**Supplementary files**

Table S1 The culture media for callus induction, somatic embryogenesis and regeneration of *G. arboreum* used in this experiment

|  |  |  |  |
| --- | --- | --- | --- |
| Medium | Basic medium ingredients | PGR | Amino acid |
| MS0  | 1/2MS+1.5% (w/v) glucose+ 0.25% (w/v) phytagel |  |  |
| MS1  | MSB+0.25% (w/v) phytagel+ 3% (w/v) glucose | 0.09 µM 2, 4-D, 2.32 µM KT |  |
| MS2  | MSB+0.25% (w/v) phytagel+ 3% (w/v) glucose | 0.045 µM 2, 4-D, 1.476 µM IBA,2.32 µM KT |  |
| MS3 | MSB+0.25% (w/v) phytagel+ 3% (w/v) glucose | 2.46 µM IBA, 0.93 µM KT | 6.8 Mm Gln3.8 Mm Asn |
| MS4 | MSB+0.1g/L NaCl+0.1g/L KCl+0.1g/L CuSO4 + 3% (w/v) glucose |  |  |
| MS5 | MSB+0.25% (w/v) phytagel+37.59 mM KNO3+62.47 µM NH4NO3 + 3% (w/v) glucose |  | 6.8 mM Gln3.8 mM Asn |

MSB: MS salts (Murashige and Skoog 1962) and B5 vitamins (Gamborg et al. 1968), 555 µM myo-inositol; Gln: glutamine; Asn: asparagines; IBA: Indole-3-butyric acid; KT: kinetin

Table S2 Plant growth regulators (PGRs) used for somatic embryogenesis in *G. arboreum* on MS5 medium

|  |  |
| --- | --- |
|  | Combination of PGR |
| G1  | 0.45 µM 2, 4-D，0.93 µM KT |
| G2 | 0.226 µM 2, 4-D，0.465 µM KT |
| G3 | 0.113 µM 2,4-D，0.23 µM KT |
| G4 | 0.045 µM 2, 4-D, 2.46 µM IBA, 0.465 µM KT |
| G5 | 2.46 µM IBA, 0.93 µM KT |
| G6 | no PGRs served as control |

Fig. S1 Callus induction and cell phenotype from callus of *G.arboreum* through solid and alternate solid-liquid culture.

A, B, C：initial callus (C1) from hypocotyls, roots and cotyledons proliferated on MS2 medium; D: The cell phenotypes of initial callus from hypocotyls; E: the cell phenotypes of new callus (SC1) formed from the one cycle suspension culture of C1 callus in MS4 medium; F: The cell phenotypes of SC1 callus proliferated on solid MS3 medium; G: The cell phenotype of new callus (SC2) formed on MS3 medium from the suspension culture in liquid MS4 medium; H: The cell phenotype of proliferated SC2 callus on MS3 medium; I: The cell phenotype of new SC3 callus formed on MS3 medium from 2-3 cycles of alternate solid-liquid cultures

Fig S2 Somatic embryogenesis on MS5 medium with different PGRs

A: embryogenic callus cultured on MS5 medium with G1 PGR; B: embryogenic callus cultured on MS5 medium with G3 PGR; C: embryogenic callus cultured on MS5 medium with G6 PGR (No PGRs supplemented in medium); D: somatic embryogenesis on MS5 medium with G1; E: somatic embryogenesis on MS5 medium with G2 PGR; F: somatic embryogenesis on MS5 medium with G3 PGR.