

GEPHE SUMMARY

	Gephebase Gene	GepheID
cly1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~cly1^#gephebase-summary-title)	GP00001315	
	Entry Status	Main curator
Published	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 SV223 (cleistogamous) and 4 other lines			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Hordeum vulgare (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Hordeum+vulgare^#gephebase-summary-title)		Hordeum vulgare (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Hordeum+vulgare^#gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
barley; Hordeum vulgare L.; Horedum vulgare		barley; Hordeum vulgare L.; Horedum vulgare	
	Rank		Rank
species		species	
	Lineage		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		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		Parent
Hordeum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512)		Hordeum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4513 (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)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Hordeum vulgare - Barley AZ (noncleistogamous)		Hordeum vulgare - Barley SV223 (cleistogamous) and 4 other lines	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
AP2		P47927 (http://www.uniprot.org/uniprot/P47927)
	Synonyms	GenebankID or UniProtKB
FLO2; AP22.49; AP22_49; APETALA 2; AtAP2; FL1; FLORAL HOMEOTIC PROTEIN APETALA 2; FLORAL MUTANT 2; FLOWER 1; At4g36920; C7A10.440		KF261342.1 (https://www.ncbi.nlm.nih.gov/nuccore/KF261342.1)
	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)		

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

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP~#gephebase-summary-title>)

Molecular Details of the Mutation

A>C @position 3090; in a miRNA targeting site.

Experimental Evidence

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

Main Reference

Cleistogamous flowering in barley arises from the suppression of microRNA-guided HvAP2 mRNA cleavage. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20018663>)

Authors

Nair SK; Wang N; Turuspekov Y; Pourkheirandish M; Sinsuwongwat S; Chen G; Sameri M; Tagiri A; Honda I; Watanabe Y; Kanamori H; Wicker T; Stein N; Nagamura Y; Matsumoto T; Komatsuda T

Abstract

The cleistogamous flower sheds its pollen before opening, forcing plants with this habit to be almost entirely autogamous. Cleistogamy also provides a means of escape from cereal head blight infection and minimizes pollen-mediated gene flow. The lodicule in cleistogamous barley is atrophied. We have isolated cleistogamy 1 (Cly1) by positional cloning and show that it encodes a transcription factor containing two AP2 domains and a putative microRNA miR172 targeting site, which is an ortholog of Arabidopsis thaliana AP2. The expression of Cly1 was concentrated within the lodicule primordia. We established a perfect association between a synonymous nucleotide substitution at the miR172 targeting site and cleistogamy. Cleavage of mRNA directed by miR172 was detectable only in a noncleistogamous background. We conclude that the miR172-derived down-regulation of Cly1 promotes the development of the lodicules, thereby ensuring noncleistogamy, although the single nucleotide change at the miR172 targeting site results in the failure of the lodicules to develop properly, producing the cleistogamous phenotype.

Additional References

Identification and mapping of cleistogamy genes in barley. (2004) (<https://pubmed.ncbi.nlm.nih.gov/15138690>)

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