

## Short Communication

## New record of twig blight on *Catharanthus roseus* in India

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**During post rainy season 2011, twig blight disease symptoms were observed on *Catharanthus roseus*. Symptoms appeared as dark brown to black girdling lesions on the twigs. Acervuli containing masses of spores and dark setae were observed within lesions. On the basis of fungal morphology and completion of Koch's postulates, the pathogen was identified as *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc.**

**Key words:** Twig blight, *Catharanthus roseus*, *Colletotrichum gloeosporioides*

### INTRODUCTION

Periwinkle or Vinca [*Catharanthus roseus* (Linn.) G. Don. syn. *Vinca rosea* Linn.] belongs to the family Apocynaceae. It is an erect highly branched lactiferous perennial herb which is a chief source of patented cancer and hypotensive drugs. Flowers are borne on axils in pairs. It is one of the very few medicinal plants which have a long history of uses. *C. roseus* has more than 400 known alkaloids in its different parts. The alkaloids like antineoplastindimeric, vinblastin and vincristine are mainly present in aerial parts, whereas ajmalicine, vinceine, vincamine, raubasine and reserpine are present in roots and basal stem. The dimeric indole alkaloids from *C. roseus* are mainly used for treatment of various human cancers. Pharmaceutical industry use it for the treatment of childhood leukemia, Hodgkin's disease, testicular cancer and cancerous tumors. *C. roseus* is one of the very few medicinal plants which have a long history of uses as diuretic, antidysenteric, hemorrhagic and antiseptic agent. It is known for use in the treatment of diabetes in Jamaica and India. Prevention of cancer, cancer treatment, anti-diabetic, stomachic, reduces high blood pressure, externally against nose bleeding, sore throat and mouth ulcers (Graf et al., 1996; Kirtikar and Basu, 1993; Narayana and Dimri, 1990).

After post-rainy season, an estimated 65-80% of the *C.*

*roseus* surveyed in Bharatpur and Jaipur, India, were infected with twig blight. Symptoms first appeared as dark brown to black girdling lesions on the twigs. When lesions occurred at the ground line, the entire runner died. Where healthy twigs touched the soil or infected plant parts, new lesions were developed. Within a few weeks, the disease was spread to stems and leaves and caused large sections of the bed to die (Figure 1). As long as cool, damp conditions remain, the disease spreads in the planting. The spores of the fungus disseminate primarily by splashing and flowing water. Acervuli containing masses of spores and dark setae were observed within lesions.

### MATERIALS AND METHODS

#### Collection of disease samples and isolation

Diseased samples were collected from *C. roseus* plants in different localities in Bharatpur (77°27'E, 27°12'N, 178.13 MASL) and brought to the laboratory for isolations. Infected tissues were cut into small (approximately 5 mm<sup>2</sup>) pieces with sterilized scalpel and surface sterilized for 20 s in 95% ethanol followed by 60 s in 0.525% NaOCl. These tissues were washed thrice with sterilized distilled water and aseptically transferred onto 2% (w/v) autoclaved potato dextrose agar (PDA; Merck, Germany) containing 50 mg/l



**Figure 1.** Stem blight symptoms on *Catharanthus roseus*.

streptomycin sulphate (Sigma, St. Louis, USA) medium in Petri plates. Inoculated Petri plates were incubated in the BOD at  $25 \pm 2^\circ\text{C}$  for seven days in the dark (Sharma et al., 2011a). Microscopic examination was conducted by mounting fungal tissue in water and lactophenol, and dimensions of 50 each conidia and conidiophores were measured from 7 days old cultures with the help of Pro-image analyser attached with light microscope (Olympus, Japan BX 51).

#### Pathogenicity test

Pathogenicity was tested by completion of Koch's postulates (Sharma et al., 2012a, 2013). Conidia obtained from 7-day-old PDA culture were suspended in sterile distilled water (SDW) to  $10^4$  conidia/ml. 20 plants (45-days old) were sprayed with conidial suspension (50 ml on each) until runoff with hand sprayer. Plants were covered with plastic bags for 48 h and kept at  $24 \pm 2^\circ\text{C}$ . After 7 days, lesions were developed on inoculated leaves. The fungus was re-isolated from acervuli that developed on the twigs and leaves, following previously outlined procedures. Inoculation tests were repeated once. The control plants sprayed with SDW did not show any symptoms. The morphological and cultural characteristics of the re-isolated pathogen were compared with the original pathogen. The fungus was identified from all infected twig samples.

## RESULTS AND DISCUSSION

Developing colonies were extremely variable, effuse, grey to brown and reverse dark brown. The teleomorph was observed as small black dots (perithecia) immersed in the centers of older colonies (more than 35 days old).

Conidia were borne on elongated phialides in acervular conidiomata. Conidia were straight, one-celled, hyaline, oblong, or cylindrical, slightly curved with truncate base and rounded apex and measured  $15.0$  to  $22.5 \times 3.0$  to  $5.5 \mu\text{m}$  in size. These morphological characteristics of the isolate were consistent with the description of *C. gloeosporioides* (Penz.) Penz. & Sacc. (Cannon et al., 2008). The Fungal Identification Service, Mycology and Plant Pathology Group, Agharkar Research Institute, Pune, India (Accession No. NFCCI 2650) confirmed the identity.

Leaf spots and stem lesions on common periwinkle caused by *C. gloeosporioides* were reported by Koelsch et al. (1995). However, twig blight of *C. roseus* was also earlier reported to be caused by *Colletotrichum dematium* (Pers.) Grove. (McMillan and Graves, 1996). *C. gloeosporioides*, causing leaf blight on many plants has been reported from India (Jamaluddin et al., 2004). The pathogen causes anthracnose on *Saraca asoca* (Sharma et al., 2011b) *Jasminum grandiflorum* (Sharma et al., 2012b), onion (Sikirou et al., 2011) and olive (Ali et al., 2010). *C. gloeosporioides* also causes banana fruit rot (Jat et al., 2013). This is the new record of *C. gloeosporioides* causing twig blight of *C. roseus* as per the literature cited in India (Bilgrami et al., 1991; Jamaluddin et al., 2004). Since *C. roseus* foliage is a good medicinal value plant, the disease damaging its foliage deserves special attention.

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