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Efficiency of Leaf Base Segments of Korean Oat Cultivars

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Objectives

The purpose of this study was to developed an efficiency of plant regeneration from leaf base segments of Samhangwiri and Malgwiri.

Materials and Methods

Material plant : Malgwiri and Samhangwiri were used.

Methods

- Preperatiom and culture of explant : Leaf bases of young seedling with a leaf length between 2~5cm were cut 1- to 2-mm segments.
- Callus induction : MS medium was supplemented with different concentration of 2,4-D, kinetin and picloram. Leaf bases were transferred to callus induction medium and incubated at 25℃ in 16/ 8h light/ dark cycle for 3weeks.
- Shoot induction : MS medium was supplemented with the combination of NAA, BA and antiauxin TIBA. After the segments had been cultured for 3 weeks on callus induction medium, the calli were transferred shoot induction medium.

Results and Discussion

Callus induction from leaf base segments showed within 1 week. In the beginning, the calli tissues appeared to be creamish and soft but embyogenic structures developed quickly. After 3 weeks of culture, calli were showed multiplication of the shoot meristems in Korean cultivars. Calli with multiple spots rapidly developed shoots and leaves in shoot medium. For regeneration best results were obtained on a shoot medium containing 1 mg/l of TIBA and 1 mg/l of BA (Table 1-A). The antiauxin, TIBA in combination with BA increased shoot initiation in leaf base segments of oats. After 4 to 5 days, calli were transferred regeneration medium (Table 1-b). During 2nd weeks, calli started to germinate and shoots formation. Both shoot(a) and regeneration medium(b) were tested for their efficiency of plantlet production. Samhangwiri and Malgwiri produced more plants on regeneration medium(b). However, the number of multiple shoot was increased and shoot initiation period was decreased in shoot medium(a). This appears that antiauxin, TIBA was found to be beneficial in leaf base segment culture of oats. In conclusion, these experiments were aimed to develop a simple and efficient short-term in vitro regeneration system for use in biolistic gene transfer experiments.

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Table 1. Percentage of regeneration from the leaf base segment of oat.

A. Calli were cultured for **3 weeks.**

Genotype	MS+TIBA(1mg/l)+BA(1mg/l)[a]			MS+TIBA(1mg/l)+kinetin(1mg/l)		
	MS 1[c]	MS 2	MS 3	MS 1	MS 2	MS 3
Malgwiri	65	56.2	69.2	57.1	45.4	64.5
Samhangwiri	54.5	80	81.8	52.3	75	68.1

B. Calli were cultured for **4 to 5 weeks.**

Genotype	MS + NAA(0.2mg/l) + BA(1mg/l)[b]		
	MS+2,4-D(3mg/l)[c]	MS+2,4-D(3)+kinetin(1)	MS+2,4-D(3)+picloram(3)
Malgwiri	64.3	71.6	78.9
Samhangwiri	62.6	87.9	77.0

[a]Shoot induction medium

[b]Regeneration medium

[c]Callus media, MS 1: 3mg/l 2,4-D, MS 2: 3mg/l 2,4-D, 1mg/l kinetin,
MS 3: 3mg/l 2,4-D, 3mg/l picloram