

## GEPHE SUMMARY

	Gephebase Gene	GephelD
cytochrome b ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase="cytochrome b">#gephebase-summary-title)	GP00002600	Main curator
	Entry Status	Courtier
Published		

## PHENOTYPIC CHANGE

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

## GENOTYPIC CHANGE

UQCFS1	Generic Gene Name	UniProtKB Homo sapiens
RIP1; RIS1; RISP; UQCR5	Synonyms	GenebankID or UniProtKB
9606.ENSP00000306397 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000306397">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000306397</a> )	String	
-	Sequence Similarities	
GO:0046872 : metal ion binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0046872">https://www.ebi.ac.uk/QuickGO/term/GO:0046872</a> ) GO:0051537 : 2 iron, 2 sulfur cluster binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0051537">https://www.ebi.ac.uk/QuickGO/term/GO:0051537</a> ) GO:0008121 : ubiquinol-cytochrome-c reductase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008121">https://www.ebi.ac.uk/QuickGO/term/GO:0008121</a> )	GO - Molecular Function	
		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 bifenazate resistance in the citrus red mite *Panonychus citri*. (2011) (<https://pubmed.ncbi.nlm.nih.gov/20735493>)

Authors

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

Abstract

Bifenazate 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 bifenazate 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 bifenazate 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 bifenazate 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

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

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[Additional References](#)

## RELATED GEPHE

1 (PSST) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%50023%20and%20Trait=Xenobiotic resistance%20and%20groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%50023%20and%20Trait=Xenobiotic%20resistance%20and%20groupHaplotypes=true#gephebase-summary-title))

[Related Genes](#)

[Related Haplotypes](#)

No matches found.

## EXTERNAL LINKS

## COMMENTS

@MitochondrialGene