GEPHE SUMMARY

Gephebase Gene
para (kdr) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^para (kdr)^#gephebase-summary-title)

GepheID
GP00002613

Entry Status
Published

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) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (insecticide)^#gephebase-summary-title)

Trait State in Taxon A
Stomoxys calcitrans

Trait State in Taxon B
Stomoxys calcitrans - resistant

Ancestral State
Taxon A

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Stomoxys calcitrans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Stomoxys calcitrans^#gephebase-summary-title)

Common Name
stable fly

Synonyms
Stomoxis calcitrans; stable fly; biting house fly

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Calyptratae; Muscoidea; Muscidae; Muscinae; Stomoxyini; Stomoxys

Parent
Stomoxys () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 35569)

NCBI Taxonomy ID
35570 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 35570)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Stomoxys calcitrans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Stomoxys calcitrans^#gephebase-summary-title)

Common Name
stable fly

Synonyms
Stomoxis calcitrans; stable fly; biting house fly

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Calyptratae; Muscoidea; Muscidae; Muscinae; Stomoxyini; Stomoxys

Parent
Stomoxys () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 35569)

NCBI Taxonomy ID
35570 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 35570)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
para

Synonyms
bas; bss; CG9907; Dmel\CG9907; DmNav; DmNav1; DmNa[[v]]; DmNa[[V]]; DmNa[[v]]1; l(1)14Da; l(1)ESHS48; lincRNA.S9469; Nav1; Ocd; olfD; par; sbl; sbl-1; Shu; Shudderer

String
7227.FBpp0303597 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 7227.FBpp0303597)

Sequence Similarities
Belongs to the sodium channel (TC 1.A.1.10) family. Para subfamily.

GO - Molecular Function
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)
GO:0005244 : voltage-gated ion channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005244)
GO:0005248 : voltage-gated sodium channel activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005248)

UniProtKB Drosophila melanogaster
P35500 (http://www.uniprot.org/uniprot/P35500)

GenebankID or UniProtKB
()

GO:0005272 : sodium channel activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0005272)

GO - Biological Process

GO:0045433 : male courtship behavior, veined wing generated song production
(https://www.ebi.ac.uk/QuickGO/term/GO:0045433)
GO:0001666 : response to hypoxia (https://www.ebi.ac.uk/QuickGO/term/GO:0001666)
GO:0009612 : response to mechanical stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0009612)
GO:0034765 : regulation of ion transmembrane transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0034765)
GO:0035725 : sodium ion transmembrane transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0035725)
GO:0007638 : mechanosensory behavior
(https://www.ebi.ac.uk/QuickGO/term/GO:0007638)
GO:0060078 : regulation of postsynaptic membrane potential
(https://www.ebi.ac.uk/QuickGO/term/GO:0060078)

GO - Cellular Component

GO:0005887 : integral component of plasma membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005887)
GO:0001518 : voltage-gated sodium channel complex
(https://www.ebi.ac.uk/QuickGO/term/GO:0001518)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

L1014F

Experimental Evidence

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

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

Main Reference

Frequency of kdr and kdr-his Alleles in Stable Fly (Diptera: Muscidae) Populations From the United States, Costa Rica, France, and Thailand. (2019)
(https://pubmed.ncbi.nlm.nih.gov/30768670)

Authors

Olafson PU; Kaufman PE; Duvallet G; SolÃ³rzano JA; Taylor DB; Fryxell RT

Abstract

Anecdotal evidence of pyrethroid insecticide product failure for the control of stable fly [Stomoxys calcitrans (L.)] populations in the United States and worldwide prompted us to evaluate the frequency of knockdown resistance (kdr)-type polymorphisms within the voltage-sensitive sodium channel (Vssc) gene of field collected specimens from the United States, France, Costa Rica, and Thailand. The kdr-his allele (L1014H), associated with permethrin resistance, was detected in stable flies from the 10 states sampled in the United States, as well as from Costa Rica and France (Toulouse). Field collections of stable flies from California (Modesto) and New York (Cliffton Springs) exhibited reduced susceptibility upon exposure to a diagnostic permethrin concentration of 10Ã— LC99, but survival did not appear to strictly associate with frequency of the kdr-his allele. This suggests that there are additional resistance mechanisms contributing to the phenotype in these states. The kdr allele (L1014F) was detected for the first time in stable flies originating in France and Thailand, and an improved, DNA-based diagnostic assay was developed and validated for use in future screens for kdr and kdr-his allele frequencies from field collections. The absence of kdr in United States and Costa Rica populations suggests that the allele is currently restricted to Europe and Asia.

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Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^35570^/or+Gene Gephebase=^para (kdr)^/and+Taxon ID=^35570^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

The kdr allele (L1014F) was detected in stable flies originating in France and Thailand but not in United States and Costa Rica populations.