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EFFECT OF BRASSINOSTEROIDS ON ABA-INDUCED GERMINATION INHIBITION

B. VIDYA VARDHINI and S. SEETA RAM RAO
Plant Physiology Division, Department of Botany, Osmania University, Hyderabad 500 007, India.

Effect of 28-homobrassinolide and 24-epibrassinolide on ABA - induced inhibition of germination and seedling growth was studied. Both the brassinosteroids reversed the inhibitory effect of ABA.

Keywords: Abscisic acid; Brassinosteroids; Germination; Seedling growth.

Introduction

Brassinosteroids are novel type of growth promoting substances[1]. As a result of extensive investigations, brassinosteroids were found to show characteristic physiological action on growth of plants in microquantities[2]. In an earlier study brassinosteroids were found to stimulate seed germination[3]. In the present study the effect of brassinosteroids on abscisic acid induced inhibition of germination and seedling growth is being investigated.

Materials and Methods

28-Homobrassinolide and 24-epibrassinolide were purchased from M/s Beak Consultants Inc. Brampton, Ontario, Canada. Seeds of *Trigonella foenum-graecum* Linn. were surface sterilized with 0.1% (W/V) mercuric chloride and washed thoroughly several times with sterile distilled water. Twenty five seeds were distributed in each petriplate (10 cm diameter) provided with Whatman No. 1 filter paper. Each plate contained 5 ml of either of the test solution distilled water; 0.5×10^{-4} M ABA; 10^{-4} M ABA; 0.5×10^{-4} M ABA along with 1µ M/3 µM brassinosteroids; 10^{-4} M ABA along with 1 µM/3 µM brassinosteroids. The plates were kept in dark room whose temperature was maintained at 25 ± 1°C. Emergence of radicle was taken as the criteria of seed germination. Germination counts were recorded at the end of 24 and 36 hours. After 48 hours only 5 seedlings were retained in each petriplate and 3 ml more of test solution was added. On the 6th day (from the start of the experiment) seedling length and fresh weight were recorded. The seedlings were dried in oven at 110°C for 24 hours and dry weight were recorded.

Results and Discussion

Effect of brassinosteroids on the ABA-induced inhibition of seed germination and seedling growth is shown in Table 1. Brassinosteroids acted as germination promoters and reversed the inhibitory effect of ABA by enhancing the percentage of seed germination. Homobrassinolide at 3 µM concentration was found to be most effective in decreasing the inhibitory nature of ABA.

Brassinosteroids stimulated the growth of *T. foenum-graecum* seedlings by counteracting the inhibitory effect of ABA. The growth of seedlings were enhanced in terms of length, fresh and dry weight. 28-Homobrassinolide at 3 µM concentration was most effective in reversing the effect of ABA. The results obtained in the present study

Table 1 : Effect of abscisic acid and its interaction with brassinosteroids on germination and seedling growth of *T. foenum-graecum.*

Treatment	Percentage of seed germination*		Seedling length	Fresh weight of seedling	Dry weight of seedling
	24 hours	36 hours	(cm)*	(mg)*	(mg)*
Control	73.3 ± 1.08	81.3 ± 1.08	6.4 ± 0.25	263.6 ± 6.9	17.9 ± 0.34
$0.5x10^{-4}$ M ABA	9.3 ± 1.08	38.6 ± 2.17	2.03 ± 0.17	92.4 ± 5.4	9.8 ± 0.31
10^{-4} M ABA	1.3 ± 1.08	30.6 ± 1.08	1.8 ± 0.14	82.6 ± 2.76	7.8 ± 0.24
$0.5x10^{-4}$ M ABA + 1 µM 28-HB	46.6 ± 1.08	82.6 ± 1.08	5.4 ± 0.20	221 ± 3.40	13.5 ± 0.97
$0.5x10^{-4}$ M ABA + 3 µM 28-HB	68.0 ± 1.88	82.6 ± 1.08	5.9 ± 0.18	238.1 ± 2.04	18.3 ± 0.24
$0.5x10^{-4}$ M ABA + 1 µM 24-EB	36.0 ± 2.00	67.0 ± 0.82	4.48 ± 0.16	213 ± 1.93	13.3 ± 0.30
$0.5x10^{-4}$ M ABA + 3 µM 24-EB	42.0 ± 1.00	73.0 ± 1.65	4.79 ± 0.11	219 ± 2.30	17.0 ± 0.29
10^{-4} M ABA + 1 µM 28-HB	60.6 ± 1.96	77.3 ± 2.17	4.69 ± 0.12	218 ± 0.61	12.8 ± 0.90
10^{-4} M ABA + 3 µM 28-HB	68.0 ± 1.88	80.0 ± 1.88	4.98 ± 0.10	228 ± 9.7	17.2 ± 0.30
10^{-4} M ABA + 1 µM 24-EB	29.3 ± 2.17	53.3 ± 1.08	4.12 ± 0.05	214 ± 2.39	12.4 ± 0.83
10^{-4} M ABA + 3 µM 24-EB	37.3 ± 2.17	65.3 ± 1.08	4.49 ± 0.10	219 ± 1.73	16.3 ± 0.27

ABA : abscisic acid, 28-HB = 28-homobrassinolide
24-EB = 24-epibrassinolide
*Mean ± SE.

indicate that brassinosteroids are capable of reversing the inhibitory effect of abscisic acid on seed germination and seedling growth. In an earlier study[4] it was reported that brassinolide stimulated growth of etiolated squash *(Cucurbita maxima)* hypocotyls was associated with decrease in the levels of ABA.

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