

RECENT ADVANCES IN MOLECULAR AND MORPHOLOGICAL RESEARCH IN MEIOBENTHIC TAXONOMY

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Taxonomy is the science of discovering, naming, describing and classifying organisms. It enables us to distinguish between species of closely related organisms, and provides information about biodiversity. When the numerous species are classified into a hierarchical system of taxonomic units, we are enabled to operate with large amounts of species, and since modern classification reflects the putative phylogeny of the grouped entities, we also obtain information about their shared evolutionary background. Hence, taxonomy plays an important role at all levels in the natural system. Within the last 15 years, advances in molecular and morphological research have had a tremendous impact on our understanding of animal evolution and phylogeny, and these advances are reflected in the taxonomy as well. In the beginning of the 1990s, the majority of the meiofaunal organisms was still believed to have a shared evolutionary origin, and they were accommodated in a clade named Aschelminthes or Nematelminthes. Today, improved phylogenetic inference of molecular and morphological data has demonstrated that these organisms evolved along independent lineages, and form at least two clades. These recent advances have also had great impact on the taxonomy of specific, previously well-established phyla, and affected that some have been split into several, separate clades, whereas others have been merged. The last decade also provided the first phylogenetic studies on the interrelationships within phyla of exclusively meiofaunal organisms, and these studies have resulted in emended taxonomies for the investigated groups. At the species level, especially advances in molecular research have enabled us to recover complexes of cryptic speciation among populations of otherwise identical animals. However, also new or improved morphological methods, such as CLSM and SEM have helped us to reveal previously unnoticed variation that subsequently has prompted description of new species.

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