



## Prospectus of Bacteriophages as natural antimicrobial agents for plant protection: A case study

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### Abstract

Bacteriophages are the natural omnilytics and viruses of bacteria. Phage infects the bacteria more specifically, causes lytic or lysogenic activity in cells resulting in the death of the bacteria. Investigation on phages is a fast expanding area in agricultural biotechnology and in plant protection. *Ralstonia solanacearum* is a Gram negative bacteria causing devastating lethality in most of the solanaceous plants including potato and ginger, resulted in heavy economic losses worldwide. The chemical method of control of this bacterium is difficult because of its drug resistance. The use of alternative bactericidal agents is now prevalent over antibiotics and synthetic chemicals. This study was aimed to find natural antimicrobial agents specifically kill the bacterial population and results in reduction of pathogenicity. *R. solanacearum* strains were isolated from wilting potato and ginger crops in Hassan district, Karnataka and were characterized by biochemical test and PCR based detection. Further DNA was subjected to 16s ribosomal sequence analysis using 16S rRNA FU8 universal primers and phylogenetic analysis were used molecular relatedness of the isolated animal pathogenic bacteria. Pathogenicity test was conducted with tomato and chilli seedlings. Isolates were subjected to antibiotic sensitivity test and all strains were exhibited antibiotic resistance. Bacteriophages  $\delta$ HMPMV2-2019 series were isolated against *R. solanacearum*. The potency of phage activity was checked in laboratory condition and field conditions. The lytic phage morphology was studied with scanning electron microscopy and partial molecular analysis of isolated phage was done. The results of the study greatly anticipated the use of bacteriophages as potent antimicrobial agents against phytopathogenic *R. solanacearum* and they can be used as natural bio-control agents for plant protection.

### Biography

Dr. Makari Hanumanthappa K has completed his Ph.D. in Microbiology (Interdisciplinary in Biotechnology) from Bharathiar University. He is serving as Assistant Professor and Head in the Department of Biotechnology, I.D.S.G Government College, Chikkamagaluru, India. He has over 50 publications that have been cited over 250 times, and his publication H-index is 07. He has published 16S rRNA sequences of 20 different bacterial types at GenBank of NCBI. He has published research reference and text books from International publishers. He is a fellow member for various National and International scientific organizations. He is the recipient of National and International awards for his outstanding research contribution in Microbial Biotechnology.



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