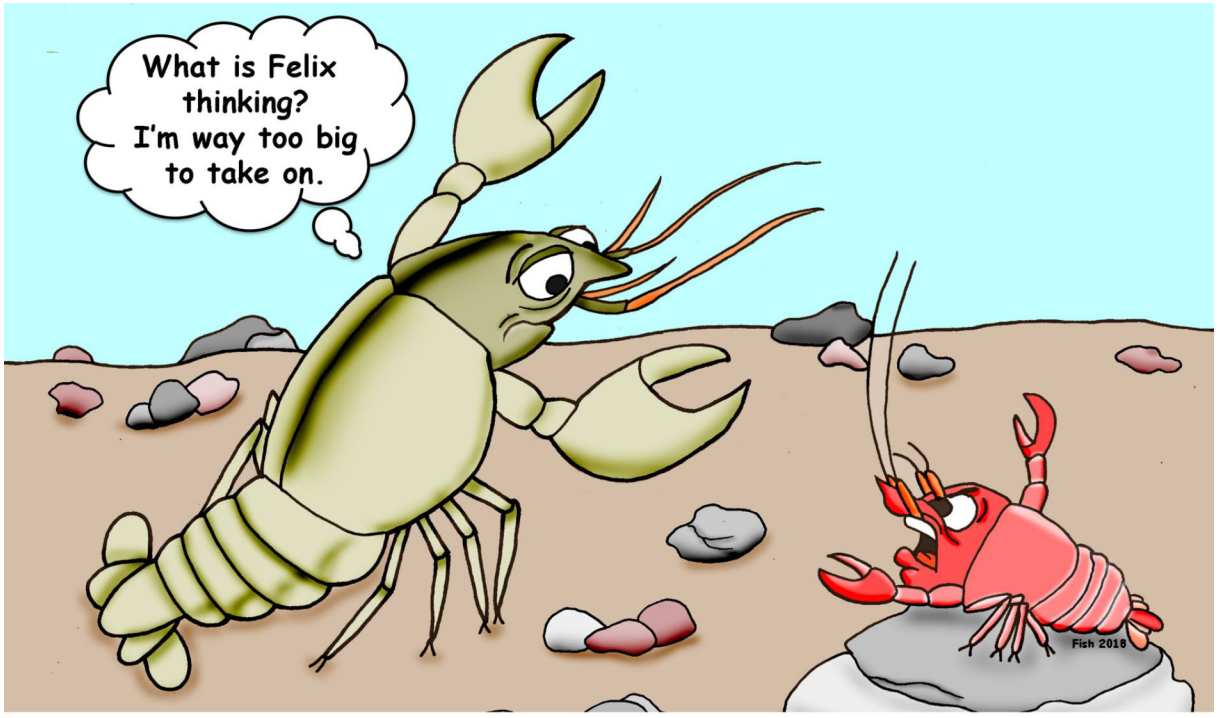
© 2018. Published by The Company of Biologists Ltd | Journal of Experimental Biology (2018) 221, jeb183889. doi:10.1242/jeb.183889

INSIDE JEB

Serotonin muddles crayfish responses to adversaries



After his serotonin injection, Felix decided to pick on someone he thought was his size.

In confrontations, it's usually a good idea to pick on someone your own size, but when Julien Bacqué-Cazenave, Daniel Cattaert, Jean Paul Delbecque and Pascal Fossat from the Université de Bordeaux, France, injected the neurotransmitter serotonin into crayfish, they found that the crustaceans that were smaller than their opponent squared up as if ready for a fight, while larger crayfish backed down. As most 'small' animals retreat meekly when faced with a larger adversary, the team compared the responses of individual crayfish to small and large opponents after serotonin injection in order to find out whether the effect of the neurotransmitter on an animal depends on its size. However, the crayfish's responses switched depending on their size relative to their opponent, with medium-sized crayfish backing down when faced with a smaller opponent, while other medium-sized animals picked fights with crayfish that outsized then.

Fossat and his colleagues say, 'Our results indicate that the effects of serotonin on aggressiveness are dependent on the perception of the relative size difference of the opponent'. They also suspect that crayfish can evaluate the risk of a confrontation with a larger or smaller opponent, in addition to assessing their relative strengths, as the crustaceans were no longer able to accurately gauge themselves relative to their rival after a serotonin injection. The team suggests, 'Serotonin is probably able to fine-tune the perception of risks to be taken in response to danger', and they add that this effect may also occur in other creatures.

10.1242/jeb.183889

Bacqué-Cazenave, J., Cattaert, D., Delbecque, J. P. and Fossat, P. (2018). Serotonin has opposite effects on the aggressiveness of crayfish facing either a smaller or a larger rival: alteration of size perception. *J. Exp. Biol.* **221**, doi:10.1242/jeb.177840.

Kathryn Knight
kathryn.knight@biologists.com