Dragonflies with waxy coating better able to resist a warming climate, research suggests

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A trio of biologists at the University of Colorado has found that dragonflies that cover themselves in a waxy coating fare better as the climate grows warmer and drier in regions where they live. In their study

, published in the *Proceedings of the National Academy of Sciences,* Michael Moore, Sarah Nalley and Dalal Hamadah tested the impact of pruinescence in two ways with dragonflies living in dry parts of North America.

Prior research has shown that some dragonfly species produce a waxy compound that they spread all over their bodies. The wax prevents body moisture from escaping, preventing overheating. Prior research has also shown that dragonflies have two major forms of courtship—one involves males perching in a well-lit position, allowing females to get a good look at them, an approach that can lead to an increased body temperature for the male.

In the other tactic, males follow a wait-and-see approach, which involves flying around and taking drink breaks. In this new effort, the researchers looked at 319 species of dragonfly to see which of the two kinds of species were more likely to use pruinescence—they found it much more predominant in perchers compared to the fliers.

The team next wondered which approach might better help dragonflies handle a warmer and drier environment as climate change affects the areas where they live. To find out, they filled a database with geographic records of 387,000 dragonflies that included information regarding pruinescence.

They found that those dragonflies using pruinescence were the most common species in warm and dry areas. By comparing these numbers over time, they found that those using pruinescence were faring better than their waxless counterparts, which suggests they might be more likely to survive in a warming world.

The findings suggest that a mating behavior exhibited by dragonflies is helping them handle a changing environment, rather than constraining them, as evolutionary theory suggests. The researchers suggest that such an adaptation may be present in other insects as well, which could be increasing their survival.

More information: Michael P. Moore et al, An evolutionary innovation for mating facilitates ecological niche expansion and buffers species against climate change, *Proceedings of the National Academy of Sciences* (2024). DOI: 10.1073/pnas.2313371121