

POSTER PRESENTATION

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# *kdr*-like mutations in the voltage gated sodium channel of a malaria vector *Anopheles stephensi* and development of PCR-based assays for their detection

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## Background

Knockdown resistance (*kdr*) in insects resulting from mutation(s) in the voltage gated sodium channel (VGSC) gene is one of the mechanisms of resistance against DDT and pyrethroid group of insecticides. The most common mutation(s) associated with knock down resistance has been reported to be present at residue Leu1014 in the IIS6 transmembrane segment of the VGSC gene. The present study reports presence of two alternative *kdr*-like mutations in *An. stephensi*—L1014S and L1014F, and development of PCR-based assays for their detection.

## Methods

The IIS6 transmembrane segment of the VGSC of Indian *Anopheles stephensi* collected from Alwar, India, was PCR-amplified from genomic DNA, sequenced and analyzed for amino acid substitutions. Polymerase chain reaction based assays were developed for the identification of two point mutations leading to L1014S and L1014F amino acid substitutions.

## Results

Analysis of DNA sequences revealed presence of two non-synonymous point mutations at residue L1014, i.e., c.3041T>C and c.3042A>T, leading to L1014S and L1014F amino acid substitutions, respectively. The PCR based assays developed for the detection of *kdr* mutations were found specific as revealed by DNA sequencing of respective samples.

## Conclusions

Two alternative *kdr*-like mutations, L1014S and L1014F, were detected in Indian *An. stephensi* population. The occurrence of L1014S is being reported for the first time in *An. stephensi*. PCR based assays were developed for the detection of two *kdr*-like mutations in *An. stephensi*.

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