

## GEPHE SUMMARY

**Gephebase Gene**  
Acetylcholinesterase (Ace)

**Entry Status**  
Published

**GepheID**  
GP00002015

**Main curator**  
Courtier

## PHENOTYPIC CHANGE

**Trait Category**  
Physiology

**Trait**  
Xenobiotic resistance (insecticide)

**Trait State in Taxon A**  
Myzus persicae - sensitive

**Trait State in Taxon B**  
Myzus persicae- resistant

**Ancestral State**  
Taxon A

**Taxonomic Status**  
Intraspecific

### Taxon A

**Latin Name**  
*Myzus persicae*

**Common Name**  
green peach aphid

**Synonyms**  
Myzus (Nectarosiphon) persicae; green peach aphid; peach-potato aphid; Myzus persicae (Sulzer, 1776); Myzus persicae

**Rank**  
species

**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; Macrosiphini; Myzus

**Parent**  
Myzus () - (Rank: genus)

**NCBI Taxonomy ID**  
13164

**is Taxon A an Intraspecies?**  
No

### Taxon B

**Latin Name**  
*Myzus persicae*

**Common Name**  
green peach aphid

**Synonyms**  
Myzus (Nectarosiphon) persicae; green peach aphid; peach-potato aphid; Myzus persicae (Sulzer, 1776); Myzus persicae

**Rank**  
species

**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; Macrosiphini; Myzus

**Parent**  
Myzus () - (Rank: genus)

**NCBI Taxonomy ID**  
13164

**is Taxon B an Intraspecies?**  
No

## GENOTYPIC CHANGE

**Generic Gene Name**  
Ace

**Synonyms**  
AcChE; ace; ACE; ace-2; ache; AchE; AChE; CG17907; CHE; dAChE; dmAChE; DmAChE; Dmel\CG17907; Dm\_ace; FBgn0000024; I(3)26; I(3)87Ed

**String**  
7227.FBpp0289713

**Sequence Similarities**  
Belongs to the type-B carboxylesterase/lipase family.

**GO - Molecular Function**  
GO:0042803 : protein homodimerization activity  
GO:0003990 : acetylcholinesterase activity  
GO:0004104 : cholinesterase activity  
GO:0043199 : sulfate binding

**GO - Biological Process**  
GO:0006581 : acetylcholine catabolic process  
GO:0001507 : acetylcholine catabolic process in synaptic cleft  
GO:0007268 : chemical synaptic transmission

**UniProtKB Drosophila melanogaster**  
P07140

**GenebankID or UniProtKB**

GO:0042426 : choline catabolic process

GO:0042331 : phototaxis

**GO - Cellular Component**

GO:0005886 : plasma membrane

GO:0005737 : cytoplasm

GO:0031225 : anchored component of membrane

GO:0030054 : cell junction

GO:0043083 : synaptic cleft

**Presumptive Null**

No

**Molecular Type**

Coding

**Aberration Type**

SNP

**SNP Coding Change**

Nonsynonymous

**Molecular Details of the Mutation**

Ser431Phe (position 331 in mature Torpedo protein)

**Experimental Evidence**

Candidate Gene

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

**Main Reference**

An amino acid substitution on the second acetylcholinesterase in the pirimicarb-resistant strains of the peach potato aphid, *Myzus persicae*. (2003)

**Authors**

Nabeshima T; Kozaki T; Tomita T; Kono Y

**Abstract**

cDNAs encoding two acetylcholinesterases (AChEs) were isolated from the peach potato aphid, *Myzus persicae*. MpAChE1 was orthologous and MpAChE2 was paralogous with the ace of *Drosophila melanogaster*. The deduced amino acid sequence of MpAChE1 cDNA was identical between the pirimicarb susceptible and resistant strains. However, a single amino acid substitution of Ser431Phe on MpAChE2 was found in the pirimicarb resistant strains. This substitution was located in the acyl pocket of the enzyme and was thought to alter the ligand specificity.

**Additional References**

**RELATED GEPHE**

**Related Genes**

4 (esterase E4, para (kdr), resistance to dieldrin, CYP6CY3)

**Related Haplotypes**

No matches found.

**EXTERNAL LINKS**

**COMMENTS**