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CERCOSPORA APII CAUSING LEAF SPOTS ON TWO BRAZILIAN TOXIC WEEDS: *SOLANUM GLAUCOPHYLLUM* AND *XANTHIUM STRUMARIUM*

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SHORT COMMUNICATION

ABSTRACT

Samples of two toxic weeds, *Solanum glaucophyllum* and *Xanthium strumarium*, bearing leaf spots symptoms were found. *Cercospora apii* was found associated to these leaf spots in both plants. These are the first reports of this fungus on these hosts in Brazil and its first report on *S. glaucophyllum* worldwide.

Keywords: Asteraceae, biological control, leaf spot, plant disease, plant pathology, Solanaceae

Pathogenic fungi have been studied since the 1980s as a potential source of biological agents to be used against weeds native from Brazil (1,2,3,12,14)

Solanum glaucophyllum Desf. (=*S. malacoxylon* Sendt.) (Solanaceae), known as "espichadeira" in Brazil, is a South American shrub, that has a great importance as a toxic weed and is particularly feared by cattle ranches in the Paraguay Basin (Pantanal of Mato Grosso). Chronic intoxication by consumption of this plant causes calcinoses, (calcification on organs including cartilages and tendons), particularly in cattle, hindering the locomotion of these animals and leading to paralysis of the joints and death. This kind of intoxication can affect up to 20% of animals in infested regions. There is no treatment for such a condition. The plant is capable of producing new branches after stems are cut, which make eradication very difficult (11).

Xanthium strumarium L. (Asteraceae), known as "carrapicho-de-carneiro" in Brazil, is native to the American continent and, has a world wide distribution, especially in subtropics and temperate regions. It is a very important weed, particularly in wool production regions for the damage caused by its burrs. It also causes intoxication in animals. In Brazil it is particularly noxious in Rio Grande do Sul (10). Little is known about pathogenic fungi occurring on these two weeds. Diseased plants of *S. glaucophyllum* and *X. strumarium* were collected in Corumbá (MS) and Ronda Alta (RS), respectively. Such plants were attacked by a leaf spot fungus preliminarily identified as a cercosporoid fungi. Samples were taken to the laboratory for further examination. Slides containing fungi structures were mounted with lactophenol and lactofucsin. Structures were measured and compared to those of other fungi found in Solanaceae that also belong to *Cercospora*. Study of the morphology of both fungi led to the conclusion that both belonged to the same species – *Cercospora apii* Fresen. (*sensu lato*). Morphology of the fungus was illustrated for the specimens obtained from *S. glaucophyllum* (Fig. A-B) and *X. strumarium* (Fig. C-D) and the morphology of the fungus on each host is described below.

Cercospora apii on *S. glaucophyllum*: conidiophores fasciculate, cylindrical, 3.0-5.0 x 54.5-142.5 µm, 3-8 septate, brown, smooth; conidiogenous cells subcylindrical, somewhat geniculate, holoblastic, 2.5-4.5 x 12.0-44.5 µm; conidiogenous loci 1.5-3.0 µm diam, darkened and thickened; conidia cilindric to filiform, 2.0-4.0 x 44.5-95.0 µm, 1-9 septate, base truncate 2.0-3.0 µm diam, apex sub-acute, hyaline.

Cercospora apii on *X. strumarium*, as above, but with the following morphologic (mainly biometric) differences: conidiophores 3.5-5.5 x 60.0-227.5 µm, 1-8 septate; conidiogenous cells 3.5-5.5 x 18.5-65.0 µm; conidiogenous loci 2.0-4.0 µm diam; conidia 2.0-4.5 x 36.5-262.5 µm, 5-24 septate, base with 2.0-4.0 µm diam.

The specimen on both hosts was compared with other fungi belonging to *Cercospora* (5,6) and it became clear that both fit well in the broad concept now accepted for *C. apii*. The report

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of *C. apii* on *X. strumarium* is novel for Brazil. Such host-pathogen association was previously known only from Cuba, India, Pakistan and USA (6). *C. apii* is here reported on *S. glaucophyllum* for the first time.

