

GEPHE SUMMARY

btr2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~btr2~#gephebase-summary-title)	Gephebase Gene	GP00001446	GepheID
	Entry Status	Prigent	Main curator
	Published		

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)		Trait Category	
Seed shattering (grain dispersal ; retention) (https://www.gephebase.org/search-criteria?/and+Trait=~Seed shattering (grain dispersal ; retention)~#gephebase-summary-title)		Trait	
Wild barley with grain falling at maturity brittle form - cultivar Kanto Nakate Gold (KNG) with wild type Brt2 allele		Trait State in Taxon A	
barley with grain retained on the inflorescence at maturity non-brittle form - cultivar Azumamugi (AZ)		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated~#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Hordeum vulgare (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Hordeum vulgare~#gephebase-summary-title)		Hordeum vulgare subsp. vulgare (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Hordeum vulgare subsp. vulgare~#gephebase-summary-title)	
-		domesticated barley	
barley; Hordeum vulgare L.; Horedum vulgare		Hordeum sativum; Hordeum vulgare var. nudum; Hordeum vulgare var. vulgare; domesticated barley; two-rowed barley; Hordeum sativum Jess.; Hordeum vulgare var. nudum Spenn.	
species		subspecies	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticeae; Triticeae; Hordeinae; Hordeum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticeae; Triticeae; Hordeinae; Hordeum; Hordeum vulgare	
Hordeum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4512)		Hordeum vulgare () - (Rank: species) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513)	
4513 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513)		112509 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 112509)	
Yes		is Taxon A an Intraspecies?	is Taxon B an Intraspecies?
Wild barley with grain falling at maturity brittle form - cultivar Kanto Nakate Gold (KNG) with wild type Brt2 allele		Barley with grain retained on the inflorescence at maturity non-brittle form - cultivar Azumamugi (AZ)	

GENOTYPIC CHANGE

BTR2	Generic Gene Name	UniProtKB Hordeum vulgare subsp. vulgare A0A0K1RKV9 (http://www.uniprot.org/uniprot/A0A0K1RKV9)
btr2	Synonyms	GenebankID or UniProtKB KR813769 (https://www.ncbi.nlm.nih.gov/nuccore/KR813769)
-	String	
-	Sequence Similarities	
-	GO - Molecular Function	

GO - Biological Process

GO - Cellular Component

Presumptive Null

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

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=~Coding^#gephebase-summary-title))

Aberration Type

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

Deletion Size

10-99 bp

Molecular Details of the Mutation

11bp deletion at position 254-264 creating a frameshift

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=~Linkage+Mapping^#gephebase-summary-title))

Main Reference

Evolution of the Grain Dispersal System in Barley. (2015) (<https://pubmed.ncbi.nlm.nih.gov/26232223>)

Authors

Pourkheirandish M; Hensel G; Kilian B; Senthil N; Chen G; Sameri M; Azhaguvel P; Sakuma S; Dhanagond S; Sharma R; Mascher M; Himmelbach A; Gottwald S; Nair SK; Tagiri A; Yukuhiro F; Nagamura Y; Kanamori H; Matsumoto T; Willcox G; Middleton CP; Wicker T; Walther A; Waugh R; Fincher GB; Stein N; Kumlehn J; Sato K; Komatsuda T

Abstract

About 12,000 years ago in the Near East, humans began the transition from hunter-gathering to agriculture-based societies. Barley was a founder crop in this process, and the most important steps in its domestication were mutations in two adjacent, dominant, and complementary genes, through which grains were retained on the inflorescence at maturity, enabling effective harvesting. Independent recessive mutations in each of these genes caused cell wall thickening in a highly specific grain “disarticulation zone,” converting the brittle floral axis (the rachis) of the wild-type into a tough, non-brittle form that promoted grain retention. By tracing the evolutionary history of allelic variation in both genes, we conclude that spatially and temporally independent selections of germplasm with a non-brittle rachis were made during the domestication of barley by farmers in the southern and northern regions of the Levant, actions that made a major contribution to the emergence of early agrarian societies.

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Additional References

RELATED GEPHE

Related Genes

1 (btr1) ([https://www.gephebase.org/search-criteria?/or+ Taxon ID=~4513^/and+ Trait=Seed shattering/or+ Taxon ID=~112509^/and+ Trait=Seed shattering/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4513^/and+Trait=Seed+shattering/or+Taxon+ID=~112509^/and+Trait=Seed+shattering/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS