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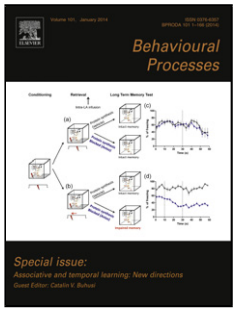

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Aversive responses by shore crabs to acetic acid but not to capsaicin

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Highlights

- Shore crabs responded to the application of acetic acid to the mouth or eyes
- Shore crabs showed no response to capsaicin
- Responses to acid ranged from withdrawal of the eye into the 'eye socket' to prolonged escape responses
- Acid on one eye did not affect withdrawal of the other eye
- Some responses might indicate nociceptive reflex but others were longer and more complex than suggested by reflex and are consistent with the idea of pain

Abstract

Nociception is the ability to encode and perceive harmful stimuli and allows for a rapid reflexive withdrawal. In some species, nociception might be accompanied by a pain experience, which is a negative feeling that allows for longer-term changes in behaviour. Different types of stimuli may affect nociceptors, but in crustaceans there is conflicting evidence about the ability to respond to chemical stimuli. This study attempts to resolve this situation by testing behavioural responses of the common shore crab, *Carcinus maenas,* to two chemical irritants frequently used in vertebrate pain studies (acetic acid and capsaicin). In our first experiment acetic acid, water, capsaicin or mineral oil were applied by brush to the mouth, and in a second experiment treatments were applied to the eyes. Application of acetic acid had a marked effect on behaviour that included vigorous movement of mouth parts, scratching at the mouth with the claws and attempts to escape from the enclosure. Acetic acid also caused holding down of the acid-treated eye in the socket. By contrast, capsaicin had no effect and was no different to the control treatment of mineral oil and