

ICES/PICES 6ZPS 2016/ Zooplankton diversity in the oceans by integrative morphological and molecular techniques

Title: Cosmopolitan, bipolar or endemic? – Phylogeography of polar copepod species-groups

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In marine ecosystems pelagic copepods play an important role in food webs, intermediating between primary producers or the microbial loop, and higher trophic levels. In the past, many copepod species have been considered to be widespread, bipolar or cosmopolitan due to the lack of apparent geographic barriers in the oceans. Increasing evidence of cryptic and pseudocryptic speciation in pelagic copepods has revealed that these large-scale distribution patterns need to be revisited. Also, potential barriers to gene flow have been identified (landmasses or continents, oceanic gyres, frontal systems, temperature or salinity ranges). To study the importance of barriers to the biogeography of polar copepods species we chose abundant polar copepods species-groups with a circumglobal distribution, but with a different vertical distribution (e.g. *Oithona similis* s.l. (epipelagic), *Microcalanus* spp. (mesopelagic) *Spinocalanus abyssalis/longicornis* (meso-bathypelagic)). Specimens were analysed from different climate zones (e.g. Southern Ocean, Arctic Ocean, North Sea, Mediterranean Sea, North Pacific Ocean, tropical eastern Atlantic) and various depths. Phylogeographic analyses were carried out based on various nuclear and mitochondrial markers (e.g. 18S, 28S, ITS1, COI). By performing a non-destructive DNA extraction that preserves the copepod exoskeleton we were able to carry out complementary morphological analyses on the same specimens used for sequencing. Results show that in epi- and mesopelagic species polar endemic cryptic or pseudo-cryptic lineages occur, while meso- and bathypelagic species may have a wider distribution.

Keywords: Species delimitation, Phylogeography, integrative taxonomy, *Oithona similis*, *Microcalanus*

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