

INVESTIGATING THE BIOLOGICAL IMPACT OF PHARMACEUTICAL POLLUTANTS EXPOSURE TOWARDS MALAYSIAN POLYCHAETES, *MARPHYSA MORIBIDII* AND *DIOPATRA CLAPAREDII* USING NUCLEAR MAGNETIC RESONANCE-BASED METABOLOMICS

There were numerous studies conducted globally and pointed out potential role of polychaete or locally known as “umpun-umpun” in the field of nature conservation, economy and even medical use. The polychaetes construct, ingest particles and irrigating activity is vital for marine ecosystems. The presence of polychaetes and different species in an integrated multi trophic aquaculture can improve efficacy, reduce waste and provide ecosystem services potentially lead to significant economic, social, and ecological benefits. In fact, the polychaetes are commonly used as fish baits. In Malaysia, the selling price of polychaetes can be up to RM1 each and probably higher depending on the size.

Besides, polychaete extract is known to possess medicinal value. *Arenicola marina* blood for example has been extensively studied to be a good substitute for human’s blood. The Malaysian exclusive polychaete species, *Marphysa moribidii* extracts exert wound healing properties. Moreover, the *M. moribidii* and *Diopatra claparedii* serve as green technology in producing silver nanoparticles. The silver nanoparticle exhibits significant antibacterial properties.



Diopatra claparedii



Marphysa moribidii



Polychaetes habitat

Photos by Mr. Mohd Amir Abd. Aziz

Polychaetes are acknowledged as ecosystem engineers, and their various activities significantly impact sediment biogeochemistry. Several species of polychaetes around the globe have been utilized as an aquatic biomonitoring system to assess the environmental quality of sediment affected by pharmaceutical contamination. In Malaysia, several pharmaceutical active compounds were detected in the aquatic system including caffeine, metformin, paracetamol, diclofenac, amoxicillin and others. The concentration however, varies according to the place of sampling. Pharmaceutical pollution in aquatic systems has been observed especially in areas with high population, high industrial and high agricultural activities. Unfortunately, the release of these pharmaceutical waste is still loosely regulated. Despite the concentration of these compounds being relatively low, its impact towards the ecosystem especially on the marine organism should not be underestimated. Moreover, the magnitude of effect due to the interactions between drugs or substances remain poorly understood.

This project is a collaborative work between researchers in the Universiti Teknologi MARA (UiTM) and Universiti Malaysia Terengganu (UMT). This work is an attempt to see whether these two species (*M. moribidii* and *D. claparedii*) can be excellent proxies for detecting the impact of pharmaceutical pollutants. In other words, whether the pollutants affect ecosystem functions and services of these two annelids.



Sampling activities at Morib mudflat area, collaborative works UiTM-UMT

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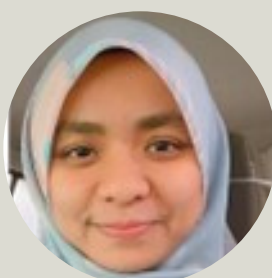


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