

Population biology of *Herves* in natural populations of *Anopheles gambiae*.

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Herves is a short inverted repeat-type (Class II) transposable element and a member of the *hAT* superfamily of transposable elements. While related to the characterized elements *hobo* and *Hermes*, *Herves* is quite distinct from these elements, sharing with them less than 25% amino acid identity in the transposase protein coding region. Functional copies of the element have been isolated from laboratory strains of *An. gambiae* and have been shown to serve as a gene vector in *Drosophila melanogaster*. *Herves* provides an opportunity to examine the dynamics of an active transposable element of the type currently being used as gene vectors and considered as genetic drive agents in *An. gambiae*. Contemporary and historical patterns of activity of *Herves* will be useful starting points in developing models for the behavior of intentionally released transposable elements carrying anti-*Plasmodium* effector genes in this species. *Herves* is present in all members of the *An. gambiae* species complex. The copy number of *Herves* is less than ten per individual in all species examined. Most of the elements are full-length or approximately full-length and internally deleted elements were rarely detected. 95% of the individuals tested within populations of *An. gambiae*, *arabiensis* and *merus* had evidence of full-length transposase coding regions. Sequence analysis however showed that approximately 20% of the individuals in these populations have potentially functional transposases (no premature stop codons), consistent with the hypothesis that these elements are active today. Element frequency distributions have been used to infer recent historical levels of activity and *Herves* shows levels of activity comparable to other transposable elements that have been examined in the past. Efforts are focused on determining the distribution of *Herves* within the species complex as well as levels of activity.