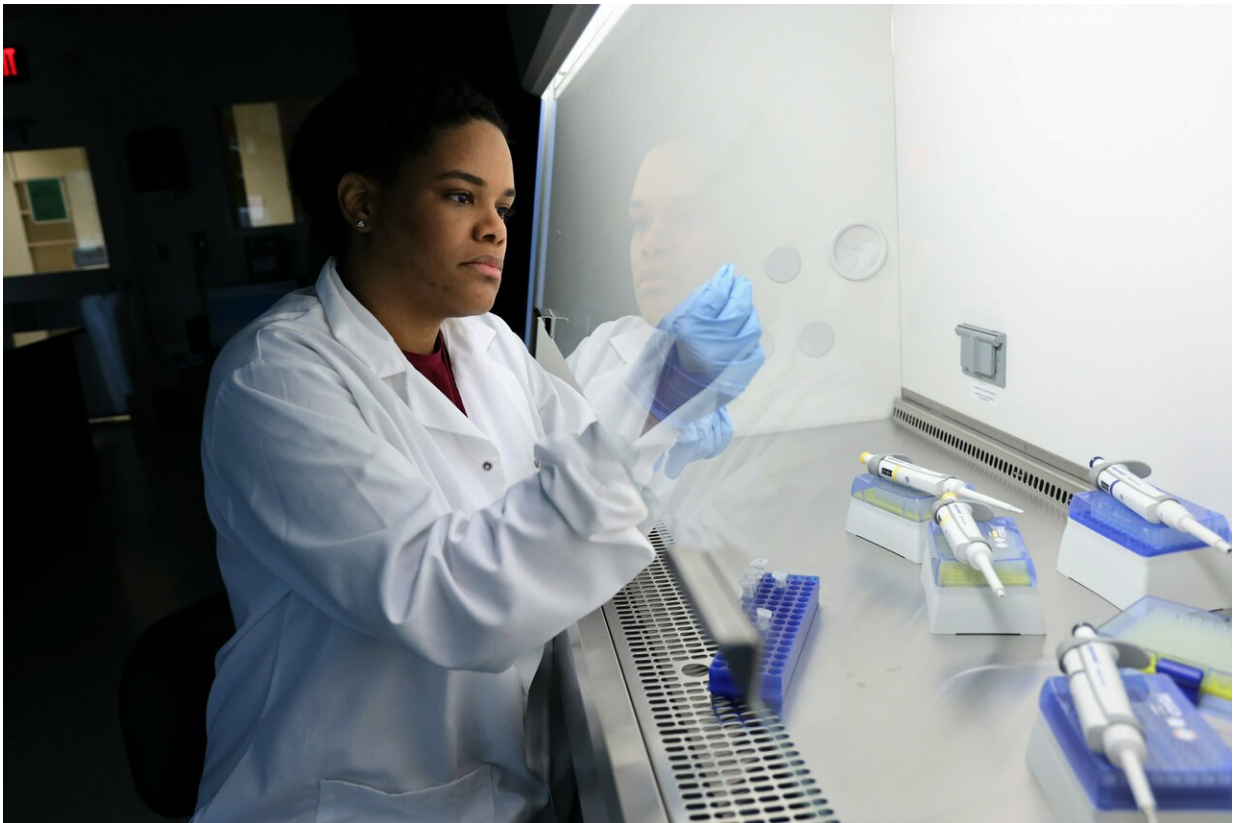


Mosquito known to transmit malaria has been detected in Ethiopia for the first time

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Tamar Carter, Ph.D., assistant professor of tropical disease biology at Baylor University Credit: Robert Rogers/Baylor University

A type of mosquito that transmits malaria has been detected in Ethiopia for the first time, and the discovery has implications for putting more

people at risk for malaria in new regions, according to a study led by a Baylor University researcher.

The mosquito, *Anopheles stephensi*, normally is found in the Middle East, Indian Subcontinent and China. Previous research shows that more than 68 percent of Ethiopia's population is at risk for malaria, with an average of 2.5 million cases reported annually, according to the World Malaria Report of 2017.

"From a public health standpoint, or that mosquito populations are increasing where they were once were scarce," said researcher Tamar Carter, Ph.D., assistant professor of tropical disease biology in Baylor's College of Arts & Sciences, who led the lab work and genetic analysis that led to the identification of the species.

"If these [mosquitoes](#) carry malaria, we may see an emergence of malaria in new regions," she said.

According to the World Health Organization, only certain species of mosquitoes of the *Anopheles* genus—and only females of those species—transmit malaria.

More studies are needed to determine how effective the *Anopheles stephensi* is in delivering a single-celled parasite that can trigger different forms of malaria, according to the research article—"First detection of *Anopheles stephensi* Liston, 1901 (Diptera: culicidae) in Ethiopia using molecular and morphological approaches"—published in *Acta Tropica*, an international journal on infectious diseases.

"We need to confirm that *Anopheles stephensi* carries malaria parasites in Ethiopia," Carter said. "We also need to investigate how the *Anopheles stephensi* got to Ethiopia and other parts of the Horn of Africa. The question I am particularly interested in is if *Anopheles stephensi* is a

relatively recent introduction or something that has been flying under the radar in Ethiopia for a long time.

"Clarifying this will help guide better mosquito control efforts in Ethiopia," she said. "We plan to use genomic techniques to study the history of *Anopheles stephensi* in Ethiopia. More research is needed on the feeding and breeding behavior of the Ethiopian *Anopheles stephensi*, and how well it responds to insecticides, to determine best ways to control the mosquito population."

If *Anopheles stephensi*'s propensity for feeding indoors is observed in Ethiopia, different malaria control strategies may need to be implemented, such as insecticide-treated bed nets and indoor residual insecticide spraying.

Throughout November and December 2016, researchers from Jigjiga University in Ethiopia, led by co-first-author Solomon Yared of Jigjiga, collected [mosquito larvae](#) and pupae from [water reservoirs](#) in Kebri Dehar, an eastern Ethiopian city with a population of 1.3 million, in the Ethiopian Somali Regional State. These larvae were reared to adulthood. Subsequent review of the morphological data confirmed findings from the genetic analysis.

Kebri Dehar has an estimated population of 100,191—51,327 men and 48,864 women, according to figures from the Ethiopian Central Statistical Agency in 2007.

The highest levels of malaria transmission are observed in the north, west and eastern lowland of Ethiopia, according to the research article. Malaria transmission exhibits a seasonal and unstable pattern there, varying with altitude and rainfall.

The article further states that as the migration of people in search of

fertile land for crop production and livestock rearing along the [river basin](#), there is concern that malaria transmission may continue to increase in and outside the region. In the eastern lowlands, such as Afar and the Ethiopian Somali Regional State, malaria is endemic along the rivers, where small-scale irrigation activities are practiced for agricultural purposes.

To date, 44 species and subspecies of anopheline mosquitoes have been documented in Ethiopia, with the predominant malaria type being *Anopheles arabiensis*.

To gain better insight into the geographic range of *Anopheles stephensi*, the next step is to conduct mosquito surveys in multiple locations throughout Ethiopia, Carter said. Researchers believe the effort should center on the eastern portion, where they said information on [malaria](#) vectors in general is scarce. They said both rural and urban surveys are needed, particularly to investigate the role that livestock presence plays in *Anopheles stephensi* abundance.

More information: Tania Pal Choudhury et al, Identification, characterization and expression analysis of *Anopheles stephensi* double peroxidase, *Acta Tropica* (2018). [DOI: 10.1016/j.actatropica.2018.10.008](#)

Provided by Baylor University

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