

GEPHE SUMMARY

	Gephebase Gene	GephelD
para (kdr) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase='para (kdr)'#gephebase-summary-title)	GP00002529	Main curator
Published	Entry Status	Courtier

PHENOTYPIC CHANGE

	Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category='Physiology'#gephebase-summary-title)	Trait	
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait='Xenobiotic resistance (insecticide)'#gephebase-summary-title)	Trait State in Taxon A	
Anopheles arabiensis	Trait State in Taxon B	
Anopheles arabiensis - resistant	Ancestral State	
Data not curated	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status='Intraspecific'#gephebase-summary-title)		
Taxon A	Latin Name	Latin Name
Anopheles arabiensis (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms='Anopheles arabiensis'#gephebase-summary-title)		
-	Common Name	Common Name
Anopheles arabiensis Patton, 1905	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Anophelinae; Anopheles; Cellia; Pyretophorus; gambiae species complex	Lineage	Lineage
gambiae species complex () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44542)	Parent	Parent
7173 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7173)	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
para	Synonyms	GenebankID or UniProtKB
bas; bss; CG9907; Dmel\CG9907; DmNav; DmNav1; DmNa[[v]]; DmNa[[V]]; DmNa[[v]]; l(1)14Da; l(1)ESHS48; lincRNA.S9469; Nav1; Ocd; olfD; par; sbl; sbl-1; Shu; Shudderer	P35500 (http://www.uniprot.org/uniprot/P35500)	
7227.FBpp0303597 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 7227.FBpp0303597)	String	
Belongs to the sodium channel (TC 1.A.1.10) family. Para subfamily.	Sequence Similarities	
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)	GO - Molecular Function	
GO:0005244 : voltage-gated ion channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005244)		
GO:0005248 : voltage-gated sodium channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005248)		

GO:0005272 : sodium channel activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005272>)

GO - Biological Process

GO:0045433 : male courtship behavior, veined wing generated song production

(<https://www.ebi.ac.uk/QuickGO/term/GO:0045433>)

GO:0001666 : response to hypoxia (<https://www.ebi.ac.uk/QuickGO/term/GO:0001666>)

GO:0009612 : response to mechanical stimulus

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009612>)

GO:0034765 : regulation of ion transmembrane transport

(<https://www.ebi.ac.uk/QuickGO/term/GO:0034765>)

GO:0035725 : sodium ion transmembrane transport

(<https://www.ebi.ac.uk/QuickGO/term/GO:0035725>)

GO:0007638 : mechanosensory behavior

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007638>)

GO:0060078 : regulation of postsynaptic membrane potential

(<https://www.ebi.ac.uk/QuickGO/term/GO:0060078>)

GO - Cellular Component

GO:0005887 : integral component of plasma membrane

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)

GO:0001518 : voltage-gated sodium channel complex

(<https://www.ebi.ac.uk/QuickGO/term/GO:0001518>)

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%No%#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Coding%#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%SNP%#gephebase-summary-title>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

L1014S

Experimental Evidence

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%Candidate+Gene%#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Leu	Ser	1014

Main Reference

Dynamics of the pyrethroid knockdown resistance allele in western Kenyan populations of *Anopheles gambiae* in response to insecticide-treated bed net trials. (2004)

(<https://pubmed.ncbi.nlm.nih.gov/15210997>)

Authors

Stump AD; Atieli FK; Vulule JM; Besansky NJ

Abstract

Permethrin and DDT resistance in *Anopheles gambiae* s.s. associated with a leucine-serine knockdown resistance (kdr) mutation in the voltage-gated sodium channel gene was discovered recently in western Kenya where a large scale permethrin-impregnated bed net (ITN) program has been implemented. Collections of *An. gambiae* s.l. were made from intervention and control villages prior to and after onset of the program. The kdr genotypes were determined using allele-specific polymerase chain reaction diagnostic tests. In *An. gambiae* s.s., the frequency of the kdr mutation prior to ITN introduction was approximately 3-4% in western Kenya and zero in samples from the coast. After ITN introduction, the kdr mutation increased in ITN and neighboring villages from approximately 4% to approximately 8%, but remained unchanged in villages at least 20 km distant and was not detected in coastal Kenya. The identical leucine-serine mutation was found in a single *An. arabiensis* individual among 658 tested. The leucine-phenylalanine kdr mutation common in west African *An. gambiae* populations was not detected in *An. gambiae* s.l. from Kenya. Implications for the population structure and control of *An. gambiae* are discussed.

Additional References

Molecular biology of insect sodium channels and pyrethroid resistance. (2014) (<https://pubmed.ncbi.nlm.nih.gov/24704279>)

RELATED GEPHE

Related Genes

1 (resistance to dieldrin) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%7173%/and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

