

GEPHE SUMMARY

Gephebase Gene
ebony

Entry Status
Published

GepheID
GP00000248

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Morphology

Trait
Coloration (abdomen)

Trait State in Taxon A
Drosophila americana

Trait State in Taxon B
Drosophila novamexicana

Ancestral State
Taxon A

Taxonomic Status
Intraspecific

Taxon A

Latin Name
Drosophila americana

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; Acalyptera; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Drosophila; virilis group

Parent
virilis group () - (Rank: species group)

NCBI Taxonomy ID
40366

is Taxon A an Intraspecies?
No

Taxon B

Latin Name
Drosophila novamexicana

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; Acalyptera; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Drosophila; virilis group

Parent
virilis group () - (Rank: species group)

NCBI Taxonomy ID
47314

is Taxon B an Intraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
e

Synonyms
ebony; CG3331

String
-

Sequence Similarities
-

GO - Molecular Function
GO:0000036 : acyl carrier activity
GO:0003833 : beta-alanyl-dopamine synthase activity
GO:0031177 : phosphopantetheine binding

GO - Biological Process
GO:0048085 : adult chitin-containing cuticle pigmentation
GO:0042417 : dopamine metabolic process
GO:0007623 : circadian rhythm
GO:0048082 : regulation of adult chitin-containing cuticle pigmentation
GO:0048066 : developmental pigmentation

UniProtKB Drosophila melanogaster
O76858

GenebankID or UniProtKB
ACD67998

GO:0043042 : amino acid adenylation by nonribosomal peptide synthase
GO:0007593 : chitin-based cuticle sclerotization
GO:0048067 : cuticle pigmentation
GO:0001692 : histamine metabolic process
GO:0045475 : locomotor rhythm
GO:0006583 : melanin biosynthetic process from tyrosine
GO:0048022 : negative regulation of melanin biosynthetic process
GO:0042440 : pigment metabolic process

GO - Cellular Component
GO:0005737 : cytoplasm

Presumptive Null
Unknown

Molecular Type
Cis-regulatory

Aberration Type
Unknown

Molecular Details of the Mutation
Not identified

Experimental Evidence
Linkage Mapping

Main Reference
Intraspecific polymorphism to interspecific divergence: genetics of pigmentation in *Drosophila*. (2009)

Authors
Wittkopp PJ; Stewart EE; Arnold LL; Neidert AH; Haerum BK; Thompson EM; Akhras S; Smith-Winberry G; Shefner L

Abstract
Genetic changes contributing to phenotypic differences within or between species have been identified for a handful of traits, but the relationship between alleles underlying intraspecific polymorphism and interspecific divergence is largely unknown. We found that noncoding changes in the *tan* gene, as well as changes linked to the *ebony* gene, contribute to pigmentation divergence between closely related *Drosophila* species. Moreover, we found that alleles linked to *tan* and *ebony* fixed in one *Drosophila* species also contribute to variation within another species, and that multiple genotypes underlie similar phenotypes even within the same population. These alleles appear to predate speciation, which suggests that standing genetic variation present in the common ancestor gave rise to both intraspecific polymorphism and interspecific divergence.

Additional References

RELATED GEPHE

Related Genes
3 (*Dat*, Dopamine N-acetyltransferase (*Dat*), *tan*)
Related Haplotypes
No matches found.

COMMENTS