

GEPHE SUMMARY

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

Gephebase Gene GP00001860

Entry Status Courtier

Published

GepheID Main curator

PHENOTYPIC CHANGE

Physiology ([https://www.gephebase.org/search-criteria?/and+Trait Category=~Physiology^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title))

Trait Category

Xenobiotic resistance (insecticide) ([https://www.gephebase.org/search-criteria?/and+Trait=~Xenobiotic resistance \(insecticide\)^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Trait=~Xenobiotic+resistance+(insecticide)^#gephebase-summary-title))

Trait

Varroa destructor - sensitive to pyrethroids

Trait State in Taxon A

Varroa destructor - resistant to pyrethroids - in samples collected from several locations in Central/ Southern England and in the Czech Republic

Trait State in Taxon B

Taxon A

Ancestral State

Intraspecific ([https://www.gephebase.org/search-criteria?/and+Taxonomic Status=~Intraspecific^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title))

Taxonomic Status

Taxon A	Latin Name	Taxon B	Latin Name
Varroa destructor ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Varroa+destructor^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Varroa destructor^#gephebase-summary-title</a> )	Varroa destructor	Varroa destructor ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Varroa+destructor^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Varroa destructor^#gephebase-summary-title</a> )	Varroa destructor
honeybee mite	Common Name	honeybee mite	Common Name
honeybee mite; honeybee ectoparasitic mite; Varroa destructor Anderson & Trueman, 2000 species	Synonyms	honeybee mite; honeybee ectoparasitic mite; Varroa destructor Anderson & Trueman, 2000 species	Synonyms
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Chelicerata; Arachnida; Acari; Parasitiformes; Mesostigmata; Monogynaspida; Gamasina; Dermanyssioidea; Varroidae; Varroa	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Chelicerata; Arachnida; Acari; Parasitiformes; Mesostigmata; Monogynaspida; Gamasina; Dermanyssioidea; Varroidae; Varroa	Lineage
Varroa () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=62624">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=62624</a> )	Parent	Varroa () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=62624">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=62624</a> )	Parent
109461 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=109461">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=109461</a> )	NCBI Taxonomy ID	109461 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=109461">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=109461</a> )	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

para

Generic Gene Name P35500 (<http://www.uniprot.org/uniprot/P35500>)

Synonyms ()

UniProtKB Drosophila melanogaster

GenebankID or UniProtKB

(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](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

L925V

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	CTG	GTG	-
Amino-acid	Leu	Val	925

Main Reference

An amino acid substitution (L925V) associated with resistance to pyrethroids in *Varroa destructor*. (2013) (<https://pubmed.ncbi.nlm.nih.gov/24367572>)

Authors

González-Cabrera J; Davies TG; Field LM; Kennedy PJ; Williamson MS

Abstract

The *Varroa* mite, *Varroa destructor*, is an important pest of honeybees and has played a prominent role in the decline in bee colony numbers over recent years. Although pyrethroids such as tau-fluvalinate and flumethrin can be highly effective in removing the mites from hives, their intensive use has led to many reports of resistance. To investigate the mechanism of resistance in UK *Varroa* samples, the transmembrane domain regions of the *V. destructor* voltage-gated sodium channel (the main target site for pyrethroids) were PCR amplified and sequenced from pyrethroid treated/untreated mites collected at several locations in Central/Southern England. A novel amino acid substitution, L925V, was identified that maps to a known hot spot for resistance within the domain IIS5 helix of the channel protein; a region that has also been proposed to form part of the pyrethroid binding site. Using a high throughput diagnostic assay capable of detecting the mutation in individual mites, the L925V substitution was found to correlate well with resistance, being present in all mites that had survived tau-fluvalinate treatment but in only 8 % of control, untreated samples. The potential for using this assay to detect and manage resistance in *Varroa*-infected hives is discussed.

Additional References

Point mutations in the sodium channel gene conferring tau-fluvalinate resistance in *Varroa destructor*. (2014) (<https://pubmed.ncbi.nlm.nih.gov/24243563>)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

3 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^109461^/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^109461^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^109461^/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^109461^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

