

GEPHE SUMMARY

Gephebase Gene		GepheID
Dopa-decarboxylase (<a +dopa-decarboxylase+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+Dopa-decarboxylase+"#gephebase-summary-title)		GP00000232
Entry Status		Martin
Published		Main curator

PHENOTYPIC CHANGE

Trait Category			
Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title)			
Trait			
Bristle number (abdomen) (<a +bristle+number+(abdomen)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Bristle+number+(abdomen)+"#gephebase-summary-title)			
Trait State in Taxon A			
Drosophila melanogaster			
Trait State in Taxon B			
Drosophila melanogaster			
Ancestral State			
Data not curated			
Taxonomic Status			
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)			
Taxon A		Taxon B	
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)		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		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	
Ddc		P05031 (http://www.uniprot.org/uniprot/P05031)	
Synonyms		GenebankID or UniProtKB	
5-HT; AADC; CG10697; ddc; DDC; DdcDm; Dmel\CG10697; fDDC; l(2)37B1; l(2)37Ch; l(2)k02104		X04661 (https://www.ncbi.nlm.nih.gov/nuccore/X04661)	
String			
7227.FBpp0080710 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0080710)			
Sequence Similarities			
Belongs to the group II decarboxylase family.			
GO - Molecular Function			
GO:0030170 : pyridoxal phosphate binding (https://www.ebi.ac.uk/QuickGO/term/GO:0030170)			
GO:0004058 : aromatic-L-amino-acid decarboxylase activity			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0004058>)

GO - Biological Process

GO:0007616 : long-term memory (<https://www.ebi.ac.uk/QuickGO/term/GO:0007616>)

GO:0048085 : adult chitin-containing cuticle pigmentation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048085>)

GO:0007615 : anesthesia-resistant memory

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007615>)

GO:0006585 : dopamine biosynthetic process from tyrosine

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006585>)

GO:0048082 : regulation of adult chitin-containing cuticle pigmentation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048082>)

GO:0009611 : response to wounding (<https://www.ebi.ac.uk/QuickGO/term/GO:0009611>)

GO:0006587 : serotonin biosynthetic process from tryptophan

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006587>)

GO:0040040 : thermosensory behavior

(<https://www.ebi.ac.uk/QuickGO/term/GO:0040040>)

GO:0043052 : thermotaxis (<https://www.ebi.ac.uk/QuickGO/term/GO:0043052>)

GO:0035220 : wing disc development

(<https://www.ebi.ac.uk/QuickGO/term/GO:0035220>)

GO - Cellular Component

-

Presumptive Null

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

Molecular Type

Cis-regulatory (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title>)

Aberration Type

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

Molecular Details of the Mutation

Promoter variation

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title>)

Main Reference

Drosophila bristles and the nature of quantitative genetic variation. (2005) (<https://pubmed.ncbi.nlm.nih.gov/16108138>)

Authors

Mackay TF; Lyman RF

Abstract

Numbers of Drosophila sensory bristles present an ideal model system to elucidate the genetic basis of variation for quantitative traits. Here, we review recent evidence that the genetic architecture of variation for bristle numbers is surprisingly complex. A substantial fraction of the Drosophila genome affects bristle number, indicating pervasive pleiotropy of genes that affect quantitative traits. Further, a large number of loci, often with sex- and environment-specific effects that are also conditional on background genotype, affect natural variation in bristle number. Despite this complexity, an understanding of the molecular basis of natural variation in bristle number is emerging from linkage disequilibrium mapping studies of individual candidate genes that affect the development of sensory bristles. We show that there is naturally segregating genetic variance for environmental plasticity of abdominal and sternopleural bristle number. For abdominal bristle number this variance can be attributed in part to an abnormal abdomen-like phenotype that resembles the phenotype of mutants defective in catecholamine biosynthesis. Dopa decarboxylase (Ddc) encodes the enzyme that catalyses the final step in the synthesis of dopamine, a major Drosophila catecholamine and neurotransmitter. We found that molecular polymorphisms at Ddc are indeed associated with variation in environmental plasticity of abdominal bristle number.

Additional References

RELATED GEPHE

Related Genes

7 (achaete-scute complex, Delta, hairy (h), poils au dos (pad), scabrous, smooth, Catecholamines up) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~7227~/and+Trait=Bristle number/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Dopa-decarboxylase~/and+Taxon ID=~7227~/or+Gene Gephebase=~Dopa-decarboxylase~/and+Taxon ID=~7227~#gephebase-summary-title>)

EXTERNAL LINKS

COMMENTS

@GxE

