**Supplementary Table 1. Combinations of digestion enzymes used.**

|  |  |  |
| --- | --- | --- |
| **Enzyme Formula** | **Material & Protoplasts Isolation Efficiency** | **References** |
| |  | | --- | | 1.5% (wt/vol) Cellulase R-10 | | 0.4% (wt/vol) Macerozyme R-10 | | 20 mM MES | | 0.4 M mannitol | | 20 mM KCl | | 10 mM CaCl2 | | 0.1% (wt/vol) BSA | | 1 ×104～2 ×105 /g | (Shen et al., 2014) |
| |  | | --- | | 1.5% (w/v) Cellulase RS | | 0.75% (w/v) Macerozyme R-10 | | 10mM MES | | 0.5M mannitol | | 10 mM CaCl2 | | 0.1% (wt/vol) BSA | | 1×104～1×105 /g | (Shen et al., 2014) |
| |  | | --- | | 1.5% (wt/vol) CellulaseR-10 | | 0.75% (wt/vol) MacerozymeR-10 | | | 10 mM MES | | | 0.6 M mannitol | | | 1mM CaCl2 | | | 0.1% (wt/vol) BSA | | | 1×104～1×105 /g | (Mazarei et al., 2008) |
| |  | | --- | | 3% (wt/vol) CellulaseR-10 | | 0.8% (wt/vol) MacerozymeR-10 | | | 20 mM MES | | | 0.4 M mannitol  20 mM KCl | | | 10 mM CaCl2 | | | 0.1% (wt/vol) BSA | | | 1×104～1.7×105 /g | * (Guo et al., 2012) |
| |  | | --- | | 3% (wt/vol) CellulaseR-10 | | 0.8% (wt/vol) MacerozymeR-10 | | | 0.04% (w/v) Pectinase  20 mM MES | | | 0.4 M mannitol  20 mM KCl | | | 10 mM CaCl2 | | | 0.1% (wt/vol) BSA | | | 1×104～1×105 /g | (Shen et al., 2017) |

**Supplementary References**

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