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# Isolation of diploid and tetraploid cytotypes from mixoploids based on adventitious bud regeneration in Populus

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| 关键词 | Adventitious bud; Colchicine; Mixoploid; Populus; Tetraploid; |
| 摘要 | Somatic chromosome doubling usually results in the production of mixoploids, which are difficult to use in breeding programs. In this study, we developed a method to isolate diploid and tetraploid cytotypes from induced mixoploids of Populus pseudo-simonii?×? P. nigra var. italica based on adventitious bud regeneration. We produced 75 mixoploids through colchicine-induced seed chromosome doubling in P. pseudo-simonii?× ?P. nigra var. italica. The highest mixoploid induction frequency was 26.67?±?5.09% following treatment with 0.1% colchicine for 96 h. We then screened a medium for adventitious bud regeneration from leaf explants of multiple genotypes, which was Murashige and Skoog (MS) medium with 0.4 mg L?1 6-benzyladenine (BA) and 0.1 mg L?1 1-naphthaleneacetic acid (NAA). The maximum frequency of leaf differentiation was 96.67?±?3.33%, and the number of adventitious buds per explant was 6.17?±?1.02. When the medium was applied for adventitious bud regeneration of 12 mixoploid genotypes, 18 tetraploids and 26 diploids were isolated, of which five mixoploids generated both diploid and tetraploid cytotypes and seven mixoploids generated either diploids or tetraploids. Compared to diploids, tetraploids varied significantly in stomatal characteristics, micropropagation coefficient and rooting ability. Significant differences were also detected among genotypes at the same ploidy level, implying that heterozygosity also affected phenotypic variation during allopolyploidization. This study provides an effective method for isolation of diploid and tetraploid cytotypes from mixoploids and generation of full-sib diploid and tetraploid germplasms for polyploidy Populus breeding programs. |
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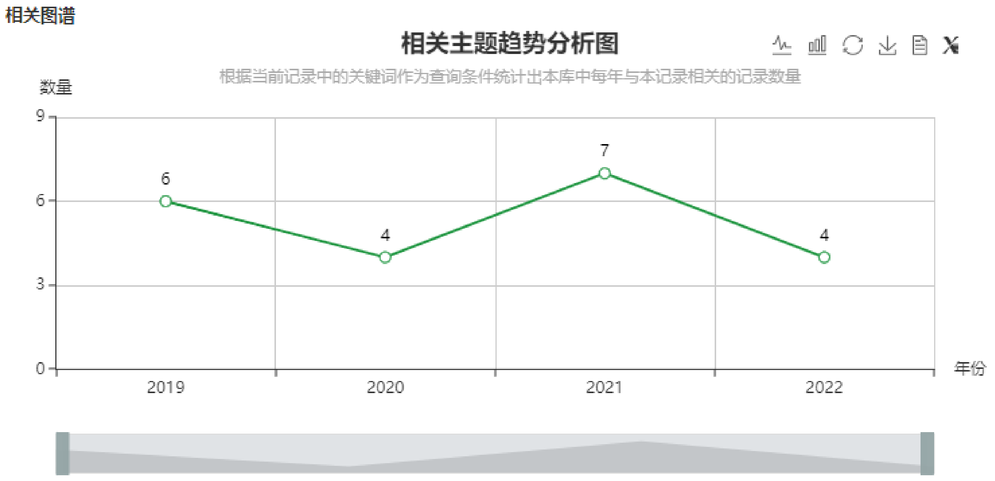


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