

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) | | GP00001861 | |
| | 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 | |
| Trialeurodes vaporariorum | | |
| | Trait State in Taxon B | |
| Trialeurodes vaporariorum - resistant | | |
| | Ancestral State | |
| Data not curated | | |
| | 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 |
|---|-----------------------------|---|-----------------------------|
| Trialeurodes vaporariorum (<a +trialeurodes+vaporariorum+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Trialeurodes+vaporariorum+"#gephebase-summary-title) | | Trialeurodes vaporariorum (<a +trialeurodes+vaporariorum+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Trialeurodes+vaporariorum+"#gephebase-summary-title) | |
| | Common Name | | Common Name |
| greenhouse whitefly | | greenhouse whitefly | |
| | Synonyms | | Synonyms |
| greenhouse whitefly; Trialeurodes vaporariorum (Westwood, 1856); Trialeurodes vaporarium | | greenhouse whitefly; Trialeurodes vaporariorum (Westwood, 1856); Trialeurodes vaporarium | |
| | 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; Hemiptera; Sternorrhyncha; Aleyrodoidea; Aleyrodidae; Aleyrodinae; Trialeurodes | | cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Sternorrhyncha; Aleyrodoidea; Aleyrodidae; Aleyrodinae; Trialeurodes | |
| | Parent | | Parent |
| Trialeurodes () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=88555) | | Trialeurodes () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=88555) | |
| | NCBI Taxonomy ID | | NCBI Taxonomy ID |
| 88556 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=88556) | | 88556 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=88556) | |
| | 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; Occl; 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>)

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

M918L - found in samples from China and Europe

Experimental Evidence

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

| | Taxon A | Taxon B | Position |
|------------|---------|---------|----------|
| Codon | ATG | - | - |
| Amino-acid | Met | Leu | 918 |

Main Reference

Mutations in the sodium channel associated with pyrethroid resistance in the greenhouse whitefly, *Trialeurodes vaporariorum*. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22228578>)

Authors

Karatos N; Gorman K; Williamson MS; Denholm I

Abstract

Trialeurodes vaporariorum Westwood is an important pest of protected crops in temperate regions of the world. Resistance to pyrethroid insecticides is long established in this species, but the molecular basis of the mechanism(s) responsible has not previously been disclosed.

Mortality rates of three European strains of *T. vaporariorum* to the pyrethroid bifenthrin were calculated, and each possessed significant resistance (up to 662-fold) when compared with a susceptible reference strain. Direct sequencing revealed three amino acid substitutions in the para-type voltage-gated sodium channel (the pyrethroid and DDT target site) of bifenthrin-resistant *T. vaporariorum* at positions previously implicated with pyrethroid or DDT resistance (M918L, L925I and T929I) in other related species.

This study indicates that resistance to bifenthrin in *T. vaporariorum* is associated with target-site insensitivity, and that the specific mutations in the sodium channel causing resistance may differ between localities.

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Additional References

Insecticide resistance in *Trialeurodes vaporariorum* populations and novel diagnostics for kdr mutations. (2018) (<https://pubmed.ncbi.nlm.nih.gov/28734106>)

RELATED GEPHE

Related Genes

1 (acetyl-CoA carboxylase (ACC)) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^88556^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^88556^/or+Gene Gephebase=^para \(kdr\)^/and+Taxon ID=^88556^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^88556^/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^88556^#gephebase-summary-title))

EXTERNAL LINKS

