Indicative benthic macroinvertebrate organisms in Taytay River-Maningning Creek Sub-basin as impacted by long-term human settlements

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Abstract

Benthic macroinvertebrates (BMIs) live on the bottom of aquatic environments and are easily recognizable to the naked eye. They are progressively known to be sensitive to varying pollution levels and anthropogenic change, making them efficient bioindicators. In many studies, their specific species presence, diversity, and community structure were utilized to provide information regarding water quality status related to the persistent anthropogenic activities and human settlements of the surrounding areas. Other developed countries have established protocols and metrics for BMIs as part of their environmental monitoring, proving their reliability for providing overall freshwater ecosystem health. However, rapid land-use change can encroach upon riverbeds and riparian zones in densely populated urban communities, compromising surface waters. As a result, changes in the community profile of BMIs may occur but are often not studied due to a lack of monitoring data and records. The Taytay River-Maningning Creek (TRMC) sub-basin, a tributary of Laguna de Bay in the Rizal Province of the Philippines, is an example of such a case. Therefore, this study aims to conduct a BMI assessment in the TRMC sub-basin to evaluate the longitudinal variation of BMIs' diversity indices, taxa richness, dominant taxa, and functional traits as persistent anthropogenic activities and long-term human settlements are impacting them. The results of this study can provide valuable insights into the overall health of the TRMC sub-basin ecosystem, which may aid in the development of environmental rehabilitation programs not only for the local province of Rizal but also for the other tributaries of Laguna de Bay.