

GEPHE SUMMARY

CYP337B3 (<a +cyp337b3+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+GeneGephebase=">https://www.gephebase.org/search-criteria?/and+GeneGephebase="+CYP337B3+"#gephebase-summary-title)		Gephebase Gene	GP00002481	GepheID
Published		Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+TraitCategory=">https://www.gephebase.org/search-criteria?/and+TraitCategory="+Physiology+"#gephebase-summary-title)		Trait Category	
Xenobiotic resistance (insecticide; pyrethroid) (<a +xenobiotic+resistance+(insecticide;+pyrethroid)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Xenobiotic+resistance+(insecticide;+pyrethroid)+"#gephebase-summary-title)		Trait	
Helicoverpa armigera - susceptible		Trait State in Taxon A	
Helicoverpa armigera - resistant strain from China - allele CYP337B3v4		Trait State in Taxon B	
Taxon A		Ancestral State	
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=">https://www.gephebase.org/search-criteria?/and+TaxonomicStatus="+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)		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)	
cotton bollworm		cotton bollworm	
Heliothis (Helicoverpa) armigera; Heliothis armigera; cotton bollworm; American bollworm; corn ear worm; scarce bordered straw; tobacco budworm; Helicoverpa armigera (Hubner, 1808)		Heliothis (Helicoverpa) armigera; Heliothis armigera; cotton bollworm; American bollworm; corn ear worm; scarce bordered straw; tobacco budworm; Helicoverpa armigera (Hubner, 1808)	
species		species	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Noctuoidea; Noctuidae; Heliothinae; Helicoverpa		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Noctuoidea; Noctuidae; Heliothinae; Helicoverpa	
Helicoverpa () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7112)		Helicoverpa () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7112)	
29058 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29058)		29058 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29058)	
No		No	

GENOTYPIC CHANGE

CYP337B3		Generic Gene Name	UniProtKB Helicoverpa armigera A0A0H3V333 (http://www.uniprot.org/uniprot/A0A0H3V333)
-		Synonyms	GenebankID or UniProtKB Helicoverpa armigera
-		String	A0A0H3V333 (https://www.ncbi.nlm.nih.gov/nuccore/A0A0H3V333)
Belongs to the cytochrome P450 family.		Sequence Similarities	
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)		GO - Molecular Function	
GO:0005506 : iron ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005506)			
GO:0004497 : monooxygenase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004497)			
GO:0016705 : oxidoreductase activity, acting on paired donors, with incorporation or			

reduction of molecular oxygen (https://www.ebi.ac.uk/QuickGO/term/GO:0016705)	GO - Biological Process
-	GO - Cellular Component
GO:0005789 : endoplasmic reticulum membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005789)	
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
Complex Change (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Complex Change~#gephebase-summary-title)	Aberration Type
The P450 chimeric gene CYP337B3 arose from unequal crossing-over between two parental P450 genes CYP337B2 and CYP337B1 . CYP337B3 can metabolize pyrethroids in vitro. Neither parental enzyme has the ability to metabolize pyrethroids in vitro. Sequence analysis revealed a distinct CYP337B3 allele (CYP337B3v2) in the Pakistani population and three distinct alleles in the Chinese populations (CYP337B3v2 CYP337B3v3 CYP337B3v4) that differ from the Australian allele (CYP337B3v1) by a number of synonymous and non-synonymous SNPs in addition to variability of the intron sequence and size. This variation may result from different crossing-over positions during recombination of the CYP337B1 and CYP337B2 parental genes with different alleles of CYP337B1 and CYP337B2 involved in the crossing-over.	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title)	Experimental Evidence
Variation in P450-mediated fenvalerate resistance levels is not correlated with CYP337B3 genotype in Chinese populations of Helicoverpa armigera . (2015) (https://pubmed.ncbi.nlm.nih.gov/00000000.000023)	Main Reference
Han Yangchun; Yu Wanting; Zhang Weiqing; Yang Yihua; Walsh Tom; Oakeshott John G; Wu Yidong	Authors
-	Abstract
Multiple recombination events between two cytochrome P450 loci contribute to global pyrethroid resistance in Helicoverpa armigera. (2018) (https://pubmed.ncbi.nlm.nih.gov/30383872)	Additional References

RELATED GEPHE

6 (ABCA2, Aminopeptidase N (APN), cadherin, Ha_BtR, para (kdr), tetraspanin) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~29058~/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
7 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~CYP337B3~/and+Taxon ID=~29058~/or+Gene Gephebase=~CYP337B3~/and+Taxon ID=~29058~#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Parallelism - Resistance to pyrethroids as a result from the formation of a chimeric P450 gene CYP337B3 has arisen multiple times during evolution of the cotton bollworm H. armigera.