

Evidence found of fish swimming in unison 50 million years ago

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Credit: © Mizumoto et al./*Proceedings of the Royal Society B*

A team of researchers from Arizona State University working with a

group from the Oishi Fossils Gallery of Mizuta Memorial Museum in Japan has found evidence of fish swimming in unison approximately 50 million years ago. In their paper published in the journal *Proceedings of the Royal Society B*, the group describes their study of a slab of stone containing an entire school of fossilized fish and what they found.

Scientists studying animals such as birds, fish and insects that fly not only in formations but with some degree of uniformity have found that they all follow two simple rules: avoid running into neighbors, and mimic the actions of the rest of the group. It is not known when such behaviors first evolved, but evidence now reported by the team with this new effort suggests it goes back at least 50 million years.

The researchers came upon the stone slab preserving the fossils while visiting the Oishi Fossils Gallery of Mizuta Memorial Museum in Japan. After gaining permission to study the slab, the team found that there were 259 fossilized fish embedded in the stone that had already been dated. They identified them as *Erismatopterus levatus*, a tiny fish that once inhabited intermountain lakes. The specimens in the slab appeared to be juveniles, but there was no evidence indicating how they had been entombed together and so quickly—the researchers suggest it might have happened as the result of a collapsing underwater sand formation. The researchers were intrigued by the positioning of the fish—almost all of them were swimming in the same direction in a pattern reminiscent of modern fish that swim in uniform schools.



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To test whether the fish had been swimming in unison, the researchers took measurements of the fish and developed a computer [simulation](#). They ran simulations under 1000 different scenarios (varying [water flow](#), spatial distribution, etc.). The simulations showed the fish swimming in unison following the same two rules as modern fish. They suggest that their simulations provide [evidence](#) of fish swimming in unison during the Eocene—probably for the same reason that [fish](#) do it today, to reduce their chances of being eaten by a predator.



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More information: Nobuaki Mizumoto et al. Inferring collective behaviour from a fossilized fish shoal, *Proceedings of the Royal Society B: Biological Sciences* (2019). [DOI: 10.1098/rspb.2019.0891](https://doi.org/10.1098/rspb.2019.0891)

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