

## An updated list of plant fungi from Ceará State (Brazil) - I Hyphomycetes<sup>1</sup>

Lista atualizada dos fungos de plantas do Estado do Ceará (Brasil) – I Hifomicetos

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**Abstract** - This study aims to provide an updated list of fungi occurring on plants in the State of Ceará (Brazil). A total of 48 genera and 226 species of fungi has been listed on plants of 71 different botanical families. The first group to be presented is the hyphomycetes, amongst which those species belonging to the genera *Acremonium*, *Beltrania*, *Camptomeris*, *Cercospora*, *Graphium*, *Mammaria*, *Nigrospora*, *Oidiopsis*, *Ovulariopsis*, *Phaeotrichoconis*, *Passalora*, *Pseudocercospora*, *Semipseudocercospora*, *Scolecostigmina*, *Spiniger*, *Stenella*, *Stigmata*, *Zanclospora* and *Zygosporium* are recorded for the first time for this state. The species *Passalora cnidoscolicola*, *P. jatrophi*, *P. pavoniicola*, *P. pulchella*, *Pseudocercospora amazoniae*, *P. brasiliensis*, *P. cochlospermi*, *P. cotizensis*, *P. davalliae*, *P. daturina*, *P. eustomatis*, *P. froelichiae*, *P. gangetici*, *P. gardeniae*, *P. guazumae*, *P. ixoriae*, *P. jahnii*, *P. kurimensis*, *P. hybanthi*, *P. jacquemontiae*, *P. schrankiicola*, *P. ubajarensis*, *P. variabilis*, *Semipseudocercospora aeschynomenes*, *Stenella hiamanthi* and *S. pavoniae* are new to Brazil. New host plants for *Cercospora apii* and for other fungi are presented. The challenge of collecting and identifying fungi in the different ecological habitats of Ceará State is discussed.

**Index terms:** hyphomycetes, fungi of Ceará State, Brazil, new fungal species and hosts.

**Resumo** - O presente trabalho tem como objetivo apresentar uma lista atualizada dos fungos ocorrentes em plantas no Estado do Ceará. Um total de 48 gêneros e 226 espécies fúngicas é registrado sobre plantas de 71 famílias botânicas distintas. O primeiro grupo estudado é o dos hifomicetos. Todas as espécies pertencentes aos gêneros *Acremonium*, *Beltrania*, *Camptomeris*, *Cercospora*, *Graphium*, *Mammaria*, *Nigrospora*, *Oidiopsis*, *Ovulariopsis*, *Phaeotrichoconis*, *Passalora*, *Pseudocercospora*, *Semipseudocercospora*, *Scolecostigmina*, *Spiniger*, *Stenella*, *Stigmata*, *Zanclospora* e *Zygosporium* são registrados pela primeira vez no Estado do Ceará. As espécies *Passalora cnidoscolicola*, *P. ixoriae*, *P. jatrophi*, *P. pavoniicola*, *P. pulchella*, *Pseudocercospora amazoniae*, *P. brasiliensis*, *P. cochlospermi*, *P. cotizensis*, *P. davalliae*, *P. daturina*, *P. eustomatis*, *P. froelichiae*, *P. gangetici*, *P. gardeniae*, *P. guazumae*, *P. ixoriae*, *P. jahnii*, *P. kurimensis*, *P. hybanthi*, *P. jacquemontiae*, *P. schrankiicola*, *P. ubajarensis*, *P. variabilis*, *Semipseudocercospora aeschynomenes*, *Stenella hiamanthi* e *S. pavoniae* são pela primeira vez identificadas no Brasil. Diversas plantas são registradas pela primeira vez no Brasil como hospedeiras do fungo *Cercospora apii*, bem como de outras espécies fúngicas. A importância de se coletar e identificar os fungos ocorrentes nos diversos habitats do Estado do Ceará é discutida.

**Termos para indexação:** hifomicetos, fungos ocorrentes no Estado do Ceará, Brasil, novas espécies fúngicas e novas plantas hospedeiras.

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## Introduction

Although located in the semi-arid northeastern region of Brazil, several types of vegetation, including mangrove, caatinga, a transition vegetation and the evergreen vegetation of hilly areas are found in Ceará State. Information on the occurrence of fungi living on plants in Ceará State is meagre. Few papers deal with this important subject, and usually they include only fungi associated with well known plant diseases. Most of the identifications have been made based upon the host plant, without a critical morphological examination of the fungus itself. Many of the species names are obsolete or have changed (Ponte, 1996; Vasconcelos, 1965; 1969; 1971). Above all, the entire complex of cercosporoid genera has been strongly revised, based on molecular data together with a reassessment of morphological features and conidiogenesis (Crous and Braun, 2003). Only the rusts (Uredinales) have been thoroughly studied (Almeida and Freire, 1981; Almeida, 1988).

A taxonomic survey of fungi associated with plants of the Ceará State has been in progress since 1997. Other updated information on some fungi on plants from Ceará State have been published elsewhere (Ponte and Freire, 1972; Freire, 1997; 1998; 1998a; 1999; Freire et al., 1999; Freire and Bezerra, 2001; Braun et al., 1999; Braun and Freire, 2002; 2004). However, not only are the fungi from Ceará State inadequately known, but also those from other Brazilian states. The purpose of this paper is to update already published information as well as to present new fungal taxa recently described associated with plants of Ceará State.

## Material and Methods

Unless otherwise stated, all the new taxa collections have been made by the author in different areas of Ceará State but mainly in Cascavel county. Infected material (leaves, fruits or branches) were taken to the Plant Pathology laboratory of Embrapa Agroindústria Tropical, in Fortaleza city. Duplicates were distributed to the Martin-Luther-University, Institute of Geobotany, Herbarium, Halle, Germany (**HAL**) and in the mycological herbarium of CABI Bioscience UK Centre - Egham, England (**IMI**). Additional specimens have been retained in the author's personal Herbarium (HFF), in Fortaleza City, Ceará State (Brazil). Only those taxa examined and authenticated by mycological experts are listed in the present work. Fungal genera and species are alphabetically arranged, followed by the host name (or substratum). The present study encompasses a total of 71 different botanical families, including cultivated, non-cultivated, ornamental and medicinal species.

## Results and Discussion

The first part of the results of the survey of fungi associated with plants are presented here in Table 1. A total of 48 genera and 226 species of fungi has been listed from plants of 71 different botanical families. The list comprises records of hyphomycetous conidial fungi which are generally asexual states of Ascomycota or Basidiomycota. Those species marked with an asterisk (\*) represent new occurrence either to Ceará State or to Brazil. Those numbered (1) have just their names updated. Despite the small area surveyed the diversity of host plants is remarkable as demonstrated by the high number of phytopathogenic fungi found. Among the hyphomycetes listed all species belonging to the genera *Acremonium*, *Beltrania*, *Camptomeris*, *Cercospora*, *Graphium*, *Mammaria*, *Mycovellosiella*, *Nigrospora*, *Phaeotrichoconis*, *Oidiopsis*, *Ovulariopsis*, *Passalora*, *Pseudocercospora*, *Semipseudocercospora*, *Scolecostigma*, *Spiniger*, *Stenella*, *Stigmata*, *Zancluspora* and *Zygosporium* are reported here for the first time as occurring in Ceará State. The species *Passalora cnidoscolicola*, *P. jatrophigena*, *P. pavoniicola*, *P. pulchella*, *Pseudocercospora amazoniae*, *P. brasiliensis*, *P. byrsonimatis*, *P. cochlospermi*, *P. cotizensis*, *P. daturina*, *P. davalliae*, *P. eustomatis*, *P. froelichiae*, *P. gangetici*, *P. gardeniae*, *P. guazumae*, *P. hybanthi*, *P. ixoriae*, *P. jacquemontiae*, *P. jahnii*, *P. kurimensis*, *P. ubajarensis*, *P. variabilis*, *Semipseudocercospora aeschynomenes*, *Stenella hiamanthi* and *S. pavoniae* are new to Brazil.

The plants *Amaranthus* sp., *Angelonia* sp., *Anthurium* sp., *Carica papaya*, *Chamaecrista* sp., *Chenopodium ambrosioides*, *Citrullus vulgaris*, *Cucumis melo*, *Gerbera jamesonii*, *Hydrocotyle* sp., *Malpighia emarginata*, *Momordica charantia*, *Physalis* sp., *Senna alata*, *S. occidentalis*, *Spigelia anthelmia*, *Tagetes* sp., *Vigna unguiculata*, *Verbena* sp., *Vitex agnus-castus*, *Wedelia paludosa* and *Zinnia elegans* are listed here for the first time as hosts of *Cercospora apii* in Brazil. So far only *Apium graveolens* has been reported as a host for this species in Brazil (Mendes et al., 1998). *Cercospora apii* comprises a large complex of morphologically indistinguishable *Cercospora* taxa with a wide range of hosts. This fungus is normally found on host leaves as long, brown, solitary to fasciculate conidiophores with darkened conidiogenous loci. The conidia are acicular, hyaline, pluriseptate and are formed singly (Crous and Braun, 2003).

The plants *Aeschynomenes hystrix*, *Annona cherimola* x *A. squamosa*, *Chamaecrista* sp., *Davallia fejeensis*, *Indigofera hirsuta*, *Macroptilium lathyroides*, *Mitracarpus* sp., *Phoradendron* sp., *Senna georgica*,

*Tocoyena* sp., *Brugmansia suaveolens*, *Cochlospermum vitifolium*, *Bauhinia* sp. and *Chiococca alba* are reported respectively as new hosts for the fungi *Semipseudocercospora aeschynomenes*, *Pseudocercospora annonae-squamosae*, *Cladosporium cassiae-surathesis*, *Pseudocercospora davalliae*, *Passalora pulchella*, *Pseudocercospora cruenta*, *P. borrieriae*, *P. struthanthi*, *P. nigricans*, *P. gardeniae*, *P. daturina*, *P. cochlospermi* *Stigmina phaeocarpa* and *Zanclospora* sp. in Brazil.

All species of *Aspergillus* and *Penicillium*, except *P. digitatum*, *P. expansum* and *P. italicum*, have been isolated from cashew kernels. The fungi *A. alternata*, *Aureobasidium pullulans*, *Corynespora cassicola*, *Curvularia lunata*, *C. senegalensis*, *Cladosporium sphaerospermum*, *C. cladosporioides*, *Fusarium solani*, *Hendersonula* sp., *Lacelinopsis* sp., *Nigrospora oryzae*, *Pseudocercospora punicae*, *Pithomyces* sp., *Scytalidium* sp., *Sporothrix* sp. and *Torula herbarum* f. *quaternella* were detected during a survey of foliar endophytes. It is evident that endophytes represent another rich source of as-yet unstudied and, possibly, undescribed species (Freire and Bezerra, 2001).

Most the species listed here associated with diseases of cultivated plants had already been reported by Batista and co-workers in other states of the Brazilian northeastern region. Such information has been compiled by Silva and Minter (1995) and by Mendes et al. (1998). A recently discovered species of *Dichotomophthora* will be published elsewhere.

The large number of ecologically diverse habitats that occur in Ceará State may potentially support specialized and unique fungi hitherto undescribed. On the other hand, large areas of the countryside are disappearing rapidly as a result of house-building, road-building and other unsustainable human activities, leading to serious problems of deforestation and, consequently, to the loss of many fungal species and other organisms. The dwindling number of mycologists and the limited financial support available from governments and other funding agencies pose great difficulties to the few scientists who need to investigate the large percentage of undescribed species. To collect and identify the rich fungal biodiversity is an exciting challenge and an urgent task.

**Table 1** - Hyphomycetes from plants of Ceará State (Brazil).

<i>Acremonium roseolum</i> (G. Sm.) W. Gams*	On kernel of <i>Anacardium occidentale</i>
<i>Alternaria alternata</i> (Fr.) Keissl.*	On kernel of <i>A. occidentale</i> and as foliar endophyte
<i>Alternaria dauci</i> (J.G. Kühn) J.W. Groves & Skolko	On leaves of <i>Daucus carota</i>
<i>A. ricini</i> (Yoshii) Hansf.	On leaves of <i>Ricinus communis</i>
<i>Asperisporium caricae</i> (Speg.) Maubl.	On leaves and fruits of <i>Carica papaya</i>
<i>Aspergillus candidus</i> Link*	On kernel of <i>A. occidentale</i>
<i>A. clavatus</i> Desm.*	On kernel of <i>A. occidentale</i>
<i>A. flavus</i> Link*	On kernel of <i>A. occidentale</i>
<i>A. fumigatus</i> Fresen.*	On kernel of <i>A. occidentale</i>
<i>A. japonicus</i> Saito*	On kernel of <i>A. occidentale</i>
<i>A. niger</i> Tiegh.*	On kernel of <i>A. occidentale</i> , on mango and on <i>Tamarindus indica</i> fruits
<i>A. ochraceus</i> Wilhelm*	On kernel of <i>A. occidentale</i>
<i>A. parasiticus</i> Speare*	On kernel of <i>A. occidentale</i>
<i>A. sydowii</i> (Bainier & Sartory) Thom & Church*	On kernel of <i>A. occidentale</i>
<i>A. tamarii</i> Kita*	On kernel of <i>A. occidentale</i>
<i>A. ustus</i> (Bainier) Thom & Church*	On kernel of <i>A. occidentale</i>
<i>A. versicolor</i> (Vuill.) Tirab.*	On kernel of <i>A. occidentale</i>
<i>Aureobasidium pullulans</i> (de Bary) G. Arnaud*	On kernel of <i>A. occidentale</i>
<i>Beltrania rhombica</i> Penz.*	On kernel of <i>A. occidentale</i> and on leaves of <i>Minalkara achras</i> *

<i>Botrytis cinerea</i> Pers.	On leaves and pods of <i>Phaseolus vulgaris</i> , <i>Vigna unguiculata</i> , flowers and fruits of <i>Ricinus communis</i> and flowers of <i>Rosa</i> spp.
<i>Botryosporium longibrachiatum</i> var. <i>macrosporum</i> N. D. Sharma*	On leaves of <i>Dendranthema morifolium</i>
<i>Camptomeris leucaenae</i> (F. Stevens & Dalby) Syd.*	On leaves of <i>Leucaena leucocephala</i>
<i>Cercospora apii</i> Fresen. s. lat.*	On leaves of <i>Amaranthus</i> sp.; <i>Angelonia</i> sp.; <i>Anthurium</i> sp., <i>Carica papaya</i> , <i>Chamaecrista</i> sp.; <i>Chenopodium ambrosioides</i> ; <i>Citrullus vulgaris</i> ; <i>Cucumis melo</i> ; <i>Gerbera jamesonii</i> ; <i>Hydrocotyle</i> sp.; <i>Malpighia emarginata</i> ; <i>Mimosa sensitiva</i> ; <i>Momordica charantia</i> ; <i>Physalis</i> sp.; <i>Senna alata</i> ; <i>S. occidentalis</i> ; <i>Spighelia anthelmia</i> ; <i>Tagetes</i> sp.; <i>Vigna unguiculata</i> ; <i>Verbena</i> sp., <i>Vitex agnus-castus</i> ; <i>Wedelia paludosa</i> and <i>Zinnia elegans</i>
<i>C. coffeicola</i> Berk. & Cooke	On leaves of <i>Coffea arabica</i>
<i>C. furfurella</i> Speg.*	On leaves of <i>Boerhaavia coccinea</i>
<i>C. ricinella</i> Sacc. & Berl.*	On leaves of <i>Ricinus communis</i>
<i>C. spermacoces</i> Thirum. & Govindu*	On leaves of <i>Borreria verticillata</i>
<i>Cercospora virgaureae</i> (Thüm.) Allesch. *	On leaves of <i>Conyza</i> sp.
<i>Cladobotryum</i> sp.*	On kernel of <i>A. occidentale</i>
<i>Cladosporium cladosporioides</i> (Fresen.) G.A. de Vries	On kernel of <i>A. occidentale</i>
<i>C. cassiae-surathesis</i> J. M. Yen *	On leaves of <i>Chamaecrista</i> sp.

(Continued...)

Table 1 - Continued.

<i>C. herbarum</i> (Pers.) Link*	On kernel of <i>A. occidentale</i>	<i>M. roridum</i> Tode ex Fr.*	On leaves and fruits of <i>Cucumis melo</i> , <i>Zanithedeschia</i> sp., on leaves of <i>Hybanthus</i> sp., <i>Crescentia</i> sp., <i>Malpighia emarginata</i>
<i>C. oxysporum</i> Berk. & Curt.*	On leaves of <i>Cucumis melo</i>	<i>Nigrospora oryzae</i> (Berk. & Broome) Petch*	On kernel of <i>A. occidentale</i>
<i>C. sphaerospermum</i> Penz. *	On kernel of <i>A. occidentale</i>	<i>Oidium anacardii</i> F. Noack	On leaves of <i>A. occidentale</i>
<i>Cordana musae</i> Zimm.	On leaves of <i>Musa</i> spp.	<i>O. bixae</i> Viégas	On leaves of <i>Bixa olerana</i>
<i>Crinula caliciiformis</i> Fr.	On stem and shoots of <i>Citrus</i> spp.	<i>O. caricae</i> F. Noack	On leaves of <i>Carica papaya</i>
<i>Corynespora cassiicola</i> (Berk. & M.A. Curtis) Wei	Leaves, stem and fruit of <i>Carica papaya</i> , on leaves of <i>Malpighia marginata</i> , <i>Vigna unguiculata</i> and endophytic in leaves of <i>M. indica</i> and <i>Spondias purpurea</i>	<i>O. leucoconium</i> Desm.	On leaves, stem and flowers of <i>Rosa</i> spp.
<i>Curvularia eragrostidis</i> (Henn.) J.A. Meyer	On leaves of <i>Cocos nucifera</i> , <i>Saccharum</i> spp. and <i>Zea mays</i>	<i>O. manihotis</i> Henn.	On leaves of <i>Manihot esculenta</i>
<i>C. lunata</i> (Wakker) Boedijn*	Endophytic in leaves of <i>A. occidentale</i>	<i>O. mangiferae</i> Berthet	On leaves of <i>Mangifera indica</i>
<i>C. senegalensis</i> (Speg.) Subram.*	On kernel of <i>A. occidentale</i>	<i>O. perseae</i> Link	On leaves of <i>Persea americana</i>
<i>C. trifolii</i> (Kauffman) Boedijn f. sp. <i>gladioli</i> Parmelee & Lutr.*	On leaves of <i>Gladiolus</i> sp.	<i>Oidium</i> sp.	On fruits of <i>Spondias purpurea</i>
<i>C. tuberculata</i> Jain*	On kernel of <i>A. occidentale</i>	<i>Oidium</i> sp.	On leaves of <i>Chamaecrista</i> sp.
<i>Cylindrocladium gracile</i> (Bugn.) Boesew.*	On leaves of <i>Byrsonima crassifolia</i> and <i>Simarouba versicolor</i>	<i>Oidium</i> sp.	On leaves of <i>Clitoria fairchildiana</i>
<i>C. scoparium</i> Morgan*	On seedlings of <i>A. occidentale</i>	<i>Oidium</i> sp.	On leaves of <i>Adenocalymna</i> sp.
<i>C. parvum</i> P.J. Anderson*	On kernel of <i>A. occidentale</i>	<i>Oidium</i> sp.	On leaves of <i>Aster</i> sp.
<i>Cylindrocladiella camelliae</i> (Venkataram. & C.S.V. Ram) Boesew.*	On seedlings of <i>Minakara achras</i>	<i>Oidium</i> sp.	On leaves of <i>Chenopodium ambrosioides</i>
<i>Dactylaria</i> sp.*	On kernel of <i>A. occidentale</i>	<i>Oidium</i> sp.	On leaves of <i>Senna alata</i> and <i>S. occidentalis</i>
<i>Deightoniella torulosa</i> (Syd.) M.B. Ellis	On leaves of <i>Musa</i> spp.	<i>Oidium</i> sp.	On leaves of <i>Heliconia</i> spp.
<i>Dichotomophthora cactacearum</i> Ponte & F. Freire	On stem of <i>Cereus jamacaru</i>	<i>Oidium</i> sp.	On leaves of <i>Hydrangea macrophylla</i>
<i>Dichotomophthora</i> sp.*	On leaves of <i>Boerhaavia coccinea</i>	<i>Oidium</i> sp.	On leaves of <i>Conyza</i> sp.
<i>Drechslera incurvata</i> (C. Bernard) M.B. Ellis*	On leaves of <i>Cocos nucifera</i>	<i>Oidium</i> sp.	On leaves of <i>Crotalaria</i> spp.
<i>D. maydis</i> (Nisikado) Subram. & Jain*	On leaves of <i>Zea mays</i>	<i>Oidium</i> sp.	On leaves of <i>Cucumis melo</i> , <i>Citrullus lanatus</i>
<i>D. cf. papendorfii</i> (Aa) M.B. Ellis*	On kernel of <i>A. occidentale</i>	<i>Oidium</i> sp.	On leaves of <i>Cleome spinosa</i>
<i>Fusarium pallidoroseum</i> (Cooke) Sacc.*	On cashew kernel and fruits of <i>Cucumis melo</i>	<i>Oidiopsis sicula</i> Scalia*	On leaves of <i>Capsicum annum</i>
<i>F. solani</i> (Mart.) Sacc.	On roots of <i>Passiflora</i> spp., <i>Gypsophyla</i> sp., <i>Ricinus communis</i> , <i>Cucumis melo</i> and on kernel of <i>A. occidentale</i>	<i>Oidiopsis</i> sp.*	On leaves of <i>Oxalis oxyptera</i>
<i>F. solani</i> (Mart.) Sacc. f. sp. <i>piperis</i> F.C. Albuq.	On roots and stem of <i>Piper nigrum</i>	<i>Oidiopsis</i> sp.*	On leaves of <i>Oxalis grisea</i>
<i>F. oxysporum</i> Schltdl. f.sp. <i>lycopersici</i> W.C. Snyder & H.N. Hansen	On <i>Lycopersicon esculentum</i>	<i>Ovulariopsis</i> sp.*	On leaves of <i>Tabebuia caraiba</i>
<i>F. oxysporum</i> Schltdl. f.sp. <i>passiflorae</i> W.L. Gordon	On <i>Passiflora</i> spp.	<i>Ovulariopsis</i> sp.*	On leaves of <i>Cleome spinosa</i>
<i>F. oxysporum</i> Schltdl. f.sp. <i>vasinfectum</i> W.C. Snyder & H.N. Hansen	On <i>Gossypium hirsutum</i>	<i>Penicillium brevicompactum</i> Dierckx*	On kernel of <i>A. occidentale</i>
<i>F. oxysporum</i> Schltdl. f.sp. <i>cubense</i> W.C. Snyder & H.N. Hansen	On <i>Musa</i> spp.	<i>P. citrinum</i> Thom*	On kernel of <i>A. occidentale</i>
<i>F. subglutinans</i> (Wollenw. & Reinking) P.E. Nelson, Toussoun & Marasas	On <i>Ananas comosus</i>	<i>P. digitatum</i> Sacc.	On citrus fruit
<i>F. verticillioides</i> (Sacc.) Nirenberg	On kernel of <i>Bertholletia excelsa</i>	<i>P. expansum</i> Link*	On pear fruits
<i>Geotrichum candidum</i> Link.*	On kernel of <i>A. occidentale</i> , <i>Cocos nucifera</i> and on citrus fruits	<i>P. glabrum</i> (Wehmer) Westling*	On kernel of <i>A. occidentale</i>
<i>Graphium putredinis</i> (Corda) Hughes	On kernel of <i>B. excelsa</i>	<i>P. italicum</i> Wehmer	On citrus fruit
<i>Myrothecium leucotrichum</i> (Peck) Tulloch*	On seedlings of <i>Carica papaya</i>	<i>P. minioluteum</i> Dierckx*	On kernel of <i>A. occidentale</i>
		<i>P. oxalicum</i> Currie & Thom*	On kernel of <i>A. occidentale</i>
		<i>P. thomii</i> Maire*	On kernel of <i>A. occidentale</i>
		<i>P. purpurogenum</i> Stoll*	On kernel of <i>A. occidentale</i>
		<i>Passalora annonigena</i> U. Braun & F. Freire*	On leaves of <i>Annona</i> sp.
		<i>P. arachidicola</i> (Hori) U. Braun <sup>1</sup>	On leaves of <i>Arachis hypogaea</i>
		<i>P. atropunctata</i> (Racib.) U. Braun & F. Freire*	On leaves of <i>Desmodium</i> sp.
		<i>P. bougainvilleae</i> (Munt.-Cvetk.) R.F. Castañeda & U. Braun*	On leaves of <i>Bougainvillea</i> sp.
		<i>P. calotropidis</i> (Ellis & Everh.) U. Braun*	On leaves of <i>Calotropis procera</i> and <i>C. gigantea</i>

(Continued...)

Table 1 - Continued.

<i>P. capsicicola</i> (Vassiljevsky) U. Braun & F. Freire*	On leaves of <i>Capsicum annuum</i>	<i>P. cotizensis</i> (A.S. Mull. & Chupp) Deighton*	On leaves of <i>Crotalaria pallida</i>
<i>P. cnidoscolicola</i> U. Braun & F. Freire*	On leaves of <i>Cnidocolus</i> sp.	<i>P. cruenta</i> (Sacc.) Deighton <sup>1</sup>	On leaves of <i>Canavalia</i> sp.; <i>Macroptilium lathyroides</i> ; and <i>Vigna unguiculata</i>
<i>P. davillae</i> U. Braun, J.C. David & F. Freire*	On leaves of <i>Davilla cearensis</i>	<i>P. cylindrosporioides</i> (Solheim & Chupp) Y.L. Guo & X.J. Liu*	On leaves of <i>Casearia</i> sp.
<i>P. henningsii</i> (Allesch.) R.F. Castañeda & U. Braun <sup>1</sup>	On leaves of <i>Manihot esculenta</i>	<i>P. daturina</i> (J.M. Yen) Deighton *	On leaves of <i>Brugmansia suaveolens</i>
<i>P. hydrocotyles</i> (Ellis & Everh.) U. Braun, Delhey & Kiehr*	On leaves of <i>Hydrocotyle</i> sp.	<i>P. davalliae</i> (A. K. Kar & M. Mandal) U. Braun & Crous*	On leaves of <i>Davallia fejeensis</i>
<i>P. jatrophigena</i> U. Braun & F. Freire*	On leaves of <i>Jatropha</i> sp.	<i>P. eugeniicola</i> U. Braun, J.C. David & F. Freire*	On leaves of <i>Eugenia</i> sp.
<i>P. lantanae</i> (Chupp) U. Braun & Crous*	On leaves of <i>Lantana camara</i>	<i>P. eustomatis</i> (Peck) U. Braun*	On leaves of <i>Eustoma grandiflorum</i>
<i>P. mikaniae</i> (F. Stevens) U. Braun & F. Freire*	On leaves of <i>Mikania</i> sp.	<i>P. formosana</i> (Yamam.) Deighton*	On leaves of <i>Lantana camara</i>
<i>P. mimosigena</i> U. Braun & F. Freire*	On leaves of <i>Mimosa caesalpiniiifolia</i>	<i>P. froelichiae</i> U. Braun & F. Freire*	On leaves of <i>Froelichia</i> sp.
<i>P. pavoniicola</i> U. Braun & F. Freire*	On leaves of <i>Pavonia cancellata</i>	<i>P. gangetic</i> (Bharadwaj) U. Braun*	On leaves of <i>Desmodium</i> sp.
<i>P. personata</i> (Berk. M.A. Curtis) S.A. Khan & M. Kamal	On leaves of <i>A. hypogaea</i>	<i>P. gardeniae</i> (Boedijn) Deighton*	On leaves of <i>Tocoyena</i> sp.
<i>P. polygalae</i> U. Braun & F. Freire*	On leaves of <i>Polygala</i> sp.	<i>P. genipicola</i> U. Braun & F. Freire*	On leaves of <i>Genipa americana</i>
<i>P. pulchella</i> (T. S. Ramakr.) U. Braun & Crous*	On leaves of <i>Indigofera hirsuta</i>	<i>P. guetardae</i> (Chupp) Deighton*	On leaves of <i>Guettarda angelica</i>
<i>Phaeotrichoconis</i> cf. <i>crotalariae</i> (M.A. Salam & P.N. Rao) Subram.*	Endophytic in leaves of <i>Copernicia prunifera</i> and on kernel of <i>A. occidentale</i>	<i>P. guazumae</i> (Syd.) Deighton*	On leaves of <i>Guazuma ulmifolia</i>
<i>Pollaccia</i> sp.	On stem of <i>Opuntia ficus-indica</i>	<i>P. heliotropii</i> U. Braun & F. Freire*	On leaves of <i>Heliotropium</i> sp.
<i>Pseudocercospora abricola</i> (Boedijn) U. Braun*	On leaves of <i>Abrus precatorius</i>	<i>P. hirtellae</i> U. Braun, J.C. David & F. Freire*	On leaves of <i>Hirtella ciliata</i>
<i>P. abelmoschi</i> (Ellis & Everh.) Deighton <sup>1</sup>	On leaves of <i>Hibiscus esculentus</i>	<i>P. hybanthi</i> U. Braun & F. Freire*	On leaves of <i>Hybanthus</i> sp.
<i>P. abutilonicola</i> (Chupp) U. Braun & Crous*	On leaves of <i>Abutilon</i> sp.	<i>P. ixoriae</i> (Solheim) Deighton*	On leaves of <i>Ixoria</i> sp.
<i>P. amazoniae</i> U. Braun & F. Freire*	On leaves of <i>Amazonia</i> sp.	<i>P. jacquemontiae</i> U. Braun & F. Freire*	On leaves of <i>Jacquemontia</i> sp.
<i>P. annonae</i> (A. S. Mull. & Chupp) U. Braun & Crous <sup>1</sup>	On leaves of <i>Annona squamosa</i>	<i>P. jahnii</i> (Syd.) U. Braun & Crous*	On leaves of <i>Tabebuia serratifolia</i>
<i>P. annonae-squamosae</i> U. Braun & Castañeda*	On leaves of <i>Annona squamosa</i> , <i>A. muricata</i> , <i>A. cherimola</i> x <i>A. squamosa</i> and <i>A. pygmaea</i>	<i>P. jussiaeae</i> (G.F. Atk.) Deighton*	On leaves of <i>Ludwigia</i> sp.
<i>P. astroniicola</i> U. Braun & F. Freire*	On leaves of <i>Astronium fraxinifolium</i>	<i>P. krameriae</i> U. Braun, J.C. David & F. Freire*	On leaves of <i>Krameria tomentosa</i>
<i>P. bixae</i> (Allesch. & F. Noack) Crous, Alfenas & Barreto <sup>1</sup>	On leaves of <i>Bixa orellana</i>	<i>P. kurimensis</i> (Fukui) U. Braun*	On leaves of <i>Nerium oleander</i>
<i>P. borrieriae</i> (Ellis & Everh.) Deighton*	On leaves of <i>Borreria verticillata</i> and <i>Mitracarpus</i> sp.	<i>P. lippiae-albae</i> U. Braun & R.F. Castañeda*	On leaves of <i>Lippia alba</i>
<i>P. bradburiae</i> (E. Young) Deighton*	On leaves of <i>Centrosema brasilianum</i>	<i>P. luetzelburgiae</i> U. Braun & F. Freire*	On leaves of <i>Luetzelburgia auriculata</i>
<i>P. brasiliensis</i> U. Braun & F. Freire*	On leaves of <i>Cuspidaria erubescens</i>	<i>P. meibomiae</i> (Chupp) Deighton*	On leaves of <i>Desmodium incanum</i>
<i>P. byrsonimatis</i> (Pat.) U. Braun & Mouch.*	On leaves of <i>Byrsonima</i> sp.	<i>P. melochiae</i> (Henn.) Deighton*	On leaves of <i>Waltheria indica</i>
<i>P. cassiae-fistulae</i> Goh & Hsieh*	On leaves of <i>Senna rizzinii</i>	<i>P. mimosigena</i> U. Braun & F. Freire*	On leaves of <i>Mimosa</i> sp. and <i>M. tenuiflora</i>
<i>P. cecropiigena</i> U. Braun & F. Freire*	On leaves of <i>Cecropia</i> sp.	<i>P. mombin</i> (Petr. & Cif.) Deighton <sup>1</sup>	On leaves of <i>Spondias purpurea</i>
<i>P. chamaecristae</i> U. Braun & F. Freire*	On leaves <i>Chamaecrista</i> sp.	<i>P. montrichardiae</i> (Henn.) U. Braun & F. Freire*	On leaves of <i>Montrichardia linifera</i>
<i>P. chamaesyces</i> (F. Stevens & Dalbey) Deighton*	On leaves of <i>Chamaesyce hyssopifolia</i>	<i>P. musae</i> (Zimm.) Deighton <sup>1</sup>	On leaves of <i>Musa</i> spp.
<i>P. cochlospermi</i> (R.E.D. Baker & W.T. Dale) U. Braun & Crous*	On leaves of <i>Cochlospermum vitifolium</i>	<i>P. nigricans</i> (Cooke) Deighton*	On leaves of <i>Senna georgica</i> and <i>S. occidentalis</i>
<i>P. combreticola</i> U. Braun & F. Freire*	On leaves of <i>Combretum</i> sp.	<i>P. ocimicola</i> (Petr. & Cif.) Deighton*	On leaves of <i>Marsypianthes chamaedrys</i>
<i>P. commonsii</i> (Sacc.) U. Braun & F. Freire*	On leaves of <i>Stylosanthes</i> sp.	<i>P. passiflorae</i> U. Braun & Crous <sup>1</sup>	On leaves of <i>Passiflora edulis</i>
<i>P. coperniciae</i> U. Braun & F. Freire*	On leaves of <i>Copernicia prunifera</i>	<i>P. plumeriifolii</i> (Bat. & Peres) U. Braun & F. Freire*	On leaves of <i>Himatanthus drasticus</i>
<i>P. corchorifoliae</i> (Thurim. & Govindu) Deighton*	On leaves of <i>Melochia pyramidata</i>	<i>P. phyllanthi</i> (Chupp) Deighton*	On leaves of <i>Phyllanthus</i> sp.
		<i>P. punicae</i> (Henn.) Deighton <sup>1</sup>	On leaves of <i>Punica granatum</i>
		<i>P. puerariicola</i> (Yamam.) Deighton*	On leaves of <i>Dioclea guianensis</i>
		<i>P. purpurea</i> (Cooke) Deighton*	On leaves of <i>Persea americana</i>
		<i>P. schrankiicola</i> U. Braun & F. Freire*	On leaves of <i>Schrankia leptocarpa</i>

(Continued...)

Table 1 - Continued.

<i>P. sesami</i> (Hansf.) Deighton*	On leaves of <i>Sesamum indicum</i>
<i>P. simaroubae</i> U. Braun & F. Freire*	On leaves of <i>Simarouba versicolor</i>
<i>P. struthanthi</i> U. Braun, F. Freire & Pons*	On leaves of <i>Struthanthus</i> sp. and <i>Phoradendron</i> sp.
<i>P. talisiae</i> U. Braun & F. Freire*	On leaves of <i>Talisia esculenta</i>
<i>P. thiloae</i> U. Braun, J.C. David & F. Freire*	On leaves of <i>Thilao glaucocarpa</i>
<i>P. tetraulaciicola</i> U. Braun & F. Freire*	On leaves of <i>Tetraulacium</i> sp.
<i>P. tigli</i> (Henn.) Crous, U. Braun & Alfenas var. <i>densa</i> U. Braun & F. Freire*	On leaves of <i>Croton lobatus</i>
<i>P. timorensis</i> (Cooke) Deighton*	On leaves of <i>Ipomoea asarifolia</i>
<i>P. turnerae</i> (Ellis & Everh.) Deighton*	On leaves of <i>Turnera ulmifolia</i>
<i>P. ubajarensis</i> U. Braun & F. Freire*	On leaves of <i>Ocotea</i> sp.
<i>P. variabilis</i> U. Braun & F. Freire*	On leaves of <i>Caesalpinia</i> sp.; <i>C. ferrea</i>
<i>P. vataireae</i> (Henn.) U. Braun & F. Freire*	On leaves of <i>Derris</i> sp.
<i>P. velutinomaculans</i> U. Braun & F. Freire*	On leaves of <i>Melissa officinalis</i>
<i>P. venezuelae</i> (Chupp) Deighton*	On leaves of <i>Solanum</i> sp.
<i>P. cf. viticicola</i> (J.M. Yen & Lim) J.M. Yen*	On leaves of <i>Aegiphila</i> sp.
<i>P. vitis</i> (Lév.) Speg.*	On leaves of <i>Vitis</i> spp.
<i>P. xanthoxyli</i> (Cooke) Y.L. Guo & X.J. Liu*	On leaves of <i>Zanthoxylum rhoifolium</i>
<i>Pseudocercospora</i> sp.*	On leaves of <i>Crotalaria stipulata</i>
<i>Pithomyces</i> sp.*	On kernel of <i>A. occidentale</i>
<i>Pyricularia oryzae</i> Cav.	On leaves and panicle of <i>Oryza sativa</i>
<i>Ramularia minax</i> (Davis) U. Braun var. <i>melampodii</i> U. Braun & F. Freire*	On leaves of <i>Melampodium</i> sp.
<i>Sarcopodium</i> sp.*	On kernel of <i>A. occidentale</i>

<i>Scolecostigmia mangiferae</i> (Koord.) U. Braun & Mouch.*	On leaves of <i>Mangifera indica</i>
<i>Scopulariopsis gracilis</i> Samson*	On kernel of <i>A. occidentale</i>
<i>Semipseudocercospora aescynomenes</i> (U. Braun & Crous) U. Braun & Crous*	On leaves of <i>Aeschynomene hystrix</i>
<i>Spegazzinia tessarthra</i> (Berk. & M.A. Curtis) Sacc.*	On kernel of <i>A. occidentale</i>
<i>Spiniger</i> sp.*	On kernel of <i>A. occidentale</i>
<i>Scytilidium</i> sp.*	On kernel of <i>A. occidentale</i>
<i>Stenella hiamanthi</i> U. Braun & F. Freire*	On leaves of <i>Hiamanthus drasticus</i>
<i>S. simaroubaearum</i> U. Braun & F. Freire*	On leaves of <i>Simarouba versicolor</i>
<i>S. pavoniae</i> U. Braun & F. Freire*	On leaves of <i>Pavonia cancellata</i>
<i>S. stemodiicola</i> U. Braun & F. Freire*	On leaves of <i>Stemodium</i> sp.
<i>Stemphylium botryosum</i> Wallr.*	On leaves of <i>Lycopersicon esculentum</i>
<i>Stigmia phaecarpa</i> (Mitter) M.B. Ellis*	On leaves of <i>Bauhinia</i> sp.
<i>Thielaviopsis paradoxa</i> (De Seynes) Hoehn.	On <i>Musa</i> spp., <i>Ananas comosus</i> , <i>Cocos nucifera</i> and <i>Saccharum</i> spp.
<i>Torula herbarum</i> (Pers.) Link f. <i>quartenella</i> Sacc.*	On kernel of <i>A. occidentale</i> and as endophyte in leaves of <i>Manihot esculenta</i>
<i>Triposporium</i> sp.*	On leaves of <i>Mimosa caesalpiniaefolia</i>
<i>Tritirachium</i> sp.*	On kernel of <i>A. occidentale</i>
<i>Ustilaginoidea virens</i> (Cooke) Takah.	On spikes of <i>Oryza sativa</i>
<i>Veronaea musae</i> M.B. Ellis*	On leaves of <i>Musa</i> spp.
<i>Zanclospora</i> sp.*	On leaves of <i>Chiococca alba</i>

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## Bibliographic References

ALMEIDA, R. T. **Espécies de uredinales no Estado do Ceará**. Fortaleza: UFC/CCA, 1988. 39p. (Boletim Técnico-Científico. CCA, 1).

ALMEIDA, R. T. ; FREIRE, V. F. **Espécies de uredinales sobre leguminosas e gramíneas no Estado do Ceará. Fitossanidade**, Fortaleza, v. 5, n.1, p. 41- 46, 1981.

BRAUN, U.; FREIRE, F. das C. O. Some cercosporoid hyphomycetes from Brazil - II. **Cryptogamie Mycologie**, Paris, v. 23, n.4, p. 295-328, 2002.

BRAUN, U.; FREIRE, F. das C. O. Some cercosporoid hyphomycetes from Brazil – III. **Cryptogamie Mycologie**, Paris, v. 25, n.3, p. 221-244, 2004.

BRAUN, U.; DAVID, J.; FREIRE, F. das C. O. Some cercosporoid hyphomycetes from Brazil. **Cryptogamie Mycologie**, Paris, v. 20, n. 2, p. 95-106, 1999.

CROUS, P. W. ; BRAUN, U. **Mycosphaerella and its anamorphs**: 1. Names published in *Cercospora* and *Passalora*. Centraalbureau voor Schimmelcultures, Wageningen, The Netherlands, Ponsen & Looyen, 2003. 571p.

FREIRE, F. das C. O. Angular leaf spot of cashew (*Anacardium occidentale* L.) caused by *Septoria anacardii* sp. nov. **Agrotropica**, Ilhéus, v. 9, n.1, p. 19-22, 1997.

FREIRE, F. das C. O. Mycoparasitism of the cashew black mould agent by *Acremonium* sp. **Agrotropica**, Ilhéus, v. 11, n.1, p. 25-30, 1999.

FREIRE, F. das C. O. Occurrence of the anamorphic basidiomycete *Spiniger* in Brazil. **Fitopatologia Brasileira**, Brasília, v. 23, n.4, p. 480-481, 1998.

FREIRE, F. das C. O. The taxonomic position of the cashew black mould agent. **Fitopatologia Brasileira**, Brasília, v. 23, n.4, p. 477-479, 1998.

FREIRE, F. das C. O.; BEZERRA, J. L. Foliar endophytic fungi of Ceará State (Brazil): a preliminary study. **Summa Phytopathologica**, Jaboticabal, v. 27, n.3, p. 304- 308, 2001.

FREIRE, F. das C. O.; KOZAKIEWICZ, Z.; PATERSON, R. R. M. Mycoflora and mycotoxins of brazilian cashew kernels. **Mycopathologia**, Baarn, v. 145, p. 95-103, 1999.

- MENDES, M. A. S.; SILVA, V. L.; DIANESE, J. C.; FERREIRA, M. A. S. V.; SANTOS, C. E. N.; NETO, E. G.; URBEN, A. F.; CASTRO, C. Fungos em plantas no Brasil. Brasília, DF: EMBRAPA - SPI: EMBRAPA - CENARGEN, 1998. 569p.
- PONTE, J. J. da. **Clínica de doenças de plantas**. Fortaleza: UFC, 1996. 872 p.
- PONTE, J.J. da ; FREIRE, F. das C. O. *Dichotomophthora cactacearum* sp. n., agent of the cactus blue rot. **Boletim Cearense de Agronomia**, Fortaleza, v. 13, p. 13-16, 1972.
- SILVA, M. da; MINTER, D. W. Fungi from Brazil: recorded by Batista and co-workers. Wallingford, UK: CAB International, 1995. 585p. (Mycological Papers, 169.)
- VASCONCELOS, I. Primeira contribuição ao inventário de fungos de plantas do Ceará. **Boletim Cearense de Agronomia**, Fortaleza, v. 6, p. 79 -99, 1965.
- VASCONCELOS, I. Segunda contribuição ao inventário de fungos de plantas do Ceará. **Boletim Cearense de Agronomia**, Fortaleza, v. 10, p. 33- 39, 1969.
- VASCONCELOS, I. Terceira contribuição ao inventário de fungos de plantas do Ceará. **Ciência Agrônômica**, Fortaleza, v. 1, n.2, p. 121-128, 1971.