The global importance of smaller mesozooplankton – a case study of *Oithona* spp. from the northern South China Sea

Hans-Uwe Dahms and Jiang-Shiou Hwang

Institute of Marine Biology, National Taiwan Ocean University, 2 Pei-Ning Road, Keelung 202, Taiwan

Abstract

The allocation of "importance" to organisms might has several dimensions: so for the ecosystem level, for applied human needs, or for the progress of science in general. Copepod crustaceans are among the most numerous and widely distributed aquatic invertebrates on the globe. Feeding on small particles and being major food for micronekton (e.g. fish larvae) in nature and in mariculture, they provide ecological key-stone functions. In applied science they also indicate as biomarkers environmental deterioration, effects of pollution and climate change, or the influence of currents. Many are used as models for various disciplines of life-science, so in biochemistry and genetics. Saying this, the importance of smaller copepod representatives has largely been underestimated. Here, we provide examples of the smaller circumglobally occurring cyclopoid copepod *Oithona* spp. that has been suggested to be the most abundant metazoan on earth, being eurythermal, euryhaline, and omnivorous - all this preadapting this taxon for a wide range of habitats. Our studies confirm the significance of *Oithona* spp. with respect to biomass and trophodynamics and coupling microbes to higher trophic levels. *Oithona* spp standing stocks are considered relatively more stable in space and time compared to that of larger planktonic copepods. Seasonal and latitudinal variations in *Oithona* spp. biomass and production raise questions about the factors determining the variation observed. Explanations provided here give examples and templates for general ecology, in terms of global scale variability in biomass, stage structure and reproduction at both coastal and oceanic localities. We provide global estimates of the potential production of *O. similis*, using observed biomass and growth rates by a method which assesses gross production and considers population losses to predation, natural mortality or advection. High taxonic diversity of *Oithona* spp. in the northern

South China Sea is supposed to be caused by both, the year-round Kuroshio Current intrusion and the SW monsoon prevailing in the South China Sea during summer that transport plankton to the area. Changes in community composition may indicate climate changes (atmosphere) and alterations of current regimes (hydrosphere). This way our results help to integrate knowledge from several disciplines of earth sciences that are also useful for a general public and for educational purposes.

Key words: Copepoda, marine plankton, populations, communities, production, food webs, climate change, South China Sea