

## GEPHE SUMMARY

	Gephebase Gene	GephelD
RYR ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase=^RYR^#gephebase-summary-title)	GP00002627	Main curator
	Entry Status	Courtier
Published		

## PHENOTYPIC CHANGE

	Trait Category
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> Category=^Physiology^#gephebase-summary-title)	
Xenobiotic resistance (insecticide ; diamide ; chlorantraniliprole ; flubendiamide) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+insecticide+diamide+chlorantraniliprole+flubendiamide">https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+insecticide+diamide+chlorantraniliprole+flubendiamide</a> )^#gephebase-summary-title)	Trait
	Trait State in Taxon A
Chilo suppressalis - susceptible	Trait State in Taxon B
Chilo suppressalis - resistant	Ancestral State
Taxon A	Taxonomic Status
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status=^Intraspecific^#gephebase-summary-title)	

Taxon A	Latin Name	Taxon B	Latin Name
Chilo suppressalis ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Chilo+suppressalis^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Chilo+suppressalis^#gephebase-summary-title</a> )		Chilo suppressalis ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Chilo+suppressalis^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Chilo+suppressalis^#gephebase-summary-title</a> )	
striped riceborer	Common Name	striped riceborer	Common Name
Crambus suppressalis; striped riceborer; Asiatic rice borer; striped rice borer; Chilo suppressalis (Walker, 1863); Chilo suppressalis; Chilo suppressalis	Synonyms	Crambus suppressalis; striped riceborer; Asiatic rice borer; striped rice borer; Chilo suppressalis (Walker, 1863); Chilo suppressalis; Chilo suppressalis	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Pyraloidea; Crambidae; Crambinae; Chilo	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Pyraloidea; Crambidae; Crambinae; Chilo	Lineage
Chilo () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630</a> )	Parent	Chilo () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630</a> )	Parent
168631 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631</a> )	NCBI Taxonomy ID	168631 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631</a> )	NCBI Taxonomy ID
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
No		No	

## GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
RyR	Synonyms	
Ryr; CG10844; D-RyR; Dmel\CG10844; DmRyR; DRR; dry; DRY; dRyR; dRyR; dy; I(2)k00424; I(2)k04913; Rya-44F; Rya-r4; rya-r44F; Rya-r44F; Rya-R44F; Rya-r76CD; ryr; RYR; RyRs		GenebankID or UniProtKB
7227.FBpp0293114 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0293114">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0293114</a> )	String	0
Belongs to the ryanodine receptor (TC 1.A.3.1) family.	Sequence Similarities	
	GO - Molecular Function	
GO:0005509 : calcium ion binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005509">https://www.ebi.ac.uk/QuickGO/term/GO:0005509</a> )		
GO:0048763 : calcium-induced calcium release activity		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048763>)  
GO:0005219 : ryanodine-sensitive calcium-release channel activity  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005219>)

GO - Biological Process

GO:0006874 : cellular calcium ion homeostasis  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006874>)  
GO:0035206 : regulation of hemocyte proliferation  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0035206>)  
GO:0006936 : muscle contraction (<https://www.ebi.ac.uk/QuickGO/term/GO:0006936>)  
GO:0006816 : calcium ion transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0006816>)  
GO:0060047 : heart contraction (<https://www.ebi.ac.uk/QuickGO/term/GO:0060047>)  
GO:0072347 : response to anesthetic (<https://www.ebi.ac.uk/QuickGO/term/GO:0072347>)

GO - Cellular Component

GO:0016021 : integral component of membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)  
GO:0030659 : cytoplasmic vesicle membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030659>)  
GO:0030018 : Z disc (<https://www.ebi.ac.uk/QuickGO/term/GO:0030018>)  
GO:0042383 : sarcolemma (<https://www.ebi.ac.uk/QuickGO/term/GO:0042383>)  
GO:0033017 : sarcoplasmic reticulum membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0033017>)  
GO:0005790 : smooth endoplasmic reticulum  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005790>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

I4758M

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Ile	Met	4758

Main Reference

Monitoring and Mechanisms of Chlorantraniliprole Resistance in *Chilo suppressalis* (Lepidoptera: Crambidae) in China. (2019) (<https://pubmed.ncbi.nlm.nih.gov/30715398>)

Authors

Wei Y; Yan R; Zhou Q; Qiao L; Zhu G; Chen M

Abstract

Chlorantraniliprole, an anthranilic diamide insecticide, is widely used for controlling lepidopteran pests, because of its high insecticidal activity. However, overuse of chlorantraniliprole has led to the selection of resistance in many insect pests, including *Chilo suppressalis* (Lepidoptera:Crambidae), one of the most damaging rice pests in China. In this study, resistance levels to chlorantraniliprole for *C. suppressalis* was surveyed from eight populations of three provinces in China. The levels of resistance were ranged from 34.4-fold to 284.0-fold compared with a susceptible population. Then, a 15402 bp fragment of the full-length cDNA of ryanodine receptor gene (*CsRyR*) from the XS strain, the highest resistant population, and a 1992 bp fragment of *CsRyR* cDNA encoding the carboxyl-terminal of *CsRyR* gene from the other seven populations were sequenced. A common previously identified mutation that was associated with chlorantraniliprole resistance against *C. suppressalis*, G4910E, was not detected in any of the eight populations in this study. However, another mutation I4758M was found in all seven resistant populations. Furthermore, the relative mRNA expression levels of *CsRyR* gene in the seven resistant populations were all reduced compared with susceptible strain. Our study provides new insights into the basis of monitoring the development of resistance and the mechanism of resistance to chlorantraniliprole in *C. suppressalis*.

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Additional References

## RELATED GEPHE

- Related Genes  
1 (Acetylcholinesterase (Ace-1)) ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=^168631^/and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true))
- Related Haplotypes  
1 ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^RYR^/and+Taxon+ID=^168631^/or+Gene+Gephebase=^RYR^/and+Taxon+ID=^168631^))

## EXTERNAL LINKS

## COMMENTS