Amphobotrys ricini causing gray mold on *Acalypha herzogiana* in Brazil

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Abstract *Amphobotrys ricini* is reported for the first time causing gray mold on the ornamental plant *Acalypha herzogiana*. This new host-pathogen association record is based on collections made at two localities in Brazil. Morphology of the fungus is described herein and its pathogenicity to *A. herzogiana* and *Ricinus communis* was demonstrated.

Keywords *Acalypha reptans* · Alternative host · *Botryotinia ricini* · Castor diseases

Amphobotrys ricini (N.F. Buchw.) Hennebert is the aetiological agent of the gray mold of castor (*Ricinus communis* L.) and although it was thought, since Godfrey's (1923) seminal work, that this fungus was specific to castor a series of reports have been published since the 1980's of *A. ricini* attacking other euphorbiaceous hosts (Soares 2012), including three recent records on *Acalypha* spp. (Lima et al. 2008; Coutinho et al. 2012; Yu et al. 2012).

During surveys for *A. ricini* isolates in South and Southeast Brazil, gray mold symptoms were observed on an yet unreported host for *A. ricini*, namely, the ornamental plant *Acalypha herzogiana* Pax & K. Hoffm. This plant is frequently grown in hanging baskets or as groundcover and although frequently misidentified as *A. reptans* Sw., its popularity raised to a level comparable with *A. hispida* Burm. f. and *A. wilkesiana* Müll. Arg. in the last two decades

(Steinmann and Levin 2011). In Brazil it is known as acalifasteira or rabo de gato, in France as acalyphe, ricinelle and queue de chat, while in the United States it is called strawberry foxtail, red firetail, dwarf cat tail, among several others (Steinmann and Levin 2011).

Diseased plants were observed in the municipalities of Progresso (state of Rio Grande do Sul) and Viçosa (state of Minas Gerais), during February and May 2012, respectively. Powdery gray colonies were seen associated with blight symptoms on inflorescences and leaves (Fig. 1a–b), and readily recognized as typical of gray mold. Samples from both sites were collected and dried in a plant press and representative specimens were deposited at the Herbarium of the Universidade Federal de Viçosa (accession numbers VIC 39107 and VIC 39108).

Isolation of the fungus from both samples was performed by direct transfer of fungal structures, with the help of a sterile needle, onto plates containing V8 juice-agar medium. Two isolates, being one of each locality, were deposited in the culture collection of the Universidade Federal de Viçosa (Coleção Octávio de Almeida Drummond) under the accession numbers COAD 1332 and COAD 1333.

Slides were prepared by scraping fungal structures from infected material and also from culture plates and mounting in lactic acid and lacto-fuchsin and examined under a DM2500 Leica microscope.

The fungus had typical morphology of *A. ricini*, the asexual stage of *Botryotinia ricini* (Godfrey) Whetzel: light brown conidiophores, reaching more than 1,000 µm, branching dichotomously and producing globose, 6–10 µm, subhyaline to light brown conidia, maturing simultaneously on terminal, not inflated conidiogenous cells and also forming black, plane-convex sclerotia on culture media.

Although recently Coutinho et al. (2012), based on ITS sequences, suggested the possibility of cryptic taxa within *A. ricini*, the genus *Amphobotrys* remains monotypic and a

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Fig. 1 Gray mold caused by *Amphobotrys ricini* on *Acalypha herzogiana*. General view of *Acalypha herzogiana* plants with inflorescence blight (a). Close-up of *Acalypha herzogiana* inflorescence and leaf blight with profuse fungal sporulation (b). Symptoms at three (c–d) and eight (e–f) days after the inoculation with *Amphobotrys ricini* on *Acalypha herzogiana* and *Ricinus communis*, respectively

wider study is necessary to corroborate or refute such hypothesis. Based on a ongoing study it appears unlikely that cryptic species exist within *A. ricini*, because among more than 200 isolates of *A. ricini* obtained from castor plants through Brazil, and also other euphorbiaceous hosts, it was observed a wide degree of morphological and cultural variability, with some isolates obtained from the same plant having very distinct characteristics, while some isolates obtained from plants more than 3,000 km each other were almost identical (D.J. Soares, data not published).

Pathogenicity of the isolate from *A. herzogiana* was tested on this plant and also on castor. Inoculum consisted of a conidial suspension using sterilized distilled water plus 0.5 % of Tween 80, of isolate COAD 1332 cultivated on malt extract-agar for 7 days in an incubator adjusted to 24 ± 1 °C and 12 h photoperiod. The suspension was adjusted to 2×10^5 spores.ml⁻¹ and sprayed on the plants until runoff. After inoculation the plants were maintained in a moisture chamber for 72 h and then transferred to a glasshouse. Mean maximum and minimum temperature and relativity humidity, as recorded with a Hobo® U12 datalogger, during the pathogenicity test were 27 and 18 °C and 99 and 75 %, respectively. Three healthy *Acalypha herzogiana* plants were inoculated at the

flowering stage, whereas three castor plants, with 30 to 40 days olds, were inoculated spraying its healthy leaves. The first symptoms appeared 3 days after inoculation as light discolorations of *A. herzogiana* inflorescences and as little brown spots in the castor leaves (Fig. 1c–d). Eight days after inoculation severe inflorescence and leaf blight were observed accompanied by profuse fungal sporulation on both hosts (Fig. 1e–f).

Although the ability of *A. ricini* to infect *A. herzogiana* (misidentified as *A. reptans*) was first demonstrated through artificial inoculation by Lima et al. (2008) this is the first report of its natural occurrence on *A. herzogiana*, demonstrating that results obtained by those authors were not a laboratory artifact. The increasing list of euphorbiaceous hosts for *A. ricini* is of great concern for gray mold management in expanding castor plantations in Brazil, since the ability of the fungus to survive on ornamentals and weeds belonging to the Euphorbiaceae in the absence of the castor crop renders its management more challenging.

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