

Equal temperature-size responses of the sexes are widespread within arthropod species - DTU Orbit (08/11/2017)

Equal temperature-size responses of the sexes are widespread within arthropod species

Sexual size dimorphism (SSD) is often affected by environmental conditions, but the effect of temperature on SSD in ectotherms still requires rigorous investigation. We compared the plastic responses of size-at-maturity to temperature between males and females within 85 diverse arthropod species, in which individuals of both sexes were reared through ontogeny under identical conditions with excess food. We find that the sexes show similar relative (proportional) temperature-body size (T-S) responses on average. The high degree of similarity occurs despite an analysis that includes a wide range of animal body sizes, variation in degree of SSD and differences in the sign of the T-S response. We find no support for Rensch's rule, which predicts greater variation in male size, or indeed the reverse, greater female size variation. SSD shows no systematic temperature dependence in any of the 17 arthropod orders examined, five of which (Diptera, Orthoptera, Lepidoptera, Coleoptera and Calanoida) include more than six thermal responses. We suggest that the same proportional T-S response may generally have equivalent fitness costs and benefits in both sexes. This contrasts with effects of juvenile density, and food quantity/quality, which commonly result in greater size plasticity in females, suggesting these variables have different adaptive effects on SSD.

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