

Infection in malaria-transmitting mosquito discovered

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Credit: CDC

Researchers have found the first evidence of an intercellular bacterial infection in natural populations of two species of *Anopheles* mosquitoes, the major vectors of malaria in Africa. The infection, called Wolbachia, has been shown in labs to reduce the incidence of pathogen infections in mosquitoes and has the potential to be used in controlling malaria-transmitting mosquito populations.

"Wolbachia is an interesting bacterium that seems perfectly suited for mosquito control. However, there were strong doubts that it could ever be used against field *Anopheles* populations," said Flaminia Catteruccia, associate professor of immunology and infectious diseases at Harvard School of Public Health (HSPH) and at the University of Perugia, Italy. "We were thrilled when we identified infections in natural mosquito populations, as we knew this finding could generate novel opportunities for stopping the spread of malaria."

The study appears online June 6, 2014 in *Nature Communications*. *Anopheles* mosquitoes are the deadliest animal on the planet. They are responsible for transmitting malaria, which causes more than 600,000 deaths each year and puts half of the world's [population](#) at risk for diseases. Wolbachia infections spread rapidly through wild insect populations by inducing a reproductive phenomenon called cytoplasm incompatibility (CI), and 66% of arthropod species are infected. However, it was commonly thought that *Anopheles* mosquitoes were not natural hosts for Wolbachia infections, and attempts to identify infections in these mosquitoes in the field had failed.

Co-author Francesco Baldini, from University of Perugia, Italy and HSPH, in collaboration with researchers from CNRS, France, collected *Anopheles* mosquitoes from villages in Burkina Faso, West Africa, and analyzed their reproductive tracts. Their objective was to identify all the bacteria in the reproductive systems of both male and female mosquitoes; they were not looking directly for Wolbachia. To their surprise, they found a novel strain of the [infection](#), which they named wAnga.

The researchers say they can now investigate whether the wAnga strain shares properties with other Wolbachia strains, which could make control strategies possible by inducing CI and reducing Plasmodium (the parasite that causes malaria) numbers in *Anopheles* mosquitoes in the

field. "If successful, exploiting Wolbachia infections in [malaria](#) mosquitoes could reduce the burden of the disease globally," said co-author Elena Levashina, from the Max Planck Institute for Infection Biology, Berlin.

More information: "Evidence of natural Wolbachia infections in field populations of *Anopheles gambiae*," Francesco Baldini, Nicola Segata, Julien Pompon, Perrine Marcenac, W. Robert Shaw, Roch K. Dabiré, Abdoulaye Diabaté, Elena A. Levashina, Flaminia Catteruccia, *Nature Communications*, [DOI: 10.1038/ncomms4985](https://doi.org/10.1038/ncomms4985) , online June 6, 2014.

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