J Gen Plant Pathol (2007) 73:377–378
DOI 10.1007/s10327-007-0033-9

DISEASE NOTES

First report of leaf blight disease of *Gloriosa superba* L. caused by *Alternaria alternata* (Fr.) Keissler in India

Chandan Kumar Maiti · Surjit Sen · Amal Kanti Paul · Krishnendu Acharya

Received: 2 February 2007 / Accepted: 23 March 2007 / Published online: 24 July 2007
© The Phytopathological Society of Japan and Springer 2007

Abstract Leaf blight disease was found on *Gloriosa superba* L. (Liliaceae), an endangered, herbaceous, perennial, climbing lily that produces colchicine, in West Bengal, India in 2004. Small brownish spots on leaves developed into concentric rings, which eventually darkened and coalesced to blight the entire leaf. The causal fungus was morphologically identified as *Alternaria alternata* (Fr.) Keissler. This is the first record of *A. alternata* on *G. superba.*

Keywords *Gloriosa superba* · Leaf blight · *Alternaria alternata*

Introduction

Gloriosa superba L. (glory lily, Liliacea) is an endangered, herbaceous, perennial, climbing medicinal plant found throughout India. Colchicine is the major compound isolated from the seed and rhizome of this plant (Sarin et al. 1974). It has abortifacient, anti-pyretic, anti-inflammatory and anti-leprotic properties (Guhabakshi et al. 2001). A leaf blight disease of this plant was observed during 2004–2006 in different areas of lower Gangetic plains of West Bengal, India. Recorded losses were estimated to be 65–80% per annum.

C. K. Maiti · S. Sen · A. K. Paul · K. Acharya (✉)
Molecular and Applied Mycology and Plant Pathology Laboratory, Department of Botany, University of Calcutta, 35, Ballygunge Circular Road, Kolkata 700 019, India
e-mail: krish_paper@yahoo.com

Symptoms

A leaf blight disease of this plant was observed during June to September (temperature 31 ± 2°C). Early symptoms appeared as small, circular to oval, light brownish spots (25–38 mm), 2–6 per leaf, scattered at the tip, margin, and midrib of the leaves. Subsequently, the spots enlarged and usually developed into a concentric ring. At an advanced stage, the spots became dark brown to blackish in colour, gradually coalesced and became irregular in shape, then the affected leaf blighted completely (Fig. 1a–c).

Identification of the pathogen

A fungus was consistently isolated from the blighted leaf on potato dextrose agar (PDA) as a pure culture (Fig. 1d). The fungus produced abundant branched, brownish, septate mycelia; conidia were found on leaf peels and scrapings, in cleared leaves and in vertical sections of leaves. Conidial size varied from 17.5–52.5 × 8.5–16 μm, with 3–5 transverse septa (Fig. 1e). Characteristics of conidia from cultures were similar to those of conidia isolated from infected plants. Based on the morphological characters, the organism was identified as *Alternaria alternata* (Fr.) Keissler (Ellis 1971), and the identification was confirmed by the Agharkar Research Institute, Pune, India.

Pathogenicity test

Leaf disks (14 mm) were surface sterilized (0.5% sodium hypochlorite for 2 min), then placed on 0.5% water agar containing 1 μg/ml of benzylaminopurine (Ash and Lanoiselet 2001). They were then inoculated with 10 μl of

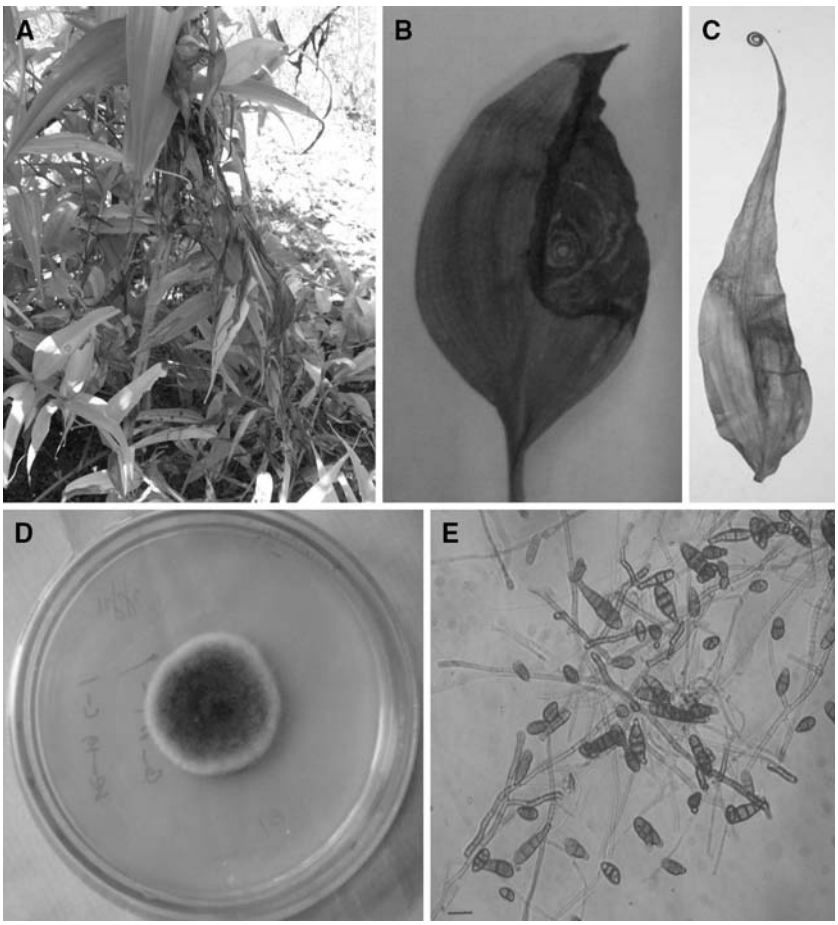

Fig. 1 **a** Leaf blight disease of Glory lily (*Gloriosa superba* L.) at an advanced stage, naturally infected with *Alternaria alternata*. **b** Close-up of a naturally infected leaf with clear *concentric rings*. **c** Blighted leaf at advanced stage. **d** 72 h old colony of *A. alternata* on PDA. **e** Mycelia and conidia of *A. alternata* isolated from a leaf lesion. *Bar* = 25 μm

a conidial suspension (10^4 conidia/ml sterile distilled water). A control leaf disk was inoculated with sterile distilled water. The leaves were incubated at 25°C for 4–5 days. After 5 days, typical target spot symptoms developed on the inoculated disks. *A. alternata* was reisolated from such disks.

Acknowledgments Authors are thankful to the Ramakrishna Mission Ashrama, Narendrapur, India for providing facilities to perform field experiments in their Medicinal Plant Garden and to the Directorate of Food Processing Industries and Horticulture, Govt. of West Bengal, India for financial assistance.

References

Ash GJ, Lanoiselet VM (2001) First report of *Alternaria alternata* causing late blight of pistachio (*Pistacia vera*) in Australia. Plant Pathol 50:803

Ellis MB (1971) Dematiaceous Hyphomycetes. Commonwealth Mycological Institute, Kew

Guhabakshi DN, Sensharma P, Paul DC (2001) In: A lexicon of medicinal plants in India. Naya Prakash, Calcutta, vol. 2. pp 262–264

Sarin YK, Jamwal PS, Gupta BK, Atal CK (1974) Colchicine from the seeds of *Gloriosa superba*. Curr Sci 43:87–90