

GEPHE SUMMARY

<p>touch insensitive larva B (tilB) (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+touch+insensitive+larva+B+(tilB)+#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00002344</p> <p>Courtier</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Behavior (https://www.gephebase.org/search-criteria?/and+Trait+Category+Behavior+#gephebase-summary-title)</p> <p>Pupation site choice (https://www.gephebase.org/search-criteria?/and+Trait+Pupation+site+choice+#gephebase-summary-title)</p> <p>Unknown</p> <p>Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+Interspecific+#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>
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Taxon A	Latin Name	Taxon B	Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Drosophila+melanogaster+#gephebase-summary-title)		Drosophila simulans (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Drosophila+simulans+#gephebase-summary-title)	
Common Name		Common Name	
fruit fly		-	
Synonyms		Synonyms	
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; 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	
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)		7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7240)	
is Taxon A an Infrapopulation?		is Taxon B an Infrapopulation?	
No		No	

GENOTYPIC CHANGE

<p>tilB</p> <p>CG14620; Dmel\CG14620; TilB</p> <p>7227.FBpp0077037 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0077037)</p> <p>Belongs to the tilB family.</p> <p>-</p> <p>GO:0045433 : male courtship behavior, veined wing generated song production (https://www.ebi.ac.uk/QuickGO/term/GO:0045433)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>UniProtKB Drosophila melanogaster</p> <p>Q9VR52 (http://www.uniprot.org/uniprot/Q9VR52)</p> <p>GenebankID or UniProtKB Drosophila melanogaster</p> <p>Q9VR52 (https://www.ncbi.nlm.nih.gov/nucleotide/Q9VR52)</p>
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GO:0010378 : temperature compensation of the circadian clock
 (https://www.ebi.ac.uk/QuickGO/term/GO:0010378)
 GO:0007605 : sensory perception of sound
 (https://www.ebi.ac.uk/QuickGO/term/GO:0007605)
 GO:0035082 : axoneme assembly (https://www.ebi.ac.uk/QuickGO/term/GO:0035082)
 GO:0060285 : cilium-dependent cell motility
 (https://www.ebi.ac.uk/QuickGO/term/GO:0060285)
 GO:0036158 : outer dynein arm assembly
 (https://www.ebi.ac.uk/QuickGO/term/GO:0036158)

GO - Cellular Component

GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)
 GO:0030425 : dendrite (https://www.ebi.ac.uk/QuickGO/term/GO:0030425)
 GO:0031514 : motile cilium (https://www.ebi.ac.uk/QuickGO/term/GO:0031514)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Gene identified via deficiency mapping. Gene more highly expressed in *D. melanogaster* than in *D. simulans*. RNAi in *D. melanogaster* leads to pupae pupating closer to the food.

Experimental Evidence

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

Main Reference

The Loci of Behavioral Evolution: Evidence That *Fas2* and *tilB* Underlie Differences in Pupation Site Choice Behavior between *Drosophila melanogaster* and *D. simulans*. (2020)
 (https://pubmed.ncbi.nlm.nih.gov/31774527)

Authors

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Abstract

The behaviors of closely related species can be remarkably different, and these differences have important ecological and evolutionary consequences. Although the recent boom in genotype-phenotype studies has led to a greater understanding of the genetic architecture and evolution of a variety of traits, studies identifying the genetic basis of behaviors are, comparatively, still lacking. This is likely because they are complex and environmentally sensitive phenotypes, making them difficult to measure reliably for association studies. The *Drosophila* species complex holds promise for addressing these challenges, as the behaviors of closely related species can be readily assayed in a common environment. Here, we investigate the genetic basis of an evolved behavioral difference, pupation site choice, between *Drosophila melanogaster* and *D. simulans*. In this study, we demonstrate a significant contribution of the X chromosome to the difference in pupation site choice behavior between these species. Using a panel of X-chromosome deficiencies, we screened the majority of the X chromosome for causal loci and identified two regions associated with this X-effect. We then collect gene disruption and RNAi data supporting a single gene that affects pupation behavior within each region: *Fas2* and *tilB*. Finally, we show that differences in *tilB* expression correlate with the differences in pupation site choice behavior between species. This evidence associating two genes with differences in a complex, environmentally sensitive behavior represents the first step toward a functional and evolutionary understanding of this behavioral divergence.

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Additional References

RELATED GEPHE

Related Genes

1 (*Fas2*) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Pupation site choice/or+Taxon ID=^7240^/and+Trait=Pupation site choice/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS