

**OCCURENCE OF *Pseudomonas fluorescens* IN RHIZOSPHERE AND RHIZOPLANE OF CABBAGE AND ITS IMPACT IN CONTROLLING BLACK ROT DISEASE**

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Black rot is a major bacterial foliar disease caused by *Xanthomonas campestris* pv. *campestris*, resulting in heavy yield losses in most of the commercially-grown cabbage varieties in Sri Lanka. The recommended control measures have limited effectiveness for this pathogen. The bacterium *Pseudomonas fluorescens* synthesizes a variety of substances, which makes it a better bio-control agent. This research was conducted to study the occurrence of *P. fluorescens* in soil rhizosphere and rhizoplane in cabbage cultivation and to identify its impact in controlling *X. campestris* pv. *campestris*. Rhizosphere and rhizoplane soil samples, ten each, from five cabbage-growing locations were examined for the presence of *P. fluorescens*. Population of *P. fluorescens* was  $9.4 \times 10^6$  cfu/g in the rhizosphere soil compared to  $8.3 \times 10^5$  cfu/g in rhizoplane soil. When the isolates of *P. fluorescens* were evaluated for their antibiosis against *X. campestris* pv. *campestris* in-vitro, each *P. fluorescens* isolate showed an inhibition zone of 16-20 mm in diameter; the isolate Pf5 showed the largest inhibition zone. Liquid form of the bacterium inoculum Pf5 isolate was tested for its bio-control effect against *X. campestris* pv. *campestris* under greenhouse condition. There were three treatments: *P. fluorescens* sprayed 24, 48 or 72 h before inoculation of the pathogen, *P. fluorescens* sprayed 24, 48 or 72 h following pathogen inoculation and *P. fluorescens* sprayed after symptom development. The control was inoculated only with *X. campestris* pv. *campestris*, and the uninoculated control received neither *X. campestris* nor *P. fluorescens*. *P. fluorescens* treated cabbage plants showed reduced occurrence of black rot disease compared to the *X. campestris* inoculated control in all three treatments tested. The uninoculated control had no disease development. Therefore, it is concluded that use of *P. fluorescens* could inhibit the *X. campestris* pv. *campestris* growth and reduce the incidence of black rot disease in cabbage.

**Keywords:** Black rot, *Pseudomonas fluorescens*, *Xanthomonas campestris* pv. *campestris*