

## GEPHE SUMMARY

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

## PHENOTYPIC CHANGE

		Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )				
Category="Physiology"#gephebase-summary-title)		Trait		
Silk yield ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=" silk="" yield"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Trait="Silk yield"#gephebase-summary-title</a> )				
Bombyx mori - local strains		Trait State in Taxon A		
Bombyx mori - domesticated strains		Trait State in Taxon B		
Taxon A		Ancestral State		
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )		Taxonomic Status		
Status="Domesticated"#gephebase-summary-title)				
Taxon A		Taxon B		
		Latin Name		Latin Name
Bombyx mori			Bombyx mori	
( <a bombyx="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" mori"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Bombyx mori"#gephebase-summary-title</a> )			( <a bombyx="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" mori"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Bombyx mori"#gephebase-summary-title</a> )	
domestic silkworm		Common Name		Common Name
domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758			domestic silkworm	
species		Synonyms		Synonyms
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			domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758	
Bombyx () - (Rank: genus)		Rank		Rank
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090</a> )			species	
7091		Lineage		Lineage
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091</a> )			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	
No		Parent		Parent
is Taxon A an Intraspecies?			Bombyx () - (Rank: genus)	
		NCBI Taxonomy ID	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7090</a> )	
			7091	
			( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7091</a> )	
			No	
			is Taxon B an Intraspecies?	

## GENOTYPIC CHANGE

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

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>)

Molecular Type

Unknown (<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>)

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>)

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>)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS