GEPHE SUMMARY

Gephebase Gene
cly1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^cly1^#gephebase-summary-title)

GepheID
GP00001316

Entry Status
Published

Main curator
Arnoult

PHENOTYPIC CHANGE

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

Trait
Pollen shedding (Cleistogamy; lodicule size) (https://www.gephebase.org/search-criteria?/and+Trait=^Pollen shedding (Cleistogamy; lodicule size)^#gephebase-summary-title)

Trait State in Taxon A
Hordeum vulgare - Barley AZ (noncleistogamous)

Trait State in Taxon B
Hordeum vulgare - Barley SV235 (cleistogamous)

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; Euphyllophyta; 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
Hordeum vulgare - Barley AZ (noncleistogamous)

Taxon B

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; Euphyllophyta; 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 B an Infraspecies?
Yes

Taxon B Description
Hordeum vulgare - Barley SV235 (cleistogamous)

GENOTYPIC CHANGE

Generic Gene Name
AP2

Synonyms
FLO2; AP22.49; AP22_49; APETALA 2; AtAP2; FL1; FLORAL HOMEOTIC PROTEIN APETALA 2; FLORAL MUTANT 2; FLOWER 1; At4g36920; C7A10.440

String
3702.AT4G36920.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT4G36920.1)

Sequence Similarities
Belongs to the AP2/ERF transcription factor family. AP2 subfamily.

GO - Molecular Function
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)

UniProtKB Arabidopsis thaliana
P47927 (http://www.uniprot.org/uniprot/P47927)

GenebankID or UniProtKB
KF261342.1 (https://www.ncbi.nlm.nih.gov/nuccore/KF261342.1)

GO - Biological Process

GO:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154)
GO:0048481 : plant ovule development
(https://www.ebi.ac.uk/QuickGO/term/GO:0048481)
GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908)
GO:0010073 : meristem maintenance
(https://www.ebi.ac.uk/QuickGO/term/GO:0010073)
GO:0048316 : seed development (https://www.ebi.ac.uk/QuickGO/term/GO:0048316)
GO:0010093 : specification of floral organ identity
(https://www.ebi.ac.uk/QuickGO/term/GO:0010093)

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)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

T>C @position -245; creating differential methylation

Experimental Evidence

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

Main Reference

An epiallele at cly1 affects the expression of floret closing (cleistogamy) in barley. (2015) (https://pubmed.ncbi.nlm.nih.gov/25398791)

Authors

Wang N; Ning S; Wu J; Tagiri A; Komatsuda T

Abstract

The swelling of the lodicule is responsible for floret opening in many grass species, allowing for pollen dispersal and cross-pollination. In barley, the closed floret habit (cleistogamy) is under the control of cly1, a gene that operates by inhibiting the development of the lodicule. In non-cleistogamous cultivars, cly1 mRNA is degraded by miR172-directed cleavage, allowing the lodicules to swell; however, in cultivars carrying the recessive allele cly1.b, a single-nucleotide substitution destroys the miR172 target site preventing mRNA cleavage. Barley cv. SV235 is cleistogamous; its cly1 coding sequence is identical to that of cly1.b, but its lodicules do develop, although insufficiently to produce a non-cleistogamous flower. In this cultivar, the downregulation of cly1 is unrelated to miR172-directed mRNA degradation, but rather is caused by an epiallele that represses transcription. Allelic relationships between known cly1 alleles were explored by the quantification of lodicule vascularization and an assessment of the response of the spike to the supply of exogenous auxin. The SV235 phenotype can be manipulated by a pre-anthesis application of 2,4-d, a feature that could be of interest in the context of hybrid barley grain production based on cleistogamy.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

2 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^cly1^/and+Taxon ID=^4513^/or+Gene Gephebase=^cly1^/and+Taxon ID=^4513^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

Not very strong empirical evidence