**Supplementary Materials**

**Supplementary Table S1** A list of 110 indica rice accessions and their callus induction percentage in three different media used for GWAS analysis

| Name | N6 | SD | B5 | SD | MS | SD |
| --- | --- | --- | --- | --- | --- | --- |
| Niaw Ubon 1 | 60.00 | 23.09 | 77.78 | 10.18 | 86.67 | 13.33 |
| Khaew | 22.22 | 3.85 | 64.44 | 3.85 | 66.67 | 6.67 |
| Chumphae 60 | 60.00 | 13.33 | 62.22 | 10.18 | 73.33 | 0.00 |
| KDML105-Bph3-1 | 75.56 | 10.18 | 56.67 | 4.71 | 53.33 | 11.55 |
| RD4 | 55.56 | 10.18 | 56.67 | 23.57 | 51.11 | 23.41 |
| JHN | 91.11 | 3.85 | 55.56 | 10.18 | 53.33 | 6.67 |
| Leuang Thong | 64.44 | 15.40 | 55.56 | 20.37 | 73.33 | 11.55 |
| Khao Ban Pong | 26.67 | 24.04 | 53.33 | 20.00 | 26.67 | 24.04 |
| Phan Thong | 60.00 | 11.55 | 51.11 | 7.70 | 53.33 | 17.64 |
| MeeKauk | 62.22 | 3.85 | 46.67 | 17.64 | 80.00 | 13.33 |
| Hom Chan | 33.33 | 6.67 | 46.67 | 6.67 | 6.67 | 0.00 |
| PTB33 | 68.89 | 10.18 | 44.44 | 20.37 | 24.44 | 7.70 |
| Luang Prathan | 22.22 | 3.85 | 44.44 | 7.70 | 55.56 | 7.70 |
| RD47 | 40.00 | 11.55 | 44.44 | 3.85 | 60.00 | 13.33 |
| RD6 | 35.56 | 10.18 | 42.22 | 3.85 | 44.44 | 10.18 |
| Setthi | 33.33 | 11.55 | 40.00 | 13.33 | 11.11 | 3.85 |
| IR62266 | 56.67 | 4.71 | 40.00 | 0.00 | 48.89 | 19.25 |
| Khao Pong Krai | 53.33 | 20.00 | 40.00 | 6.67 | 53.33 | 11.55 |
| Niew Khiaw Ngoo | 46.67 | 6.67 | 40.00 | 11.55 | 71.11 | 3.85 |
| Suphan Buri 2 | 33.33 | 11.55 | 40.00 | 0.00 | 28.89 | 16.78 |
| Pokkali | 26.67 | 6.67 | 40.00 | 6.67 | 28.89 | 13.88 |
| Sang Yod | 22.22 | 10.18 | 40.00 | 20.00 | 57.78 | 7.70 |
| BENARA | 11.11 | 10.18 | 40.00 | 13.33 | 33.33 | 6.67 |
| HomMali803-2 | 62.22 | 7.70 | 37.78 | 3.85 | 50.00 | 4.71 |
| Leuang Yai | 33.33 | 6.67 | 37.78 | 13.88 | 44.44 | 16.78 |
| Pin Kaset 3 | 28.89 | 21.43 | 37.78 | 16.78 | 35.56 | 3.85 |
| Suphan Buri 1 | 53.33 | 11.55 | 37.78 | 15.40 | 57.78 | 7.70 |
| Kalubala Vee | 46.67 | 11.55 | 37.78 | 15.40 | 55.56 | 7.70 |
| PSM | 62.22 | 3.85 | 35.56 | 3.85 | 28.89 | 16.78 |
| Pin Kaset 4 | 35.56 | 10.18 | 35.56 | 3.85 | 44.44 | 13.88 |
| DULAR | 15.56 | 13.88 | 35.56 | 7.70 | 60.00 | 11.55 |
| Leuang Dong | 8.89 | 7.70 | 35.56 | 10.18 | 28.89 | 3.85 |
| Phuma Dum | 28.89 | 7.70 | 35.56 | 13.88 | 37.78 | 13.88 |
| Hom Phu Khaew | 23.33 | 4.71 | 35.56 | 10.18 | 20.00 | 0.00 |
| T6-6 | 33.33 | 11.55 | 33.33 | 6.67 | 37.78 | 10.18 |
| KD20 | 28.89 | 20.37 | 33.33 | 24.04 | 68.89 | 7.70 |
| Dee See | 17.78 | 7.70 | 33.33 | 11.55 | 42.22 | 16.78 |
| Mae Lad | 22.22 | 23.41 | 31.11 | 3.85 | 22.22 | 19.25 |
| Leuang Patew 123 | 42.22 | 16.78 | 31.11 | 13.88 | 11.11 | 7.70 |
| CNTLR82006-KSR-2-7 | 35.56 | 10.18 | 28.89 | 10.18 | 28.89 | 3.85 |
| Prachin Buri 2 | 33.33 | 11.55 | 28.89 | 3.85 | 0.00 | 0.00 |
| Phuang Nug | 22.22 | 10.18 | 28.89 | 3.85 | 20.00 | 6.67 |
| Dor Khao | 15.56 | 7.70 | 28.89 | 15.40 | 37.78 | 13.88 |
| Hom Phama | 8.89 | 7.70 | 28.89 | 15.40 | 28.89 | 10.18 |
| Phitsanulok 60-1 | 84.44 | 3.85 | 26.67 | 6.67 | 37.78 | 3.85 |
| BA7 | 40.00 | 11.55 | 26.67 | 6.67 | 46.67 | 0.00 |
| Khao Khum | 31.11 | 7.70 | 26.67 | 13.33 | 35.56 | 16.78 |
| Sri Nuan | 26.67 | 13.33 | 26.67 | 6.67 | 24.44 | 13.88 |
| Rathu heenati | 24.44 | 3.85 | 26.67 | 6.67 | 24.44 | 10.18 |
| DH103 | 22.22 | 3.85 | 26.67 | 6.67 | 44.44 | 13.88 |
| Rice Berry | 20.00 | 20.00 | 26.67 | 11.55 | 37.78 | 10.18 |
| Chiang Phatthalung | 0.00 | 0.00 | 26.67 | 6.67 | 33.33 | 6.67 |
| Hom Chan | 37.78 | 3.85 | 24.44 | 7.70 | 35.56 | 3.85 |
| RD27 | 33.33 | 20.00 | 24.44 | 15.40 | 33.33 | 0.00 |
| Khao Klang | 17.78 | 7.70 | 24.44 | 13.88 | 20.00 | 6.67 |
| Chempan | 22.22 | 3.85 | 24.44 | 10.18 | 33.33 | 6.67 |
| Kon Kaew | 20.00 | 6.67 | 24.44 | 10.18 | 24.44 | 7.70 |
| Pin Kaew 56 | 2.22 | 3.85 | 24.44 | 10.18 | 40.00 | 23.09 |
| Khao Kor Diaw 35 | 33.33 | 19.25 | 22.22 | 16.78 | 31.11 | 10.18 |
| Num SaKui 19 | 17.78 | 7.70 | 22.22 | 7.70 | 22.22 | 3.85 |
| Hom Khlong Luang 1 | 44.44 | 7.70 | 20.00 | 20.00 | 35.56 | 13.88 |
| Leuang Kamin | 30.00 | 4.71 | 20.00 | 9.43 | 48.89 | 3.85 |
| Hom Dong | 24.44 | 3.85 | 20.00 | 0.00 | 35.56 | 3.85 |
| Hom Satabhutra | 24.44 | 3.85 | 20.00 | 13.33 | 22.22 | 21.43 |
| Khao Banna 432 | 37.78 | 7.70 | 17.78 | 7.70 | 57.78 | 16.78 |
| Lug Dang Pattani | 33.33 | 13.33 | 17.78 | 3.85 | 46.67 | 17.64 |
| TDK1-Sub | 31.11 | 23.41 | 17.78 | 3.85 | 24.44 | 3.85 |
| Khao Ta Hang | 26.67 | 6.67 | 17.78 | 7.70 | 31.11 | 3.85 |
| Hom Lao | 20.00 | 13.33 | 17.78 | 7.70 | 26.67 | 6.67 |
| Khao Ruang 88 | 15.56 | 13.88 | 17.78 | 20.37 | 17.78 | 7.70 |
| Chor Lung 97 | 8.89 | 3.85 | 17.78 | 3.85 | 2.22 | 3.85 |
| IR40 | 2.22 | 3.85 | 17.78 | 3.85 | 4.44 | 7.70 |
| Niaw Sonpatong | 28.89 | 10.18 | 16.67 | 4.71 | 15.56 | 3.85 |
| Hom Nang Nuan | 46.67 | 0.00 | 15.56 | 7.70 | 48.89 | 10.18 |
| Nakwan | 22.22 | 3.85 | 15.56 | 13.88 | 53.33 | 17.64 |
| Konjood | 6.67 | 6.67 | 15.56 | 10.18 | 28.89 | 15.40 |
| Mali Dang | 28.89 | 10.18 | 13.33 | 0.00 | 35.56 | 10.18 |
| Kon Kaew | 28.89 | 10.18 | 13.33 | 6.67 | 6.67 | 0.00 |
| RD13 | 26.67 | 17.64 | 13.33 | 6.67 | 40.00 | 6.67 |
| HomMali803-1 | 24.44 | 16.78 | 13.33 | 7.70 | 73.33 | 6.67 |
| Sian Orn | 20.00 | 11.55 | 13.33 | 6.67 | 11.11 | 10.18 |
| CNTBR82040-259-1-1-1 | 17.78 | 3.85 | 13.33 | 9.43 | 33.33 | 18.86 |
| Taban | 17.78 | 3.85 | 13.33 | 6.67 | 20.00 | 6.67 |
| Surin 1 | 16.67 | 4.71 | 13.33 | 6.67 | 6.67 | 11.55 |
| MNTK75 | 13.33 | 11.55 | 13.33 | 0.00 | 35.56 | 7.70 |
| Mark Num | 6.67 | 6.67 | 13.33 | 11.55 | 22.22 | 13.88 |
| Ruang Diaw | 23.33 | 4.71 | 11.11 | 10.18 | 24.44 | 10.18 |
| E-pid | 23.33 | 4.71 | 11.11 | 7.70 | 20.00 | 11.55 |
| Hom Thong | 17.78 | 15.40 | 11.11 | 3.85 | 48.89 | 13.88 |
| Niaw Dum | 17.78 | 13.88 | 11.11 | 3.85 | 26.67 | 6.67 |
| RD8 | 13.33 | 6.67 | 11.11 | 10.18 | 17.78 | 16.78 |
| Khao Nok | 8.89 | 7.70 | 11.11 | 3.85 | 6.67 | 6.67 |
| Khao Ngachang | 37.78 | 15.40 | 8.89 | 7.70 | 24.44 | 13.88 |
| Mabang | 33.33 | 13.33 | 8.89 | 10.18 | 33.33 | 13.33 |
| Ayutthaya 1 | 22.22 | 3.85 | 8.89 | 3.85 | 28.89 | 13.88 |
| Nipponbare | 13.33 | 6.67 | 8.89 | 3.85 | 20.00 | 6.67 |
| Char Makok | 8.89 | 7.70 | 8.89 | 3.85 | 22.22 | 21.43 |
| RD37 | 37.78 | 19.25 | 6.67 | 11.55 | 42.22 | 7.70 |
| Rak Hang | 16.67 | 4.71 | 6.67 | 9.43 | 24.44 | 3.85 |
| RD7 | 8.89 | 10.18 | 4.44 | 3.85 | 33.33 | 24.04 |
| RD11 | 6.67 | 6.67 | 4.44 | 3.85 | 15.56 | 7.70 |
| Tom Muangluang | 0.00 | 0.00 | 4.44 | 7.70 | 0.00 | 0.00 |
| Phitsanulok 80 | 15.56 | 10.18 | 3.33 | 4.71 | 3.33 | 4.71 |
| Kemthong Phatthalung | 35.56 | 7.70 | 2.22 | 3.85 | 24.44 | 7.70 |
| Thong Raksai | 17.78 | 3.85 | 2.22 | 3.85 | 22.22 | 16.78 |
| Kee Thom Klang | 4.44 | 7.70 | 2.22 | 3.85 | 2.22 | 3.85 |
| RD39 | 0.00 | 0.00 | 2.22 | 3.85 | 6.67 | 6.67 |
| Suphan Buri 4 | 6.67 | 9.43 | 0.00 | 0.00 | 10.00 | 4.71 |
| Jao Hom Suphan Buri | 4.44 | 7.70 | 0.00 | 0.00 | 26.67 | 9.43 |
| Suphan Buri 90 | 4.44 | 7.70 | 0.00 | 0.00 | 4.44 | 7.70 |
