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Evaluation of botanicals for *in vitro* management *Sclerotinia sclerotiorum* causing white mold of *Phaseolous lunatus*

I.J. YADAV, V.K. GUPTA, INDRA JEET YADAV, M. VERMA AND S.R. YADAV

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SUMMARY

The white mold, caused by *Sclerotinia sclerotiorum*, is a very important disease in *Phaseolous lunatus.* Chemical control and their application may not be environmental friendly. Compounds of plant origin have been proved possible alternate pesticide use. The objective of this work was to study the effect of plant extracts on the *in vitro* growth of fungus. Ten plant extracts were evaluated for their antimicrobial capacity against five isolates of *Sclerotinia sclerotiorum.* Positive control consisted of Petridishes with PDA medium and negative control treatment consisted of PDA medium with plant extracts. Fungus colonies were incubated at 22^{0}C and light intensity of 200 lux. All the plant extract tested were found to be effective in controlling the radial growth of *Sclerotinia sclerotiorum*. However, the plant extract of *Calotropis gigantea* L.R.Br. and *Azadirachta indica A. Juss.* were very effective in reducing the radial growth of *Sclerotinia sclerotiorum*.

Key words : *Phaseolous lunatus,* Plant extracts, *Sclerotina sclerotiorum,* White mold, Antimicrobial.

The fungus *Sclerotinia sclerotiorum* (Lib.) deBary is a disease casual agent in more than 400 botanical species (Boland and Hall, 1990). *Phaseolous lunatus* is one of the important vegetable crop where this fungus causes white mold disease. This polyphagous fungus is able to remain active in the soil, as sclerotia, for long periods (Coley-smith and Cooke, 1971). Usual disease control methods are soil solarization (Ferraz, 2001), crop rotation, and chemical control (Kurozawa *et al.*, 1997). Among the alternative products to control, pests and disease neem oil, pyroligeneous liquor, bio-fertilizers and monosodium glutamate (Bettiol *et al.*, 1990). Neem oil, usually extracted from seeds of *Azadirachta indica* tree. Botanicals have also reported to control the growth of fungal pathogens (Bhatnagar *et al.*, 2004; Ramanathan *et al.*, 2004; Gupta *et al.*, 2007). However, such work has not been conducted in case of white mold of *Phaseolous lunatus*. Therefore, the present study was undertaken to evaluate leaf extracts of ten plant species against white mold pathogen (*Sclerotinia sclerotiorum*) of *Phaseolous lunatus* for their antifungal activity.

MATERIALS AND METHODS

Work was carried out at Physiology and Biochemistry Laboratory, Department of Botany, K.S. Saket P.G. College, Ayodhya, Faizabad (U.P.), India.

Correspondence to:
S.R. YADAV, Department of Botany, K.S. Saket P.G. College, Ayodhya, FAIZABAD (U.P.) INDIA
Authors' affiliations:
I.J. YADAV, M. VERMA AND INDRA JEET YADAV, Department of Botany, K.S. Saket P.G. College, Ayodhya, FAIZABAD (U.P.) INDIA
V.K. GUPTA, Central Institute for Sub-tropical, Horticulture, LUCKNOW (U.P.) INDIA

Maintenance of sclerotinia sclerotiorum isolates:

Five isolates of *S. sclerotiorum* used in this study were collected from diverse geographic origins (Table 1) The isolates were further purified by growing single sclerotia from each colony on potato dextrose agar (PDA) slants.

Colony characteristics:

Radial growth (cm.) morphology and sclerotia per plate were evaluated in the Petridishes on PDA. At least three PDA plates were inoculated with 5 mm dia, mycelial discs taken from the margin of actively growing colonies (3-4 day-old) of each plate. The inoculated plates were then incubated at 25^0±2^{0}C. The colony diameter was measured every day till 5th day. The number of sclerotia per plate was counted after 20-25 days of incubation. The data from replicated plates were averaged. Colony morphology was also observed after 10 days of incubation.

Ten plant species (Table 2) were selected, which are reported to have antifungal activity. Leaves were washed thoroughly and dried in shade after removing the extra water with blotting paper. Leaves of these plants were subjected for preparation of extracts as per the method described by Gerarod *et al.* (1994). Fifty grams of leaf samples from each plant species were collected, mixed with fifty ml of sterile distilled water, plant extract prepared by crushing the plant samples in mortar and pestle and filtered through fine muslin cloth. The extracts were subjected to low speed centrifugation at 3000 rpm for 5 min and supernatant decanted. This was designated as 100 per cent concentration. Clear supernatant of the plant extracts were diluted with equal quantity of sterile distilled