P011

Efficiency of Regeneration from Mature Embryos and Leaf Base Segments of Oat

Kyung-Hee Kim, Sang-Kyu Lee, Jung-Hun Moon, and Byung-Moo Lee*
Department of Plant Resources, Dongguk University, Seoul 100-175, Korea

국내 귀리 품종의 성숙배와 잎절편체를 이용한 재분화 효율성

김경희 · 이상규 · 문정훈 · 이병무*
동국대학교 식물자원학과

Objectives

The purpose of this study was to developed an efficient method of callus induction and plant regeneration from mature embryos and leaf base segments of Samhangwiri and Malgwiri.

Materials and Methods

Materials Plant : Malgwiri and Samhangwiri

Methods : Efficiency of callus induction and plant regeneration from mature embryos and leaf base segments of Malgwiri and Samhangwiri was evaluated.

- Culture of Leaf base segments : From 4 to 5 days seedlings 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 3 weeks.
- Regeneration : After the segments had been cultured for 4~5 weeks on callus induction medium, the calli were transferred regeneration medium (MS+NAA+BA).

Results and Discussion

Callus induction from mature embryos of Samhangwiri and Malgwiri showed high efficiency in medium containing 3 mg/l of 2,4-D and 3 mg/l of picloram (Table1). In leaf base segments, callus induction rates of Malgwiri showed high efficiency in medium containing 3 mg/l of 2,4-D and 1 mg/l of kinetin (91.8%). While, Samhangwiri did not showed difference among the combinations of phytohormones (Table 2). Percentage of plant regeneration from mature embryos showed high in medium containing 3mg/l of 2,4-D and 3 mg/l of picloram (Table 3). The callus initiation medium affected the subsequent plant regeneration. Treatment with 3 mg/l of 2,4-D and 3 mg/l of picloram in callus induction media showed high frequency for plant regeneration. In leaf base segments, highest regeneration frequencies of Samhangwiri and Malgwiri were obtained with callus media containing 3 mg/l of 2,4-D and 1 mg/l of kinetin, and 3 mg/l of 2,4-D and 3 mg/l of picloram (Table 4). It appears that the callus initiation medium may be an important factor for subsequent plant regeneration. In summary, leaf base segments have proven to be a very suitable target for the production of transgenic oat plants due to their easy availability, the short culture period and their high regeneration potential.

*Corresponding author: Tel : 02-2260-3307 E-mail : bmlee@dongguk.edu

Table 1. Percentage of callus induction from mature of oat.

Genotype	MS+2,4-D(3mg/l)[a]	MS+2,4-D(3)+kinetin(1)	MS+2,4-D(3)+picloram(3)
Malgwiri	93.8	83.4	97.5
Samhangwiri	97.4	76.8	98.3

[a]Callus medium

Table 2. Percentage of callus induction from the leaf base segment of oat.

Genotype	MS+2,4-D(3mg/l)[a]	MS+2,4-D(3)+kinetin(1)	MS+2,4-D(3)+picloram(3)
Malgwiri	66	91.8	83.3
Samhangwiri	65.7	63.4	67.8

[a]Callus medium

Table 3. Percentage of regeneration from mature embryos in oat.

Genotype	MS + NAA(0.2mg/l) + BA(1mg/l)[a]		
	MS+2,4-D(3mg/l)[b]	MS+2,4-D(3)+kinetin(1)	MS+2,4-D(3)+picloram(3)
Malgwiri	53.5	61.8	74
Samhangwiri	61.8	65.4	70.8

[a]Regeneration medium, [b]Callus media

Table 4. Percentage of regeneration from the leaf base segment of oat.

Genotype	MS + NAA(0.2mg/l) + BA(1mg/l)[a]		
	MS+2,4-D(3mg/l)[b]	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]Regeneration medium, [b]Callus media