| Kan Chan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**Supplementary Table 2** A list of candidate genes for the callus induction in the qCI-B5-Chr6; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os06g0253350 | 7954357 | 7958130 | Hypothetical gene. (Os06t0253350-00) |
| Os06g0253600 | 7964478 | 7967674 | Similar to secretory protein-like. (Os06t0253600-00) |
| Os06g0254200 | 7982027 | 7983859 | Similar to Potassium channel protein NKT5. (Os06t0254200-00) |
| Os06g0254300 | 7983970 | 7990956 | Similar to EF-hand calcium bining protein. (Os06t0254300-01) |
| Os06g0254600 | 7996917 | 8004842 | Caleosin related family protein. (Os06t0254600-01) |
| Os06g0254700 | 8011879 | 8014834 | Caleosin related family protein. (Os06t0254700-01) |
| Os06g0254901 | 8029753 | 8030718 | Non-protein coding transcript. (Os06t0254901-00) |
| Os06g0255001 | 8034209 | 8035027 | Non-protein coding transcript. (Os06t0255001-00) |
| Os06g0255100 | 8038476 | 8041831 | 2OG-Fe(II) oxygenase domain containing protein. (Os06t0255100-01) |
| Os06g0255200 | 8043566 | 8067365 | Conserved hypothetical protein. (Os06t0255200-01) |
| Os06g0255400 | 8069204 | 8069983 | Similar to Nudix hydrolase 18, mitochondrial precursor (EC 3.6.1.-) (AtNUDT18). (Os06t0255400-01) |
| Os06g0255700 | 8097302 | 8104472 | DEAD-like helicase, N-terminal domain containing protein. (Os06t0255700-01) |
| Os06g0255900 | 8116249 | 8119845 | Conserved hypothetical protein. (Os06t0255900-01) |
| Os06g0256000 | 8127437 | 8129334 | Conserved hypothetical protein. (Os06t0256000-01) |
| Os06g0256200 | 8129560 | 8134453 | Similar to Keratinocytes proline-rich protein. (Os06t0256200-01) |
| Os06g0256300 | 8142728 | 8147085 | Similar to Calmodulin-binding heat-shock protein. (Os06t0256300-01) |
| Os06g0256500 | 8152444 | 8159313 | Similar to Glucose-6-phosphate isomerase. (Os06t0256500-01) |
| Os06g0256600 | 8162028 | 8166874 | Conserved hypothetical protein. (Os06t0256600-01) |
| Os06g0256800 | 8176855 | 8177675 | Hypothetical conserved gene. (Os06t0256800-01) |
| Os06g0256900 | 8178991 | 8184548 | Glycoside hydrolase family 9 subclass B3, Endo-beta-1,4-glucanase, Lignocellulose crystallinity modification in stem internode growth and development, Plant strength, cellulose modification, and biomass saccharification (Os06t0256900-01) |
| Os06g0257050 | 8179502 | 8184497 | Hypothetical protein. (Os06t0257050-00) |
| Os06g0257200 | 8194555 | 8198058 | Similar to Signal recognition particle 9 kDa protein. (Os06t0257200-01) |
| Os06g0257450 | 8230555 | 8232480 | Ribonucleotide reductase, Chloroplast biogenesis (Os06t0257450-01) |
| Os06g0257600 | 8236902 | 8238699 | Esterase, SGNH hydrolase-type domain containing protein. (Os06t0257600-01) |
| Os06g0258000 | 8251038 | 8252390 | Similar to Typical P-type R2R3 Myb protein (Fragment). (Os06t0258000-01) |
| Os06g0258500 | 8283058 | 8283486 | Myb transcription factor domain containing protein. (Os06t0258500-00) |
| Os06g0258900 | 8301780 | 8316896 | NAD(P)-binding domain containing protein. (Os06t0258900-01) |
| Os06g0259000 | 8319050 | 8321692 | Hypothetical conserved gene. (Os06t0259000-01) |

**Supplementary Table 3** A list of candidate genes for the callus induction in the qCI-MS-Chr2; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os02g0255900 | 8825029 | 8825614 | Conserved hypothetical protein. (Os02t0255900-01) |
| Os02g0256000 | 8834020 | 8835881 | Hypothetical protein. (Os02t0256000-01) |
| Os02g0256100 | 8834369 | 8837492 | Pectin lyase fold/virulence factor domain containing protein. (Os02t0256100-01) |
| Os02g0256200 | 8842948 | 8844249 | Histidine- and alanine-rich protein, Leaf sheath elongation (Os02t0256200-02) |
| Os02g0256500 | 8850623 | 8851897 | Conserved hypothetical protein. (Os02t0256500-01) |
| Os02g0256800 | 8854327 | 8854985 | Cupredoxin domain containing protein. (Os02t0256800-00) |
| Os02g0257001 | 8856566 | 8860576 | Hypothetical conserved gene. (Os02t0257001-00) |
| Os02g0257100 | 8866815 | 8867667 | Cupredoxin domain containing protein. (Os02t0257100-01) |
| Os02g0257200 | 8869192 | 8871520 | Conserved hypothetical protein. (Os02t0257200-01) |
| Os02g0257250 | 8869357 | 8871474 | Hypothetical gene. (Os02t0257250-00) |
| Os02g0257300 | 8873101 | 8875996 | Rhodanese-like domain containing protein. (Os02t0257300-00) |
| Os02g0257400 | 8876190 | 8876441 | Non-protein coding transcript. (Os02t0257400-01) |
| Os02g0257500 | 8879339 | 8882660 | Basic helix-loop-helix (bHLH) transcription factor, Initiation of stomatal development, Control of stomatal initiation and meristemoid fate (Os02t0257500-01) |
| Os02g0258000 | 8927818 | 8928740 | Hypothetical conserved gene. (Os02t0258000-00) |
| Os02g0258200 | 8935193 | 8936223 | Similar to high mobility group family. (Os02t0258200-01) |
| Os02g0258250 | 8936361 | 8937179 | Hypothetical conserved gene. (Os02t0258250-00) |
| Os02g0258300 | 8938133 | 8943482 | Zinc finger, FYVE/PHD-type domain containing protein. (Os02t0258300-01) |
| Os02g0258800 | 8973633 | 8977322 | Conserved hypothetical protein. (Os02t0258800-01) |
| Os02g0258900 | 8976792 | 8981140 | Similar to Molybdopterin biosynthesis CNX2 protein (Molybdenum cofactor biosynthesis enzyme CNX2). (Os02t0258900-01) |
| Os02g0259100 | 8984621 | 8989570 | Conserved hypothetical protein. (Os02t0259100-01) |
| Os02g0259600 | 9005264 | 9007486 | Similar to 50S ribosomal protein L21, chloroplast precursor (CL21) (CS-L7). (Os02t0259600-01) |
| Os02g0259850 | 9016923 | 9018833 | Hypothetical gene. (Os02t0259850-00) |
| Os02g0259900 | 9021454 | 9023102 | Conserved hypothetical protein. (Os02t0259900-01) |
| Os02g0260000 | 9026460 | 9026900 | Non-protein coding transcript. (Os02t0260000-01) |
| Os02g0260200 | 9042064 | 9046144 | Kelch repeat-containing F-box protein, Regulation of panicle architecture (Os02t0260200-01) |
| Os02g0260400 | 9052733 | 9056389 | Protein of unknown function DUF37 family protein. (Os02t0260400-01) |
| Os02g0260500 | 9066936 | 9068429 | Hypothetical conserved gene. (Os02t0260500-00) |
| Os02g0260700 | 9082763 | 9087989 | Similar to GAMYB-binding protein (Fragment). (Os02t0260700-01) |
| Os02g0260800 | 9091400 | 9091461 | Non-protein coding transcript. (Os02t0260800-00) |
| Os02g0260900 | 9095708 | 9096382 | Similar to H0315A08.1 protein. (Os02t0260900-00) |

**Supplementary Table 4** A list of candidate genes for the callus induction in the qCI-MS-Chr6; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os06g0486400 | 16604884 | 16616223 | Serine/threonine protein kinase domain containing protein. (Os06t0486400-01) |
| Os06g0486800 | 16649553 | 16653244 | Similar to Formate dehydrogenase, mitochondrial precursor (EC 1.2.1.2) (NAD- dependent formate dehydrogenase) (FDH). (Os06t0486800-01) |
| Os06g0486900 | 16676478 | 16683024 | Similar to Formate dehydrogenase, mitochondrial precursor (EC 1.2.1.2) (NAD- dependent formate dehydrogenase) (FDH). (Os06t0486900-01) |
| Os06g0487300 | 16693757 | 16694391 | Hypothetical protein. (Os06t0487300-01) |
| Os06g0487380 | 16693769 | 16694662 | Hypothetical gene. (Os06t0487380-01) |
