

Crabs 'sense and remember pain'

Crabs' reaction to shocks seems to suggest that they also remember pain

Queen's University says new research it conducted shows crabs not only suffer pain but retain a memory of it.

The study, which looked at the reactions of hermit crabs to small electric shocks, was carried out by Professor Bob Elwood and Mirjam Appel.

The crabs reacted adversely to the shocks but also seemed to try to avoid future shocks, suggesting that they recalled the past ones. The research is published in the journal *Animal Behaviour*.

Professor Elwood said the research highlighted the need to investigate how crustaceans used in food industries are treated, saying that a "potentially very large problem" was being ignored.

Shell shocked

Hermit crabs have no shell of their own so inhabit other structures.

As part of the research, wires were attached to shells to deliver small shocks to the abdomen of some of the crabs.

The study revealed the only crabs to get out of their shells were those which had received shocks, indicating that the experience was unpleasant for them.

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Professor Bob Elwood

Hermit crabs are known to prefer some species of shells to others and it was found that they were more likely to come out of the shells they least preferred.

The main aim of the experiment was to deliver a shock just under the threshold that causes crabs to move out of the shell, to see what happened when a new shell was then offered.

Those responsible for the study said crabs that had been shocked but remained in their shell appeared to remember the experience of the shock.

They said these crabs quickly moved towards the new shell, investigated it briefly and were more likely to change to the new shell compared to those that had not been shocked.

Professor Elwood, who previously carried out a study showing that prawns endure pain, said: "There has been a long debate about whether crustaceans including crabs, prawns and lobsters feel pain.

"We know from previous research that they can detect harmful stimuli and withdraw from the source of the stimuli but that could be a simple reflex without the inner 'feeling' of unpleasantness that we associate with pain.

"This research demonstrates that it is not a simple reflex but that crabs trade-off their need for a quality shell with the need to avoid the harmful stimulus.

Crustaceans

"Trade-offs of this type have not been previously demonstrated in crustaceans. The results are consistent with the idea of pain being experienced by these animals."

Queen's said the findings of both studies were consistent with observations of pain in mammals.

However, Professor Elwood said that in contrast to mammals, little protection is given to the millions of crustaceans that are used in the fishing and food industries each day.

"Legislation to protect crustaceans has been proposed but it is likely to cover only scientific research," he said.

"Millions of crustaceans are caught or reared in aquaculture for the food industry.

"There is no protection for these animals - with the possible exception of certain states in Australia - as the presumption is that they cannot experience pain.

"With vertebrates we are asked to err on the side of caution and I believe this is the approach to take with these crustaceans."