

GEPHE SUMMARY

	Gephebase Gene	GepheID
alcohol dehydrogenase (Adh) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="alcohol dehydrogenase (Adh)"#gephebase-summary-title)	GP00001991	
	Entry Status	Main curator
Published	Courtier	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category="Physiology"#gephebase-summary-title)			
	Trait		
Xenobiotic resistance (alcohol) (<a #gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(alcohol)">https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic resistance (alcohol)"#gephebase-summary-title)			
	Trait State in Taxon A		
Drosophila melanogaster - low enzyme activity			
	Trait State in Taxon B		
Drosophila melanogaster - null allele - no enzyme activity			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Intraspecific"#gephebase-summary-title)			
		Taxon B	
	Latin Name		Latin Name
Drosophila melanogaster (<a #gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Drosophila+melanogaster">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Drosophila melanogaster"#gephebase-summary-title)		Drosophila melanogaster (<a #gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Drosophila+melanogaster">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Drosophila melanogaster"#gephebase-summary-title)	
	Common Name		Common Name
fruit fly		fruit fly	
	Synonyms		Synonyms
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	
	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; melanogaster subgroup		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		Parent
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)		melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)		7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
Adh		P00334 (http://www.uniprot.org/uniprot/P00334)
	Synonyms	GenebankID or UniProtKB
adh; ADH; Adh3; BG:DS01486.8; CG32954; CG3481; dADH; DM-ADH; DmADH; Dmel\CG3481; Dreg-1; Reg-1; T16		M22210 (https://www.ncbi.nlm.nih.gov/nucore/M22210)
	String	
7227.FBpp0100048 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0100048)		
	Sequence Similarities	
Belongs to the short-chain dehydrogenases/reductases (SDR) family.		
	GO - Molecular Function	
GO:0042803 : protein homodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0042803)		
GO:0008774 : acetaldehyde dehydrogenase (acetylating) activity		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0008774>)
GO:0004022 : alcohol dehydrogenase (NAD) activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0004022>)
GO:0016491 : oxidoreductase activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0016491>)
GO - Biological Process

GO:0006117 : acetaldehyde metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006117>)
GO:0046164 : alcohol catabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0046164>)
GO:0006066 : alcohol metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006066>)
GO:0048149 : behavioral response to ethanol
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048149>)
GO:0006067 : ethanol metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006067>)
GO:0006069 : ethanol oxidation (<https://www.ebi.ac.uk/QuickGO/term/GO:0006069>)
GO:0055114 : oxidation-reduction process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0055114>)

GO - Cellular Component

GO:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0032991 : protein-containing complex
(<https://www.ebi.ac.uk/QuickGO/term/GO:0032991>)

Presumptive Null

Yes (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes~#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title>)

Aberration Type

Deletion (<https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion~#gephebase-summary-title>)

Deletion Size

100-999 bp

Molecular Details of the Mutation

438-bp deletion which removes most of exon 2. Lys to Thr substitution: ACG at the sites 1489--1491

Experimental Evidence

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title>)

Main Reference

Molecular relationships between alcohol dehydrogenase null-activity alleles from natural populations of *Drosophila melanogaster*. (1992) (<https://pubmed.ncbi.nlm.nih.gov/1560761>)

Authors

Gibson JB; Wilks AV; Agrotis A

Abstract

Alcohol dehydrogenase null-activity alleles extracted from a number of natural populations of *Drosophila melanogaster* in Tasmania were shown to be molecularly similar by probing, with an oligonucleotide specific to an inserted region in intron 2 of the gene, genomic DNA amplified by the polymerase chain reaction. This insertion had previously been shown to be the cause of the loss of activity in one of the null alleles whose DNA sequence was known. Three Adh null alleles from mainland populations did not contain the insertion. Two of these null alleles, extracted from the Coffs Harbour population in different years, were cloned, and their DNA sequences showed that they were identical and that both had a 438-bp deletion which removed most of exon 2. The third null allele, identified in a sample of flies from Chateau Tahbilk, was shown by 4-bp restriction-endonuclease mapping to contain a 320-bp insertion in intron 1, although this may not be the cause of the loss of activity. The data show that at least three different Adh null alleles have been found in Australian populations and that at least two have been maintained as heterozygotes over a period of years.

Additional References

RELATED GEPHE

Related Genes

19 (Acetylcholinesterase (Ace-2), Aldehyde dehydrogenase (Aldh), CG11699, Cyp12d1, Cyp28d1, Cyp28d1-Cyp28d2, cyp6d2, cyp6g1, glutamate-gated chloride channel (GluCl), GSS (glutathione synthetase), GSTE1-E10 cluster, kin of irre (kire), para (kdr), PHGPx, resistance to dieldrin, RnrS, SOD1, Ugt86Dd, CHKov1) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~7227~/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

4 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~alcohol dehydrogenase \(Adh\)~/and+Taxon ID=~7227~/or+Gene Gephebase=~alcohol dehydrogenase \(Adh\)~/and+Taxon ID=~7227~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~alcohol dehydrogenase (Adh)~/and+Taxon ID=~7227~/or+Gene Gephebase=~alcohol dehydrogenase (Adh)~/and+Taxon ID=~7227~#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

<http://flybase.org/reports/FBa0028900.html>

