

THE RESPONSE OF *TRITICUM AESTIVUM* IN VITRO TO THE ACTION OF DIFFERENT STRESS FACTORS

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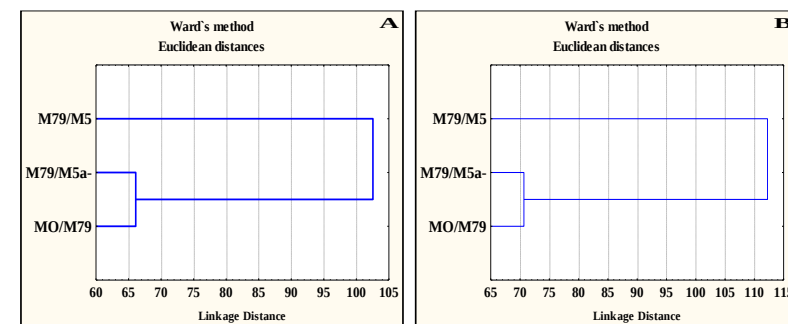
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The impact of global climate change, accompanied by increasing water resource scarcity, involves a considerable loss of wheat yield, while pathogens have increased chances of developing virulent strains, thus generating a frequent incidence of combined stress. In vitro culture techniques minimize time and environmental conditions, investigations being focused on applying associated stress under controlled conditions. This study aims to evaluate the callus induction response in mature embryos to the separate and combined effects of drought factors and pathogens, the causative agents of root rot in wheat.

The wheat genotypes M79/M5, M79/M5, a-, and MO/M79 were studied for the apical meristem response to the separate and combined effects of drought treatments (PEG 6000) and culture filtrate (CF) from three strains each of the fungi *Alternaria alternata* (Aa), *Drechslera sorokiniana* (Ds), and *Fusarium solani* (Fs). Both treatments were administered (10% and 20%) in Murashige-Scougen (MS) basal medium, which contained a complete set of macro- and microelements. The excised apical meristem was placed in Petri dishes. The parameters callus induction frequency, % (CIF), callus area, mm² (CA), and callus fresh weight, mg (CFW) were recorded at 14 days of culture. The tolerance reduction index was calculated using the following formula: $TRI (\%) = [1 - (\text{value under stress}) / (\text{value without stress})] \times 100$.

The analysis of variance revealed a reduction in the genotype weight under the combined action of stress factors compared to the separate action of the FC treatment. The valorization of the weight of the FC source of variation for FIC and SC in the interactions of *A. alternata*, *D. sorokiniana* and *F. solani* with PEG desiccant was accompanied by a significant reduction in the weight of the interaction – G x FC. The phenomenon attests to the additivity response of the effects to the combined stress. The PEG-mediated drought factor presented values of contributions close to those of the genotype in the variability of the CIF and CA characters, but much higher in the case of FWC.

The tolerance reduction index (TRI) was calculated relative to the control (H₂O treatment). In the response of the M79/M5 and M79/M5 (a-) genotypes to the separate action of CF TRI, only negative values were observed for CIF, CA and FWC. The greatest reduction was recorded for the FWC trait in M79/M5. CF Aa2 and 3 produced the greatest reduction in FWC, at -43.7% and -43.5% respectively. The M79/M5 (a-) genotype showed a high reduction (-29.7% and -37.7%) in the CA trait response to CF Ds3 and CF Fs3. The MO/M79 genotype responded with the lowest reductions for the callus traits. With a few exceptions, the traits fell within the range of index reduction from 10 per cent to -10 per cent, thus exhibiting resistance..



Acknowledgments: This research was conducted under the State Program project 011102 „Extending and conserving genetic diversity, improving agricultural crop genotypes in the context of climate change”, funded by the Ministry of Education and Research of the Republic of Moldova.