

GEPHE SUMMARY

	Gephebase Gene		GephelD
tan (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~tan^#gephebase-summary-title)		GP00001101	
	Entry Status	Courtier	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)		Trait	
Coloration (abdomen; male) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+abdomen;+male^#gephebase-summary-title)		Trait State in Taxon A	
dark posterior male abdomen		Trait State in Taxon B	
light posterior male abdomen		Ancestral State	
Taxon A		Taxonomic Status	
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific^#gephebase-summary-title)			
		Taxon A	Taxon B
	Latin Name		Latin Name
Drosophila yakuba (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+yakuba^#gephebase-summary-title)		Drosophila santomea (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+santomea^#gephebase-summary-title)	
-	Common Name	-	Common Name
-	Synonyms	-	Synonyms
Drosophila yakuba Burla, 1954		-	
species	Rank	species	Rank
	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)	
7245 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7245)	NCBI Taxonomy ID	129105 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=129105)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Drosophila melanogaster
t		Q9W369 (http://www.uniprot.org/uniprot/Q9W369)	
	Synonyms		GenebankID or UniProtKB
CG12120; Dmel\CG12120; Tan; tan; Dmel_CG12120		ACA49238 (https://www.ncbi.nlm.nih.gov/nuccore/ACA49238)	
-	String		
-	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0016787 : hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016787)			
GO:0003832 : beta-alanyl-dopamine hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003832)			
GO:0031964 : beta-alanyl-histamine hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0031964)			
	GO - Biological Process		
GO:0048085 : adult chitin-containing cuticle pigmentation			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048085>)
GO:0048067 : cuticle pigmentation (<https://www.ebi.ac.uk/QuickGO/term/GO:0048067>)
GO:0001692 : histamine metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001692>)
GO:0007601 : visual perception (<https://www.ebi.ac.uk/QuickGO/term/GO:0007601>)
GO:0042416 : dopamine biosynthetic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042416>)
GO:0001694 : histamine biosynthetic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001694>)

GO - Cellular Component	
GO:0005829 : cytosol (https://www.ebi.ac.uk/QuickGO/term/GO:0005829)	Presumptive Null
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)	Molecular Type
Cis-regulatory (<a +cis-regulatory+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular Type=">https://www.gephebase.org/search-criteria?/and+Molecular Type="+Cis-regulatory+"#gephebase-summary-title)	Aberration Type
Deletion (<a +deletion+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Aberration Type=">https://www.gephebase.org/search-criteria?/and+Aberration Type="+Deletion+"#gephebase-summary-title)	Deletion Size
100-999 bp	Molecular Details of the Mutation
san MSE del212 (212bp deletion)	
	Experimental Evidence
Linkage Mapping (<a +linkage="" href="https://www.gephebase.org/search-criteria?/and+Experimental Evidence=" mapping+"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping+"#gephebase-summary-title)	Main Reference
The evolution of gene regulation underlies a morphological difference between two Drosophila sister species. (2008) (https://pubmed.ncbi.nlm.nih.gov/18329365)	
Jeong S; Rebeiz M; Andolfatto P; Werner T; True J; Carroll SB	
Abstract	
Understanding the mechanisms underlying the morphological divergence of species is one of the central goals of evolutionary biology. Here, we analyze the genetic and molecular bases of the divergence of body pigmentation patterns between <i>Drosophila yakuba</i> and its sister species <i>Drosophila santomea</i> . We found that loss of pigmentation in <i>D. santomea</i> involved the selective loss of expression of the tan and yellow pigmentation genes. We demonstrate that tan gene expression was eliminated through the mutational inactivation of one specific tan cis-regulatory element (CRE) whereas the Tan protein sequence remained unchanged. Surprisingly, we identify three independent loss-of-function alleles of the tan CRE in the young <i>D. santomea</i> lineage. We submit that there is sufficient empirical evidence to support the general prediction that functional evolutionary changes at pleiotropic loci will most often involve mutations in their discrete, modular cis-regulatory elements.	
Additional References	
Evolution of the tan locus contributed to pigment loss in <i>Drosophila santomea</i> : a response to Matute et al. (2009) (https://pubmed.ncbi.nlm.nih.gov/20005811)	

RELATED GEPHE

		Related Genes
5 (Abdominal-B, ebony, pdm3, yellow, bab) (<a +7245+"="" and+trait='Coloration/and+groupHaplotypes=true#gephebase-summary-title"' href="https://www.gephebase.org/search-criteria?/or+Taxon ID=" id="+129105+">https://www.gephebase.org/search-criteria?/or+Taxon ID="+7245+"/and+Trait=Coloration/or+Taxon ID="+129105+"/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)		
2 (<a #gephebase-summary-title"="" +tan+"="" and+taxon="" gephebase="+tan" href="https://www.gephebase.org/search-criteria?/or+Gene Gephebase=" id="+129105" or+gene="">https://www.gephebase.org/search-criteria?/or+Gene Gephebase="+tan"/and+Taxon ID="+7245"/or+Gene Gephebase="+tan"/and+Taxon ID="+129105"#gephebase-summary-title)		Related Haplotypes

EXTERNAL LINKS

COMMENTS

@SexualTrait Soft sweep