

INSIDE JEB

Sharpshooting dwarf gouramis target dinner with dribbly jets



A female dwarf gourami squirting at a green bead suspended above the water. Photo credit: Ella Ackroyd-Weldon.

The roll call of animals that use tools continues growing; from twig-wielding birds and primates to dolphins stirring up prey with sponges and even water-squirting fish. ‘To be considered a tool, an object: must not be part of the animal itself; must be an unattached or manipulable attached environmental object; and be manipulated to achieve some beneficial outcome’, says Nick Jones from the University of St Andrews, UK. Targeted jets of water fall easily within this definition. Of course, the pre-eminent jet sharpshooter is the archerfish, famed for its precision and 2 m spurts. But dwarf gouramis (*Trichogaster lalius*) are also capable of aiming a squirt, albeit on a more diminutive scale. ‘Their shots reach a limited height of 5 cm’, says Jones, yet no one really knew if these fish spit water to dislodge lunch, simply do it for the sheer pleasure, or whether females even have the ability.

Jones teamed up with animal tool use expert Barbara Klump (Max Planck

Institute of Animal Behavior, Germany), Teresa Abaurrea (University of Helsinki, Finland), and Sophie Harrower, Clare Marr, Louise Scott, Luke Rendell and Mike Webster from the University of St Andrews to check out the spitting prowess of dwarf gouramis. ‘Male dwarf gouramis build nests of bubbles that they make by sucking in air at the surface and then blowing bubbles coated with their saliva’, says Jones, who was curious to find out whether bubble blowing provides jet-squirting male dwarf gouramis with an advantage over the females. Jones, Marr and Harrower trained both sexes to target a black bead with a jet of water, in return for fish food pellet rewards, to test their sharpshooting abilities and recall that the gouramis were very cooperative. ‘The first week we got females in the lab, one started shooting on day two’, says Jones.

So, it was quickly clear that the females were equally as enthusiastic as the males at taking pot-shots. ‘I easily won my bet with my supervisor [Mike Webster] that

they would shoot as well as males’, chuckles Jones. In addition, when the team tested whether five untrained female gouramis could dislodge a fly or cricket wandering along a dowel located 2 cm above the water, most successfully aimed their sloppy jets, enthusiastically taking a shot by the time the third insect came into range. Some of the successful hunters even stopped for a nibble after bringing down their prey.

Then, Scott tested the range of the gouramis’ jets, spending days training the fish to spit at a blob of plasticine at heights ranging from 1 to 5 cm above the water, rewarding the fish with a tasty bloodworm snack even when they didn’t hit the target, to ensure that the fish always took a shot. And it turned out that the popular pet-trade animals had steely determination, doggedly squirting at the target up to 10 times before successfully landing a shot. However, the fish seemed to have a good sense of their own limitations, hesitating longer and taking fewer shots at plasticine blobs placed toward the upper end of their range (4 and 5 cm). The team also noticed that the fish that were quicker on the draw tended to down their prey more often and kept firing for longer until they successfully struck the target; they are definitely determined sharpshooters.

So, dwarf gouramis can add their name to the list of water squirts capable of downing dinner with a ballistic jet, albeit a shorter dribbler imitation of the archerfish’s high-precision fluid missiles.

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