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First report of *Colletotrichum gloeosporioides* on *Pedilanthus tithymaloides* in India

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ABSTRACT

Leaf spot symptoms were observed on the leaves of *Pedilanthus tithymaloides*. The spots were dark red, circular shaped lesions on leaves. The fungus after cultural and microscopic examinations was identified as *Colletotrichum gloeosporioides*. To best our knowledge this is the first report from India showing that *C. gloeosporioides* causes leaf spot disease on *P. tithymaloides.*

Key Words: *Pedilanthus tithymaloides*, leaf spot, *Colletotrichum gloeosporioides*

INTRODUCTION

Pedilanthus tithymaloides Poit. is a short, perennial shrub belongs to the family euphorbiaceae, distributed worldwide. The plant has alternate to sub-opposite, three-to five-lobed with a spiral type of leaf arrangement and possessing bioactive compounds with antibacterial, anti-inflammatory, antidermatitis and hemagglutination properties. The milk form the green parts have been applied to warts, leucoderma, scorpion and centipede bites. (Lim & Soepadmo, 1984; Abreu *et al.* 2008). The plant is extensively used as an ornamental hedge plant through India. Recently, a new leaf spot disease was found on *Pedilanthus tithymaloides* at district Bilaspur of Himachal Pradesh in 2011.

The symptoms on *Pedilanthus tithymaloides* on the leaves initially appeared as a small brown-red, circular spots gradually enlarge with the central part being light brown and dark brown to black margin. The spots were measured in the range 2-8 mm diameter (Fig. 1).

The disease was found to be started in June-July, spreads with the rainy season, when temperatures ranged from 25 - 30°C and lasts up to the end of winter season. No symptoms were observed in summer season.

The leaves showing the typical disease symptoms were cut into small fragments, washed thoroughly in tap water and then surface sterilize with 1% sodium hypochlorite (NaOCl) for 2 min. Then these small leaf fragments were washed three to four times in sterile distilled water. The surface sterilized leaf pieces were then aseptically plated on PDA with streptomycin (50ppm) and incubated at 25±2º C for 7 days under 12 h light and dark conditions. Hyphal tips from the margin of each developing colony were subculture on PDA. The 5-6 days old fungal culture was mounted in fungal stain (lactophenol-cotton blue) and microscopic dimensions were measured.

Figure 1. Leaves of *P. tithymaloides* infected with *C. gloeosporioides*

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Developing colonies on PDA were greyish black, circular, wooly or cottony in appearence (Fig. 3). Microscopic examination revealed that the mycelium is hyaline with simple, short medium sized and erect conidiophores. Acervuli were formed after 18-20 days of inoculation. Conidia were straight with rounded or bulbous ends, hyaline, one celled and dumbbell shaped. The size of conidia varied from 12.5-18×3-5 µm (Fig. 2).Setae were brown and ranged in size from 42-150 × 4-5 µm (Fig. 4). These morphological and microscopic characteristics of the isolate were consistent with the description of *C. gloeosporioides* (Sutton, 1992).

Based on the symptoms, cultural and microscopic characteristics, the fungus was identified as *Colletotricum gloeosporioides*. This identification was also confirmed by Indian Type Culture Collection (ITCC), Indian Agricultural Research Institute, New Delhi, India (ITCC-8606.11).

Pathogenicity of the isolated organism was confirmed on healthy leaf by pin prick method. A spore suspension of 10-day-old cultures grown on PDA at 25^0C under the black light was prepared in sterilized distilled water. The pinpricked leaves ware spray inoculated with spore suspension (10^5 conidia mL^{-1}) of the pathogen till round off. Leaves sprayed with sterile distilled water served as a control. Typical symptoms were produced on the inoculated leaves after four to seven days. The pathogen from the infected leaves was re-isolated and compared with the original pathogen. No symptoms were observed in control leaves.

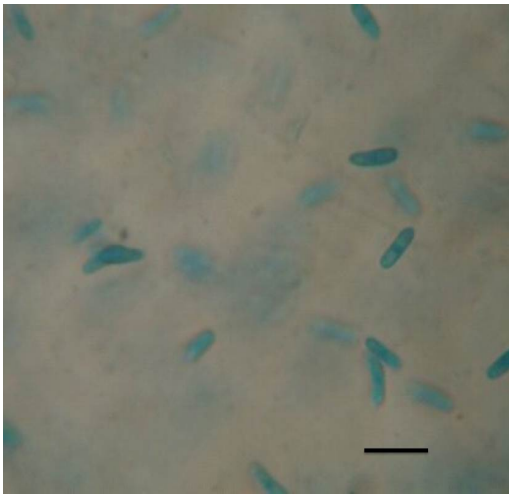

Figure 2. Conidia of *C. gloeosporioides* isolated from an infected leaf of *P. tithymaloides* (bar = 20 µm)

