

GEPHE SUMMARY

<p>bab1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~bab1^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00000131</p> <p>Courtier</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)</p>		<p>Trait Category</p>		
<p>Coloration (abdomen) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(abdomen)^#gephebase-summary-title)</p>		<p>Trait</p>		
<p>monomorphic abdominal coloration - <i>Drosophila willistoni</i></p>		<p>Trait State in Taxon A</p>		
<p>dimorphic abdominal coloration - <i>Drosophila melanogaster</i></p>		<p>Trait State in Taxon B</p>		
<p>Taxon A</p>		<p>Ancestral State</p>		
<p>Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific^#gephebase-summary-title)</p>		<p>Taxonomic Status</p>		
<p>Taxon A</p>	<p>Latin Name</p>	<p>Taxon B</p>	<p>Latin Name</p>	
<p><i>Drosophila willistoni</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+willistoni^#gephebase-summary-title)</p>	<p><i>Drosophila melanogaster</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+melanogaster^#gephebase-summary-title)</p>	<p><i>Drosophila melanogaster</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+melanogaster^#gephebase-summary-title)</p>	<p><i>Drosophila melanogaster</i> (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+melanogaster^#gephebase-summary-title)</p>	
<p>-</p>	<p>Common Name</p>	<p>-</p>	<p>Common Name</p>	
<p>-</p>	<p>Synonyms</p>	<p>fruit fly</p>	<p>Synonyms</p>	
<p>species</p>	<p>Rank</p>	<p>Sophophora melanogaster; fruit fly; <i>Drosophila melanogaster</i> Meigen, 1830; <i>Sophophora melanogaster</i> (Meigen, 1830); <i>Drosophila melangaster</i></p>	<p>Rank</p>	
<p>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; <i>Drosophila</i>; Sophophora; willistoni group; willistoni subgroup</p>	<p>Lineage</p>	<p>species</p>	<p>Lineage</p>	
<p>willistoni subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32367)</p>	<p>Parent</p>	<p>melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)</p>	<p>Parent</p>	
<p>7260 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7260)</p>	<p>NCBI Taxonomy ID</p>	<p>7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)</p>	<p>NCBI Taxonomy ID</p>	
<p>No</p>	<p>is Taxon A an Intraspecies?</p>	<p>No</p>	<p>is Taxon B an Intraspecies?</p>	

GENOTYPIC CHANGE

<p>bab1</p>	<p>Generic Gene Name</p>	<p>Q9W0K7 (http://www.uniprot.org/uniprot/Q9W0K7)</p>	<p>UniProtKB <i>Drosophila melanogaster</i></p>	
<p>anon-WO0118547.639; bab; BAB; BAB-1; bab-I; Bab1; BAB1; bric-a-brac; CG13910; CG9097; Dmel\CG9097</p>	<p>Synonyms</p>	<p>()</p>	<p>GenebankID or UniProtKB</p>	
<p>7227.FBpp0072538 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0072538)</p>	<p>String</p>			
<p>-</p>	<p>Sequence Similarities</p>			
<p>GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)</p> <p>GO:0003680 : AT DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003680)</p>		<p>GO - Molecular Function</p>		

GO - Biological Process

- GO:0006357 : regulation of transcription by RNA polymerase II
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006357>)
- GO:0006355 : regulation of transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006355>)
- GO:0007548 : sex differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0007548>)
- GO:0006351 : transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006351>)
- GO:0048085 : adult chitin-containing cuticle pigmentation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048085>)
- GO:0007455 : eye-antennal disc morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007455>)
- GO:0046660 : female sex differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0046660>)
- GO:0007478 : leg disc morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007478>)
- GO:0048086 : negative regulation of developmental pigmentation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048086>)
- GO:0048092 : negative regulation of male pigmentation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048092>)
- GO:0048070 : regulation of developmental pigmentation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048070>)
- GO:0048071 : sex-specific pigmentation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048071>)

GO - Cellular Component

- GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

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=))

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=))

Aberration Type

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

Molecular Details of the Mutation

inter - ABD-B- and DSX- binding site spacing was reduced in regions I, II, and III
gain of ABD-B binding site 13

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Candidate Gene+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

Main Reference

The regulation and evolution of a genetic switch controlling sexually dimorphic traits in *Drosophila*. (2008) (<https://pubmed.ncbi.nlm.nih.gov/18724934>)

Authors

Williams TM; Selegue JE; Werner T; Gompel N; Kopp A; Carroll SB

Abstract

Sexually dimorphic traits play key roles in animal evolution and behavior. Little is known, however, about the mechanisms governing their development and evolution. One recently evolved dimorphic trait is the male-specific abdominal pigmentation of *Drosophila melanogaster*, which is repressed in females by the Bric-À-brac (Bab) proteins. To understand the regulation and origin of this trait, we have identified and traced the evolution of the genetic switch controlling dimorphic bab expression. We show that the HOX protein Abdominal-B (ABD-B) and the sex-specific isoforms of Doublesex (DSX) directly regulate a bab cis-regulatory element (CRE). In females, ABD-B and DSX(F) activate bab expression whereas in males DSX(M) directly represses bab, which allows for pigmentation. A new domain of dimorphic bab expression evolved through multiple fine-scale changes within this CRE, whose ancestral role was to regulate other dimorphic features. These findings reveal how new dimorphic characters can emerge from genetic networks regulating pre-existing dimorphic traits.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@SexualTrait

