

CYP9J26 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~CYP9J26~#gephebase-summary-title)	Gephebase Gene	GP00002606	GepheID
Published	Entry Status	Courtier	Main curator

Physiology (#https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology)		Trait Category	
Xenobiotic resistance (insecticide) (#https://www.gephebase.org/search-criteria?/and+Trait=~Xenobiotic resistance (insecticide))		Trait	
Aedes aegypti		Trait State in Taxon A	
Aedes aegypti - resistant strain from the Caribbean		Trait State in Taxon B	
Taxon A		Ancestral State	
Intraspecific (#https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific)		Taxonomic Status	
Taxon A		Taxon B	
Aedes aegypti (#https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Aedes aegypti)		Aedes aegypti (#https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Aedes aegypti)	
yellow fever mosquito		yellow fever mosquito	
Stegomyia aegypti; yellow fever mosquito; Aedes aegypti (Linnaeus, 1762)		Stegomyia aegypti; yellow fever mosquito; Aedes aegypti (Linnaeus, 1762)	
species		species	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Culicinae; Aedini; Aedes; Stegomyia		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Nematocera; Culicomorpha; Culicoidea; Culicidae; Culicinae; Aedini; Aedes; Stegomyia	
Stegomyia () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=53541)		Stegomyia () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=53541)	
7159 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7159)		7159 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7159)	
is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
No		No	

CYP9J	Generic Gene Name	Q8T4S7 (http://www.uniprot.org/uniprot/Q8T4S7)	UniProtKB Aedes aegypti
-	Synonyms		GenebankID or UniProtKB Aedes aegypti
-	String	Q8T4S7 (https://www.ncbi.nlm.nih.gov/nucore/Q8T4S7)	
	Sequence Similarities		
Belongs to the cytochrome P450 family.			
	GO - Molecular Function		
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)			
GO:0005506 : iron ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005506)			
GO:0004497 : monooxygenase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004497)			
GO:0016705 : oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen (https://www.ebi.ac.uk/QuickGO/term/GO:0016705)			
	GO - Biological Process		
-			
	GO - Cellular Component		

GO:0016021 : integral component of membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)

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

Gene Amplification (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Gene Amplification~#gephebase-summary-title>)

Insertion (<https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion~#gephebase-summary-title>)

unknown

CYP9J26 gene amplified about 6â€“7 times

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

Gene amplification, ABC transporters and cytochrome P450s: unraveling the molecular basis of pyrethroid resistance in the dengue vector, *Aedes aegypti*. (2012)
(<https://pubmed.ncbi.nlm.nih.gov/22720108>)

Bariami V; Jones CM; Poupardin R; Vontas J; Ranson H

Pyrethroid insecticides are widely utilized in dengue control. However, the major vector, *Aedes aegypti*, is becoming increasingly resistant to these insecticides and this is impacting on the efficacy of control measures. The near complete transcriptome of two pyrethroid resistant populations from the Caribbean was examined to explore the molecular basis of this resistance.

Two previously described target site mutations, 1016I and 1534C were detected in pyrethroid resistant populations from Grand Cayman and Cuba. In addition between two and five per cent of the *Ae. aegypti* transcriptome was differentially expressed in the resistant populations compared to a laboratory susceptible population. Approximately 20 per cent of the genes over-expressed in resistant mosquitoes were up-regulated in both Caribbean populations (107 genes). Genes with putative monooxygenase activity were significantly over represented in the up-regulated subset, including five CYP9 P450 genes. Quantitative PCR was used to confirm the higher transcript levels of multiple cytochrome P450 genes from the CYP9J family and an ATP binding cassette transporter. Over expression of two genes, CYP9J26 and ABCB4, is due, at least in part, to gene amplification.

These results, and those from other studies, strongly suggest that increases in the amount of the CYP9J cytochrome P450s are an important mechanism of pyrethroid resistance in *Ae. aegypti*. The genetic redundancy resulting from the expansion of this gene family makes it unlikely that a single gene or mutation responsible for pyrethroid resistance will be identified in this mosquito species. However, the results from this study do pave the way for the development of new pyrethroid synergists and improved resistance diagnostics. The role of copy number polymorphisms in detoxification and transporter genes in providing protection against insecticide exposure requires further investigation.

RELATED GEPHE

4 (ABCB4, CYP9M6, para (kdr), resistance to dieldrin) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~7159~/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

No matches found.

EXTERNAL LINKS

COMMENTS