

## Revision of *Cercospora* species described by K.B. Boedijn

by

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With 19 figures

Braun, U. (2001): Revision of *Cercospora* species described by K.B. Boedijn. - Nova Hedwigia 73: 419-436.

**Abstract:** Type material of *Cercospora* spp. described by K.B. Boedijn was re-examined, and the species concerned were reassessed based on modern generic concepts in cercosporoid hyphomycetes. *Cercospora amorphophallicola* sp. nov. and *Stenella pseudoramularia* sp. nov. are described and the following new combinations and new names are proposed: *Pseudocercospora abricola* comb. nov., *P. cinchonicola* comb. nov., *P. combretigena* nom. nov., *P. evodiicola* comb. nov., *P. hedychii* comb. nov., *P. micheliae* comb. nov., *P. boedijniana* nom. nov., *P. nicolaiiae* comb. nov., *P. premnicola* comb. nov., *P. rademacheriae* comb. nov., *P. stemonae* comb. nov., *Stenella extremorum* comb. nov. and *S. schefflerae* comb. nov.

Karel B. Boedijn (1893-1964) was a Dutch mycologist who worked in Indonesia from 1926-1958 (Stafleu & Cowan 1976). In 1961, he published a paper dealing with *Cercospora* spp. collected in Indonesia, mostly in Bogor Botanical Garden, Java, including descriptions of numerous new species. Boedijn's generic concept of *Cercospora* s.lat. was based on Chupp (1954). Holotype material of the *Cercospora* spp. described by K.B. Boedijn is deposited at L, isotypes at IMI. A re-examination of the collections concerned has been carried out in order to reassess these species based on modern generic concepts in cercosporoid hyphomycetes.

### 1. Reassessment of *Cercospora* species newly described by K.B. Boedijn (1961)

#### 1.1. *Pseudocercospora abricola* (Boedijn) U. Braun, comb. nov. Fig. 1

≡ *Cercospora abricola* Boedijn, Nova Hedwigia 3: 421 (1961).

= *Pseudocercospora abri* Deighton, Trans. Brit. Mycol. Soc. 88(3): 365 (1987).

Holotype: on *Abrus precatorius* (Fabaceae), Indonesia, Java, Bogor, Botanical Garden, 3 July 1953, K.B. Boedijn (L 53843; isotype IMI 91593).

0029-5035/01/0073-0419 \$ 4.50

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Verlagsbuchhandlung, D-14129 Berlin · D-70176 Stuttgart

Leaf spots rather inconspicuous, only with small diffuse yellowish greenish discolorations. Caespituli epiphyllous, punctiform, dark brown to blackish. Mycelium internal; stromata well-developed, intraepidermal, 20-70 µm diam., subglobose, dark brown. Conidiophores numerous, in loose to dense fascicles, arising from stromata, erumpent, erect, straight, subcylindrical to slightly geniculate-sinuous, unbranched, 20-70 × 3-5.5 µm, continuous to sparingly septate, smooth, yellowish to olivaceous-brown or pale brown, paler towards the tip; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 20-50 µm long, conidiogenous loci without conspicuous scars. Conidia solitary, obclavate(-subcylindrical), small conidia sometimes ellipsoid-fusiform, (0-)1-4(-5)-septate, subhyaline to very pale olivaceous, smooth, apex obtuse, base obconically truncate, hila about 2 µm diam., unthickened, non-pigmented.

*Cercospora abtricola* is a typical *Pseudocercospora* with inconspicuous conidiogenous loci. In the type material of *C. abtricola*, only epiphyllous caespituli are present, which correspond well with those of *P. abri* (type IMI 8662 examined). The characteristic hypophyllous fructification, developed in the type collection of the latter species, is lacking in the present collection. Obvious differences between epiphyllous and hypophyllous fructifications in *Pseudocercospora* are not uncommon.

1.2. **Cercospora angiopteridis** Boedijn, Nova Hedwigia 3: 424 (1961)

= *Pseudocercospora angiopteridis* Goh & W.H. Hsieh, Trans. Mycol. Soc. Republic of China 4(2): 27 (1989).

Holotype: on *Angiopteris evecta* (Marattiaceae), Indonesia, Java, Bogor, Botanical Garden, 27 July 1953, K.B. Boedijn (L 53845; isotype IMI 91585).

*Cercospora angiopteridis* and *Pseudocercospora angiopteridis* are morphologically indistinguishable.

1.3. **Pseudocercospora cinchonicola** (Boedijn) U. Braun, comb. nov. Fig. 2

= *Cercospora cinchonicola* Boedijn, Nova Hedwigia 3: 427 (1961).

Holotype: on *Cinchona* sp. (Rubiaceae), Indonesia, Java, Paqjet, Aug. 1950, T. Hadwidjaja (IMI 91956).

Leaf spots amphigenous, subcircular to irregular, at first small, 2-3 mm diam., later confluent and larger, often oblong, up to 40 mm long, brown, finally greyish brown to dingy-grey, margin indefinite or with a narrow darker border or marginal line. Caespituli mainly hypophyllous, punctiform, scattered, dark brown to blackish. Mycelium internal; stromata lacking or small, 10-40 µm diam., substomatal, olivaceous-brown. Conidiophores in small to moderately large fascicles, loose to dense, arising from stromata, emerging through stomata, erect, subcylindrical, straight to geniculate-sinuous, unbranched, 10-40(-60) × 2-6 µm, continuous or sparingly septate, subhyaline to pale olivaceous-brown, tips often paler, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-30 µm long, conidiogenous loci inconspicuous, unthickened, not darkened. Conidia

solitary, subcylindrical-filiform, subcylindrical-obclavate, occasionally subacicular, 35-110 × 2-5 µm, 2-8-septate, subhyaline to pale olivaceous, smooth, apex obtuse to subacute, base truncate to slightly obconically truncate, hila unthickened, not darkened, (1.5-)-2-2.5(-3) µm diam.

Based on conidiogenous cells with inconspicuous scars and conidia with unthickened, not darkened hila, this species has to be placed in *Pseudocercospora*.

1.4. **Cercospora clematidis** Boedijn, Nova Hedwigia 3: 426 (1961)

= *Pseudocercospora clematidis* Goh & W.H. Hsieh, Trans. Mycol. Soc. Republic of China 4(2): 6 (1989).

Holotype: on *Clematis zeylanica* (Ranunculaceae), Indonesia, Java, Bogor, Botanical Garden, 26 May 1950, K.B. Boedijn (L 53850; isotype IMI 91594).

*Cercospora clematidis* is morphologically indistinguishable from *Pseudocercospora clematidis* according to the description.

1.5. **Pseudocercospora combretigena** U. Braun, nom. nov. Fig. 3

= *Cercospora combretii* Boedijn, Nova Hedwigia 3: 415 (1961) [non *Pseudocercospora combretii* A.K. Singh & Kamal 1988].

Holotype: on *Combretum* sp. (Combretaceae), Indonesia, Java, Bogor, Botanical Garden, 27 July 1950, K.B. Boedijn (L 53853).

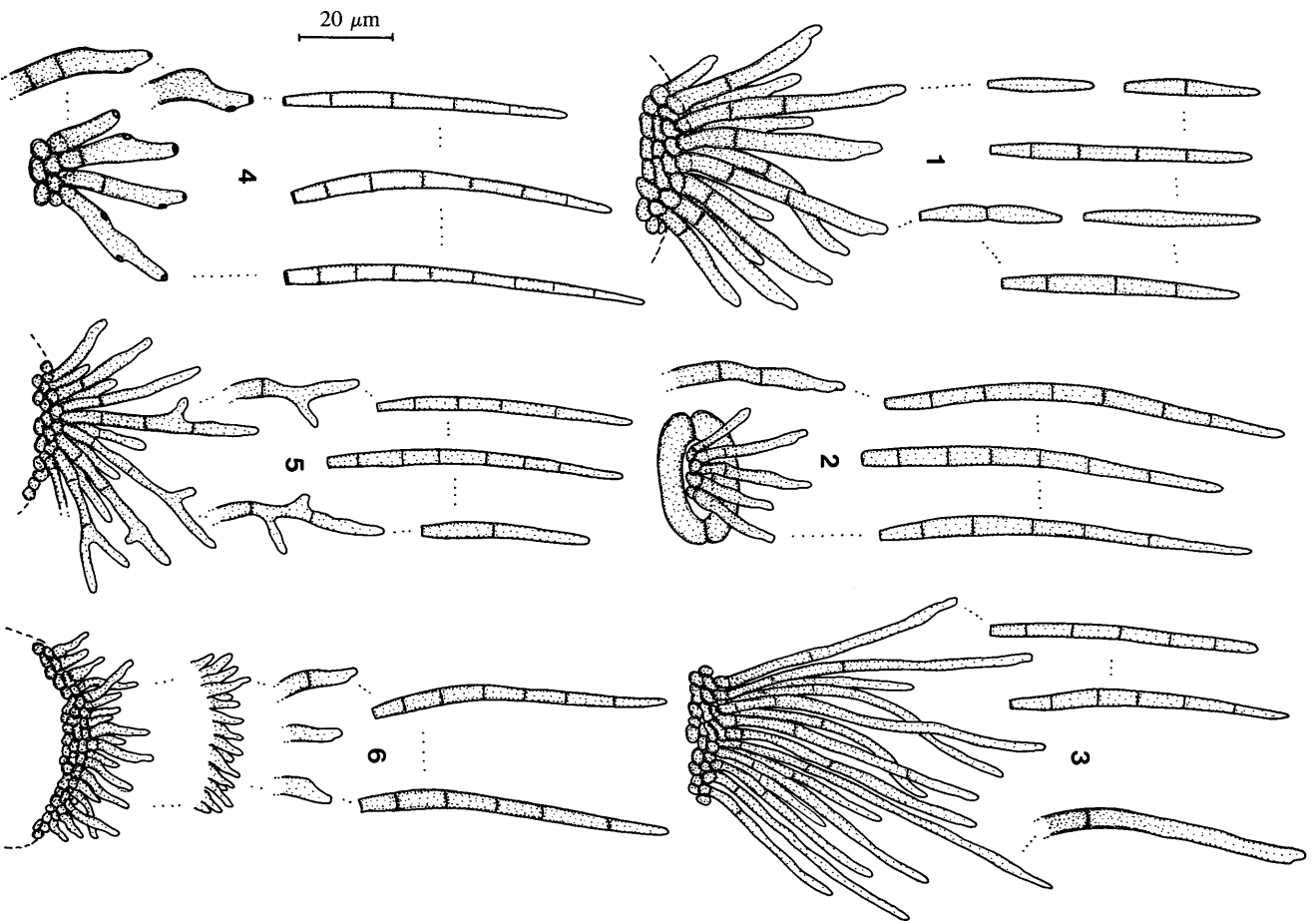
Leaf spots indefinite, diffuse, with pale brown discolorations, confluent, often along the margin of the leaf. Caespituli epiphyllous, punctiform, dark. Mycelium internal; stromata immersed, subglobose, dark brown, 30-50 µm diam. Conidiophores in moderately large fascicles, fairly dense, arising from stromata, erumpent, erect, filiform, sometimes sinuous, but hardly geniculate, usually unbranched, 50-100 × 3-5 µm, 0-2(-3)-septate, olivaceous-brown, paler towards the apex, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, conidiogenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, 40-70 × 3-4 µm, 3-7-septate, subhyaline to pale olivaceous, smooth, apex subacute, base obconically truncate, 1-2 µm diam., hilum unthickened, non-pigmented.

The conidiogenous loci and hila of the conidia are unthickened and not darkened, so that this species has to be reallocated to *Pseudocercospora*. *Pseudocercospora combretii* (type IMI 256096 examined) differs from *P. combretigena* in having very short, aseptate conidiophores, 15-25 × 4-5 µm, and wider conidia, 40-120 × 5-6 µm with up to 30 septa.

1.6. **Cercospora colei** Boedijn, Nova Hedwigia 3: 420 (1961) Fig. 4

Lectotype: on *Coleus × hybridus* (Lamiaceae), Indonesia, Java, Bogor, Botanical Garden, 24 May 1950, K.B. Boedijn (L 53852), selected here; isolectotype IMI 91591.

Syntype: on *Coleus atropurpureus*, Indonesia, Java, Bogor, July 1949, van Hoof (L 53851).



Figs 1-6. Conidiophore fascicles, conidiophores, conidia. 1 - *Pseudoecerospora abricola*, 2 - *P. cinchonicola*, 3 - *P. combreticola*, 4 - *Cercospora colei*, 5 - *Pseudoecerospora evoditicola*, 6 - *P. gardeniae*.

*Cercospora colei* is a true *Cercospora* s.str., well-characterised and distinguished from *C. coleicola* Chupp & A.S. Mull. (= *C. apii* Fresen. s.lat.) by uniformly short conidiophores and obclavate-subcylindrical conidia.

1.7. ***Pseudoecerospora evoditicola* (Boedijn) U. Braun, comb. nov.** Fig. 5

= *Cercospora evoditicola* Boedijn, Nova Hedwigia 3: 128 (1961).

Lectotype: on *Evodia ridleyi* (Rutaceae), Indonesia, Java, Bogor, Botanical Garden, 1 July 1953. K. B. Boedijn (L 53856), selected here; isoelectotype IMI 91599.

Syntypes: Indonesia, Java, Bogor, Botanical Garden, June 1950, K.B. Boedijn (L 53854) and Dec. 1950 (L 53855).

Leaf spots amphigenous, subcircular to angular-irregular, 2-5 mm diam., often confluent, occupying large leaf segments or entire leaves, becoming dry, necrotic, greyish green, ochraceous, pale brown, margin indefinite or with a narrow border line. Caespituli amphigenous, punctiform, dark. Mycelium internal; stromata lacking to well-developed, substomatal to intraepidermal, 10-70 µm diam., subglobose to flattened, medium to dark olivaceous-brown. Conidiophores in small to large fascicles, loose to moderately dense, arising from internal hyphae or stromata, through stomata or erumpent through the cuticle, erect, straight, subcylindrical to geniculate-sinuous, simple or frequently branched, 10-90 × 3-5 µm, continuous to pluriseptate, pale olivaceous to olivaceous-brown, smooth; conidiogenous cells integrated, terminal, 10-40 µm long; conidiogenous loci inconspicuous. Conidia solitary, narrowly obclavate-subcylindrical, fusiform, 25-65 × 3-4.5 µm, 1-7-septate, subhyaline to pale olivaceous, smooth, apex obtuse to subacute, base obconically truncate, 1-2 µm diam., hilum neither thickened nor pigmented.

Based on inconspicuous conidiogenous loci and conidia with unthickened, non-pigmented hila, this species must be assigned to *Pseudoecerospora*.

1.8. ***Pseudoecerospora gardeniae* (Boedijn) Deighton, Mycol. Pap. 140: 144 (1976)**

Fig. 6

= *Cercospora gardeniae* Boedijn, Nova Hedwigia 3: 427 (1961).

Holotype: on *Gardenia jasminoides* (Rubiaceae), Indonesia, Java, Bogor, Botanical Garden, 24 Aug. 1950, K.B. Boedijn (L 53857).

Leaf spots amphigenous, subcircular, 5-10 mm diam., pale brown. Caespituli amphigenous, punctiform, dark brown. Mycelium internal; stromata small to well-developed, 10-60 µm diam., intraepidermal on the upper side, substomatal below, olivaceous-brown. Conidiophores in small to moderately large fascicles, arising from stromata, through stomata or erumpent, more or less dense, erect, straight, subcylindrical-conical to slightly geniculate-sinuous, unbranched, 3-40 × 2-3.5 µm diam., 0-1-septate, olivaceous to olivaceous-brown, tips paler, smooth; conidiogenous cells terminal or conidiophores reduced to conidiogenous cells, 3-20 µm long, conidiogenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, fusoid, 50-70 × 2-4 µm, 4-6-septate, pale olivaceous, smooth, apex subobtuse to subacute, base obconically truncate, 1-2.5 µm diam., hilum neither thickened nor darkened.

1.9. **Pseudocercospora hedychii** (Boedijn) U. Braun, comb. nov. Fig. 7

≡ *Cercospora hedychii* Boedijn, Nova Hedwigia 3: 432 (1961).

Holotype: on *Hedychium coccineum* (Zingiberaceae), Indonesia, Java, Bogor, Botanical Garden, 28 June 1950, K.B. Boedijn (L 53858; isotype IMI 91602).

Leaf spots amphigenous, often lateral or apical, pale greyish brown, confluent, size and shape variable. Caespituli amphigenous, punctiform to subeffuse, dark. Primary mycelium internal; secondary mycelium external, almost absent or sparingly developed; secondary hyphae superficial, creeping, unbranched or sparingly branched, septate, subhyaline to pale olivaceous, smooth, 1-2.5 µm wide; stromata substomatal to intraepidermal, medium to dark olivaceous-brown, 10-40 µm diam. Conidiophores in small to moderately large fascicles, arising from stromata through stomata, becoming erumpent, or solitary, arising from creeping hyphae, lateral or terminal, erect, straight, subcylindrical-conical to geniculate-sinuous, unbranched, 5-50 × 2-3 µm, 0-1-septate, subhyaline to pale olivaceous-brown, tips paler; conidiophores usually reduced to conidiogenous cells, conidiogenous loci inconspicuous. Conidia solitary, narrowly obclavate-subcylindrical, acicular, 40-80 × 2-3 µm, 4-10-septate, subhyaline to very pale olivaceous, smooth, apex subobtuse to subacute, base truncate to obconically truncate, hilum unthickened, not darkened.

*Cercospora hedychii* is a typical *Pseudocercospora* characterised by having inconspicuous conidiogenous loci and conidia with unthickened, non-pigmented hila.

1.10. **Cercospora kalanchoës** Boedijn, Nova Hedwigia 3: 417 (1961) Fig. 8

Holotype: on *Kalanchoë* sp. (Crassulaceae), Indonesia, Java, Bogor, Botanical Garden, Mar. 1950, K.B. Boedijn (L 53863; isotype IMI 91590).

*Cercospora kalanchoës* is a true *Cercospora* s.str. with thickened, darkened conidiogenous loci and hila, distinguished from *C. apii* Fresen. s.lat. and *C. pseudokalanchoës* Crous & U. Braun by having obclavate-subcylindrical, rarely subacicular conidia and somewhat smaller scars (1.5-2.5 µm diam.).

1.11. **Pseudocercospora itseicola** (Boedijn) Y.L. Guo & X.J. Liu, Acta Mycol. Sinica 11: 294 (1992).

≡ *Cercospora itseicola* Boedijn, Nova Hedwigia 3: 420 (1961).

Holotype: on *Linsea* sp. (Lauraceae), Indonesia, Java, Bogor, Botanical Garden, Apr. 1950, K.B. Boedijn (L 53864; isotype IMI 91592).

1.12. **Pseudocercospora micheliae** (Boedijn) U. Braun, comb. nov. Fig. 9

≡ *Cercospora micheliae* Boedijn, Nova Hedwigia 3: 424 (1961).

= *Cercoseptoria micheliae* Patil & Thirum., Sydowia 20: 34 (1966) (1968), syn. nov.

Holotype: on *Michelia champaca* (Magnoliaceae), Indonesia, Java, Bogor, Botanical Garden, Apr. 1950, K.B. Boedijn (L 53866; isotype IMI 51595).

Leaf spots amphigenous, subcircular to irregular, at first smooth, 2-10 mm diam., greyish brown, grey, greyish white, with a narrow darker margin, sometimes with a diffuse ochraceous-brownish halo, later confluent, forming large patches, up to 30 mm diam. or even larger, covering large leaf segments. Caespituli amphigenous, mainly hypophyllous, punctiform, dark brown to black. Fruiting very variable. Primary mycelium internal; secondary mycelium lacking to sparingly developed, creeping hyphae sparingly branched, septate, subhyaline to pale olivaceous-brown, 1.5-4 µm wide, smooth; stromata almost lacking to well-developed, 10-70 µm diam., intraepidermal, brown. Conidiophores in small to moderately large fascicles, loose to dense, arising from internal hyphae or stromata, or solitary, arising from creeping hyphae, lateral or terminal, erect to decumbent, decumbent threads often developing into secondary hyphae, 5-50 × 2-5 µm, subcylindrical-conical, geniculate-sinuous, simple or branched, continuous to pluriseptate, pale olivaceous to olivaceous-brown throughout or tips paler, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5-20 µm long, conidiogenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, 25-90 × 2-4 µm, 3-10 pluriseptate, apex obtuse to subacute, base obconically truncate, subtruncate or rounded, 1.5-2 µm diam., hilum unthickened, not pigmented.

The conidiogenous loci and hila are unthickened and non-pigmented, so that this species has to be placed in *Pseudocercospora*. Type material of *Cercoseptoria micheliae* could not be traced, but the original description and illustration agree very well with *Cercospora micheliae* so as to conclude about synonymy.

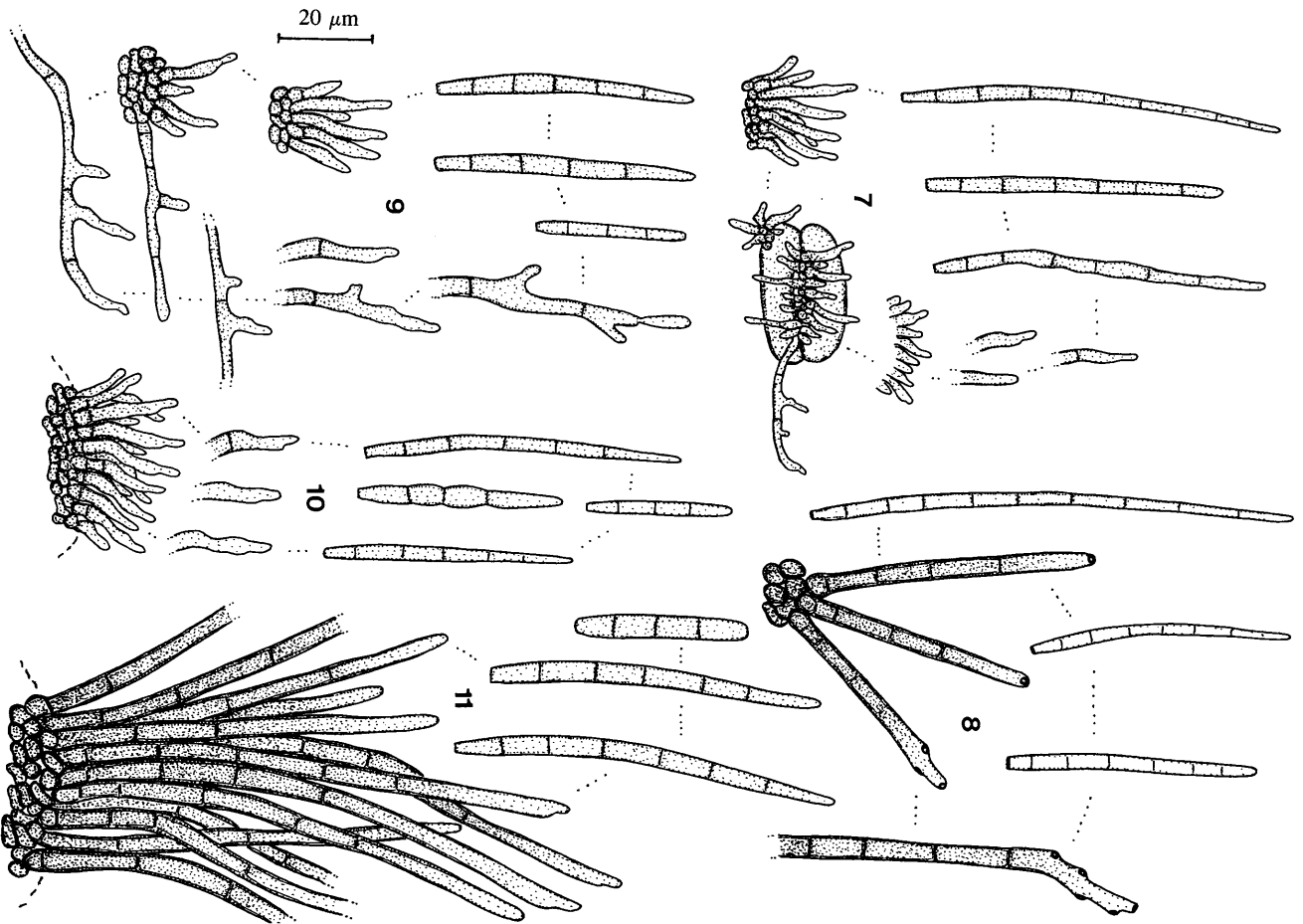
1.13. **Pseudocercospora boedijniana** U. Braun, nom. nov. Fig. 10

≡ *Cercospora mirragynae* Boedijn, Nova Hedwigia 3: 428 (1961) [non *Pseudocercospora mirragynae* (M.S. Pavgi, U.P. Singh & Deighton) U. Braun 1995].