| Os06g0487620 | 16705088 | 16705640 | Conserved hypothetical protein. (Os06t0487620-01) |
| Os06g0487660 | 16719026 | 16719110 | Non-protein coding transcript. (Os06t0487660-00) |
| Os06g0487700 | 16719409 | 16719801 | Hypothetical conserved gene. (Os06t0487700-00) |
| Os06g0487900 | 16732927 | 16745662 | SUMO (Small Ubiquitin-like Modifier) Protease, Salt tolerance (Os06t0487900-01) |
| Os06g0488050 | 16763476 | 16768965 | Similar to Protein kinase family protein. (Os06t0488050-00) |
| Os06g0488125 | 16763594 | 16768949 | Hypothetical protein. (Os06t0488125-00) |
| Os06g0488200 | 16774133 | 16785410 | Similar to Myosin heavy chain (Fragment). (Os06t0488200-01) |
| Os06g0488600 | 16793652 | 16795663 | Similar to Potential phospholipid-transporting ATPase 7 (EC 3.6.3.1) (Aminophospholipid flippase 7). (Os06t0488600-01) |
| Os06g0489200 | 16825601 | 16836194 | Protein of unknown function DUF1604 domain containing protein. (Os06t0489200-01) |
| Os06g0489500 | 16852004 | 16858593 | CMP/dCMP deaminase, zinc-binding domain containing protein. (Os06t0489500-01) |
| Os06g0489900 | 16877329 | 16878690 | Domain of unknown function DUF1618 domain containing protein. (Os06t0489900-00) |
| Os06g0490000 | 16879618 | 16881668 | Similar to DIMETHYLADENOSINE TRANSFERASE. (Os06t0490000-01) |
| Os06g0490200 | 16886792 | 16888459 | Conserved hypothetical protein. (Os06t0490200-01) |
| Os06g0490400 | 16896478 | 16897774 | Similar to Class III peroxidase 80. (Os06t0490400-00) |
| Os06g0490700 | 16910985 | 16916624 | Conserved hypothetical protein. (Os06t0490700-01) |
| Os06g0491300 | 16963479 | 16966760 | Hypothetical conserved gene. (Os06t0491300-01) |
| Os06g0491566 | 16968153 | 16970345 | Conserved hypothetical protein. (Os06t0491566-01) |
| Os06g0491800 | 16991828 | 16994085 | HAT dimerisation domain containing protein. (Os06t0491800-01) |
| Os06g0491901 | 16998507 | 17002390 | Non-protein coding transcript. (Os06t0491901-01) |
| Os06g0492000 | 17003636 | 17010230 | Similar to Phosphatidylinositol synthase. (Os06t0492000-01) |
| Os06g0492101 | 17006585 | 17008463 | Hypothetical conserved gene. (Os06t0492101-00) |

**Supplementary Table 5** A list of candidate genes for the callus induction in the qCI-N6-Chr6.1; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os06g0165500 | 3305304 | 3307872 | S-Domain receptor like kinase-37, Response to drought in tolerant genotypes (Os06t0165500-00) |
| Os06g0165600 | 3310919 | 3311822 | Homolog of CBF/DREB1 (Os06t0165600-01) |
| Os06g0165800 | 3314114 | 3315452 | Similar to Caffeoyl-CoA 3-O-methyltransferase (Fragment). (Os06t0165800-01) |
| Os06g0165900 | 3316737 | 3317378 | Conserved hypothetical protein. (Os06t0165900-00) |
| Os06g0166000 | 3319112 | 3322249 | Cyclin-like F-box domain containing protein. (Os06t0166000-01) |
| Os06g0166050 | 3321838 | 3322412 | Hypothetical gene. (Os06t0166050-00) |
| Os06g0166100 | 3322909 | 3327600 | FAR1 domain containing protein. (Os06t0166100-01) |
| Os06g0166200 | 3328557 | 3331513 | Zinc finger, C2H2-type domain containing protein. (Os06t0166200-01) |
| Os06g0166400 | 3337151 | 3338155 | Similar to TINY-like protein (AP2 domain containing protein RAP2.10) (Fragment). (Os06t0166400-01) |
| Os06g0166500 | 3342464 | 3346318 | Aux/IAA protein, Mediation of abiotic stress tolerance, Drought and salt tolerance (Os06t0166500-01) |
| Os06g0166900 | 3360524 | 3363523 | Protein kinase, core domain containing protein. (Os06t0166900-01) |
| Os06g0167000 | 3363900 | 3371061 | Similar to predicted protein. (Os06t0167000-01) |
| Os06g0167100 | 3376576 | 3386418 | Armadillo-like helical domain containing protein. (Os06t0167100-01) |
| Os06g0167125 | 3385199 | 3386449 | Non-protein coding transcript. (Os06t0167125-00) |
| Os06g0167150 | 3388823 | 3390644 | Hypothetical gene. (Os06t0167150-01) |
| Os06g0167200 | 3389074 | 3390445 | Similar to RING-H2 finger protein ATL1R (RING-H2 finger protein ATL8). (Os06t0167200-01) |
| Os06g0167400 | 3405405 | 3407716 | Di-trans-poly-cis-decaprenylcistransferase family protein. (Os06t0167400-01) |
| Os06g0167500 | 3408660 | 3418587 | Leucine-rich repeat, plant specific containing protein. (Os06t0167500-01) |
| Os06g0167600 | 3420507 | 3421462 | Similar to Proteasome subunit alpha-3 (Fragment). (Os06t0167600-01) |
| Os06g0168000 | 3428704 | 3433378 | Glutathione S-transferase, C-terminal-like domain containing protein. (Os06t0168000-01) |
| Os06g0168150 | 3431958 | 3432897 | Hypothetical gene. (Os06t0168150-00) |
| Os06g0168400 | 3440104 | 3443075 | RNA polymerase Rpb7, N-terminal domain containing protein. (Os06t0168400-01) |
| Os06g0168500 | 3445034 | 3448312 | Qa-SNARE (soluble N-ethylmaleimide sensitive factor attachment protein receptor), t-SNARE, Regulation of arbuscular mycorrhizal (AM) symbiosis (Os06t0168500-01) |
| Os06g0168600 | 3449701 | 3454747 | Ribonucleotide reductase, Chloroplast biogenesis (Os06t0168600-01) |
| Os06g0168700 | 3455800 | 3456811 | Similar to Prolin rich protein. (Os06t0168700-01) |
| Os06g0168800 | 3460493 | 3465373 | Similar to Protein kinase. (Os06t0168800-01) |
| Os06g0168901 | 3468467 | 3469940 | Hypothetical conserved gene. (Os06t0168901-00) |
| Os06g0169001 | 3474629 | 3476370 | GOS9 protein. (Os06t0169001-01) |
| Os06g0169600 | 3490289 | 3490874 | Similar to Beta-tubulin (Fragment). (Os06t0169600-00) |
| Os06g0169800 | 3504741 | 3505001 | Hypothetical protein. (Os06t0169800-00) |
| Os06g0169900 | 3507359 | 3509141 | Similar to GOS9 protein. (Os06t0169900-00) |
| Os06g0170000 | 3513202 | 3514396 | Non-protein coding transcript. (Os06t0170000-00) |
| Os06g0170100 | 3515130 | 3518031 | Similar to WAK80 - OsWAK receptor-like protein kinase. (Os06t0170100-00) |
| Os06g0170200 | 3519052 | 3520463 | Conserved hypothetical protein. (Os06t0170200-00) |
| Os06g0170500 | 3536683 | 3540219 | Similar to RNA-binding protein-like. (Os06t0170500-01) |
| Os06g0170800 | 3558158 | 3559922 | Similar to H0124B04.16 protein. (Os06t0170800-01) |
| Os06g0170866 | 3559947 | 3561401 | F-box domain, cyclin-like domain containing protein. (Os06t0170866-00) |
| Os06g0171500 | 3585217 | 3588270 | Conserved hypothetical protein. (Os06t0171500-01) |
| Os06g0171600 | 3588217 | 3595865 | Membrane insertion protein, OxaA/YidC domain containing protein. (Os06t0171600-01) |
| Os06g0171700 | 3596001 | 3598291 | Cdk-activating kinase assembly factor (MAT1) family protein. (Os06t0171700-01) |
| Os06g0171800 | 3598466 | 3605188 | VRR-NUC domain containing protein. (Os06t0171800-01) |
| Os06g0171900 | 3632670 | 3639453 | WD40 subfamily protein, Salt stress (Os06t0171900-01) |
| Os06g0172000 | 3640786 | 3643222 | Pentatricopeptide repeat domain containing protein. (Os06t0172000-01) |
| Os06g0172101 | 3649379 | 3650265 | Hypothetical gene. (Os06t0172101-00) |
| Os06g0172200 | 3649517 | 3650686 | EF-Hand type domain containing protein. (Os06t0172200-02) |
| Os06g0172600 | 3656494 | 3657055 | Similar to predicted protein. (Os06t0172600-00) |
| Os06g0172675 | 3660715 | 3661175 | Hypothetical protein. (Os06t0172675-00) |
| Os06g0172750 | 3663062 | 3664355 | Non-protein coding transcript. (Os06t0172750-01) |
| Os06g0172800 | 3675795 | 3679085 | Similar to alkaline alpha galactosidase 2. (Os06t0172800-00) |
| Os06g0172901 | 3676277 | 3678331 | Hypothetical protein. (Os06t0172901-00) |
| Os06g0173000 | 3682377 | 3688555 | Armadillo-type fold domain containing protein. (Os06t0173000-00) |
| Os06g0173100 | 3689676 | 3694342 | 26S proteasome 19S regulatory particle triple-A ATPase subunit 5b (Os06t0173100-01) |
| Os06g0173450 | 3692016 | 3693281 | Hypothetical protein. (Os06t0173450-00) |

**Supplementary Table 6** A list of candidate genes for the callus induction in the qCI-N6-Chr6.2; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os06g0250600 | 7799085 | 7806567 | Outward Shaker K<sup>+</sup> channel, K<sup>+</sup> release by guard cells for stomatal closure, K<sup>+</sup> translocation toward the shoots (Os06t0250600-01) |
| Os06g0251000 | 7825468 | 7829696 | Similar to mitochondrion protein. (Os06t0251000-01) |
| Os06g0251100 | 7835332 | 7840950 | Membrane attack complex component/perforin (MACPF) domain domain containing protein. (Os06t0251100-00) |
| Os06g0251200 | 7841699 | 7844795 | Kelch related domain containing protein. (Os06t0251200-01) |
| Os06g0251700 | 7848384 | 7854067 | Myosin II heavy chain-like family protein. (Os06t0251700-01) |
| Os06g0251900 | 7848697 | 7854050 | Hypothetical protein. (Os06t0251900-00) |
| Os06g0252300 | 7920702 | 7923482 | Hypothetical conserved gene. (Os06t0252300-01) |
| Os06g0252800 | 7933984 | 7935241 | Similar to STF-1 (Fragment). (Os06t0252800-01) |
| Os06g0253100 | 7940956 | 7941680 | Heat shock protein Hsp20 domain containing protein. (Os06t0253100-01) |
| Os06g0253350 | 7954357 | 7958130 | Hypothetical gene. (Os06t0253350-00) |
| Os06g0253600 | 7964478 | 7967674 | Similar to secretory protein-like. (Os06t0253600-00) |
| Os06g0254200 | 7982027 | 7983859 | Similar to Potassium channel protein NKT5. (Os06t0254200-00) |
| Os06g0254300 | 7983970 | 7990956 | Similar to EF-hand calcium bining protein. (Os06t0254300-01) |
| Os06g0254600 | 7996917 | 8004842 | Caleosin related family protein. (Os06t0254600-01) |
| Os06g0254700 | 8011879 | 8014834 | Caleosin related family protein. (Os06t0254700-01) |
| Os06g0254901 | 8029753 | 8030718 | Non-protein coding transcript. (Os06t0254901-00) |
| Os06g0255001 | 8034209 | 8035027 | Non-protein coding transcript. (Os06t0255001-00) |
| Os06g0255100 | 8038476 | 8041831 | 2OG-Fe(II) oxygenase domain containing protein. (Os06t0255100-01) |
| Os06g0255200 | 8043566 | 8067365 | Conserved hypothetical protein. (Os06t0255200-01) |
| Os06g0255400 | 8069204 | 8069983 | Similar to Nudix hydrolase 18, mitochondrial precursor (EC 3.6.1.-) (AtNUDT18). (Os06t0255400-01) |
| Os06g0255700 | 8097302 | 8104472 | DEAD-like helicase, N-terminal domain containing protein. (Os06t0255700-01) |
| Os06g0255900 | 8116249 | 8119845 | Conserved hypothetical protein. (Os06t0255900-01) |
| Os06g0256000 | 8127437 | 8129334 | Conserved hypothetical protein. (Os06t0256000-01) |
| Os06g0256200 | 8129560 | 8134453 | Similar to Keratinocytes proline-rich protein. (Os06t0256200-01) |
| Os06g0256300 | 8142728 | 8147085 | Similar to Calmodulin-binding heat-shock protein. (Os06t0256300-01) |
| Os06g0256500 | 8152444 | 8159313 | Similar to Glucose-6-phosphate isomerase. (Os06t0256500-01) |
| Os06g0256600 | 8162028 | 8166874 | Conserved hypothetical protein. (Os06t0256600-01) |
