

GEPHE SUMMARY

	Gephebase Gene		GepheID
fatty acid synthase (https://www.gephebase.org/search-criteria?/and+Gene)		GP00002063	
Gephebase= [^] fatty acid synthase [^] #gephebase-summary-title)			Main curator
	Entry Status	Courtier	
Published			

PHENOTYPIC CHANGE

Trait #1	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category= [^] Physiology [^] #gephebase-summary-title)	Trait
Desiccation tolerance (https://www.gephebase.org/search-criteria?/and+Trait)	
Category= [^] Desiccation tolerance [^] #gephebase-summary-title)	Trait State in Taxon A
D. serrata - relatively desiccation resistant and produces relatively large amounts of mbCHCs	
	Trait State in Taxon B
D. birchii - desiccation sensitive and produces very low amounts of mbCHCs	

Trait #2	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category= [^] Physiology [^] #gephebase-summary-title)	Trait
Pheromone production (mbCHC) (https://www.gephebase.org/search-criteria?/and+Trait)	
Category= [^] Pheromone production (mbCHC) [^] #gephebase-summary-title)	Trait State in Taxon A
D. serrata - relatively desiccation resistant and produces relatively large amounts of mbCHCs	
	Trait State in Taxon B
D. birchii - desiccation sensitive and produces very low amounts of mbCHCs	

	Ancestral State		
Unknown			
	Taxonomic Status		
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)			
Status= [^] Interspecific [^] #gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name		Latin Name
Drosophila serrata		Drosophila birchii	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Drosophila serrata [^] #gephebase-summary-title)		(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Drosophila birchii [^] #gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
Drosophila serrata Malloch, 1927		Drosophila birchii Dobzhansky & Mather, 1961	
	Rank		Rank
species		species	
	Lineage		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; montium subgroup; Drosophila serrata species complex		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; montium subgroup; Drosophila serrata species complex	
	Parent		Parent
Drosophila serrata species complex () - (Rank: no rank)		Drosophila serrata species complex () - (Rank: no rank)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=446045)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=446045)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
7274		46829	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7274)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=46829)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

FASN3	Generic Gene Name	UniProtKB Drosophila melanogaster
CG17374; Dmel\CG17374; DM_7289423; FAS; FASN[CG17374]; FAS[CG17374]; Dmel_CG17374	Synonyms	GenebankID or UniProtKB
7227.FBpp0297101 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0297101)	String	
-	Sequence Similarities	
GO:0016491 : oxidoreductase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016491)	GO - Molecular Function	
GO:0031177 : phosphopantetheine binding (https://www.ebi.ac.uk/QuickGO/term/GO:0031177)		
GO:0016788 : hydrolase activity, acting on ester bonds (https://www.ebi.ac.uk/QuickGO/term/GO:0016788)		
GO:0004312 : fatty acid synthase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004312)		
GO:0009058 : biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0009058)	GO - Biological Process	
-	GO - Cellular Component	
No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^ #gephebase-summary-title)		Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^ #gephebase-summary-title)		Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^ #gephebase-summary-title)		Aberration Type
No expression of the gene in <i>D. birchii</i> . The coding region of the <i>D. birchii</i> gene is intact. Cis-regulatory region tested in reporter assays in <i>D. melanogaster</i> - exact causing mutation(s) unknown. RNAi against mFAS/CG17354 in <i>D. serrata</i> recapitulates the <i>D. birchii</i> phenotype.		Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^ #gephebase-summary-title)		Experimental Evidence
A single gene affects both ecological divergence and mate choice in <i>Drosophila</i> . (2014) (https://pubmed.ncbi.nlm.nih.gov/24526311)		Main Reference
Chung H; Loehlin DW; Dufour HD; Vaccarro K; Millar JG; Carroll SB		Authors
Evolutionary changes in traits involved in both ecological divergence and mate choice may produce reproductive isolation and speciation. However, there are few examples of such dual traits, and the genetic and molecular bases of their evolution have not been identified. We show that methyl-branched cuticular hydrocarbons (mbCHCs) are a dual trait that affects both desiccation resistance and mate choice in <i>Drosophila serrata</i> . We identify a fatty acid synthase mFAS (CG3524) responsible for mbCHC production in <i>Drosophila</i> and find that expression of mFAS is undetectable in oenocytes (cells that produce CHCs) of a closely related, desiccation-sensitive species, <i>D. birchii</i> , due in part to multiple changes in cis-regulatory sequences of mFAS. We suggest that ecologically influenced changes in the production of mbCHCs have contributed to reproductive isolation between the two species.		Abstract
		Additional References

RELATED GEPHE

1 (fatty acyl-CoA reductase FAR2-B) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7274^/and+Trait=Desiccation tolerance/or+Taxon ID=^7274^/and+Trait=Pheromone production/or+Taxon ID=^46829^/and+Trait=Desiccation tolerance/or+Taxon ID=^46829^/and+Trait=Pheromone production/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

Direction of change unknown but since this is a full loss of expression in oenocytes we can hypothesize that *D. birchii* displays the derived trait.

