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## Latest press releases

### Piranhas - vicious or victims?

2 Jul 2007

A research team from the University of St Andrews and the Mamirauá Sustainable Development Institute in Brazil are challenging the common myth that piranhas are aggressive predators most notably portrayed as a means of disposing Blofeld's enemies in the Bond film *You Only Live Twice*. Instead, they have found that the main reason piranhas shoal is for protection from their own predators.

The findings, which also dispel the widely-held view that piranhas shoal to form 'cooperative hunting' groups, will be on display along with a live tank of piranhas at the Royal Society [Summer Science Exhibition](#), which opens 2 July 2007.

The researchers have been studying piranha behaviour in the flooded forests of the Amazon their natural habitat. Working in a reserve that covers an area over half the size of Wales, the biologists have not only discovered why piranhas shoal, but also how this shoaling behaviour changes in relation to the level of danger from predators.

Professor Anne Magurran, at the University of St Andrews, who is investigating these fish in collaboration with Dr Helder Queiroz of the Mamirauá Institute, said: "Contrary to popular belief - and their sharp teeth - piranhas are omnivores. They are scavengers more than predators, eating mainly fish, plant material and insects.

Piranhas are under constant attack from a number of large predators including river dolphins, caiman (a relative of the crocodile) and some of the world's largest fish, such as the piracucu which can grow up to three metres long. Their cautious behaviour is crucial to avoid being eaten."

Shoaling is not just a matter of safety in numbers however. The team also examined the structure of the shoal, and while identifying that they are not always made up of the same fish members come and go and they have discovered a distinct pattern. The larger, more mature piranhas place themselves in the middle and are surrounded by smaller, younger fish.

Professor Magurran continued: "Our study has given us a better understanding of the function of shoaling. Previously it was thought piranhas shoaled as it enabled them to form a cooperative hunting group. However we have found that it is primarily a defensive behaviour, and quite a complex one.

"There is a distinct structure. But there is no lead fish' or cooperation the piranhas pretty much look out for themselves. The bigger, older fish tend to swim in the middle as they are reproductively mature and need to keep safe, whereas the outer layer of the shoal is made up of smaller, younger piranhas. Being at the edge of the group means they can get access to food sooner essential if they are to grow more quickly and mature."

The researchers also noticed that the size of the shoal changed in relation to predation risk. The water level of the flooded forest is dependent on seasonal rainfall and ice melt from the Andes rising as much as 12 metres throughout the year.

Professor Magurran added: "We realised that the shoaling behaviour of the piranhas depends on the water level. At high water the fish swim in small shoals, as there is more space to avoid predators, and the threat is low. However, when the water level drops isolating the flood water into smaller lakes and channels shoals can grow to over 50 fish due to the close proximity of predators such as caiman and pirarucu."

The scientists, working with the Zoological Society of London who are providing the tank of live piranhas, will be on hand at the Royal Society Summer Science Exhibition, which runs from the 2 -5 July but unlike Blofeld's enemies in *You only live Twice*, visitors to the exhibition won't be lowered into the tank...

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