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Malaria-infected Mosquitoes Carry Fungi

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Editorial

Mosquitoes are infected with *Metarhizium anisopliae* through the cuticle, and it multiplies inside the hemolymph. We created recombinant lines that express chemicals that focus on sporozoites as they travel through the hemolymph to the salivary glands, allowing *M. anisopliae* to combat malaria in mosquitoes with advanced malaria infections. Mosquitoes were treated with scorpine, an antibacterial toxin, or *M. anisopliae* expressing salivary gland and midgut peptide 1 (SM1), which prevents sporozoites from adhering to salivary glands, eleven days after ingesting blood infected with Plasmodium [1]. By means of 71 percent, 85 percent, and 90 percent, respectively, these reduced sporozoite counts. Sporozoite numbers were reduced by 98 percent when *M. anisopliae* expressed scorpine and a [SM1]8:scorpine fusion protein indicating that metarhizium-mediated suppression of Plasmodium development may be a useful tool for the treatment of malaria.

Over 1,000,000 people, primarily African children, succumb to the disease each year, and over half of the world's population is at risk of catching malaria. The increasing resistance of parasites and vectors to tablets and pesticides hinders attempts to control the disease. Because pyrethroid-treated bed nets constitute the cornerstone of malaria control programmes and there are no immediate opportunities for new chemical insecticides, the emergence and spread of pyrethroid-resistant mosquitoes is a particular challenge. Therefore, there is a pressing need for practical malaria management solutions [2].

Fungi, including *Metarhizium anisopliae*, which can be pathogenic to human mosquitoes, have been employed in a number of field and laboratory studies [3]. Fungal pathogens, as opposed to microorganisms and viruses, infect mosquitoes directly through contact with the cuticle, making them amenable to the methods currently used to transport chemical insecticides, such as spraying on indoor surfaces of homes, cotton ceiling hangings, curtains, and mattress nets, or using them in outdoor odorbaited traps. Because fungi act synergistically with a variety of insecticides, including pyrethroids and dichlorodiphenyltrichloroethane (DDT), and because fungi are equally effective against insecticide-resistant and insecticide-inclined mosquitoes, fungal spores persist on some treated surfaces for months (five) and may be used in insecticide-resistance control or combined vector control [4].

Using currently available fungal lines, mosquito demise is slow, but it takes Plasmodium falciparum, the malaria-causing parasite, 12 to 14 days to develop inside the mosquito from ingested gametocytes to infectious sporozoites. Using a rat malaria model, it was discovered that fungal biopesticides reduced the capacity of mosquitoes to transmit malaria by 98 percent as long as the fungus irritated them shortly after ingesting Plasmodium [5]. The success of fungal biopesticides depends on a high likelihood of early contamination, and the high level of insurance that this requires can be challenging to provide in the area because of issues like individual resistance. However, a slow rate of kill that allows mosquitoes to reach some of their lifetime reproductive output may reduce choice stress for resistance to the biopesticide and translate into longer periods of effective product use. Metarhizium may be developed to kill insects more quickly. It may be very beneficial to develop fungal lines that significantly reduce mosquito transmission because this will improve disease management without accelerating the spread of resistance (five). We modified *M. anisopliae* to produce chemicals that specifically prevent parasite development in the vector in order to achieve this effect.

Conflicts of Interest

None.

References

1. Breman, Joel G. "The ears of the hippopotamus: manifestations, determinants, and estimates of the malaria burden." *Am J Trop Med Hyg* 64 (2001).
2. Jasinskiene, Nijole, Craig J. Coates, Mark Q. Benedict and Anthony J. Cornel. "Transformation of the yellow fever mosquito, Aedes aegypti, with the Hermes element from the housefly." *Proc Natl Acad Sci* 95 (1998): 3743-3747.
3. Coates, Craig J., Nijole Jasinskiene, Linda Miyashiro and Anthony A. James. "Mariner Transposition and transformation of the yellow fever mosquito, Aedes aegypti." *Proc Nat Acad Sci* 95 (1998): 3748-3751.
4. Catteruccia, Flaminia, Tony Nolan, Thanasis G. Loukeris and Claudia Blass, et al. "Stable germline transformation of the malaria mosquito Anopheles stephensi." *Nat* 405 (2000): 959-962.
5. Arankalle, Vidya A., Shubham Shrivastava, Sarah Cherian and Rashmi S. Gunjikar, et al. "Genetic divergence of Chikungunya viruses in India (1963-2006) with special reference to the 2005-2006 explosive epidemic." *J Gen Virol* 88 (2007): 1967-1976.

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