

# Monograph On Alternaria Diseases Of Crucifers



## Biocontrol Potential of *Streptomyces hydrogenans* Strain DH16 toward *Alternaria brassicicola* to Control Damping Off and Black Leaf Spot of *Raphanus sativus*

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Biocontrol agents and their bioactive metabolites provide one of the best alternatives to decrease the use of chemical pesticides. In light of this, the present investigation reports the biocontrol potential of *Streptomyces hydrogenans* DH16 and its metabolites towards *Alternaria brassicicola*, causal agent of black leaf spot and damping off of seedlings of crucifers. *In vitro* antibiosis of strain against pathogen revealed complete suppression of mycelial growth of pathogen, grown in potato dextrose broth supplemented with culture supernatant (20% v/v) of *S. hydrogenans* DH16. Microscopic examination of the fungal growth showed severe morphological abnormalities in the mycelium caused by antifungal metabolites. *In vivo* studies showed the efficacy of streptomycete cells and culture supernatant as seed dressings to control damping off of *Raphanus sativus* seedlings. Treatment of pathogen infested seeds with culture supernatant (10%) and streptomycete cells significantly improved seed germination (75–80%) and vigor index (1167–1538). Furthermore, potential of cells and culture supernatant as foliar treatment to control black leaf spot was also evaluated. Clearly visible symptoms of disease were observed in the control plants with 66.81% disease incidence and retarded growth of root system. However, disease incidence reduced to 6.78 and 1.47% in plants treated with antagonist and its metabolites, respectively. Additionally, treatment of seeds and plants with streptomycete stimulated various growth traits of plants over uninoculated control plants in the absence of pathogen challenge. These results indicate that *S. hydrogenans* and its culture metabolites can be developed as biofungicides as seed dressings to control seed borne pathogens, and as sprays to control black leaf spot of crucifers.

**Keywords:** *Streptomyces hydrogenans* DH16, *Alternaria brassicicola*, *Raphanus sativus*, biocontrol, culture supernatant

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### INTRODUCTION

*Alternaria brassicicola* is one of the economically important pathogens worldwide with broad host range, and is established and widespread in many countries, including India (Verma and Saharan, 1994; Reis and Boiteux, 2010). It causes black spot disease and damping off of seedlings in *Brassica* spp. throughout the world and causes huge economic losses (Rimmer and Buchwaldt, 1995). Host

Monograph on Alternaria Diseases of Crucifers. Front Cover. P. R. Verma, G. S. Saharan. Research Branch, Agriculture and Agri-Food Canada, Includes bibliographical references (p. ) and index. Research Branch Technical Bulletin E Monograph on Alternaria Diseases of Crucifers Saskatoon Research Centre Canada Cover illustration The. Department/Agency, Agriculture and Agri-Food Canada. Research Branch. Title, Monograph on alternaria diseases of crucifers /. Series Title, Technical bulletin. Monograph on alternaria diseases of crucifers. Translate with. google-logo. translator. This translation tool is powered by Google. FAO is not responsible for the. Monograph on alternaria diseases of crucifers /. P.R. Verma and G.S. Saharan. imprint. Saskatoon, Sask.: Saskatoon Research Centre, Research Branch. Monograph on alternaria diseases of crucifers by P. R. Verma, , Saskatoon Research Centre, Research Branch, Agriculture and Agri-Food. Indian Central Oilseed Committee, Hyderabad, pp 7786 Verma PR, Saharan GS () Monograph on Alternaria diseases of crucifers. Saskatoon Research. A detached leaf culture technique for the study of white rust disease of brassica species. Can. Monograph on Alternaria diseases of crucifers. Agriculture and. Plant Sci 48(2) Trivedi RKS () Strategies to control *Alternaria radicina* in Saharan GS () Monograph on Alternaria diseases of crucifers. He has been editor of books, i.e. Diseases of Oilseed Crops He has authored monographs on white rust, Alternaria blight, and downy mildew diseases of. PDF Alternaria blight disease caused by *Alternaria brassicae* (Berk.) Sacc. has been reported from all the continents of the world affects most cruciferous crops and is one among the important diseases of rapeseed-mustard Monograph on. CORLETT, MACLATCHY: ALTERNARIA BRASSICICOLA to oil seed brassicas (Verma and Saharan, Monograph on Alternaria Diseases of Crucifers. English: Alternaria blight; black spot of cabbage; black spot of crucifers; brown rot of Monograph on Alternaria diseases of crucifers. The occurrence and prevalence of Alternaria species causing leaf spots in brassica crops in Pernambuco was .. Monograph on Alternaria diseases of crucifers. Monograph on alternaria diseases of crucifers by P. R. Verma, , Saskatoon Research Centre., Research Branch, Agriculture and Agri-Food Monograph on alternaria diseases of crucifers by P. R. Verma (Book) 3 editions published between and in English and held by 27 WorldCat member . In vegetable brassica seeds, especially white cabbage and cauliflower, *A. brassicicola* is the dominant Monograph on Alternaria diseases of crucifers.

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