

GEPHE SUMMARY

<p>pdm3 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^pdm3^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001401</p> <p>Prigent</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>Coloration (female abdomen) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration+(female+abdomen)^#gephebase-summary-title)</p> <p>Drosophila kikkawai & D leontia female light form</p> <p>Drosophila kikkawai & D leontia female dark form</p> <p>Unknown</p> <p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Drosophila kikkawai & D leontia female light form</p> <p>Drosophila kikkawai & D leontia female dark form</p> <p>Unknown</p> <p>Intraspecific</p>	<p></p>
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Taxon A	Latin Name	Taxon B	Latin Name
Drosophila kikkawai (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+kikkawai^#gephebase-summary-title)	Drosophila kikkawai	Drosophila kikkawai (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+kikkawai^#gephebase-summary-title)	Drosophila kikkawai
-	Common Name	-	Common Name
-	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; Acalyptera; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; montium 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; Acalyptera; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; montium subgroup	Lineage
montium subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352)	Parent	montium subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32352)	Parent
30033 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033)	NCBI Taxonomy ID	30033 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30033)	NCBI Taxonomy ID
No	is Taxon A an Infrasppecies?	No	is Taxon B an Infrasppecies?

GENOTYPIC CHANGE

<p>pdm3</p> <p>BcDNA:AT16994; CG11641; CG14755; CG42698; Dmel\CG42698; Pdm3; Dmel_CG42698</p> <p>-</p> <p>Belongs to the POU transcription factor family.</p> <p>GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)</p> <p>GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)</p> <p>GO:0007411 : axon guidance (https://www.ebi.ac.uk/QuickGO/term/GO:0007411)</p> <p>GO:0007409 : axonogenesis (https://www.ebi.ac.uk/QuickGO/term/GO:0007409)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>UniProtKB Drosophila melanogaster A0A0B4LEG2 (http://www.uniprot.org/uniprot/A0A0B4LEG2)</p> <p>GenebankID or UniProtKB</p> <p>0</p>
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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="+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

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="+Linkage Mapping^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

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="+30033^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=))

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@SexualTrait