

## GEPHE SUMMARY

	Gephebase Gene		GepheID
tan ( <a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~tan^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~tan^#gephebase-summary-title</a> )		GP00001098	
Published	Entry Status	Martin	Main curator

## PHENOTYPIC CHANGE

	Trait Category		
Morphology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title</a> )			
	Trait		
Coloration (abdomen) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(abdomen)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(abdomen)^#gephebase-summary-title</a> )			
	Trait State in Taxon A		
Drosophila americana			
	Trait State in Taxon B		
Drosophila novamexicana			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title</a> )			
Taxon A		Taxon B	
	Latin Name		Latin Name
Drosophila americana ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+americana^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+americana^#gephebase-summary-title</a> )		Drosophila novamexicana ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+novamexicana^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+novamexicana^#gephebase-summary-title</a> )	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
-		-	
	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; Acalypratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Drosophila; virilis group		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; Acalypratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Drosophila; virilis group	
	Parent		Parent
virilis group () - (Rank: species group) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335</a> )		virilis group () - (Rank: species group) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335</a> )	
	NCBI Taxonomy ID		NCBI Taxonomy ID
40366 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=40366">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=40366</a> )		47314 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=47314">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=47314</a> )	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Drosophila melanogaster
t		Q9W369 ( <a href="http://www.uniprot.org/uniprot/Q9W369">http://www.uniprot.org/uniprot/Q9W369</a> )	
	Synonyms		GenebankID or UniProtKB
CG12120; Dmel\CG12120; Tan; tan; Dmel_CG12120		ACV86761 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/ACV86761">https://www.ncbi.nlm.nih.gov/nuccore/ACV86761</a> )	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0016787 : hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0016787">https://www.ebi.ac.uk/QuickGO/term/GO:0016787</a> )			
GO:0003832 : beta-alanyl-dopamine hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003832">https://www.ebi.ac.uk/QuickGO/term/GO:0003832</a> )			
GO:0031964 : beta-alanyl-histamine hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0031964">https://www.ebi.ac.uk/QuickGO/term/GO:0031964</a> )			
	GO - Biological Process		
GO:0048085 : adult chitin-containing cuticle pigmentation ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0048085">https://www.ebi.ac.uk/QuickGO/term/GO:0048085</a> )			

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

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

2.7kb non-coding interval; 13 SNPs + 2 indels differing between species

Experimental Evidence

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

Main Reference

Intraspecific polymorphism to interspecific divergence: genetics of pigmentation in *Drosophila*. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19900891>)

Authors

Wittkopp PJ; Stewart EE; Arnold LL; Neidert AH; Haerum BK; Thompson EM; Akhras S; Smith-Winberry G; Shefner L

Abstract

Genetic changes contributing to phenotypic differences within or between species have been identified for a handful of traits, but the relationship between alleles underlying intraspecific polymorphism and interspecific divergence is largely unknown. We found that noncoding changes in the tan gene, as well as changes linked to the ebony gene, contribute to pigmentation divergence between closely related *Drosophila* species. Moreover, we found that alleles linked to tan and ebony fixed in one *Drosophila* species also contribute to variation within another species, and that multiple genotypes underlie similar phenotypes even within the same population. These alleles appear to predate speciation, which suggests that standing genetic variation present in the common ancestor gave rise to both intraspecific polymorphism and interspecific divergence.

Additional References

## RELATED GEPHE

Related Genes

3 (Dat, Dopamine N-acetyltransferase (Dat), ebony) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~40366^/and+Trait=Coloration/or+Taxon+ID=~47314^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS