
Why is there no effect of host species on the physiological thermotolerance of generalist parasitoids?

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Abstract

During immature development, the insect host represents the sole source of nutrients for the developing parasitoid. The quality of the host therefore has important implications for the development and resultant fitness of the emerging parasitoid and has been shown to impact development time, adult size, fecundity, longevity and offspring sex ratio. Generalist aphid parasitoids, such as those belonging to the genus *Aphidius*, play an important role in the control of aphid pests. For this reason, much research has focused on the thermal biology of insect parasitoids to better understand and predict their efficacy as biological control agents. Throughout the year, *Aphidius* parasitoids utilize a succession of cereal aphid species as the aphid population composition changes from winter to spring. These cereal aphids are known to differ in their nutritional value for both aphid predators and parasitoids. However, the effect of aphid host on the thermal tolerance of the emerging parasitoid is unknown.

The current study aimed to investigate the effect of cereal aphid host (*Metopolophium dirhodum*, *Rhopalosiphum padi* and *Sitobion avenae*) on the cold tolerance of four species of parasitoids belonging to the genus *Aphidius* (*Aphidius avenae*, *Aphidius ervi*, *Aphidius matricariae* and *Aphidius rhopalosiphi*). Results revealed no effect of aphid host on the cold tolerance of emerging parasitoids. We propose that aphid host has no significant effect on parasitoid thermal tolerance because the parasitoid may engage in behavioural host manipulation to evade unfavourable thermal conditions.

Keywords: thermotolerance, host, parasitoid interactions, host effect, *Aphidius*

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