

GEPHE SUMMARY

yellow (<a +yellow+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+yellow+"#gephebase-summary-title)	Gephebase Gene	GP00002623	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title)	Trait Category		
Coloration (body; wing) (<a +coloration+(body;+wing)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Coloration+(body;+wing)+"#gephebase-summary-title)	Trait		
Musca domestica - wild-type strain	Trait State in Taxon A		
Musca domestica - bwB mutant in the aabys genome sequence strain	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)	Taxonomic Status		

Taxon A	Latin Name	Taxon B	Latin Name
Musca domestica (<a +musca+domestica+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Musca+domestica+"#gephebase-summary-title)	Musca domestica (<a +musca+domestica+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Musca+domestica+"#gephebase-summary-title)	Musca domestica (<a +musca+domestica+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Musca+domestica+"#gephebase-summary-title)	Musca domestica (<a +musca+domestica+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Musca+domestica+"#gephebase-summary-title)
house fly	house fly	house fly	house fly
house fly; Musca domestica Linnaeus, 1758	house fly; Musca domestica Linnaeus, 1758	house fly; Musca domestica Linnaeus, 1758	house fly; Musca domestica Linnaeus, 1758
species	species	species	species
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; Calypratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca	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; Calypratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca	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; Calypratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca	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; Calypratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca
Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=44052)	Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=44052)	Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=44052)	Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=44052)
7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7370)	7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7370)	7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7370)	7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7370)
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

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

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Yes^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Insertion Size

1-9 bp

Molecular Details of the Mutation

a 4â€%bp insertion at amino acid position 67 that causes a frameshift and a premature stop codon

Experimental Evidence

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

Main Reference

CRISPR-Cas9 targeted disruption of the yellow ortholog in the housefly identifies the brown body locus. (2017) (https://pubmed.ncbi.nlm.nih.gov/28676649)

Authors

Heinze SD; Kohlbrenner T; Ippolito D; Meccariello A; Burger A; Mosimann C; Saccone G; Bopp D

Abstract

The classic brown body (bwb) mutation in the housefly *Musca domestica* impairs normal melanization of the adult cuticle. In *Drosophila melanogaster*, a reminiscent pigmentation defect results from mutations in the yellow gene encoding dopachrome conversion enzyme (DCE). Here, we demonstrate that the bwb locus structurally and functionally represents the yellow ortholog of *Musca domestica*, MdY. In bwb *Musca* strains, we identified two mutant MdY alleles that contain lesions predicted to result in premature truncation of the MdY open reading frame. We targeted wildtype MdY by CRISPR-Cas9 RNPs and generated new mutant alleles that fail to complement existing MdY alleles, genetically confirming that MdY is the bwb locus. We further found evidence for Cas9-mediated interchromosomal recombination between wildtype and mutant bwb alleles. Our work resolves the molecular identity of the classic bwb mutation in *Musca domestica* and establishes the feasibility of Cas9-mediated genome editing in the *Musca* model.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

The mutant allele also contains a nonsense mutation at amino acid position 65. Another mutant allele carries in addition to the 4-bp insertion and the nonsense mutation a 1.5â€%kb insertion into the 5â€² UTR region.