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## The diversity of cercosporoid hyphomycetes – new species, combinations, names and nomenclatural clarifications

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The new species *Stenella leucothoës* and *S. pittospori* are described, and the new combinations and new names *Asperisporium rafinesquiae*, *Passalora euphorbiicola*, *P. sterculiacearum*, *Pseudocercospora campanulae*, *P. lonicerigena*, *P. photinae-serrulatae*, *P. physostegiae* and *Stenella prosopidis* are introduced. Based on re-examinations of type collections, the taxonomic status of *Cercospora saccharini* and *C. rhagadioli* as genuine species of *Cercospora*, morphologically distinct from *C. apii* s. l., could be confirmed, and it could be demonstrated that *Cercospora pittospori* had been correctly reallocated to *Pseudocercospora*. Furthermore, the nomenclature of *Passalora polygonati-maximoviczii*, *Pseudocercospora dendrobii* and *P. sacchari* is discussed, the status of *Cercospora solani-nigri* as a synonym of *Pseudocercospora atomarginalis* is verified, and new records of *Passalora bocconiae* and *Pseudocercospora thouinia* are added.

**Key words:** *Asperisporium*, *Cercospora*, *Mycosphaerella* anamorphs, new combinations, new names, new species, nomenclature, *Passalora*, *Pseudocercospora*, *Stenella*, taxonomy

### Introduction

*Mycosphaerella* Johanson is one of the largest genera of ascomycetes (Aptroot, 2006), embracing a wide range of coelomycetous and hyphomycetous anamorphs (Arx, 1987; Schubert and Braun, 2005; Crous *et al.*, 2006a-c; den Breeÿen *et al.*, 2006), among which cercosporoid fungi, i.e., hyphomycetes belonging in the genus *Cercospora* Fresen. and its segregates, constitute major part (Deighton, 1967, 1974, 1976, 1979; Braun, 1995, 1998; Crous *et al.*, 2000; Braun *et al.*, 2006). During the course of monographic studies of cercosporoid hyphomycetes, comprehensive molecular sequence analyses have been carried out and, together with reassessments of morphological characters, led to new circumscriptions of the anamorph genera concerned (Crous *et al.*, 2000, 2001, 2006b). Based on the new generic classification and re-examinations of hundreds

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of type collections of species assigned to *Cercospora* and thousands of non-type specimens, Crous and Braun (2003) published an annotated check-list of *Cercospora* and *Passalora* Fr. names, containing 5720 taxa and taxonomic reallocations of numerous species. However, type collections of some species could not be traced or were not available prior to the publication of this check-list. Braun and Crous (2005) listed first additions and corrections to *Cercospora* and *Passalora* names, which are supplemented in the present paper.

## Materials and methods

Type material and other herbarium specimens have been examined in distilled water and lactic acid using an Olympus BX40 light microscope, including phase-contrast optical instruments and devices. The collections examined are deposited at BPI, CUP, F, HAL, ILL and NY (abbreviations according to Holmgren *et al.*, 1990).

## Results and Discussion

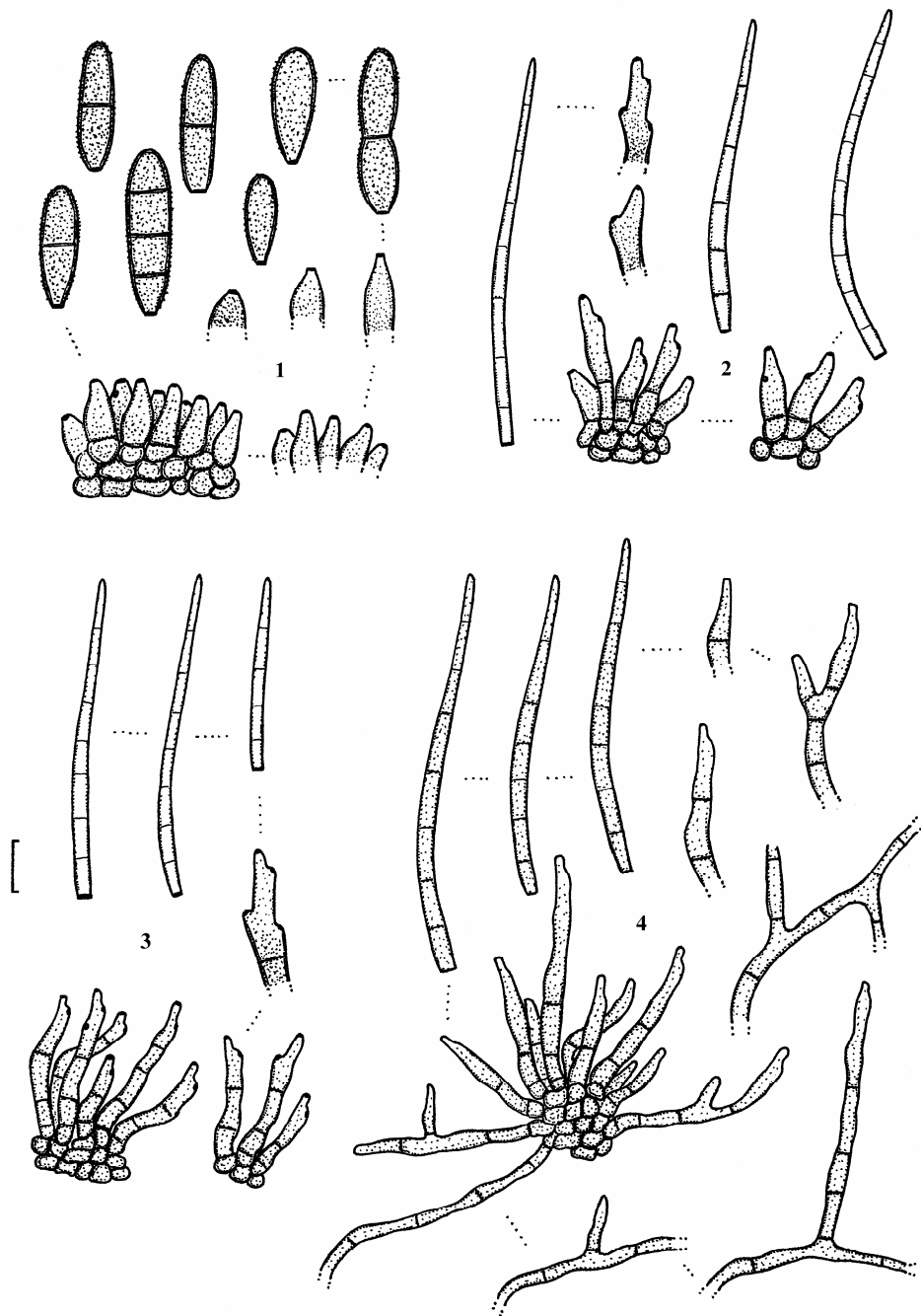
*Asperisporium rafinesquiae* (Harkn.) U. Braun & Crous, **comb. nov.** (Fig. 1)  
MycoBank: 510442

≡ *Cercospora rafinesquiae* Harkn., Calif. Acad. Sci. Bull. 1: 39, 1884.

*Material examined:* on *Rafinesquia californica* (Asteraceae), USA, California, San Francisco, Golden Gate Park ['bay', according to Chupp (1954)], June 1881 (BPI 440257, 440258; syntypes of *C. rafinesquiae*).

*Leaf spots* lacking or diffuse, forming large brown to blackish discolorations. *Caespituli* hypophyllous, conspicuous, punctiform, dark brown, scattered to gregarious. *Mycelium* internal. *Stromata* immersed to somewhat erumpent, well-developed, 20-80 µm diam., medium brown to dark brown. *Conidiophores* numerous, arising from stromata, forming dense sporodochial conidiomata, erect, subcylindrical-conical, neither geniculate nor sinuous, unbranched, 5-25 × 3-6 µm, aseptate, brown, thin-walled, almost smooth to rough-walled; conidiophores reduced to conidiogenous cells, conidiogenous loci conspicuous, conidiogenous cells mostly unilocal, 1.5-2 µm diam., somewhat thickened and darkened. *Conidia* solitary, ellipsoid-ovoid to cylindrical, 13-40 × 5-8 µm, (0-)1(-3)-septate, olivaceous, thin-walled, verruculose, apex broadly rounded, base rounded to short obconically truncate, hila conspicuous or only subconspicuous, 1.5-2 µm diam., slightly thickened and darkened.

*Comments:* *C. rafinesquiae* is a morphologically unusual cercosporoid hyphomycete, best fitting into *Asperisporium* Maubl. due to sporodochial conidiomata with short conidiophores and conspicuous conidiogenous loci as



**Figs 1-4.** Conidiophores, conidia and superficial hyphae: **1.** *Asperisporium rafinesquiae*. **2.** *Cercospora rhagadioli*. **3.** *C. saccharini*. **4.** *Pseudocercospora dendrobii*. Bar = 10  $\mu$ m. U. Braun del.

well as amero- to phragmosporous, pigmented, verruculose conidia (Ellis, 1971, 1976; Braun, 1995; Crous and Braun, 2003). The conidiogenous loci and conidial hila are, however, less conspicuous, i.e. less thickened and darkened, than in the type species of *Asperisporium* and most other members of this genus, and the conidial surface is rather verruculose than verrucose, although these differences are only gradual. The taxonomy of *Asperisporium* is not yet settled since molecular sequence analyses are not available up to now. Therefore, Crous and Braun (2003) maintained this genus only tentatively, and discussed the possibility that it may eventually be shown to be a synonym of *Passalora* Fr.

***Cercospora rhagadioli* Bubák** (Fig. 2)

*Material examined:* on *Rhagadiolus stellatus* (Asteraceae), Montenegro, near Rijeka, 10 April 1905, F. Bubák (BPI 440322; holotype of *C. rhagadioli*).

*Leaf spots* amphigenous, subcircular to somewhat irregular, 2-8 mm wide, pale to dark brown, occasionally somewhat zonate, margin indefinite. *Caespituli* amphigenous, olivaceous-brown, but mostly rather inconspicuous. Mycelium internal. *Stromata* lacking or only formed as small substomatal aggregation of some swollen hyphal cells, 10-20 µm diam., brown. *Conidiophores* in small, loose to moderately dense fascicles, arising from internal hyphae or substomatal hyphal aggregations, emerging through stomata, erect, straight, subcylindrical to distinctly geniculate-sinuous, unbranched, 5-30 × 3-6 µm, occasionally somewhat enlarged at the very base, 0-1-septate, pale olivaceous-brown or brown, thin-walled, smooth, conidiophores usually reduced to conidiogenous cells, occasionally conidiogenous cells integrated, terminal, 5-20 µm long, conidiogenous loci conspicuous, thickened and darkened, 2-3 µm diam. *Conidia* solitary, acicular to narrowly obclavate, 30-100 × 2-4 µm, 3-9-septate, hyaline, thin-walled, smooth, apex acute or subacute, base truncate, occasionally obconically truncate, hila thickened and darkened, 2-3 µm diam.

*Comments:* Beside the original description, this species was also treated in Chupp (1954). *C. rhagadioli*, belonging in *Cercospora* s. str., is close to *C. apii* s. l., but differs in having uniformly short conidiophores.

***Cercospora saccharini* Liberta & Boewe** (Fig. 3)

*Material examined:* on *Acer saccharinum* (Aceraceae), USA, Illinois, Massac County, Metropolis, 15 October 1959, G.H. Boewe (BPI 440811, 440924; syntype material of *C. saccharini*).

*Leaf spots* amphigenous, angular-irregular, 1-2 mm wide or confluent, forming larger irregular blotches, greyish brown, margin indefinite. *Caespituli* hypophyllous, delicate, scattered, rather inconspicuous. Mycelium internal.

*Stromata* almost absent or relatively small, 10-40 µm diam., substomatal to intraepidermal, brown. *Conidiophores* in small to moderately large fascicles, loose to moderately dense, arising from internal hyphae or stromata, emerging through stomata or erumpent, erect, straight, subcylindrical to geniculate-sinuous, unbranched, 15-50 × 2-7 µm, (0-)1-3-septate, pale olivaceous-brown, thin-walled, smooth; conidiogenous cells integrated, terminal, 5-25 µm long, conidiogenous loci conspicuous, thickened and darkened, 1-2 µm diam. *Conidia* solitary, narrowly acicular-filiform, 40-80(-120) × 1.5-3.5 µm, 3-9-septate, hyaline, thin-walled, smooth, apex acute, base truncate to slightly obconically truncate, hila 1-2 µm wide, somewhat thickened and darkened.

*Comments:* *C. saccharini*, described by Liberta and Boewe (1960), is a true species of *Cercospora s. str.*, characterised by having pigmented conidiophores with thickened, darkened scars and colourless scolecosporous conidia formed singly. Due to small conidiogenous loci (1-2 µm diam.) and narrowly acicular-filiform conidia with small hila, it does not pertain to the *C. apii s. l.* complex.

***Passalora bocconiae* (Chupp) U. Braun & Crous**

*Material examined:* on *Bocconia frutescens* (*Papaveraceae*), Venezuela, road from Timotes to Chachopu, Mérida, 29 August 1932, Chardon & Toro 977 (CUP; holotype of *P. bocconiae*); on *Bocconia* sp., Guatemala, Reg. Santa Elena, Dept. Chimaltenango, Cerro de Tecpám, alt. 2700 m, 4 December 1938, P.C. Stanley (F).

*Comments:* The second collection, rendering this species new to Guatemala, was deposited at F as *Cladosporium* sp.

***Passalora euphorbiicola* U. Braun & Crous, **nom. nov.****

MycoBank: 510443

≡ *Phaeoramularia euphorbiae* Y.Q. Ge, X.J. Liu, T. Xu & Y.L. Guo, Acta Phytopathol. Sin. 12(4): 9, 1982, non *Passalora euphorbiae* (Karak.) Arx, 1983.

≡ *Passalora euphorbiicola* U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 452, 2003, nom. inval. (ICBN, Arts 33.3, 33.4).

*Comments:* The new name *Passalora euphorbiicola*, introduced in Crous and Braun (2003), was considered to be invalid due to an omission of a full reference to the replacement synonym (see Index of Fungi, Vol. 7(12): 726, 2006). Strictly speaking, this treatment is formally correct. The replacement synonym was cited as ‘Acta Phytopathol. Sin. 12: 9, 1982’. However, the description of *Phaeoramularia euphorbiae* was published on page 9 of issue 4 in volume 12. Since all issues of this journal were individually paginated, the quotation of a combination of volume and page was not unmistakable and insufficient, i.e., in order to validate the new name, it is necessary to add the particular number of the issue.

***Passalora polygonati-maximoviczii*** Poonam Srivast., J. Living World 1(2): 117, 1994, nom. nov. [as '(Katsuki) Poonam Srivast., comb. nov.]

≡ *Cercosporidium polygonati-maximoviczii* Katsuki, Trans. Mycol. Soc. Japan 16: 12-13, 1975, nom. superfl. (ICBN, Art. 52.1).

≡ *Cercospora polygonati-maximoviczii* Togashi, Jap. J. Bot. 2: 75, 1924.

≡ *Passalora polygonati-maximoviczii* (Togashi) U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 331, 2003, nom. illeg. (ICBN, Art. 53.1), non *P. polygonati-maximoviczii* Poonam Srivast., 1994.

**Comments:** The oldest valid name for this species is *C. polygonati-maximoviczii* Togashi. Katsuki in Katsuki and Kobayashi (1975) introduced the new species *Cercosporidium polygonati-maximoviczii*, but cited *C. polygonati-maximoviczii* as synonym, which rendered Katsuki's name illegitimate (nom. superfl.). Srivastava (1994) introduced the combination *Passalora polygonati-maximoviczii*, based on Katsuki's illegitimate name. According to Art. 58.1 of the ICBN, this combination has to be considered a new name, only attributable to Srivastava himself, and this new name is not superfluous since Srivastava (1994) only cited *Cercosporidium polygonati-maximoviczii* as basionym, i.e., the older valid name *Cercospora polygonati-maximoviczii* was not mentioned.

***Passalora sterculiacearum*** U. Braun & Crous, **nom. nov.**

MycoBank: 510444

≡ *Cercosporina helicteris* Syd. & P. Syd., Phillip. J. Sci., C, Bot. 9: 189, 1914.

≡ *Passalora helicteris* (Syd. & P. Syd.) U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 214, 2003, *nom. illeg.* (ICBN, Art. 53.1), non *P. helicteris* (Soni, Dadwal & Jamaluddin) Poonam Srivast., J. Living World 1: 116, 1994.

**Comments:** Srivastava (1994) transferred numerous names of *Cercosporidium* to *Passalora*, but almost all combinations were invalidly published. However, *P. helicteris* (Soni, Dadwal & Jamaluddin) Poonam Srivast. was one of the few valid combinations which rendered *P. helicteris* (Syd. & P. Syd.) U. Braun & Crous illegitimate.

***Pseudocercospora atromarginalis*** (G.F. Atk.) Deighton

= *Cercospora solani-nigri* Chidd.

**Material examined:** on *Solanum nigrum* (*Solanaceae*), India, Poona, near Mulha river bed, 18 December 1957, P.P. Chiddarwar (BPI 441404; syntype of *C. solani-nigri*).

**Conidiophores** fasciculate, emerging through stomata, subcylindrical to geniculate-sinuuous, unbranched, 10-60 × 2-6 μm, 0-3-septate, pale olivaceous, conidiogenous loci inconspicuous. **Conidia** solitary, subcylindrical to

obclavate-cylindrical, 20-110 × 3-5 µm, (1-)3-8(-10)-septate, subhyaline to pale olivaceous, thin-walled, smooth or almost so, apex obtuse, base obconically truncate, hila unthickened, not darkened.

*Comments:* Chiddarwar (1962) introduced *C. solani-nigri*, but without any discussion and without comparing his new species with any of the other numerous *Cercospora* species described from *Solanum* spp. The re-examination of type material clearly showed *C. solani-nigri* to be a synonym of *P. atromarginalis*.

***Pseudocercospora campanulae* U. Braun & Crous, nom. nov.**

Mycobank: 510445

≡ *Cercoseptoria minuta* Davis, Trans. Wisconsin Acad. Sci. 22: 174, 1926.

≡ *Cercospora minuta* (Davis) Chupp, A monograph of the fungus genus *Cercospora*: 95, 1954.

≡ *Pseudocercospora minuta* (Davis) U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 276, 2003, nom. illeg. (ICBN, Art. 53.1), non *P. minuta* S.R. Chowdhury & Chandel, Proc. Natn. Acad. Sci. India, Sect. B, Biol. Sci., 56(1): 81, 1986.

*Comments:* Since the epithet *minuta* is preoccupied in *Pseudocercospora*, a new name is necessary for the North American fungus on *Campanula aparinoides*.

***Pseudocercospora dendrobii* Goh & W.H. Hsieh, in Hsieh & Goh, *Cercospora* and similar fungi from Taiwan: 255, 1990. (Fig. 4)**

= *Cercospora dendrobii* H.C. Burnett, Proc. Florida State Hort. Soc. 77: 465-466, '1964' 1965.

≡ *Pseudocercospora dendrobii* (H.C. Burnett) U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 452, 2003, nom. illeg. (ICBN, Art. 53.1), non *P. dendrobii* Goh & W.H. Hsieh (in Hsieh and Goh, 1990: 255).

Description based on type material of *C. dendrobii*: *Leaf spots* amphigenous, at first small, later forming large patches, 2-30 mm wide or confluent, covering large leaf segments or almost entire leaves. *Caespituli* hypophyllous, punctiform, dense, greyish brown to medium dark brown. Mycelium internal and external. *Superficial hyphae* branched, 1.5-4.5 µm wide, septate, pale olivaceous to medium olivaceous-brown, thin-walled, smooth. *Stromata* 10-40 µm diam., substomatal, olivaceous-brown. *Conidiophores* in small to moderately large fascicles, loose to dense, arising from stromata, emerging through stomata, or solitary, arising from superficial hyphae, lateral, erect to decumbent, straight, subcylindrical-conical to geniculate-sinuous, unbranched or branched, 10-100 × 2-5 µm, continuous to pluriseptate, olivaceous to olivaceous-brown, thin-walled, smooth;

conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-30  $\mu\text{m}$  long, conidiogenous loci inconspicuous to subdenticulate, but always unthickened, not darkened. *Conidia* solitary, narrowly obclavate to subacicular, 15-80  $\times$  2-4.5  $\mu\text{m}$ , 3-8-septate, pale olivaceous to olivaceous-brown, thin-walled, smooth, apex subacute, base truncate to obconically truncate, hila (1-)1.5-2.5(-3)  $\mu\text{m}$  diam., unthickened, not darkened.

*Comments:* *P. dendrobii*, introduced in Hsieh and Goh (1990), is valid and cannot be considered a superfluous name since the older *C. dendrobii* was not definitely cited as synonym. In the discussion, Hsieh and Goh (1990) just mentioned *C. dendrobii* as possible synonym.

*P. dendrobii*, based on type material from Taiwan, and *C. dendrobii*, described from the USA, are regarded to be synonyms. Type material of the latter species and a sample from Hawaii have been examined (on *Dendrobium* sp., USA, Florida, Winter Haven, 17 January 1962, H.C. Burnett, CUP 41041, holotype of *C. dendrobii*; on *Dendrobium* sp. (hybrid), intercepted at Hawaii, plants coming from Japan, 24 July 1972, E.S. Shiroma, BPI 435527). Hsieh and Goh (1990) described larger stromata, but did not observe any superficial hyphae with solitary conidiophores. Otherwise, their description agrees well with the type of *C. dendrobii*.

***Pseudocercospora lonicerigena* U. Braun & Crous, **nom. nov.** (Fig. 5)**

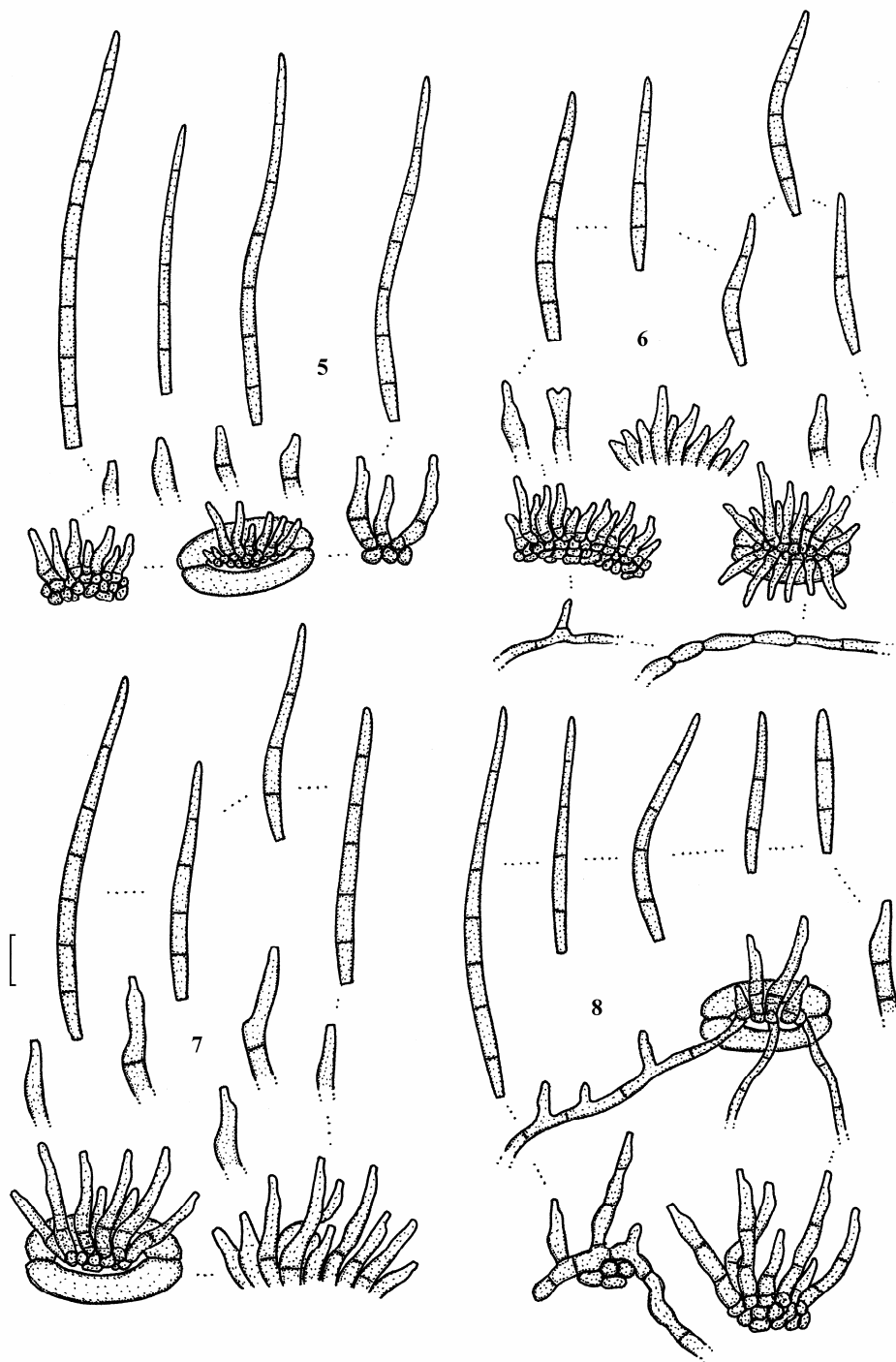
MycoBank: 510446

$\equiv$  *Cercospora lonicerae* Chupp, A monograph of the fungus genus *Cercospora*: 102, 1954.

$\equiv$  *Pseudocercospora lonicerae* (Chupp) U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 256, 2003, nom. illeg. (ICBN, Art. 53.1), non *P. lonicerae* Y.L. Guo (1995: 121).

*Comments:* The North American *P. lonicerigena* is characterised by having very short conidiophores, 5-25  $\times$  1.5-3.5  $\mu\text{m}$ , pale olivaceous to olivaceous-brown, 0(-1)-septate, forming small to moderately large, loose to dense fascicles, arising from substomatal stromata, up to 40  $\mu\text{m}$  diam. The conidia are formed singly, acicular to narrowly obclavate, 20-100  $\times$  2-4  $\mu\text{m}$ , 3-9-septate, subhyaline to pale olivaceous, apex subacute, base truncate to obconically truncate, 1.5-2  $\mu\text{m}$  diam. *P. lonicericola* (Yamam.) Deighton, widespread on *Lonicera* spp. and *Leycesteria formosa* in Asia and New Zealand, is quite distinct by forming superficial hyphae with solitary conidiophores, and the Chinese *P. lonicerae* differs in having large stromata, 65-120  $\mu\text{m}$  diam., much longer, pluriseptate conidiophores, up to 96  $\mu\text{m}$ , and wider conidia, 40-120  $\times$  3-6  $\mu\text{m}$  (Chupp, 1954; Hsieh and Goh, 1990; Guo, 1994; Guo and Hsieh, 1995; Guo *et al.*, 1998; Crous and Braun, 2003).





**Figs 5-8.** Conidiophores, conidia and superficial hyphae: **5.** *Pseudocercospora lonicerigena*. **6.** *P. photiniae-serrulatae*. **7.** *P. physostegiae*. **8.** *P. pittospori*. Bar = 10  $\mu$ m. U. Braun del.

***Pseudocercospora photiniae-serrulatae*** (L. Anzal. & Plakidas) U. Braun & Crous, **comb. nov.** (Fig. 6)

Mycobank: 510510447

≡ *Cercospora photiniae-serrulatae* L. Anzal. & Plakidas, Mycologia 49: 415, 1957.

*Material examined:* on *Photinia serrulata* (*Rosaceae*), USA, Louisiana, Loranger, 7 August 1956, L. Anzalone (BPI 439624, 439625; syntypes of *C. photiniae-serrulatae*); USA, Texas, College Station, December 1936, J.J. Taubehaus (BPI 439626); USA, Georgia, Richmond Hill, 20 December 1943, Inspector Blizzard, Blizzard No. 932 (BPI 439627).

*Leaf spots* amphigenous, angular-irregular, 2-20 mm wide or confluent and larger, at first somewhat chlorotic, later purplish, finally pale to dark brown, greyish brown or dingy grey, margin indefinite or narrow to moderately wide, darker, purplish violet to dark brown. *Caespituli* amphigenous, punctiform, dark brown to blackish. *Mycelium* internal and external; superficial hyphae abundant, branched, (1-)2-5 µm wide, septate, thin-walled, smooth, pale to medium olivaceous or olivaceous-brown. *Stromata* variable, often well-developed, large, 10-100 µm diam., subcircular to oblong in outline, usually intra- to subepidermal, somewhat erumpent, occasionally substomatal, olivaceous-brown, composed of swollen hyphal cells, 1.5-6 µm diam. *Conidiophores* in small to usually large, often very large fascicles, loose to mostly dense (large fascicles sporodochial), arising from stromata, erumpent, occasionally emerging through stomata, erect, straight, subcylindrical-conical to geniculate-sinuuous, usually unbranched, 5-35(-45) × 2-4 µm, 0-2(-3)-septate, pale olivaceous to olivaceous-brown, thin-walled, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5-20 µm long, conidiogenous loci inconspicuous, occasionally subdenticulate, but always unthickened, not darkened. *Conidia* solitary, obclavate, short conidia sometimes subcylindrical, 20-60(-90) × 2-3 µm, indistinctly 1-6(-9)-septate, subhyaline, thin-walled, smooth, apex subacute, base obconically truncate, hila 1-1.5 µm diam., unthickened, not darkened.

*Comments:* On account of inconspicuous, unthickened, non-pigmented conidiogenous loci and conidial hila, this species, described by Anzalone and Plakidas (1957), has to be reallocated to *Pseudocercospora*.

***Pseudocercospora physostegiae*** (Jenkins) U. Braun & Crous, **comb. nov.**

Mycobank: 510448

(Fig. 7)

≡ *Cercospora physostegiae* Jenkins, Phytopathology 35: 329, 1945.

*Material examined:* on *Dracocephalum virginianum* [≡ *Physostegia virginiana*] (*Lamiaceae*), USA, Virginia, Chatham, 15 July 1944, A. Jenkins (BPI 608496; topotype material of *C. physostegiae*).

*Leaf spots* amphigenous, subcircular to irregular, 2-10 mm wide, pale to medium brown, reddish brown, finally darker or with a greyish tinge, margin indefinite. *Caespituli* amphigenous, punctiform to subeffuse, loose to dense,

greyish olivaceous. *Stromata* lacking or small, 10-40  $\mu\text{m}$  diam., pale yellowish olivaceous to brown, composed of slightly swollen hyphal cells, 2-5  $\mu\text{m}$  diam. *Conidiophores* in small to moderately large fascicles, loose to moderately dense, arising from internal hyphae or substomatal stromata, emerging through stomata, more or less erect, straight, subcylindrical to strongly geniculate-sinuous, unbranched, (5-)10-30(-35)  $\times$  2-6  $\mu\text{m}$ , 0-1(-2)-septate, subhyaline to pale olivaceous or olivaceous-brown, thin-walled, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5-20  $\mu\text{m}$  long, conidiogenous loci inconspicuous to subdenticulate, 1-2  $\mu\text{m}$  diam., but neither thickened nor darkened. *Conidia* solitary, narrowly obclavate, subacicular-filiform, short conidia sometimes obclavate-cylindrical, (15-)30-80(-85)  $\times$  2-4  $\mu\text{m}$ , (1-)3-8(-10)-septate, subhyaline to pale olivaceous, thin-walled, smooth, apex subacute or subobtuse, base short to long obconically truncate, 1-2  $\mu\text{m}$  diam., hila neither thickened nor darkened.

*Comments:* This species was also treated in Chupp (1954). Owing to unthickened, non-pigmented conidiogenous loci and conidial hila, *C. physostegiae* has to be placed in *Pseudocercospora*. The original material deposited at BPI is marked as 'ex type', although the date given on the label (15 July 1944) does not coincide with the protologue (31 August 1943). Hence, the BPI collection can only be considered topotype material.

***Pseudocercospora pittospori* (Plakidas) Y.L. Guo & X.J. Liu** (Fig. 8)

$\equiv$  *Cercospora pittospori* Plakidas.

*Material examined:* on *Pittosporum tobira* (*Pittosporaceae*), USA, Louisiana, Baton Rouge, 3 June 1939, A.G. Plakidas (BPI 439752; holotype of *C. pittospori*).

Description based on type material: *Leaf spots* epiphyllous, subcircular to angular-irregular, 1-5 mm wide, different shades of brown, ranging from yellowish brown to medium dark brown, margin indefinite. *Colonies* hypophyllous, rather inconspicuous, effuse to subeffuse, olivaceous to pale brownish. *Mycelium* internal and external; superficial hyphae sparingly branched, 1.5-4  $\mu\text{m}$  wide, septate, subhyaline to pale olivaceous, thin-walled, smooth. *Stromata* lacking or only with small substomatal hyphal aggregations of swollen hyphal cells, 1.5-5  $\mu\text{m}$  diam., olivaceous brown. *Conidiophores* in small, usually loose fascicles, 2-15, arising from internal hyphae or hyphal aggregations, emerging through stomata, or solitary, arising from superficial hyphae, lateral or occasionally terminal, erect, straight, subcylindrical-conical to geniculate-sinuous, simple, rarely branched, 5-70(-100)  $\times$  2-4  $\mu\text{m}$ , 0-5-septate, pale olivaceous to olivaceous-brown, thin-walled, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5-30  $\mu\text{m}$  long, conidiogenous loci inconspicuous, unthickened, not darkened. *Conidia* solitary, narrowly obclavate-filiform, short

conidia sometimes cylindrical or subclavate, straight to curved, (20-)25-80(-130) × 2-4 µm, (2-)3-8(-12)-septate, subhyaline to pale olivaceous, thin-walled, smooth, apex subacute or subobtuse, base obconically truncate, occasionally truncate, hila 1-1.5(-2) µm diam., unthickened, not darkened.

*Comments:* Guo and Liu (1991) assigned this species to *Pseudocercospora* using Chinese collections, but type material had not been studied and compared. Descriptions and illustrations of *P. pittospori* were repeated in Guo and Hsieh (1995) and Guo *et al.* (1998). The re-examination of the North American type material clearly showed that the reallocation of *C. pittospori* to *Pseudocercospora* was justified.

***Pseudocercospora sacchari*** K. Bhalla & A.K. Sarbhoy, Indian Phytopathol. 53(3): 265, 2000, nom. nov. [as '(Sarbjana) K. Bhalla & A.K. Sarbhoy comb. nov.']

≡ *Mycovellosiella sacchari* Sarbjana, J. Mycopathol. Res. 28: 162, 1990, nom. inval. (Art. 37.5).

≡ *Pseudocercospora sacchari* U. Braun & Crous, in Crous & Braun, *Mycosphaerella* and its anamorphs: 1. Names published in *Cercospora* and *Passalora*. CBS Biodiversity Series 1: 488, 2003, superfluous validation.

*Comments:* Bhalla & Sarbhoy (2000) introduced the combination *P. sacchari*, based on the invalid name *M. sacchari*, and cited IMI 311125 as holotype. However, according to Art. 58.1 of the ICBN, this combination has to be regarded as introduction of a new name, only attributable to the introducing authors. Therefore, the validation of *P. sacchari* proposed in Crous and Braun (2003) was superfluous.

***Pseudocercospora thouinia*** (F. Stevens) U. Braun & Crous

*Material examined:* on *Thouinia stricta* (*Sapindaceae*), Puerto Rico, Maricao, 13 April 1913, F.L. Stevens 751 (ILL 15747a; holotype); on *Thouinia* sp., Puerto Rico, eight miles west of Ponce, 1 December 1902, A.A. Heller, Porto Rican Fungi 6172 (F).

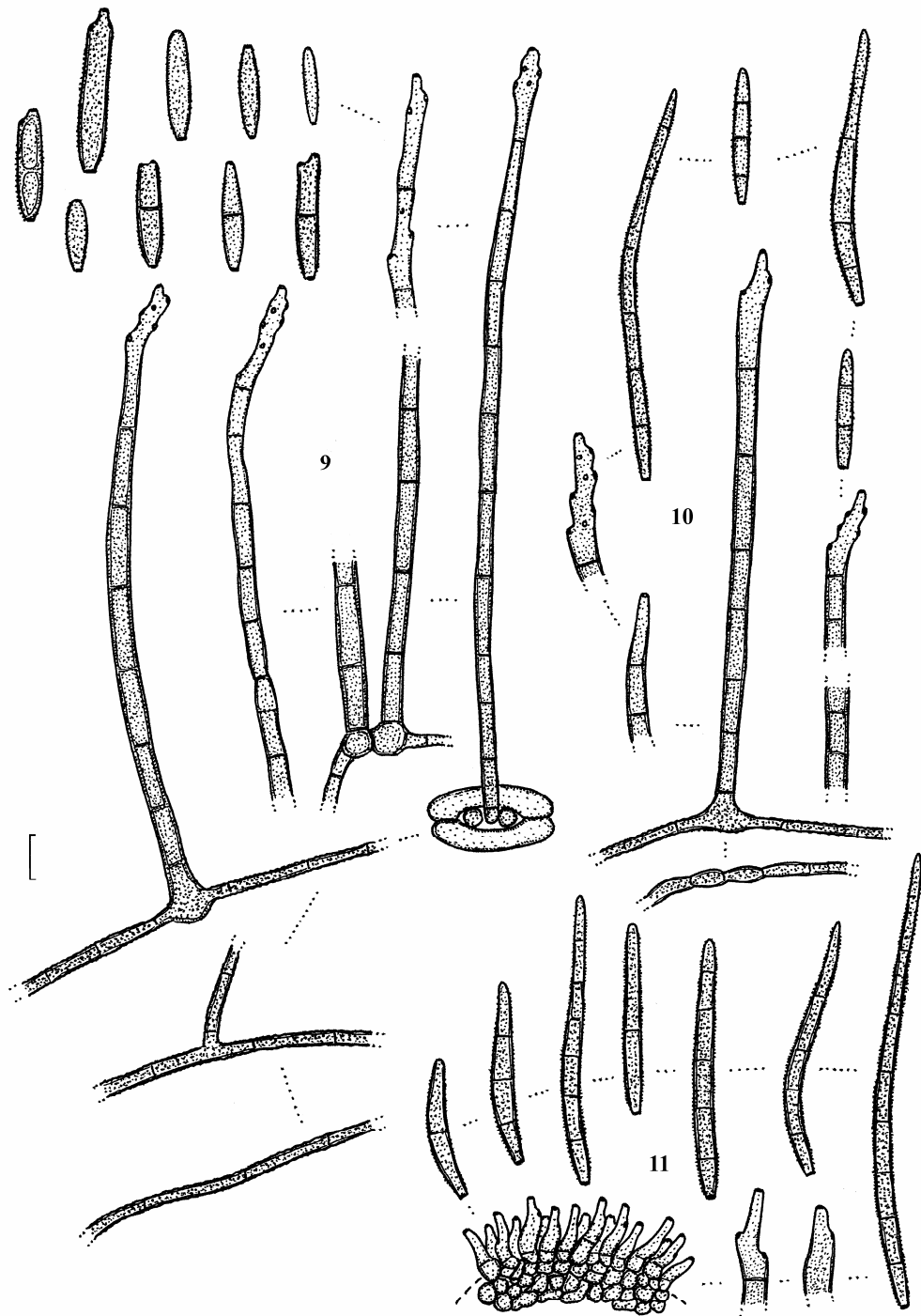
*Comments:* This species was reallocated to *Pseudocercospora* in Crous and Braun (2003). It was previously only known from the type collection in Puerto Rico. The second, older specimen from 1902, was incorrectly identified and deposited as a species of *Cladosporium*.

***Stenella leucothoës*** U. Braun, **sp. nov.** (Fig. 9)

Mycobank: 510450

Differt a *S. oxycocci* stromatibus nullis, conidiophoris longioribus, (50-)100-300 µm, et latoribus, 2-8(-10) µm, ad basim saepe inflatis, atrioribus et conidiis catenatis.

*Material examined:* on *Leucothoë axillaris* var. *editorum* [≡ *L. editorum*] (*Ericaceae*), USA, North Carolina, Macon County, 1.5 km east of Highlands on US 64, 8 June 1981, W.R. Buck 6043 (NY; holotype), as *Cladosporium tenuissimum*.



**Figs 9-11.** Conidiophores, conidia and superficial hyphae: **9.** *Stenella leucothoës*. **10.** *S. pittospori*. **11.** *S. prosopidis*. Bar = 10  $\mu$ m. U. Braun del.

*Leaf spots* amphigenous, subcircular to irregular, 2-30 mm wide, brownish to greyish white, with a narrow margin, dark brown to blackish, sometimes with a narrow purplish violet halo. *Colonies* hypophyllous, effuse, thin, dark brown to blackish. *Mycelium* internal and external; superficial hyphae simple or sparingly branched at right angle, 1.5-4 µm wide, septate, subhyaline to pale olivaceous, thin-walled, verruculose. *Stromata* lacking. *Conidiophores* solitary, arising from superficial hyphae, lateral, supporting hyphae often swollen at the place of attachment, occasionally a single or few conidiophores arising from immersed or substomatal swollen hyphal cells, erumpent or emerging through stomata, erect, straight, subcylindrical-filiform, (50-)100-300 × 2-8(-10) µm, narrower towards the tips, pluriseptate throughout, medium to dark brown, tips paler, wall thin to somewhat thickened, 0.5-1.5 µm wide, smooth; conidiogenous cells integrated, terminal, occasionally intercalary, 10-30(-40) µm long, geniculate, occasionally somewhat swollen, usually with numerous conspicuous conidiogenous loci, 1-1.5 µm diam., thickened and darkened. *Conidia* in simple or branched chains, ellipsoid-ovoid to cylindrical, 5-25 × 2-4 µm, 0-1-septate, rarely with a single distoseptum, subhyaline to pale olivaceous or olivaceous-brown, thin-walled, verruculose, ends rounded to attenuated, hila 0.5-1(-1.5) µm diam., somewhat thickened and darkened.

*Comments:* Three species of *Stenella* Syd. are hitherto known on hosts belonging to the *Ericaceae*. *Stenella leucothoës* is morphologically close to *S. oxycocci* (Shear) K. Schub. & U. Braun (Schubert and Braun, 2007), a North American species on *Vaccinium macrocarpum*, but the latter species differs in having well-developed stromata, 25-45 µm diam., paler, much shorter and narrower conidiophores, 50-100 × 2-5 µm, without swollen base, and conidia formed singly. *S. rhododendricola* Seema Misra, A.K. Srivast. & Kamal on *Rhododendron campanulatum* in Nepal (Misra *et al.*, 1999) is distinguished by having shorter (10-190 µm), verruculose conidiophores and longer (11.5-54 µm), 1-4-septate conidia, and lastly *S. rhododenri* R.K. Verma & Kamal (Verma and Kamal, 1987), also on *Rhododendron campanulatum* but in India, is characterised by its very long and broad, obclavate conidia, 91.5-350 × 3-8 µm.

***Stenella pittospori* U. Braun, sp. nov.**

(Fig. 10)

MycoBank: 510451

*Maculae* amphigenae, angulares-irregulares, 1-10 mm latae, hypophyllo ochraceo-brunneae ad medio-brunneae, in epiphylo atriore brunneae, saepe irregulariter brunneae, interdum leniter zontae, margine indistincto. *Coloniae* hypophyllae, inconspicuae. *Mycelium* internum et externum. *Stromata* nulla. *Hyphae* per stoma emergentiae, superficiales, sparse ramosae, 1-3 µm latae, septatae, interdum constrictae, hyalinae vel pallidissime olivaceae,

tenuitunicatae, verruculosae. *Conidiophora* solitaria, ex hyphis superficialibus oriunda, erecta, non-ramosa, recta, subcylindrica, apice geniculato,  $40\text{-}130 \times 3\text{-}5 \mu\text{m}$ , pluriseptata, medio-brunnea, apicem versus pallidiora, leniter crassitunicata, ad  $1 \mu\text{m}$ , levia vel sublevia. *Cellulae conidiogenae* integratae, terminales,  $10\text{-}50 \mu\text{m}$  longae, sympodiales, geniculatae, locis conidiogenis solitariis vel saepe numerosis,  $1\text{-}2 \mu\text{m}$  diam., leniter incrassatis et fuscatis. *Conidia* solitaria, obclavata, interdum cylindrica,  $20\text{-}100 \times 3\text{-}5 \mu\text{m}$ , 2-10-septata, hyalina, pallidissime flavo-virides vel olivacea, tenuitunicata, verruculosa, apice obtuso vel subacuto, basi obconice truncata, interdum truncate, hila lenissime incrassata, fuscata,  $1.5\text{-}2 \mu\text{m}$  diam.

*Material examined:* on *Pittosporum podocarpum* (*Pittosporaceae*), China, Sichuan, Dujiangyan, 20 September 2006, S. Both (HAL 1945 F; holotype).

*Leaf spots* amphigenous, angular-irregular, 1-20 mm wide, ochraceous-brown to medium brown on the lower leaf surface, darker on the upper side, pigmentation uneven, occasionally slightly zonate, margin indefinite. *Colonies* hypophyllous, inconspicuous. Mycelium internal and external. *Stromata* lacking, at most with a few swollen substomatal cells. *Superficial hyphae* emerging through stomata, sparingly branched,  $1\text{-}3 \mu\text{m}$  wide, septate, occasionally constricted at the septa, hyaline to very pale olivaceous, thin-walled, verruculose. *Conidiophores* solitary, arising from superficial hyphae (supporting cells of fertile hyphae often somewhat darker and wider than sterile hyphae), erect, unbranched, main portion of the conidiophores straight, subcylindrical, only apical fertile portion (conidiogenous cells) distinctly geniculate,  $40\text{-}130 \times 3\text{-}5 \mu\text{m}$ , pluriseptate throughout, medium brown, paler towards the apex, wall somewhat thickened, up to  $1 \mu\text{m}$  wide, smooth or almost so; conidiogenous cells integrated, terminal,  $10\text{-}50 \mu\text{m}$  long, sympodially proliferating, mostly distinctly geniculate, with a single to numerous conspicuous conidiogenous loci,  $1\text{-}2 \mu\text{m}$  diam., slightly thickened and somewhat darkened. *Conidia* solitary, obclavate, short conidia sometimes cylindrical,  $20\text{-}100 \times 3\text{-}5 \mu\text{m}$ , 2-10-septate, hyaline to very pale yellowish, greenish or olivaceous, thin-walled, verruculose, apex obtuse to subacute, base obconically truncate, occasionally truncate in cylindrical conidia, hila very slightly thickened and darkened,  $1.5\text{-}2 \mu\text{m}$  diam.

*Comments:* *S. pittospori* is presently the only species of *Stenella* known from a host belonging to the *Pittosporaceae* (Pittosporales). It is a typical member of this genus, characterised by having abundant verruculose superficial mycelium, solitary conidiophores and verruculose conidia.

***Stenella prosopidis* (Heald & F.A. Wolf) U. Braun & Crous, comb. nov.**

MycoBank: 510449

(Fig. 11)

≡ *Cercospora prosopidis* Heald & F.A. Wolf, Mycologia 3: 20, 1911.

*Material examined:* on *Prosopis glandulosa* (*Mimosaceae*), USA, Texas, Uvalde, 19 August 1909, F.D. Heald & F.A. Wolf (BPI 439991; holotype of *C. prosopidis*); USA, Texas, Falfurrias, 14 September 1909, F.D. Heald & F.A. Wolf (BPI 439992; paratype); USA, Texas, Luling, 26 August 1909, F.D. Heald & F.A. Wolf (BPI 439993; paratype); USA, Texas,

Kennedy, 18 September 1909, F.D. Heald & F.A. Wolf (BPI 439994; paratype); USA, Texas, Floresville, 18 September 1909, F.D. Heald & F.A. Wolf (BPI 439995; paratype).

*Leaf spots* amphigenous, subcircular to angular-irregular, 1-5 mm wide or confluent and larger, pale brown, greyish brown, finally dingy greyish white, pale spots often with darker margin, narrow, brown. *Caespituli* amphigenous, punctiform, larger ones pustulate, scattered to gregarious, dark brown. *Mycelium* internal. *Stromata* lacking to well-developed, 10-75  $\mu\text{m}$  diam., substomatal to intraepidermal, shape subglobose to irregular, brown. *Conidiophores* in small to moderately large fascicles, usually dense to very dense, arising from stromata, erumpent or emerging through stomata, large fascicles sporodochial, conidiophores erect, straight subcylindrical-conical to slightly geniculate-sinuous, unbranched, 5-30(-40)  $\times$  2-5  $\mu\text{m}$ , 0-1-septate, pale olivaceous-brown, thin-walled, smooth or almost so; conidiophores mostly reduced to conidiogenous cells, conidiogenous loci conspicuous, 1-1.5  $\mu\text{m}$  diam., somewhat thickened and darkened. *Conidia* solitary, obclavate-cylindrical, (20-)25-95(-110)  $\times$  2.5-5  $\mu\text{m}$ , (0-)1-10(-14)-septate, pale olivaceous to olivaceous-brown, thin-walled, verruculose to verrucose, apex subacute to obtuse, base obconically truncate, occasionally truncate or rounded, hila 1-1.5  $\mu\text{m}$  diam., slightly thickened and darkened.

*Comments:* Applying previous concepts of cercosporoid hyphomycete genera, *C. prosopidis* was assignable to *Stenellopsis* B. Huguenin, a genus very close to *Stenella*, but distinguishable by lacking superficial mycelium on the host. However, the formation of superficial mycelium, which is frequently influenced by environmental conditions, is a rather unreliable character for generic separation among cercosporoid fungi. Most cercosporoid genera encompass species with and without superficial hyphae (Crous and Braun 2003). Therefore, Braun and Crous (2005) preferred to reduce *Stenellopsis* to synonymy with *Stenella*, which was demonstrated by the description of *Stenella hymenocallidis* U. Braun & Crous, which is also characterised by lacking superficial mycelium.

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