

GEPHE SUMMARY

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)	Gephebase Gene	GP00002487	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

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 Category		
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		
Helicoverpa armigera	Trait State in Taxon A		
Helicoverpa armigera - resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
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)	Taxonomic Status		
	Taxon A	Taxon B	
Helicoverpa armigera (<a +helicoverpa+armigera+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="+Helicoverpa armigera+"#gephebase-summary-title)	Latin Name	Helicoverpa armigera (<a +helicoverpa+armigera+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="+Helicoverpa armigera+"#gephebase-summary-title)	Latin Name
cotton bollworm	Common Name	cotton bollworm	Common Name
Heliothis (Helicoverpa) armigera; Heliothis armigera; cotton bollworm; American bollworm; corn ear worm; scarce bordered straw; tobacco budworm; Helicoverpa armigera (Hubner, 1808)	Synonyms	Heliothis (Helicoverpa) armigera; Heliothis armigera; cotton bollworm; American bollworm; corn ear worm; scarce bordered straw; tobacco budworm; Helicoverpa armigera (Hubner, 1808)	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Dityisia; Obtectomera; Noctuoidea; Noctuidae; Heliothinae; Helicoverpa	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Dityisia; Obtectomera; Noctuoidea; Noctuidae; Heliothinae; Helicoverpa	Lineage
Helicoverpa () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7112)	Parent	Helicoverpa () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7112)	Parent
29058 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29058)	NCBI Taxonomy ID	29058 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29058)	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)	UniProtKB Drosophila melanogaster
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	Synonyms	()	GenebankID or UniProtKB
7227.FBpp0303597 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0303597)	String		
Belongs to the sodium channel (TC 1.A.1.10) family. Para subfamily.	Sequence Similarities		
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)	GO - Molecular Function		
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) Presumptive Null
 Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title) Molecular Type
 SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP^#gephebase-summary-title) Aberration Type
 Nonsynonymous SNP Coding Change
 D1561V resulting from a GAC to GTC single base change and glutamic acid to glycine E1565G substitution resulting from a GAA to GGA single base change. Molecular Details of the Mutation
 Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene^#gephebase-summary-title) Experimental Evidence

	Taxon A	Taxon B	Position
Codon	GAC	GTC	-
Amino-acid	Asp	Val	1561

Novel mutations in the para-homologous sodium channel gene associated with phenotypic expression of nerve insensitivity resistance to pyrethroids in Heliothine lepidoptera. (1998) Main Reference
 (https://pubmed.ncbi.nlm.nih.gov/9535164)
 Head DJ; McCaffery AR; Callaghan A Authors
 Coding sequences from the intracellular segment linking repeat domains III and IV of the para-homologous sodium channel gene were amplified and cloned from two species of Heliothine larvae using RT-PCR techniques. Sequence comparisons between standard laboratory susceptible and nerve insensitive strains of the tobacco budworm (*Heliothis virescens*) and the cotton bollworm (*Helicoverpa armigera*) identified two mutations. These were an aspartic acid (GAC) to valine (GTC) and a glutamic acid (GAA) to glycine (GGA) mutation. PCR and sequencing was undertaken only on individuals that were demonstrated to be phenotypically nerve insensitive or susceptible to pyrethroids using a neurophysiological technique. The finding of identical mutations across two species suggests that they may be implicated in resistance. Abstract
 Additional References

Mutation #2

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No^#gephebase-summary-title) Presumptive Null
 Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title) Molecular Type
 SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP^#gephebase-summary-title) Aberration Type
 Nonsynonymous SNP Coding Change
 D1561V resulting from a GAC to GTC single base change and glutamic acid to glycine E1565G substitution resulting from a GAA to GGA single base change. Molecular Details of the Mutation
 Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene^#gephebase-summary-title) Experimental Evidence

	Taxon A	Taxon B	Position
Codon	GAA	GGA	-
Amino-acid	Glu	Gly	1565

Main Reference

Novel mutations in the para-homologous sodium channel gene associated with phenotypic expression of nerve insensitivity resistance to pyrethroids in Heliothine lepidoptera. (1998)
<https://pubmed.ncbi.nlm.nih.gov/9535164>

Authors

Head DJ; McCaffery AR; Callaghan A

Abstract

Coding sequences from the intracellular segment linking repeat domains III and IV of the para-homologous sodium channel gene were amplified and cloned from two species of Heliothine larvae using RT-PCR techniques. Sequence comparisons between standard laboratory susceptible and nerve insensitive strains of the tobacco budworm (*Heliothis virescens*) and the cotton bollworm (*Helicoverpa armigera*) identified two mutations. These were an aspartic acid (GAC) to valine (GTC) and a glutamic acid (GAA) to glycine (GGA) mutation. PCR and sequencing was undertaken only on individuals that were demonstrated to be phenotypically nerve insensitive or susceptible to pyrethroids using a neurophysiological technique. The finding of identical mutations across two species suggests that they may be implicated in resistance.

Additional References

RELATED GEPHE

Related Genes

6 (ABCA2, Aminopeptidase N (APN), cadherin, CYP337B3, Ha_BtR, tetraspanin) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~29058^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Parallelism - same nucleotide changes in two pest species