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V INTERNATIONAL CONFERENCE ON
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PROCEEDINGS COAST 2026

FACULTY OF MANAGEMENT HERCEG NOVI

HERCEG NOVI, MONTENEGRO

09 JUNE – 13 JUNE 2026

FAKULTET ZA MENADŽMENT
HERCEG NOVI

V INTERNATIONAL CONFERENCE ON
ADVANCES IN SCIENCE AND TECHNOLOGY

BOOK OF PROCEEDINGS

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The authors have full responsibility for the originality and content of their own papers.

GREEN SYNTHESIS OF SILVER NANOPARTICLES AND THEIR EFFECTS ON WINTER WHEAT AND BARLEY VARIETIES UNDER LOW-TEMPERATURE CONDITIONS

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ABSTRACT:

Silver nanoparticles represent a potential solution for mitigating the negative effects of temperature stress on cereals. This study investigates the impact of silver nanoparticles on winter varieties of wheat and barley during the tillering phase, focusing on proline concentration, antioxidant activity and extract yield under winter field conditions. Silver nanoparticles (AgNPs) were synthesized using a green method with an aqueous extract of the plant Agri-monia eupatoria L. (fam. Rosaceae). Two winter cereal varieties, Simonida (Triticum aestivum L.) and Nonius (Hordeum vulgare L.), were foliar treated with 5 and 10 mg/mL AgNPs–H_2O. The experiment lasted for 10 days, during which the minimum recorded temperature was –7 °C under field conditions. The proline concentration was increased in both varieties treated with nano-particles compared to the controls. Antioxidant activity was assessed using the DPPH method for both treated and untreated samples, with ascorbic acid used as a positive control. Antioxidant activity has increased in all treated samples compared to the untreated samples. Only specific concentrations of AgNPs–H_2O increased the extract yield. Based on these results, our study emphasizes the potential of AgNPs–H_2O to improve the tolerance of winter cereals to low temperatures.

Keywords: *green synthesis, cereals, proline, antioxidant activity, low temperatures*