

GEPHE SUMMARY

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

PHENOTYPIC CHANGE

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

|  |                        |
|--|------------------------|
| Trait #2   | Trait Category         |
| Morphology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a><br>Category="Morphology" #gephebase-summary-title)    |                        |
|  | Trait                  |
| Root growth ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=" root"="">https://www.gephebase.org/search-criteria?/and+Trait="Root</a><br>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 ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a><br>Status="Domesticated" #gephebase-summary-title) |                  |

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

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

GENOTYPIC CHANGE

|   |                         |  |  |
|---|-------------------------|--|--|
| Dro1  | Generic Gene Name       | Q69P88 ( <a href="http://www.uniprot.org/uniprot/Q69P88">http://www.uniprot.org/uniprot/Q69P88</a> ) | UniProtKB Oryza sativa subsp. japonica |
| O509g0439800; OJ1344_B01.21; OSNPB_090439800  | Synonyms                | ()   | GenebankID or UniProtKB                |
| 39947.LOC_Os09g26840.1<br>( <a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os09g26840.1">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os09g26840.1</a> )   | String                  |  |  |
| -   | Sequence Similarities   |  |  |
| -   | GO - Molecular Function |  |  |
| -   | GO - Biological Process |  |  |
| -   | GO - Cellular Component |  |  |
| Yes ( <a href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Yes^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Yes^#gephebase-summary-title</a> )   |                         |  | Presumptive Null                       |
| Coding ( <a href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Coding^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Coding^#gephebase-summary-title</a> )  |                         |  | Molecular Type                         |
| Deletion ( <a href="https://www.gephebase.org/search-criteria?/and+Aberration+Type=^Deletion^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Aberration+Type=^Deletion^#gephebase-summary-title</a> )  |                         |  | Aberration Type                        |
| 1-9 bp  |                         |  | Deletion Size                          |
| 1bp deletion within exon 4  |                         |  | Molecular Details of the Mutation      |
| Linkage Mapping ( <a href="https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephebase-summary-title</a> )   |                         |  | Experimental Evidence                  |
| Control of root system architecture by DEEPER ROOTING 1 increases rice yield under drought conditions. (2013) ( <a href="https://pubmed.ncbi.nlm.nih.gov/23913002">https://pubmed.ncbi.nlm.nih.gov/23913002</a> )   |                         |  | 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