

PHENOTYPIC PLASTICITY IN THE SAILFIN MOLLY III. GEOGRAPHIC VARIATION IN REACTION NORMS OF GROWTH AND MATURATION TO TEMPERATURE AND SALINITY

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Abstract

Phenotypic plasticity, the ability of a single genotype to produce different phenotypes under different environmental conditions, plays a profound role in several areas of evolutionary biology. However, it is unclear how much reaction norms vary among conspecific populations and whether differences in reaction norms represent adaptations to different levels of environmental variation. We present data on the reaction norms of growth and maturation to variation in temperature and salinity in sailfin mollies (*Poecilia latipinna*) from three populations from South Carolina (SC). This area is the northern edge of the species range and we compare these reaction norms to those previously reported in populations from north Florida (NF), which is the center of the species range. In general, fish from SC displayed less plasticity than fish from NF because they grew faster and matured earlier at the lower temperatures and salinities compared to NF fish. Among fish from both regions, males were much less plastic than females. In both sexes, fish from SC matured at much younger ages than NF fish in the same conditions. While there was no detectable heterogeneity among populations from NF, males from one of the SC populations displayed a strikingly different response in age at maturity to temperature variation than did males from the other two SC populations, maturing earlier at the lower temperature, rather than at the higher one. The pattern in fish from SC is one of countergradient variation, in which they grow faster and mature earlier in conditions that would otherwise slow growth and delay maturity. This pattern is well-matched to the cooler thermal regime and shorter growing season experienced in SC populations, suggesting an adaptive divergence in reaction norms.

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