| Os06g0256800 | 8176855 | 8177675 | Hypothetical conserved gene. (Os06t0256800-01) |
| Os06g0256900 | 8178991 | 8184548 | Glycoside hydrolase family 9 subclass B3, Endo-beta-1,4-glucanase, Lignocellulose crystallinity modification in stem internode growth and development, Plant strength, cellulose modification, and biomass saccharification (Os06t0256900-01) |
| Os06g0257050 | 8179502 | 8184497 | Hypothetical protein. (Os06t0257050-00) |
| Os06g0257200 | 8194555 | 8198058 | Similar to Signal recognition particle 9 kDa protein. (Os06t0257200-01) |

**Supplementary Table 7** A list of candidate genes for the callus induction in the qCI-N6-Chr7; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

|  |  |  |  |
| --- | --- | --- | --- |
| Gene ID | GenePosStart | GenePosEnd | Description |
| Os07g0255200 | 8704268 | 8706000 | Similar to Helicase-like protein [Oryza sativa (japonica cultivar-group)]. (Os07t0255200-01) |
| Os07g0255300 | 8709616 | 8710266 | Conserved hypothetical protein. (Os07t0255300-01) |
| Os07g0255900 | 8783519 | 8785197 | Domain of unknown function DUF231, plant domain containing protein. (Os07t0255900-00) |
| Os07g0256200 | 8807273 | 8811445 | RNA recognition motif, RNP-1 domain containing protein. (Os07t0256200-01) |
| Os07g0256300 | 8812366 | 8815314 | Conserved hypothetical protein. (Os07t0256300-00) |
| Os07g0256700 | 8828926 | 8830964 | Protein of unknown function DUF231, plant domain containing protein. (Os07t0256700-01) |
| Os07g0256866 | 8845266 | 8857772 | Hypothetical gene. (Os07t0256866-00) |

**Supplementary Table 8** A list of candidate genes for the callus induction in the qCI-N6-Chr11; the golden highlight(s) showed the gene(s) located at the significant SNP of the QTL.

| **Gene ID** | **GenePosStart** | **GenePosEnd** | **Description** |
| --- | --- | --- | --- |
| Os11g0636600 | 25134253 | 25137270 | Conserved hypothetical protein. (Os11t0636600-01) |
| Os11g0636900 | 25148722 | 25153451 | Similar to Splicing factor U2af large subunit A. (Os11t0636900-01) |
| Os11g0637000 | 25153799 | 25155522 | Similar to Sugar transporter family protein. (Os11t0637000-01) |
| Os11g0637050 | 25153911 | 25155463 | Hypothetical protein. (Os11t0637050-00) |
| Os11g0637100 | 25160019 | 25161761 | Similar to Sugar transporter family protein. (Os11t0637100-00) |
| Os11g0637166 | 25162871 | 25164608 | Hypothetical gene. (Os11t0637166-01) |
| Os11g0637200 | 25165988 | 25167744 | Similar to Sorbitol transporter. (Os11t0637200-01) |
| Os11g0637300 | 25171719 | 25172081 | Hypothetical conserved gene. (Os11t0637300-00) |
| Os11g0637501 | 25177818 | 25180272 | Similar to membrane protein. (Os11t0637501-00) |
| Os11g0637600 | 25182326 | 25183324 | Similar to potyvirus VPg interacting protein. (Os11t0637600-00) |
| Os11g0637700 | 25193013 | 25197347 | RNA-binding protein, Heterogeneous nuclear ribonucleoprotein 1 (hnRNP1), Regulation of spikelet hull length (Os11t0637700-01) |
| Os11g0637800 | 25199882 | 25206038 | Similar to 1-acyl-sn-glycerol-3-phosphate acyltransferase PLS1. (Os11t0637800-01) |
| Os11g0637900 | 25205090 | 25206092 | Hypothetical gene. (Os11t0637900-00) |
| Os11g0638000 | 25213451 | 25216758 | Similar to GTP-binding protein engA. (Os11t0638000-01) |
| Os11g0638200 | 25218327 | 25222357 | Conserved hypothetical protein. (Os11t0638200-00) |
| Os11g0638700 | 25237345 | 25239585 | Protein of unknown function DUF594 domain containing protein. (Os11t0638700-00) |
| Os11g0638802 | 25238381 | 25239594 | Non-protein coding transcript. (Os11t0638802-00) |