

GEPHE SUMMARY

Published	Gephebase Gene	Entry Status	GepheID
RYR (https://www.gephebase.org/search-criteria?/and+GeneGephebase=%RYR%#gephebase-summary-title)	GP00002626	Courtier	Main curator

PHENOTYPIC CHANGE

	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology ^#gephebase-summary-title)	
	Trait
Xenobiotic resistance (insecticide ; diamide ; chlorantraniliprole ; flubendiamide) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+(insecticide+;+diamide+;+chlorantraniliprole+;+flubendiamide)+#gephebase-summary-title)	
	Trait State in Taxon A
Chilo suppressalis - susceptible	
	Trait State in Taxon B
Chilo suppressalis - 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	Taxon B	Latin Name
	Common Name		Common Name
	Synonyms		Synonyms
	Rank		Rank
	Lineage		Lineage
	Parent		Parent
	NCBI Taxonomy ID		NCBI Taxonomy ID
Chilo suppressalis (https://www.gephbase.org/search-criteria/?and+Taxon+and+Synonyms=%Chilo+suppressalis%#gephbase-summary-title)	striped riceborer	Chilo suppressalis (https://www.gephbase.org/search-criteria/?and+Taxon+and+Synonyms=%Chilo+suppressalis%#gephbase-summary-title)	striped riceborer
Crambus suppressalis; striped riceborer; Asiatic rice borer; striped rice borer; Chilo suppressalis (Walker, 1863); Chilo suppersalis; Chilo supressalis		Crambus suppressalis; striped riceborer; Asiatic rice borer; striped rice borer; Chilo suppressalis (Walker, 1863); Chilo suppersalis; Chilo supressalis	
species		species	
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		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	
Chilo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630)		Chilo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168630)	
168631 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631)		168631 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=168631)	
No	is Taxon A an Infraspecies?	No	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

RyR	Generic Gene Name	UniProtKB Drosophila melanogaster
	Synonyms	GenebankID or UniProtKB
Ryr; CG10844; D-RyR; Dmel\CG10844; DmRyR; DRR; dry; DRY; dRyr; dRYR; dya; l(2)k00424; l(2)k04913; Rya-44F; Rya-r4; rya-r44F; Rya-r44F; Rya-R44F; Rya-r76CD; ryr; RYR; RyRs	Q24498 (http://www.uniprot.org/uniprot/Q24498) 0	
	String	
7227.FBpp0293114 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0293114)		
Belongs to the ryanodine receptor (TC 1.A.3.1) family.	Sequence Similarities	
	GO - Molecular Function	
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)		
GO:0005510 : calcium ion binding 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 (<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

G494E

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Gly	Glu	4946

Main Reference

Monitoring and mechanisms of insecticide resistance in *Chilo suppressalis* (Lepidoptera: Crambidae), with special reference to diamides. (2017) (<https://pubmed.ncbi.nlm.nih.gov/27624654>)

Authors

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Abstract

The rice stem borer, *Chilo suppressalis* Walker (Lepidoptera: Crambidae), is one of the most economically important pests of rice in Asia. Chemical control remains the most efficient primary means for controlling this pest.

Significant variations among field populations in their resistance to seven insecticides were observed. The populations exhibited LC values that ranged between 0.605 and 108.088 mg AI L for chlorantraniliprole and between 0.046 and 3.919 mg AI L for flubendiamide. The YY14 population collected from Yuyao in Zhejiang Province in 2014 showed a moderate resistance level to the two diamides, i.e. up to 77.6-fold and 42.6-fold for chlorantraniliprole and flubendiamide respectively. Synergism tests and biochemical assays showed no obvious correlations between diamide resistance and three detoxifying enzymes. Sequence comparison of the ryanodine receptor gene between the YY14 resistant population and susceptible population revealed that a glycine to glutamic acid substitution (G4910E) was presented in the YY14 population.

G4910E mutation might be involved in the resistance evolution of *C. suppressalis* to the diamides. An appropriate insecticide resistance management programme should be established to maintain the effectiveness of the insecticides and to ensure sustainable management. © 2016 Society of Chemical Industry.

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Additional References

Investigation of the contribution of RyR target-site mutations in diamide resistance by CRISPR/Cas9 genome modification in *Drosophila*. (2017) (<https://pubmed.ncbi.nlm.nih.gov/28669775>)

RELATED GEPHE

Related Genes

1 (Acetylcholinesterase (Ace-1)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^168631^/and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^RYR^/and+Taxon+ID=^168631^/or+Gene+Gephebase=^RYR^/and+Taxon+ID=^168631^#gephebase-summary-title>)

EXTERNAL LINKS

COMMENTS

@Parallelism