Climate change may disrupt butterfly flight seasons

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This image shows butterfly specimens. Credit: Heather Kharouba

The flight season timing of a wide variety of butterflies is responsive to temperature and could be altered by climate change, according to a UBC study that leverages more than a century's worth of museum and weather records.

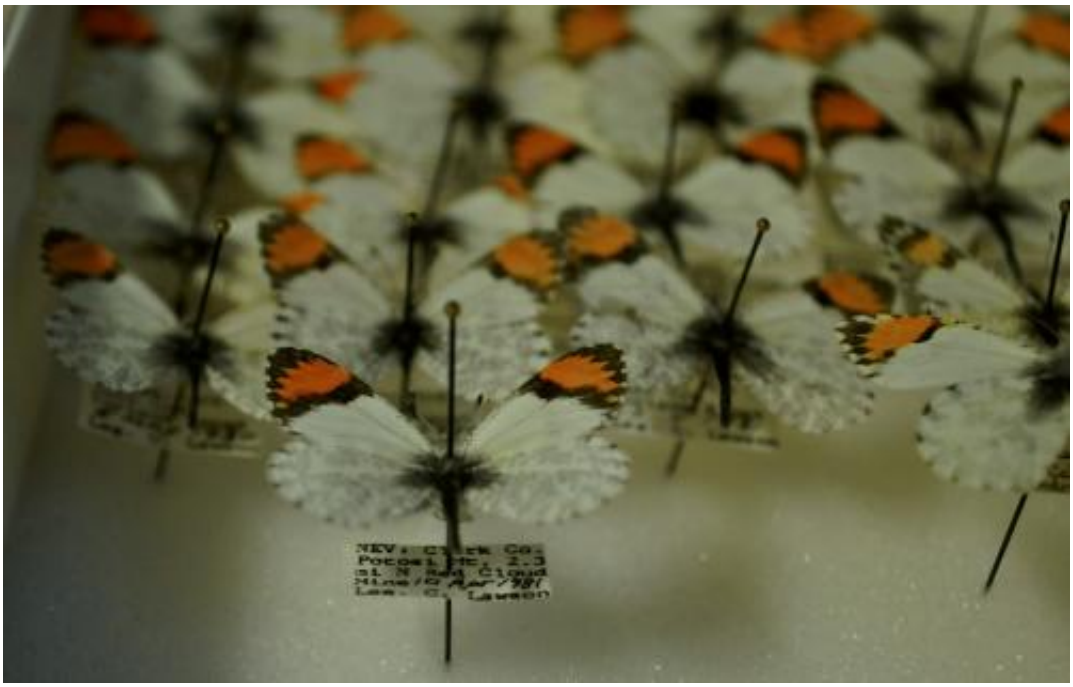
Researchers from UBC, the Université de Sherbrooke and the University

of Ottawa combed through Canadian museum collections of more than 200 species of butterflies and matched them with weather station data going back 130 years. They found butterflies possess a widespread temperature sensitivity, with flight season occurring on average 2.4 days earlier per degree celsius of temperature increase.

"With warmer temperatures butterflies emerge earlier in the year, and their active flight season occurs earlier," says Heather Kharouba, lead author of the paper published this week in *Global Change Biology*. "This could have several implications for butterflies. If they emerge too early, they could encounter frost and die. Or they might emerge before the food plants they rely on appear and starve."

"Butterflies are also a bell-weather, and provide an early warning signal for how other wildlife may respond to climate change," adds Kharouba, who conducted the research while completing her PhD at UBC, and is now a post-doctoral researcher with the University of California, Davis.

The researchers utilized the day of collection found in records to estimate the timing of flight season for each species, and compared it with the historical weather data.



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The study was possible thanks to the massive amount of data housed in museum collections and records. Much of the butterfly data in Canada has been centralized via the Canadian National Collection of Butterflies—records in British Columbia being the exception. To gather data for this province, Kharouba relied on private collections. Only a small portion of the butterfly specimens found in UBC's Beaty Biodiversity Museum-Vancouver natural history museum are databased.

"Museum collection records are an under-exploited resource of ecological data and can provide a window into the past, and potentially the future," says Kharouba. "We should invest in efforts to properly database and centralize more of these records."

Provided by University of British Columbia