Dormancy and Germination Characteristics of Medicinal Plant Seeds
I. *Bupleurum falcatum* Seed Germination

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Objectives:

To determine the effect of several different promoting substances for seed germination, GA_3, kinetine, indoleacetic acid, potassium nitrate, etc. Also, to verify the effectiveness of teterazolium test for viability of seed.

Materials and Methods:

Various *Umbelliferous* seeds, grown in the southern part of Gyeongnam area were tested for breaking dormancy and to accelerate germination. In this chapter, *Bupleurum falcatum* only will be covered.

(A) Several plant growth regulators as mentioned above were applied in different concentrations or combinations with three or four replications. To verify the proper temperature for *Bupleurum falcatum*, the experiments were also conducted at several different temperatures, 15℃, 20℃ and 30℃ of growth chambers.

(B) Teterazolium tests were conducted on 100 seeds with three different time periods. The samples were soaked in water for up to 16 hours at 15℃ before each seed is cut in half under the magnifying glasses and transferred to 0.5%, 1.0% and 2.0% solution of tetrazolium chloride so that it is completely covered by its solution. After 3 to 4 hours the cut surface was examined for red-pink granular area under the electromicroscope.

(C) And also 400 seeds were soaked in 100cc distilled water for 24 hours and another lot for 48 hours. The extracted solution soaked in water applied to *Dianthus sinensis* for germination to find out certain inhibiting factors.

Results and Discussion:

Growth regulators were little or no effect in increasing germination per cent. Whether regulators were applied or not the total germination per cent catagorized within 40 per cent maximum. And also leaching method did not show any effectiveness. *Dianthus sinensis* germinated 100 per cent without any abnormal sprout. Tetrazolium test showed that the ratio between seeds with or without embryo resulted 36 per cent against 34 per cent of without. Therefore, the low per cent of germination results occurred by embryolessness of seed. Any hormone treatments to enhance the germinability for *Bupleurum falcatum* cannot be applied unless we could cultivate a better strand of seeds. Maybe some other factors remain to be determined.

Table 1. Germination per cent of *Burpleurum falcatum* after being treated with the several different methods for breaking dormancy

	Treatment	Germination per cent			
		7th	14th	21st	Total
15-20℃	Control	-	13.5	14.5	27.5
15℃	Control		6.0	12.7	18.7
	Prechilling	4.0	12.3	10.6	26.6
	Prechilling + 50 ppm	1.3	17.0	19.7	38.0
	Prechilling + 100 ppm	2.0	15.3	16.0	33.3
	Prechilling + 200 ppm	7.3	21.3	11.4	40.0
	GA_3 50 ppm	6.0	8.0	11.3	25.3
	GA_3 100 ppm	4.0	13.0	6.0	23.0
	GA_3 200 ppm	6.0	8.0	0.7	14.7
	Chilling + 50 ppm	-	-	-	-
20℃	Control	33.0	-	-	33.3
	Prechilling 6 days	-	0.3	10.7	11.0
	Prechilling 14 days	7.3	20.0	-	27.3
	Prechilling 21 days	-	-	-	-
	Chilling + GA_3 50 ppm	0.5	1.8	9.2	11.5
	Chilling + GA_3 100 ppm	0.8	0.5	16.5	17.8
	Chilling + GA_3 200 ppm	-	0.5	14.5	15.0
	GA_3 50 ppm	-	6.7	4.7	11.4
	GA_3 100 ppm	1.3	12.3	9.3	22.9
	GA_3 200 ppm	-	9.3	11.3	20.6
	Leaching 24 hrs	-	17.5	9.5	27.0
	Leaching 24 hrs + Chilling	38.0	-	-	38.0
	Leaching 48 hrs + Chilling	-	3.0	27.5	30.0
25℃	Control(Jan.)	-	-	5.5	5.5
	Control(April)	-	9.5	6.0	15.5
	Prechilling 6 days	-	1.5	25.8	27.3
	Prechilling 14 days	-	24.7	-	24.7
	Prechilling 21 days.	-	10.0	-	10.0
	Chilling + GA_3 50 ppm	-	2.5	28.8	31.3
	Chilling + GA_3 100 ppm	-	1.3	32.3	33.6
	Chilling + GA_3 200 ppm	-	2.0	31.0	33.0
	GA_3 50 ppm	0.8	4.0	9.3	14.1
	GA_3 100 ppm	-	8.6	11.3	19.9
	GA_3 200 ppm	-	2.7	16.7	19.4
	Leaching 24 hrs	-	4.0	17.0	21.0
	Leaching 24 hrs + Chilling	15.0	-	-	15.0
	Leaching 48 hrs + Chilling	-	0.5	6.0	6.5
	Stratification	11.3	-	0.7	12.0

Table 2. Germination per cent of *Burpleurum falcatum* after being treated with the several different methods for breaking dormancy

	Treatment	Germination per cent			
		7th	14th	21st	Total
15℃	Control	1.3	4.7	5.3	23.0
	Kinetine 10^{-6}	-	5.3	2.3	7.6
	Kinetine 10^{-5}	9.3	9.3	3.3	21.9
	Kinetine 10^{-6} + GA_3 25 M	-	9.3	10.7	20.0
	IAA 10^{-4}	-	1.3	-	1.3
	IAA 5.0 × 10^{-6}	-	2.0	-	2.0
	IAA 2.5 × 10^{-6}	1.3	11.3	-	12.6
	IAA 5.0 × 10^{-5}	3.3	8.7	-	12.0
	KNO_3 10^{-2} 12 hour	-	8.0	27.4	35.4
	KNO_3 10^{-2} 24 hour	-	-	-	-
	KNO_3 10^{-3} 12 hour	-	8.0	28.0	36.0
	KNO_3 10^{-3} 24 hour	-	4.0	29.4	33.4
20℃	Control	3.3	14.7	17.7	35.3
	Kinetine 10^{-6}	4.0	20.7	5.7	30.4
	Kinetine 10^{-5}	1.3	20.6	5.3	27.2
	Kinetine 10^{-6} + GA_3 25 M	0.7	12.0	10.0	22.7
	IAA 10^{-4}	-	4.0	2.0	6.0
	IAA 5.0 × 10^{-6}	-	8.7	2.0	10.7
	IAA 2.5 × 10^{-6}	0.7	12.7	-	13.4
	IAA 5.0 × 10^{-5}	4.7	5.3	-	10.0
	KNO_3 10^{-2} 12 hour	-	-	-	-
	KNO_3 10^{-2} 24 hour	-	5.3	-	5.3
	KNO_3 10^{-3} 12 hour	-	3.3	-	3.3
	KNO_3 10^{-3} 24 hour	-	-	-	-
25℃	Control	-	21.3	7.3	27.6
	Kinetine 10^{-6}	1.3	16.7	4.0	22.0
	Kinetine 10^{-5}	-	14.7	6.0	20.7
	Kinetine 10^{-6} + GA_3 25 M	0.7	12.7	16.0	29.4
	IAA 10^{-4}	-	0.7	-	0.7
	IAA 5.0 × 10^{-6}	1.3	0.7	-	2.0
	IAA 2.5 × 10^{-6}	-	6.7	-	6.7
	IAA 5.0 × 10^{-5}	0.7	8.0	-	8.7
	KNO_3 10^{-2} 12 hour	-	-	-	-
	KNO_3 10^{-2} 24 hour	-	-	-	-
	KNO_3 10^{-3} 12 hour	-	-	-	-
	KNO_3 10^{-3} 24 hour	-	4.0	-	4.0