

GEPHE SUMMARY

|                                                                                                                                                                                                               |                |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
|                                                                                                                                                                                                               | Gephebase Gene | GepheID      |
| tan ( <a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~tan^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=~tan^#gephebase-summary-title</a> ) | GP00001098     |              |
|                                                                                                                                                                                                               | Entry Status   | Martin       |
| Published                                                                                                                                                                                                     |                | Main curator |

PHENOTYPIC CHANGE

|                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Trait Category              |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
| Morphology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait Category=~Morphology^#gephebase-summary-title</a> )                                                                                                                                                                                |                             | Trait                                                                                                                                                                                                                                                                                                                                                                                                             |                             |
| Coloration (abdomen) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(abdomen)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Coloration (abdomen)^#gephebase-summary-title</a> )                                                                                                                                                                     |                             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Trait State in Taxon A      |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
| Drosophila americana                                                                                                                                                                                                                                                                                                                                                                                              |                             | Trait State in Taxon B                                                                                                                                                                                                                                                                                                                                                                                            |                             |
| Drosophila novamexicana                                                                                                                                                                                                                                                                                                                                                                                           |                             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Ancestral State             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
| Taxon A                                                                                                                                                                                                                                                                                                                                                                                                           |                             | Taxonomic Status                                                                                                                                                                                                                                                                                                                                                                                                  |                             |
| Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic Status=~Intraspecific^#gephebase-summary-title</a> )                                                                                                                                                                   |                             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Taxon A                     |                                                                                                                                                                                                                                                                                                                                                                                                                   | Taxon B                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Latin Name                  |                                                                                                                                                                                                                                                                                                                                                                                                                   | Latin Name                  |
| Drosophila americana ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+americana^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Drosophila americana^#gephebase-summary-title</a> )                                                                                                                                          |                             | Drosophila novamexicana ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Drosophila+novamexicana^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Drosophila novamexicana^#gephebase-summary-title</a> )                                                                                                                                 |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Common Name                 |                                                                                                                                                                                                                                                                                                                                                                                                                   | Common Name                 |
| -                                                                                                                                                                                                                                                                                                                                                                                                                 |                             | -                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Synonyms                    |                                                                                                                                                                                                                                                                                                                                                                                                                   | Synonyms                    |
| -                                                                                                                                                                                                                                                                                                                                                                                                                 |                             | -                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Rank                        |                                                                                                                                                                                                                                                                                                                                                                                                                   | Rank                        |
| species                                                                                                                                                                                                                                                                                                                                                                                                           |                             | 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 |                             | 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) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32335</a> )                                                                                                                                                                                                                   |                             | virilis group () - (Rank: species group) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32335">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32335</a> )                                                                                                                                                                                                                   |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | NCBI Taxonomy ID            |                                                                                                                                                                                                                                                                                                                                                                                                                   | NCBI Taxonomy ID            |
| 40366 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=40366">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 40366</a> )                                                                                                                                                                                                                                                      |                             | 47314 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=47314">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 47314</a> )                                                                                                                                                                                                                                                      |                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | is Taxon A an Intraspecies? |                                                                                                                                                                                                                                                                                                                                                                                                                   | is Taxon B an Intraspecies? |
| No                                                                                                                                                                                                                                                                                                                                                                                                                |                             | No                                                                                                                                                                                                                                                                                                                                                                                                                |                             |

GENOTYPIC CHANGE

|                                                                                                                                                                         |                         |                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                         | Generic Gene Name       | UniProtKB Drosophila melanogaster                                                                                      |
| t                                                                                                                                                                       |                         | Q9W369 ( <a href="http://www.uniprot.org/uniprot/Q9W369">http://www.uniprot.org/uniprot/Q9W369</a> )                   |
|                                                                                                                                                                         | Synonyms                | GenebankID or UniProtKB                                                                                                |
| CG12120; Dmel\CG12120; Tan; tan; Dmel_CG12120                                                                                                                           |                         | ACV86761 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/ACV86761">https://www.ncbi.nlm.nih.gov/nuccore/ACV86761</a> ) |
|                                                                                                                                                                         | String                  |                                                                                                                        |
| -                                                                                                                                                                       |                         |                                                                                                                        |
|                                                                                                                                                                         | Sequence Similarities   |                                                                                                                        |
| -                                                                                                                                                                       |                         |                                                                                                                        |
|                                                                                                                                                                         | GO - Molecular Function |                                                                                                                        |
| GO:0016787 : hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0016787">https://www.ebi.ac.uk/QuickGO/term/GO:0016787</a> )                           |                         |                                                                                                                        |
| GO:0003832 : beta-alanyl-dopamine hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003832">https://www.ebi.ac.uk/QuickGO/term/GO:0003832</a> )      |                         |                                                                                                                        |
| GO:0031964 : beta-alanyl-histamine hydrolase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0031964">https://www.ebi.ac.uk/QuickGO/term/GO:0031964</a> )     |                         |                                                                                                                        |
|                                                                                                                                                                         | GO - Biological Process |                                                                                                                        |
| GO:0048085 : adult chitin-containing cuticle pigmentation ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0048085">https://www.ebi.ac.uk/QuickGO/term/GO:0048085</a> ) |                         |                                                                                                                        |

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| GO:0048067 : cuticle pigmentation ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0048067">https://www.ebi.ac.uk/QuickGO/term/GO:0048067</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |
| GO:0001692 : histamine metabolic process ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0001692">https://www.ebi.ac.uk/QuickGO/term/GO:0001692</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                   |
| GO:0007601 : visual perception ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007601">https://www.ebi.ac.uk/QuickGO/term/GO:0007601</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                   |
| GO:0042416 : dopamine biosynthetic process ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0042416">https://www.ebi.ac.uk/QuickGO/term/GO:0042416</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |
| GO:0001694 : histamine biosynthetic process ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0001694">https://www.ebi.ac.uk/QuickGO/term/GO:0001694</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |
| GO - Cellular Component                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                   |
| GO:0005829 : cytosol ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005829">https://www.ebi.ac.uk/QuickGO/term/GO:0005829</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Presumptive Null                  |
| Unknown ( <a href="https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown~#gephebase-summary-title</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Molecular Type                    |
| Cis-regulatory ( <a href="https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Aberration Type                   |
| Unknown ( <a href="https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown~#gephebase-summary-title</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Molecular Details of the Mutation |
| 2.7kb non-coding interval; 13 SNPs + 2 indels differing between species                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Experimental Evidence             |
| Linkage Mapping ( <a href="https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Main Reference                    |
| Intraspecific polymorphism to interspecific divergence: genetics of pigmentation in Drosophila. (2009) ( <a href="https://pubmed.ncbi.nlm.nih.gov/19900891">https://pubmed.ncbi.nlm.nih.gov/19900891</a> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 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), ebony) ( <a href="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">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</a> ) | Related Haplotypes |
| No matches found.                                                                                                                                                                                                                                                                                                                                                                                                                |                    |

EXTERNAL LINKS

COMMENTS