

GEPHE SUMMARY

	Gephebase Gene		GepheID
VRS1 = SIX-ROWED SPIKE 1 (https://www.gephebase.org/search-criteria?/and+Gene)		GP00001190	
Gephebase="VRS1 = SIX-ROWED SPIKE 1" #gephebase-summary-title)			Main curator
	Entry Status	Martin	
Published			

PHENOTYPIC CHANGE

Trait #1	Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category="Morphology" #gephebase-summary-title)	Trait
Plant architecture (https://www.gephebase.org/search-criteria?/and+Trait="Plant)	
architecture" #gephebase-summary-title)	Trait State in Taxon A
Hordeum vulgare	
	Trait State in Taxon B
Hordeum vulgare	

Trait #2	Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category="Morphology" #gephebase-summary-title)	Trait
Inflorescence architecture (https://www.gephebase.org/search-criteria?/and+Trait="Inflorescence)	
architecture" #gephebase-summary-title)	Trait State in Taxon A
-	
	Trait State in Taxon B
-	

	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)	Common Name
vulgare" #gephebase-summary-title)	
-	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; Triticeae;	
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 Intraspecies?
No	

Taxon B	Latin Name
Hordeum vulgare	
(https://www.gephebase.org/search-criteria?/and+Taxon)	Common Name
vulgare" #gephebase-summary-title)	
-	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; Triticeae;	
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 Intraspecies?
No	

GENOTYPIC CHANGE

Vrs1	Generic Gene Name	UniProtKB Hordeum vulgare subsp. vulgare
		A1HK8 (http://www.uniprot.org/uniprot/A1HK8)
Hox1	Synonyms	GenebankID or UniProtKB
-	String	0
-	Sequence Similarities	
	GO - Molecular Function	
	GO:0043565 : sequence-specific DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043565)	
	GO - Biological Process	
	GO:0006355 : regulation of transcription, DNA-templated (https://www.ebi.ac.uk/QuickGO/term/GO:0006355)	
	GO - Cellular Component	
	GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)	
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
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Insertion^#gephebase-summary-title)		Aberration Type
1-9 bp		Insertion Size
1bp insertion resulting in frameshift		Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping^#gephebase-summary-title)		Experimental Evidence
Six-rowed barley originated from a mutation in a homeodomain-leucine zipper I-class homeobox gene. (2007) (https://pubmed.ncbi.nlm.nih.gov/17220272)		Main Reference
Komatsuda T; Pourkheirandish M; He C; Azhaguvel P; Kanamori H; Perovic D; Stein N; Graner A; Wicker T; Tagiri A; Lundqvist U; Fujimura T; Matsuoka M; Matsumoto T; Yano M		Authors
Increased seed production has been a common goal during the domestication of cereal crops, and early cultivators of barley (<i>Hordeum vulgare</i> ssp. <i>vulgare</i>) selected a phenotype with a six-rowed spike that stably produced three times the usual grain number. This improved yield established barley as a founder crop for the Near Eastern Neolithic civilization. The barley spike has one central and two lateral spikelets at each rachis node. The wild-type progenitor (<i>H. vulgare</i> ssp. <i>spontaneum</i>) has a two-rowed phenotype, with additional, strictly rudimentary, lateral rows; this natural adaptation is advantageous for seed dispersal after shattering. Until recently, the origin of the six-rowed phenotype remained unknown. In the present study, we isolated vrs1 (six-rowed spike 1), the gene responsible for the six-rowed spike in barley, by means of positional cloning. The wild-type Vrs1 allele (for two-rowed barley) encodes a transcription factor that includes a homeodomain with a closely linked leucine zipper motif. Expression of Vrs1 was strictly localized in the lateral-spikelet primordia of immature spikes, suggesting that the VRS1 protein suppresses development of the lateral rows. Loss of function of Vrs1 resulted in complete conversion of the rudimentary lateral spikelets in two-rowed barley into fully developed fertile spikelets in the six-rowed phenotype. Phylogenetic analysis demonstrated that the six-rowed phenotype originated repeatedly, at different times and in different regions, through independent mutations of Vrs1.		Abstract
INTERMEDIUM-C, a modifier of lateral spikelet fertility in barley, is an ortholog of the maize domestication gene TEOSINTE BRANCHED 1. (2011) (https://pubmed.ncbi.nlm.nih.gov/21217754)		Additional References

RELATED GEPHE

1 (teosinte branched 1 (tb1) = IntC) (https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4513~/and+Trait=Plant+architecture/or+Taxon+ID=~4513~/and+Trait=Inflorescence+architecture/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
2 (https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~VRS1+SIX-ROWED+SPIKE+1~/and+Taxon+ID=~4513~/or+Gene+Gephebase=~VRS1+SIX-ROWED+SPIKE+1~/and+Taxon+ID=~4513^#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

COMMENTS

