

GEPHE SUMMARY

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|--|---|---------------------------------|------------------------------------|
| <p>bab2 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^bab2^#gephebase-summary-title)</p> <p>Published</p> | <p>Gephebase Gene</p> <p>Entry Status</p> | <p>GP00000132</p> <p>Martin</p> | <p>GepheID</p> <p>Main curator</p> |
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PHENOTYPIC CHANGE

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| <p>Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title)</p> <p>Fertility (ovariole number) (https://www.gephebase.org/search-criteria?/and+Trait=^Fertility+ovariole+number^#gephebase-summary-title)</p> <p>Drosophila melanogaster</p> <p>Drosophila melanogaster</p> <p>Data not curated</p> <p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)</p> | <p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p> | <p>Taxon A</p> <p>Latin Name</p> <p>Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)</p> <p>Common Name</p> <p>fruit fly</p> <p>Synonyms</p> <p>Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)</p> <p>NCBI Taxonomy ID</p> <p>7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p> | <p>Taxon B</p> <p>Latin Name</p> <p>Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)</p> <p>Common Name</p> <p>fruit fly</p> <p>Synonyms</p> <p>Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)</p> <p>NCBI Taxonomy ID</p> <p>7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p> |
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GENOTYPIC CHANGE

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|--|---|---|
| <p>bab2</p> <p>bab; BAB; bab-II; Bab2; BAB2; BTB-II; BtblI; CG13911; CG9102; Dmel\CG9102</p> <p>7227.FBpp0072535 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0072535)</p> <p>-</p> <p>GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)</p> <p>GO:0003680 : AT DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003680)</p> | <p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p> | <p>UniProtKB Drosophila melanogaster</p> <p>Q9W0K4 (http://www.uniprot.org/uniprot/Q9W0K4)</p> <p>AJ252173 (https://www.ncbi.nlm.nih.gov/nucleotide/AJ252173)</p> <p>GenebankID or UniProtKB</p> |
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GO:0006357 : regulation of transcription by RNA polymerase II
 (https://www.ebi.ac.uk/QuickGO/term/GO:0006357)
 GO:0006355 : regulation of transcription, DNA-templated
 (https://www.ebi.ac.uk/QuickGO/term/GO:0006355)
 GO:0006351 : transcription, DNA-templated
 (https://www.ebi.ac.uk/QuickGO/term/GO:0006351)
 GO:0007455 : eye-antennal disc morphogenesis
 (https://www.ebi.ac.uk/QuickGO/term/GO:0007455)
 GO:0007478 : leg disc morphogenesis
 (https://www.ebi.ac.uk/QuickGO/term/GO:0007478)
 GO:0061040 : female gonad morphogenesis
 (https://www.ebi.ac.uk/QuickGO/term/GO:0061040)
 GO:2000736 : regulation of stem cell differentiation
 (https://www.ebi.ac.uk/QuickGO/term/GO:2000736)

GO - Cellular Component

GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)
 GO:0005700 : polytene chromosome
 (https://www.ebi.ac.uk/QuickGO/term/GO:0005700)

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null="Unknown" #gephebase-summary-title) Presumptive Null
 Unknown (https://www.gephebase.org/search-criteria?/and+Molecular Type="Unknown" #gephebase-summary-title) Molecular Type
 Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type="Unknown" #gephebase-summary-title) Aberration Type
 unknown ; loss of function reduces ovariole number Molecular Details of the Mutation
 Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence="Linkage Mapping" #gephebase-summary-title) Experimental Evidence
 Convergent evolution of a reproductive trait through distinct developmental mechanisms in Drosophila. (2012) (https://pubmed.ncbi.nlm.nih.gov/23022298) Main Reference
 Authors

Green DA; Extavour CG

Abstract

Convergent morphologies often arise due to similar selective pressures in independent lineages. It is poorly understood whether the same or different developmental genetic mechanisms underlie such convergence. Here we show that independent evolution of a reproductive trait, ovariole number, has resulted from changes in distinct developmental mechanisms, each of which may have a different underlying genetic basis in Drosophila. Ovariole number in Drosophila is species-specific, highly variable, and largely under genetic control. Convergent changes in Drosophila ovariole number have evolved independently within and between species. We previously showed that the number of a specific ovarian cell type, terminal filament (TF) cells, determines ovariole number. Here we examine TF cell development in different Drosophila lineages that independently evolved a significantly lower ovariole number than the D. melanogaster Oregon R strain. We show that in these Drosophila lineages, reduction in ovariole number occurs primarily through variations in one of two different developmental mechanisms: (1) reduced number of somatic gonad precursors (SGP cells) specified during embryogenesis; or (2) alterations of somatic gonad cell morphogenesis and differentiation in larval life. Mutations in the D. melanogaster Insulin Receptor (InR) alter SGP cell number but not ovarian morphogenesis, while targeted loss of function of bric-Å -brac 2 (bab2) affects morphogenesis without changing SGP cell number. Thus, evolution can produce similar ovariole numbers through distinct developmental mechanisms, likely controlled by different genetic mechanisms.

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Additional References

Quantitative trait loci affecting phenotypic plasticity and the allometric relationship of ovariole number and thorax length in Drosophila melanogaster. (2008)
 (https://pubmed.ncbi.nlm.nih.gov/18716336)

RELATED GEPHE

Related Genes

6 (Drip, PPAR-gamma, Sdic gene cluster, InR, PHGPx, RnrS) (https://www.gephebase.org/search-criteria?/or+Taxon ID="7227"/and+Trait=Fertility/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

