

GEPHE SUMMARY

	Gephebase Gene	GephelD
yellow (https://www.gephebase.org/search-criteria?/and+GeneGephebase=%22yellow%22#gephebase-summary-title)	GP00002623	Main curator
Published	Entry Status	Courtier

PHENOTYPIC CHANGE

	Trait Category	
Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=%22Morphology%22#gephebase-summary-title)	Trait	
Coloration (body; wing) (https://www.gephebase.org/search-criteria?/and+Trait=%22Coloration+(body%3B+wing)%22#gephebase-summary-title)	Trait State in Taxon A	
Musca domestica - wild-type strain	Trait State in Taxon B	
Musca domestica - bwb mutant in the aabys genome sequence strain	Ancestral State	
Taxon A	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=%22Intraspecific%22#gephebase-summary-title)		
Taxon A	Latin Name	Latin Name
Musca domestica (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=%22Musca+domestica%22#gephebase-summary-title)		
house fly	Common Name	Common Name
house fly; Musca domestica Linnaeus, 1758	Synonyms	Synonyms
species	Rank	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; Calyptratae; Muscoidea; Muscidae; Muscinae; Muscini; Musca; Musca	Lineage	Lineage
Musca () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 44052)	Parent	Parent
7370 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7370)	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

y	Generic Gene Name	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: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	Presumptive Null
GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)	Molecular Type
GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)	Aberration Type
GO:0070451 : cell hair (https://www.ebi.ac.uk/QuickGO/term/GO:0070451)	Insertion Size
Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=%27Yes%27#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Coding%27#gephebase-summary-title)	Molecular Type
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Insertion%27#gephebase-summary-title)	Aberration Type
1-9 bp	Insertion Size
a 4bp insertion at amino acid position 67 that causes a frameshift and a premature stop codon	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Candidate Gene%27#gephebase-summary-title)	Experimental Evidence
CRISPR-Cas9 targeted disruption of the yellow ortholog in the housefly identifies the brown body locus. (2017) (https://pubmed.ncbi.nlm.nih.gov/28676649)	Main Reference
Heinze SD; Kohlbrenner T; Ippolito D; Meccariello A; Burger A; Mosimann C; Saccone G; Bopp D	Authors
The classic brown body (bw ^b) mutation in the housefly <i>Musca domestica</i> impairs normal melanization of the adult cuticle. In <i>Drosophila melanogaster</i> , a reminiscent pigmentation defect results from mutations in the yellow gene encoding dopachrome conversion enzyme (DCE). Here, we demonstrate that the bw ^b locus structurally and functionally represents the yellow ortholog of <i>Musca domestica</i> , MdY. In bw ^b <i>Musca</i> 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 bw ^b locus. We further found evidence for Cas9-mediated interchromosomal recombination between wildtype and mutant bw ^b alleles. Our work resolves the molecular identity of the classic bw ^b mutation in <i>Musca domestica</i> and establishes the feasibility of Cas9-mediated genome editing in the <i>Musca</i> model.	Abstract
	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 1.5kb insertion into the 5' UTR region.