

GEPHE SUMMARY

		Gephebase Gene		GepheID
glutamate dehydrogenase (GDH) (https://www.gephebase.org/search-criteria?/and+Gene			GP00002406	
Gephebase="glutamate dehydrogenase (GDH)"#gephebase-summary-title)				Main curator
	Entry Status		Courtier	
Published				

PHENOTYPIC CHANGE

		Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait				
Category="Physiology"#gephebase-summary-title)		Trait		
Silk yield (<a a="" href="https://www.gephebase.org/search-criteria?/and+Trait=" silk="" yield"#gephebase-summary-title)<="">				
	Trait State in Taxon A			
Bombyx mori - local strains		Trait State in Taxon B		
Bombyx mori - domesticated strains				
	Ancestral State			
Taxon A		Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic				
Status="Domesticated"#gephebase-summary-title)				
Taxon A		Taxon B		
	Latin Name		Latin Name	
Bombyx mori		Bombyx mori		
(<a a="" bombyx="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" mori"#gephebase-summary-title)<="">		(<a a="" bombyx="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" mori"#gephebase-summary-title)<="">		
	Common Name		Common Name	
domestic silkworm		domestic silkworm		
	Synonyms		Synonyms	
domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758		domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758		
	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; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Bombycoidea; Bombycidae; Bombycinae; Bombyx		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Bombycoidea; Bombycidae; Bombycinae; Bombyx		
	Parent		Parent	
Bombyx () - (Rank: genus)		Bombyx () - (Rank: genus)		
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090)		
	NCBI Taxonomy ID		NCBI Taxonomy ID	
7091		7091		
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091)		
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
No		No		

GENOTYPIC CHANGE

		Generic Gene Name		UniProtKB Drosophila melanogaster
bb8			Q9VCN3 (http://www.uniprot.org/uniprot/Q9VCN3)	
	Synonyms			GenebankID or UniProtKB
CG4434; Dmel\CG4434; Dmel_CG4434			()	
	String			
7227.FBpp0083774				
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0083774				
)		Sequence Similarities		
Belongs to the Glu/Leu/Phe/Val dehydrogenases family.				
	GO - Molecular Function			
GO:0000166 : nucleotide binding (https://www.ebi.ac.uk/QuickGO/term/GO:0000166)				
GO:0004352 : glutamate dehydrogenase (NAD+) activity				
(https://www.ebi.ac.uk/QuickGO/term/GO:0004352)				
	GO - Biological Process			
GO:0006538 : glutamate catabolic process				
(https://www.ebi.ac.uk/QuickGO/term/GO:0006538)				

GO:0090258 : negative regulation of mitochondrial fission
(<https://www.ebi.ac.uk/QuickGO/term/GO:0090258>)

GO - Cellular Component

GO:0005739 : mitochondrion (<https://www.ebi.ac.uk/QuickGO/term/GO:0005739>)

Presumptive Null

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null+No+Gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null+No+Gephebase-summary-title))

Molecular Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Molecular Type+Unknown+Gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type+Unknown+Gephebase-summary-title))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type+Unknown+Gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type+Unknown+Gephebase-summary-title))

Molecular Details of the Mutation

Increased expression in the domesticated strains

Experimental Evidence

Association Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence+Association Mapping+Gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence+Association+Mapping+Gephebase-summary-title))

Main Reference

The evolutionary road from wild moth to domestic silkworm. (2018) (<https://pubmed.ncbi.nlm.nih.gov/29967484>)

Authors

Xiang H; Liu X; Li M; Zhu Y; Wang L; Cui Y; Liu L; Fang G; Qian H; Xu A; Wang W; Zhan S

Abstract

The Silk Road, which derives its name from the trade of silk produced by the domestic silkworm *Bombyx mori*, was an important episode in the development and interaction of human civilizations. However, the detailed history behind silkworm domestication remains ambiguous, and little is known about the underlying genetics with respect to important aspects of its domestication. Here, we reconstruct the domestication processes and identify selective sweeps by sequencing 137 representative silkworm strains. The results present an evolutionary scenario in which silkworms may have been initially domesticated in China as trimoulting lines, then subjected to independent spreads along the Silk Road that gave rise to the development of most local strains, and further improved for modern silk production in Japan and China, having descended from diverse ancestral sources. We find that genes with key roles in nitrogen and amino acid metabolism may have contributed to the promotion of silk production, and that circadian-related genes are generally selected for their adaptation. We additionally identify associations between several candidate genes and important breeding traits, thereby advancing the applicable value of our resources.

Additional References

High-resolution silkworm pan-genome provides genetic insights into artificial selection and ecological adaptation. (2022) (<https://pubmed.ncbi.nlm.nih.gov/36153338>)

RELATED GEPHE

Related Genes

6 (asparagine synthetase (AS), E2F1, Fkh, glutamate synthase (GOGAT), glutamine synthetase 2 (GS), sage) ([https://www.gephebase.org/search-criteria?/or+Taxon ID+7091+and+Trait=Silk yield+and+groupHaplotypes=true#Gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+TaxonID+7091+and+Trait=Silk+yield+and+groupHaplotypes=true#Gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS