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Annotated list of *Cercospora* species (epithets a–b) described by C. CHUPP¹

With 13 Figures

Summary

Cercospora species (epithets a–b) described by C. CHUPP (1954) are listed and their generic affinities based on taxonomic concepts currently applied to this fungal group are discussed. The new species *Passalora adenocalymmatidis*, *P. bunchosiae*, *P. kreiseliana*, *P. malpighiae-glabrae*, *Pseudocercospora annonae*, *P. blechi* and *Pseudodidymaria aeschnomenes* are described and the new combinations *Passalora arrectaria*, *P. gliricidiae*, *P. bidenticola*, *P. bocconiae*, *P. boldoae*, *Pseudocercospora abutilonicola*, *P. acioidis* and *P. anemopsidis* are introduced.

Cercospora FRESEN. s.l. is one of the largest and more heterogeneous genera of Hyphomycetes with over 3000 names. The North American phytopathologist C. CHUPP (1886–1967) made significant contributions to our knowledge of this taxon which he monographed in 1954. In his monograph he compiled 1758 species of *Cercospora* including numerous new species. DEIGHTON (1967, 1974, 1976), PONS & SUTTON (1988), BRAUN (1993), BRAUN & MELNIK (1997) and various other authors segregated a number of *Cercospora* species into smaller allied genera, already existing or newly described, based mainly on morphological aspects exhibited by the conidiogeneous loci

¹ Dedicated to Professor Dr. Hanns Kreisel, Greifswald on the occasion of his 70th birthday

Zusammenfassung

Kommentierte Liste der von C. CHUPP beschriebenen *Cercospora*-Arten (Epitheta a–b)

Die von C. CHUPP (1954) beschriebenen *Cercospora*-Arten (Epitheta a und b) werden in der vorliegenden Arbeit aufgelistet, und ihre Gattungszugehörigkeit wird auf der Grundlage heutiger taxonomischer Konzepte diskutiert. Die neuen Arten *Passalora adenocalymmatidis*, *P. bunchosiae*, *P. kreiseliana*, *P. malpighiae-glabrae*, *Pseudocercospora annonae*, *P. blechi* und *Pseudodidymaria aeschnomenes* werden beschrieben und die neuen Kombinationen *Passalora arrectaria*, *P. gliricidiae*, *P. bidenticola*, *P. bocconiae*, *P. boldoae*, *Pseudocercospora abutilonicola*, *P. acioidis* und *P. anemopsidis* werden eingeführt.

and the hila during the conidium production combined with other criteria like growth habit, arrangement of conidiophores in conidiomata, pigmentation and septation of conidia and conidiophores. Reviews of the *Cercospora*-like generic assemblage were published by BRAUN (1995), BRAUN & MELNIK (1997) and CROUS et al. (2000). Molecular examination of cercosporoid Hyphomycetes recently carried out by CROUS et al. (2000, 2001) led to a re-evaluation of morphological features for taxonomic purposes at generic rank and to a reduction of the number of genera in this group. Numerous *Cercospora* spp. have already been re-examined and re-described on the basis of the newly revised generic circumscriptions, but this process is far from complete. To facilitate this process, a comprehensive checklist of all

cercosporoid Hyphomycetes has been initiated, together with a re-evaluation of all the taxa compiled by CHUPP (1954). Type material deposited in CHUPP's herbarium at CUP (Ithaca, New York, U.S.A.) has been examined. In the present paper, species with epithets a–b are listed and discussed. The original names of the *Cercospora* spp. concerned are followed by the current name (in bold) based on the new generic taxonomy. Descriptions, illustrations and notes are added. Names of species which have already been treated and re-assessed in previous papers are only listed with references to their present status and the literature concerned. In some cases, notes are added. The names of the herbaria are abbreviated according to HOLMGREN et al. (1990).

1. *Cercospora abutilonicola* CHUPP,
A monograph of the fungus genus
Cercospora: 368. 1954, basionym

Fig. 1

≡ *Pseudocercospora abutilonicola* (CHUPP)
U. BRAUN & CROUS, **comb. nov.**

Material examined: on *Abutilon graveolens* WRIGHT & ARN. (Malvaceae), Puerto Rico, Martin Pena, 03 Jun. 1930, *M. T. COOK*, holotype of *C. abutilonicola* (CUP); on *A. graveolens*, Puerto Rico, Marino Mari, 23 Nov. 1937, *W. A. MCCUBBIN* (CUP).

Leaf spots lacking or indefinite. Caespituli amphigenous, irregular, effuse, forming olivaceous patches. Primary mycelium internal; secondary mycelium external; hyphae emerging through stomata, superficial, creeping, septate, sparingly branched, 1.0–3.5 µm wide, pale olivaceous, smooth, secondary hyphae sometimes forming ropes and climbing leaf hairs. Stromata lacking or small, up to 25 µm diam., brown. Conidiophores solitary, arising from creeping hyphae, lateral, sometimes terminal, occasionally in small, loose to dense fascicles, emerging through stomata, erect, straight, subcylindrical to geniculate-sinuous, simple, occasionally branched, 5–70 × 2–4 µm, continuous to sparingly septate, subhyaline to pale olivaceous or olivaceous-brown, smooth; conidiophores usually reduced to conidiogenous cells, sometimes conidiogenous cells integrated, terminal, 5–30 µm long; conidioge-

nous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, subfusiform, 20–110 × 2–5 µm, 3–9-septate, subhyaline to pale olivaceous, smooth, apex obtuse to subacute, base obconically truncate to long obconically truncate, 1–2 µm diam., hila unthickened, not darkened.

Notes: This species is a typical *Pseudocercospora* with inconspicuous conidiogenous loci and conidia with unthickened, not darkened hila.

2. *Cercospora achyranthina* THIRUM. & CHUPP, *Mycologia* 40: 352. 1948

= *Cercospora apii* FRESEN. s.l.

Notes: CROUS & BRAUN (2001) re-examined type material of this species from BPI and elucidated its taxonomic status.

3. *Cercospora aciculina* CHUPP,
A monograph of the fungus genus
Cercospora: 118. 1954

Notes: Type material of this species has not yet been traced. It is not deposited at CUP.

4. *Cercospora aciotidis* CHUPP,
A monograph of the fungus genus
Cercospora: 378. 1954, basionym

Fig. 2

≡ *Pseudocercospora aciotidis* (CHUPP) U. BRAUN & CROUS, **comb. nov.**

Material examined: on *Aciotis indecora* (BONPL.) TRIANA (Melastomaceae), Colombia, near Buenaventura, Department de Valle, 08 May 1928, *C. E. CHARDON 217*, holotype of *C. aciotis* (CUP).

Leaf spots amphigenous, angular-irregular, 0.5–4.0 mm diam., red to reddish brown, margin indefinite. Caespituli hypophyllous, punctiform to subeffuse, brownish. Mycelium internal. Stromata absent or small, composed of a few swollen hyphal cells, brown. Conidiophores in small to moderately large fascicles, loose to moderately dense, arising from internal hyphae or stromata, erumpent, erect, occasionally decumbent, flexuous, subcylindrical to

slightly geniculate-sinuuous, simple, occasionally branched. 20–105 × 3–6 µm, continuous or usually pluriseptate, occasionally constricted at the sepa, olivaceous to medium dark brown throughout or tips paler, smooth; conidiogenous cells integrated, terminal, 20–40 µm long, conidiogenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, 20–95 × 3–5 µm, 0–8-septate, subhyaline to pale olivaceous, smooth, apex obtuse to subacute, base obconically truncate, 1.5–2.0 µm diam., hila unthickened, not darkened.

Notes: Since the conidiogenous loci and conidial hila are unthickened and not darkened, this species belongs in *Pseudocercospora*.

5. *Cercospora adenocalymmatidis*
(*'adenocalymmae'*) A.S.MULL. & CHUPP,
Arq. Inst. Biol. Veg., Rio de Janeiro 1: 213.
1935, nom. inval. (without Latin
diagnosis)

≡ *Passalora adenocalymmatidis* U.BRAUN & CROUS,
sp. nova

≡ *Phaeoramularia adenocalymmatidis* (A.S.MULL. &
CHUPP) CROUS & M.P.S.CÂMARA, Mycotaxon 68:
303. 1998, comb. inval.

Maculae amphigenae, suborbiculatae, 0.5–4.0 mm diam., griseae, margine tenui, atro-brunneo, leviter elevato vel rubro-purpureo cinctae. Mycelium immersum. Hyphae ramosae, leviae vel subtiliter verruculosae, brunneae, 3–4 µm diam. Caespituli hypophylli, punctiforme, brunnei. Conidiophora pauca vel modice numerosa, dense fasciculata, ex cellulis stromatibus oriunda, erecta, recta, subcylindrica vel leviter geniculata-sinuosa, non-ramosa, 25–75 × 4–5 µm, 1–5-septata, pallide brunnea, levia vel subtiliter verruculosa; cellulae conidiogenae integratae, terminales, 10–35 × 4.0–4.5 µm, cicatrices conidiales conspicuae, leviter incrassatae et fuscatae, 1–2 µm diam. Conidia solitaria, interdum catenata, cylindrica-obclavata, (30)50–100(–150) × 3.5–4.0(–4.5) µm, (1–)3–8(–10)-septata, pallide brunnea, levia vel subtiliter verruculosa, apice obtuso, basi obconice truncata, 1–2 µm diam., hila leviter incrassata et fuscata.

Holotypus: on *Adenocalymma bullata* BUREAU (Bignoniaceae), Brazil, Minas Gerais, Viçosa-Escola, 15 Aug. 1931, A. S. MULLER (CUP).

English description: CROUS & CÂMARA (1998: 303).

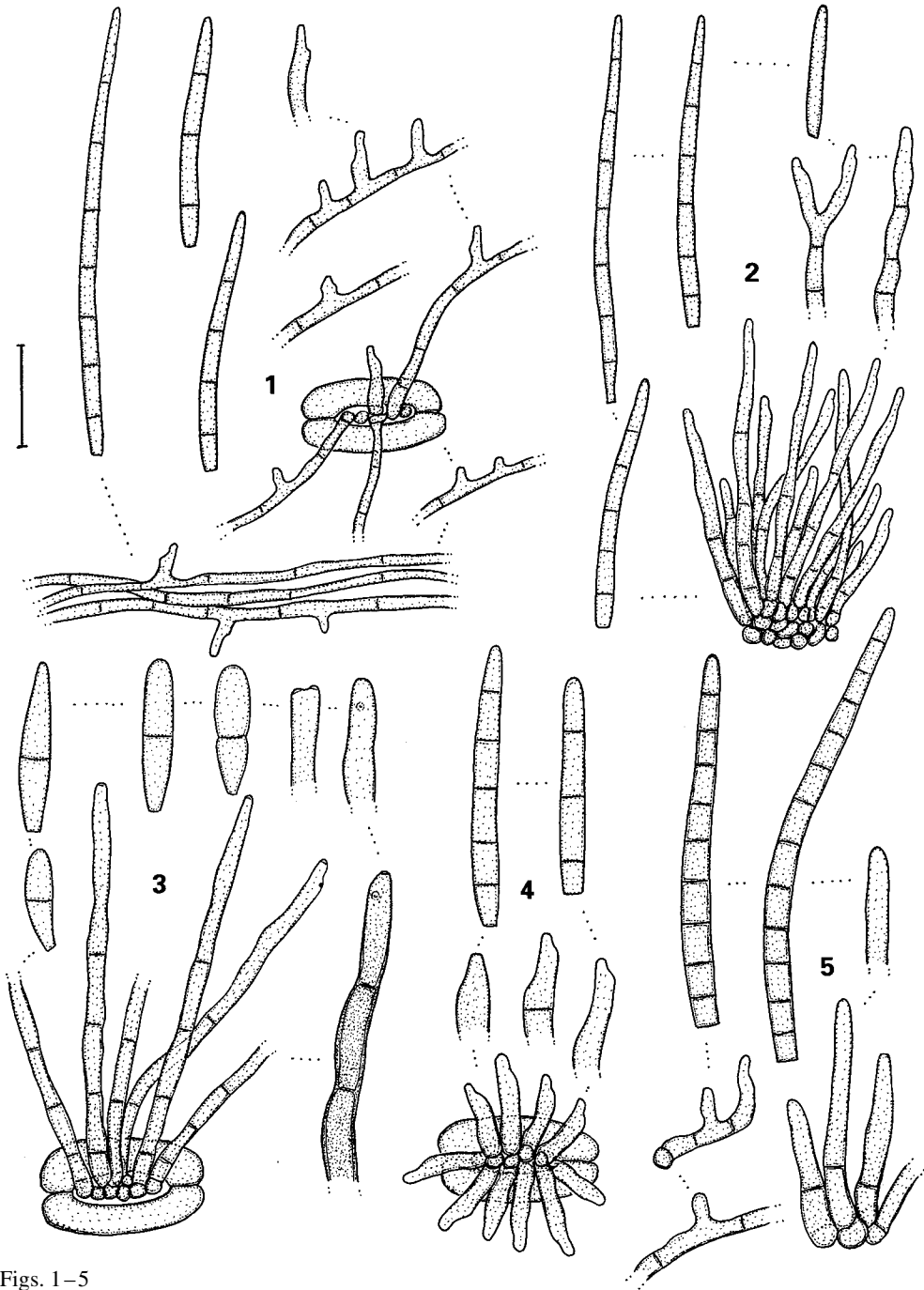
Notes: CROUS & CÂMARA (1998) examined a specimen of this species in Brazil collected in 1938 (BPI 432404), re-described it and published an illustration. Based on type material the morphological features and the taxonomic status of *C. adenocalymmatidis* could be confirmed. This species is a typical '*Phaeoramularia*' with thickened, darkened conidiogenous loci and hila and conidia formed in chains. However, *Phaeoramularia* has been reduced to synonymy with *Passalora* on the basis of morphological and molecular examinations (CROUS et al. 2000, 2001). The basionym *C. adenocalymmatidis* and the name *Phaeoramularia adenocalymmatidis* were published without Latin description, so that this species is here formally validated as *Passalora adenocalymmatidis*.

6. *Cercospora aeshynomenes* A.S.MULL. & CHUPP, Arq. Inst. Biol. Veg.,
Rio de Janeiro, 3: 91. 1936, nom. inval.
(without Latin diagnosis)

Fig. 3

≡ *Pseudodidymaria aeshynomenes* U.BRAUN &
CROUS, **sp. nova**

Maculae indistinctae vel minutae, effusae, flavido-ochraceae. Caespituli hypophylli, punctiformes, confluentes, atro-brunneae. Mycelium immersum. Stromata nulla vel parva, substomatalia, brunnea. Conidiophora pauca vel modice numerosa, laxe fasciculata, per stoma emergentia, erecta, valde geniculata-sinuosa, simplicia, raro ramosa, 50–150 × 3–7 µm, pluriseptata, pallide vel modice brunnea, apicem versus pallidiora, levia vel leviter verruculosa, tenui-tunicata; cellulae conidiogenae integratae, terminales, 10–40 µm longa, cicatrices conidiales subconspicuae, vix incrassatae, leviter fuscatae-refractivae, saepe protuberantes, 1.5–2.0 µm diam. Conidia solitaria, ellipsoidea-ovoidea, subcylindrica (-fusiformia), 15–35 × 5–8 µm, 1-septata, subhyalina vel pallidissime olivacea, levia vel leviter verruculosa, tenui-tunicata, apice obtuso, ro-



Figs. 1–5
External hyphae, conidiophore fascicles, conidiophores, conidia

1 — *Pseudocercospora abutiloncola*; 2 — *P. aciotidis*; 3 — *Pseudodidymaria aeschynomenes*; 4 — *Pseudocercospora anemopsidis*; 5 — *P. annonae*

Scale bar: 20 µm

tundato, basi obconice truncata, 1.5–2.0 µm diam., hila non incrassata, non fuscata, saepe refractiva.

Holotypus: on *Aeschynomene falcata* DC. (Fabaceae), Brazil, Minas Gerais, Viçosa-Escola, 20 Apr. 1935, A. S. MULLER 893 (CUP), type material of *Cercospora aeschynomenes*.

Leaf spots almost absent or only with small diffuse discolorations, yellowish ochraceous. Caespituli hypophyllous, punctiform, confluent, dark brown. Mycelium internal. Stromata absent or small, substomatal, brown. Conidiophores in small to moderately large fascicles, loose, arising from internal hyphae or stromata, emerging through stomata, erect, strongly geniculate-sinuuous, simple, rarely branched, 50–150 × 3–7 µm, pluriseptate throughout, pale to medium brown throughout or tips paler, smooth to faintly rough-walled, thin-walled; conidiogenous cells integrated, terminal, 10–40 µm long, conidiogenous loci subconspicuous, unthickened or almost so, but slightly darkened-refractive, often somewhat bulging, convex, 1.5–2.0 µm diam. Conidia solitary, ellipsoid-ovoid, subcylindrical (-fusoid), 15–53 × 5–8 µm, 1-septate, subhyaline to very pale olivaceous, smooth to faintly rough-walled, thin-walled, apex obtuse, broadly rounded, base obconically truncate, 1.5–2.0 µm diam., hila unthickened, not darkened, but often somewhat refractive.

Notes: CHUPP (1954) stated that this fungus does not fit into *Cercospora* and referred it tentatively to *Didymaria* CORDA, which is, however, a synonym of *Ramularia* UNGER (BRAUN 1998). Based on the structure of the conidiogenous loci and the conidial shape, size, colour and septation, this species is here placed in *Pseudodidymaria* U.BRAUN.

7. *Cercospora agarwalii* CHUPP,
in AGARWAL & HASIJA, Proc. Natl. Acad.
Sci. India, Sect. B 31 (3): 56. 1961

≡ *Pseudocercospora agarwalii* (CHUPP) U.BRAUN
& BAGYAN., in BAGYANARAYANA & BRAUN,
Sydowia 51 (11): 15. 1999

Notes: BAGYANARAYANA & BRAUN
(1999) examined type material of this species,

re-allocated it to *Pseudocercospora* and published a description and illustration.

8. *Cercospora alni* CHUPP & H.C.GREENE,
in GREENE, Farlowia 1: 580. 1944

≡ *Passalora alni* (CHUPP & H.C.GREENE)
DEIGHTON, Mycol. Pap. 112: 10. 1967

Notes: DEIGHTON (1967) re-examined type material and other collections of this species, referred it to *Passalora* FR. and published a comprehensive description and some illustrations.

9. *Cercospora ambrosiae* CHUPP,
J. Dept. Agric. Porto Rico 14: 282. 1930

≡ *Passalora ambrosiae* (CHUPP) CROUS &
U.BRAUN, Mycotaxon 78: 331. 2001

Material examined: on *Ambrosia peruviana* WILLD. (Asteraceae), Colombia, Ferrocarril de Girardot, Dept. Cundinamarca, 21 Jun. 1929, C. E. CHARDON & J. A. B. NOLLA 580, lectotype of *C. ambrosiae*, selected here (CUP); isolectotype: BPI 432585.

Notes: CROUS & BRAUN (2001) described and illustrated *P. ambrosiae* based on the examination of type material from BPI.

10. *Cercospora anacardii* A.S.MULL.
& CHUPP, Arq. Inst. Biol. Veg.,
Rio de Janeiro 1: 214. 1935, nom. inval.
(without Latin diagnosis)

≡ *Pseudocercospora anacardii* E.CASTELL.
& CRASULLI, Rev. Agric. Subtrop. Trop. 75: 103.
1981

11. *Cercospora anemopsidis* CHUPP,
A monograph of the fungus genus
Cercospora: 513. 1954, basionym

≡ *Pseudocercospora anemopsidis* (CHUPP)
U.BRAUN & CROUS, **comb. nov.**

Fig. 4

Material examined: on *Anemopsis californica* (NUTT.) HOOK. & ARN. (Saururaceae),

U.S.A., California, Los Angeles, 01 Oct. 1926, O. A. PLUNKETT, lectotype of *C. anemopsidis*, selected here (CUP); isolecotypes: CUP.

Leaf spots amphigenous, subcircular to irregular, 2–6 mm diam., dark brown to somewhat greyish brown, with a dark, somewhat raised marginal line and a narrow to moderately wide, brown to dark violet halo. Caespituli epiphyllous, punctiform, dark brown, scattered to dense. Mycelium internal. Stromata substomatal, brown, 10–50 µm diam. Conidiophores in small to moderately large fascicles, loose to dense, erect, straight, subcylindrical or attenuated towards the apex, occasionally apex somewhat enlarged, barely or only slightly geniculate-sinuuous, unbranched, (5–)10–40(–65) × 3–7 µm, continuous or sparingly septate, pale to medium olivaceous brown, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5–30 µm long, conidiogenous loci inconspicuous. Conidia solitary, obclavate-cylindrical, 20–70 × 3–5 µm, 1–6-septate, pale olivaceous, smooth or almost so, apex obtuse, base truncate, obconically truncate or occasionally rounded, 1.5–2.0 µm diam., hila unthickened, not darkened, at almost somewhat refractive.

Notes: Since the conidiogenous loci are neither thickened nor darkened, *C. anemopsidis* has to be placed in *Pseudocercospora*.

12. *Cercospora angustata* CHUPP & SOLHEIM, in CHUPP, A monograph of the fungus genus *Cercospora*: 280. 1954

≡ *Pseudocercospora angustata* (CHUPP & SOLHEIM) DEIGHTON, Mycol. Pap. 140: 139. 1976

≡ *Phaeoisariopsis angustata* (CHUPP & SOLHEIM) L.G.BROWN & MORGAN-JONES, Mycotaxon 6: 267. 1977

Notes: BROWN & MORGAN-JONES (1977) examined type material of this species, re-allocated it to *Phaeoisariopsis* and provided a full description and good illustration, but since the conidiogenous loci and conidial hila are unthickened and not darkened the combination *Pseudocercospora angustata* proposed by DEIGHTON (1976) is here confirmed.

13. *Cercospora anonae* A.S.MULL. & CHUPP, Arq. Inst. Biol. Veg., Rio de Janeiro 1(3): 214. 1935, nom. inval. (without Latin diagnosis)

≡ *Pseudocercospora anonae* U.BRAUN & CROUS, sp. nova

Fig. 5

Maculae amphigenae, angulares-irregulares, 0.5–5.0 mm diam., saepe per venas limitatae, subnigrae, margine indistincto. Caespituli amphigeni, punctiformes vel subeffusei, brunnei. Mycelium primarium immersum, mycelium secundarium nullum vel sparse evolutum, externum; hyphae per stoma emergentiae, sparse ramosae, septatae, subhyalinae vel pallide olivaceae, 1.5–4.0 µm latae, leviae. Stromata nulla vel minuta, brunnea. Conidiophora pauca vel modice numerosa, laxe vel dense fasciculata, per stoma emergentia vel solitaria, ex hyphis secundariis oriunda, erecta, recta, subcylindrica, flexuosa, simplicia, raro ramosa, vix geniculata-sinuosa, 10–110 × 3–5 µm, 0–2-septata, pallide olivacea, levia; cellulae conidiogenae integratae, terminales vel idem ac conidiophoris, 10–30 µm longae; cicatrices conidiales inconspicuae. Conidia solitaria, obclavata, obclavata-cylindrica, subacicularia, 50–150 × 5–7 µm, dense pluriseptata, saepe 6–18-septata, distantia 4–15 µm, subhyalina vel medi-olivacea, levia, apice subobtusum vel sub-acutum, basi truncata vel obconice truncata, 2.5–3.5 µm diam., hila non incrassata, non fuscata.

Holotypus: on *Annona squamosa* L. (Annonaceae), Brazil, Minas Gerais, Viçosa-Escola, 07 Apr. 1932, A. S. MULLER 335 (CUP); Paratypus: on *Rollinia sylvatica* WERNST. (Annonaceae), Brazil, Minas Gerais, Viçosa-Escola, 29 Apr. 1934, A. S. MULLER 779 (CUP).

Leaf spots amphigenous, angular-irregular, 0.5–5.0 mm diam., often vein-limited, blackish, margin indefinite. Caespituli amphigenous, punctiform to subeffuse, brown. Primary mycelium internal; secondary mycelium lacking to sparingly developed, external; hyphae emerging through stomata, sparingly branched, septate, subhyaline to pale olivaceous, 1.5–4.0 µm wide, smooth. Stromata lacking or small, composed of a few swollen hyphal cells, substomatal, brown. Conidiophores in small to

moderately large, loose to dense fascicles, arising from internal hyphae or hyphal aggregations, emerging through stromata or solitary, arising from creeping hyphae, lateral, erect, straight, subcylindrical, flexuous, simple or rarely branched, barely geniculate-sinuuous, 10–110 × 3–5 µm, 0–2-septate, pale olivaceous, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10–30 µm long, conidiogenous loci inconspicuous. Conidia solitary, obclavate-cylindrical, subacicular, 50–150 × 5–7 µm, densely pluriseptate, usually 6–18-septate, distance between septa 4–15 µm, subhyaline to medium olivaceous, smooth, apex subobtuse to subacute, base truncate to somewhat obconically truncate, 2.5–3.5 µm diam., hila unthickened, not darkened.

Notes: This species is characterised by having conidiogenous cells with inconspicuous scars and unthickened, not darkened conidial hila, so that it clearly belongs in *Pseudocercospora*. *C. anonae* was published in 1935 without Latin description and is validated here as *P. annonae*.

14. *Cercospora antirrhini* A.S. MULL. & CHUPP, Ceiba 1: 171. 1950

= *Cercospora apii* s.l.

Material examined: on *Antirrhinum majus* L. (Scrophulariaceae), Guatemala, Chimaltenango, 01 Oct. 1943, A. S. MULLER, holotype of *C. antirrhini* (CUP).

Notes: Type material of *C. antirrhini* shows conidiophores up to 200 × 3–8 µm, with thickened, darkened scars, 2–3 µm diam., and conidia formed singly, acicular, hyaline, pluriseptate, up to 100 × (2.0–)3.0–4.5 µm, so that this species is morphologically indistinguishable from *C. apii* s.l.

15. *Cercospora argyrolobii* CHUPP & DOIDGE, Bothalia 4: 881. 1948

= *Pseudocercospora argyrolobii* (CHUPP & DOIDGE) DEIGHTON, Mycol. Pap. 140: 139. 1976

Notes: CROUS & BRAUN (1996) examined type material of this species from PREM and

confirmed DEIGHTON's re-allocation (DEIGHTON 1976).

16. *Cercospora aristidae* CHUPP,
A monograph of the fungus genus
Cercospora: 243. 1954

= *Cercospora apii* s.l.

Material examined: on *Aristida* sp. (Poaceae), U.S.A., Alabama, Union Town, 04 Sept. 1894, B. M. DUGGAR, holotype of *C. aristidae* (CUP).

Notes: The conidiophores, scars and acicular, hyaline conidia are indistinguishable from *C. apii* s.l.

17. *Cercospora arrabidaeae* CHUPP & VIÉGAS, Bol. Soc. Brasil Agron. 8: 8. 1945

= *Passalora arrabidaeae* (CHUPP & VIÉGAS) CROUS, ALFENAS & R.W. BARRETO, Mycotaxon 64: 408. 1997

Material examined: on *Arrabidaea platyphylla* (CHAM.) BUREAU & K. SCHUM. (Bignoniaceae), Brazil, S. Paulo, Cerrado, Mogi-Mirin, 27 Febr. 1941, A. P. VIÉGAS and A. A. COSTA 3726, lectotype of *C. arrabidaeae*, selected here (CUP); isolectotype: IACM.

Notes: CROUS et al. (1997) described and illustrated *P. arrabidaeae* based on type material from IACM. The original material from CHUPP's herbarium at CUP is selected to serve as lectotype.

18. *Cercospora arracacina* CHUPP,
A monograph of the fungus genus
Cercospora: 570. 1954

= *Cercospora apii* s.l.

Material examined: on *Arracacia xanthorrhiza* BANCROFT (Apiaceae), Venezuela, Baruta, Edu. Miranda, 13 Oct. 1939, M. F. BARUS 3516, holotype of *C. arracacina* (CUP).

Notes: The conidiophores are up to 200 × 5–6 µm, medium brown, pluriseptate, with thickened, darkened scars, 3–4 µm diam., and the conidia are formed singly, acicular, hyaline,

pluriseptate, up to $200 \times 2\text{--}5 \mu\text{m}$ with thickened, darkened hila. This species is morphologically indistinguishable from *C. apii* s.l.

19. *Cercospora arrectaria* CHUPP,

A monograph of the fungus genus
Cercospora: 570. 1954, basionym

≡ *Passalora arrectaria* (CHUPP) U.BRAUN & CROUS, **comb. nov.**

Fig. 6

Material examined: on *Arracacia rigida* COULT. & ROSE (Apiaceae), Mexico, D. F., El Deserto, 08 Jul 1932, O. A. PLUNKETT 23, holotype of *C. arrectaria* (CUP).

Leaf spots indistinct to angular, 0.5–3.0 mm diam., olivaceous to dingy grey, margin indistinct or narrow, brown. Caespituli hypophyllous, subeffuse, olivaceous. Primary mycelium internal; secondary mycelium external; hyphae emerging through stomata, superficial, creeping, 1.5–4.5 μm wide, septate, sparingly branched, subhyaline to pale olivaceous, smooth. Stromata lacking or small, brown, substomatal. Conidiophores in small to moderately large fascicles, loose to moderately dense, arising from internal hyphae or stromata, through stomata, erect to decumbent, or conidiophores solitary, arising from superficial hyphae, lateral or terminal, straight, subcylindrical to flexuous, geniculate-sinuous or torulose, simple, occasionally branched, 10–80 \times 2–8 μm , continuous to pluriseptate, olivaceous to medium brown throughout or tips paler, thin-walled, smooth to faintly rough-walled; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10–30 μm long; conidiogenous loci conspicuous, slightly thickened and darkened, 1–2 μm diam. Conidia solitary, obclavate-subcylindrical, 20–75 \times (3–)4–7 μm , 1–6-septate, subhyaline or pale to medium olivaceous, smooth, apex obtuse, base obconically truncate, 1.5–2.0 μm diam., hila slightly thickened and darkened.

Notes: This species is a typical '*Mycovellosiella*' with secondary hyphae, solitary conidiophores and conspicuous scars, but the latter genus has been reduced to synonymy with *Passalora* (CROUS et al. 2000, 2001).

20. *Cercospora atropurpurascens* CHUPP,
Monogr. Univ. Puerto Rico, Ser. B, 2:
243. 1934

= *Passalora gliricidiae* (SYD. & P.SYD.) U.BRAUN & CROUS, **comb. nov.**

≡ *Cercospora gliricidiae* SYD. & P.SYD., Philipp. J. Sci. 8: 283. 1913

≡ *Sirosporium gliricidiae* (SYD. & P.SYD.) DEIGHTON, in ELLIS, More dematiaceous Hyphomycetes: 299. 1976

≡ *Mycovellosiella gliricidiae* (SYD. & P.SYD.) U.BRAUN in BRAUN et al., New Zealand J. Bot. 37: 302. 1999

Notes: ELLIS (1976) pointed out that *C. atropurpurascens* must be considered a synonym of *C. gliricidiae*. BRAUN (in BRAUN et al. 1999) revised the taxonomy of this species and transferred it to *Mycovellosiella*, which is now a synonym of *Passalora* (s. CROUS et al. 2000, 2001).

21. *Cercospora austrinae* CHUPP & VIÉGAS,
Bol. Soc. Brasil. Agron. 8: 10. 1945

= *Cercospora apii* s.l.

Material examined: on *Pueraria hirsuta* KURZ (Fabaceae), Brazil, S. Paulo, Campinas, 29 May 1935, H. P. KRUG and A. S. COSTA 696, lectotype of *C. austrinae*, selected here (CUP); isoelectotypes: CUP and IACM.

Notes: The specimens examined have conidiogenous loci thickened, darkened, (1.5–) 2.0–3.0 μm diam., and conidia formed singly, acicular, hyaline, pluriseptate, 40–200 \times 4–5 μm . They represent a typical *Cercospora* s.str., indistinguishable from *C. apii* s.l. INACÍO et al. (1996) examined type material of this species from IACM.

22. *Cercospora avicennae* CHUPP,
A monograph of the fungus genus
Cercospora 369. 1954

= *Cercospora apii* s.l.

Material examined: on *Abutilon avicenna* GAERTN. (Malvaceae), U.S.A., Kansas, Manhattan, Sept. 1884, W. A. KELLERMAN, holotype of *C. avicennae* (NY).

Notes: The fungus examined is indistinguishable from other *Cercospora* spp. on hosts

of the Malvaceae and from *C. apii* s.l. ELLIS (1976) re-described and illustrated this species as *C. avicennae*.

23. *Cercospora bangalorensis* THIRUM. & CHUPP, Mycologia 40: 353. 1948

≡ *Pseudocercospora bangalorensis* (THIRUM. & CHUPP) DEIGHTON, Mycol. Pap. 140: 140. 1976

Notes: Type material of this species from BPI was examined by CROUS & BRAUN (2001) who confirmed the re-allocation proposed by DEIGHTON (1976).

24. *Cercospora bertrandii* CHUPP,
A monograph of the fungus genus
Cercospora: 110. 1954

Material examined: on *Spinacia oleracea* L. (Chenopodiaceae), Canada, Quebec, Pied de la Montagne, Sept. 1943, P. BERTRAND, holotype of *C. bertrandii* (CUP).

Notes: This species is a member of *Cercospora* s.str. distinct from *C. apii* s.l. by having obclavate-cylindrical conidia. Conidiophores formed in small to moderately large, loose to dense fascicles, arising from small, brown stromata, erect, subcylindrical to slightly geniculate-sinuous, unbranched, subhyaline, pale olivaceous to olivaceous brown or light brown, tips paler, 10–50(–60) × 3–7 μm, 0–1-septate, smooth; conidiogenous loci conspicuous, scars thickened and darkened, 2.0–2.5 μm diam.; conidia solitary, obclavate or cylindrical, 15–70 × 3.0–5.5 μm, 3–7-septate, hyaline, smooth, apex obtuse, base obconically truncate, 2–3 μm wide, hila thickened and darkened. VASUDEVA (1961) described and illustrated this species from India on *Chenopodium ambrosioides* L.

25. *Cercospora bidenticola* CHUPP,
A monograph of the fungus genus
Cercospora: 123. 1954, basionym

≡ *Passalora bidenticola* (CHUPP) U.BRAUN & CROUS, **comb. nov.**

Fig. 7

Material examined: on *Bidens cynapifolia* HUMB., BONPL. & KUNTH (Asteraceae), Dominican

Republic, Santiago, Ravine, 04 Aug. 1937, C. E. CHARDON 940, holotype of *C. bidenticola* (CUP).

Leaf spots absent or only with irregular, brown discolorations on the upper leaf surface. Caespituli hypophyllous, in effuse, brown patches, 1–4 mm diam., or confluent. Primary mycelium internal; secondary mycelium external; hyphae emerging through stomata, superficial, creeping, sparingly branched, 1–4 μm wide, septate, hyaline, pale olivaceous to reddish brown, smooth. Stromata lacking. Conidiophores in small, loose fascicles, arising from internal hyphae, through stomata or solitary, arising from creeping hyphae, lateral or terminal, erect to decumbent, straight, subcylindrical to somewhat geniculate-sinuous, simple, occasionally branched, continuous or sparingly septate, subhyaline to pale olivaceous brown, smooth, thin-walled; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5–20 μm long, conidiogenous loci conspicuous, scars thickened and darkened, 1–2 μm diam. Conidia solitary or catenate, occasionally in branched chains, obclavate-cylindrical, fusiform, 15–90 × 2–4 μm, 1–8-septate, hyaline, subhyaline to pale olivaceous, smooth, apex subobtuse to subacute or truncate in catenate conidia, base obconically truncate, 1–2 μm diam., hila slightly thickened and darkened.

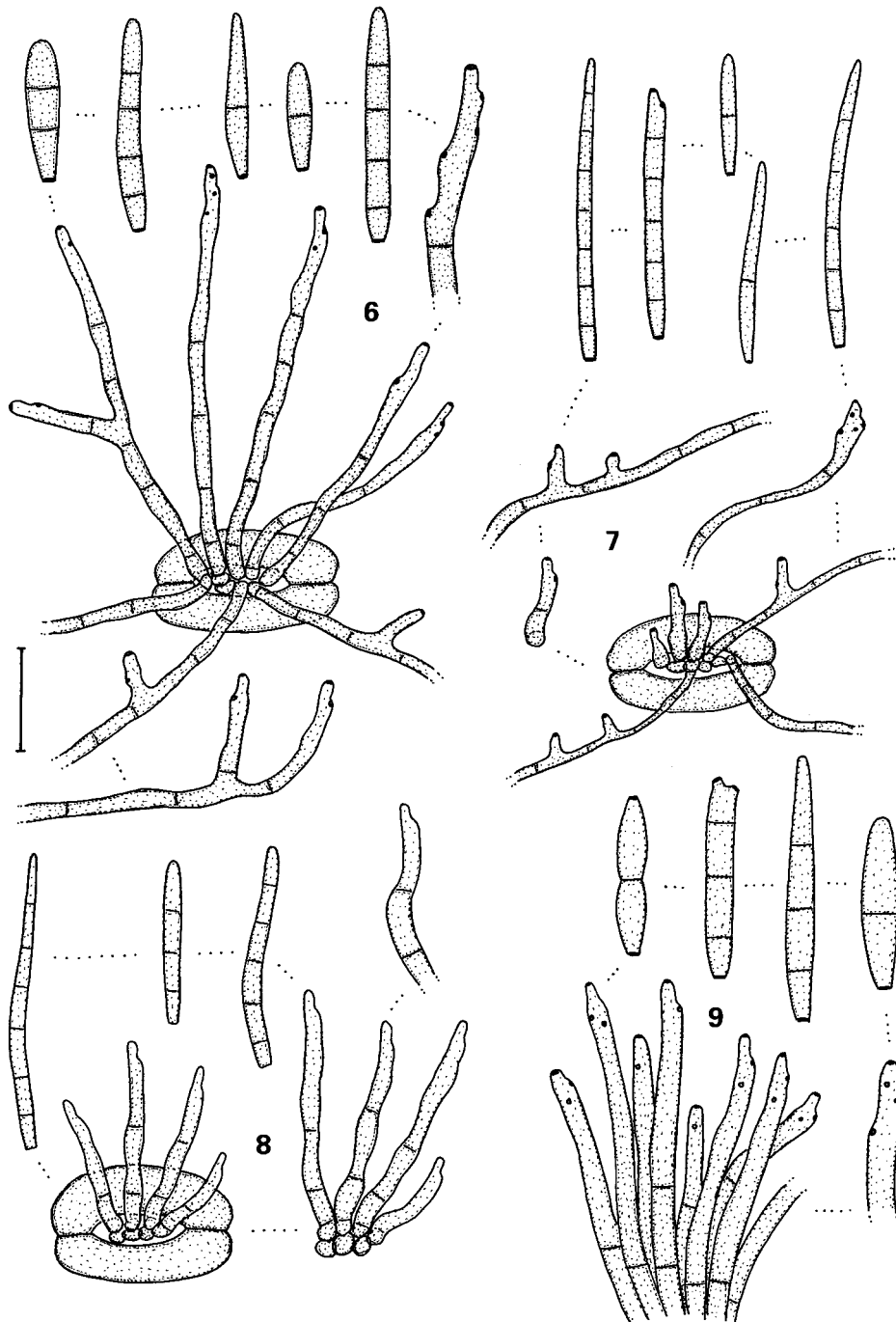
Notes: *C. bidenticola* is a typical '*Mycovellosiella*' with secondary mycelium, solitary conidiophores, conspicuous scars and catenate conidia, but the latter genus has recently been reduced to synonymy with *Passalora* (CROUS et al. 2000, 2001).

26. *Cercospora blechi* CHUPP & A.S.MULL.,
Bol. Soc. Venez. Ci. Nat. 8 (52): 37. 1942,
nom. inval. (without Latin diagnosis)

≡ *Pseudocercospora blechi* U.BRAUN, CROUS & N.PONS, **sp. nova**

Fig. 8

Maculae saepe epiphyllae, indistinctae vel irregulares, 0.5–3.0 mm diam., rubellae, margine indistinctae, interdum confluentes. Caespituli hypophylli, subeffusi, atro-olivacei vel subnigri. Mycelium immersum. Stromata nulla vel parva, brunnea. Conidiophora pauca,



Figs. 6–9
External hyphae, conidiophore fascicles, conidiophores, conidia

6 — *Passalora arrectaria*; 7 — *P. bidenticola*; 8 — *Pseudocercospora blechi*; 9 — *Passalora bocconiae*
Scale bar = 20 μ m

interdum modice numerosa, laxe fasciculata, per stoma emergentia, erecta, flexuosa, geniculata-sinuosa, simplicia, raro ramosa, $10\text{--}90 \times 2\text{--}4 \mu\text{m}$, 0–3-septata, pallide olivacea vel olivaceo-brunnea, levia; cellulae conidiogenae integratae, terminales, $10\text{--}30 \mu\text{m}$ longae, vel idem ac conidiophoris; cicatrices conidiales inconspicuae. Conidia solitaria, cylindrica vel obclavata-cylindrica, $15\text{--}65 \times 2\text{--}4 \mu\text{m}$, 1–6-septata, subhyalina vel pallide olivacea, apice obtuso vel subacuto, basi obconice truncata, $1.0\text{--}1.5 \mu\text{m}$ diam., hila non incrassata, non fuscata.

Holotypus: on *Blechnum brownei* HUMB., BONPL. & KUNTH (Acanthaceae), Venezuela, Caracas, 28 Jul. 1938, A. S. MULLER 2240 (CUP); isotypus: VIA.

Leaf spots mainly epiphyllous, indistinct to irregular, 0.5–3.0 mm diam., margin indefinite, sometimes confluent. Caespituli hypophyllous, subeffuse, dark olivaceous to blackish. Mycelium internal. Stromata lacking or small, composed of a few swollen hyphal cells, brown. Conidiophores in small, loose fascicles, occasionally in moderately large fascicles, arising from internal hyphae or hyphal aggregations, emerging through stomata, erect, flexuous, geniculate-sinuuous, simple, rarely branched, $10\text{--}90 \times 2\text{--}4 \mu\text{m}$, 0–3-septate, pale olivaceous or olivaceous-brown, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, $10\text{--}30 \mu\text{m}$ long, conidiogenous loci (scars) inconspicuous. Conidia solitary, cylindrical or obclavate-cylindrical, $15\text{--}65 \times 2\text{--}4 \mu\text{m}$, 1–6-septate, subhyaline to pale olivaceous, apex obtuse to subacute, base obconically truncate, $1\text{--}1.5 \mu\text{m}$ diam., hila unthickened, not darkened.

Notes: The name *C. blechi* was published without Latin diagnosis (MULLER & CHUPP 1942). This species is a typical member of *Pseudocercospora* with unthickened, not darkened scars and hila.

27. *Cercospora blephiliae* CHUPP & H.C. GREENE, Trans. Wisconsin Acad. Sci. 36: 266. 1946

= *Cercospora apii* s.l.

Material examined: on *Blephilia ciliata* (L.) BENTH. (Lamiaceae), U.S.A., Wisconsin, Wankasha

County, Scuppernong Prairie, 08 Aug. 1943, H. C. GREENE, lectotype of *C. blephiliae* (CUP); isolectotype WIS; on *Lycopus uniflorus* MICHX. (Lamiaceae), U.S.A., Wisconsin, Madison, 01 Sept. 1944, H. C. GREENE (CUP).

Notes: This species with conidiophores $40\text{--}100 \times 3\text{--}6 \mu\text{m}$, pluriseptate, brown, conidiogenous loci thickened and darkened, $2.0\text{--}2.5 \mu\text{m}$ diam. and conidia solitary, acicular, $20\text{--}100 \times 2\text{--}4 \mu\text{m}$, pluriseptate, hyaline, apex subacute, base truncate, hila thickened and darkened is indistinguishable from *C. apii* s.l.

28. *Cercospora bocconiae* CHUPP, Monogr. Univ. Puerto Rico, Ser. B 2: 243. 1934

= *Passalora bocconiae* (CHUPP) U. BRAUN & CROUS, **comb. nov.**

Fig. 9

Material examined: on *Bocconia frutescens* L. (Papaveraceae), Venezuela, road from Timotes to Chachopa, Mérida, 29 Aug. 1932, CHARDON and TORO 977, holotype of *C. bocconiae* (CUP).

Leaf spots amphigenous, subcircular, 2–8 mm diam., brownish to dingy grey, margin wide, brown to purplish. Caespituli amphigenous, punctiform to subeffuse, brown. Mycelium internal. Stromata small, substomatal, brown. Conidiophores few to numerous, in dense fascicles, often almost synnematous, filiform, barely geniculate-sinuuous, unbranched, $40\text{--}150 \times 2\text{--}5 \mu\text{m}$, pluriseptate throughout, pale olivaceous to brownish, medium brown in mass, tips often paler, smooth; conidiogenous cells integrated, terminal, $10\text{--}30 \mu\text{m}$ long, conidiogenous loci conspicuous, scars thickened and darkened, $1.5\text{--}2.0 \mu\text{m}$ diam. Conidia solitary or catenate, occasionally in branched chains, obclavate-subcylindrical, ellipsoid-cylindrical, $15\text{--}70 \times 3\text{--}6 \mu\text{m}$, 0–6-septate, pale olivaceous or olivaceous-brown, smooth, apex obtuse to truncate in catenate conidia, base obconically truncate, $1.5\text{--}2.0 \mu\text{m}$ diam., hila slightly thickened and darkened.

Notes: Based on conidiogenous cells with conspicuous scars and pigmented conidia with thickened and darkened hila, this species has to be re-allocated to *Passalora*.

29. *Cercospora boldoae* CHUPP &

A.S.MULL., Bol. Soc. Venez. Ci. Nat. 8 (52): 38. 1942, nom. inval. (without Latin diagnosis)

≡ *Passalora boldoae* (N.PONS) U.BRAUN, CROUS & N.PONS, **comb. nov.**

≡ *Mycovellosiella boldoae* N.PONS, *Ernstia* 23: 17. 1984

Notes: PONS (1984) examined type material of this species from VIA, validated this species under *Mycovellosiella* and published a re-description and illustration. Based on new morphological and molecular investigations (CROUS et al. 2000, 2001), *Mycovellosiella* has been reduced to synonymy of *Passalora* and the new combination *P. boldoae* is proposed.

30. *Cercospora boutelouae* CHUPP

& H.C.GREENE, *Farlowia* 1: 579. 1944

Fig. 10

Material examined: on *Bouteloua curtipendula* (MICHX.) A.GRAY (Poaceae), U.S.A, Wisconsin, Madison, 28 Jul. 1943, *H. C. GREENE*, lectotype of *C. boutelouae*, selected here (CUP); isolectotype: WIS.

Notes: This species is a typical member of *Cercospora* s.str. characterised by having conidiogenous cells with thickened, darkened conidiogenous loci and solitary, hyaline, scolecosporous conidia with thickened, darkened hila, but it differs from *C. apii* s.l. in having frequently obclavate conidia with distinctly obconically truncate bases.

31. *Cercospora broussonetiae* CHUPP

& LINDER, *Mycologia* 29: 27. 1937

≡ *Pseudocercospora broussonetiae* (CHUPP & LINDER) X.J.LIU & Y.L.GUO, in GUO & LIU, *Mycosystema* 2: 229. 1989

Material examined: on *Broussonetia* sp. (Moraceae), China, Province Kwangsi, Yung Hsien, 17 Oct. 1933, *S. Y. CHEO* 2900, lectotype of *C. broussonetiae*, selected here (CUP); isolectotypes: Reliquiae Farlowianae 827 (e.g., CUP, FH).

Notes: GUO & LIU assigned this species to *Pseudocercospora* based on some other Chinese collections. This treatment is here confirmed by the examination of type material.

32. *Cercospora browalliae* CHUPP

& BARRUS, in CHUPP, A monograph of the fungus genus *Cercospora*: 534. 1954

Notes: Type material of this species could not yet be traced and examined.

33. *Cercospora bunchosiae* CHUPP &

A.S.MULL., Bol. Soc. Venez. Ci. Nat. 8 (52): 38. 1942, nom. inval. (without Latin diagnosis)

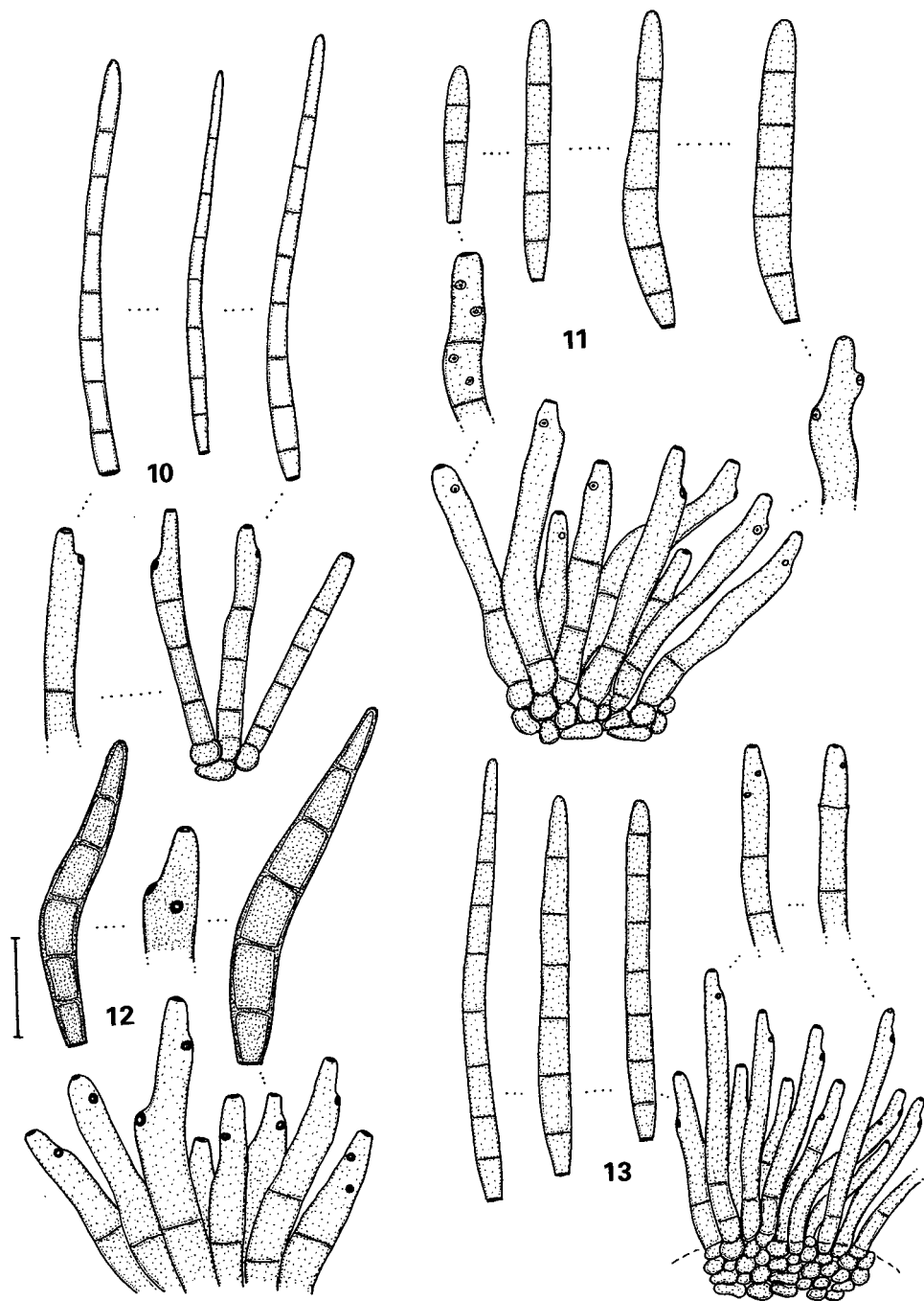
≡ *Passalora bunchosiae* N.PONS, U.BRAUN & CROUS, **sp. nova**

Fig. 11

Differt a *P. malpighiae-glabrae* lesionibus distinctis, conspicue zonatis, cicatricibus conidiis vix incrassatis, leviter fuscatis, 1.5–2.5 µm latis, conidiophoris et conidiis tenuitunicatis.

Holotypus: on *Bunchosia glandulifera* HUMB., BONPL. & KUNTH (Malpighiaceae), Venezuela, Caracas, 15 Jul. 1938, A. S. MULLER 2210 (CUP); isotypus: VIA.

Leaf spots amphigenous, subcircular, 2–8 mm diam., centre grey, then brown which gradually fades into the healthy tissue, often zonate. Caespituli amphigenous, punctiform, brown. Mycelium internal. Stromata usually substomatal, globular, 15–60 µm, dark brown. Conidiophores in moderately large fascicles, usually dense, arising from stromata, through stomata or erumpent, erect, straight, subcylindrical, subclavate to flexuous, but barely geniculate-sinuous, simple, rarely branched, 30–100 × 4–9 µm, septate, pale to medium olivaceous, olivaceous-brown or brown, thin-walled, smooth; conidiogenous cells integrated, terminal, 10–40 µm long, conidiogenous loci conspicuous, but barely thickened, slightly darkened, rather pale, 1.5–2.5 µm diam. Conidia solitary or catenate, obclavate-subcylindrical, 20–75 × 5–8 µm, 3–8-septate, pale to medium olivaceous, smooth, thin-walled, apex obtuse, usually broadly rounded,



Figs. 10–13

External hyphae, conidiophore fascicles, conidiophores, conidia

10 — *Cercospora boutelouae*; 11 — *Passalora bunchosiae*; 12 — *P. malpighiae-glabrae*; 13 — *P. kreiseliana*Scale bar = 20 μ m

base obconically truncate, 2–3 µm diam., hila barely thickened, but slightly darkened-refractive.

Notes: This species is a typical *Passalora* with conspicuous conidiogenous loci and pigmented conidia. It is well-characterised by having rather pale scars and broad conidia. A second collection of '*C. bunchosiae*' on *Malpighia glabra* L. from Florida, also deposited at CUP, was examined and turned out to represent a different, undescribed species, distinguished from *P. bunchosiae* by having larger, darker scars and thick-walled conidiophores and conidia. A third collection on *Malpighia glabra* from Jamaica, deposited at IMI under '*Cercosporidium* sp.', represents a distinct species as well. The two new species are described as follows.

***Passalora malpighiae-glabrae* U.BRAUN & CROUS, sp. nova**

Fig. 12

Differt a *P. bunchosiae* lesionibus distinctis, non zonatis, cicatricibus conidialis conspicue incrassatis, fuscatis, 2.0–3.5 µm latis, conidiophoris crassitunicatis, conidiis semper obclavatis, crassitunicatis.

Holotypus: on *Malpighia glabra* L. (Malpighiaceae), U.S.A, Florida, Miami, 30 Dec. 1959, H. BURNETT, as '*C. bunchosiae*' (CUP).

Leaf spots amphigenous, subcircular to angular-irregular, 1–6 mm diam., pale to medium brown, reddish brown, later centre pale, surrounded by a dark margin. Caespituli amphigenous, punctiform to confluent, dense, dark brown. Mycelium internal. Stromata substomatal to intraepidermal, 30–60 µm diam., brown. Conidiophores in moderately large to large fascicles, loose to dense, arising from stromata, through stomata or erumpent, erect, straight, subcylindrical to moderately geniculate-sinuuous, unbranched, 30–90 × 3–10 µm, continuous to pluriseptate, pale olivaceous, olivaceous-brown or yellowish brown, smooth, wall somewhat thickened; conidiogenous cells integrated, terminal, conidiophores occasionally reduced to conidiogenous cells, 10–30 µm long, conidiogenous loci conspicuous, thickened and darkened, 2.0–3.5 µm diam.

Conidia solitary, consistently obclavate, usually curved, 40–110 × 6–10 µm, 4–11-septate, pale olivaceous to yellowish olivaceous, smooth, wall thickened, apex obtuse, base obconically truncate, 2.5–3.5 µm diam., hila somewhat thickened and darkened.

***Passalora kreiseliana* U.BRAUN & CROUS, sp. nova²**

Fig. 13

Differt a *P. bunchosiae* et *P. malpighiae-glabrae* stromatibus magnis (25–90 µm diam.) et conidiis 3–5 µm latis.

Holotypus: on *Malpighia glabra* L. (Malpighiaceae), Jamaica, St. Andrew, garden, Mar. 1975, F. YOUNG, CB 1292 (IMI 19244).

Leaf spots amphigenous, subcircular to somewhat angular, 1–3 mm diam., whitish, margin indefinite or narrow, dark. Caespituli amphigenous, punctiform, loose to dense, dark brown. Mycelium internal. Stromata large, 25–90 µm diam., substomatal to intraepidermal, occasionally somewhat erumpent, brown, composed of swollen hyphal cells, 2–7 µm diam. Conidiophores numerous, arising from stromata, through stomata or erumpent, erect, straight, subcylindrical or attenuated towards the apex, barely geniculate-sinuuous, unbranched, 10–50(–60) × 4–6 µm, 0–2(–4)-septate, pale to medium brown or olivaceous-brown, tips often paler, smooth to faintly rough-walled, thin-walled; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10–30 µm long, conidiogenous loci somewhat thickened and darkened, small, 1.0–1.5 µm diam. Conidia solitary, obclavate-cylindrical, 40–110 × 3–5 µm, 3–12-septate, pale olivaceous to brown, smooth or almost so, apex obtuse to subacute, base obconically truncate, 1–2 µm diam., hila slightly thickened and darkened.

The three species on *Bunchosia* and *Malpighia* (Malpighiaceae) can be keyed out as follows:

² Dedicated to Professor Dr. Hanns Kreisel, German mycologist, on the occasion of his 70th birthday

1. Stromata large, 25–90 µm diam.; conidiogenous loci with small scars, 1–1.5 µm diam.; conidia narrow, 3–5 µm wide; on *Malpighia glabra* *P. kreiseliana*
1. Stromata 15–60 µm diam.; conidiogenous loci with larger scars, 1.5–3.5 µm diam.; conidia 5–10 µm wide 2
2. Conidiogenous loci with very pale, barely thickened, slightly darkened scars, 1.5–2.5 µm diam.; conidia thin-walled; on *Bunchosia glandulifera* *P. bunchosiae*
2. Conidiogenous loci with conspicuously thickened and darkened scars, 2.0–3.5 µm diam.; conidia thick-walled; on *Malpighia glabra* *P. malpighiae-glabrae*

Acknowledgements

The authors are indebted to the curators of CUP, IMI and VIA for the possibility to examine type material of *Cercospora* spp. in their keeping.

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Manuscript received: September 5th, 2001.