Results: Values of EC_{10} and EC_{50} were 0.8 and 5.4 mg/dm^3 for MCPA and 0.7 and 10.4 mg/dm^3 for chloridazon, respectively. When chloridazon was applied at EC_{50} value, antagonistic interaction between MCPA and chloridazon was observed, irrespective of MCPA concentration. However, antagonism, synergism and as well as addition revealed all other binary mixtures of tested substances.

Conclusions: The comparison of EC_{50} values indicates that chloridazon was less toxic to duckweed than MCPA. Both herbicides showed interaction. Chloridazon reduced inhibitory effect of MCPA on growth of Lemna minor.

References

ISO 200079:2005(E): Water quality – Determination of the toxic effect of water constituents and waste water on duckweed (*Lemna minor*) – Duckweed growth inhibition test.
Teisseire H., Couderchet M., Vernet G., (1996). Phytotoxicity of diuron alone and in combination with copper or folpet on duckweed (*Lemna minor*). Environ. Pollut. 106: 39-45.

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Effect of combined drought and heat stress on heat shock proteins in wheat varieties

*B. Grigorova, *I. Vasseva, *K. Demirevska, **U. Feller

*Institute of Plant Physiology, Bulgarian Academy of Sciences, Sofia 1113, Bulgaria
**Institute of Plant Sciences, University of Bern, CH-3013, Switzerland

Introduction: The response of crop plants exposed on drought or heat shock is related to decrease in the synthesis of normal proteins, accompanied by increased translation of heat shock proteins (HSPs). Though drought and heat stress have been studied individually, little is know about their combined effect on plants.

Methods: The wheat (*Triticum aestivum* L.) varieties (Katya- tolerant, Sadovo or Mladka-susceptible) were potted in soil. Eight-day-old plants were exposed to withdrawing water for seven days. Heat shock was realized in growth chamber at 40 ˚C for 6h. A combination of drought and heat shock was performed by subjecting drought-stressed plants to heat shock treatment. Expression of HSPs in the first leaf of wheat varieties was analyzed by SDS electrophoresis and immunoblotting. Polyclonal antibodies against HSP20, HSP60, HSP110 and mononclonal antibodies against HSP70 were used to distinguish the mentioned HSPs.

Results: The leaf relative water content (RWC), which indicated the level of plant dehydration decreased significantly (34 %) under drought stressed conditions The electrolyte leakage of ions (EL), representing the level of the cell membrane stability increased markedly (68 %), especially under combination of drought and heat. Maximum EL was observed in drought susceptible varieties Sadovo and Mladka. Drought and heat shock combination in the wheat plants resulted in the induction of specific HSPs.

Conclusions: Our results demonstrate that the response of the wheat plants to a combination of drought and heat stress is different from the response of plants to each of these stresses applied separately. Induction of synergetic effect on HSP expression in case of combination between drought and heat was discussed in the case of two contrasting wheat varieties.

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