GEPHE SUMMARY

Gephebase Gene
OsSPL14 / WFP (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^OsSPL14 / WFP^#gephebase-summary-title)

GepheID
GP00000813

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Oryza sativa L. ssp. Japonica and Indica

Trait State in Taxon B
Oryza sativa L. ssp. Japonica and Indica

Ancestral State
Data not curated

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; Oryzeae; 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 Infraspecies?
Yes

Taxon A Description
Oryza sativa L. ssp. Japonica and Indica

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; Oryzeae; 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 Infraspecies?
Yes

Taxon B Description
Oryza sativa L. ssp. Japonica and Indica

GENOTYPIC CHANGE

Generic Gene Name
IPA1

Synonyms
-

String
-

Sequence Similarities
-

GO - Molecular Function
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)

GO - Biological Process
-

GO - Cellular Component
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)

UniProtKB Oryza sativa
D8WJ58 (http://www.uniprot.org/uniprot/D8WJ58)

GenebankID or UniProtKB
GU136674 (https://www.ncbi.nlm.nih.gov/nuccore/GU136674)

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

Point mutation resulting in altered binding of a micro-RNA

Experimental Evidence

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

Main Reference

Regulation of OsSPL14 by OsmiR156 defines ideal plant architecture in rice. (2010) (https://pubmed.ncbi.nlm.nih.gov/20495565)

Authors

Jiao Y; Wang Y; Xue D; Wang J; Yan M; Liu G; Dong G; Zeng D; Lu Z; Zhu X; Qian Q; Li J

Abstract

Increasing crop yield is a major challenge for modern agriculture. The development of new plant types, which is known as ideal plant architecture (IPA), has been proposed as a means to enhance rice yield potential over that of existing high-yield varieties. Here, we report the cloning and characterization of a semidominant quantitative trait locus, IPA1 (Ideal Plant Architecture 1), which profoundly changes rice plant architecture and substantially enhances rice grain yield. The IPA1 quantitative trait locus encodes OsSPL14 (SOUAMOSA PROMOTER BINDING PROTEIN-LIKE 14) and is regulated by microRNA (miRNA) OsmiR156 in vivo. We demonstrate that a point mutation in OsSPL14 perturbs OsmiR156-directed regulation of OsSPL14, generating an 'ideal' rice plant with a reduced tiller number, increased lodging resistance and enhanced grain yield. Our study suggests that OsSPL14 may help improve rice grain yield by facilitating the breeding of new elite rice varieties.

Additional References

OsSPL14 promotes panicle branching and higher grain productivity in rice. (2010) (https://pubmed.ncbi.nlm.nih.gov/20495564)

RELATED GEPHE

Related Genes

4 (Chalk5, DEP1, OsCKX2=Gn1a, THOUSAND-GRAIN WEIGHT 6 (TGW6)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^4530^/and+Trait=Grain yield/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS