

# GEPHE SUMMARY

pdm3 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene">https://www.gephebase.org/search-criteria/?and+Gene</a> Gephebase="pdm3">#gephebase-summary-title)	Gephebase Gene	GP00001401	GephelD
	Entry Status	Prigent	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait">https://www.gephebase.org/search-criteria/?and+Trait</a> Category="Morphology">#gephebase-summary-title)	Trait
Coloration (female abdomen) ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Coloration+female+abdomen">#gephebase-summary-title</a> )	Trait State in Taxon A
Drosophila kikkawai & D leontia female light form	Trait State in Taxon B
Drosophila kikkawai & D leontia female dark form	Ancestral State
Unknown	Taxonomic Status
Intraspecific ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic">https://www.gephebase.org/search-criteria/?and+Taxonomic</a> Status="Intraspecific">#gephebase-summary-title)	

Taxon A	Latin Name	Taxon B	Latin Name
Drosophila kikkawai ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+kikkawai">#gephebase-summary-title</a> )		Drosophila kikkawai ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+kikkawai">#gephebase-summary-title</a> )	
-	Common Name	-	Common Name
-	Synonyms	-	Synonyms
-	Rank	-	Rank
species	Lineage	species	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; Ephydriodea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; montium 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; Acalyptratae; Ephydriodea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; montium subgroup	
montium subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352</a> )	Parent	montium subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352</a> )	Parent
30033 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033</a> )	NCBI Taxonomy ID	30033 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033</a> )	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	No	is Taxon B an Infraspecies?

## GENOTYPIC CHANGE

pdm3	Generic Gene Name	UniProtKB Drosophila melanogaster A0A0B4LEG2 ( <a href="http://www.uniprot.org/uniprot/A0A0B4LEG2">http://www.uniprot.org/uniprot/A0A0B4LEG2</a> )
BcDNA:AT16994; CG11641; CG14755; CG42698; Dmel\CG42698; Pdm3; DmeL_CG42698	Synonyms	GenebankID or UniProtKB 0
-	String	
Belongs to the POU transcription factor family.	Sequence Similarities	
GO:0003700 : DNA-binding transcription factor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003700">https://www.ebi.ac.uk/QuickGO/term/GO:0003700</a> )	GO - Molecular Function	
GO:0003677 : DNA binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003677">https://www.ebi.ac.uk/QuickGO/term/GO:0003677</a> )		GO - Biological Process
GO:0007411 : axon guidance ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007411">https://www.ebi.ac.uk/QuickGO/term/GO:0007411</a> )		
GO:0007409 : axonogenesis ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007409">https://www.ebi.ac.uk/QuickGO/term/GO:0007409</a> )		

GO:0007608 : sensory perception of smell  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007608>)  
GO:0007412 : axon target recognition  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007412>)

#### 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=%22No%22#gephebase-summary-title>)

Molecular Type

Cis-regulatory (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%22Cis-regulatory%22#gephebase-summary-title>)

Aberration Type

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%22Unknown%22#gephebase-summary-title>)

Molecular Details of the Mutation

associated SNPs occur in the intergenic upstream region except one in the second intron

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%22Linkage+Mapping%22#gephebase-summary-title>)

Main Reference

The *pdm3* Locus Is a Hotspot for Recurrent Evolution of Female-Limited Color Dimorphism in *Drosophila*. (2016) (<https://pubmed.ncbi.nlm.nih.gov/27546577/>)

Authors

Yassin A; Delaney EK; Reddix AJ; Seher TD; Bastide H; Appleton NC; Lack JB; David JR; Chenoweth SF; Pool JE; Kopp A

Abstract

Sex-limited polymorphisms are an intriguing form of sexual dimorphism that offer unique opportunities to reconstruct the evolutionary changes that decouple male and female traits encoded by a shared genome. We investigated the genetic basis of a Mendelian female-limited color dimorphism (FLCD) that segregates in natural populations of more than 20 species of the *Drosophila* montium subgroup. In these species, females have alternative abdominal color morphs, light and dark, whereas males have only one color morph in each species. A comprehensive molecular phylogeny of the montium subgroup supports multiple origins of FLCD. Despite this, we mapped FLCD to the same locus in four distantly related species—the transcription factor POU domain motif 3 (*pdm3*), which acts as a repressor of abdominal pigmentation in *D. melanogaster*. In *D. serrata*, FLCD maps to a structural variant in the first intron of *pdm3*; however, this variant is not found in the three other species—*D. kikkawai*, *D. leontia*, and *D. burlai*—and sequence analysis strongly suggests the *pdm3* alleles responsible for FLCD originated independently at least three times. We propose that cis-regulatory changes in *pdm3* form sexually dimorphic and monomorphic alleles that segregate within species and are preserved, at least in one species, by structural variation. Surprisingly, *pdm3* has not been implicated in the evolution of sex-specific pigmentation outside the montium subgroup, suggesting that the genetic paths to sexual dimorphism may be constrained within a clade but variable across clades.

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Additional References

## RELATED GEPHE

1 (yellow) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%2230033%22/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

@SexualTrait