

GEPHE SUMMARY

	Gephebase Gene	GepheID
teosinte glume architecture (tga1) (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~teosinte+glume+architecture+(tga1)^#gephebase-summary-title)	GP00001118	
	Entry Status	Main curator
Published	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)		Trait	
Cupule retraction (https://www.gephebase.org/search-criteria?/and+Trait=~Cupule+retraction^#gephebase-summary-title)			
	Trait State in Taxon A		
Zea mays ssp. parviglumis and mexicana (teosinthe)		Trait State in Taxon B	
Zea mays ssp. mays			
	Ancestral State		
Data not curated		Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Zea+mays^#gephebase-summary-title)		Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Zea+mays^#gephebase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays		Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	
	Parent		Parent
Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)		Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)	
4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	NCBI Taxonomy ID	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Zea mays ssp. parviglumis and mexicana (teosinthe)		Zea mays ssp. mays	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
TGA1		Q39237 (http://www.uniprot.org/uniprot/Q39237)
	Synonyms	GenebankID or UniProtKB
MQN23.15; MQN23_15; TGACG sequence-specific binding protein 1; BZIP47; At5g65210		AEP96351 (https://www.ncbi.nlm.nih.gov/nucleotide/AEP96351)
	String	
3702.AT5G65210.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G65210.1)		
	Sequence Similarities	
Belongs to the bZIP family.		
	GO - Molecular Function	
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)		
GO:0043565 : sequence-specific DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043565)		
GO:0044212 : transcription regulatory region DNA binding		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0044212>)

GO - Biological Process

GO:0006351 : transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006351>)
GO:0042742 : defense response to bacterium
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042742>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

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=))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Coding^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Aberration Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+SNP^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

K6N; the lysine residue being conserved in rice and wheat

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

The origin of the naked grains of maize. (2005) (<https://pubmed.ncbi.nlm.nih.gov/16079849>)

Authors

Wang H; Nussbaum-Wagler T; Li B; Zhao Q; Vigouroux Y; Faller M; Bomblies K; Lukens L; Doebley JF

Abstract

The most critical step in maize (*Zea mays ssp. mays*) domestication was the liberation of the kernel from the hardened, protective casing that envelops the kernel in the maize progenitor, teosinte. This evolutionary step exposed the kernel on the surface of the ear, such that it could readily be used by humans as a food source. Here we show that this key event in maize domestication is controlled by a single gene (teosinte glume architecture or *tga1*), belonging to the SBP-domain family of transcriptional regulators. The factor controlling the phenotypic difference between maize and teosinte maps to a 1-kilobase region, within which maize and teosinte show only seven fixed differences in their DNA sequences. One of these differences encodes a non-conservative amino acid substitution and may affect protein function, and the other six differences potentially affect gene regulation. Molecular evolution analyses show that this region was the target of selection during maize domestication. Our results demonstrate that modest genetic changes in single genes can induce dramatic changes in phenotype during domestication and evolution.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS