

Genetic marker for insecticide resistance in mosquitoes identified

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Research led by the Liverpool School of Tropical Medicine has identified the genetic basis for resistance to commonly-used insecticides in one of the major malaria-carrying mosquitoes in Africa.

Malaria remains one of the biggest killers of children and pregnant women in the developing world. Much of the effort to combat malaria is focused on controlling the mosquitoes which transmit the disease through the use of insecticides in bednets and indoor spraying.

Mosquitoes can evolve to overcome the way in which insecticides work and the emergence of insecticide-resistant strains of mosquitoes is an increasing problem, therefore understanding more about its genetic and biological basis is critical.

The group, led by Dr Charles Wondji at LSTM, studied strains of the *Anopheles funestus* mosquito and identified a family of genes coding for enzymes known as cytochrome P450s, detecting two genes which were associated with resistance to pyrethroid insecticide. Dr Hilary Ranson of the Liverpool School of Tropical Medicine, an author of the study, explained that these same genes were also recently identified with pyrethroid resistance in the other major malaria-carrying mosquito in Africa, *Anopheles gambiae*:

"We expected to find that different species and populations would have different groups of genes responsible but they are very similar. This is encouraging news because it means that work to overcome resistance in one species is likely to be effective against the other."

Furthermore, provided these genetic markers identified in laboratory populations of mosquitoes are equally predictive in the field - something currently being tested by Dr Wondji - this will overcome a major blocking point in the evaluation of wild mosquito populations. Dr Ranson explained: "Routine use of these molecular

markers for resistance will provide early warning of future control problems due to insecticide resistance and should greatly enhance our ability to mitigate the potentially devastating effects of resistance on malaria control."

Source: Liverpool School of Tropical Medicine

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