

## Variable Temperatures Leave Insects with a Frosty Reception

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The study, conducted by Biology PhD candidate Katie Marshall and supervisor Brent Sinclair, has been published online today by the prestigious journal, <u>Proceedings of the Royal Society B</u>.

Results showed that flies exposed to multiple bouts of cold survived better, but produced fewer <u>offspring</u>. Past research had demonstrated that insects survive cold better if periodically exposed to warm conditions, which had led researchers to believe repeated cold exposures were better for insects than a prolonged cold exposure.

When Marshall and Sinclair tracked the number, sex and development time of offspring, however, they found that flies experiencing multiple cold exposures traded their future ability to reproduce for a chance at survival. In particular, cold-exposed flies produced fewer daughters, which is important because the number of female offspring limits the growth of a population much more than the number of male offspring.

"It is clear that, in nature, animals are exposed to thermal stress on a



regular and repeated basis," says Marshall. "Understanding the consequences of these repeated stresses is essential to interpreting and predicting <u>climatic change</u> effects in the natural world."

Climate change in Ontario is expected to decrease the amount of snow cover, which insulates the ground and keeps soil temperatures from becoming too low. As such, insects will experience a greater number of low-temperature events throughout the winter.

"Insect populations have important effects on many aspects of human society," says Marshall. "Pest species can harm crops and impact human health, while beneficial insects contribute to biodiversity and the control of pest species. If we understand the effects of temperature on <u>insects</u>, we can become better at predicting and responding to insect populations in a changing climate."

Marshall plans to extend her work to see if repeated cold exposure has similar effects on forest and agricultural pests.

More information: rspb.royalsocietypublishing.org/

Provided by University of Western Ontario

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