

GEPHE SUMMARY

| | Gephebase Gene | GephelD |
|---|----------------|--------------|
| ebony (https://www.gephebase.org/search-criteria?/and+GeneGephebase=%22ebony%22#gephebase-summary-title) | GP00000248 | |
| Published | Entry Status | Main curator |

PHENOTYPIC CHANGE

| | Trait Category | |
|---|-----------------------------|-----------------------------|
| Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=%22Morphology%22#gephebase-summary-title) | Trait | |
| Coloration (abdomen) (https://www.gephebase.org/search-criteria?/and+Trait=%22Coloration(abdomen)%22#gephebase-summary-title) | Trait State in Taxon A | |
| Drosophila americana | Trait State in Taxon B | |
| Drosophila novamexicana | 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 |
| Drosophila americana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=%22Drosophila+americana%22#gephebase-summary-title) | Common Name | Common Name |
| - | Synonyms | Synonyms |
| - | Rank | Rank |
| species | Lineage | 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; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Drosophila; virilis group | Parent | Parent |
| virilis group () - (Rank: species group) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32335) | NCBI Taxonomy ID | NCBI Taxonomy ID |
| 40366 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 40366) | | |
| | is Taxon A an Infraspecies? | is Taxon B an Infraspecies? |
| No | | |

GENOTYPIC CHANGE

| | Generic Gene Name | UniProtKB Drosophila melanogaster |
|---|-------------------------|--|
| ebony; CG3331 | Synonyms | GenebankID or UniProtKB |
| - | String | ACD67998 (https://www.ncbi.nlm.nih.gov/nuccore/ACD67998) |
| - | Sequence Similarities | |
| GO:0000036 : acyl carrier activity (https://www.ebi.ac.uk/QuickGO/term/GO:0000036) | GO - Molecular Function | |
| GO:0003833 : beta-alanyl-dopamine synthase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003833) | | |
| GO:0031177 : phosphopantetheine binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031177) | | |
| GO:0048085 : adult chitin-containing cuticle pigmentation (https://www.ebi.ac.uk/QuickGO/term/GO:0048085) | GO - Biological Process | |

GO:0042417 : dopamine metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042417>)
GO:0007623 : circadian rhythm (<https://www.ebi.ac.uk/QuickGO/term/GO:0007623>)
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:0043042 : amino acid adenylylation by nonribosomal peptide synthase
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043042>)
GO:0007593 : chitin-based cuticle sclerotization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007593>)
GO:0048067 : cuticle pigmentation (<https://www.ebi.ac.uk/QuickGO/term/GO:0048067>)
GO:0001692 : histamine metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001692>)
GO:0045475 : locomotor rhythm (<https://www.ebi.ac.uk/QuickGO/term/GO:0045475>)
GO:0006583 : melanin biosynthetic process from tyrosine
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006583>)
GO:0048022 : negative regulation of melanin biosynthetic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048022>)
GO:0042440 : pigment metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042440>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)

Presumptive Null

Unknown (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Unknown^#gephebase-summary-title>)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Not identified

Experimental Evidence

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

Main Reference

Intraspecific polymorphism to interspecific divergence: genetics of pigmentation in Drosophila. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19900891>)

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

ebony affects pigmentation divergence and cuticular hydrocarbons in Drosophila americana and D. novamexicana . (2020) (<https://pubmed.ncbi.nlm.nih.gov/00000000.000047>)

RELATED GEPHE

Related Genes

3 (Dat, Dopamine N-acetyltransferase (Dat), tan) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^40366^/and+Trait=Coloration/or+Taxon+ID=^47314^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Divergence of ebony contributes to pigmentation divergence in the overall body as well as in pigmentation along the dorsal abdominal midline.

