

GEPHE SUMMARY

	Gephebase Gene	GephelD
Chitin synthase 1 (CHS1) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Chitin synthase 1 (CHS1)^#gephebase-summary-title)	GP00002628	Main curator
	Entry Status	Courtier
Published		

PHENOTYPIC CHANGE

	Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait	
Xenobiotic resistance (insecticide; benzoylurea) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+(insecticide;+benzoylurea)^#gephebase-summary-title)		
Frankliniella occidentalis - susceptible	Trait State in Taxon A	
Frankliniella occidentalis - resistant	Trait State in Taxon B	
Taxon A	Ancestral State	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)	Taxonomic Status	
Taxon A	Latin Name	Taxon B
Frankliniella occidentalis (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Frankliniella+occidentalis^#gephebase-summary-title)		Latin Name
western flower thrips	Common Name	
Euthrips occidentalis; Frankliniella brunnescens; Frankliniella californica; Frankliniella occidentalis brunnescens; western flower thrips; Frankliniella occidentalis (Pergande, 1895); Frankliniella occidentalis brunnescens Priesner, 1932	Synonyms	
species	Rank	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripoidea; Thripidae; Thripinae; Frankliniella	Lineage	
Frankliniella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45059)	Parent	
133901 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 133901)	NCBI Taxonomy ID	
	is Taxon A an Infraspecies?	
No		
Taxon B	Latin Name	
Frankliniella occidentalis (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Frankliniella+occidentalis^#gephebase-summary-title)		
western flower thrips	Common Name	
Euthrips occidentalis; Frankliniella brunnescens; Frankliniella californica; Frankliniella occidentalis brunnescens; western flower thrips; Frankliniella occidentalis (Pergande, 1895); Frankliniella occidentalis brunnescens Priesner, 1932	Synonyms	
species	Rank	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripoidea; Thripidae; Thripinae; Frankliniella	Lineage	
Frankliniella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45059)	Parent	
133901 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 133901)	NCBI Taxonomy ID	
	is Taxon B an Infraspecies?	
No		

GENOTYPIC CHANGE

CHS1	Generic Gene Name	UniProtKB Plutella xylostella
CHS1; PxCHS1B	Synonyms	GenebankID or UniProtKB
-	String	0
-	Sequence Similarities	
GO:0016758 : transferase activity, transferring hexosyl groups (https://www.ebi.ac.uk/QuickGO/term/GO:0016758)	GO - Molecular Function	
-	GO - Biological Process	
GO:0016021 : integral component of membrane	GO - Cellular Component	

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

isoleucine to methionine

Experimental Evidence

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%Candidate+Gene%#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	ATC	ATG	-
Amino-acid	Ile	Met	-

Main Reference

Benzoylurea resistance in western flower thrips *Frankliniella occidentalis* (Thysanoptera: Thripidae): the presence of a point mutation in chitin synthase 1. (2017)(<https://pubmed.ncbi.nlm.nih.gov/30364015>)

Authors

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Abstract

We examined the susceptibility of field strains (BO-1, BO-2, TO-1, and YH-1) and one laboratory strain (H-1) of the western flower thrip, *Frankliniella occidentalis*, to benzoylureas. LC values of novaluron were determined as 0.64‰ ppm against laboratory strain and 2.1-130‰ ppm against field strains. In the presence of piperonyl butoxide, a cytochrome P450 inhibitor, the insecticidal activity of novaluron tended to be enhanced. To examine whether point mutations in chitin synthase 1 (CHS1) discovered in an etoxazole-resistant strain of *Tetranychus urticae* and a benzoylurea-resistant strain of *Plutella xylostella* exist in *F. occidentalis*, the nucleotide sequence of CHS1 was analyzed. We found a nonsynonymous substitution that corresponded to the location of the mutations found in *T. urticae* and *P. xylostella* in the field strains of *F. occidentalis* but not in the laboratory strain, indicating that this point mutation might be associated with the benzoylurea resistance exhibited by the field strains.

Additional References

RELATED GEPHE

Related Genes

2 (nAChR, para (kdr)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%133901%and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS