Effects of pyrene exposure and temperature on early development of two co-existing Arctic copepods

Oil exploration is expected to increase in the near future in Western Greenland. At present, effects of exposure to oil compounds on early life-stages of the ecologically important Calanus spp. are unknown. We investigated the effects of the oil compound pyrene, on egg hatching and naupliar development of the calanoid copepods Calanus glacialis and C. finnarchicus, two key species in the Disko Bay, Western Greenland. At low temperature the nauplii of C. glacialis experienced reduced growth when exposed to pyrene, and survival in both species decreased. Naupliar mortality increased with temperature at high pyrene concentration in C. finnarchicus. Both Calanus species were affected by pyrene exposure but C. finnarchicus was more sensitive compared to C. glacialis. Lowered growth rate and increased mortality of the naupliar stages entail reduced recruitment to copepod populations. Exposure to pyrene from an oil spill may reduce the standing stock of Calanus, which can lead to less energy available to higher trophic levels in the Arctic marine food web.

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