



GERMINATION, α -, β -AMYLASE AND TOTAL DEHYDROGENASE ACTIVITIES OF AMARANTHUS CAUDATUS SEEDS UNDER WATER STRESS IN THE PRESENCE OF ETHEPHON OR GIBBERELLIN A₃

BOŻENA BIAŁECKA AND JAN KĘPCZYŃSKI*

*Department of Plant Physiology and Biotechnology,
University of Szczecin, ul. Wąska 13, 71-415 Szczecin, Poland*

Received July 27, 2008; revision accepted February 3, 2010

Amaranthus caudatus L. seed germination was studied under different levels of water deficit induced by PEG 6000 in laboratory conditions. PEG at osmotic potentials -0.2 to -0.3 MPa at 24°C in darkness delayed germination and reduced final germination percentage. PEG solutions at osmotic potential lower than -0.3 MPa almost totally blocked seed germination. Ethephon was much more effective than GA₃ in reversing PEG-caused inhibition of *A. caudatus* seed germination. PEG decreased α -amylase activity after 14 h incubation. It decreased β -amylase activity after 14 and 20 h, and caused an increase in total dehydrogenase activity only after 20 h of incubation. Unlike GA₃, ethephon increased α -amylase activity in seeds after 12 and 14 h of incubation under water deficit. After 20 h of incubation there was no difference in α -amylase activity in any of the treatments. Neither ethephon nor GA₃ affected the activity of β -amylase and dehydrogenase.

Key words: *Amaranthus caudatus* seeds, α -, β -amylase, dehydrogenase, ethylene, gibberellin A₃, polyethylene glycol.

e-mail: jankepcz@wp.pl