

## GEPHE SUMMARY

**Gephebase Gene**  
Jheh1-Jheh2-Jheh3 complex

**Entry Status**  
Published

**GepheID**  
GP00001782

**Main curator**  
Courtier

## PHENOTYPIC CHANGE

**Trait Category**  
Physiology

**Trait**  
Oxidative stress resistance

**Trait State in Taxon A**  
Drosophila melanogaster

**Trait State in Taxon B**  
Drosophila melanogaster

**Ancestral State**  
Taxon A

**Taxonomic Status**  
Intraspecific

### Taxon A

**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 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**  
JHEH

**Synonyms**  
JHEH; bommo-JHEH

**String**  
7091.BGIBMGA013930-TA

**Sequence Similarities**  
Belongs to the peptidase S33 family.

**GO - Molecular Function**  
GO:0033961 : cis-stilbene-oxide hydrolase activity

**GO - Biological Process**  
GO:0019439 : aromatic compound catabolic process

**GO - Cellular Component**  
GO:0016021 : integral component of membrane  
GO:0005789 : endoplasmic reticulum membrane  
GO:0031090 : organelle membrane

**UniProtKB Bombyx mori**  
Q6U6J0

**GenebankID or UniProtKB**  
Q7KB18

#### Presumptive Null

No

#### Molecular Type

Cis-regulatory

#### Aberration Type

Insertion

#### Insertion Size

1-10 kb

#### Molecular Details of the Mutation

insertion of a transposable element Bari-Jheh associated with downregulation of Juvenile hormone epoxy hydroxylase 2 (Jheh2) and Jheh3 in nonstress conditions and with upregulation of Jheh1 and Jheh2 and downregulation of Jheh3 under oxidative stress conditions

#### Experimental Evidence

Association Mapping

#### Main Reference

[A recent adaptive transposable element insertion near highly conserved developmental loci in \*Drosophila melanogaster\*. \(2009\)](#)

#### Authors

González J; Macpherson JM; Petrov DA

#### Abstract

A recent genomewide screen identified 13 transposable elements that are likely to have been adaptive during or after the spread of *Drosophila melanogaster* out of Africa. One of these insertions, Bari-Juvenile hormone epoxy hydrolase (Bari-Jheh), was associated with the selective sweep of its flanking neutral variation and with reduction of expression of one of its neighboring genes: Jheh3. Here, we provide further evidence that Bari-Jheh insertion is adaptive. We delimit the extent of the selective sweep and show that Bari-Jheh is the only mutation linked to the sweep. Bari-Jheh also lowers the expression of its other flanking gene, Jheh2. Subtle consequences of Bari-Jheh insertion on life-history traits are consistent with the effects of reduced expression of the Jheh genes. Finally, we analyze molecular evolution of Jheh genes in both the long- and the short-term and conclude that Bari-Jheh appears to be a very rare adaptive event in the history of these genes. We discuss the implications of these findings for the detection and understanding of adaptation.

#### Additional References

[The dominance effect of the adaptive transposable element insertion Bari-Jheh depends on the genetic background. \(2015\)](#)

## RELATED GEPHE

#### Related Genes

1 (metallothionein (MtnA))

#### Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

@TE The transposable element insertion acts on the regulation of the three neighboring genes Jheh1 Jheh2 and Jheh3 - <http://flybase.org/reports/FBal0243312> - <http://flybase.org/reports/FBal0243313>