

Gammarus: Asellus Ratio as an Index of Organic Pollution: A Case Study in Markeaton, Kedleston Hall, and Allestree Park Lakes Derby, UK

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Abstract : Macro-invertebrates have been used to monitor organic pollution in rivers and streams. Several biotic indices based on macro-invertebrates have been developed over the years including the Biological Monitoring Working Party (BMWP). A new biotic index, the Gammarus:Asellus ratio has been recently proposed as an index of organic pollution. This study tested the validity of the Gammarus:Asellus ratio as an index of organic pollution, by examining the relationship between the Gammarus:Asellus ratio and physical-chemical parameters, and other biotic indices such as BMWP and, Average Score Per Taxon (ASPT) from lakes and streams at Markeaton Park, Allestree Park, and Kedleston Hall, Derbyshire. Macro invertebrates were sampled using the standard five-minute kick sampling techniques physical and chemical environmental variables were obtained based on standard sampling techniques. Eighteen sites were sampled, six sites from Markeaton Park (three sites across the stream and three sites across the lake). Six sites each were also sampled from Allestree Park and Kedleston Hall lakes. The Gammarus:Asellus ratio showed an opposite significant positive correlations with parameters indicative of organic pollution such as the level of nitrates, phosphates, and calcium and also revealed a negatively significant correlations with other biotic indices (BMWP/ASPT). The BMWP score correlated positively significantly with some water quality parameters such as dissolved oxygen and flow rate, but revealed no correlations with other chemical environmental variables. The BMWP score was significantly higher in the stream than the lake in Markeaton Park, also The ASPT scores appear to be significantly higher in the upper Lakes than the middle and lower lakes. This study has further strengthened the use of BMWP/ASPT score as an index of organic pollution. But, additional application is required to validate the use of Gammarus:Asellus as a rapid bio monitoring tool.

Keywords : Asellus, biotic index, Gammarus, macro invertebrates, organic pollution

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