

GEPHE SUMMARY

	Gephebase Gene		GepheID
resistance to dieldrin (https://www.gephebase.org/search-criteria?/and+Gene Gephebase= [^] resistance to dieldrin [^] #gephebase-summary-title)		GP00000977	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category= [^] Physiology [^] #gephebase-summary-title)			
	Trait		
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait criteria= [^] Xenobiotic resistance (insecticide) [^] #gephebase-summary-title)			
	Trait State in Taxon A		
Hypothenemus hampei			
	Trait State in Taxon B		
Hypothenemus hampei - resistant			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status= [^] Intraspecific [^] #gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Hypothenemus hampei (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Hypothenemus hampei [^] #gephebase-summary-title)		Hypothenemus hampei (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Hypothenemus hampei [^] #gephebase-summary-title)	
	Common Name		Common Name
coffee berry borer		coffee berry borer	
	Synonyms		Synonyms
coffee berry borer; Hypothenemus hampei (Ferrari, 1867)		coffee berry borer; Hypothenemus hampei (Ferrari, 1867)	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Coleoptera; Polyphaga; Cucujiformia; Curculionoidea; Curculionidae; Scolytinae; Hypothenemus		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Coleoptera; Polyphaga; Cucujiformia; Curculionoidea; Curculionidae; Scolytinae; Hypothenemus	
	Parent		Parent
Hypothenemus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57061)		Hypothenemus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57061)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
57062 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57062)		57062 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57062)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Drosophila melanogaster
Rdl		P25123 (http://www.uniprot.org/uniprot/P25123)	
	Synonyms		GenebankID or UniProtKB
CG10537; CT29555; Dmel\CG10537; DmRdl; DmRDL; gaba; GABA; GABA-R; GABA _r ; GABA[[A]]; GABA[[A]] receptor; GABA[[A]]-R; GABA[[A]]R; LCCH1; Rd1; rdl; RDL		()	
	String		
7227.FBpp0305970 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0305970)			
	Sequence Similarities		
Belongs to the ligand-gated ion channel (TC 1.A.9) family. Gamma-aminobutyric acid receptor (TC 1.A.9.5) subfamily.			
	GO - Molecular Function		
GO:0004890 : GABA-A receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004890)			
GO:0022851 : GABA-gated chloride ion channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0022851)			
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:0034220 : ion transmembrane transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0034220>)
- GO:0042493 : response to drug (<https://www.ebi.ac.uk/QuickGO/term/GO:0042493>)
- 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:0006811 : ion transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0006811>)
- GO:0042048 : olfactory behavior (<https://www.ebi.ac.uk/QuickGO/term/GO:0042048>)
- GO:0030431 : sleep (<https://www.ebi.ac.uk/QuickGO/term/GO:0030431>)
- GO:0009612 : response to mechanical stimulus (<https://www.ebi.ac.uk/QuickGO/term/GO:0009612>)
- GO:0002121 : inter-male aggressive behavior (<https://www.ebi.ac.uk/QuickGO/term/GO:0002121>)
- GO:0050805 : negative regulation of synaptic transmission (<https://www.ebi.ac.uk/QuickGO/term/GO:0050805>)
- GO:0042749 : regulation of circadian sleep/wake cycle (<https://www.ebi.ac.uk/QuickGO/term/GO:0042749>)
- GO:0090328 : regulation of olfactory learning (<https://www.ebi.ac.uk/QuickGO/term/GO:0090328>)

GO - Cellular Component

- GO:0016021 : integral component of membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)
- GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)
- GO:0005887 : integral component of plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)
- GO:0030054 : cell junction (<https://www.ebi.ac.uk/QuickGO/term/GO:0030054>)
- GO:0030425 : dendrite (<https://www.ebi.ac.uk/QuickGO/term/GO:0030425>)
- GO:0043005 : neuron projection (<https://www.ebi.ac.uk/QuickGO/term/GO:0043005>)
- GO:0030424 : axon (<https://www.ebi.ac.uk/QuickGO/term/GO:0030424>)
- 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:0034707 : chloride channel complex (<https://www.ebi.ac.uk/QuickGO/term/GO:0034707>)
- GO:0032589 : neuron projection membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0032589>)
- GO:0032809 : neuronal cell body membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0032809>)

- No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~No~#gephebase-summary-title)) Presumptive Null
- Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding~#gephebase-summary-title)) Molecular 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~#gephebase-summary-title)) Aberration Type
- Nonsynonymous SNP Coding Change
- Ala302Ser Molecular Details of the Mutation
- 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=~Candidate+Gene~#gephebase-summary-title)) Experimental Evidence

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

- Functional haplodiploidy: a mechanism for the spread of insecticide resistance in an important international insect pest. (1995) (<https://pubmed.ncbi.nlm.nih.gov/7568233>) Main Reference
- Brun LO; Stuart J; Gaudichon V; Aronstein K; French-Constant RH Authors

Abstract

The coffee berry borer, *Hypothenemus hampei*, is the most important insect pest of coffee worldwide and has an unusual life history that ensures a high degree of inbreeding. Individual females lay a predominantly female brood within individual coffee berries and because males are flightless there is almost entirely full sib mating. We investigated the genetics associated with this interesting life history after the important discovery of resistance to the cyclodiene type insecticide endosulfan. Both the inheritance of the resistance phenotype and the resistance-associated point mutation in the gamma-aminobutyric acid receptor gene Rdl were examined. Consistent with haplodiploidy, males failed to express and transmit paternally derived resistance alleles. Furthermore, while cytological examination revealed that males are diploid, one set of chromosomes was condensed, and probably nonfunctional, in the somatic cells of all males examined. Moreover, although two sets of chromosomes were present in primary spermatocytes, the chromosomes failed to pair before the single meiotic division, and only one set was packaged in sperm. Thus, the coffee berry borer is "functionally" haplodiploid. Its genetics and life history may therefore represent an interesting intermediate step in the evolution of true haplodiploidy. The influence of this breeding system on the spread of insecticide resistance is discussed.

Additional References

Single nucleotide polymorphism detection at the Hypothenemus hampei Rdl gene by allele-specific PCR amplification with Tm-shift primers . (2010)

(<https://pubmed.ncbi.nlm.nih.gov/00000000.000037>)

A molecular diagnostic for endosulfan insecticide resistance in the coffee berry borer Hypothenemus hampei (Coleoptera: Scolytidae) . (1994)

(<https://pubmed.ncbi.nlm.nih.gov/00000000.000038>)

RELATED GEPHE

No matches found.

No matches found.

Related Genes

Related Haplotypes

EXTERNAL LINKS

COMMENTS