CHAPTER 5:
WATER QUALITY ANALYSIS:
MACROINVERTEBRATES IN WATER

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INTRODUCTION

The benthic is the bottom part of the water body. Macroinvertebrates are invertebrates that are small yet can be seen by the naked eye. Therefore, benthic macroinvertebrates refer to all small invertebrates that live most of their life at the bottom part of the stream, rivers, lakes, and ponds. Several researchers used these organisms as a biological indicator for assessing water quality for freshwater.

However, their compositions and distribution in the benthic area depend on food availability and habitat suitability. Each benthic macroinvertebrate has a different morphology that adapts to certain habitats, which are the substrates at the bottom part of water bodies. Meanwhile, their existence in those habitats plays a role in maintaining the ecosystem which involves food chain mechanisms and also plays a role in the nutrient cycle process as well as filtering several compounds in water. Therefore, ecologists grouped some benthic macroinvertebrates by their feeding behaviour, called a Functional Feeding Group (FFG). There are several categories in this group, such as shredders, scrapers, collectors, predators, grazers, and filterers. Each group plays its role in maintaining water-bodies ecosystems. Any changes in the water bodies will alter their distribution and composition depending on the tolerance level of pollution, survival, and adaptation to their environmental changes. Therefore, benthic macroinvertebrates can assess the ecosystem's health and water quality in the water bodies by using biotic indexes.

METHODOLOGY

Sampling Equipment

Benthic macroinvertebrates can be sampled using a net sampler, grab sampler or artificial substrates sampler (Table 5.1). However, a big sieve and basin are enough to catch the benthic macroinvertebrates as they can be seen by the naked eye for a simple monitoring process.

Table 5.1: Description of sampler equipment

Kick sampler/ Surber Net Sampler/ D-Net sampler	
• The sampler is used by placing it upright to the water flow and disturbing their substrates to dislodge the organisms in the area. Then the sample is collected from the sampler net. • The kick sampler and Surber net can be handled by one person whereas, a D-net sampler needs at least two persons as it's bigger and can cover a larger sample's area. • This sampler can be used in shallow water body with less than 1 m depth.	
Grab Sampler • The sampler is used to grab the benthos at a deep-water body (more than 1 m depth) along with the substrates.	