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Research Article

Addition to the host range of *Sclerotinia sclerotiorum* in West Bengal

Bholanath Mondal[1], Dinesh Chandra Khatua[2], Subhas Hansda[2] and Rishu Sharma[2]
[1]Department of Plant Protection, Palli-Siksha Bhavana (Institute of Agriculture), Visva-Bharati, Srinikatan 731 236, West Bengal, India
[2]Department of Plant Pathology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur741252, Nadia West Bengal, India

***Corresponding author**
Bholanath Mondal
Email: bholanath.ppvb@gmail.com

Abstract: During survey in the month of January, 2015 *Sclerotinia sclerotiorum* (Lib.) de Bary has been recorded first time in West Bengal (India), on five plants which include one vegetable (*Daucus carota* L.), two ornamentals (*Cosmos sulpureus* Cav. and pink flower producing *Barleria cristata* L.), one medicinal (*Enhydra fluctuans* Lour.) and one spice plant (*Foeniculum vulgare* Mill.). Aerial parts of all the plants were susceptible to the pathogen. Infected plant parts became covered with white mycelial growth of the pathogen. Sclerotia were produced on the diseased tissue except on *Enhydra fluctuans*. The pathogen produced white mycelium with hyaline, branched and septate hyphae. Black sclerotia near spherical to irregular in shape generally were formed towards the periphery of the medium (PDA) in petridish. The sclerotia were silvery white in the initial stages of development but turned dark with increasing age of the culture. Surface of the sclerotia was rough and pitted. The pathogen did not have host specificity.
Keywords: First record, host range, Sclerotinia rot, *Sclerotinia sclerotiorum*, white rot.

INTRODUCTION

Sclerotinia sclerotiorum (Lib.) de Bary is a soil borne plant pathogen having world-wide distribution. The disease caused by this pathogen has been reported from different parts of India. It has very wide host range, attacks more than 500 plant species [1-3] and the disease caused by this pathogen is differently known as *Sclerotinia* rot, white rot, watery soft rot, cottony rot, white blight, etc. Regular incidence of Sclerotinia rot in different states of India has been recorded earlier [3]. In recent years Sclerotinia rot has been reported on 25 plants from West Bengal [4-11]. Infection of some new hosts by this pathogen in West Bengal is presented in this study.

MATERIALS AND METHODS

Surveys were conducted during winter season of November 2014 to February 2015 in southern districts of West Bengal (India) to record the incidence of the disease in different crops. Symptoms of the disease on individual crop were recorded. During survey Sclerotinia rot was recorded on five crops. Disease samples were collected for isolation of the causal pathogen. The pathogen was isolated on PDA medium amended with chloramphenicol by putting sclerotia or small piece of surface sterilized disease tissue [8]. Pathogen was maintained in PDA medium. Pathogenicity test was conducted for individual isolate on their respective host. Mycelial strip from four days old culture prepared on PDA in Petriplate was used as inoculum. Small incision (0.5cm length and 0.5-1mm depth) was given on the branch of the plant at the internode and the mycelial strip was put on the injured tissue. Mycelial strip was then wrapped with thin layer of moist cotton. Water was sprayed on the branch and was covered with polythene bag to maintain humidity. In case of carrot, mycelial strip was placed at the crown region and the entire plant was covered with polythene bag to maintain humidity. Such inoculation was done after sunset in the month of February. Three days after inoculation the polythene bag was removed. Disease symptom appeared at 5 to 7 days after inoculation. Cultural and morphological characteristic of the pathogen was studied by growing this pathogen on PDA medium in Petriplates [9].

RESULT AND DISCUSSION

During survey *Sclerotinia* rot has been recorded in West Bengal on five plants in the month of January, 2015 which include one vegetable, two ornamental, one medicinal and one spice plant.

Carrot (*Daucus carota* L., Family: Apiaceae)

The disease appeared in patches in the field. Rotting of the leaves with white mycelial growth was the first symptom of the disease (Fig. 1). With the age of the plants, fleshy roots developed. The fleshy roots underwent rotting and sclerotia were formed on the mycelial growth over the root (Fig. 2). White mycelial growth also spread on the surrounding soil surface.

Pink flower producing *Barleria* (*Barleria cristata* L., Family: Acanthaceae)

It is a perennial herb and it produces flower in winter months. Drooping of small branches was the first noticeable symptom of the disease. On inspection light brown lesions were found on the branches and most cases the lesions were covered with white mycelial growth (Fig. 3). On some lesion prominent irregular shaped black sclerotia were produced. With the progress of the disease, many branches were dried but the affected plant remained alive.

Cosmos (*Cosmos sulpureus* Cav., Family: Asteraceae)

Light brown water soaked lesion appeared any part of the stem, branch and flower stalk. All the lesions were covered with prominent white growth of the pathogen (Fig. 4). With the progress of the disease affected branches showed drooping symptom. Ultimately such branches dried up. Sclerotia were formed on the diseased tissue. Many of the plants also died.

Helencha (*Enhydra fluctuans* Lour., Family: Asteraceae)

Helencha (Water Cress) that usually grows in swampy ground in tropical and subtropical areas. Now-a-days, some people are growing this plant in homestead garden for medicinal purpose. This plant is a prostate, spreading herb. The stems are somewhat fleshy, 30 cm or more in length, branched. Rooting occurs at the lower nodes. The leaves are sessile, linear-oblong, 3 to 5 cm in length, pointed or blunt at the tip, usually truncatise at the base, and somewhat toothed at the margins. The flowering heads are without stalks, are borne singly in the axils of the leaves, and excluding the bracts, are less than 1 cm in diameter. In the swampy ground or homestead garden this plant grows as compact population. In the winter months Sclerotinia rot appeared in homestead garden. Water soaked lesions produced on stem and leaves (Fig. 5). Soon the affected area covered with white growth of the causal fungus. Many plants were died. Sclerotia formation was not found on the infected plants.

Fennel (*Foeniculum vulgare* Mill., Family: Apiaceae)

It is cultivated in winter season as spice crop. Dried seeds have fragrant odour and aromatic test. They are used for flavouring food, beverages and pickles. It is also used for medicinal purpose. Sclerotinia rot was noticed in farmers' field in Nadia district of West Bengal. The disease appeared in patches in the field. Water soaked lesion appeared on the stem and the affected area became covered with prominent white fungal growth. A few black hard sclerotia were formed on the stem and inside the hollow space of the stem. Frequently the infected plant broke at the point of infection (Fig. 6). Ultimately the infected plants died.

Sclerotinia rot has been reported earlier on 25 hosts in West Bengal, but incidence of the disease is recorded first time in West Bengal on *Daucus carota*, *Barleria cristata*, *Cosmos sulpureus*, *Enhydra fluctuans* and *Foeniculum vulgare*.

On isolation from all the hosts, the pathogen produced white mycelium with hyaline, branched and septate hyphae. Black sclerotia near spherical to irregular in shape generally were formed within 4 -7 days of incubation at 28°C towards the periphery of the medium in petridish (Fig. 7). The sclerotia were silvery white in the initial stages of development but turned dark with increasing age of the culture. Surface of the sclerotia was rough and pitted. Based on the cultural characteristics the pathogen was identified as *Sclerotinia sclerotiorum* (Lib.) de Bary [1, 9, 11]. Pathogenicity tests of the *Sclerotinia sclerotiorum* isolates were successful on their respective host. Isolate of *Sclerotinia sclerotiorum* from bean plant (*Phaseolus vulgaris* L.) could infect all the five plants (*Daucus carota*, *Barleria cristata*, *Cosmos sulpureus*, *Enhydra fluctuans*, *Foeniculum vulgare*) on artificial inoculation indicating the pathogen did not have host specificity [9].

Fig-1: Rotting of Carrot leaves along with white mycelial growth of the fungus

Fig-2: Infected Carrot root with mycelial growth and sclerotia of the fungus

Fig-3: Infected branch of Barleria showing white mycelial growth of the fungus

Fig-4: Cosmos plant with infected branches

Fig-5: Water soaked lesions on stem and leaves of Helencha plant

Fig-6: Infected Fannel plant showing white mycelial growth of the fungus

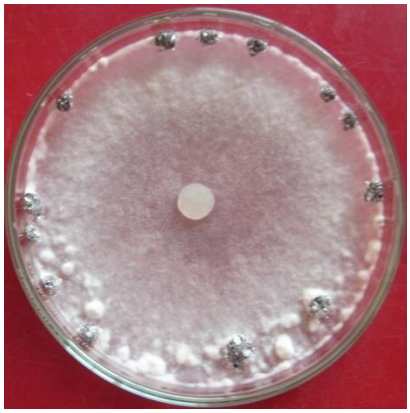

Fig-7: The white mycelial growth of the fungus and blackish sclerotia in petridish

CONCLUSION

Sclerotinia sclerotiorum (Lib.) de Bary is a soil borne plant pathogen having world-wide distribution. Disease caused by this pathogen has been reported earlier from different parts of India. Sclerotinia rot caused by *Sclerotinia sclerotiorum* is recoded in West Bengal only in the recent years on thirty different plants including the five plants recorded in the present studies. This disease appears to be new threat in crop cultivation in West Bengal.

REFERENCES

1. Purdy LH; *Sclerotinia sclerotiorum*: history, diseases and symptomatology, host range, geographic distribution, and impact. Phytopathology, 1979; 69:875-880.
2. Boland GJ, Hall R; Index of plant hosts of *Sclerotinia sclerotiorum*. Canadian Journal of Plant Pathology, 1994; 16: 93-108.
3. Saharan GS, Mehta N; Sclerotinia Diseases of Crop Plants: Biology, Ecology and Disease Management. Spinger, 2008; 485.
4. Panja BN, Jana JC; White mould disease of *Phaseolus vulgaris* L. from Tarai region of West

Bengal. Journal of Interacademicia, 2001; 5(1):121-122.
5. Dutta S, Ghosh PP, Kuiry SP; Stem rot, a new disease of potato in West Bengal, India. Australasian Plant Disease Notes, 2009; 4: 80–81.
6. Mondal B, Mahapatra S, Khatua DC; Records of some new diseases of horticultural plants of West Bengal. Journal of Interacademicia, 2012; 16(1): 36-43.
7. Mondal B, Hansda B, Khatua DC; Sclerotinia rot of *Barleria cristata* in West Bengal. European Journal of Biotechnology and Bioscience, 2014; 2(1): 54-56.
8. Khatua DC, Mondal B, Hansda S, Ray S; Sclerotinia rot of ridge gourd and pointed gourd in lateritic zone of West Bengal, India. Scholars Academic Journal of Biosciences, 2014; 2(4): 251-254.
9. Khatua DC, Pauraia N, Mondal B; Sclerotinia rot of *Ocimum sanctum* and the host range of the pathogen. International Journal of Agriculture, Environment & Biotechnology, 2014; 7(3): 651-656.
10. Khatua DC, Mondal B, Hansda S; White rot of *Coreopsis drummondii* - a new record from West Bengal, India. J. Mycopathol. Res., 2014c; 52(1): 157-158.
11. Hansda S, Ray SK, Dutta S, Khatua DC; Sclerotinia rot in West Bengal. Journal of Mycopathological Research, 2014; 52(2): 2273-278.