



Two cues for sex determination in *Gammarus duebeni*: Adaptive variation in environmental sex determination?

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ABSTRACT: In the crustacean *Gammarus duebeni*, sex is determined by the interaction of a number of environmental, genetic and parasitic factors, which may, in turn, influence sex ratios and population dynamics. We produce novel evidence that environmental sex determination (ESD) in *G. duebeni* depends primarily on the interaction of two environmental cues: day length and temperature. Whereas previous work found that male-biased sex ratios were produced under long day conditions and female biases under short days, we show that, at the lower temperatures normally experienced by this species at northern latitudes, the reverse pattern can occur. We measured ESD in four U.K. populations and found among-population variation in the level of ESD and in the cues that determined sex. In the light of these findings, we conclude that patterns of ESD across the four populations may reflect selection based on differences in breeding season and discrete/overlapping generations.

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