## GEPHE SUMMARY

Gephebase Gene
Jheh1-Jheh2-Jheh3 complex (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Jheh1-Jheh2-Jheh3 complex^#gephebase-summary-title)

GepheID
GP00001782

Entry Status
Published

Main curator
Courtier

## PHENOTYPIC CHANGE

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

Trait
Oxidative stress resistance (https://www.gephebase.org/search-criteria?/and+Trait=^Oxidative stress resistance^#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
JHEH

Synonyms
JHEH; bommo-JHEH

String
7091.BGIBMGA013930-TA (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7091.BGIBMGA013930-TA )

Sequence Similarities
Belongs to the peptidase S33 family.

GO - Molecular Function
GO:0033961 : cis-stilbene-oxide hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0033961)

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

UniProtKB Bombyx mori
Q6U6J0 (http://www.uniprot.org/uniprot/Q6U6J0)

GenebankID or UniProtKB
Q7KB18 (https://www.ncbi.nlm.nih.gov/nuccore/Q7KB18)

(https://www.ebi.ac.uk/QuickGO/term/GO:0019439)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005789 : endoplasmic reticulum membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005789)
GO:0031090 : organelle membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0031090)

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

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

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

Main Reference

A recent adaptive transposable element insertion near highly conserved developmental loci in Drosophila melanogaster. (2009) (https://pubmed.ncbi.nlm.nih.gov/19458110)

Authors

GonzÃilez 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) (https://pubmed.ncbi.nlm.nih.gov/25912044)

## RELATED GEPHE

Related Genes

1 (metallothionein (MtnA)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Oxidative stress resistance/and+groupHaplotypes=true#gephebase-summary-title)

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