

## GEPHE SUMMARY

|   |  |                                    |
|---|--|------------------------------------|
| <p>DEP1 (DENSE AND ERECT PANICLES 1) (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^DEP1+(DENSE+AND+ERECT+PANICLES+1)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^DEP1+(DENSE+AND+ERECT+PANICLES+1)^#gephebase-summary-title</a>)</p> <p>Published</p> | <p>Gephebase Gene</p> <p>GP00001376</p> <p>Prigent</p> <p>Entry Status</p> | <p>GepheID</p> <p>Main curator</p> |
|---|--|------------------------------------|

## PHENOTYPIC CHANGE

|  |   |   |   |  |   |
|--|---|---|---|--|---|
| <p>Physiology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title</a>)</p> <p>Nitrogen use (metabolism) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=^Nitrogen+use+(metabolism)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=^Nitrogen+use+(metabolism)^#gephebase-summary-title</a>)</p> <p>O. s. indica Nanjing6 ; DEP1 ; highly responsive to nitrogen</p> <p>O. s. japonica Qianzhonglang2 ; Dep1 ; reduced response to nitrogen</p> <p>Unknown</p> <p>Domesticated (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Domesticated^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Domesticated^#gephebase-summary-title</a>)</p> | <p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p> | <p>Taxon A</p> <p>Oryza sativa Indica Group<br/>(<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa+Indica+Group^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa+Indica+Group^#gephebase-summary-title</a>)</p> <p>long-grained rice</p> <p>Oryza sativa (indica cultivar-group); Oryza sativa (indica group); Oryza sativa subsp. indica; long-grained rice; Indian rice; Indica rice; Oryza sativa subsp. indica Kato; Oryza sativa indica; Oryza sativa ssp. indica</p> <p>no rank</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza; Oryza sativa</p> <p>Oryza sativa (rice) - (Rank: species)<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>)</p> <p>39946<br/>(<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39946">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39946</a>)</p> <p>Yes</p> <p>O. s. indica Nanjing6 ; DEP1 ; highly responsive to nitrogen</p> | <p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon A an Intraspecies?</p> <p>Taxon A Description</p> | <p>Taxon B</p> <p>Oryza sativa Japonica Group<br/>(<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa+Japonica+Group^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa+Japonica+Group^#gephebase-summary-title</a>)</p> <p>Japanese rice</p> <p>Oryza sativa (japonica cultivar-group); Oryza sativa subsp. japonica; Japanese rice; Japonica rice; Oryza sativa (japonica cultivar-group); Oryza sativa japonica; Oryza sativa ssp. japonica</p> <p>no rank</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza; Oryza sativa</p> <p>Oryza sativa (rice) - (Rank: species)<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>)</p> <p>39947<br/>(<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39947">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39947</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p> <p>O. s. japonica Qianzhonglang2 ; Dep1 ; reduced response to nitrogen</p> | <p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p> |
|--|---|---|---|--|---|

## GENOTYPIC CHANGE

|   |   |   |
|---|---|---|
| <p>P0046G12.12-1</p> <p>DN1; DEP1; pay1; Os09g0441900; OsJ_29530; OSNPB_090441900</p> <p>39947.LOC_Os09g26999.1<br/>(<a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os09g26999.1">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os09g26999.1</a>)</p> <p>-</p> <p>-</p> | <p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p> | <p>UniProtKB Oryza sativa subsp. japonica<br/>Q67UU9 (<a href="http://www.uniprot.org/uniprot/Q67UU9">http://www.uniprot.org/uniprot/Q67UU9</a>)</p> <p>GenebankID or UniProtKB</p> <p>()</p> |
|---|---|---|

GO:0007186 : G protein-coupled receptor signaling pathway  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007186>)

GO - Cellular Component

GO:0005882 : intermediate filament (<https://www.ebi.ac.uk/QuickGO/term/GO:0005882>)

Presumptive Null

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Coding^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Aberration Type

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+SNP^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

p.Cys105Tyr affecting affinity interaction between the GGL domain of DEP1 and RGB1 subunit

Experimental Evidence

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

|            | Taxon A | Taxon B | Position |
|------------|---------|---------|----------|
| Codon      | -       | -       | -        |
| Amino-acid | -       | -       | -        |

Main Reference

Heterotrimeric G proteins regulate nitrogen-use efficiency in rice. (2014) (<https://pubmed.ncbi.nlm.nih.gov/24777451>)

Authors

Sun H; Qian Q; Wu K; Luo J; Wang S; Zhang C; Ma Y; Liu Q; Huang X; Yuan Q; Han R; Zhao M; Dong G; Guo L; Zhu X; Gou Z; Wang W; Wu Y; Lin H; Fu X

Abstract

The drive toward more sustainable agriculture has raised the profile of crop plant nutrient-use efficiency. Here we show that a major rice nitrogen-use efficiency quantitative trait locus (qNGR9) is synonymous with the previously identified gene DEP1 (DENSE AND ERECT PANICLES 1). The different DEP1 alleles confer different nitrogen responses, and genetic diversity analysis suggests that DEP1 has been subjected to artificial selection during *Oryza sativa* spp. japonica rice domestication. The plants carrying the dominant dep1-1 allele exhibit nitrogen-insensitive vegetative growth coupled with increased nitrogen uptake and assimilation, resulting in improved harvest index and grain yield at moderate levels of nitrogen fertilization. The DEP1 protein interacts in vivo with both the G $\alpha$ 1 (RGA1) and G $\beta$ 1 (RGB1) subunits, and reduced RGA1 or enhanced RGB1 activity inhibits nitrogen responses. We conclude that the plant G protein complex regulates nitrogen signaling and modulation of heterotrimeric G protein activity provides a strategy for environmentally sustainable increases in rice grain yield.

Additional References

## RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS