

Gephebase Gene		GepheID
Carotenoid-binding protein (CBP) (https://www.gepibase.org/search-criteria?/and+Gene+Gepibase~Carotenoid-binding+protein+(CBP)*#gepibase-summary-title)	GP00000169	Main curator
Entry Status	Martin	
Published		

Morphology (#gephebase-summary-title)		Trait Category	
Coloration (silk) (#gephebase-summary-title)		Trait	
Bombyx mandarina		Trait State in Taxon A	
Bombyx mori - various strains		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Bombyx mandarina (#gephebase-summary-title)	Latin Name	Bombyx mori (#gephebase-summary-title)	Latin Name
wild silkworm	Common Name	domestic silkworm	Common Name
Bombyx mori mandarina; Theophila mandarina; wild silkworm; Bombyx mandarina (Moore, 1872)	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; Amphiesmenoptera; 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; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Bombycoidea; Bombycidae; Bombycinae; Bombyx	Lineage
Bombyx () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7090)	Parent	Bombyx () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7090)	Parent
7092 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7092)	NCBI Taxonomy ID	7091 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7091)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

	Generic Gene Name	UniProtKB Bombyx mori
-		Q1HE01 (http://www.uniprot.org/uniprot/Q1HE01)
	Synonyms	GenebankID or UniProtKB
-		DQ497196 (https://www.ncbi.nlm.nih.gov/nuccore/DQ497196)
	String	
7091.BGIBMGA007585-TA (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7091.BGIBMGA007585-TA)		
	Sequence Similarities	
Belongs to the RRM NCBP2 family.		
	GO - Molecular Function	
GO:0000339 : RNA cap binding (https://www.ebi.ac.uk/QuickGO/term/GO:0000339)		
	GO - Biological Process	
GO:0031047 : gene silencing by RNA (https://www.ebi.ac.uk/QuickGO/term/GO:0031047)		
GO:0045292 : mRNA cis splicing, via spliceosome		

(https://www.ebi.ac.uk/QuickGO/term/GO:0045292)	
GO - Cellular Component	
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)	
GO:0005846 : nuclear cap binding complex	
(https://www.ebi.ac.uk/QuickGO/term/GO:0005846)	
	Presumptive Null
No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	
	Molecular Type
Gene Amplification (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Gene Amplification~#gephebase-summary-title)	
	Aberration Type
Complex Change (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Complex Change~#gephebase-summary-title)	
	Molecular Details of the Mutation
Copy Number Variation (up to 20 copies in B. mori ; only one in the wild form; B. mandarina)	
	Experimental Evidence
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	
	Main Reference
Diversity in copy number and structure of a silkworm morphogenetic gene as a result of domestication. (2011) (https://pubmed.ncbi.nlm.nih.gov/21242537)	
	Authors
Sakudoh T; Nakashima T; Kuroki Y; Fujiyama A; Kohara Y; Honda N; Fujimoto H; Shimada T; Nakagaki M; Banno Y; Tsuchida K	
	Abstract
The carotenoid-binding protein (CBP) of the domesticated silkworm, Bombyx mori, a major determinant of cocoon color, is likely to have been substantially influenced by domestication of this species. We analyzed the structure of the CBP gene in multiple strains of B. mori, in multiple individuals of the wild silkworm, B. mandarina (the putative wild ancestor of B. mori), and in a number of other lepidopterans. We found the CBP gene copy number in genomic DNA to vary widely among B. mori strains, ranging from 1 to 20. The copies of CBP are of several types, based on the presence of a retrotransposon or partial deletion of the coding sequence. In contrast to B. mori, B. mandarina was found to possess a single copy of CBP without the retrotransposon insertion, regardless of habitat. Several other lepidopterans were found to contain sequences homologous to CBP, revealing that this gene is evolutionarily conserved in the lepidopteran lineage. Thus, domestication can generate significant diversity of gene copy number and structure over a relatively short evolutionary time.	
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	Additional References
The evolutionary road from wild moth to domestic silkworm. (2018) (https://pubmed.ncbi.nlm.nih.gov/29967484)	

RELATED GEPHE

	Related Genes
1 (Tyrosine hydroxylase) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~7092~/and+Trait=Coloration/or+Taxon ID=~7091~/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)	
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS