

BACTERIOCIN: A NEW APPROACH TO CONTROL PLANT DISEASES

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INTRODUCTION

Microbial species employ several strategies in the competitive conditions, especially for achieving nutrients. Bacteriocins are a subgroup of the antibacterial substances that were originally defined as proteinaceous compounds that kill strains of the same or closely related species. The application potential of bacteriocins is well recognized in some fields such as the food fermentation industry. However, this aspect is noteworthy in plant disease control, recently. *Pectobacterium carotovorum* subsp. *carotovorum* (*Pcc*) is widely distributed pectinolytic pathogen which is responsible for large economic losses in potato in the field and during storage. But there is no efficient method to control this disease globally. Therefore, we screened the antibacterial activities of some Iranian *Pcc* strains against the causative agent of potato soft rot and blackleg in vitro.

MATERIALS AND METHODS

Bacterial strains. Forty strains of *Pcc* were collected from different host plant and location in Iran. Isolates were characterized using phenotypic and molecular methods.

Bacteriocin assay. Antibacterial activity was detected by the spot-on-lawn method on LB agar for screening of inhibitory activity against *Pcc* and other related genus and species. We also used some inducers including UV light, mitomycin C, nalidixic acid and glucose in known concentration. Clear zones around the spotted area on LB medium were measured after 24h.

RESULTS AND DISCUSSION

Evaluation antibacterial activities. The antibacterial activity of 40 *Pcc* strains (producer) against some native *Pcc* and other five reference *Pectobacterium*, *Dickeya* and *Erwinia* strains (indicator

) were estimated. The producer strains were grouped based on their activity on control (LB agar) and treatments containing inducers. Different inducers have separate effect on producer's activity.

Antibacterial activity against closely related genus and species. In this assay, mitomycin C and UV against *Pectobacterium* species and subspecies except *P. atrosepticum*, UV against *Dickeya* species and glucose against *Erwinia* are caused more production of bacteriocin by producers in comparison to controls.

Conclusions. In agreement to other data, our results demonstrate that *Pcc* strains are capable of producing several bacteriocin patterns. Further tests are running to detect genes responsible for this function. It seems that studied producers may merit to employ as a strategy to control soft rot pathogens.

Keywords : Bacteriocin, Inducer, *Pectobacterium*

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