

cadherin (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^cadherin^#gephebase-summary-title)	Gephebase Gene	GP00000162	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)	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Helicoverpa armigera
BtR		
	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)	

Yes (#gephebase-summary-title)	Presumptive Null
Coding (#gephebase-summary-title)	Molecular Type
Deletion (#gephebase-summary-title)	Aberration Type
100-999 bp	Deletion Size
126bp in-frame deletion	Molecular Details of the Mutation
Linkage Mapping (#gephebase-summary-title)	Experimental Evidence
Three cadherin alleles associated with resistance to <i>Bacillus thuringiensis</i> in pink bollworm. (2003) (https://pubmed.ncbi.nlm.nih.gov/12695565)	Main Reference
Morin S; Biggs RW; Sisterson MS; Shriver L; Ellers-Kirk C; Higginson D; Holley D; Gahan LJ; Heckel DG; CarriÃ¨re Y; Dennehy TJ; Brown JK; Tabashnik BE	Authors
Evolution of resistance by pests is the main threat to long-term insect control by transgenic crops that produce <i>Bacillus thuringiensis</i> (Bt) toxins. Because inheritance of resistance to the Bt toxins in transgenic crops is typically recessive, DNA-based screening for resistance alleles in heterozygotes is potentially much more efficient than detection of resistant homozygotes with bioassays. Such screening, however, requires knowledge of the resistance alleles in field populations of pests that are associated with survival on Bt crops. Here we report that field populations of pink bollworm (<i>Pectinophora gossypiella</i>), a major cotton pest, harbored three mutant alleles of a cadherin-encoding gene linked with resistance to Bt toxin Cry1Ac and survival on transgenic Bt cotton. Each of the three resistance alleles has a deletion expected to eliminate at least eight amino acids upstream of the putative toxin-binding region of the cadherin protein. Larvae with two resistance alleles in any combination were resistant, whereas those with one or none were susceptible to Cry1Ac. Together with previous evidence, the results reported here identify the cadherin gene as a leading target for DNA-based screening of resistance to Bt crops in lepidopteran pests.	Abstract
Diverse genetic basis of field-evolved resistance to Bt cotton in cotton bollworm from China. (2012) (https://pubmed.ncbi.nlm.nih.gov/22689968)	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)	Related Genes
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 Haplotypes

EXTERNAL LINKS

COMMENTS