Variability of under-ice habitats and communities in the Central Arctic Ocean

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During RV Polarstern cruise ARK XXVII/3 a major objective of the HGF Young Investigators Group Iceflux was to investigate the relationship of the under-ice community with physical habitat properties using a Surface and Under-Ice Trawl (SUIT; van Franeker *et al.*, 2009), equipped with a bio-environmental sensor array. During 2 August-7 October 2012 data was collected at 15 stations, 3 were conducted in open water, and 12 were conducted under various types of sea ice, including multi-year ice and scattered ice floes. The average ice coverage of the under-ice hauls was 57%. Modal ice thickness ranged between 60cm in first-year floes, and 105cm in multi-year ice floes. The species composition of SUIT samples indicated a clear distinction between open water and under-ice communities. Under sea ice, samples were dominated in density by the ice-associated amphipod *Apherusa glacialis*. In open water, the pelagic amphipod *Themisto libellula* was most abundant. The average density of polar cod, *Boreogadus saida*, was 1.9 ind.100m^{-2} under sea ice, and 0.2 ind.100m^{-2} in open water, with a size range from 54 to 140mm total length. At several stations both in open water and under sea ice, the ctenophores *Beroe cucumis* and *Mertensia ovum* occurred in very high densities. This first trawl survey of under-ice macrofauna in the Arctic Ocean gives evidence of a rich and diverse under-ice community, emphasising key species correlated with sea ice properties. The association of this community with the under-ice habitat indicates a possibly important role of ice algal production in the Arctic ecosystem.

Keywords: under-ice habitat; sea ice properties; ice-associated fauna; polar cod.

References

van Franeker J.A., H. Flores and M. van Dorssen. 2009. The Surface and Under-Ice Trawl (SUIT).