

GEPHE SUMMARY

OsCKX2=Gn1a (https://www.gephebase.org/search-criteria/?and+Gene	Gephebase Gene	GP00000809	GepheID
Gephebase=^OsCKX2=Gn1a^#gephebase-summary-title)			Main curator
Published	Entry Status	Martin	

PHENOTYPIC CHANGE

Trait Category			
Morphology (https://www.gephebase.org/search-criteria/?and+Trait	Trait		
Category=^Morphology^#gephebase-summary-title)			
Grain yield (https://www.gephebase.org/search-criteria/?and+Trait=^Grain	Trait State in Taxon A		
yield^#gephebase-summary-title)			
Triticum aestivum - Yanzhan1	Trait State in Taxon B		
Triticum aestivum - Neixiang188	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria/?and+Taxonomic			
Status=^Domesticated^#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Triticum aestivum (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title)		Triticum aestivum (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title)	
bread wheat	Common Name	bread wheat	Common Name
Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8	Synonyms	Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	Lineage
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564)	Parent	Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564)	Parent
4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565)	NCBI Taxonomy ID	4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565)	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Triticum aestivum - Yanzhan1	Taxon A Description	Triticum aestivum - Neixiang188	Taxon B Description

GENOTYPIC CHANGE

Generic Gene Name		UniProtKB Oryza sativa subsp. japonica
CKX2	Synonyms	Q4ADV8 (http://www.uniprot.org/uniprot/Q4ADV8)
CKX2; Gn1a; OsCKX2; OsJ_00744; B1046G12.8; Os01g0197700; LOC_Os01g10110; P0419B01.20	String	GenebankID or UniProtKB
39947.LOC_Os01g10110.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os01g10110.1)	Sequence Similarities	AFM10539 (https://www.ncbi.nlm.nih.gov/nuccore/AFM10539)
Belongs to the oxygen-dependent FAD-linked oxidoreductase family.	GO - Molecular Function	
GO:0071949 : FAD binding (https://www.ebi.ac.uk/QuickGO/term/GO:0071949)		
GO:0019139 : cytokinin dehydrogenase activity		

GO:0009736 : cytokinin-activated signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009736>)

GO:0010229 : inflorescence development

(<https://www.ebi.ac.uk/QuickGO/term/GO:0010229>)

GO:0009690 : cytokinin metabolic process

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009690>)

GO:0005615 : extracellular space (<https://www.ebi.ac.uk/QuickGO/term/GO:0005615>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

Linkage Mapping (<https://www.gephbase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephbase-summary-title>)

Main Reference

TaCKX6-D1, the ortholog of rice OsCKX2, is associated with grain weight in hexaploid wheat. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22670578>)

Authors

Zhang L; Zhao YL; Gao LF; Zhao GY; Zhou RH; Zhang BS; Jia JZ

Abstract

The cytokinin oxidase/dehydrogenase (CKX) gene plays a principal role in controlling cytokinin levels and has been shown to be a major quantitative trait locus (QTL) affecting grain number in rice. However, the function and evaluation of the haplotypes of the wheat CKX gene have yet to be illustrated. In this study, TaCKX6-D1, a wheat ortholog of rice OsCKX2, was cloned and its haplotype variants were determined to be significantly associated with the 1000-grain weight on the basis of linkage mapping, association analysis and gene expression analysis. Five TaCKX6-D1 haplotypes, designated a-e, were identified. An indel marker was developed to identify haplotype a, which was associated with higher grain weight. Haplotype a showed decreased expression relative to haplotype b in seeds at 8 d after pollination. Sequence variations among modern cultivars, landraces and wild species suggest a significant domestication signature at the TaCKX6-D1 locus in Chinese wheat germplasm. TaCKX6-D1 may serve as a useful gene for the breeding of high-yielding wheat. A strategy for allele mining and utilization of TaCKX6-D1 was proposed. Our study also sheds light on the mechanisms of grain development and domestication of wheat, as well as the functional divergence of orthologs in comparative genomics.

© 2012 Institute of Crop Sciences. CAAS New Phytologist © 2012 New Phytologist Trust.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS