



## Ecological, morphological, and genetic differentiation of *Daphnia* (*Hyalodaphnia*) from the Finnish and Russian subarctic

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**ABSTRACT:** We studied genetic differentiation of two subarctic *Daphnia* species (subgenus *Hyalodaphnia*; Cladocera: Anomopoda) in relation to ecological and morphological diversification. *Daphnia longispina* and the recently discovered species *Daphnia umbra* are genetically differentiated based on mitochondrial 12S rDNA and internal transcribed spacer (ITS) regions. Genetic differentiation of 12S rDNA among the two sister taxa is in the range of differentiation among other *Hyalodaphnia* species (uncorrected genetic distance = 0.11). Despite frequent interspecific hybridization among *Daphnia* (*Hyalodaphnia*) species, we found no interspecific hybrids of *D. umbra* and *D. longispina*. *D. umbra* is for the first time recorded to occur in Northern Finland and Russia (Pechora Delta), and to cooccur in neighboring sympatry with *Daphnia longispina* across a subarctic region in northern Finland. Species are ecologically differentiated: *D. umbra* occurred at higher elevations, in larger and deeper water bodies than *D. longispina*. Species did not differ significantly in levels of ultraviolet-protective melanin pigmentation but varied with regard to environmental preferences, such as fish predation and levels of total dissolved organic carbon (DOC). These findings argue that ecological differentiation and divergent selection might have caused speciation or at least are responsible for the maintenance of reproductive isolation among subarctic *Daphnia* (*Hyalodaphnia*) species.

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