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Effect of Seed Priming with Salicylic Acid and Jasmonic Acid on Emergence and Early Growth of Pumpkin (*Cucurbita Pepo* L.) Seedlings under Drought Stress Condition

MAJID ROSTAMI¹, AHMAD JAVADI²

¹Malayer University, Dept. of Agronomy, Iran

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Abstract

Undesirable germination is one of the most important problems that increases the cost of production and reduces the agricultural inputs efficiency. Seed priming is a useful process which can improve the rate and final percentage of germination and also cause the establishment of uniform seedlings in the field. There are several methods for seed priming, but depending on the plant species, a suitable method should be selected. In order to study the effect of seed priming with salicylic acid (SA) and jasmonic acid (JA) on emergence and early growth of pumpkin (*Cucurbita pepo* L.) seedlings under drought stress condition, a factorial experiment based on randomised complete block design (RCBD) with four replications was conducted at the greenhouse of Malayer University. Experimental treatments were seed priming with salicylic acid (0, 100 and 200 ppm) and jasmonic acid (0, 50 and 100 ppm) and three levels of drought stress (100, 60 and 30 % of field capacity). Based on results, drought stress significantly ($P \leq 0.05$) affected the percentage and rate of seedling emergence. In the severe drought stress (30 % of field capacity) percentage and rate of seedling emergence were decreased 10 % and 54 %, respectively. Furthermore, seedling length, seedling dry weight and seedling length vigour index were decreased 11 %, 9 % and 25 %, respectively, whereas at the same condition malondialdehyde and proline content increased 84 % and 13 %, respectively. Severe drought stress also increased the activity of catalase and peroxidase enzymes in pumpkin seedlings up to 39 and 57 percent, respectively. Seed priming with salicylic acid and jasmonic acid significantly ($P \leq 0.05$) decreased the negative effect of drought stress on all of the studied traits except seedling emergence percentage. Simultaneous priming with highest level of salicylic acid and jasmonic acid resulted in highest drought tolerance in pumpkin seedlings.

Keywords: Antioxidant enzymes, germination rate, plant hormones, seed priming