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

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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 mgL^{-1} 2 ,4-D ; 0 , 0 .2 , 0 .4 or 0 .6 mgL^{-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℃ low temperature for 72 hours , divided into 5groups according to their length from 1 cm to 6 cm , then immersion disinfection in 70% ethyl alcohol for 3 min and 0 .1% $HgCl_2$ 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℃ low temperature for 24 hours , immersion disinfection in 70% ethyl alcohol for 30 sec and 0 .1% $HgCl_2$ 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℃ 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 6mg 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 .5mg L^{-1} and that for P8401 was 0 .3mg 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

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