The findings of this study, worth USD 9,262 (RM 38269.19) and funded by The Mohamed bin Zayed Species Conservation Fund, are published in *Science of the Total Environment*, a leading international scientific journal.

The group found nine Malaysian and one introduced Chinese species in the peninsula. Whilst the introduced species is rapidly spreading and posing an additional threat to native mussels, many of the native species are declining. Authors believe that another species previously recorded from the region may have already become extinct in the country.



Dr Zieritz collecting mussels in Sungai Pahang. Credit:

University of Nottingham

Sungai Pahang and Sungai Perak, two of the longest rivers in Peninsular Malaysia are of particular importance to the conservation of very rare mussel species. One of these, holding the scientific name *Hyriopsis bialata* but simply called "layar" (sail) by the locals in the surrounding villages, cannot be found anywhere else on the planet. To protect these globally unique populations of mussels, the authors recommend establishing riparian buffers and improving waste water treatment for rivers running through agricultural and residential land.

"I hope that the study will serve as an example for future projects of this kind in Southeast Asia and ultimately lead to the legal protection of these important organisms. Mussels and other invertebrates are often overlooked in this respect, because they are less charismatic than beautiful large mammals such as tigers. However, these small organisms represent an equally important part of our ecosystems, especially in freshwater habitats." said Dr Zieritz.

"Our ultimate goal is to get concrete Action Plans for the most endangered species in Malaysia in place, which could involve habitat restoration and breeding programs. Whilst this might come too late for the presumably extinct *Ensidens ingallsianus*, taking action will be vital to preserve Malaysia's unique and rare species such as *Hyriopsis bialata* for future generations," Dr Zieritz said.

"Freshwater mussels and many other freshwater animal groups show very high rates of endemism in Southeast Asia. This means that many of these species have a very restricted distribution, such as *Hyriopsis bialata*, which can be found exclusively in the lower Pahang river. That means if we lose these mussels in the lower Pahang, we have lost the entire species for good on the whole planet," Dr Zieritz explained.

In collaboration with the International Union for Conservation of Nature, Dr Zieritz and her team are currently revising the conservation status of the

Malaysian species and developing a National Red-list of the [freshwater mussels](#) of Malaysia, including Sarawak and Sabah, which will be publicly available at the National Red List website. Readers interested in becoming involved in the project are encouraged to get in touch with Dr. Zieritz through her project webpage.

Provided by University of Nottingham

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