

Pyrethroid Resistance in *Anopheles gambiae* s.l. from Oyo State, Nigeria: Mechanisms and Implications for Malaria Control

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INTRODUCTION & AIM

Malaria is a devastating disease in sub-Saharan African region. Nigeria accounts for 31% of global malaria deaths and 36% of under-five mortality. Dynamics of malaria transmission and burden in urban areas differ from rural areas however unplanned urbanization may put the populations at increased risk. Malaria primary vectors are *Anopheles gambiae* s.l. and *An. funestus* s.l., its control is highly effective and fundamental in malaria elimination.

METHOD

Larval and pupal stages of *Anopheles* mosquitoes were collected from different breeding sites across each LGA, nurtured Female mosquitoes per community was identified morphologically WHO bioassay was conducted Samples were used for molecular study using Allele-specific PCR-primers and species-specific single nucleotide polymorphism assays to determine the knock down resistance (*kdr*) mutation and members of *An. gambiae* s.l.,

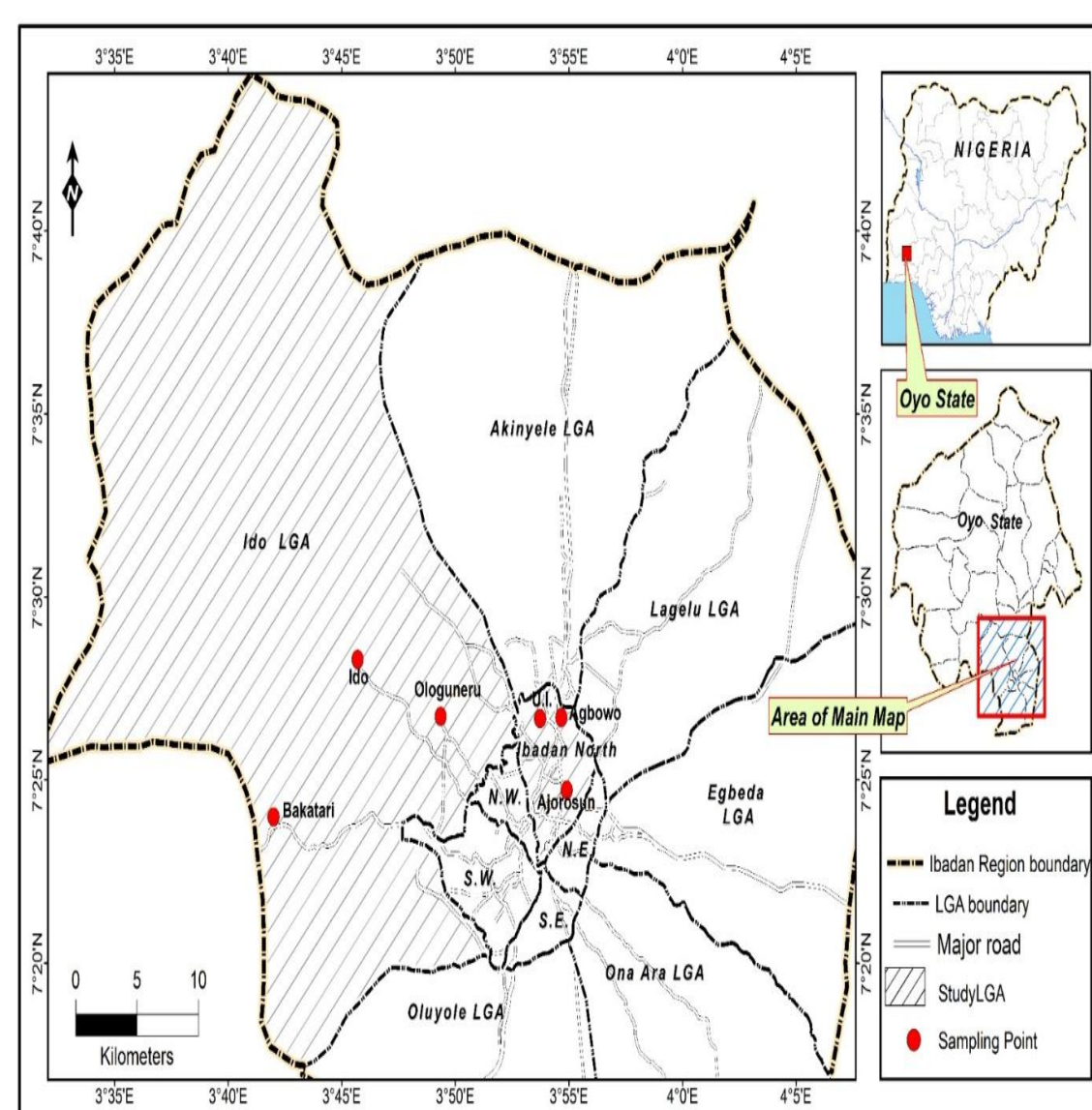


Figure 1. Study communities in Ibadan North and Ido LGA Oyo State

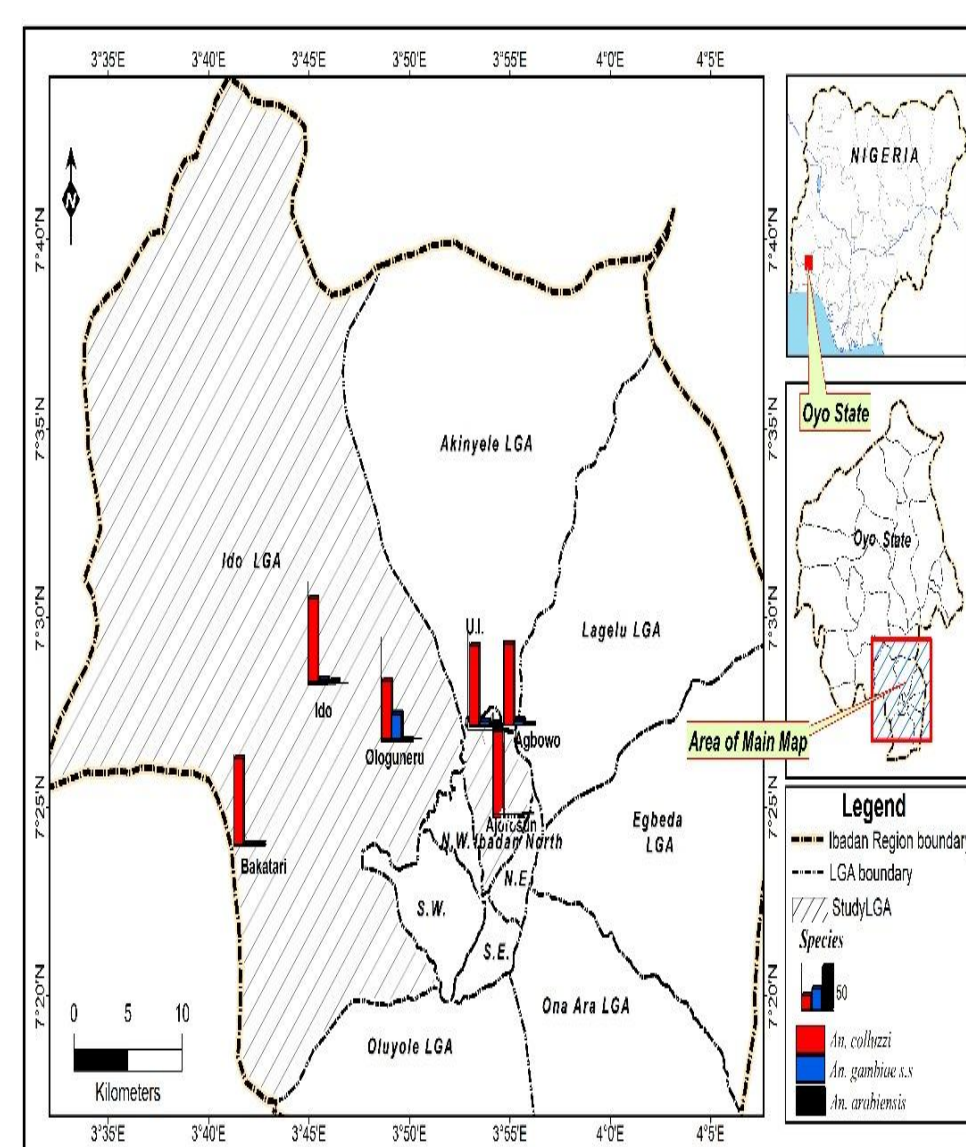


Figure 2. Molecular identification of *Anopheles* species

RESULTS & DISCUSSION

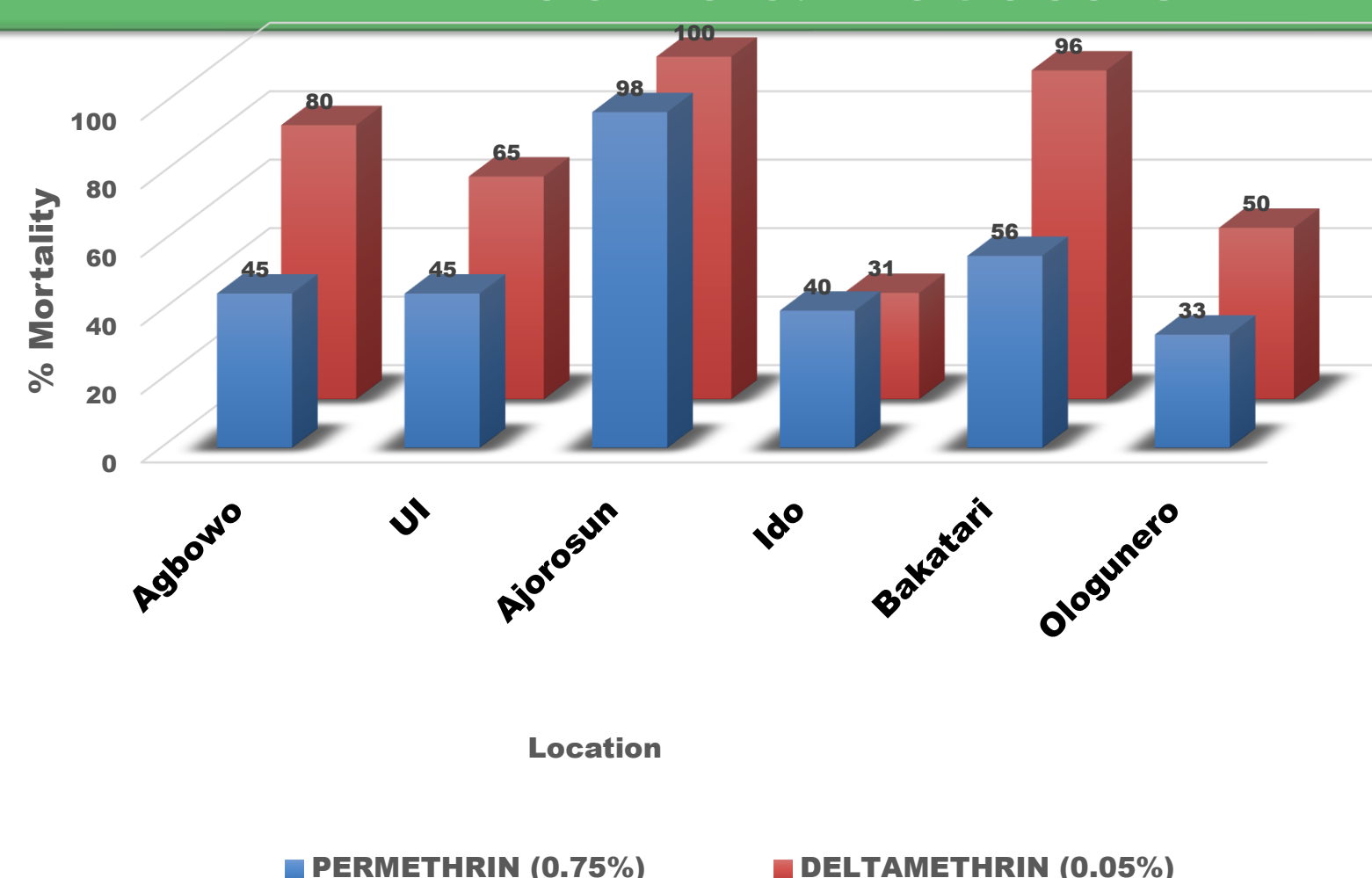


Figure 3. Susceptibility status of *Anopheles* population to insecticides

❖ Synergy bioassay restored 100% susceptibility to deltamethrin in Agbowo, UI and Bakatari, but did not restore susceptibility to permethrin in Agbowo, UI, Ido, Ologunero and Bakatari

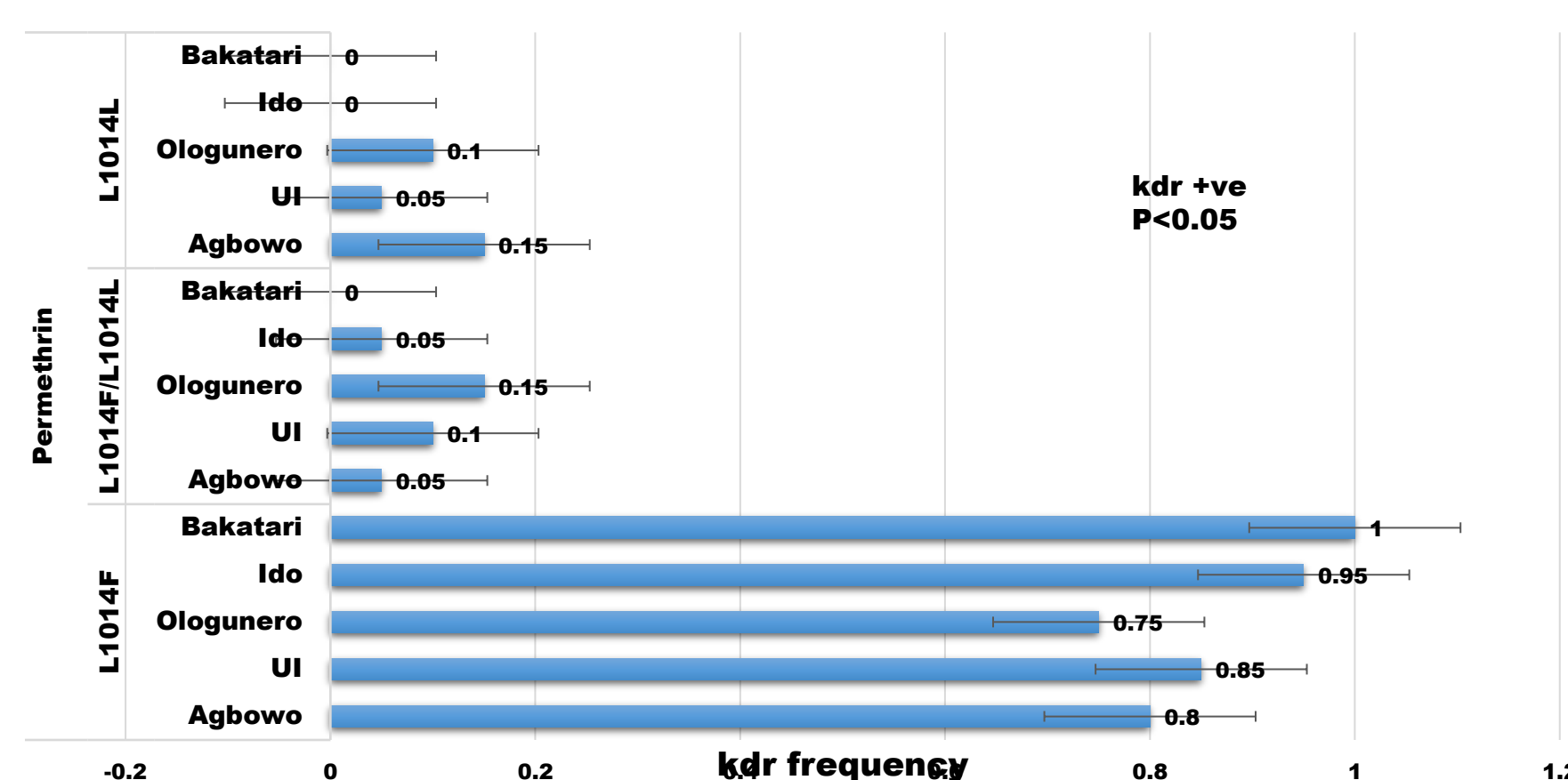


Figure 4. The frequency of *kdr* allele with respect to permethrin. $p < 0.05$.

CONCLUSION

Allele-specific *kdr* genotyping detected the presence of *kdr*-west (L1014F) at the VGSC which is a sensitive indicator of resistance in the populations and is key in resistance monitoring

FUTURE WORK / REFERENCES

Ebrahim E. Eissa, EH Radwan, N Abdel Hakeem, KK Abdel Aziz, HO Hashem, K.H. Radwan4 (2020). Impact If Chlorpyrifos On The Second Instar Mosquito Larvae As Bioindicator In El-Beheira Governorate, Egypt. *International Journal of Limnology*. Doi: 10.14302/Issn.2691-3208.Ijli-20-3268.
Martinez-Torres D, Chandre F, Williamson MS, Darriet F, Berge JB, Devonshire AA, et al., (1998). Molecular characterization of pyrethroid knockdown resistance (*kdr*) in the major malaria vector *Anopheles gambiae* s.s. *Insect Mol Biol* 7:179–84
WHO (2022). Manual for monitoring insecticide resistance in mosquito vectors and selecting appropriate interventions.

