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FIRST PERSON

First person – Ishani Mukherjee

First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping researchers promote themselves alongside their papers. Ishani Mukherjee is first author on 'What drives mixed-species shoaling among wild zebrafish? The roles of predators, food access, abundance of conspecifics and familiarity', published in BiO. Ishani is a PhD student in the lab of Dr Anuradha Bhat at the Indian Institute of Science Education and Research in Kolkata, West Bengal, India, investigating how ecological factors impact behaviour of multi-species schools.

Describe your scientific journey and your current research focus

Since childhood, I liked observing animals and I was always interested in biology. A research project on fish behaviour during my Master's increased my curiosity towards animal behaviour. I was truly fascinated by how intelligently designed experiments can answer ultimate questions such as why a particular behaviour or phenotype has been selected by nature for over millions of years. Soon after, I got the opportunity to work on ants and my Master's thesis was on information use during nest relocation in an ant species. By the end of my Master's, I was quite certain that I wanted to do a PhD on animal behaviour. I joined the Fish Ecology and Behaviour Lab led by Dr Anuradha Bhat at the Indian Institute of Science Education and Research, Kolkata, for a PhD and I am currently answering questions such as why different fish species exist in the same group and how fish groups escape predation.

"I was truly fascinated by how intelligently designed experiments can answer ultimate questions such as why a particular behaviour or phenotype has been selected by nature for over millions of years."

Who or what inspired you to become a scientist?

My PhD mentor (Dr Bhat) and my dissertation mentor (Dr Sumana Annagiri) have inspired me to pursue the subject of my interest. My sister (Dr Rukmini Mukherjee), who is a post-doctoral researcher in the field of cell biology, has also been a source of inspiration.

How would you explain the main finding of your paper?

Animals around us frequently form groups comprising different species; we often see bird flocks, ungulate herds or fish schools

Ishani Mukherjee

comprising more than a single species. This study examined the benefits of multi-species grouping in tropical fish schools comprising zebrafish, flying barbs and whitespots from the perspective of zebrafish. We found that zebrafish might group with other species for benefits related to predator avoidance and access to food. Another driving factor towards grouping with other species is simply its familiarity with the co-occurring species.

"This study examined the benefits of multi-species grouping in tropical fish schools…"

What are the potential implications of this finding for your field of research?

Understanding what causes fish species to group together would be vital when planning conservation strategies. Species that form mixed species groups can be conserved as mixed-species groups by externally monitoring ecological parameters that result in their formation. Further, a recent review shows that while research on fish schooling behaviour is increasing, very few studies are conducted on multi-species groups. Therefore, this study not only has potential implications in future conservation strategies but

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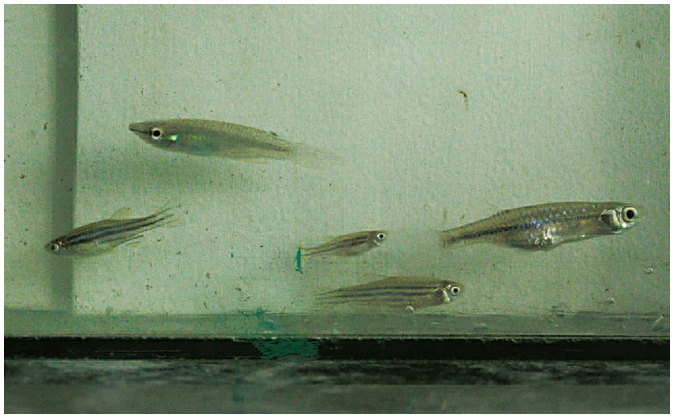

A mixed-species shoal comprising three zebrafish (striped fish), one flying barb (fish with single dark line) and one whitespot (fish without line markings).

also provides insight into an understudied aspect of fish schooling behaviour.

Which part of this research project was the most rewarding?

For me the most rewarding part of the project was the results! I was fascinated when I saw zebrafish individuals choosing to school with the other species more often than their own species in the presence of a predator. We often observe animals around us but partly knowing why a particular behaviour exists provides satisfaction.

What do you enjoy most about being an early-career researcher?

The fact that I still have a long way to go to become an established researcher is exciting. I also enjoy that I have fewer administrative responsibilities as compared to senior researchers and therefore I can spend most of my time thinking, coming up with questions, forming hypotheses and designing experiments.

What piece of advice would you give to the next generation of researchers?

I think researchers should be far-sighted and should focus on problems that we are likely to encounter in the coming years. For instance, we are likely to experience harsh climatic conditions and therefore research that can aid inhabitants of our planet through this climate crisis must be carried out. Also, curiosity-driven research should always be encouraged as such research increases our knowledge and acts as the foundation for applied research.

What's next for you?

After completing my PhD towards the end of 2023, I am keen to pursue my interest in behavioural ecology as a post-doctoral fellow. For me, the ideal next step would be asking questions in the field of behavioural ecology and relying on animal behaviour, physiology and genetics to answer such questions.

Reference

Mukherjee, I. and Bhat, A. (2023). What drives mixed-species shoaling among wild zebrafish? The roles of predators, food access, abundance of conspecifics and familiarity. *Biol. Open* **12** bio.059529.