

Monitoring transitional waters: can complexity be summarised by simple user-friendly descriptors?

Basset A., Sabetta L.

Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali – Università di Lecce

The search for simple and effective descriptors of biological ecosystem components is a major challenge of monitoring aquatic ecosystem health. It is particularly true for transitional water ecosystems, such as river mouth ecosystems, lagoons and coastal brackish or salt lakes. Since transitional waters are heterogeneous, variable, instable and dynamic productive ecosystems, it seems that the interactions which determine their structures and dynamics have to be taken into consideration in the view to keep their complexity, producing reliable descriptors of their ecological status. Here, we discuss the relevance of body size related descriptors in monitoring the health of transitional aquatic ecosystems. The rationale is that individual body size relates body size-abundance distributions to disturbance pressures through individual energetic, population dynamics, inter-specific interactions and species coexistence responses. Body size is generally easy to measure and to undergo inter-calibration procedures, it is comparable across taxa, guilds and sites, and, as a community feature, it is expected to vary on disturbance gradients, according to energetic and ecological constraints. The mechanistic relevance of individual body size as a community feature, through coexistence relationships, still requires field and laboratory tests; standard methods to analyse body size-abundance distributions are not yet fully developed. Field experiments on coastal lagoons and freshwater and marine ecosystems of Southern Italy, which were designed to test the relevance of body size related constraints on the organization of detritus-based benthic guilds, are reviewed. Study cases emphasized a number of interesting features of body size and related descriptors, which support their relevance as descriptors of ecosystem health: (a) body size abundance distributions are consistently less variable than taxonomic composition; (b) their width is mainly due to the inter-specific component; (c) the descriptors of body size abundance distributions seem to respond on environmental gradients and generally co-vary with species density, richness and diversity, on which most of the monitoring programmes actually rely.