

GEPHE SUMMARY

<p>esterase NI-EST1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+^esterase+NI-EST1^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00002638</p> <p>Courtier</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category+^Physiology^#gephebase-summary-title)</p> <p>Xenobiotic resistance (organophosphorus insecticides) (https://www.gephebase.org/search-criteria?/and+Trait+^Xenobiotic+resistance+(organophosphorus+insecticides)^#gephebase-summary-title)</p> <p>Nilaparvata lugens - sensitive</p> <p>Nilaparvata lugens - resistant</p> <p>Taxon A</p> <p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+^Intraspecific^#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Nilaparvata lugens (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+^Nilaparvata+lugens^#gephebase-summary-title)</p> <p>Common Name</p> <p>brown planthopper</p> <p>Synonyms</p> <p>brown planthopper; Nilaparvata lugens (Stal, 1854); Nilaparvata lugens</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Auchenorrhyncha; Fulgoromorpha; Fulgoroidea; Delphacidae; Delphacinae; Nilaparvata</p> <p>Parent</p> <p>Nilaparvata () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=108930)</p> <p>NCBI Taxonomy ID</p> <p>108931 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=108931)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Nilaparvata lugens (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+^Nilaparvata+lugens^#gephebase-summary-title)</p> <p>Common Name</p> <p>brown planthopper</p> <p>Synonyms</p> <p>brown planthopper; Nilaparvata lugens (Stal, 1854); Nilaparvata lugens</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Paraneoptera; Hemiptera; Auchenorrhyncha; Fulgoromorpha; Fulgoroidea; Delphacidae; Delphacinae; Nilaparvata</p> <p>Parent</p> <p>Nilaparvata () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=108930)</p> <p>NCBI Taxonomy ID</p> <p>108931 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=108931)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p>
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GENOTYPIC CHANGE

<p>Ces1</p> <p>CEH; Ces1; Ces-1; Ses-1; Ces1g</p> <p>10090.ENSMUSP00000037555 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=10090.ENSMUSP00000037555)</p> <p>Belongs to the type-B carboxylesterase/lipase family.</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>Q8VCC2 (http://www.uniprot.org/uniprot/Q8VCC2)</p> <p>()</p> <p>UniProtKB Mus musculus</p> <p>GenebankID or UniProtKB</p>
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GO:0009617 : response to bacterium (<https://www.ebi.ac.uk/QuickGO/term/GO:0009617>)
 GO:0006695 : cholesterol biosynthetic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0006695>)
 GO:0042632 : cholesterol homeostasis
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0042632>)
 GO:0008203 : cholesterol metabolic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0008203>)
 GO:0034378 : chylomicron assembly (<https://www.ebi.ac.uk/QuickGO/term/GO:0034378>)
 GO:0010875 : positive regulation of cholesterol efflux
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0010875>)
 GO:0043691 : reverse cholesterol transport
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0043691>)
 GO:0010468 : regulation of gene expression
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0010468>)
 GO:0016042 : lipid catabolic process (<https://www.ebi.ac.uk/QuickGO/term/GO:0016042>)
 GO:0030855 : epithelial cell differentiation
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0030855>)
 GO:0010887 : negative regulation of cholesterol storage
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0010887>)
 GO:0071397 : cellular response to cholesterol
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0071397>)
 GO:0071404 : cellular response to low-density lipoprotein particle stimulus
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0071404>)
 GO:0051791 : medium-chain fatty acid metabolic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0051791>)
 GO:0090205 : positive regulation of cholesterol metabolic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0090205>)
 GO:0070857 : regulation of bile acid biosynthetic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0070857>)
 GO:0120188 : regulation of bile acid secretion
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0120188>)
 GO:0090320 : regulation of chylomicron remnant clearance
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0090320>)
 GO:0090207 : regulation of triglyceride metabolic process
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0090207>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
 GO:0005783 : endoplasmic reticulum
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0005783>)
 GO:0005788 : endoplasmic reticulum lumen
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0005788>)
 GO:0005811 : lipid droplet (<https://www.ebi.ac.uk/QuickGO/term/GO:0005811>)

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

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Molecular Details of the Mutation

Southern analysis of genomic DNA from the Sri Lankan OP-resistant and susceptible strains suggests that the NI-EST1 esterase gene is amplified in the resistant strain

Experimental Evidence

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

Main Reference

Molecular characterization of the amplified carboxylesterase gene associated with organophosphorus insecticide resistance in the brown planthopper, Nilaparvata lugens. (2000)
 (<https://pubmed.ncbi.nlm.nih.gov/1122474>)

Authors

Small GJ; Hemingway J

Abstract

Widespread resistance to organophosphorus insecticides (OPs) in Nilaparvata lugens is associated with elevation of carboxylesterase activity. A cDNA encoding a carboxylesterase, NI-EST1, has been isolated from an OP-resistant Sri Lankan strain of N. lugens. The full-length cDNA codes for a 547-amino acid protein with high homology to other esterases/lipases. NI-EST1 has an N-terminal hydrophobic signal peptide sequence of 24 amino acids which suggests that the mature protein is secreted from cells expressing it. The nucleotide sequence of the homologue of NI-EST1 in an OP-susceptible, low esterase Sri Lankan strain of N. lugens is identical to NI-EST1. Southern analysis of genomic DNA from the Sri Lankan OP-resistant and susceptible strains suggests that NI-EST1 is amplified in the resistant strain. Therefore, resistance to OPs in the Sri Lankan strain is through amplification of a gene identical to that found in the susceptible strain.

Additional References

RELATED GEPHE

Related Genes

4 (Acetylcholinesterase (Ace-1), CYP6AY1, CYP6ER1, GST) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^108931^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS