

Morphological and molecular evidence reveal underestimated ctenophore species richness
– peeking into the group of unidentified species

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Gelatinous zooplankton, including ctenophores, has attracted attention during the last decade, mainly as a result of the enigma around their potentially increased abundances around the world. Despite the increased attention, they remain neglected in most zooplankton studies and monitoring programs, and are considered one of the most difficult groups of pelagic animals to study. Yet, they are known to play important roles in the world's ocean ecosystems and share physiological attributes that allow them to better exploit the changing environmental conditions than many other zooplankton groups. Working with these gelatinous organisms is challenging, since they are fragile and difficult to sample in good condition. Also, many fixatives used for preserving zooplankton cause distortion and shrinkage of their gelatinous bodies, rendering the animals difficult or impossible to identify morphologically. Consequently, their diversity and ecological role are grossly oversimplified and misunderstood, leading to biased views of ecosystem functioning. Here, we demonstrate with case studies from Arctic and other northern areas, how prompt sorting and photographing of zooplankton samples immediately after sampling followed by combination of morphological and molecular identification methods reveal the underestimation of ctenophore species richness; for example co-occurrence of *Mertensia ovum*, *Euplokamis* sp. and undescribed mertensiid species in Svalbard region. This increased taxonomic knowledge is a valuable first step towards establishing a baseline for future monitoring and ecological studies. Hence, clear recommendations and instructions for inclusion of gelatinous zooplankton taxa in monitoring are urgently needed.

Keywords: Ctenophora, Diversity, Identification, Monitoring, Zooplankton

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