

Biocontrol potential of bacteriophage KΦ1 in control of pepper bacterial spot

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Xanthomonas euvesicatoria causes bacterial spot and pepper yield losses in Serbia. In order to increase efficacy and sustainability of the disease control strategies, alternative approaches were studied. A strain of bacteriophage KΦ1 was isolated from the rhizosphere of diseased pepper plants. The phage showed lytic activity to all *X. euvesicatoria* strains tested and did not lyse other *Xanthomonas* neither less related species. The strain KΦ1 is resistant to chloroform, stable in different media and buffers, sustain pH 3-9, and can be stored at 4°C at least two years without decreasing of titer. Copper compounds reduced the phage vitality proportionally to the used bactericide concentration. UV light was detrimental to the phage, but skim milk plus sucrose formulation extended its survival. Whole genome sequence analysis showed that KΦ1 phage genome does not carry toxin genes, virulence genes, or genes related to lysogeny, indicating its suitability for a phage therapy. Results of the three repeated greenhouse experiments showed that foliar application of KΦ1 phage (10^8 PFU/ml) on artificially inoculated pepper plants significantly reduced the symptom severity compared to the untreated control.