

Media Release

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There's no place like home: butterflies stick to their burbs

Members of at least one species choose mates and egg sites based on where they were born, research reveals

Birthplace exerts a lifelong influence on butterflies as well as humans, new research reveals.

In a paper published in the journal *Proceedings of the Royal Society B: Biological Sciences*, Macquarie University ARC Future Fellow Associate Professor Darrell Kemp reveals that the American passionfruit butterfly, *Heliconius charithonia*, selects its mate and egg-laying site based on the species of plant that hosted its own egg.

The finding constitutes the first evidence that conditions in very early life for butterflies determine adult behaviour – something many researchers previously thought impossible.

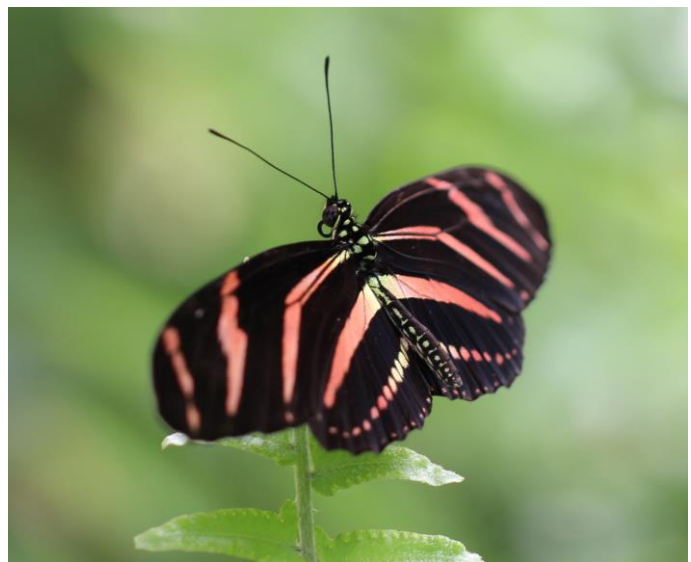
“There was considerable doubt about this,” says Professor Kemp. “How can conditioning that occurs in a developing caterpillar survive the complete neural rearrangement that happens once it pupates?”

“This research however goes a long way to demonstrating that it does.”

H. charithonia butterflies feed and lay eggs on more than 20 species of plants, all of which belong to a single genus, *Passiflora*.

To establish his findings, Dr Kemp collected 38 wild female butterflies from a breeding colony in Florida. These insects were breeding exclusively on a passionfruit species known as *Passiflora incarnata*.

Eggs laid by the cohort were then randomly assigned either to *P. incarnata* plants, or to a related species, *P. suberosa*.



The American passionfruit butterfly, *Heliconius charithonia*.
Credit: Derrell Kemp

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After the caterpillars developed and pupated into butterflies, the adults were released into a large rainforest enclosure. Here, their reproductive behaviour was found to carry intriguing imprints of their early-life hostplant experience.

Females raised in *P. suberosa* tended to mate with males which had grown up on the same species, and then tended to lay eggs on it, as well. This was the case even though *P. incarnata* generation members were on the whole larger and developed more rapidly.

“Males as well as females were influenced by their birthplaces, which in insects is really unusual,” says Dr Kemp.

“It’s possible that this sort of preferential behaviour could influence the development of distinct and isolated populations – and perhaps eventually new species.”

The paper is available here:

<http://rspb.royalsocietypublishing.org/lookup/doi/10.1098/rspb.2019.1225>

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Paper: [Manipulation of natal host modifies adult reproductive behavior in the butterfly *Heliconius charithonia*](https://doi.org/10.1098/rspb.2019.1225); Darrell Kemp, Macquarie University; *Proceedings of the Royal Society B: Biological Sciences*; <https://dx.doi.org/10.1098/rspb.2019.1225>

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