

Impact of human activities on the dynamics of insecticide resistance in *Anopheles gambiae*: Case of Benin (West Africa)

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Abstract:

Vector control for malaria prevention remains mainly based on the use of Long Lasting Insecticide Nets (LLINs) and Indoor Residual Spraying (IRS) in Sub-Saharan Africa. The effectiveness of these tools is threatened by insecticide resistance of *An. gambiae* s.s., one of the main African vectors of human *Plasmodium*. Historically, resistance against DDT in natural populations of African malaria vector since the 60's has been selected by insecticide use in public health. Nowadays, it is also clear that most cases of resistance against others classes of insecticides in *An gambiae* s.s. are the result of massive use of these products against crop pests in vegetable and cotton growing areas in the whole West African region.

In addition, some of the pesticides used in agriculture are used against other pest insects (cockroaches, fleas, termites ...), increasing insecticide pressure on *Anopheles* mosquitoes and representing also a risk to the health of humans exposed to these products. This phenomenon remains poorly studied.

To develop food resources, extension of cultivated areas and the need of modern agricultural practices with high yield have to be implemented in sub-Saharan region of Africa. This could further increase the amount of pesticides and selection pressure for resistance in mosquitoes knowing that much more insecticides are used for agriculture purpose than public health. In this situation, what can we do to ensure the efficacy of current or news resistance management strategies and therefore prevent the failure of vector control tools used?

Keywords: *Anopheles*, malaria, vector control; insecticide; resistance; agriculture, Africa