

	Gephebase Gene	GepheID
para (kdr) (<a +para+(kdr)+"#gepbase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+para+(kdr)+"#gepbase-summary-title)	GP00002644	
	Entry Status	Courtier
Published		Main curator

Trait Category		Trait	
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology^#gephebase-summary-title)			
Xenobiotic resistance (insecticide) (https://www.gephebase.org/search-criteria?/and+Trait=~Xenobiotic resistance (insecticide)^#gephebase-summary-title)			
	Trait State in Taxon A		
Musca domestica			
	Trait State in Taxon B		
Musca domestica - resistant - super-kdr+D600N			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Intraspecific^#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Musca domestica (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Musca domestica^#gephebase-summary-title)		Musca domestica (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Musca domestica^#gephebase-summary-title)	
	Common Name		Common Name
house fly		house fly	
	Synonyms		Synonyms
house fly; Musca domestica Linnaeus, 1758		house fly; Musca domestica Linnaeus, 1758	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Calyptratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Calyptratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca	
	Parent		Parent
Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44052)		Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44052)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7370)		7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7370)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

para	Generic Gene Name	P35500 (http://www.uniprot.org/uniprot/P35500)	UniProtKB Drosophila melanogaster
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	Synonyms	NP_001273814 (https://www.ncbi.nlm.nih.gov/nuccore/NP_001273814)	GenebankID or UniProtKB
7227.FBpp0303597 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0303597)	String		
	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)			

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>)

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)	Molecular Type
SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP~#gephebase-summary-title)	Aberration Type
Nonsynonymous	SNP Coding Change
super-kdr+D600N - super-kdr+D600N confers higher levels of resistance to seven pyrethroids relative to super-kdr.	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title)	Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Asp	Asn	600

Two novel house fly Vssc mutations, D600N and T929I, give rise to new insecticide resistance alleles. (2017) (https://pubmed.ncbi.nlm.nih.gov/29183579)	Main Reference
Sun H; Kasai S; Scott JG	Authors

Abstract

The house fly, *Musca domestica*, is a serious pest because it transmits a large diversity of human and veterinary diseases. Insecticides, particularly pyrethroids, are commonly used to control house flies. However, the evolution of pyrethroid resistance has reduced the effectiveness of these insecticides. A major mechanism of resistance to pyrethroids is target site insensitivity caused by the mutations in the voltage-sensitive sodium channel (Vssc) gene (e.g. kdr [L1014F] and super-kdr [M918T+L1014F]). Recently, two novel Vssc alleles, super-kdr+D600N and kdr+T929I were detected in a field collected resistant house fly population in Kansas, USA in 2013. To determine the levels of resistance that these new alleles confer to pyrethroids, we isolated strains having the unique Vssc alleles, but being otherwise congenic to the susceptible strain, aabys. We compared levels of resistance conferred to 14 pyrethroids and determined the inheritance of resistance to 8 pyrethroids. Our results revealed that super-kdr+D600N conferred higher levels of resistance to seven pyrethroids relative to super-kdr, and kdr+T929I showed super-kdr-like levels of resistance in house flies. Our results are compared with previous studies and reveal that addition of T929I to the kdr mutation (L1014F) increased resistance to all pyrethroids (except etofenprox), and enhanced resistance by ~1000-fold to acrinathrin and flumethrin. The implications of these results on the evolution of resistance are discussed.

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Additional References

RELATED GEPHE

5 (Acetylcholinesterase (Ace-2), Acetylcholinesterase (Ace), CYP6D1, esterase isozyme E7 = E3, resistance to dieldrin) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~7370~/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
3 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~para (kdr)~/and+Taxon ID=~7370~/or+Gene Gephebase=~para (kdr)~/and+Taxon ID=~7370~#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

