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Malaria mosquito resistance revealed

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Malaria causes more than a million deaths a year in Africa alone. Attempts to combat the disease have been frustrated on two fronts: acquisition of resistance to antimalarial agents by the parasite itself and acquisition of resistance to insecticides by its mosquito vector, *Anopheles gambiae*. In the May 8 *Nature*, Mylene Weill and colleagues at the Institut des Sciences et de l'Evolution, Montpellier, France, identify a mechanism of resistance to organophosphate insecticides, paving the way for a renewed attack on the most common resistant strains (*Nature*, 423:136-137, May 8, 2003).

Weill *et al.* compared the sequence of an organophosphate target (the acetylcholinesterase gene *ace-1*) in a resistant and susceptible strain of the mosquito *Culex pipiens* - vector of the West Nile virus. Analysis revealed one of 27 nucleotide differences resulting in a G119S substitution that they localized to a position near the active site of the enzyme. Further analysis confirmed the coincidence of this amino acid substitution with insecticide resistance in several other strains of the same species, and it was also identified in the *ace-1* of a resistant strain of *A. gambiae*. In addition, they showed that this amino acid substitution has arisen independently at least three times in mosquito species.

"The development of new insecticides that can specifically inhibit the G119S mutant form of acetylcholinesterase-1 will be crucial in overcoming the spread of resistance," conclude the authors.

References

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