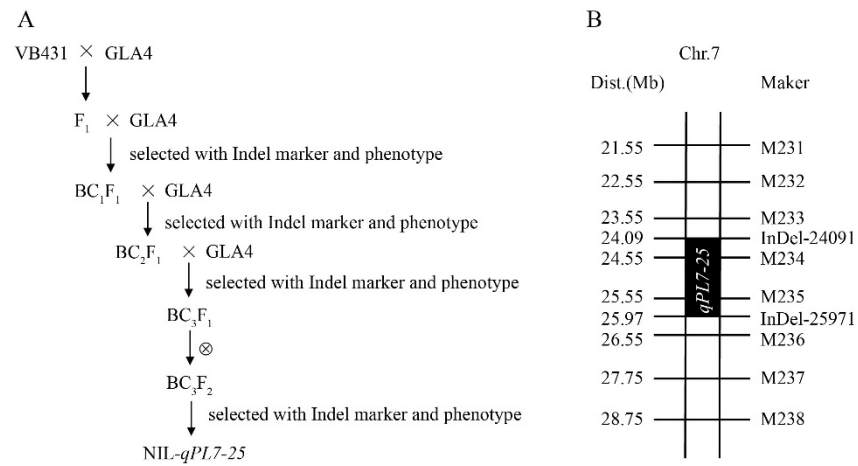
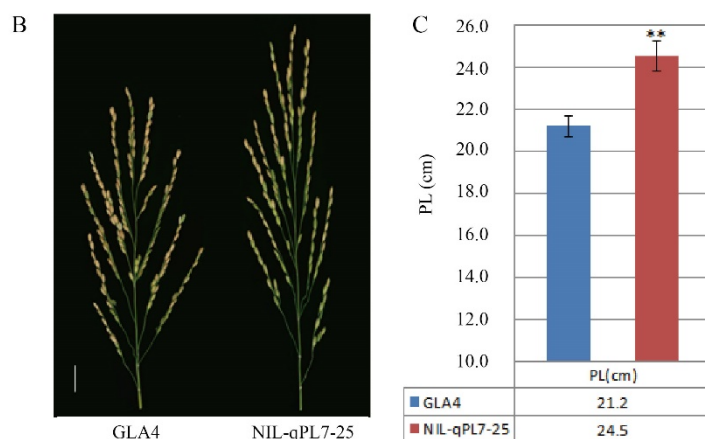
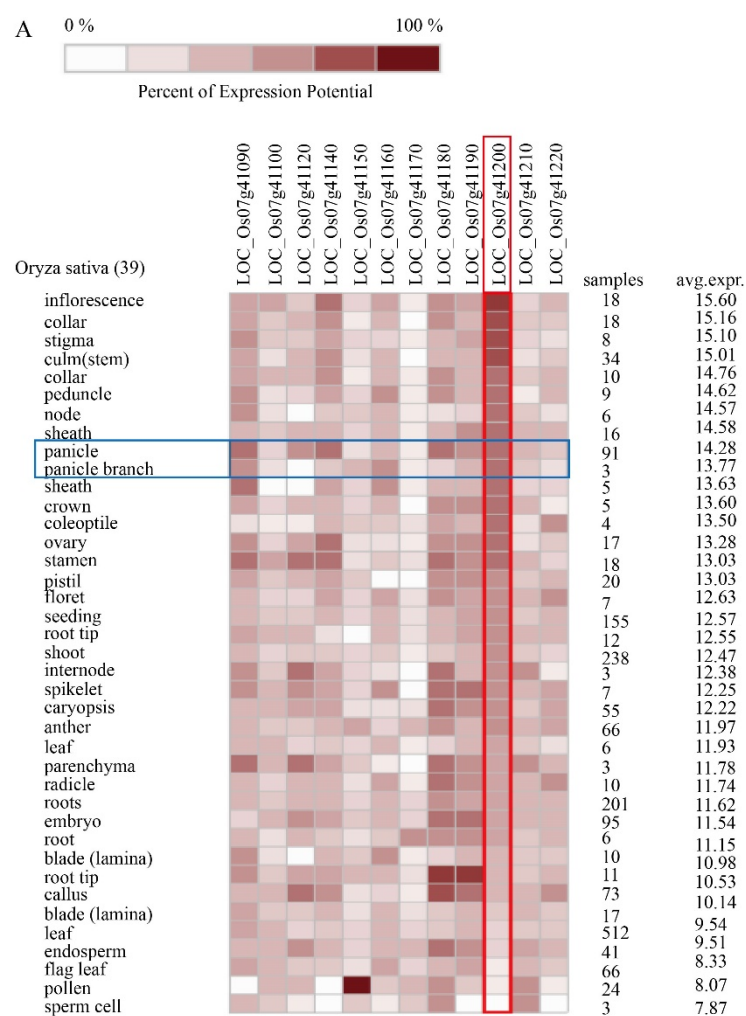


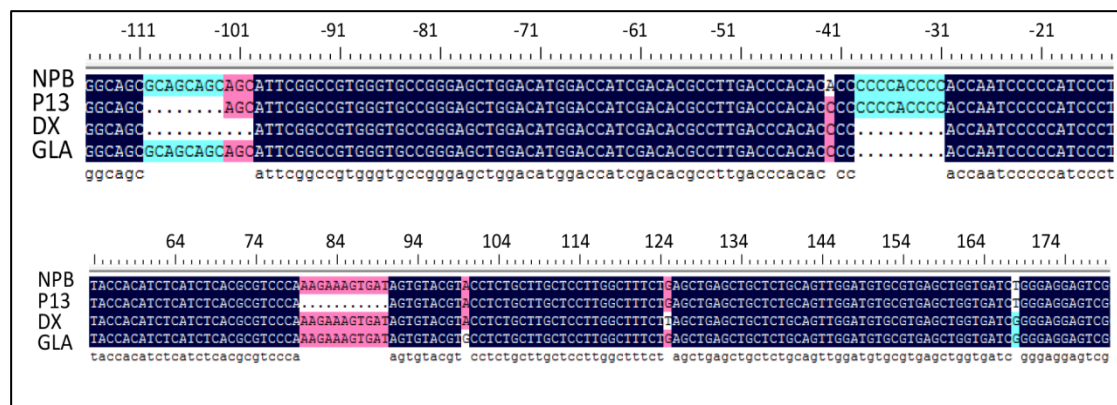
Supplementary Figure S1. The morphology and grain size comparisons of mature grains from GLA4 and DXWR. (A) The morphology of mature grains from GLA4 and DXWR, bar=2 cm. (B-F) Comparisons of grain length (B), grain width (C), grain thickness (D), ratio of grain length to width (E) and 1000-grain weight (F) ($n \geq 100$ in B-E and $n = 3$ in F). Data are shown as means \pm SD. ** indicate a significant difference between DXWR and GLA4 at 0.01 levels according to *t*-test.



Supplementary Figure S2. Construction of NIL (A) and linkage map of *qPL7-25* on chromosome 7 in the NIL (B).



Supplementary Figure S3. Expression patterns of candidate genes. (A) Expression heat map of candidate genes in different tissues. (B) Comparison of panicle phenotypes between NIL-*qPL7-25* and GLA4. (C) Comparisons of panicle length between NIL-*qPL7-25* and GLA4 ($n = 5$). Data are shown as means \pm SD. ** indicate a significant difference between NIL-*qPL7-25* and GLA4 at 0.01 levels according to *t*-test.



Supplementary Figure S4. Sequence alignment of promoter region and 5'UTR region of *GL7* gene. NPB, Nipponbare; P13, Ping13; DX, Dongxiang wild rice; GLA, Guangluai 4.

Supplementary Table S1. InDel primers used in fine mapping of *qPL7-25*.

Marker	Forward primers	Reverse primers	Product size/bp
InDel-24091	TGCATCAAGGGGTGTTTACATGG	CGTCTCGCAGATGATTAGCTCTTAT	138
InDel-24477	CTCCGGCAGTTCAGGCTTTG	CTCGTGCAGCTCCATCGGC	130
InDel-24554	TGCGAGTGTTTTGCAGTTTACTG	AATATGGTATTGGTACGGCCGC	114
InDel-24591	GGGATAAAGGGAGTCCTAT	AGCGAGTATAAATGCCCCAC	104
InDel-24710	TGTCCCATCTACCCAGAAGTTGTT	ACTACAGGCATCTCCCTCTTGAGG	123
InDel-24736	TAGTATGTGCTGCTGTTCCCTGTGC	CCGCAAGCGAACAAGAGAAG	112
InDel-24811	GTTGGTGTCTAAGGAGGGTCCTG	CACTCCGGCCTGCATCTAGG	171
InDel-24973	AGTTAGGTGGCCCGATCCC	GACCTCGAGCTGGATTCCCTT	171
InDel-25971	TTTCTAGCATTGTCCACATT	CATTCATATTGATGTTAGTAAATC	120

Supplementary Table S2. Predicted ORF on RGAP.

ORF	Candidate gene	Putative function
ORF1	LOC_Os07g41090	Histone deacetylase
ORF 2	LOC_Os07g41100	Conserved hypothetical protein
ORF 3	LOC_Os07g41110	Retrotransposon protein
ORF 4	LOC_Os07g41120	RNA recognition motif containing protein
ORF 5	LOC_Os07g41140	Receptor-like protein kinase precursor
ORF 6	LOC_Os07g41150	Glycerophosphoryl diester phosphodiesterase family protein
ORF 7	LOC_Os07g41160	Protein of unknown function DUF1675 domain containing protein
ORF 8	LOC_Os07g41170	Expressed protein
ORF 9	LOC_Os07g41180	RNA-binding protein-like
ORF 10	LOC_Os07g41190	WD domain, G-beta repeat domain containing protein
ORF 11	LOC_Os07g41200	Grain Length on Chromosome 7; LONGIFOLIA protein; grain width
ORF 12	LOC_Os07g41210	Negative regulator of GL7
ORF 13	LOC_Os07g41220	Peptidase aspartic family protein
ORF 14	LOC_Os07g41230	Methyl esterase-like

Abbreviation: ORF, open reading frame.

Supplementary Table S3. Data collection of main agronomic traits of Huazhan and NIL-Huazhan-*GL7^{P13}* in Hangzhou.

Traits	Huazhan	NIL-Huazhan- <i>GL7^{P13}</i>
Plant height (cm)	103.1±1.8	112.9±1.5**
Panicle length (cm)	24.1±0.7	26.5±0.5**
Primary branch number	11.0±0.4	12.2±0.6*
Secondary branch number	42.8±1.1	39.0±1.5**
Spikelet number per panicle	206.0±8.7	200.7±4.3
Grain length (cm)	8.5±0.1	10.1±0.3**
Grain width (cm)	2.4±0.1	2.3±0.1
Ratio of grain length to width	3.54±0.12	4.37±0.20**
1000-grain weight (g)	20.2±0.4	20.9±0.5
Grain yield per plant (g)	37.5±1.6	35.3±1.2

Data are shown as means ± SD ($n = 5$). * and ** indicate a significant difference between Huazhan and NIL-Huazhan-*GL7^{P13}* at 0.05 and 0.01 levels by *t*-test, respectively.

Supplementary Table S4. Data collection of main agronomic traits of GLA4 and NIL-*qPL7-25* in Hangzhou.

Traits	GLA4	NIL- <i>qPL7-25</i>
Plant height (cm)	83.7±1.3	86.4±1.7*
Panicle length (cm)	21.2±0.5	24.5±0.4**
Primary branch number	11.7±0.5	12.9±0.7*
Secondary branch number	22.6±0.3	21.0±0.9*
Spikelet number per panicle	122.9±5.0	131.4±4.1*
Grain length (cm)	7.7±0.1	8.5±0.3**
Grain width (cm)	3.4±0.1	3.3±0.2
Ratio of grain length to width	2.26±0.08	2.58±0.13**
1000-grain weight (g)	25.5±0.3	25.6±0.1
Grain yield per plant (g)	17.3±0.4	18.0±0.5

Data are shown as means ± SD ($n = 5$). * and ** indicate a significant difference between GLA4 and NIL-*qPL7-25* at 0.05 and 0.01 levels by *t*-test, respectively.