

## GEPHE SUMMARY

<p>O<sub>s</sub>PPKL1/qGL3 (<a +o<sub="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">sPPKL1/qGL3+"#gephebase-summary-title"&gt;https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+O<sub>s</sub>PPKL1/qGL3+"#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00000812</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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## PHENOTYPIC CHANGE

<p>Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title</a>)</p> <p>Grain size (<a +grain+size+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Grain+size+"#gephebase-summary-title</a>)</p> <p>Oryza sativa L. ssp. indica - N643</p> <p>Oryza sativa L. ssp. Japonica N411</p> <p>Data not curated</p> <p>Domesticated (<a +domesticated+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">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>Oryza sativa L. ssp. indica - N643</p> <p>Oryza sativa L. ssp. Japonica N411</p> <p>Data not curated</p> <p>Domesticated</p>
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Taxon A	Latin Name	Taxon B	Latin Name
Oryza sativa ( <a +oryza+sativa+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Oryza+sativa+"#gephebase-summary-title</a> )			
Common Name	Common Name	Common Name	Common Name
rice	rice	rice	rice
Synonyms	Synonyms	Synonyms	Synonyms
rice; red rice; Oryza sativa L.			
Rank	Rank	Rank	Rank
species	species	species	species
Lineage	Lineage	Lineage	Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza
Parent	Parent	Parent	Parent
Oryza () - (Rank: genus) ( <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> )	Oryza () - (Rank: genus) ( <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> )	Oryza () - (Rank: genus) ( <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> )	Oryza () - (Rank: genus) ( <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	NCBI Taxonomy ID	NCBI Taxonomy ID	NCBI Taxonomy ID
4530 ( <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?	is Taxon A an Intraspecies?	is Taxon B an Intraspecies?	is Taxon B an Intraspecies?
Yes	Yes	Yes	Yes
Taxon A Description	Taxon A Description	Taxon B Description	Taxon B Description
Oryza sativa L. ssp. indica - N643	Oryza sativa L. ssp. indica - N643	Oryza sativa L. ssp. Japonica N411	Oryza sativa L. ssp. Japonica N411

## GENOTYPIC CHANGE

<p>qLTG-3-1</p> <p>qGL3-1; qLTG3-1</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>No (<a +no+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive+Null="+No+"#gephebase-summary-title</a>)</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>GO - Cellular Component</p>	<p>UniProtKB Oryza sativa subsp. japonica</p> <p>B3IW10 (<a href="http://www.uniprot.org/uniprot/B3IW10">http://www.uniprot.org/uniprot/B3IW10</a>)</p> <p>GenebankID or UniProtKB</p> <p>AAD27631 (<a href="https://www.ncbi.nlm.nih.gov/nuccore/AAD27631">https://www.ncbi.nlm.nih.gov/nuccore/AAD27631</a>)</p> <p>Presumptive Null</p>
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Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding^#gephebase-summary-title>)

Molecular Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=~SNP^#gephebase-summary-title>)

Aberration Type

Nonsynonymous

SNP Coding Change

Asp364Glu

Molecular Details of the Mutation

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

Experimental Evidence

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

Rare allele of OsPPKL1 associated with grain length causes extra-large grain and a significant yield increase in rice. (2012) (<https://pubmed.ncbi.nlm.nih.gov/23236132>)

Main Reference

Zhang X; Wang J; Huang J; Lan H; Wang C; Yin C; Wu Y; Tang H; Qian Q; Li J; Zhang H

Authors

Grain size and shape are important components determining rice grain yield, and they are controlled by quantitative trait loci (QTLs). Here, we report the cloning and functional characterization of a major grain length QTL, qGL3, which encodes a putative protein phosphatase with Kelch-like repeat domain (OsPPKL1). We found a rare allele qgl3 that leads to a long grain phenotype by an aspartate-to-glutamate transition in a conserved AVLDT motif of the second Kelch domain in OsPPKL1. The rice genome has other two OsPPKL1 homologs, OsPPKL2 and OsPPKL3. Transgenic studies showed that OsPPKL1 and OsPPKL3 function as negative regulators of grain length, whereas OsPPKL2 as a positive regulator. The Kelch domains are essential for the OsPPKL1 biological function. Field trials showed that the application of the qgl3 allele could significantly increase grain yield in both inbred and hybrid rice varieties, due to its favorable effect on grain length, filling, and weight.

Abstract

Additional References

## RELATED GEPHE

9 (GL3.1, GS3, GS5, GW2, qSW5, OsSPL13, GL7, Os07g0603400, OsSPL16) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4530^/and+Trait=Grain+size/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS