

To protect yourself from malaria sleep with a chicken next to your bed

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Credit: CDC

For the first time, scientists have shown that malaria-transmitting mosquitoes actively avoid feeding on certain animal species such as chickens, using their sense of smell. Odors emitted by species such as chickens could provide protection for humans at risk of mosquito-transmitted diseases, according to a study in the open access *Malaria Journal*.

Researchers at the Swedish University of Agricultural Sciences and Addis Ababa University, Ethiopia found that *Anopheles arabiensis*, one of the predominant species transmitting malaria in sub-Saharan Africa, avoids [chickens](#) when looking for hosts to feed on. This indicates that, unlike humans, cattle, goats and sheep, chickens are a non-host species for *An. arabiensis* and that the mosquitoes have developed ways of distinguishing them from host species.

Rickard Ignell, the corresponding author, said: "We were surprised to find that [malaria mosquitoes](#) are repelled by the odors emitted by chickens. This study shows for the first time that malaria mosquitoes actively avoid feeding on certain animal species, and that this behavior is regulated through odor cues."

To find out which species the mosquitoes prefer, the research team collected data on the population of human and domestic animals in three Ethiopian villages. They also collected blood-fed mosquitoes to test for the source of the blood that the mosquitoes had fed on. People living in the areas in which the research was conducted share their living quarters with their livestock. The researchers found that while *An. arabiensis* strongly prefers human over animal blood when seeking hosts indoors, it randomly feeds on cattle, goats and sheep when outdoors, but avoids chickens in both settings, despite their relatively high abundance.

Since mosquitoes select and discriminate between their hosts mainly based on their sense of smell, the researchers collected hair, wool and feathers from potential host and non-host species to analyze the odor compounds present in them. Identifying certain compounds that were only present in chicken feathers, the researchers used these and other compounds obtained from all species to test their ability to repel mosquitoes from mosquito traps. The traps were set up in 11 thatched houses in one of the villages for a total of 11 days. In each of the houses, a single volunteer aged between 27 and 36 years slept under an untreated

bed net.

The researchers found that significantly fewer mosquitoes were caught in traps baited with chicken compounds than in control traps. Suspending a living chicken in a cage next to a trap had a similar repellent effect.

Because it feeds indoors and outdoors on various host species, *An. arabiensis* is difficult to control with existing methods, according to previous research. The results of this study suggest that, in combination with established control methods, the odors emitted by chickens and other non-host [species](#) could prove useful in controlling *An. arabiensis*.

Rickard Ignell said: "People in sub-Saharan Africa have suffered considerably under the burden of malaria over an extended period of time and mosquitoes are becoming increasingly physiologically resistant to pesticides, while also changing their feeding habits for example by moving from indoors to outdoors. For this reason there is a need to develop novel control methods. In our study, we have been able to identify a number of natural odour compounds which could repel host-seeking malaria [mosquitoes](#) and prevent them from getting in contact with people."

More information: Kassahun T. Jaleta et al, Chicken volatiles repel host-seeking malaria mosquitoes, *Malaria Journal* (2016). [DOI: 10.1186/s12936-016-1386-3](#)

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