

TINY WORMS CAN MAKE COMPLEX TRAVEL DECISIONS WHEN HITCH-HIKING: IISC STUDY

Relevant for: Science & Technology | Topic: Science and Technology- developments and their applications and effects in everyday life

When using public transport we often weigh the merits of jumping onto a crowded train or bus to be on time for a meeting, or wait for an empty bus to pull up so that we can travel in comfort but arrive a little later than planned. There are trade-offs to be made at every stage, and the decisions we take affects the outcome. Tiny organisms, too, appear to be able to engage in such complex decision-making processes that belie their size.

This was one of the key findings by two researchers from the Centre for Ecological Sciences (CES) at the Indian Institute of Science who studied how microscopic worms called nematodes that live in fig trees hitch a ride on fig wasps so that they can move from one tree to another.

A fig tree depends on a fig wasp for pollination, and in return the wasp has a place to lay its eggs and reproduce. This mutualistic association goes back millions of years, but there's a third factor in this relationship: the hitch-hiking nematodes. Young nematodes enter the abdomen of the wasp which they use as a vehicle.

But it's not as simple as jumping onto the first fig wasp they meet. The nematodes have to assess whether the pollinator wasp they choose to hitch a hike on is the right vehicle. Is it too crowded with other organisms? Are the organisms of the same species? Does that affect the outcome?

The researchers found that nematodes generally tend to choose wasps that have less crowded guts, and are already carrying other worms of their own species. "Travelling with members of their own species can boost their chances of finding a mate when they reach their destination," stated IISc. in a press release.

The findings were published in the *Journal of Animal Ecology*. "The main take-home message is that even very tiny organisms such as nematodes have complex decision-making processes," Renee Borges, Professor at CES and senior author of the paper said in the release. "This kind of decision-making is exactly what we humans may do when we are making choices about which mode of transport we may use. We wouldn't want to get on to an overcrowded bus unless there was no other bus available."

Satyajeet Gupta, research associate at CES is first author of the study.

The nematodes, too, tend to select wasps with a fewer passengers. "They check for this using chemical cues by sniffing out volatile compounds that the wasps emit by standing on their tails and waving their heads around. When the researchers offered the worms a choice between compounds emitted by a wasp carrying either fewer or more passengers, the worms selected the former," said the release.

In an earlier study where the researchers conducted controlled experiments, they found that if "there were too many worms boarding a wasp, they turn into parasites and affect not just the wasp but also the tree they reach".

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