

# Human trickery could help bacterium kill deadly mosquitoes

By Tom Spears January 1, 2009



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Photograph by : Christian Puygrenier/AFP/Getty Images

OTTAWA — There's a new proposal to control mosquitoes that carry deadly parasitic diseases such as malaria and dengue fever. Showing a touch of irony, scientists want to infect them with parasites.

The little bacterium called Wolbachia doesn't immediately kill mosquitoes. It weakens them, and shortens their lifespan — possibly making them die before they can incubate a deadly dose of dengue or malaria parasites.

Just one problem: Wolbachia has been around the insect world for a long time, and it hasn't hurt mosquitoes yet.

What it needs, according to one Australian team, is a helping push by humans.

Wolbachia is a naturally occurring bug. The problem: "It's naturally occurring in fruit flies, not mosquitoes," explains biologist Andrew Read of Penn State University's Center for Infectious Disease Dynamics.

"We don't really know why mosquitoes don't have Wolbachia."

But infectious bugs can "jump species," like a flu bug moving from birds or pigs into humans. "To make it jump," he says, "you have to do some trickery."

The Australian team reporting Thursday in the research journal *Science* persuaded one genetic sub-group of Wolbachia to develop a taste for mosquito cells. In principle it's simple: Grow the bacteria in a glass dish, add mosquito cells, and some bacteria in the mix will adapt to living in the new cells.

Step two is to release those bacteria to attack live mosquitoes.

The Aussie team under Scott O'Neill of the University of Queensland found a single sub-group of Wolbachia that adapts well to mosquitoes. These bugs tore into a population of the mosquito species that carries dengue, weakening the insects and killing off the older ones.

Researchers have also raised the possibility of genetically altering Wolbachia to make it adapt to mosquitoes, though this hasn't been tried yet.

*Science* adds in a summary of the research: "Since the dengue virus requires a couple (of) weeks to incubate in the mosquitoes before they are infectious, the researchers suggest that shortening the mosquitoes' lives will effectively slow the transmission of dengue and other similar, deadly viruses."

In theory, says Penn State's Read, "once you start it, you don't have to do anything more. It may be a one-off" — a single release of bacteria that will spread through all the regions where dengue is a problem. That would be a huge advantage over pesticides, which have to be sprayed over and over.

"It's got to be a pretty big push to get it started, but in principle, one push might do it," he said.

He calls this "reason for optimism," though it falls short of absolute proof at this early stage.

Malaria is spread by a different mosquito species, but the research team suggests the same approach might some day attack those mosquitoes too.

When?

The science research needed for one mosquito species could take as little as three to five years, Read suggests. But doing safety tests and getting regulatory approval for the release of bacteria, even bacteria that are not genetically engineering, might take a lot longer.

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