GEPHE SUMMARY

Gephebase Gene
JYalpha (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^JYalpha^#gephebase-summary-title)

GepheID
GP00000508

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Hybrid incompatibility (F2 male sterility) (https://www.gephebase.org/search-criteria?/and+Trait=^Hybrid incompatibility (F2 male sterility)^#gephebase-summary-title)

Trait State in Taxon A
Drosophila melanogaster

Trait State in Taxon B
Drosophila simulans

Ancestral State
Data not curated

Taxonomic Status
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Interspecific^#gephebase-summary-title)

Taxon A

Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila melanogaster^#gephebase-summary-title)

Common Name
fruit fly

Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster

Rank
species

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; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup

Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Drosophila simulans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila simulans^#gephebase-summary-title)

Common Name
-

Synonyms
-

Rank
species

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; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup

Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID
7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
JYalpha

Synonyms
CG17923; CG40625; CG45760; Dmel\CG45760; JY-alpha; JYAlpha; Dmel_CG45760

String
7227.FBpp0291443 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 7227.FBpp0291443)

Sequence Similarities
Belongs to the cation transport ATPase (P-type) (TC 3.A.3) family. Type IIC subfamily.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)
GO:0005391 : sodium:potassium-exchanging ATPase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005391)

UniProtKB Drosophila melanogaster
A8QI34 (http://www.uniprot.org/uniprot/A8QI34)

GenebankID or UniProtKB
EDW63117 (https://www.ncbi.nlm.nih.gov/nuccore/EDW63117)

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)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

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)

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 (gfzf, 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)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS