

GEPHE SUMMARY

Ha_BtR (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^Ha_BtR^#gephebase-summary-title)	Gephebase Gene	GP00000428	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Physiology^#gephebase-summary-title)	Trait Category		
Xenobiotic resistance (insecticide; Bt Cry1Ac toxin) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (insecticide; Bt Cry1Ac toxin)^#gephebase-summary-title)	Trait		
Helicoverpa armigera - Bt-Cry1Ac susceptible	Trait State in Taxon A		
Helicoverpa armigera - Bt-Cry1Ac resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=^Intraspecific^#gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
Helicoverpa armigera (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Helicoverpa armigera^#gephebase-summary-title)	Latin Name	Helicoverpa armigera (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; Amphimesenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; 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; Amphimesenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; 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

ABCA2	Generic Gene Name	A0A0S0G7V0 (http://www.uniprot.org/uniprot/A0A0S0G7V0)	UniProtKB Helicoverpa armigera
-	Synonyms		GenebankID or UniProtKB
-	String		
-	Sequence Similarities		
-	GO - Molecular Function		
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)			
GO:0042626 : ATPase activity, coupled to transmembrane movement of substances (https://www.ebi.ac.uk/QuickGO/term/GO:0042626)			
-	GO - Biological Process		

GO:0016021 : integral component of membrane
<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title))

Presumptive Null

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))

Molecular Type

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

Aberration Type

1-10 kb

Insertion Size

Insertion of a LTR retrotransposon

Molecular Details of the Mutation

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))

Experimental Evidence

Identification and molecular detection of a deletion mutation responsible for a truncated cadherin of *Helicoverpa armigera*. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16935222>)

Main Reference

Yang Y; Chen H; Wu S; Yang Y; Xu X; Wu Y

Authors

Cadherins are a class of receptor proteins for *Bacillus thuringiensis* Cry1A toxins. Disruption of a cadherin gene (Ha_BtR) is associated with Cry1Ac resistance in the cotton bollworm *Helicoverpa armigera* [Xu, X., Yu, L., Wu, Y., 2005. Disruption of a cadherin gene associated with resistance to Cry1Ac delta-endotoxin of *B. thuringiensis* in *H. armigera*. *Appl. Environ. Microbiol.* 71, 948-954]. Determination of the genomic DNA sequences of Ha_BtR gene showed that the wild type Ha_BtR coding sequence is comprised of 34 exons. A deletion between Exon 8 and Exon 25 was found to be responsible for a truncated cadherin in the Cry1Ac-resistant GYBT strain of *H. armigera*. The mutant allele of Ha_BtR (r1) has two possible transcription variants, both of which produce the same truncated protein. A DNA-based detection method specific to the r1 allele was developed. This study will facilitate the monitoring of cadherin mutant frequency in field populations of *H. armigera*.

Abstract

Additional References

Diverse cadherin mutations conferring resistance to *Bacillus thuringiensis* toxin Cry1Ac in *Helicoverpa armigera*. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20079435>)

RELATED GEPHE

Related Genes

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

Related Haplotypes

7 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Ha_BtR^/and+Taxon ID=~29058^/or+Gene Gephebase=~Ha_BtR^/and+Taxon ID=~29058^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~Ha_BtR^/and+Taxon+ID=~29058^/or+Gene+Gephebase=~Ha_BtR^/and+Taxon+ID=~29058^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

@TE Parallelism: repeated loss-of-function