Fungal pathogens have a well demonstrated potential as biological control agents (7) for weeds. *Cercospora* and related genera are among fungal pathogens that have been evaluated and used in weed biological control [e.g: *Cercospora echii* Winter, *Cercospora piaropii* Tharp, *Phaeoramularia eupatorii-odorati* (Yen) Liu & Guo (8); *Cercospora caricis* (4,13)] but there are no records of the use of *C. apii*. It seems that under its present concept *C. apii* is a collective species containing both host specific and polyphagous forms and its use in weed control would require a thorough evaluation of host-range of any isolate. Defoliation of *S. glaucophyllum* in the field resulting from the attack of *C. apii* appeared to be severe whereas damage to *X. strumarium* did not appear very significant. The inundative/mycoherbicidal approach (9) would be more appropriate for biocontrol of *S. glaucophyllum* in Brazil but propagules of cercosporoid fungi are notoriously difficult to mass-produce and, therefore, it would probably be difficult to develop a mycoherbicide with *C. apii*. Its use in classical approach (9) against *X. strumarium* might be of interest in case a virulent and host-specific strain is found.

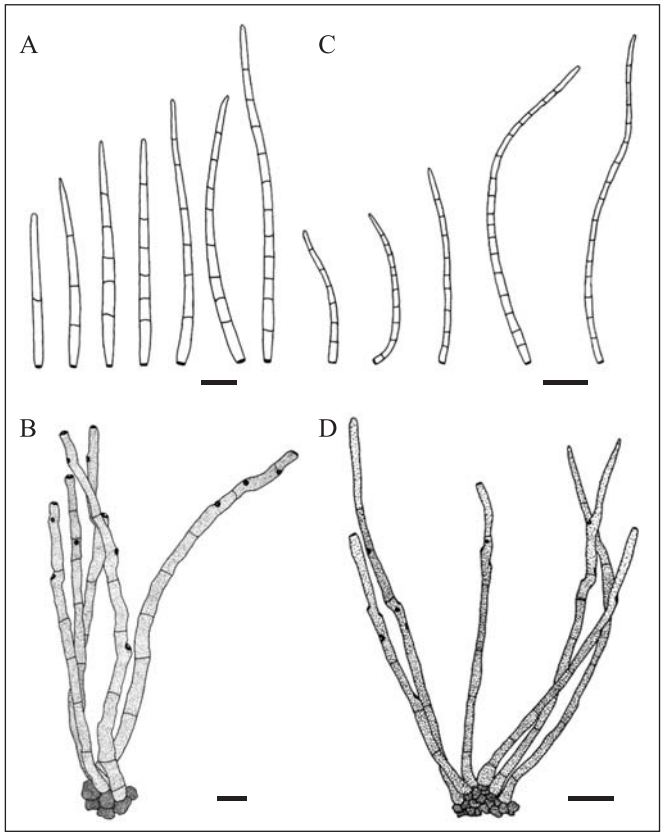

Figure A-B. Conidia and conidiophores of *Cercospora apii* on *Solanum glaucophyllum.* Bar = 10 µm. Fig. **C-D**: Conidia and conidiophores of *C. apii* on *Xanthium strumarium.* Bar = 25 µm.

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RESUMO

Cercospora apii causando manchas foliares em duas plantas tóxicas no Brazil: *Solanum glaucophyllum* e *Xanthium strumarium*

Foram encontrados plantas das espécies *Solanum glaucophyllum* e *Xanthium strumaruium* apresentando sintomas de manchas foliares. *Cercospora apii* foi encontrado associado lesões foliares em ambas as plantas. Estes são os primeiros relatos desse fungo nestes hospedeiros no Brasil e o primeiro relato de sua ocorrência em *S. glaucophyllum* no mundo.

Palavras-chave: Asteraceae, controle biológico, doenças de plantas, fitopatologia, mancha foliar, Solanaceae

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