

UV-B Absorbing Compounds and Polyamine Levels in *Capsicum annuum* L. Seedlings by Enhanced UV-B Radiation

Min-Jung Kim*, Jwa-Kyung Sung^{***}, Su-Yeon Lee*, So-Hyeon Park**, Beom-Heon Song^{***},
Tae-Wan Kim*

*Dept. of Plant Resources and Science, Hankyong National University, Anseong, Korea

**National Institute of Agricultural Science and Technology, RDA, Suwon, Korea

***Dept. of Agronomy, Chungbuk National University, Cheongju, Korea

Objectives

The purpose of the present study is to evaluate the effect of phenolic acids and polyamine as endogenous protectant against UV-B stress.

Materials and Methods

- Plant : Paprika (*Capsicum annuum* L.)
- UV-B treatment
 - Fifty-day-old paprika plants were treated with the supplemental UV-B radiation (1.2W m⁻²) for 0, 3, 6 or 9 hours. Fully expanded leaves of plants were taken after UV-B treatment.
 - Phenolic acids and polyamine were measured using HPLC system.
 - UV-absorbing compounds were checked on each UV-B treatment.

Results and Discussion

○ Quantification was done via a calibration with standards (external standard method). The amount of phenolic acids detected in the analysed sampled is shown in Table 1. UV-B increased the content of some phenolic substances. All phenolic acids measured except *p*-hydroxybenzoic and *p*-coumaric acid were significantly induced by UV-B radiation.

○ The analyses of polyamine contents in the leaves of control and UV-B treated plants reveled a different pattern for endogenous polyamine levels (Fig. 1). As UV-B treatment initialized plants have already started to increase polyamine levels, with putrescine and spermidine showing already higher values than control, and spermine seemed to be a slight delay compared to putrescine and spermidine.

○ Phenolic acids and polyamine was concluded to play an important role as endogenous secondary metabolites in protecting plants against the oxidative stress like UV-B.

[†] Corresponding author: (Phone) 031-290-0551 (E-mail) jksung@rda.go.kr

Table 1. Content of phenolic acids in UV-B-treated plant extracts

UV-B Treatment (hrs)	Content ($\mu\text{g/g}$ dry sample)*						
	<i>p</i> -Hydroxybenzoic acid	Sinapic acid	Caffeic acid	Syringic acid	Ferulic acid	<i>p</i> -Coumaric acid	Cinnamic acid
0	126.5 \pm 9.6	6.7 \pm 0.5	1.8 \pm 0.2	2.4 \pm 0.2	18.7 \pm 0.9	4.8 \pm 0.4	1.1 \pm 0.2
3	101.0 \pm 5.6	27.1 \pm 1.0	2.1 \pm 0.3	2.6 \pm 0.5	19.0 \pm 1.5	5.6 \pm 0.4	8.9 \pm 0.5
6	115.6 \pm 9.8	21.2 \pm 1.1	3.6 \pm 0.3	7.1 \pm 0.6	36.7 \pm 1.4	5.2 \pm 0.2	8.0 \pm 0.6
9	126.3 \pm 13.9	24.3 \pm 0.6	3.8 \pm 0.4	7.4 \pm 0.6	46.3 \pm 0.7	5.2 \pm 0.3	8.0 \pm 0.3

*Each value is the mean ($\mu\text{g/g}$ dry sample) of three replications \pm standard deviation

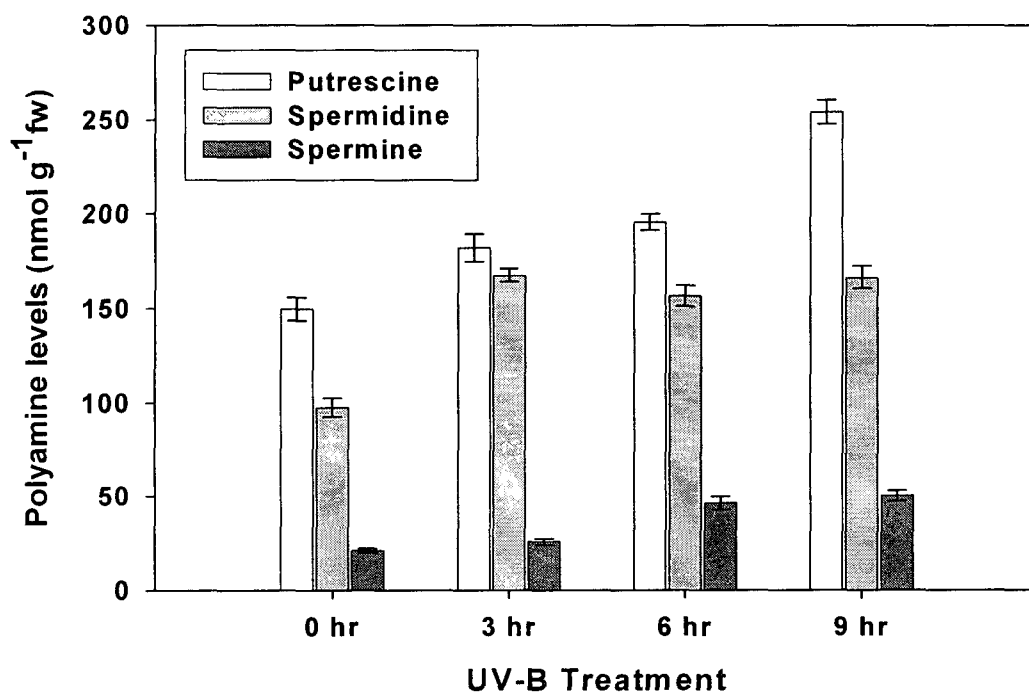


Fig. 1. Effect of UV-B radiation on polyamine levels in leaves of *Capsicum annuum* L. Each value is the mean of two replications \pm standard deviation.