

GEPHE SUMMARY

	Gephebase Gene		GepheID
CS (<a +cs+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+CS+"#gephebase-summary-title)		GP00001447	Main curator
Published	Entry Status	Prigent	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology+"#gephebase-summary-title)			
	Trait		
Plant secondary metabolite (pungency) (<a +plant+secondary+metabolite+(pungency)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Plant+secondary+metabolite+(pungency)+"#gephebase-summary-title)			
	Trait State in Taxon A		
C. frutescens BG2816 (a pungent wild pepper)			
	Trait State in Taxon B		
C. annuum Bellpeppers			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (<a +domesticated+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Domesticated+"#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Capsicum frutescens (<a +capsicum+frutescens+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Capsicum+frutescens+"#gephebase-summary-title)		Capsicum annuum (<a +capsicum+annuum+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Capsicum+annuum+"#gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
bird pepper; chili pepper; hot pepper; Capsicum frutescens L.		Capsicum annuum L.; Capsicum annum; Capsicum capsicum	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Capsiceae; Capsicum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Capsiceae; Capsicum	
	Parent		Parent
Capsicum (peppers) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4071)		Capsicum (peppers) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4071)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4073 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4073)		4072 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4072)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
C. frutescens BG2816 (a pungent wild pepper)		C. annuum Bellpeppers	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Capsicum annuum
csy1		Q09UW1 (http://www.uniprot.org/uniprot/Q09UW1)	GenebankID or UniProtKB
	Synonyms		
-		DQ349225 (https://www.ncbi.nlm.nih.gov/nuccore/DQ349225)	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			
	GO - Biological Process		
-			
	GO - Cellular Component		
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)			

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Deletion Size

-

Molecular Details of the Mutation

Large 2.5 kb deletion spanning 1.8 kb of the putative promoter and 0.7 kb of the first exon was observed in the *C. annuum* Bellpeppers

Experimental Evidence

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

Main Reference

Genome sequence of the hot pepper provides insights into the evolution of pungency in *Capsicum* species. (2014) (<https://pubmed.ncbi.nlm.nih.gov/24441736>)

Authors

Kim S; Park M; Yeom SI; Kim YM; Lee JM; Lee HA; Seo E; Choi J; Cheong K; Kim KT; Jung K; Lee GW; Oh SK; Bae C; Kim SB; Lee HY; Kim SY; Kim MS; Kang BC; Jo YD; Yang HB; Jeong HJ; Kang WH; Kwon JK; Shin C; Lim JY; Park JH; Huh JH; Kim JS; Kim BD; Cohen O; Paran I; Suh MC; Lee SB; Kim YK; Shin Y; Noh SJ; Park J; Seo YS; Kwon SY; Kim HA; Park JM; Kim HJ; Choi SB; Bosland PW; Reeves G; Jo SH; Lee BW; Cho HT; Choi HS; Lee MS; Yu Y; Do Choi Y; Park BS; van Deynze A; Ashrafi H; Hill T; Kim WT; Pai HS; Ahn HK; Yeam I; Giovannoni JJ; Rose JK; S_A,rensen I; Lee SJ; Kim RW; Choi IY; Choi BS; Lim JS; Lee YH; Choi D

Abstract

Hot pepper (*Capsicum annuum*), one of the oldest domesticated crops in the Americas, is the most widely grown spice crop in the world. We report whole-genome sequencing and assembly of the hot pepper (Mexican landrace of *Capsicum annuum* cv. CM334) at 186.6 \times coverage. We also report resequencing of two cultivated peppers and de novo sequencing of the wild species *Capsicum chinense*. The genome size of the hot pepper was approximately fourfold larger than that of its close relative tomato, and the genome showed an accumulation of Gypsy and Caulimoviridae family elements. Integrative genomic and transcriptomic analyses suggested that change in gene expression and neofunctionalization of capsaicin synthase have shaped capsaicinoid biosynthesis. We found differential molecular patterns of ripening regulators and ethylene synthesis in hot pepper and tomato. The reference genome will serve as a platform for improving the nutritional and medicinal values of *Capsicum* species.

Additional References

The Pun1 gene for pungency in pepper encodes a putative acyltransferase. (2005) (<https://pubmed.ncbi.nlm.nih.gov/15918882>)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS