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A new record of Southern blight disease of Valeriana in India

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ABSTRACT

The initial symptoms of disease appear as yellowing of the lower outermost leaves subsequently turning brown resulting into severe blight. The plant gave sickly appearance and brown necrotic lesions frequently observed near the soil line in the basal part of the plant. The infected plants gradually withered and white fan shaped mycelial mat appeared on the infected tissues as well as on the surrounding soil. Numerous light brown to dark brown round mustard shaped sclerotia found in abundance attached to the infected plant tissues as well as scattered all over on the nearby soil surface. The infected plants either wilted completely or fell over on the ground and withered away.

Key Words: Blight, fan shaped, sclerotia, *Sclerotium rolfsii*, Valeriana.

INTRODUCTION

Valeriana commonly called as Valerian is a perennial herb of the family Valerianaceae. Several species of genus Valeriana have been reported from Chile, Brazil, South Africa and sub-tropical Asia and among these twelve species occur in India. Historically called the wild nard, Valerian was originally used as stimulant and valued for its odour and food flavouring characteristics (Tyler 1995). The herb is also used as an antispasmodic to treat hysteria and nervous afflictions, an emmenagogne, a carminative and a diuretic, among other uses (Hobbs 1996). It is well known for its sedative and restorative effects on the nervous system and is widely used in herbal and allopathic medicines.

In India, *V. jatamansi* Jones syn. *V. wallichi* known as Indian Valerian (Mushkibala in Hindi) is an important temperate medicinal plant species widely distributed in temperate Himalayas between 1500-3500 m altitude in Himachal Pradesh, Jammu & Kashmir and north eastern states and possesses great potential for commercial cultivation. Another species of Valeriana, *V. officinalis* is also grown on commercial lines by private entrepreneurs in Kullu and Mandi districts of Himachal Pradesh.

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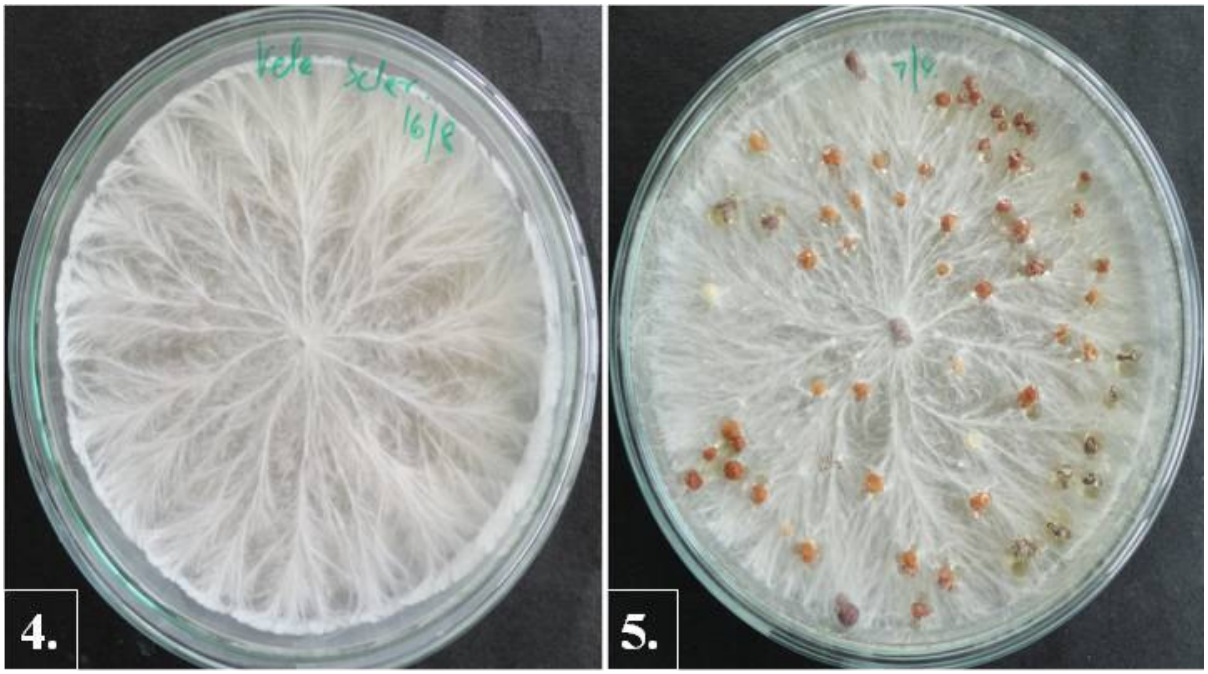
MATERIALS AND METHODS

During a routine survey in June, 2012 a blight disease was observed in private farms growing medicinal plants at Naggar, Seobagh, Jia and Garsa areas in Kullu valley of Himachal Pradesh where an incidence ranging from 5 to 32 percent was recorded. In the following year (2013) the disease appeared in the month of May in these farms with an incidence ranging from 22 to 45 percent (Fig.1). The initial symptoms observed were yellowing of lower outermost leaves of the crown subsequently turning brown and dried from the margin back towards the base (Fig. 2). Water soaked brown necrotic lesions were frequently observed near the soil line in the basal part of the plant. Infected plants gradually withered and white fan shaped mycelial mat appeared on the infected tissues as well as on the surrounding soil surface. The fungus spread rapidly in the tissues and the plant either wilted completely or fell over on the ground due to rotting of stem portion at the base. Numerous light brown to dark brown round mustard seed shaped sclerotia (1-2 mm in dia) were found attached to the infected tissues of the plants as well as scattered all over on the nearby soil surface (Fig.3).

Figs 1-3: 1. Disease in the field; **2** Initial symptoms; **3** Brown necrotic lesions in basal parts with sclerotia on ground.



Figs 4-5: 4. Fan shaped mycelium in culture; **5.** Sclerotia with drop of fluid.

Fig 6. Pathogenecity test-control on left.

The root system of heavily infected or plants harbouring the infection for quite sometime had turned brown and dried completely resulting into complete drying of the plants. The infected stem portions were cut into small bits and surface sterilized using mercury chloride (1:1000) solution for 30 sec. The bits were then washed thoroughly in sterile distilled water three times to remove traces of mercury chloride. The molten warm potato dextrose agar (PDA) medium was poured into sterilised Petri plates and allowed to solidify. The surface sterilised bits were placed on PDA medium. The inoculated plates were incubated at 25±1°C and observed periodically for fungal growth. The pathogenecity of the purified fungus was tested in 5 potted plants grown in sterilized garden soil media by placing 2 discs (5 mm) of 5 days old culture of test fungus growing on PDA near the collar region of each potted plant. Sterile medium discs were placed in another 5 plants to serve as control. For cross inoculation, 2 potted plants of another medicinal plant *Stevia rebaudiana* were also inoculated. All the plants were kept in the open (27±2° C) and observed daily for symptom development.

RESULTS AND DISCUSSION

The repeated isolations on PDA from the infected tissues of the samples drawn from all above mentioned sites revealed the presence of *Sclerotium rolfsii*. In the cultures, a bright white cottony fan shaped mycelial threads, uprising from the apex developed covering whole Petri plate (90 mm) in 7-8 days (Fig.4). After 10 days of incubation at 25±1°C, white, round fuzzy mycelial aggregates started forming which turned into light brown sclerotia 2-3 days later. Initially, sclerotia were small (1-2 mm) light tan brown in colour, changing to dark brown with irregular outer margin having shiny drop of fluid. Within 2-3 days, the sclerotia turned dark brown with smooth periphery and round in shape. The number of such sclerotia scattered all over or distributed around the periphery varied from 87-109 in 90 mm Petri plate and the size of the sclerotia was larger (2-5mm) as compared to the sclerotia found in the fields (1-2 mm) under natural conditions (Fig.5).

In pathogenecity tests, after 5 days of inoculation, the wilting symptoms were observed and after 7 days white aggregates of mycelium were visible on both *Valeriana* (fig.6) as well as *Stevia* plants (Fig.7). Numerous light brown mustard seed shaped sclerotia developed after 9-10 days of incubation. No such symptoms however were observed on the control plants. The same pathogen

Fig 7. Pathogenecity test on *Stevia rebaudiana.*

was reisolated from the symptomatic lesions of inoculated plants to fulfil Koch's postulates.

Sclerotium rolfsii Sacc. state of *Corticium rolfsii* Curzi is considered to be a serious soil borne pathogen affecting several economically important crops (Aycook 1996). Girija and Umamaheswaran (2003) have also reported a wide host range of this pathogen infecting ornamentals and vegetables. Recently, Dadwal and Bhartiya (2011) reported the damping off disease of a medicinal plant Ashwagandha (*Withania somnifera*) caused by *S. rolfsii* from Jabalpur in Madhya Pradesh. The present report of the occurrence of this pathogen on Valeriana however, constitutes the first record (Bilgrami et al. 1991; Jamaluddin et al. 2004; Mukerji and Jayanthi 1986; Sarbhoy et al. 1996) from India.

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