

GEPHE SUMMARY

Gephebase Gene
desatF

Entry Status
Published

GepheID
GP00000219

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology

Trait
Pheromone production

Trait State in Taxon A
Drosophila (Sophophora) spp.

Trait State in Taxon B
Drosophila melanogaster

Ancestral State
Data not curated

Taxonomic Status
Interspecific

Taxon A

Latin Name
Drosophila

Common Name
-

Synonyms
Drosophila (Drosophila); Drosophila (Drosophila) Fallen, 1823

Rank
subgenus

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

Parent
Drosophila (fruit flies) - (Rank: genus)

NCBI Taxonomy ID
32281

is Taxon A an Intraspecies?
No

Taxon B

Latin Name
Drosophila melanogaster

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

Parent
melanogaster subgroup () - (Rank: species subgroup)

NCBI Taxonomy ID
7227

is Taxon B an Intraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
desatF

Synonyms
-

String
-

Sequence Similarities
Belongs to the fatty acid desaturase type 1 family.

GO - Molecular Function
GO:0016717 : oxidoreductase activity, acting on paired donors, with oxidation of a pair of donors resulting in the reduction of molecular oxygen to two molecules of water

GO - Biological Process
GO:0006633 : fatty acid biosynthetic process

GO - Cellular Component
GO:0016021 : integral component of membrane

UniProtKB Drosophila melanogaster
A7DZ97

GenebankID or UniProtKB
AM773627

Presumptive Null

No

Molecular Type

Cis-regulatory

Aberration Type

Unknown

Molecular Details of the Mutation

Enrichment/gain of DSX binding sites

Experimental Evidence

Candidate Gene

Main Reference

Evolution of a desaturase involved in female pheromonal cuticular hydrocarbon biosynthesis and courtship behavior in *Drosophila*. (2008)

Authors

Legendre A; Miao XX; Da Lage JL; Wicker-Thomas C

Abstract

Drosophila species exhibit polymorphism in female pheromonal cuticular hydrocarbons, with 7-monoenes produced in *Drosophila simulans* and 7,11-dienes in most populations of *Drosophila melanogaster* (5,9-dienes in several African populations). A female-biased desaturase, *desatF*, expressed only in *D. melanogaster* is involved in the synthesis of 7,11-dienes. We investigated the role of *desatF* in 5,9-diene flies. We constructed a 5,9-diene strain knock-down for *desatF* and showed that *desatF* is involved in 5,9-diene formation. We also studied *D. melanogaster*/*D. simulans* hybrids. These hybrid females produced dienes and received normal courtship from *D. melanogaster* males, but copulation success was reduced. With *D. simulans* males, courtship was decreased and no copulation occurred. Hybrids with a chromosomal deletion of the *D. melanogaster desatF* gene had no dienes and received normal courtship from *D. simulans* males; depending on the *D. simulans* parental strain, 7-19% of them succeeded in mating. *D. simulans desatF* promoter region shows 21-23% gaps and 86-89% identity with *D. melanogaster* promoter region, the coding region 93-94% identity, depending on the strain. These differences could explain the functional polymorphism of *desatF* observed between both species, contributing to different cuticular hydrocarbon profiles, that constitute an effective barrier between species.

Additional References

Rapid evolution of sex pheromone-producing enzyme expression in *Drosophila*. (2009)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1

EXTERNAL LINKS

COMMENTS