GEPHE SUMMARY

Gephebase Gene
tan (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^tan^#gephebase-summary-title)

GepheID
GP00002622

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Coloration (thorax; abdomen; trident) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (thorax; abdomen; trident)^#gephebase-summary-title)

Trait State in Taxon A
Drosophila melanogaster

Trait State in Taxon B
Drosophila melanogaster

Ancestral State
Taxon A

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila melanogaster^#gephebase-summary-title)

Common Name
fruit fly

Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster

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

Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila melanogaster^#gephebase-summary-title)

Common Name
fruit fly

Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster

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

Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
t

Synonyms
CG12120; Dmel\CG12120; Tan; tan; Dmel_CG12120

String
-

Sequence Similarities
-

GO - Molecular Function
GO:0016787 : hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016787)
GO:0003832 : beta-alanyl-dopamine hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003832)
GO:0031964 : beta-alanyl-histamine hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0031964)

GO - Biological Process

UniProtKB Drosophila melanogaster
Q9W369 (http://www.uniprot.org/uniprot/Q9W369)

GenebankID or UniProtKB
()

GO:0048085 : adult chitin-containing cuticle pigmentation (https://www.ebi.ac.uk/QuickGO/term/GO:0048085)
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:0007601 : visual perception (https://www.ebi.ac.uk/QuickGO/term/GO:0007601)
GO:0042416 : dopamine biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0042416)
GO:0001694 : histamine biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0001694)

GO - Cellular Component

GO:0005829 : cytosol (https://www.ebi.ac.uk/QuickGO/term/GO:0005829)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#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

exact causing mutation(s) unknown

Experimental Evidence

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

Main Reference

A genome-wide, fine-scale map of natural pigmentation variation in Drosophila melanogaster. (2013) (https://pubmed.ncbi.nlm.nih.gov/23754958)

Authors

Bastide H; Betancourt A; Nolte V; Tobler R; StÃ¶be P; Futschik A; SchlÃ¶tterer C

Abstract

Various approaches can be applied to uncover the genetic basis of natural phenotypic variation, each with their specific strengths and limitations. Here, we use a replicated genome-wide association approach (Pool-GWAS) to fine-scale map genomic regions contributing to natural variation in female abdominal pigmentation in Drosophila melanogaster, a trait that is highly variable in natural populations and highly heritable in the laboratory. We examined abdominal pigmentation phenotypes in approximately 8000 female European D. melanogaster, isolating 1000 individuals with extreme phenotypes. We then used whole-genome Illumina sequencing to identify single nucleotide polymorphisms (SNPs) segregating in our sample, and tested these for associations with pigmentation by contrasting allele frequencies between replicate pools of light and dark individuals. We identify two small regions near the pigmentation genes tan and bric-Ã -brac 1, both corresponding to known cis-regulatory regions, which contain SNPs showing significant associations with pigmentation variation. While the Pool-GWAS approach suffers some limitations, its cost advantage facilitates replication and it can be applied to any non-model system with an available reference genome.

Additional References

Genetic Architecture of Abdominal Pigmentation in Drosophila melanogaster. (2015) (https://pubmed.ncbi.nlm.nih.gov/25933381)
Reconciling Differences in Pool-GWAS Between Populations: A Case Study of Female Abdominal Pigmentation in Drosophila melanogaster. (2016) (https://pubmed.ncbi.nlm.nih.gov/26715669)
Pleiotropic effects of regulatory variation in tan result in correlation of two pigmentation traits in Drosophila melanogaster. (2018) (https://pubmed.ncbi.nlm.nih.gov/29957826)

RELATED GEPHE

Related Genes

5 (bab, bab1, ebony, yellow, wingless (wg)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Pleiotropy @SexualTrait (abdominal pigmentation variation in females)