

Effect of Treatment for Breaking of self-Incompatibility *Astragalus membranaceus* Bunge Local Collections in Gangwon Area

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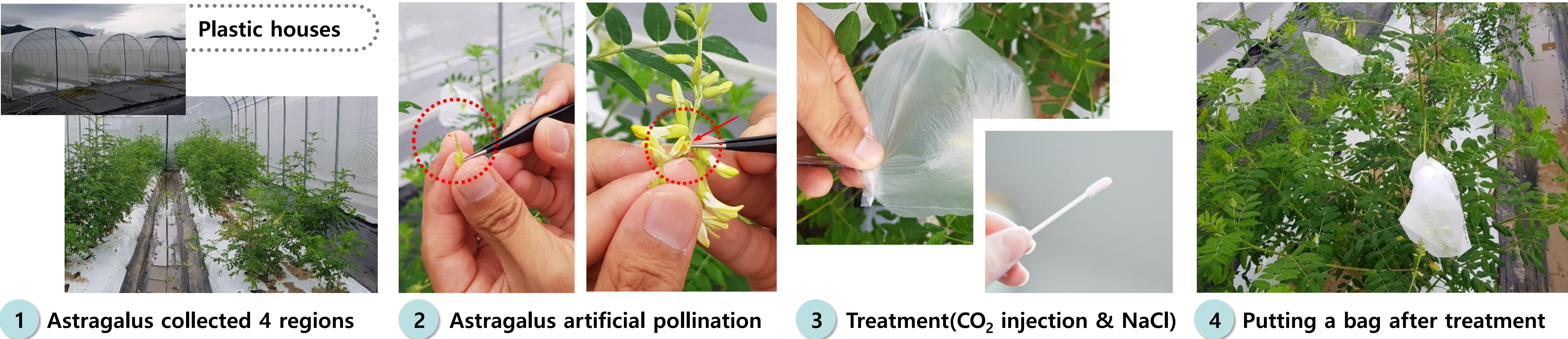
Abstract

Background : *Astragalus membranaceus* bunge is a medicinal crop belonging to the Leguminosae family with self-incompatibility. Self-incompatibility characteristics can be maintained pure through the temporary break-down method of self-incompatibility, and chemical treatment, temperature treatment, and CO₂ treatment have been studied as methods to overcome. Therefore, in this study, NaCl treatment, CO₂ treatment, and artificial pollination treatment were used to compare the self-incompatibility effect of *Astragalus* collecting species in Gangwon.

Methods and Results : *Astragalus* collected from 4 regions of Gangwon was sown in a small plastic house in a test field at the Ginseng & Medicinal Plants Research Institute in Cheorwon-gun, Gangwon-do, around the beginning of April. For each treatment, artificial pollination was carried out with a cotton swab to artificially pollinate the pollen of different flowers blooming from the same plant after putting a bag on the pedicel with flower buds and then removing the bag on the day of flowering. It was carried out in early August to late September. For NaCl treatment, a cotton swab was moistened with 1, 3, or 7% NaCl for artificial pollination. In the CO₂ treatment, a small amount of 99.99% pure CO₂ gas was injected after artificial pollination before putting it in tho the bag to maintain the CO₂ density in the bag at 0.5% (5,000ppm ± 500), and completely sealed for 2 hours. As a result of examining the pod setting and seed set for each treatment, in early August, the pod setting and seed set of artificial pollination were 2.6% and 85.7%, respectively, and when NaCl was treated, the pod setting and seed set were 0.0~7.5% and 0.0~66.7% depending on the density. Also when CO₂ treatment was 2.6% and 66.7%. At the end of August, CO₂ treatment had the highest pod setting at 25.4%, artificial pollination showed a 3.4% pod setting, NaCl 1% treatment showed 12.9%, and NaCl 7% treatment had a pod setting of 9.6%. was relatively low. At the beginning of September, when CO₂ was treated, the pod setting was 42.3%, and when NaCl was treated with 1%, the pod setting was 66.5%. At the end of September, all the treatment groups showed a decrease in the pod setting and the seed set, and in the case of artificial pollination, the pod setting was lowered to 6.1%.