Previously, *Colletotrichum gloeosporioides* has been reported as an anthracnose pathogen of olives (*Olea europaea*) in Australia (Sergeeva *et al.*2008), onion (*Allium cepa*) in Benin (Sikirou *et al.* 2011) and *Garcinia indicia* and in Kokum (Jadhav *et al.* 2009). *C. gloeosporioides* is also widespread pathogen affecting a wide range of hosts, as anthracnose of *Aloe vera* leaves (Avasthi *et al.* 011) and *Jasminum grandiflorum* (Sharma *et al*. 2012) in India. A die back disease of *P. tithymaloides*

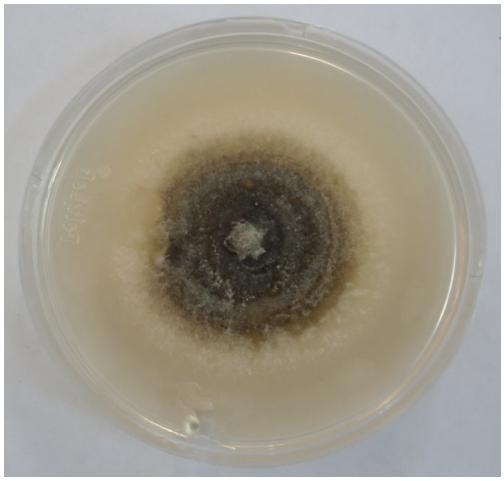

Figure 3. *C. gloeosporioides, s*even-day old culture

has been reported by Singh (1982) in India, but no leaf spot disease has been reported yet. Thus, leaf spot on *P. tithymaloides* caused by *C. gloeosporioides* to the best of our knowledge; is the first report from India and worldwide.

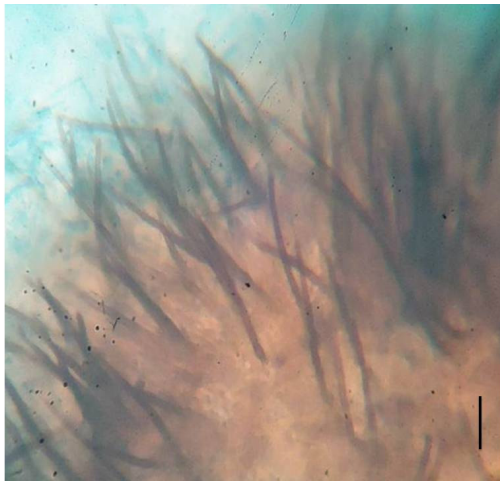

Figure 4. Acervulus of *C. gloeosporioides* with dark coloured setae measure (bar = 20 µm)

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REFERENCES

Abreu PM, Matthew S, Gonzalez T, Vonickova L, Costa D, Gomes A, Segundo AL, Fernandes E. 2008. Isolation and identification of antioxidants from *Pedilanthus tithymaloides*. J Nat Med 62:67-70

Avasthi S, Gautam AK, Bhadauria R. 2011. First report of anthracnose disease of *Aloe vera* caused by *Colletotrichum gloeosporioides.* J Res Biol 6: 408-410

Jadhav SK, Diwakar MP, Sawant UK, Kadam JJ. 2008. Management of leaf spot disease of Kokum *(Garcinia indica)* incited by *Colletotrichum gloeosporioides* Penz. J Pl Dis Sc 3

Lim TK, Soepadmo E. 1984. Eye injury from plant sap of *Pedilanthus tithymaloides Poit.* Singapore Med J, 25:412-419

Sergeeva V, Spooner-Hart R, Nair NG. 2008. *Colletotrichum acutatum* and *C. gloeosporioides* causing leaf spots of olives (Olea europaea) in Australia. Aus Pl Dis Notes 3:143-144

Sharma P, Singh N, Verma OP. 2012. First report of *Colletotrichum gloeosporioides* on *Jasminum grandiflorum* in india. J Pl Prot Res 52: 91-92

Sikirou R, Beed F, Hotègni F, Winter S, Assogba-Komlan F, Reeder R Miller SA. 2011. First report of anthracnose caused by *Colletotrichum gloeosporioides* on onion (*Allium cepa*) in Benin. New Dis Rep 23:7

Singh J. 1982. Die back of *Pedilanthus tithymaloides*. Ind J Mycol Pl Pathol 12:207

Sutton BC. 1992. The genus *Glomerella* and its anamorph *Colletotrichum.* p. 1–27. In: "*Colletotrichum* Biology, Pathology and Control" (J.A. Bailey, M.J. Jeger, eds.). CABI, Wallingford, UK, 388 pp.