

# Slow-growing underwater creatures have a better chance of avoiding death

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Come get me: New Deakin University research shows small and slow underwater creatures have a better chance of avoiding death by fishing hook than their bigger and bolder family and friends.

Slow and steady doesn't just win the race between a tortoise and a hare, with new Deakin University research showing sluggish, shy and slow-growing underwater creatures have a better chance of avoiding death by fishing hook than their bigger and bolder counterparts.

The research, from Deakin's School of Life and Environmental Sciences, found that unless catch rates are reduced, future fish and crustacean populations will be made up of mostly slow-growing, small and un-productive individuals.

During the research, Associate Professor Peter Biro and co-author Portia Sampson measured individual behaviour and growth of 86 yabbies (the Australian native freshwater crayfish) and found that fast-growing individuals were consistently bold and voracious over time.

"In other words, bold personality traits in these animals was directly related to their capacity to consume food and to grow quickly," Associate Professor Biro said.

"They were subsequently more likely to be harvested in single-and group-trapping trials."

The research, Fishing directly selects on growth rate via behaviour: implications of growth selection that is independent of size, is published today in the prestigious journal *Proceedings of the Royal Society of London Series B*.

Associate Professor Biro said the researchers were motivated by earlier studies which showed size-selective harvest of fish and crustacean populations had reduced stock numbers and led to reduced growth rates and earlier maturation. But, the role of behaviour in catchability has been little studied.

"During our study, we also found that gender appears to play some role in behaviour and trapability, with our female yabbies tending to be less active, shyer, slower-growing and less likely to be harvested," he said.

"Our study was the first of its kind to study this at the individual level, and suggests that behaviour is an important mechanism for fishing selectivity that could potentially lead to evolution of reduced intrinsic growth rates."

During the four-month study the team individually housed yabbies and

fed them as much food as they could eat, measuring growth, activity levels, and motivation to feed.

"We found that those who showed bold personality traits also had higher growth potential, so we then exposed our yabbies to baited traps, individually and in mixed groups, and in all cases found the active & bold individuals were more likely to be trapped," Associate Professor Biro said.

"These results have important management implications, because traditional size-limits used to protect segments of a population cannot fully protect fast-growers, because at any given size, fast growers are more vulnerable to capture because they are active and bold.

"In essence, fishing in wild populations does exactly the opposite of what we strive for in agriculture, which is to select for fast growth and high production – fishing wild populations at high levels will likely select for slow-grower, and low production".

"Yabbies are commercially and recreationally harvested in Australia, so our results have direct implications for them".

The result are also likely to have implications for marine crustaceans that are commercially trapped, such as lobster and crayfish, and crabs.

"So it is imperative that we rethink strategies for safeguarding fisheries and this will need to include moves towards reducing overall harvest rates."

**More information:** Fishing directly selects on growth rate via behavior: implications of growth-selection that is independent of size, *Proceedings of the Royal Society of London Series B*, [rspb.royalsocietypublishing.org/.../1098/rspb.2014.2283](http://rspb.royalsocietypublishing.org/.../1098/rspb.2014.2283)

Provided by Deakin University

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