

SUMMARY

Title: **Effect of Methyl Salicylate on The Physiological and Biochemical Response of Wheat to Cold Stress**

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Wheat (*Triticum aestivum*) is one of the most important cereal crops with the largest area of cultivation, globally. Despite the increasing rate of wheat production, climate change and its resultant abiotic stressors like cold stress tend to significantly affect the crop's performance. Methyl salicylate (MeSA) is a volatile organic compound and herbivore-induced plant volatile (HIPV) whose role in plant abiotic stress response has not received enough investigation.

This study, therefore, sought to unearth the effect of methyl salicylate (MeSA) on the physiological and biochemical response of wheat to cold stress. The Department of Plant Physiology and Metabolomics at the Centre for Agricultural Research - Martonvásár, was the study area. The experiment was laid out in a completely randomized design (CRD). Seeds of the Gk-Szeged variety were soaked in a MeSA solution for 4 hours before sowing. Sample collection for laboratory analysis was performed in two stages: before cold treatment and after cold treatment. The cold treatment also lasted 4 hours. With the help of the spectrophotometer, the guaiacol peroxidase (GPX), ascorbate peroxidase (APX), glutathione s-transferase (GST), glutathione reductase (GR) as well as malondialdehyde (MDA) content in plants were measured and statistically analyzed using the two-way multivariate analysis of variance (MANOVA) procedure in IBM SPSS (v 27) at a significance level of 5%.

The study could not provide enough evidence to accept the alternate hypothesis. It was, therefore, concluded that MeSA had no significant effect on lipid peroxidation reduction as well as the synthesis of antioxidant enzymes in plants, under cold stress. Therefore, further research geared towards the assessment of MeSA's effect on crop response to longer durations of abiotic stressors is recommended.