

Surprising sand fly find yields new species of bacteria

May 6 2021, by Mick Kulikowski



Sand flies are attracted to a newly discovered species of bacteria. Credit: Edgar Rowton

Researchers at North Carolina State University and the University of North Carolina Greensboro made a surprising finding while examining areas where sand flies rear their young: a new species of bacteria that is highly attractive to pregnant, or gravid, sand flies. The findings could advance the production of ecologically safe baits or traps to reduce sand

fly populations.

Sand flies are vectors for important parasitic diseases affecting people in tropical and subtropical regions in Asia, Africa and the Middle East. One of those diseases is Leishmaniasis, which generally causes sores and skin ulcers but in some cases can detrimentally affect internal organs.

"Sand flies live in sheltered places such as animal burrows, caves, and rock or tree crevices, so it's difficult to reach them with insecticides," said Loganathan Ponnusamy, principal research scholar in NC State's Department of Entomology and Plant Pathology and the corresponding author of a paper describing the research. "If you're able to attract [sand flies](#) with a chemical that attracts them in nature, you're better able to target and kill them."

The research team, which included researchers from Gideon Wasserberg's lab at the University of North Carolina Greensboro, cultured a number of different bacterial species from the sand fly larval rearing area and found one that hadn't yet been identified: *Sphingobacterium phlebotomi*, a new member of the family of bacteria known as Sphingobacteriaceae.

To prove that the bacterium hadn't already been identified, Madhavi Kakumanu, an NC State research scholar, performed a number of tests—including scanning [electron microscopy](#), [chemical analysis](#) and whole genome sequencing—and showed the bacterium's novelty.

"We were culturing and isolating a lot of different bacteria and found this new one almost by accident," Kakumanu, the paper's first author, said.

Bahjat Fadi Marayati, a [graduate student](#) in Wasserberg's lab, conducted attraction tests and demonstrated that this new bacteria species produces

volatile chemicals that were attractive to pregnant sand flies.

Pregnant sand flies preferred the smell of the new bacterium over other [chemical](#) compounds presented during testing, Ponnusamy said, showing that the bacterium acted as a beacon for an appropriate place for females to lay eggs.

Ponnusamy says further testing will be done to narrow down even further the [chemical compounds](#) that attract [sand](#) flies.

The paper describing the new bacterium – and presenting a name for it – appears in the *International Journal of Systematic and Evolutionary Microbiology*.

More information: Madhavi L. Kakumanu et al, *Sphingobacterium phlebotomi* sp. nov., a new member of family Sphingobacteriaceae isolated from sand fly rearing substrate, *International Journal of Systematic and Evolutionary Microbiology* (2021). [DOI: 10.1099/ijsem.0.004809](#)

Provided by North Carolina State University

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