

GEPHE SUMMARY

	Gephebase Gene		GepheID
DEEPER ROOTING 1 (https://www.gephebase.org/search-criteria?/and+Gene)		GP00000215	
Gephebase="DEEPER ROOTING 1" #gephebase-summary-title)			Main curator
	Entry Status	Martin	
Published			

PHENOTYPIC CHANGE

Trait #1	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category="Physiology" #gephebase-summary-title)	Trait
Drought tolerance (https://www.gephebase.org/search-criteria?/and+Trait)	
tolerance" #gephebase-summary-title)	Trait State in Taxon A
-	
	Trait State in Taxon B
-	

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

	Ancestral State
Taxon A	
	Taxonomic Status
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic)	
Status="Domesticated" #gephebase-summary-title)	

Taxon A	Latin Name
Oryza sativa	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Oryza	
sativa" #gephebase-summary-title)	Common Name
rice	
	Synonyms
rice; red rice; Oryza sativa L.	
	Rank
species	
	Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;	
Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;	
Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae;	
Oryzinae; Oryza	Parent
Oryza () - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)	NCBI Taxonomy ID
4530	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530)	
	is Taxon A an Intraspecies?
No	

Taxon B	Latin Name
Oryza sativa	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Oryza	
sativa" #gephebase-summary-title)	Common Name
rice	
	Synonyms
rice; red rice; Oryza sativa L.	
	Rank
species	
	Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;	
Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;	
Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae;	
Oryzinae; Oryza	Parent
Oryza () - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)	NCBI Taxonomy ID
4530	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530)	
	is Taxon B an Intraspecies?
No	

GENOTYPIC CHANGE

Dro1	Generic Gene Name	Q69P88 (http://www.uniprot.org/uniprot/Q69P88)	UniProtKB Oryza sativa subsp. japonica
O509g0439800; OJ1344_B01.21; OSNPB_090439800	Synonyms	()	GenebankID or UniProtKB
39947.LOC_Os09g26840.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os09g26840.1)	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
1-9 bp			Deletion Size
1bp deletion within exon 4			Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephebase-summary-title)			Experimental Evidence
Control of root system architecture by DEEPER ROOTING 1 increases rice yield under drought conditions. (2013) (https://pubmed.ncbi.nlm.nih.gov/23913002)			Main Reference
Uga Y; Sugimoto K; Ogawa S; Rane J; Ishitani M; Hara N; Kitomi Y; Inukai Y; Ono K; Kanno N; Inoue H; Takehisa H; Motoyama R; Nagamura Y; Wu J; Matsumoto T; Takai T; Okuno K; Yano M			Authors
The genetic improvement of drought resistance is essential for stable and adequate crop production in drought-prone areas. Here we demonstrate that alteration of root system architecture improves drought avoidance through the cloning and characterization of DEEPER ROOTING 1 (DRO1), a rice quantitative trait locus controlling root growth angle. DRO1 is negatively regulated by auxin and is involved in cell elongation in the root tip that causes asymmetric root growth and downward bending of the root in response to gravity. Higher expression of DRO1 increases the root growth angle, whereby roots grow in a more downward direction. Introducing DRO1 into a shallow-rooting rice cultivar by backcrossing enabled the resulting line to avoid drought by increasing deep rooting, which maintained high yield performance under drought conditions relative to the recipient cultivar. Our experiments suggest that control of root system architecture will contribute to drought avoidance in crops.			Abstract
			Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS