

GEPHE SUMMARY

	Gephebase Gene		GepheID
para (kdr) (<a +para+(kdr)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+para+(kdr)^#gephebase-summary-title)		GP00002501	
	Entry Status	Courtier	Main curator
Published			

PHENOTYPIC CHANGE

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

Taxon A	Latin Name	Taxon B	Latin Name
Thrips tabaci (<a +thrips+tabaci^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Thrips+tabaci^#gephebase-summary-title)		Thrips tabaci (<a +thrips+tabaci^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Thrips+tabaci^#gephebase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
Thrips tabaci Lindeman, 1889		Thrips tabaci Lindeman, 1889	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripodea; Thripidae; Thripinae; Thrips		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripodea; Thripidae; Thripinae; Thrips	
	Parent		Parent
Thrips () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=45057)		Thrips () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=45057)	
161014 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=161014)	NCBI Taxonomy ID	161014 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=161014)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

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		
	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>)

Mutation #1

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="No"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive Null=))

Presumptive Null

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="Coding"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular Type=))

Molecular Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="SNP"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration Type=))

Aberration Type

Nonsynonymous

SNP Coding Change

M918L+V1010A

Molecular Details of the Mutation

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="Candidate Gene"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental Evidence=))

Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Met	Thr	918

Identification of an alternative knockdown resistance (kdr)-like mutation, M918L, and a novel mutation, V1010A, in the Thrips tabaci voltage-gated sodium channel gene. (2014) (<https://pubmed.ncbi.nlm.nih.gov/23983138>)

Main Reference

Wu M; Gotoh H; Waters T; Walsh DB; Lavine LC

Authors

Knockdown resistance (kdr) has been identified as a main mechanism against pyrethroid insecticides in many arthropod pests including in the onion thrips, Thrips tabaci. To characterize and identify pyrethroid-resistance in onion thrips in Washington state, we conducted insecticide bioassays and sequenced a region of the voltage gated sodium channel gene from several different T. tabaci populations.

Abstract

Field collected Thrips tabaci were found to have large variations in resistance to the pyrethroid insecticide lambda-cyhalothrin. We identified two single nucleotide substitutions in our analysis of a partial sequence of the T. tabaci voltage-gated sodium channel gene. One mutation resulted in the non-synonymous substitution of methionine with leucine (M918L), which is well known to be responsible for super knockdown resistance in some pest species. Another non-synonymous substitution, a valine (GTT) to alanine (GCT) replacement at amino acid 1010 (V1010A) was identified in our study and was associated with lambda-cyhalothrin resistance.

We have characterized a known kdr mutation and identified a novel mutation in the voltage-gated sodium channel gene of Thrips tabaci associated with resistance to lambda-cyhalothrin. This gene region and these mutations are expected to be useful in the development of a diagnostic test to detect kdr resistance in many onion thrips populations.

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Additional References

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

Mutation #2

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="No"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive Null=))

Presumptive Null

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="Coding"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular Type=))

Molecular Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="SNP"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration Type=))

Aberration Type

Nonsynonymous

SNP Coding Change

M918T+L1014F

Molecular Details of the Mutation

Experimental Evidence

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

Identification of an alternative knockdown resistance (kdr)-like mutation, M918L, and a novel mutation, V1010A, in the Thrips tabaci voltage-gated sodium channel gene. (2014) (<https://pubmed.ncbi.nlm.nih.gov/23983138>)

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Additional References

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RELATED GEPHE

No matches found.

Related Genes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase="para \(kdr\)"/and+Taxon ID="161014"/or+Gene Gephebase="para \(kdr\)"/and+Taxon ID="161014"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=))

Related Haplotypes

EXTERNAL LINKS

COMMENTS