

GEPHE SUMMARY

	Gephebase Gene		GepheID
Nup96 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~Nup96~#gephebase-summary-title)		GP00000743	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)		
	Trait	
Hybrid incompatibility (F1 male sterility) (https://www.gephebase.org/search-criteria?/and+Trait=~Hybrid incompatibility (F1 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+TaxonomicStatus=~Interspecific~#gephebase-summary-title)		

Taxon A		Taxon B	
	Latin Name		Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Drosophila melanogaster~#gephebase-summary-title)		Drosophila simulans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Drosophila simulans~#gephebase-summary-title)	
	Common Name		Common Name
fruit fly		-	
	Synonyms		Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		-	
	Rank		Rank
species		species	
	Lineage		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		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		Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)		melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)		7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
NUP96		Q8LLD0 (http://www.uniprot.org/uniprot/Q8LLD0)	
	Synonyms		GenebankID or UniProtKB
3; F23A5.3; F23A5_3; MODIFIER OF SNC1; MOS3; NUP96; PRE; PRECOCIOUS; SUPPRESSOR OF AUXIN RESISTANCE 3; SAR3; At1g80680		KMZ05388 (https://www.ncbi.nlm.nih.gov/nuccore/KMZ05388)	
	String		
3702.AT1G80680.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 3702.AT1G80680.1)			
	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0003723 : RNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003723)			
GO:0017056 : structural constituent of nuclear pore (https://www.ebi.ac.uk/QuickGO/term/GO:0017056)			

GO:0008139 : nuclear localization sequence binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008139>)
GO:0015288 : porin activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0015288>)
GO - Biological Process
GO:0006952 : defense response (<https://www.ebi.ac.uk/QuickGO/term/GO:0006952>)
GO:0009733 : response to auxin (<https://www.ebi.ac.uk/QuickGO/term/GO:0009733>)
GO:0006606 : protein import into nucleus
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006606>)
GO:0009870 : defense response signaling pathway, resistance gene-dependent
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009870>)
GO:0051028 : mRNA transport (<https://www.ebi.ac.uk/QuickGO/term/GO:0051028>)
GO:0000973 : posttranscriptional tethering of RNA polymerase II gene DNA at nuclear periphery (<https://www.ebi.ac.uk/QuickGO/term/GO:0000973>)
GO:0006405 : RNA export from nucleus
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006405>)
GO:0034398 : telomere tethering at nuclear periphery
(<https://www.ebi.ac.uk/QuickGO/term/GO:0034398>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0005635 : nuclear envelope (<https://www.ebi.ac.uk/QuickGO/term/GO:0005635>)
GO:0031965 : nuclear membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0031965>)
GO:0044614 : nuclear pore cytoplasmic filaments
(<https://www.ebi.ac.uk/QuickGO/term/GO:0044614>)

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No^#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title)	Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown^#gephebase-summary-title)	Aberration Type
Coding divergence	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title)	Experimental Evidence
Adaptive evolution drives divergence of a hybrid inviability gene between two species of Drosophila. (2003) (https://pubmed.ncbi.nlm.nih.gov/12802326)	Main Reference
Presgraves DC; Balagopalan L; Abmayr SM; Orr HA	Authors

Abstract

Speciation--the splitting of one species into two--occurs by the evolution of any of several forms of reproductive isolation between taxa, including the intrinsic sterility and inviability of hybrids. Abundant evidence shows that these hybrid fitness problems are caused by incompatible interactions between loci: new alleles that become established in one species are sometimes functionally incompatible with alleles at interacting loci from another species. However, almost nothing is known about the genes involved in such hybrid incompatibilities or the evolutionary forces that drive their divergence. Here we identify a gene that causes epistatic inviability in hybrids between two fruitfly species, *Drosophila melanogaster* and *D. simulans*. Our population genetic analysis reveals that this gene--which encodes a nuclear pore protein--evolved by positive natural selection in both species' lineages. These results show that a lethal hybrid incompatibility has evolved as a by-product of adaptive protein evolution.

Additional References

RELATED GEPHE

6 (gzf, Hybrid male rescue, JYalpha, Lethal Hybrid rescue, Nup160, 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 Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Epistasis

