

GEPHE SUMMARY

	Gephebase Gene	
esterase B5 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~esterase+B5^#gephebase-summary-title)	GP00002640	GepheID
Published	Entry Status	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; chlorpyrifos) (https://www.gephebase.org/search-criteria?/and+Trait=~Xenobiotic+resistance+(insecticide;+chlorpyrifos)^#gephebase-summary-title)	Trait State in Taxon A	
Culex pipiens - sensitive	Trait State in Taxon B	
Culex pipiens - resistant from Cyprus	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
Culex pipiens (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Culex+pipiens^#gephebase-summary-title)	Common Name	Common Name
northern house mosquito	Synonyms	Synonyms
Culex agilis; Culex autogenicus; Culex azoriensis; Culex bicolor; Culex bifurcatus; Culex calcitrans; Culex calloti; Culex comitatus; Culex consobrinus; Culex dipseticus; Culex disjunctus; Culex doliorum; Culex domesticus; Culex erectus; Culex fasciatus; Culex haematophagus; Culex longefurcatus; Culex luteus; Culex marginalis; Culex melanorhinus; Culex meridionalis; Culex osakaensis; Culex pallipes; Culex phytophagus; Culex quasimodestus; Culex rufinus; Culex rufus; Culex sternopunctatus; Culex thoracicus; Culex torridus; Culex trifurcatus; Culex unistriatus; Culex varioannulatus; northern house mosquito; Culex pipiens Linnaeus, 1758	Rank	Rank
species	Lineage	Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Culicinae; Culicini; Culex; Culex; Culex pipiens complex	Parent	Parent
Culex pipiens complex () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=518105)	NCBI Taxonomy ID	NCBI Taxonomy ID
7175 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7175)	is Taxon A an Intraspecies?	is Taxon B an Intraspecies?
No		No

GENOTYPIC CHANGE

	Generic Gene Name	
B1	P16854 (http://www.uniprot.org/uniprot/P16854)	UniProtKB Culex pipiens
-	Synonyms	GenebankID or UniProtKB
-	String	
	Sequence Similarities	
Belongs to the type-B carboxylesterase/lipase family.	GO - Molecular Function	
GO:0052689 : carboxylic ester hydrolase activity		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0052689>)

GO - Biological Process

-

GO - Cellular Component

-

Presumptive Null

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

Molecular Type

Gene Amplification (<https://www.gephebase.org/search-criteria?/and+Molecular Type=^Gene Amplification^#gephebase-summary-title>)

Aberration Type

Insertion (<https://www.gephebase.org/search-criteria?/and+Aberration Type=^Insertion^#gephebase-summary-title>)

Insertion Size

-

Molecular Details of the Mutation

The production of the esterase B is approximately 50- and 500-fold higher in mosquitoes from France and Cyprus (respectively) than in susceptible insects whereas the number of gene copies is about 25 and 250. Differences of about 7- and 95-fold were also found in the degree of chlorpyrifos resistance.

Experimental Evidence

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

Main Reference

Identification of two distinct amplifications of the esterase B locus in *Culex pipiens* (L.) mosquitoes from Mediterranean countries. (1992) (<https://pubmed.ncbi.nlm.nih.gov/1520252>)

Authors

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Abstract

Two new highly active esterases were detected by starch electrophoretic studies in *Culex pipiens* mosquitoes from the area of Montpellier (France) and from Cyprus. We demonstrate here that both the French and the Cyprus esterases B are overproduced due to amplification of the coding gene. The production of the esterase B is approximately 50- and 500-fold higher in mosquitoes from France and Cyprus, respectively, than in susceptible insects, whereas the number of gene copies is about 25 and 250. Differences of about 7- and 95-fold were also found in the degree of chlorpyrifos resistance. RFLP comparison of the amplified region containing the esterase B gene revealed large differences between French and Cyprus mosquitoes. It thus appears that two distinct haplotypes with an esterase B gene coding an enzyme with identical electrophoretic mobility have been amplified. We therefore named the haplotypes in mosquitoes from France and Cyprus B4 and B5, respectively. The estimated genetic distance between these two haplotypes is not smaller than those observed in all pair comparisons of other known esterase B haplotypes. These results are discussed in the context of amplification phenomena.

Additional References

RELATED GEPHE

Related Genes

5 (Acetylcholinesterase (Ace-1), Cpm1, esterase A8 and B8, esterase B4, para (kdr)) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^7175^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Parrallelism