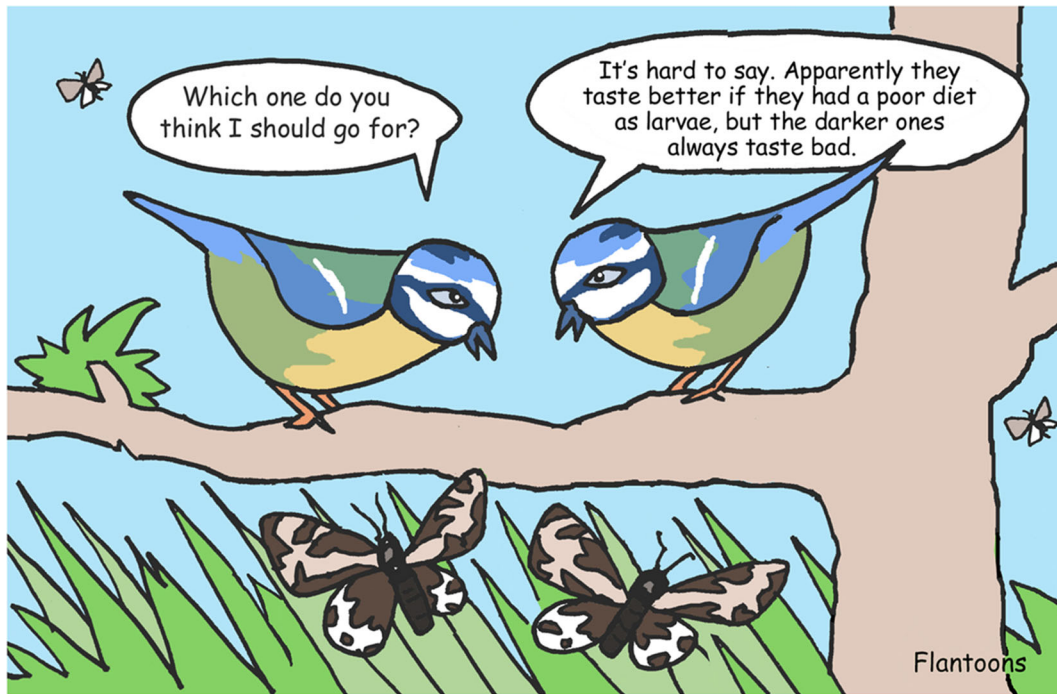


## INSIDE JEB

## Wood tiger moths taste better after a hungry start



In all walks of life there's only so much to go around, whether you're a fish, bird, mammal or insect, so creatures allocate scarce resources selectively, cutting back on some distinguishing features – such as warning markings or unpleasant tasting body fluids – to eke out their reserves. For example, wood tiger moths (*Arctia plantaginis*) are covered in distinctive black and white markings to warn predators of their disgusting flavour. Bibiana Rojas (University of Veterinary Medicine Vienna, Austria), Emily Burdfield-Steel (University of Amsterdam, The Netherlands), Johanna Mappes (University of Helsinki, Finland) and colleagues were keen to find out whether moths that were fed on a poor diet as larvae, with relatively little protein, might cut back on the flavours that make them taste unpleasant in favour of their flamboyant protective markings.

After collecting wood tiger moth larvae from a lab colony, Miriam Furlanetto (University of Jyväskylä, Finland), Burdfield-Steel and Rojas fed some of the larvae on a high-protein diet for

~2 months, while others were reared on a low-protein diet, before the youngsters retreated into their cocoons, emerging 7–10 days later as adults complete with elaborate dark wing markings. Furlanetto, Cristina Ottocento (University of Helsinki, Finland) and colleagues then checked the moth's wing markings to find out how their diet had impacted the moth's appearance. However, there was little difference between the adult moths that had been well and poorly fed as larvae; 'The expression of the pigment melanin – which causes the characteristic black markings – in their wings did not differ', says Ottocento. So, the quality of the moth's early diet had not affected their appearance, but had it impacted their flavour?

This time, Ottocento, Burdfield-Steel and Rojas collected body fluids from the thoraxes of the adult moths before soaking oats in the liquids and offering them to blue tits, to find out whether the birds, which sometimes dine on wood tiger moths, would turn up their beaks or

wolf down the moth-flavoured oats. It turned out that the blue tits did not like the oats soaked in the body fluids of the moths that had been well fed as larvae, while they gobbled up the oats flavoured with the body fluids of the moths that had been fed a low-protein diet as youngsters. The moths that developed from larvae fed an inferior diet didn't taste as bad because they had cut back production of the chemical responsible for their unpleasant flavour in favour of their distinctive dark deterrent markings.

'Our findings show that the resources available to the moths during early life have a huge effect on how distasteful they are to predators, but not on the appearance of their dark wing coloration', says Rojas.

10.1242/jeb.247309

**Ottocento, C., Rojas, B., Burdfield-Steel, E., Furlanetto, M., Nokelainen, O., Winters, S. and Mappes, J.** (2024). Diet influences resource allocation in chemical defence but not melanin synthesis in an aposematic moth. *J. Exp. Biol.* **227**, jeb245946. doi:10.1242/jeb.245946

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