

# 첨가물질에 의한 벼 유묘의 염해경감효과

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Effect of Various Additives on Alleviating NaCl Stress in Rice Seedling

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## 실험목적

본연구는 염분이 함유된 배양액에 몇가지-첨가물질을 혼합처리하고 벼의 유묘 생육, isozyme, DNA band pattern을 분석하여 내염성에 관한 기초자료를 얻고자 실시하였다.

## 재료 및 방법

-공시재료: 일품벼

-처 리 구: 대조구, NaCl 86mM, NaCl 86mM+proline 10mM,  
NaCl 86mM+trehalose 10mM, NaCl 86mM+putrescine 10mM  
NaCl 86mM+sorbitol 10mM, NaCl 86mM+glycine 10mM.  
NaCl 86mM+fructose 10mM, NaCl 86mM+mannitol 10mM,

-조사항목: 생체중, proline검정, isozyme분석, RAPD분석.

## 결과 및 고찰

Glycine을 제외하고 proline, trehalose, putrescine, sorbitol, fructose, mannitol 처리구에서는 NaCl 86mM 처리구보다 초장생육이 향상되었다. 그러나 glycine 처리구는 NaCl 86mM 처리구보다 proline 함량이 약 1.4배 축적되었다(Table 1).

Trehalose처리구는 NaCl 86mM 처리구 와 proline함량은 비슷하였으나 초장 생육이 우수 하였다(Table 1).

Proline 처리구는 NaCl 86mM 처리구보다 proline함량이 약10배 축적되었고, 생체중도 약 2.5배 증가하였다(Table 1, 2).

Proline, trehalose 처리구에서 lignin 합성효소인 peroxidase의 2번째 band가 진하게 나타났다(Fig 1).

RAPD 분석결과 첨가물질에 따라 specific band를 확인할수 있었는데 이러한 band들이 내염성과 관계있는 것으로 사료된다(Fig 2).

Table 1 Free proline contents of rice seedling shoot grown in the saline solution with the various additives

Cultivar	Treatments of additives	Free proline contents ( $\mu\text{g/g}$ fresh wt.)
Iipumbyeo	Control	117
	NaCl 86mM	222
	NaCl 86mM+proline 10mM,	2,064
	NaCl 86mM+trehalose 10mM,	223
	NaCl 86mM+putrescine 10mM,	385
	NaCl 86mM+sorbitol 10mM,	478
	NaCl 86mM+fructose 10mM,	396
	NaCl 86mM+mannitol 10mM,	270
	NaCl 86mM+glycine 10mM	313
L.S.D(5%)		3.2

Table 2. Fresh weight of rice seedling shoot grown in the saline solution with the various additives

Cultivar	Treatments of additives	Fresh weight (mg/10 shoots)
Iipumbyeo	Control	250
	NaCl 86mM	104
	NaCl 86mM+proline 10mM,	238
	NaCl 86mM+trehalose 10mM,	151
	NaCl 86mM+putrescine 10mM,	217
	NaCl 86mM+sorbitol 10mM,	139
	NaCl 86mM+fructose 10mM,	156
	NaCl 86mM+mannitol 10mM,	147
	NaCl 86mM+glycine 10mM	106
L.S.D(5%)		6.14

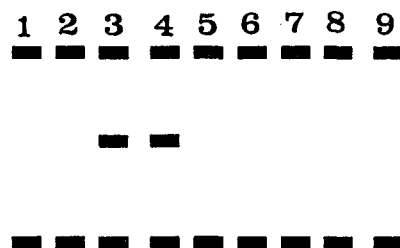


Fig 1. Peroxidase characteristics of Iipumbyeo

1. Control, 2. NaCl 86mM,
  3. NaCl 86mM+proline 10mM,
  4. NaCl 86mM+trehalose 10mM,
  5. NaCl 86mM+putrescine 10mM,
  6. NaCl 86mM+sorbitol 10mM,
  7. NaCl 86mM+fructose 10mM,
  8. NaCl 86mM+mannitol 10mM,
  9. NaCl 86mM+glycine 10mM
- \* Where the darker color the more peroxidase.

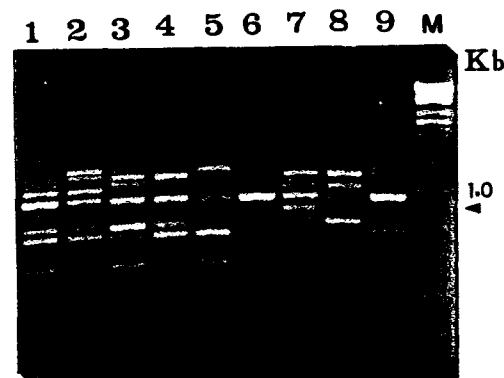


Fig 2. DNA polymorphism detected by PCR amplification of genomic DNA, using WAKO primer B25.

- M: DNA size marker
1. Control, 2. NaCl 86mM, 3. NaCl 86mM+proline 10mM,
  4. NaCl 86mM+trehalose 10mM, 5. NaCl 86mM+putrescine 10mM,
  6. NaCl 86mM+sorbitol 10mM, 7. NaCl 86mM+fructose 10mM,
  8. NaCl 86mM+mannitol 10mM, 9. NaCl 86mM+glycine 10mM
- Arrow: The band related salt-tolerance marker