

GEPHE SUMMARY

nAChR (https://www.gephebase.org/search-criteria?/and+GeneGephebase=nAChR#gephebase-summary-title)	Gephebase Gene	GP00002555	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=Physiology#gephebase-summary-title)	Trait Category		
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic resistance (insecticide)#gephebase-summary-title)	Trait		
Thrips palmi	Trait State in Taxon A		
Thrips palmi - resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=Intraspecific#gephebase-summary-title)	Taxonomic Status		

Taxon A		Taxon B	
	Latin Name		Latin Name
Thrips palmi (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Thrips palmi#gephebase-summary-title)	Thrips palmi	Thrips palmi (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Thrips palmi#gephebase-summary-title)	Thrips palmi
-	Common Name	-	Common Name
Thrips palmi Karny, 1925	Synonyms	Thrips palmi Karny, 1925	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripodea; Thripidae; Thripinae; Thrips	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Thysanoptera; Terebrantia; Thripodea; Thripidae; Thripinae; Thrips	Lineage
Thrips () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=45057)	Parent	Thrips () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=45057)	Parent
161013 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=161013)	NCBI Taxonomy ID	161013 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=161013)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

nAChRbeta1	Generic Gene Name	P04755 (http://www.uniprot.org/uniprot/P04755)	UniProtKB Drosophila melanogaster
AChR; AchR64B; AChR64B; Acr64B; AcrD; ard; Ard; ARD; beta 64B; beta1 nAChR; CG11348; CG11348-PA; CG12606; Dbeta1; Dmel\CG11348; nAChR; nAChR-beta64B; nAcR64B; nAcRbeta-64B	Synonyms	()	GenebankID or UniProtKB
7227.FBpp0073155 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0073155)	String		
Belongs to the ligand-gated ion channel (TC 1.A.9) family. Acetylcholine receptor (TC 1.A.9.1) subfamily.	Sequence Similarities		
GO:0004888 : transmembrane signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004888)	GO - Molecular Function		
GO:0022848 : acetylcholine-gated cation-selective channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0022848)			

GO:1904315 : transmitter-gated ion channel activity involved in regulation of postsynaptic membrane potential (<https://www.ebi.ac.uk/QuickGO/term/GO:1904315>)
 GO:0005231 : excitatory extracellular ligand-gated ion channel activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0005231>)
 GO:0030594 : neurotransmitter receptor activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0030594>)

GO - Biological Process

GO:0007165 : signal transduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007165>)
 GO:0007268 : chemical synaptic transmission (<https://www.ebi.ac.uk/QuickGO/term/GO:0007268>)
 GO:0007271 : synaptic transmission, cholinergic (<https://www.ebi.ac.uk/QuickGO/term/GO:0007271>)
 GO:0034220 : ion transmembrane transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0034220>)
 GO:0050877 : nervous system process (<https://www.ebi.ac.uk/QuickGO/term/GO:0050877>)
 GO:0042391 : regulation of membrane potential (<https://www.ebi.ac.uk/QuickGO/term/GO:0042391>)

GO - Cellular Component

GO:0005887 : integral component of plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)
 GO:0043005 : neuron projection (<https://www.ebi.ac.uk/QuickGO/term/GO:0043005>)
 GO:0045211 : postsynaptic membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0045211>)
 GO:0045202 : synapse (<https://www.ebi.ac.uk/QuickGO/term/GO:0045202>)
 GO:0070161 : anchoring junction (<https://www.ebi.ac.uk/QuickGO/term/GO:0070161>)

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="No" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive Null=))

Presumptive Null

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="Coding" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular Type=))

Aberration Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="SNP" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration Type=))

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

G275E in nAChR alpha 6 due to a single nucleotide change

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="Candidate Gene" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental Evidence=))

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

Main Reference

Spinosad resistance of melon thrips, *Thrips palmi*, is conferred by G275E mutation in $\hat{\pm}6$ subunit of nicotinic acetylcholine receptor and cytochrome P450 detoxification. (2014) (<https://pubmed.ncbi.nlm.nih.gov/24974117>)

Authors

Bao WX; Narai Y; Nakano A; Kaneda T; Murai T; Sonoda S

Abstract

To examine the resistance mechanisms of *Thrips palmi* against spinosad, we cloned partial nucleotide sequences of the nicotinic acetylcholine receptor $\hat{\pm}6$ subunit (TP $\hat{\pm}6$) gene from susceptible (OK) and resistant (TS1 and TS5) strains and compared the deduced amino acid sequences among the three strains. The OK, TS1, and TS5 strains respectively showed LC50 values of 3.4mg/L, 2838.5mg/L, and 6655.5mg/L. The deduced amino acid sequence of TP $\hat{\pm}6$ gene showed 96% identity with that of *Frankliniella occidentalis*. Comparison of the deduced amino acid sequences of TP $\hat{\pm}6$ gene among the three strains showed that the TS1 and TS5 strains had a resistant amino acid, Glu, at amino acid position 275. On the other hand, a susceptible amino acid, Gly, was encoded at the corresponding amino acid position for the OK strain. The synergist, piperonyl butoxide, respectively caused 1.1-fold, 5.8-fold, and 9.0-fold decreases in the resistance ratios of the OK, TS1, and TS5 strains. These results suggest that spinosad resistance of *T. palmi* is conferred by reduced sensitivity of TP $\hat{\pm}6$ and cytochrome P450-mediated detoxification.

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Additional References

Genotype to phenotype, the molecular and physiological dimensions of resistance in arthropods. (2015) (<https://pubmed.ncbi.nlm.nih.gov/26047113>)

RELATED GEPHE

Related Genes

1 (para (kdr)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="161013" /and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon ID=))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS