

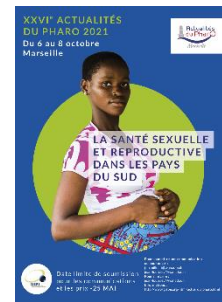
## Actualités du Pharo 2021 – Session 7

### Review of multiple insecticide resistance in *Anopheles gambiae* s.l and vector control challenges in West Africa

Keywords: malaria, multiple resistance, *Anopheles gambiae*, West Africa, review

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**Introduction:** Malaria remains the most deadly disease in sub-Saharan Africa and in West Africa in particular. In the absence of an effective vaccine, vector control (use of long-lasting insecticide-treated nets (LLINs) and indoor residual spraying (IRS)) remains fundamental to the control of the disease. However, the emergence of multiple insecticide resistance in *Anopheles gambiae* s.l., the main vector in the region, can significantly reduce the effectiveness of control interventions. Thus, the objective of this review is to i) Review the level of expansion of this resistance in West Africa ii) Reveal the challenge of vector control iii) Discuss the implementation of innovative alternative strategies and methods.

**Methodology:** The online bibliographic databases Pubmed, Google Scholar were used by inserting keywords "Malaria", "insecticide resistance", "*Anopheles gambiae*" and "Africa". The period covered was 2000 to 2018. Information such as: year & study sites, mosquito species, insecticides used, types of resistance and mechanisms involved were extracted and screened. The inclusion criterion was: presence of phenotypic resistance associated with both target mutation and metabolic enzyme involvement.

**Results:** A total of 20 articles were included. The results reveal a wide expansion of this multiple resistance in the malaria vector *An. gambiae* s.l in the different ecological zones (Forest and Savannah) and even in urban areas of the West African region. Few data are available on *An. melas* in mangrove areas.

**Discussion:** The expansion of this multiple resistance in *An. gambiae* s.l compromises the malaria control and elimination effort. The gap revealed is the lack of harmonisation of vector control strategies in cross-border areas between countries and the lack of interest in the resistance status and mechanisms involved in *An. melas*, the main malaria vector in mangrove areas. There is an urgent need to make resistance management guidelines applicable within national control programmes in order to maintain the effectiveness of control interventions. Alternative methods based on biological and genetic control: *Wolbachia* spp infection, release of sterile males and transgenic mosquitoes should be considered. Communities should be sensitized to take ownership of environmental management.