Fish “remember” each other

Do fish have memories? The common perception is that they do not, or that they have ridiculously short, ephemeral recollection abilities. Recent work from the National Institute of Advanced Studies (NIAS), Bangalore shows otherwise. Research on the climbing perch, a highly prized and delicious food fish from south and southeast Asia indicates that this fish can visually distinguish between familiar and unfamiliar individuals. Furthermore, they prefer to join a shoal (group) of fellow fish based on the familiarity or size of the shoal.

Few people think of fish as anything more than food. However, V. V. Binoyviews them as cognitive beings. “Why fish? Why not monkeys or chimps?”, he was often asked when he first began work on recognition and cognitive behaviour in fish. “Fish have well developed brain, can live in variable environments, and many of the group-living species have social hierarchies. This indicates that they may be quite cognitively complex”, he replies. His current work on the shoaling decisions of climbing perch in collaboration with Rajesh Kasturirangan and Anindya Sinha (both from NIAS) shows this to be quite true.

Experiments on the climbing perch were conducted by first allowing fish to ‘familiarise’ themselves with other fish using either only visual, only chemical (smell) or both kinds of signals. Following this, the fish were tested to see if they preferred to ‘join’ equally sized shoals of familiar fish or unfamiliar fish. The results clearly indicated that climbing perch not only preferred to ‘join’ a shoal of fish with ‘familiar individuals’, but that the familiarity was based solely on visual clues. This was a surprising find, as many popular fish species that have been studied use chemical signals or a combination of chemical and visual signals for such decisions.

An even more intriguing result was that if the fish were given a choice between a small ‘familiar’ shoal, and a large ‘unfamiliar’ shoal, they preferred the larger ‘unfamiliar’ shoal. “This actually makes sense”, says Binoy, “The climbing perch are obligatory air-breathers, which means that they come to the surface of the water periodically to gulp atmospheric air. But when they do this, they can be eaten by birds or other predators. So, being part of a large group and synchronising the surfacing to gulp air lessens the chance that any individual fish will get caught”. An even more intriguing result was that if the fish were given a choice between a small ‘familiar’ shoal, and a large ‘unfamiliar’ shoal, they preferred the larger ‘unfamiliar’ shoal.

Since the climbing perch is a valued food fish, its natural populations are declining mainly due to overexploitation. Most of the contemporary research on this fish, therefore, is focussed almost exclusively on aquaculture programmes for artificial cultivation. However, Binoy believes that behavioural studies like the one he has conducted are equally important for the three C’s of successful animal resource management – Conservation of endangered species, Control of invasive species, and Cultivation of economically important species. “If we don’t even know how an animal behaves, how will we take steps to conserve, control, or, in the case of the climbing perch, cultivate it?”, he queries.

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