

ABSTRACT

INVESTIGATION OF THE EFFECTS OF POTASSIUM MONO-PHOSPHATE, POTASSIUM SILICATE AND CHITOSAN APPLICATIONS ON THE RESISTANCE INDUCTION OF TOMATO PLANTS AGAINST TOMATO BACTERIAL CANKER AND WILTING DISEASE

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In this study, the effects of different concentrations of potassium mono-phosphate (PFM) (10mM, 15mM, 20 mM, 25mM and 30 mM), potassium silicate (PS)(2, 4, 6, 8, and 10 mL⁻¹) and chitosan (CHI)(0.05 mM, 0.10 mM, 0.15 mM, 0.2 mM and 0.25 mM), which are alternative inducers to agrochemicals were researched for their resistance induction against *Clavibactermichiganensis* subsp. *michiganensis*, a causal agent of tomato bacterial wilt and canker of tomato.

The resistance induction after applications of the different concentrations of PMP, PS and CHI on tomato variety, "Ömür" was determined by the analyses of peroxidase, catalase, total protein, nitrogen ratio (N%), total soluble sugar, leaf chlorophyll and charetoine, ascorbic acid (vitamin C), leaf proline, leaf membrane stability index (%) and relative water content (%).

Potassium mono-phosphate in 10 mM concentration showed the highest resistance induction, and the disease ratio in the applied plant was 0.7% compared to the 41.4% disease ratio of control plants. The activities of peroxidase, catalase and membrane stability index were determined to be increased from 76.44% to 85.92%; from 4.2 mg protein⁻¹ to 6.2 mg⁻¹; from 4.0 mg protein⁻¹ to 6.2 mg⁻¹, respectively, on the 10 mm PMP applied tomato plants compared to the control plants. These increased activities may explain the higher resistance induction that prevented the disease ratio on the tomato plants. The total chlorophyll ratio was found to be increased on the PMF30 and Psi2 applied tomato plants from 8.48 mg/gFW to 9.70 mg/gFW compared to the control plants. The ratio of charetoine in the Psi2 applied tomato plants was recorded to be increased from 2.40 mg/gFW to 2.8 mg/gFW compared to the control plants. The total soluble sugar ratio of the Ki0.05 applied tomato plants was the highest and changed from 31.4 mg/g to 114.8 mg/g compared to the control plants. The vitamin C ratio in the PM10 applied tomato leaves recorded the highest increase of 23.0% compared to the control plants, which had 13.9% vitamin C. The nitrogen ratio was the highest in the PSi10 applied plants with 5.39% N compared to the control plants with 3.64% N. The protein level increased to 33.6% in the PSi applied plants, whereas the control plants had 22.7% protein level.

KEY WORDS: Potassium Mono-Phosphate, Potassium Silicate, Chitosan, *Clavibactermichiganensis* subsp. *michiganensis*, Chlorophyll, Protein, Proline, Nitrogen, Membrane Stability Index, Catalase and Peroxidase.

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