

## GEPHE SUMMARY

JYalpha ( <a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~JYalpha^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~JYalpha^#gephebase-summary-title</a> )	Gephebase Gene	GP00000508	GepheID
Published	Entry Status	Martin	Main curator

## PHENOTYPIC CHANGE

Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title</a> )	Trait Category		
Hybrid incompatibility (F2 male sterility) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=~Hybrid+incompatibility+(F2+male+sterility)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Hybrid+incompatibility+(F2+male+sterility)^#gephebase-summary-title</a> )	Trait		
Drosophila melanogaster	Trait State in Taxon A		
Drosophila simulans	Trait State in Taxon B		
Data not curated	Ancestral State		
Interspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific^#gephebase-summary-title</a> )	Taxonomic Status		
	Taxon A	Taxon B	
Drosophila melanogaster ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+melanogaster^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+melanogaster^#gephebase-summary-title</a> )	Latin Name	Drosophila simulans ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+simulans^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+simulans^#gephebase-summary-title</a> )	Latin Name
fruit fly	Common Name	-	Common Name
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms	-	Synonyms
species	Rank	species	Rank
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; Acalypratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	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; Acalypratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	Lineage
melanogaster subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351</a> )	Parent	melanogaster subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351</a> )	Parent
7227 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227</a> )	NCBI Taxonomy ID	7240 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7240">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7240</a> )	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

## GENOTYPIC CHANGE

JYalpha	Generic Gene Name	A8QI34 ( <a href="http://www.uniprot.org/uniprot/A8QI34">http://www.uniprot.org/uniprot/A8QI34</a> )	UniProtKB Drosophila melanogaster
CG17923; CG40625; CG45760; Dmel\CG45760; JY-alpha; JYAlpha; Dmel_CG45760	Synonyms	EDW63117 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/EDW63117">https://www.ncbi.nlm.nih.gov/nuccore/EDW63117</a> )	GenebankID or UniProtKB
7227.FBpp0291443 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0291443">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0291443</a> )	String		
Belongs to the cation transport ATPase (P-type) (TC 3.A.3) family. Type IIC subfamily.	Sequence Similarities		
GO:0005524 : ATP binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005524">https://www.ebi.ac.uk/QuickGO/term/GO:0005524</a> )	GO - Molecular Function		
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:0005391 : sodium:potassium-exchanging ATPase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005391">https://www.ebi.ac.uk/QuickGO/term/GO:0005391</a> )			

GO - Biological Process

- GO:0030317 : flagellated sperm motility  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030317>)
- GO:0015991 : ATP hydrolysis coupled proton transport  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0015991>)
- GO:0006812 : cation transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0006812>)
- GO:0030007 : cellular potassium ion homeostasis  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030007>)
- GO:0006883 : cellular sodium ion homeostasis  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006883>)
- GO:1990573 : potassium ion import across plasma membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:1990573>)
- GO:0036376 : sodium ion export across plasma membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0036376>)

GO - Cellular Component

- GO:0016021 : integral component of membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)
- GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)

Unknown ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="Unknown" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive Null=))

Presumptive Null

Molecular Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Molecular Type="Unknown" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular Type=))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type="Unknown" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration Type=))

Molecular Details of the Mutation

Gene transposition

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="Linkage Mapping" #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental Evidence=))

Main Reference

Gene transposition as a cause of hybrid sterility in *Drosophila*. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16960009>)

Authors

Masly JP; Jones CD; Noor MA; Locke J; Orr HA

Abstract

We describe reproductive isolation caused by a gene transposition. In certain *Drosophila melanogaster*-*D. simulans* hybrids, hybrid male sterility is caused by the lack of a single-copy gene essential for male fertility, *JYAlpha*. This gene is located on the fourth chromosome of *D. melanogaster* but on the third chromosome of *D. simulans*. Genomic and molecular analyses show that *JYAlpha* transposed to the third chromosome during the evolutionary history of the *D. simulans* lineage. Because of this transposition, a fraction of hybrids completely lack *JYAlpha* and are sterile, representing reproductive isolation without sequence evolution.

Additional References

RELATED GEPHE

Related Genes

6 (gzf, Hybrid male rescue, Lethal Hybrid rescue, Nup160, Nup96, tyrosyl-tRNA synthetase (mt-TyrRS)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="7227"/and+Trait=Hybrid incompatibility/or+Taxon ID="7240"/and+Trait=Hybrid incompatibility/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon ID=))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS