

INSIDE JEB

Corroboree frogs get yellower but no thanks to β -carotene

Southern corroboree frogs (*Pseudophryne corroboree*) may look cute clambering over moss in their Australian alpine bog homes, but the tiny amphibian's bright yellow bands are a potent warning. The animals are fantastically toxic and best avoided. The warnings signalled by many brightly coloured creatures depend on plant pigments – carotenoids – consumed in their diets, and Phillip Byrne and Aimee Silla from the University of Wollongong, Australia, knew that two such pigments, lutein and β -carotene, turn up in the skins of corroboree frogs. In addition, the tiny creatures become increasingly vivid as they grow, yet it wasn't clear whether carotenoids consumed in their diets contribute to their flashy display. So, Byrne, Silla and Sara Walton (University of Wollongong) put recently hatched corroboree froglets on a

diet of crickets dusted with different quantities of a β -carotene supplement (ranging from 0 to $3 \mu\text{g g}^{-1}$) and kept an eye on the youngsters as they grew, to find out whether the carotenoids they consumed contributed to their developing colour.

However, after 32 weeks, the frogs on the least-supplemented diets were just as vivid as frogs of the same age that consumed the largest amounts of carotenoid. Their diet didn't seem to impact their hue. By contrast, when Walton, Byrne and sensory ecologist John Endler from Deakin University, Australia, compared the colour of the youngest frogs with their hues when older, it was clear that their stripes had become much yellower as they grew, probably as the pigment cells –

chromatophores – developed and accumulated an alternative yellow pigment – pteridine.

But why do these frogs turn up their colour as they grow? Explaining that the black tadpoles probably depend on their pigment for camouflage in their boggy peat pond homes, the team suspects that the rapidly growing frogs switch to advertising their presence to warn would-be predators that they would definitely get more than they bargained for if they tried a mouthful of corroboree frog.

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Walton, S. J., Silla, A. J., Endler, J. A. and Byrne, P. G. (2021). Does dietary β -carotene influence ontogenetic colour change in the southern corroboree frog? *J. Exp. Biol.* **224**, jeb243182. doi:10.1242/jeb.243182