

GEPHE SUMMARY

Catecholamines up (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^Catecholamines up^#gephebase-summary-title)		Gephebase Gene	GP00000172	GepheID
Published		Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Trait #1	Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Morphology^#gephebase-summary-title)	Trait
Bristle number (https://www.gephebase.org/search-criteria?/and+Trait=^Bristle number^#gephebase-summary-title)	Trait State in Taxon A
Drosophila melanogaster	Trait State in Taxon B
Drosophila melanogaster	

Trait #2	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Physiology^#gephebase-summary-title)	Trait
Lifespan (https://www.gephebase.org/search-criteria?/and+Trait=^Lifespan^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Trait #3	Trait Category
Behavior (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Behavior^#gephebase-summary-title)	Trait
Locomotor activity (https://www.gephebase.org/search-criteria?/and+Trait=^Locomotor activity^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Trait #4	Trait Category
Behavior (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Behavior^#gephebase-summary-title)	Trait
Sleep (https://www.gephebase.org/search-criteria?/and+Trait=^Sleep^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Data not curated		Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=^Intraspecific^#gephebase-summary-title)		Taxonomic Status		
Taxon A		Taxon B		Latin Name
	Latin Name			

Drosophila melanogaster (<a +drosophila+melanogaster`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Drosophila+melanogaster`#gephebase-summary-title)	Common Name	Drosophila melanogaster (<a +drosophila+melanogaster`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Drosophila+melanogaster`#gephebase-summary-title)	Common Name
fruit fly		fruit fly	
	Synonyms		Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		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)		7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
Catsup		Q9V3A4 (http://www.uniprot.org/uniprot/Q9V3A4)
	Synonyms	GenebankID or UniProtKB
Bc; catsup; cg10449; CG10449; dCATSUP; Dmel\CG10449; dZipCatsup; dZipCATSUP; fs(2)ltoQT50; l(2)37Bc; l(2)E13; l(2)k05402; l(2)k05424		AF216584 (https://www.ncbi.nlm.nih.gov/nuccore/AF216584)
	String	
7227.FBpp0080687 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0080687)		
	Sequence Similarities	
Belongs to the ZIP transporter (TC 2.A.5) family. KE4/Catsup subfamily.		
	GO - Molecular Function	
GO:0030234 : enzyme regulator activity (https://www.ebi.ac.uk/QuickGO/term/GO:0030234) GO:0005385 : zinc ion transmembrane transporter activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005385)		
	GO - Biological Process	
GO:0006882 : cellular zinc ion homeostasis (https://www.ebi.ac.uk/QuickGO/term/GO:0006882) GO:0010312 : detoxification of zinc ion (https://www.ebi.ac.uk/QuickGO/term/GO:0010312) GO:0007300 : ovarian nurse cell to oocyte transport (https://www.ebi.ac.uk/QuickGO/term/GO:0007300) GO:1903688 : positive regulation of border follicle cell migration (https://www.ebi.ac.uk/QuickGO/term/GO:1903688) GO:0042069 : regulation of catecholamine metabolic process (https://www.ebi.ac.uk/QuickGO/term/GO:0042069) GO:2000274 : regulation of epithelial cell migration, open tracheal system (https://www.ebi.ac.uk/QuickGO/term/GO:2000274) GO:0071577 : zinc ion transmembrane transport (https://www.ebi.ac.uk/QuickGO/term/GO:0071577)		
	GO - Cellular Component	
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021) GO:0043025 : neuronal cell body (https://www.ebi.ac.uk/QuickGO/term/GO:0043025) GO:0030424 : axon (https://www.ebi.ac.uk/QuickGO/term/GO:0030424) GO:0097038 : perinuclear endoplasmic reticulum (https://www.ebi.ac.uk/QuickGO/term/GO:0097038) GO:0045202 : synapse (https://www.ebi.ac.uk/QuickGO/term/GO:0045202) GO:0008021 : synaptic vesicle (https://www.ebi.ac.uk/QuickGO/term/GO:0008021)		
No (<a +no`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive+Null="+No`#gephebase-summary-title)		Presumptive Null
		Molecular Type
Coding (<a +coding`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=">https://www.gephebase.org/search-criteria?/and+Molecular+Type="+Coding`#gephebase-summary-title)		
		Aberration Type
Unknown (<a +unknown`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Aberration+Type=">https://www.gephebase.org/search-criteria?/and+Aberration+Type="+Unknown`#gephebase-summary-title)		
		Molecular Details of the Mutation
unknown; but most large-effect variants appear to be coding		

Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
Phenotypic variation and natural selection at catsup, a pleiotropic quantitative trait gene in Drosophila. (2006) (https://pubmed.ncbi.nlm.nih.gov/16682353)	Main Reference
Carbone MA; Jordan KW; Lyman RF; Harbison ST; Leips J; Morgan TJ; DeLuca M; Awadalla P; Mackay TF	Authors
Quantitative traits are shaped by networks of pleiotropic genes . To understand the mechanisms that maintain genetic variation for quantitative traits in natural populations and to predict responses to artificial and natural selection, we must evaluate pleiotropic effects of underlying quantitative trait genes and define functional allelic variation at the level of quantitative trait nucleotides (QTNs). Catecholamines up (Catsup), which encodes a negative regulator of tyrosine hydroxylase , the rate-limiting step in the synthesis of the neurotransmitter dopamine, is a pleiotropic quantitative trait gene in Drosophila melanogaster. We used association mapping to determine whether the same or different QTNs at Catsup are associated with naturally occurring variation in multiple quantitative traits. We sequenced 169 Catsup alleles from a single population and detected 33 polymorphisms with little linkage disequilibrium (LD). Different molecular polymorphisms in Catsup are independently associated with variation in longevity, locomotor behavior, and sensory bristle number. Most of these polymorphisms are potentially functional variants in protein coding regions, have large effects, and are not common. Thus, Catsup is a pleiotropic quantitative trait gene, but individual QTNs do not have pleiotropic effects. Molecular population genetic analyses of Catsup sequences are consistent with balancing selection maintaining multiple functional polymorphisms.	Abstract
Hippocampal volume in women victimized by childhood sexual abuse. (1997) (https://pubmed.ncbi.nlm.nih.gov/9234472)	Additional References

RELATED GEPHE

11 (achaete-scute complex, Delta, Dopa-decarboxylase, hairy (h), poils au dos (pad), scabrous, smooth, Darkener of apricot (Doa), InR, Period (per), timeless (tim)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~7227~/and+Trait=Bristle number/or+Taxon ID=~7227~/and+Trait=Lifespan/or+Taxon ID=~7227~/and+Trait=Locomotor activity/or+Taxon ID=~7227~/and+Trait=Sleep/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Pleiotropy @BalancingSelection