

cadherin (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^cadherin^#gephebase-summary-title)		Gephebase Gene	GP00000165	GepheID
Published		Entry Status	Martin	Main curator

	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title)	
	Trait
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(insecticide)^#gephebase-summary-title)	
	Trait State in Taxon A
Pectinophora gossypiella - Bt susceptible	
	Trait State in Taxon B
Pectinophora gossypiella - Bt resistant	
	Ancestral State
Taxon A	
	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)	

BtR	Generic Gene Name	UniProtKB Helicoverpa armigera
	Synonyms	GenebankID or UniProtKB
-	String	
-	Sequence Similarities	
-	GO - Molecular Function	
	GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)	
	GO - Biological Process	
	GO:0007156 : homophilic cell adhesion via plasma membrane adhesion molecules (https://www.ebi.ac.uk/QuickGO/term/GO:0007156)	
	GO - Cellular Component	
	GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)	
	GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)	

No (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title>)

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title>)

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

Nonsynonymous

E1266L R1268E and E1270V - whether each mutation has an effect or only one of them is unknown

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

Presumptive Null

Molecular Type

Aberration Type

SNP Coding Change

Molecular Details of the Mutation

Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Diverse genetic basis of field-evolved resistance to Bt cotton in cotton bollworm from China. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22689968>)

Zhang H; Tian W; Zhao J; Jin L; Yang J; Liu C; Yang Y; Wu S; Wu K; Cui J; Tabashnik BE; Wu Y

Main Reference

Authors

Evolution of pest resistance reduces the efficacy of insecticidal proteins from *Bacillus thuringiensis* (Bt) used in sprays or in transgenic crops. Although several pests have evolved resistance to Bt crops in the field, information about the genetic basis of field-evolved resistance to Bt crops has been limited. In particular, laboratory-selected resistance to Bt toxin Cry1Ac based on recessive mutations in a gene encoding a toxin-binding cadherin protein has been identified in three major cotton pests, but previous work has not determined if such mutations are associated with field-selected resistance to Bt cotton. Here we show that the most common resistance alleles in field populations of cotton bollworm, *Helicoverpa armigera*, selected with Bt cotton in northern China, had recessive cadherin mutations, including the deletion mutation identified via laboratory selection. However, unlike all previously studied cadherin resistance alleles, one field-selected cadherin resistance allele conferred nonrecessive resistance. We also detected nonrecessive resistance that was not genetically linked with the cadherin locus. In field-selected populations, recessive cadherin alleles accounted for 75-84% of resistance alleles detected. However, most resistance alleles occurred in heterozygotes and 59-94% of resistant individuals carried at least one nonrecessive resistance allele. The results suggest that resistance management strategies must account for diverse resistance alleles in field-selected populations, including nonrecessive alleles.

Additional References

RELATED GEPHE

1 (ABCA2) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^13191^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

6 (<https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^cadherin^/and+Taxon ID=^13191^/or+Gene Gephebase=^cadherin^/and+Taxon ID=^13191^#gephebase-summary-title>)

Related Genes

Related Haplotypes

EXTERNAL LINKS

COMMENTS