

CYP6BG1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~CYP6BG1*#gephebase-summary-title)	Gephebase Gene	GP00002064	GepheID
Published	Entry Status	Cao	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
Plutella xylostella -diamide (chlorantraniliprole) less resistant	
	Trait State in Taxon B
Plutella xylostella - diamide (chlorantraniliprole) more resistant	
	Ancestral State
Taxon A	
	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)	

Accession	Gene Name	Organism
CYP6BG1	Generic Gene Name	UniProtKB Plutella xylostella
-	Synonyms	GenebankID or UniProtKB Plutella xylostella
-	String	A0A222NX20 (https://www.ncbi.nlm.nih.gov/nuccore/A0A222NX20)
Sequence Similarities		
Belongs to the cytochrome P450 family.		
GO - Molecular Function		
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)		
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	
-		Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown~#gephebase-summary-title)		
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title)		Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown~#gephebase-summary-title)		Aberration Type
promoters tested in luciferase assays		Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title)		Experimental Evidence
Transcription factor FTZ-F1 and cis-acting elements mediate expression of CYP6BG1 conferring resistance to chlorantraniliprole in <i>Plutella xylostella</i> . (2019) (https://pubmed.ncbi.nlm.nih.gov/30471186)		Main Reference
Li X; Shan C; Li F; Liang P; Smagghe G; Gao X		Authors
Cytochrome P450-mediated detoxification plays an important role in the development of insecticide resistance. Previous studies have demonstrated that overexpression of CYP6BG1 was responsible for permethrin resistance in <i>Plutella xylostella</i> , and our experiments also showed that upregulation of this gene is associated with chlorantraniliprole resistance in <i>P. xylostella</i> . However, the transcriptional regulation involved in the expression of CYP6BG1 remains unknown. To further investigate the regulation of CYP6BG1 expression, the promoters of this gene were cloned and analyzed from one susceptible and four different resistant populations of <i>P. xylostella</i> .		Abstract
First, the promoter region of <i>P. xylostella</i> CYP6BG1 was compared in five populations, and three types of 5'-flanking region were found. Second, the region between -562 and +49 of CYP6BG1 in a field population (TH) of <i>P. xylostella</i> showed the highest promoter activity and could be induced by chlorantraniliprole. Third, the transcriptional factor FTZ-F1, which is an orphan nuclear receptor and binds to the fushi tarazu (<i>ftz</i>) gene, was predicted by the online software Algen and Jaspar. It was proved to regulate the expression of CYP6BG1 by RNAi. The expression levels of FTZ-F1 and CYP6BG1 could be induced by chlorantraniliprole and were significantly higher in the resistant populations.		
These data give a better understanding of the transcriptional regulation of an important insecticide detoxification enzyme gene, and therefore will help in understanding the molecular mechanisms of insecticide resistance in <i>P. xylostella</i> . © 2018 Society of Chemical Industry.		
© 2018 Society of Chemical Industry.		
A flavin-dependent monooxygenase confers resistance to chlorantraniliprole in the diamondback moth, <i>Plutella xylostella</i> . (2019) (https://pubmed.ncbi.nlm.nih.gov/31626952)		Additional References

RELATED GEPHE

	Related Genes
10 (ABCC2, Acetylcholinesterase (Ace-1), Chitin synthase 1 (CHS1), FMO2, glutamate-gated chloride channel (GluCl), MAP4K4, nAChR, para (kdr), resistance to dieldrin, RYR) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~51655~/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title)	
No matches found.	
	Related Haplotypes

EXTERNAL LINKS

COMMENTS