

GEPHE SUMMARY

Gephebase Gene

yellow

Entry Status

Published

GepheID

GP00002023

Main curator

Courtier

PHENOTYPIC CHANGE

Trait Category

Morphology

Trait

Coloration (abdomen; male)

Trait State in Taxon A

dark posterior male abdomen

Trait State in Taxon B

light posterior male abdomen

Ancestral State

Taxon A

Taxonomic Status

Interspecific

Taxon A

Latin Name

Drosophila yakuba

Common Name

-

Synonyms

Drosophila yakuba Burla, 1954

Rank

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; Acalytratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup

Parent

melanogaster subgroup () - (Rank: species subgroup)

NCBI Taxonomy ID

7245

is Taxon A an Intraspecies?

No

Taxon B

Latin Name

Drosophila santomea

Common Name

-

Synonyms

-

Rank

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; Acalytratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup

Parent

melanogaster subgroup () - (Rank: species subgroup)

NCBI Taxonomy ID

129105

is Taxon B an Intraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

y

Synonyms

CG5757; Dmel\CG5757; EG:125H10.2; T6; Y

String

7227.FBpp0070070

Sequence Similarities

Belongs to the major royal jelly protein family.

GO - Molecular Function

-

GO - Biological Process

GO:0042438 : melanin biosynthetic process

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

GO:0048066 : developmental pigmentation

GO:0048067 : cuticle pigmentation

GO:0006583 : melanin biosynthetic process from tyrosine

GO:0048065 : male courtship behavior, veined wing extension

UniProtKB *Drosophila melanogaster*

P09957

GenebankID or UniProtKB

GO:0060179 : male mating behavior

GO - Cellular Component

GO:0005737 : cytoplasm

GO:0005576 : extracellular region

GO:0070451 : cell hair

Presumptive Null

No

Molecular Type

Cis-regulatory

Aberration Type

Unknown

Molecular Details of the Mutation

change in a cis-regulatory region - exact causing mutation(s) unknown - decreased yellow abdominal expression associated with lighter color

Experimental Evidence

Linkage Mapping

Main Reference

Changes throughout a Genetic Network Mask the Contribution of Hox Gene Evolution. (2019)

Authors

Liu Y; Ramos-Womack M; Han C; Reilly P; Brackett KL; Rogers W; Williams TM; Andolfatto P; Stern DL; Rebeiz M

Abstract

Hox genes pattern the anterior-posterior axis of animals and are posited to drive animal body plan evolution, yet their precise role in evolution has been difficult to determine. Here, we identified evolutionary modifications in the Hox gene Abd-B that dramatically altered its expression along the body plan of *Drosophila santomea*. Abd-B is required for pigmentation in *Drosophila yakuba*, the sister species of *D. santomea*, and changes to Abd-B expression would be predicted to make large contributions to the loss of body pigmentation in *D. santomea*. However, manipulating Abd-B expression in current-day *D. santomea* does not affect pigmentation. We attribute this epistatic interaction to four other genes within the *D. santomea* pigmentation network, three of which have evolved expression patterns that do not respond to Abd-B. Our results demonstrate how body plans may evolve through small evolutionary steps distributed throughout Hox-regulated networks. Polygenicity and epistasis may hinder efforts to identify genes and mechanisms underlying macroevolutionary traits.

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Additional References

RELATED GEPHE

Related Genes

5 (Abdominal-B, ebony, pdm3, tan, bab)

Related Haplotypes

No matches found.

COMMENTS

@SexualTrait @SeveralMutationsWithEffect