

P34. Effects of Methyl Jasmonate on Chilling Tolerance at Seedling Stage in Two Rice Cultivars

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Objective

At rice seedling stage the air temperature is being lowered below 10°C. So farmers have used the poly ethylene film covering to protect the cold damage during nursery period. Even though covering with poly film, it is usually taken place the cold stress. MeJA treatment is known to be lessen the cold stress in plant, and it was investigated the response with MeJA treatment at 3 leaf stage of rice seedlings in the low temperature.

Materials and Methods

- ◎ Tested Variation : Seoan(Japonica), Dasan(Indica x Japonica)
- ◎ MeJA Conc(μ Mole) : 0.001, 0.01, 0.1, 10, 1000
- ◎ Treated with MeJA : 3 leaf stage
- ◎ Temperature : day/night 10/8 °C for 7 days

Results and Discussions

Two rice cultivars(*Oryza sativa*L), Dasan developed by the crosses of indica×japonica and Seoan developed by the crosses of japonica, which have shown different growth characteristics with different environmental conditions were used. The seedlings were grown with two different temperature treatment for 7days after transplanting, 10/8°C and natural condition respectively, and the growth and physiological responses of two tested varieties were investigated. Electrolyte leakage of two rice varieties was higher under low temperature(10/8°C) than that under natural condition, and it was decreased with MeJA treatment. In two rice cultivars, T-N contents were lowered at 10/8°C(day/night) with the treatment of MeJA, while P2O5 contents were increased. The chilling stress of rice seedlings was reduced due to low nitrogen content of rice plant. Electrolyte leakage of two rice cultivars was higher under low temperature(10/8°C) than that under natural condition. The nitrogen content of rice plant with MeJA treatment was decreased with raising the nitrogen levels.

Conclusion

Methyl Jasmonate was effective to reduce the cold damage at nursery period of rice in the low temperature. Degree of electrolyte leakage with MeJA was reduced more than that of no-treatment under low temperature condition, and N content of rice seedlings were decreased in MeJA plot more than in control plot. But P contents were increased in MeJA plot more than in control plot.

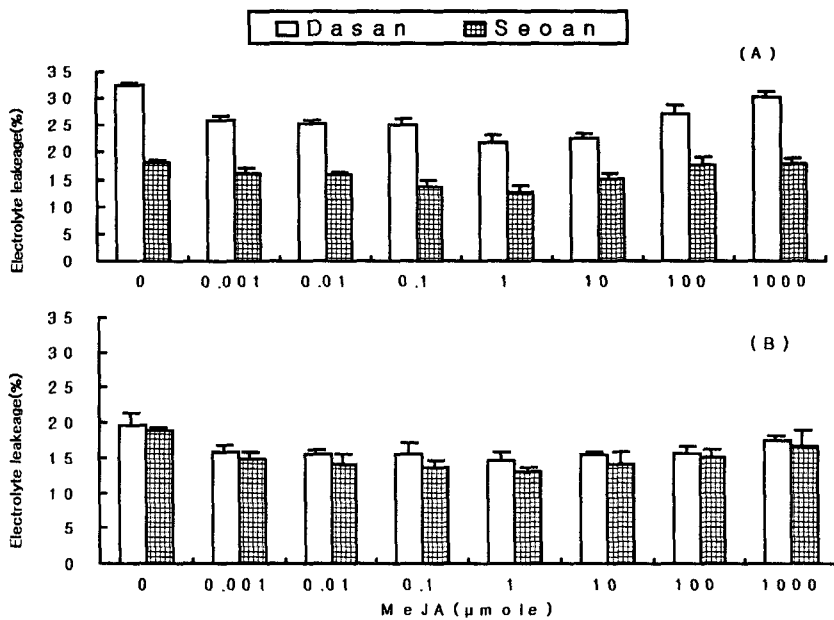


Fig 1. Effect of temperature conditions, 10/8°C (A) and 20/14°C (B) on Electrolyte leakage with treatment of different MeJA concentration in two rice cultivars.

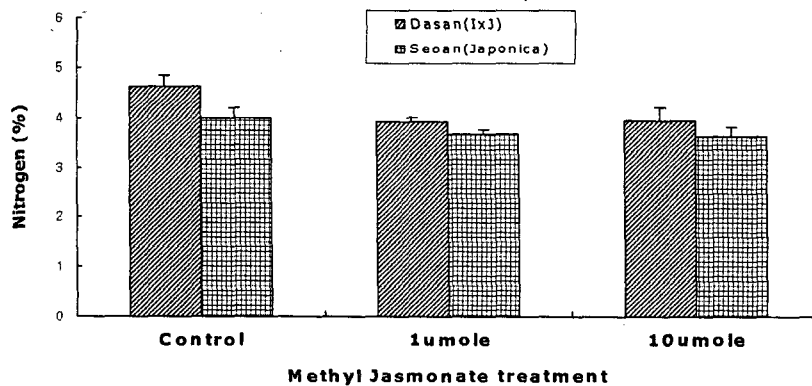


Fig.2 Nitrogen content of rice seedling as affected by with and without MeJA at 3 leaf stage under 10/8 C(day/night) .

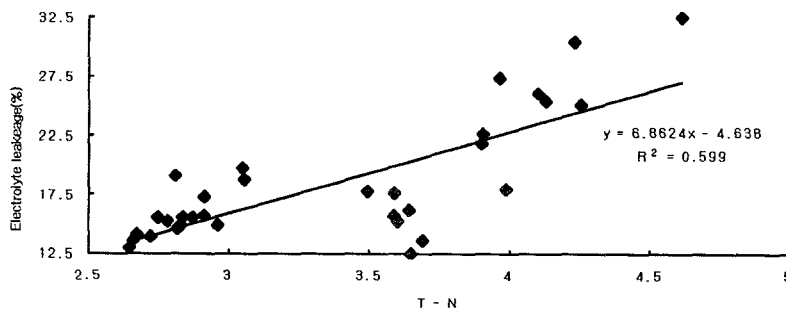


Fig 3. Relationship between T-N contents and Electrolyte leakage of rice seedlings by treatment of MeJA