

GEPHE SUMMARY

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

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
<i>Drosophila yakuba</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+yakuba^#gephebase-summary-title)		<i>Drosophila santomea</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+santomea^#gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
<i>Drosophila yakuba</i> Burla, 1954		-	
	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; Acalyptera; 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; Acalyptera; 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
7245 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7245)		129105 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=129105)	
	is Taxon A an Infrasppecies?		is Taxon B an Infrasppecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB <i>Drosophila melanogaster</i>
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 ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null+No^#gephebase-summary-title))

Molecular Type

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

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=^Deletion^#gephebase-summary-title](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 ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage 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>)

Authors

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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 *Drosophila yakuba* and its sister species *Drosophila santomea*. We found that loss of pigmentation in *D. santomea* 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 *D. santomea* 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 *Drosophila santomea*: 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) ([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](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))

Related Haplotypes

2 ([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](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))

EXTERNAL LINKS

COMMENTS

@SexualTrait Soft sweep