

GEPHE SUMMARY

yellow (https://www.gephebase.org/search-criteria/?and+GeneGephebase=%22yellow%22#gephebase-summary-title)	Gephebase Gene	GP00001220	GephelD
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category
Morphology (https://www.gephebase.org/search-criteria/?and+TraitCategory=%22Morphology%22#gephebase-summary-title)	Trait
Coloration (abdomen) (https://www.gephebase.org/search-criteria/?and+Trait=%22Coloration(abdomen)%22#gephebase-summary-title)	Trait State in Taxon A
Drosophila melanogaster	Trait State in Taxon B
Drosophila kikkawai	Ancestral State
Data not curated	Taxonomic Status
Interspecific (https://www.gephebase.org/search-criteria/?and+TaxonomicStatus=%22Interspecific%22#gephebase-summary-title)	

Taxon A	Latin Name	Taxon B	Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%22Drosophila+melanogaster%22#gephebase-summary-title)		Drosophila kikkawai (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%22Drosophila+kikkawai%22#gephebase-summary-title)	
fruit fly	Common Name	-	Common Name
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms	-	Synonyms
species	Rank	species	Rank
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	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; montium subgroup	Lineage
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	Parent	montium subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352)	Parent
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID	30033 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033)	NCBI Taxonomy ID
	is Taxon A an Infraspecies?	No	is Taxon B an Infraspecies?
No			

GENOTYPIC CHANGE

y	Generic Gene Name	UniProtKB Drosophila melanogaster
CG3757; Dmel\CG3757; EG:125H10.2; T6; Y	Synonyms	P09957 (http://www.uniprot.org/uniprot/P09957)
7227.FBpp0070070 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0070070)	String	GenebankID or UniProtKB
Belongs to the major royal jelly protein family.	Sequence Similarities	XP_017030366 (https://www.ncbi.nlm.nih.gov/nuccore/XP_017030366)
-	GO - Molecular Function	
GO:0042438 : melanin biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0042438)	GO - Biological Process	

GO:0048082 : regulation of adult chitin-containing cuticle pigmentation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048082>)

GO:0048066 : developmental pigmentation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048066>)

GO:0048067 : cuticle pigmentation (<https://www.ebi.ac.uk/QuickGO/term/GO:0048067>)

GO:0006583 : melanin biosynthetic process from tyrosine

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006583>)

GO:0048065 : male courtship behavior, veined wing extension

(<https://www.ebi.ac.uk/QuickGO/term/GO:0048065>)

GO:0060179 : male mating behavior (<https://www.ebi.ac.uk/QuickGO/term/GO:0060179>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)

GO:0005576 : extracellular region (<https://www.ebi.ac.uk/QuickGO/term/GO:0005576>)

GO:0070451 : cell hair (<https://www.ebi.ac.uk/QuickGO/term/GO:0070451>)

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%27No%27#gephebase-summary-title>)

Molecular Type

Cis-regulatory (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%27Cis-regulatory%27#gephebase-summary-title>)

Aberration Type

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%27Unknown%27#gephebase-summary-title>)

Molecular Details of the Mutation

indel and/or SNP located within a cis-regulatory element

Experimental Evidence

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%27Candidate+Gene%27#gephebase-summary-title>)

Main Reference

Regulation of body pigmentation by the Abdominal-B Hox protein and its gain and loss in Drosophila evolution. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16814723>)

Authors

Jeong S; Rokas A; Carroll SB

Abstract

Hox genes have been implicated in the evolution of many animal body patterns, but the molecular events underlying trait modification have not been elucidated. Pigmentation of the posterior male abdomen is a recently acquired trait in the *Drosophila melanogaster* lineage. Here, we show that the Abdominal-B (ABD-B) Hox protein directly activates expression of the yellow pigmentation gene in posterior segments. ABD-B regulation of pigmentation evolved through the gain of ABD-B binding sites in a specific cis-regulatory element of the yellow gene of a common ancestor of sexually dimorphic species. Within the *melanogaster* species group, male-specific pigmentation has subsequently been lost by at least three different mechanisms, including the mutational inactivation of a key ABD-B binding site in one lineage. These results demonstrate how Hox regulation of traits and target genes is gained and lost at the species level and have general implications for the evolution of body form at higher taxonomic levels.

Additional References

RELATED GEPHE

Related Genes

5 (bab, bab1, ebony, tan, wingless (wg)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%277227%27/and+Trait=Coloration/or+Taxon+ID=%2730033%27/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=%27yellow%27/and+Taxon+ID=%277227%27/or+Gene+Gephebase=%27yellow%27/and+Taxon+ID=%2730033%27#gephebase-summary-title>)

EXTERNAL LINKS

COMMENTS

@SexualTrait