

GEPHE SUMMARY

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

PHENOTYPIC CHANGE

Trait Category
 Physiology (<https://www.gephebase.org/search-criteria?/and+Trait>
Category=^Physiology^#gephebase-summary-title)

Trait

Seed shattering (grain dispersal ; retention) ([https://www.gephebase.org/search-criteria?/and+Trait=^Seed shattering \(grain dispersal ; retention\)^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Trait=^Seed shattering (grain dispersal ; retention)^#gephebase-summary-title))

Trait State in Taxon A

Wild barley with grain falling at maturity brittle form - cultivar Kanto Nakate Gold (KNG)
with wild type Brt2 allele

Trait State in Taxon B

barley with grain retained on the inflorescence at maturity non-brittle form - cultivar
Azumamugi (AZ)

Ancestral State

Taxon A

Taxonomic Status
 Domesticated (<https://www.gephebase.org/search-criteria?/and+Taxonomic>
Status=^Domesticated^#gephebase-summary-title)

Taxon A

Latin Name
 Hordeum vulgare
(<https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Hordeum vulgare^#gephebase-summary-title>)

Common Name
 -

Synonyms
 barley; Hordeum vulgare L.; Horedum vulgare

Rank
 species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;
Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;
Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae;
Triticeae; Hordeinae; Hordeum

Parent

Hordeum () - (Rank: genus)
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4512>)

NCBI Taxonomy ID

4513
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513>)

is Taxon A an Infraspecies?

Yes

Taxon A Description

Wild barley with grain falling at maturity brittle form - cultivar Kanto Nakate Gold (KNG)
with wild type Brt2 allele

Taxon B

Latin Name
 Hordeum vulgare subsp. vulgare
(<https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Hordeum vulgare subsp. vulgare^#gephebase-summary-title>)

Common Name
 domesticated barley

Synonyms
 Hordeum sativum; Hordeum vulgare var. nudum; Hordeum vulgare var. vulgare;
domesticated barley; two-rowed barley; Hordeum sativum Jess.; Hordeum vulgare var.
nudum Spenn.

Rank
 subspecies

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;
Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;
Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae;
Triticeae; Hordeinae; Hordeum; Hordeum vulgare

Parent

Hordeum vulgare () - (Rank: species)
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513>)

NCBI Taxonomy ID

112509
(<https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 112509>)

is Taxon B an Infraspecies?

Yes

Taxon B Description

Barley with grain retained on the inflorescence at maturity non-brittle form - cultivar
Azumamugi (AZ)

GENOTYPIC CHANGE

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

GO - Biological Process

GO - Cellular Component

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Yes#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding#gephebase-summary-title)	Molecular Type
Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Deletion#gephebase-summary-title)	Aberration Type
10-99 bp	Deletion Size
11bp deletion at position 254-264 creating a frameshift	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage Mapping#gephebase-summary-title)	Experimental Evidence
Evolution of the Grain Dispersal System in Barley. (2015) (https://pubmed.ncbi.nlm.nih.gov/26232223)	Main Reference
Pourkherandish M; Hensel G; Kilian B; Senthil N; Chen G; Sameri M; Azhagavel 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	Authors
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.	Abstract

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Additional References

RELATED GEPHE

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>)

Related Genes

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS