

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=))

Gephebase Gene GP00002518

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=))

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=))

Trait

Lepeophtheirus salmonis

Trait State in Taxon A

Lepeophtheirus salmonis - resistant

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=))

Taxonomic Status

| Taxon A   | Latin Name              | Taxon B   | Latin Name              |
|---|-------------------------|---|-------------------------|
| Lepeophtheirus salmonis ( <a +lepeophtheirus+salmonis+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" Lepeophtheirus salmonis ^#gephebase-summary-title</a> ) | Lepeophtheirus salmonis | Lepeophtheirus salmonis ( <a +lepeophtheirus+salmonis+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" Lepeophtheirus salmonis ^#gephebase-summary-title</a> ) | Lepeophtheirus salmonis |
| salmon louse  | Common Name             | salmon louse  | Common Name             |
| salmon louse; Lepeophtheirus salmonis (Kroyer, 1837); Lepeophtheirus salmonis species   | Synonyms                | salmon louse; Lepeophtheirus salmonis (Kroyer, 1837); Lepeophtheirus salmonis species   | Synonyms                |
| cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Crustacea; Multicrustacea; Hexanauplia; Copepoda; Neocopepoda; Podoplea; Siphonostomatoida; Caligidae; Lepeophtheirus           | Rank                    | cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Crustacea; Multicrustacea; Hexanauplia; Copepoda; Neocopepoda; Podoplea; Siphonostomatoida; Caligidae; Lepeophtheirus           | Rank                    |
| Lepeophtheirus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72035">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72035</a> )   | Lineage                 | Lepeophtheirus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72035">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72035</a> )   | Lineage                 |
| 72036 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72036">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72036</a> )   | Parent                  | 72036 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72036">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=72036</a> )   | Parent                  |
| is Taxon A an Intraspecies?   | NCBI Taxonomy ID        | is Taxon B an Intraspecies?   | NCBI Taxonomy ID        |
| No  |                         | No  |                         |

GENOTYPIC CHANGE

para

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

Synonyms ()

UniProtKB Drosophila melanogaster

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Q945R in transmembrane segment IIS5

Experimental Evidence

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=~Candidate+Gene^#gephebase-summary-title))

|            | Taxon A | Taxon B | Position |
|------------|---------|---------|----------|
| Codon      | -       | -       | -        |
| Amino-acid | Gln     | Arg     | 945      |

Main Reference

Novel point mutation in the sodium channel gene of pyrethroid-resistant sea lice *Lepeophtheirus salmonis* (Crustacea: Copepoda). (2005) (<https://pubmed.ncbi.nlm.nih.gov/16060266>)

Authors

Fallang A; Denholm I; Horsberg TE; Williamson MS

Abstract

Knockdown resistance (kdr) to pyrethroid insecticides is caused by point mutations in the pyrethroid target site, the para-type sodium channel of nerve membranes. This most commonly involves alterations within the domain II (S4-S6) region of the channel protein, where several different mutation sites have been identified across a range of insect species. To investigate the possibility that a kdr-type mechanism is responsible for pyrethroid resistance in sea lice, a domain II region of the *Lepeophtheirus salmonis* sodium channel gene was PCR amplified and sequenced. To our knowledge, this is the first published sodium channel sequence from a crustacean. Comparison of sequences from a range of samples, including several individuals from areas in which control failures had been reported, failed to identify any of the mutations within this region that have previously been linked with resistance. Instead, a novel glutamine to arginine mutation, Q945R, in transmembrane segment IIS5 was consistently found in the samples from areas of control failure and may therefore be associated with resistance to pyrethroids in this species.

Additional References

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

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

