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**TITLE:** Susceptibility to insecticides and molecular characterization of the complex *Anopheles gambiae* in Banambani and Pimperena, Mali (West Africa).

**ABSTRACT:**

Vector control is an important component of the WHO strategy to fight against malaria. Insecticide impregnated bed nets are widely used for the control of malaria vectors in Africa; unfortunately, *An. gambiae s.l.* mosquitoes' resistance to most of these insecticides has been already described in Africa.

Given the reliance of the control strategy on ITNs, it is necessary to assess the susceptibility of vectors to insecticides in different environmental conditions.

The local vector populations were assayed against the four main groups of insecticides used in malaria control: organochlorines (DDT), and pyrethroids (Permethrin, Deltamethrin, Lambdacyhalothrin).

In this study, our objectives were three-folds: 1) to determine the current level of insecticide resistance, 2) to characterize the tested mosquito populations, and 3) to identify *Kdr* gene in the same mosquito populations. The study was carried out in Banambani and Pimperena, two localities where vegetables and cotton are cultivated respectively. The method used to test *An. gambiae* susceptibility to insecticides was the standard W.H.O test (WHO/VBC/81.806). The *kdr* diagnostic was performed on all samples.

In Banambani, mosquito populations showed resistance to Lambdacyhalothrin (78.75%), whereas they were only suspected to be resistant to DDT, Permethrin, and Deltamethrin with respectively 83.75% , 88.75% and 90% of the observed mortality.

In Pimperena, mosquito-vectors were resistant to DDT and Permethrin with respectively 24% and 59% of the observed mortality, whereas they were only suspected to be resistant to Lambdacyhalothrin (80%) and to Deltamethrin (95%).

Analyses of specimens collected in the Banambani and Pimperena show that the *kdr* allele was already present in the Savanna population.

Comparing the samples collected in Banambani and Pimperena, the *kdr* frequency was significantly higher in Pimperena (98.7%) than in the Banambani (72.41%). The *kdr* allele is associated only with the Savanna form population.

**Key Words:** Malaria, Vector, Insecticide, Resistance, and *kdr* gene.