

## GEPHE SUMMARY

		Gephebase Gene		GepheID
glutamine synthetase 2 (GS) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> )			GP00002405	
Gephebase="glutamine synthetase 2 (GS)"#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	Latin Name	Taxon B	Latin Name
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> )		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> )	
domestic silkworm	Common Name	domestic silkworm	Common Name
domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758	Synonyms	domestic silkworm; silk moth; silkworm; Bombyx mori Linnaeus, 1758	Synonyms
species	Rank	species	Rank
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	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	Lineage
Bombyx () - (Rank: genus) ( <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> )	Parent	Bombyx () - (Rank: genus) ( <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> )	Parent
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> )	NCBI Taxonomy ID	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> )	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

## GENOTYPIC CHANGE

		Generic Gene Name	UniProtKB Drosophila melanogaster
Gs2		Synonyms	P20478 ( <a href="http://www.uniprot.org/uniprot/P20478">http://www.uniprot.org/uniprot/P20478</a> )
CG1743; Dmel\CG1743; gs-c; gs2; GS2; Gsll		String	GenebankID or UniProtKB
7227.FBpp0073344 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0073344">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=7227.FBpp0073344</a> )		Sequence Similarities	()
Belongs to the glutamine synthetase family.		GO - Molecular Function	
GO:0005524 : ATP binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005524">https://www.ebi.ac.uk/QuickGO/term/GO:0005524</a> )			
GO:0004356 : glutamate-ammonia ligase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0004356">https://www.ebi.ac.uk/QuickGO/term/GO:0004356</a> )		GO - Biological Process	
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:0006542 : glutamine biosynthetic process  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0006542)  
 GO:0045213 : neurotransmitter receptor metabolic process  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0045213)  
 GO:0007416 : synapse assembly (https://www.ebi.ac.uk/QuickGO/term/GO:0007416)  
 GO - Cellular Component  
 GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)

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

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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 dehydrogenase (GDH), glutamate synthase (GOGAT), 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