Conclusion : The treatment for self-incompatibility of *Astragalus* local collections in Gangwon area was most effective when treated with 1% NaCl in early September.

Material & methods



Results

Table 1. Mean of pod and seed set by artificial pollination in green house of *Astragalus* local collections in Gangwon

Treatment date	Control			Artificial pollination		
	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)
Early of Aug.	0	0	0	2.6	85.7	2.3
End of Aug.	0	0	0	3.4	80	1.6
Early of Sep.	2.8	66.7	1.2	10.6	100	4.7
End of Sep.	0	0	0	6.1	100	5.6

Table 2. Mean of pod and seed set by NaCl density treatment in green house of *Astragalus* local collections in Gangwon

Treatment date	NaCl 1%			NaCl 3%			NaCl 7%		
	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)
Early of Aug.	7.5	66.7	1.3	4.6	66.7	1.7	0	0	0
End of Aug.	12.9	66.7	1.4	11.8	69.2	1.1	9.6	84.6	1.3
Early of Sep.	66.5	98	3.8	51.1	98.5	4.5	44.7	100	4.4
End of Sep.	24.3	100	4.9	10.3	97.3	4.1	6.2	100	5.4

Table 3. Mean of pod and seed set by CO₂ 0.5% treatment in green house of *Astragalus* local collections in Gangwon

Treatment date	CO ₂ 0.5%		
	Pods rate(%)	Seeds rate(%)	Seeds per pod(ea)
Early of Aug.	2.6	66.7	1.3
End of Aug.	25.4	66.7	1.4
Early of Sep.	42.3	98	3.8
End of Sep.	26.7	100	4.9

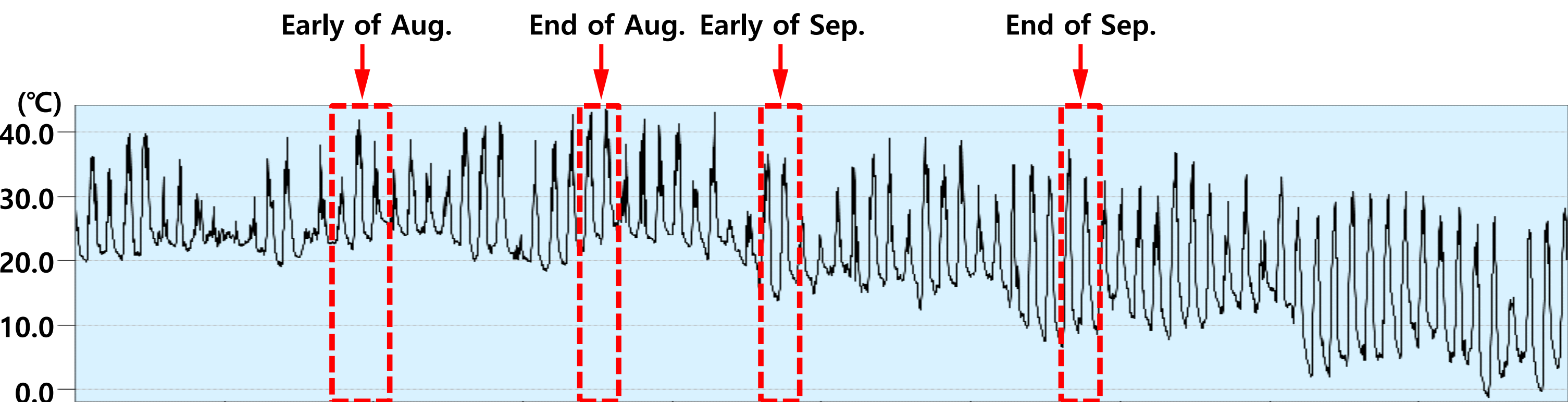


Fig. 1. Daily temperature pattern of in the plastic house during the treatment period

References

❖ Kim DH, Park CG, Yeo JH, Ahn YS, Park HK and Kim YG. (2008). Study on Breaking of Self-Incompatibility in *Astragalus membranaceus* Bunge. Treat. Of Ginseng & Medicinal Plants Res. 1:3-12.

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