

Fish more inclined to crash than bees

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Swimming fish do not appear to use their collision warning system in the same way as flying insects, according to new research from Lund University in Sweden that has compared how zebra fish and bumblebees avoid collisions. The fish surprised the researchers.

All animals need some form of [warning system](#) that prevents them colliding with objects in their surroundings. The warning system helps them to continually regulate their speed and judge their distance from objects. For flying and swimming creatures this is an extra challenge because they also have to deal with winds and currents that affect their speed and direction.

"Bumblebees use what is known as an [optic flow](#) to help them avoid crashing into surrounding objects", said Christine Scholtyssek, Postdoc at the Department of Biology at Lund University.

The optic flow can be described as the sensation that surrounding objects move as the bumblebee flies past. To the bumblebee, reality is reversed – it is as though the bee remains still while the objects speed past. Humans can have a similar experience when travelling by train, for example, when the surroundings race past the window. The closer the bee comes to an object, the faster the object appears to move, i.e. the optic flow in the bee's field of vision grows stronger. If the optic flow suddenly becomes stronger in the right eye than the left, the bumblebee will turn left to reduce the risk of a collision.

"The [bumblebee](#) has to constantly balance the optic flow between its two eyes", said Christine Scholtyssek.

The researchers at Lund University used specially constructed tunnels containing water and air to compare the optic flow of swimming and flying creatures respectively. The new study is the first to investigate the optic flow of swimming species. The results showed that zebra fish also use optic flow. However, the zebra fish did not react in the way

the researchers had expected.

"Surprisingly, the fish steered towards a stronger optic flow rather than away from it like the bees", said Christine Scholtyssek.

In other words, the fish chose to approach objects rather than steering away from them. The researchers believe the reason for this could be that zebra fish live in a more turbid underwater environment where visibility is only around 30 centimetres. This means that the [zebra fish](#) are reluctant to swim away from objects because they risk finding themselves in a situation where they have no points of reference in their surroundings. This in turn makes it more difficult to use their in-built warning system to control speed and direction.

The research on animals' collision warning systems is not only of interest to gain fundamental knowledge about animals, but also in areas such as the engineering of machines with automatic steering.

Provided by Lund University

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