Importance of phenotypic plasticity in the invasive success of Drosophila suzukii

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Abstract

Biological invasions, largely related to human activities (development of international trade and intercontinental transport), are causing increasingly strong ecological and economic damages. From an academic point of view, invasions represent "natural experiments" that allow investigating evolutionary processes in real time. A process that is supposed to play a fundamental role in the success of an invasion is phenotypic plasticity. Phenotypic plasticity is the ability of a genotype to express different phenotypes depending on environmental conditions. Adaptive phenotypic plasticity allows organisms to express advantageous phenotypes in a broader range of environments at very short time scales (within single generations). It is often assumed that populations of invasive species present greater phenotypic plasticity in their new invasive range compared to populations within the native range. To test this hypothesis we have investigated phenotypic plasticity of wing size in invasive pest species, *Drosophila suzukii*. We have investigated two amongst the most relevant environmental factors for a successful invasion, temperature and nutrition: temperature because it is tightly associated with the latitudinal cline of the invasion, and one of the best-studied environmental factors affecting *Drosophila*; and food substrates because *D. suzukii* is unique amongst *Drosophila* for its ability to exploit unripe rather than rotting fruits and because nutrition influences many traits and individual fitness. By comparing native and invasive populations, we will be able to investigate the genetic variability of the plasticity of size in this species.

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