

GEPHE SUMMARY

cytochrome b (https://www.gephebase.org/search-criteria?/and+Gene Gephebase= [^] cytochrome b [^] #gephebase-summary-title)	Gephebase Gene	GP00002600	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category= [^] Physiology [^] #gephebase-summary-title)	Trait Category		
Xenobiotic resistance (insecticide ; bifenazate) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=<sup>^</sup>Xenobiotic resistance (insecticide ; bifenazate)<sup>^</sup>#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=[^]Xenobiotic resistance (insecticide ; bifenazate)[^]#gephebase-summary-title)	Trait		
Panonychus citri - sensitive	Trait State in Taxon A		
Panonychus citri - resistant to bifenazate	Trait State in Taxon B		
Taxon A	Ancestral State		
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status= [^] Interspecific [^] #gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
	Latin Name	Latin Name	
Panonychus citri (<a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=<sup>^</sup>Panonychus citri<sup>^</sup>#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=[^]Panonychus citri[^]#gephebase-summary-title)	Panonychus citri (<a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=<sup>^</sup>Panonychus citri<sup>^</sup>#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=[^]Panonychus citri[^]#gephebase-summary-title)	Panonychus citri (<a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=<sup>^</sup>Panonychus citri<sup>^</sup>#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=[^]Panonychus citri[^]#gephebase-summary-title)	
	Common Name	Common Name	
citrus red mite	citrus red mite	citrus red mite	
	Synonyms	Synonyms	
citrus red mite; citrus fruit mite; Panonychus citri (McGregor, 1916); Panonnychus citri	citrus red mite; citrus fruit mite; Panonychus citri (McGregor, 1916); Panonnychus citri	citrus red mite; citrus fruit mite; Panonychus citri (McGregor, 1916); Panonnychus citri	
	Rank	Rank	
species	species	species	
	Lineage	Lineage	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Chelicerata; Arachnida; Acari; Acariformes; Trombidiformes; Prostigmata; Eleutherengona; Raphignathae; Tetranychoidae; Tetranychidae; Panonychus	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Chelicerata; Arachnida; Acari; Acariformes; Trombidiformes; Prostigmata; Eleutherengona; Raphignathae; Tetranychoidae; Tetranychidae; Panonychus	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Chelicerata; Arachnida; Acari; Acariformes; Trombidiformes; Prostigmata; Eleutherengona; Raphignathae; Tetranychoidae; Tetranychidae; Panonychus	
	Parent	Parent	
Panonychus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50022)	Panonychus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50022)	Panonychus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50022)	
	NCBI Taxonomy ID	NCBI Taxonomy ID	
50023 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50023)	50023 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50023)	50023 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 50023)	
	is Taxon A an Intraspecies?	is Taxon B an Intraspecies?	
No	No	No	

GENOTYPIC CHANGE

UQCRFS1	Generic Gene Name	P47985 (http://www.uniprot.org/uniprot/P47985)	UniProtKB Homo sapiens
RIP1; RIS1; RISP; UQCR5	Synonyms	()	GenebankID or UniProtKB
	String		
9606.ENSP00000306397 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSP00000306397)	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)			
GO:0051537 : 2 iron, 2 sulfur cluster binding (https://www.ebi.ac.uk/QuickGO/term/GO:0051537)			
GO:0008121 : ubiquinol-cytochrome-c reductase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008121)			
	GO - Biological Process		

GO:0006122 : mitochondrial electron transport, ubiquinol to cytochrome c

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006122>)

GO - Cellular Component

GO:0016021 : integral component of membrane

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

GO:0005739 : mitochondrion (<https://www.ebi.ac.uk/QuickGO/term/GO:0005739>)

GO:0005743 : mitochondrial inner membrane

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005743>)

GO:0005751 : mitochondrial respiratory chain complex IV

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005751>)

GO:0005750 : mitochondrial respiratory chain complex III

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005750>)

Mutation #1

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

G126S and A133T. These mutations did not always occur in combination.

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	Gly	Ser	126

Main Reference

Parallel evolution of cytochrome b mediated bifentazate resistance in the citrus red mite *Panonychus citri*. (2011) (<https://pubmed.ncbi.nlm.nih.gov/20735493>)

Authors

Van Leeuwen T; Van Nieuwenhuysse P; Vanholme B; Dermauw W; Nauen R; Tirry L

Abstract

Bifentazate is a recently developed acaricide that is mainly used to control spider mites on a variety of crops. Although first thought to be a neurotoxin, genetic evidence obtained from bifentazate resistant *Tetranychus urticae* strains suggested an alternative mode of action as a Qo pocket inhibitor of the mitochondrial complex III. In this study, we reveal how bifentazate resistance in strains of *Panonychus citri* is maternally inherited and can confer cross-resistance to the known Qo inhibitor acequinocyl. The mitochondrial genome of *P. citri* was sequenced and Qo pocket mutations were shown to be linked with the resistant trait. Parallel evolution of cytochrome b mediated bifentazate resistance corroborates the alternative mode of action and yet again illustrates that care should be taken when employing Qo inhibitors as crop protection compounds.

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Additional References

Mutation #2

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

G126S and A133T. These mutations did not always occur in combination.

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	Ala	Thr	133

Main Reference

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[Additional References](#)

RELATED GEPHE

1 (PSST) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=^50023^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=^50023^/and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true#gephebase-summary-title))

[Related Genes](#)

No matches found.

[Related Haplotypes](#)

EXTERNAL LINKS

COMMENTS

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