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Effect of exogenous hormone and explants maturity on callus induction in *Psathyrostachys juncea*

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Key words: Russian wildrye, inflorescences, immature embryos, abscisic acid, casein hydrolysate

Introduction *Psathyrostachys juncea* (Russian wildrye) is a cross-pollinated, long-lived perennial bunchgrass, and is the only species which achieved recognition as an important forage grass in the *Psathyrostachys* genus (Asay, K. H. et al. 1996). It is exceptionally cold and drought tolerant. Only 2 cultivars were released in China, both were selected from natural populations distributed in Xinjiang China. An improved new strain (P8401) have obtained by Inner Mongolia Agric Univ. The parental germplasm was cultivar Bozoisky-select which introduced from USDA-ARS. FRRL. Tissues culture is the basis of somatic embryo propagation and genetic transformation in further breeding. The research aimed to discuss the effect of the sampling time of callus induction, medium screening, hormone regulation and the maturity of explants on the callus induction in *Psathyrostachys juncea*.

Materials and methods inflorescences and immature embryos in 2 varieties (strain), Shandan and P8401 of *P. juncea* were taken as explants, to inoculate on MS and N6 basic medium with appending different hormones, including containing 0, 2, 4 or 6 mg L⁻¹ 2, 4-D; 0, 0.2, 0.4 or 0.6 mg L⁻¹ 6-BA; 0, 0.3, 0.5, 1.0 or 1.5 mg L⁻¹ ABA; 0 or 500 mg L⁻¹ CH. Unemerged inflorescences at booting stage were cut and placed in 4°C low temperature for 72 hours, divided into 5 groups according to their length from 1 cm to 6 cm, then immersion disinfection in 70% ethyl alcohol for 3 min and 0.1% HgCl₂ for 7 min, wash 4 times with sterile water, cut into 3 mm long sections and inoculate on media. After pollinated the immature seeds were collected from 8th d to 23th d and placed in 4°C low temperature for 24 hours, immersion disinfection in 70% ethyl alcohol for 30 sec and 0.1% HgCl₂ for 5 min, washed 4 times. The immature embryos were picked out from scutum of seeds and inoculate on media after glumes were taken away. Explants were Cultivated in darkness for 2 weeks at 25°C then transfer to 4000 Lx light intensity. Data was recorded after 3 weeks of culture. Embryogenic callus were counted according to Armstrong (1985).

Results The callus quality induced by 2 kinds of explants and medium, MS and N6 had no obvious difference. The optimum induction medium for inflorescences of Shandan was N6 with adding 2 mg L⁻¹ 2, 4-D and that for P8401 was MS with adding 6 mg L⁻¹ 2, 4-D. Adding abscisic acid (ABA) to MS medium could significantly promote the growth of callus. The suitable concentration of adding ABA for callus culture of inflorescences in Shandan was 1.5 mg L⁻¹ and that for P8401 was 0.3 mg L⁻¹. Casein hydrolysate (CH) only had the effect of accelerating the growth of callus, its promotion effect on the callus induction of *P. juncea* was little. Taking neonatal inflorescences materials with the length of 1-2 cm as explants for callus induction was most ideal for P8401 and the callus induction rate of more mature inflorescences on MS medium with the length of 5-6 cm was higher than inflorescences for Shandan. The optimum immature embryo age of Shandan was 11-14d, and that for P8401 was 14-17d. The suitable induction medium for immature embryo of both varieties was MS with adding 2 mg L⁻¹ 2, 4-D and 0.2 mg L⁻¹ 6-BA.

Conclusions Embryogenic callus could be induced from Both kind of explants, inflorescences and immature embryos in *P. juncea*. Both MS and N6 with adding 2, 4-D could be used for the callus induction. ABA could promote callus induction of inflorescences and 6-BA with low concentration have positive effects on immature embryos induction in *P. juncea*. The sampling time of explants was key factors in the process of tissue culture. Two varieties with different original area have significantly genetic difference in callus induction.

References

- Asay, K. H., and K. B. Jensen. (1996). Wheatgrasses. p. 691-724. IN L. E. Moser et al. Cool-season forage grasses. *Agronomy Monograph* no. 34. ASA, CSSA, and SSSA, Madison, WI.
- Armstrong C. L., Green C. E. Establishment and maintenance of friable embryogenic maize callus and involvement of L-proline. *J. Planta*. 1985, (164): 207-214.