

GEPHE SUMMARY

	Gephebase Gene		GepheID
para (kdr) (<a +para+(kdr)^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+para+(kdr)^#gepbase-summary-title)		GP00000823	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category	
Physiology (<a +physiology^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology^#gepbase-summary-title)		
	Trait	
Xenobiotic resistance (insecticide) (<a +xenobiotic+resistance+(insecticide)^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Xenobiotic+resistance+(insecticide)^#gepbase-summary-title)		
	Trait State in Taxon A	
Bemisia tabaci		
	Trait State in Taxon B	
Bemisia tabaci - resistant		
	Ancestral State	
Taxon A		
	Taxonomic Status	
Intraspecific (<a +intraspecific^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific^#gepbase-summary-title)		

Taxon A	Latin Name	Taxon B	Latin Name
Bemisia tabaci (<a +bemisia+tabaci^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Bemisia+tabaci^#gepbase-summary-title)		Bemisia tabaci (<a +bemisia+tabaci^#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Bemisia+tabaci^#gepbase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
Aleyrodes tabaci; sweet potato whitefly; Bemisia tabaci (Gennadius, 1889)		Aleyrodes tabaci; sweet potato whitefly; Bemisia tabaci (Gennadius, 1889)	
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Sternorrhyncha; Aleyrodoidea; Aleyrodidae; Aleyrodinae; Bemisia		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Sternorrhyncha; Aleyrodoidea; Aleyrodidae; Aleyrodinae; Bemisia	
	Parent		Parent
Bemisia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7037)		Bemisia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7037)	
7038	NCBI Taxonomy ID	7038	NCBI Taxonomy ID
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7038)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7038)	
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
para		P35500 (http://www.uniprot.org/uniprot/P35500)
	Synonyms	GenebankID or UniProtKB
bas; bss; CG9907; Dmel\CG9907; DmNav; DmNav1; DmNa[[v]]; DmNa[[V]]; DmNa[[v]]1; l(1)14Da; l(1)ESH548; lincRNA.S9469; Nav1; Ocd; olfD; par; sbl; sbl-1; Shu; Shudderer		CAD29438 (https://www.ncbi.nlm.nih.gov/nuccore/CAD29438)
	String	
7227.FBpp0303597 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0303597)		
	Sequence Similarities	
Belongs to the sodium channel (TC 1.A.1.10) family. Para subfamily.		
	GO - Molecular Function	
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)		
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

M918V

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	-	-	-

Main Reference

Mutations in the Bemisia tabaci para sodium channel gene associated with resistance to a pyrethroid plus organophosphate mixture. (2002) (<https://pubmed.ncbi.nlm.nih.gov/12429130>)

Authors

Morin S; Williamson MS; Goodson SJ; Brown JK; Tabashnik BE; Dennehy TJ

Abstract

The voltage-gated sodium channel is the primary target site of pyrethroid insecticides. In some insects, super knockdown resistance (super-kdr) to pyrethroids is caused by point mutations in the linker fragment between transmembrane segments 4 and 5 of the para-type sodium channel protein domain II (II S4-5). Here, we identify two mutations in the II S4-5 linker of the para-type sodium channel of the whitefly, BEMISIA TABACI: methionine to valine at position 918 (M918V) and leucine to isoleucine at position 925 (L925I). Although each mutation was isolated independently from strains >100-fold resistant to a pyrethroid (fenpropathrin) plus organophosphate (acephate) mixture, only L925I was associated with resistance in strains derived from the field in 2000 and 2001. The L925I mutation occurred in all individuals from nine different field collections that survived exposure to a discriminating concentration of fenpropathrin plus acephate. Linkage analysis of hemizygous male progeny of unmated heterozygous F1 females (L925I x wild-type) shows that the observed resistance is tightly linked to the voltage-gated sodium channel locus. The results provide a molecular tool for better understanding, monitoring and managing pyrethroid resistance in B. tabaci.

Additional References

Mutations in DIIS5 and the DIIS4-S5 linker of Drosophila melanogaster sodium channel define binding domains for pyrethroids and DDT. (2007) (<https://pubmed.ncbi.nlm.nih.gov/17991435>)

The molecular interactions of pyrethroid insecticides with insect and mammalian sodium channels. (2001) (<https://pubmed.ncbi.nlm.nih.gov/11695180>)

RELATED GEPHE

Related Genes

5 (acetyl-CoA carboxylase (ACC), Acetylcholinesterase (Ace-1), Acetylcholinesterase (Ace-2), CYP6CM1, resistance to dieldrin) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^7038^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^7038^/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^7038^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^7038^/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^7038^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

