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# Neither the time nor the place! Female guppy fish learn to become better swimmers to escape sexual harassment

- Researchers at the Universities of Exeter and Glasgow subjected female guppies to differing levels of harassment from eager males for months
- They found females exposed to higher levels of harassment were able to swim much more efficiently, using less energy to maintain a given speed
- Study suggests that fish learn to swim more efficiently with practice

By [SARAH GRIFFITHS FOR DAILYMAIL.COM](#)

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It's not uncommon in the animal world for males to harass females and force them to mate with them, even if the females are not interested.

But a new study has revealed female guppy fish learn to become better swimmers to outpace amorous males and evade their unwelcome advances.

The researchers say their work shows that fish learn to swim more efficiently with practice and have likened the change in their swimming technique to that of human athletes who become better at sports.

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










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© Darren P. Croft, University of Exeter UK

A new study has revealed female guppy fish learn to become better swimmers, to outpace amorous males. A female and two male guppies (*Poecilia reticulata*) from the Arima River, Trinidad are shown

'Sexual coercion of females by males is widespread across sexually reproducing species,' said Dr Shaun Killen, of the University of Glasgow.

'Typically, male reproductive success is limited by access to females, and males of many species will try to overcome this using a number of behaviours, such as chasing and even attacking females in an attempt to gain a mating.'

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'These types of behaviours are considered sexually harassing as males are attempting to coerce females into mating with them. Females can spend a lot of energy avoiding males in these situations and can even be injured.'

'To reduce these costs, one possibility is that females may be able to change their own behaviour or physiology in ways that reduce the negative energetic consequences of harassment or allows them to more easily escape male coercion.'



© Louie Psihoyos/Corbis

The researchers say their work shows that fish learn to swim more efficiently with practice and have likened the change in their swimming technique to that of human athletes who become better at sports. Here, a researcher analyses a swimmer's stroke at an Olympic training centre in Colorado Springs

Together with researchers at the University of Exeter, Dr Killen tested this idea in a laboratory by exposing female Trinidadian guppies (*Poecilia reticulata*) to varying levels of male harassment that they would normally encounter in the wild, for a period of several months.

Dr Safi Darden of the University of Exeter explained: 'In the wild, male guppies spend most of their time courting and coercing females in an attempt to mate with them.'

'Most of this male attention is unwanted and females attempt to avoid males by rapidly swimming

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away from them during pursuits.'

After five months, females exposed to higher levels of harassment were able to swim much more efficiently, the researchers found.

The harassed female fish used less energy to swim at a given speed compared to those exposed to lower levels of pestering.

Dr Darden said: 'It seems that prolonged increases in high-intensity swimming in females, caused by male harassment, leads to changes in the physiology or swimming mechanics of individual fish, which reduces the energy costs of swimming and could allow female guppies to reduce the burden of this coercive behaviour.'

Dr Killen added: 'An important factor appears to be swimming technique, and female guppies that experienced lower levels of harassment spent more time swimming with their pectoral fins extended, an indicator of an inefficient swimming technique.'

'This change is very similar to that seen in human athletes who train to become better at their sports.'

Professor Darren Croft, also from Exeter, said: 'In the broader context our findings show that swimming efficiently is something that fish may have to learn and practice.'

'As with learning to swim in humans, this takes time and energy, both of which are very costly for these fish.'

'This can explain why it is only the fish that are exposed to higher levels of harassment from males which develop the refined swimming technique'.

**THE STUDY IN A NUTSHELL**

Researchers exposed female guppy fish to different levels of harassment from males, for five months.

They found females exposed to higher levels of harassment were able to swim much more efficiently.

The harassed female fish used less energy to swim at a given speed compared to those exposed to lower levels of pestering.

Those exposed to less pestering swap with their pectoral fins extended - an inefficient technique.

The experts said the changes in swimming technique show that fish learn to swim better and practice, much like human athletes.

**THE INSOMINAC MATING TACTICS OF THE SANDPIPER**

Male pectoral sandpiper birds avoid sleeping for weeks so they don't miss out on any mating opportunities.

Scientists found the birds spend 95 per cent of their time awake, but suffer no ill effects.

Those allowing themselves to snooze were likely to lose out to their rivals.

Birds that slept least during the breeding season produced the most offspring, the 2012 research showed.



Male pectoral sandpiper birds (pictured) avoid sleeping for weeks so they don't miss out on any mating opportunities with reluctant females

The polygamous pectoral sandpiper breeds for three weeks in the constant daylight of the Arctic summer.

Each male might mate with several females - but sex is no easy affair.

'Males have to constantly repel their rivals through male-male competition and simultaneously convince females with intensive courtship display,' said study leader Dr Bart Kempenaers, from the Max Planck Institute for Ornithology at Seewiesen in Germany.

Males competed in 'aerial chases' of females and engaged in physical fights.

Females, on the other hand, were 'very reluctant' to surrender to male advances.

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**back of his head**  
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