

INSIDE JEB

Crayfish don't shrug off moulting



Procambarus clarkii, taken near a lake in Gironde, France. Photo credit: Duloup under the terms of the GNU Free Documentation License, Version 1.2, CC-BY-SA-3.0 or CC BY-SA 2.5.

Change can be nerve-racking – you should see me when our IT system gets upgraded. Even natural life events, such as going through puberty or becoming parents, can be stressful. Although insects and crustaceans appear to shrug off their skins with little drama, Julien Bacqué-Cazenave, Pascal Fossat, Jean-Paul Delbecque and colleagues from Université de Bordeaux, France, wondered how anxious the animals may feel while disposing of an old shell. They investigated how stressed crayfish,

Procambarus clarkii, become when moulting.

Allowing the crustaceans to explore a cross-shaped maze, with two light arms and two comforting dark arms, the team confirmed that the crayfish were equally happy to explore both zones when feeling chilled before moulting. However, the crayfish appeared to become quite anxious during the week prior to shedding their shells – spending most of the time in the security of the dark regions of the

maze – and only recovered slowly until they eventually resumed exploring the light and dark arms of the maze 2 weeks later.

In short, crayfish experience anxiety while moulting. And, when Bacqué-Cazenave injected the crustaceans with 20-hydroxyecdysone, a hormone that is known to trigger moulting, he was impressed to see that they began displaying the same anxiety symptoms 4 days later, ‘suggesting a long-term, possibly indirect hormonal effect’, says Delbecque. However, when Bacqué-Cazenave gave the anxious animals a dose of the sedative chlordiazepoxide they quickly recovered, dividing their time equally between the bright and dimly lit maze arms. The team also suspects that other arthropods – including insects, millipedes and spiders – may suffer similarly when their time comes to moult.

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Bacqué-Cazenave, J., Berthomieu, M., Cattaert, D., Fossat, P. and Delbecque, J. P. (2019). Do arthropods feel anxious during molts? *J. Exp. Biol.* **222**, jeb186999.

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