

# GEPHE SUMMARY

	Gephebase Gene	GephelD
esterase type I ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase=^esterase type I^#gephebase-summary-title)	GP00002637	Main curator
Published	Entry Status	Courtier

## 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)	Trait		
Xenobiotic resistance (insecticide) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(insecticide)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(insecticide)^#gephebase-summary-title</a> )	Trait State in Taxon A		
Schizaphis graminum - sensitive	Trait State in Taxon B		
Schizaphis graminum - 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
Schizaphis graminum ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Schizaphis+graminum^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Schizaphis+graminum^#gephebase-summary-title</a> )		Schizaphis graminum ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Schizaphis+graminum^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Schizaphis+graminum^#gephebase-summary-title</a> )	
greenbug	Common Name		Common Name
greenbug	Synonyms		Synonyms
species	Rank		Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Sternorrhyncha; Aphidomorpha; Aphidoidea; Aphididae; Aphidinae; Aphidini; Schizaphis		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Sternorrhyncha; Aphidomorpha; Aphidoidea; Aphididae; Aphidinae; Aphidini; Schizaphis	
Schizaphis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13261">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13261</a> )	Parent	Schizaphis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13261">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13261</a> )	Parent
13262 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13262">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13262</a> )	NCBI Taxonomy ID	13262 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13262">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=13262</a> )	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
	No		

## GENOTYPIC CHANGE

-	Generic Gene Name	UniProtKB Myzus persicae
-	Synonyms	GenebankID or UniProtKB
-	String	
-	Sequence Similarities	
Belongs to the type-B carboxylesterase/lipase family.		
GO:0052689 : carboxylic ester hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0052689">https://www.ebi.ac.uk/QuickGO/term/GO:0052689</a> )	GO - Molecular Function	
-	GO - Biological Process	
-	GO - Cellular Component	
No ( <a href="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</a> )		Presumptive Null
		Molecular Type

The greenbug aphid, *Schizaphis graminum* (Rondani) has developed resistance to organophosphorus insecticides by the over-production of esterases that have been classified as Type I and Type II. The first twenty N-terminal amino acids of the Type I esterase were determined and used to design an oligonucleotide, which in conjunction with an active site primer derived from conserved sequences of other insect esterases and two internal primers specific for esterases from another aphid species resulted in a 0.85 kb genomic DNA fragment from resistant greenbugs. This was extended by 5' RACE which provided approximately 1.2 kb of the 5' end of the esterase gene. The 5' DNA sequence corresponded to 19 of the 20 known amino acids of the Type I esterase, with the last needing only a one base change (probably resulting from a PCR artifact). Furthermore, the sequence showed very close similarity to the amplified E4/FE4 esterase genes of *Myzus persicae* (Sulzer). A comparison of sequences suggested that the *S. graminum* gene has introns in the same positions as the first two introns of E4/FE4, with the second intron being considerably larger in *S. graminum*. Probing of Southern blots with the 0.85 kb esterase fragment showed that the gene encoding the Type I esterase is amplified 4- to 8-fold in resistant *S. graminum* and that the amplified sequences contain 5-methylcytosine at Mspl/Hpall sites, again in agreement with previous findings for *M. persicae* genes.

## RELATED GEPHE

No matches found.

No matches found.

## EXTERNAL LINKS

## COMMENTS