GEPHE SUMMARY

Gephebase Gene

Chitin synthase 1 (CHS1) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Chitin synthase 1 (CHS1)^#gephebase-summary-title)

GepheID

GP00002628

Entry Status

Published

Main curator

Courtier

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)

Trait State in Taxon A

Frankliniella occidentalis - susceptible

Trait State in Taxon B

Frankliniella occidentalis - resistant

Ancestral State

Taxon A

Taxonomic Status

Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name

Frankliniella occidentalis (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Frankliniella occidentalis^#gephebase-summary-title)

Common Name

western flower thrips

Synonyms

Euthrips occidentalis; Frankliniella brunnescens; Frankliniella californica; Frankliniella occidentalis brunnescens; western flower thrips; Frankliniella occidentalis (Pergande, 1895); Frankliniella occidentalis brunnescens Priesner, 1932

Rank

species

Lineage

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

Parent

Frankliniella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45059)

NCBI Taxonomy ID

133901 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 133901)

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)

Common Name

western flower thrips

Synonyms

Euthrips occidentalis; Frankliniella brunnescens; Frankliniella californica; Frankliniella occidentalis brunnescens; western flower thrips; Frankliniella occidentalis (Pergande, 1895); Frankliniella occidentalis brunnescens Priesner, 1932

Rank

species

Lineage

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

Parent

Frankliniella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45059)

NCBI Taxonomy ID

133901 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 133901)

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

CHS1

Synonyms

CHS1; PxCHS1B

String

-

Sequence Similarities

-

GO - Molecular Function

GO:0016758 : transferase activity, transferring hexosyl groups (https://www.ebi.ac.uk/QuickGO/term/GO:0016758)

GO - Biological Process

-

GO - Cellular Component

GO:0016021 : integral component of membrane

UniProtKB Plutella xylostella

A3KCN0 (http://www.uniprot.org/uniprot/A3KCN0)

GenebankID or UniProtKB

()

(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)

Presumptive Null

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

Suzuki Y; Shiotsuki T; Jouraku A; Miura K; Minakuchi C

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 0.64â€‰ppm against laboratory strain and 2.1-130â€‰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