
Painful memories for goldfish

By Roger Highfield, Science Editor

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Popular mythology holds that goldfish have three-second memories. Now it seems that they can remember pain for at least a day, according to research that will reopen the debate about whether angling is a cruel sport.

The urban legend of the amnesiac fish has been dealt a new blow by a study which shows that goldfish can learn to avoid parts of their tanks where they receive electric shocks for at least 24 hours, probably longer. Earlier work at the University of Plymouth showed that they can be trained to remember for up to three months.

The new study was conducted by Rebecca Dunlop, Sarah Millsopp and Peter Laming at the Queen's University of Belfast and is published in the journal *Applied Animal Behaviour Science*.

"Angling is not considered to be a cruel sport as it has been assumed that fish cannot perceive pain. Rather it is a reflex action," said Miss Dunlop yesterday.

"This paper shows that pain avoidance in fish does not seem to be a reflex response, rather one that is learned, remembered and is changed according to different circumstances. Therefore, if fish can perceive pain, then angling cannot be continued to be considered a non-cruel sport." The Belfast team showed that goldfish can remember accurately where in their tanks they receive electric shocks.

The stronger the shocks, the less likely the fish were to return to the sector of the tank where they had received them. The team reported similar results with trout.

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