Holotype: on *Mirragyna* sp. (Rubiaceae), Indonesia, Java, Bogor, Botanical Garden, 4 Aug. 1950, K.B. Boedijn (L 53869; isotype IMI 191340).

Leaf spots amphigenous, angular-irregular, 1-6 mm diam. or confluent and larger, ochraceous to brown, margin narrow, darker. Caespituli amphigenous, mainly hypophyllous, scattered, punctiform, dark brown to black. Mycelium internal; stromata intraepidermal, 10-40 µm diam., subglobose, dark olivaceous-brown. Conidiophores in moderately large fascicles, loose to fairly dense, arising from stromata, erumpent, erect, straight, subcylindrical to geniculate-sinuous, unbranched, 5-35 × 1.5-4 µm, 0-1-septate, pale olivaceous to olivaceous-brown throughout or tips paler, smooth; conidiophores usually reduced to conidiogenous cells, conidiogenous loci inconspicuous. Conidia formed singly, obclavate-subcylindrical, fusiform, 20-70 × 2-4 µm, 2-6-septate, occasionally with constrictions, pale olivaceous, smooth, apex obtuse to subacute, base short obconically truncate, 1-2 µm diam., hilum unthickened, not darkened.

On account of inconspicuous conidiogenous loci and conidia with unthickened, non-pigmented hila, this species has to be referred to *Pseudocercospora*.



Figs 7-11. Conidiophore fascicles, conidiophores, conidia, secondary hyphae (in 9). 7 - *Pseudocercospora hedyschii*, 8 - *Cercospora kalamahoës*, 9 - *Pseudocercospora mitchelli*, 10 - *P. boedijniana*, 11 - *P. nicolaiæ*.

1.14. ***Pseudocercospora nicolaiæ*** (Boedijn) U. Braun, comb. nov. Fig. 11  
 = *Cercospora nicolaiæ* Boedijn, Nova Hedwigia 3: 432 (1961).

Holotype: on *Nicolaia* sp. (Zingiberaceae), Indonesia, Java, Bogor, Feb. 1949, K.B. Boedijn (L 53870; isotype IMI 91603).

Leaf spots absent, sometimes with diffuse ochraceous discolorations. Caespititii amphigenous, punctiform, dark, often spread between veins. Mycelium internal; stromata variable, small to well-developed, subglobose to oblong, up to  $60 \times 30 \mu\text{m}$ , dark brown. Conidiophores in small to very large fascicles, loose to dense, sometimes even subsynematosus, arising from stromata, erect, straight, subcylindrical to slightly geniculate-sinuous, unbranched,  $30\text{--}150 \times 2.5\text{--}5 \mu\text{m}$ , pluriseptate throughout, wall slightly thickened, pale- to medium-brown throughout or tips paler, smooth; conidigenous cells integrated, terminal,  $10\text{--}40 \mu\text{m}$  long, conidigenous loci inconspicuous. Conidia solitary, obclavate-cylindrical,  $30\text{--}85 \times 2.5\text{--}5 \mu\text{m}$ , 1-7-septate, pale olivaceous to olivaceous-brown, smooth, apex obtuse to subacute, base truncate to obconically truncate, 2-3  $\mu\text{m}$  wide, hilum unthickened, not darkened.

Since the conidigenous loci and hila of the conidia are unthickened and non-pigmented in this species, it has to be placed in *Pseudocercospora*.

1.15. ***Pseudocercospora premmicola*** (Boedijn) U. Braun, comb. nov. Fig. 12  
 = *Cercospora premmicola* Boedijn, Nova Hedwigia 3: 431 (1961).

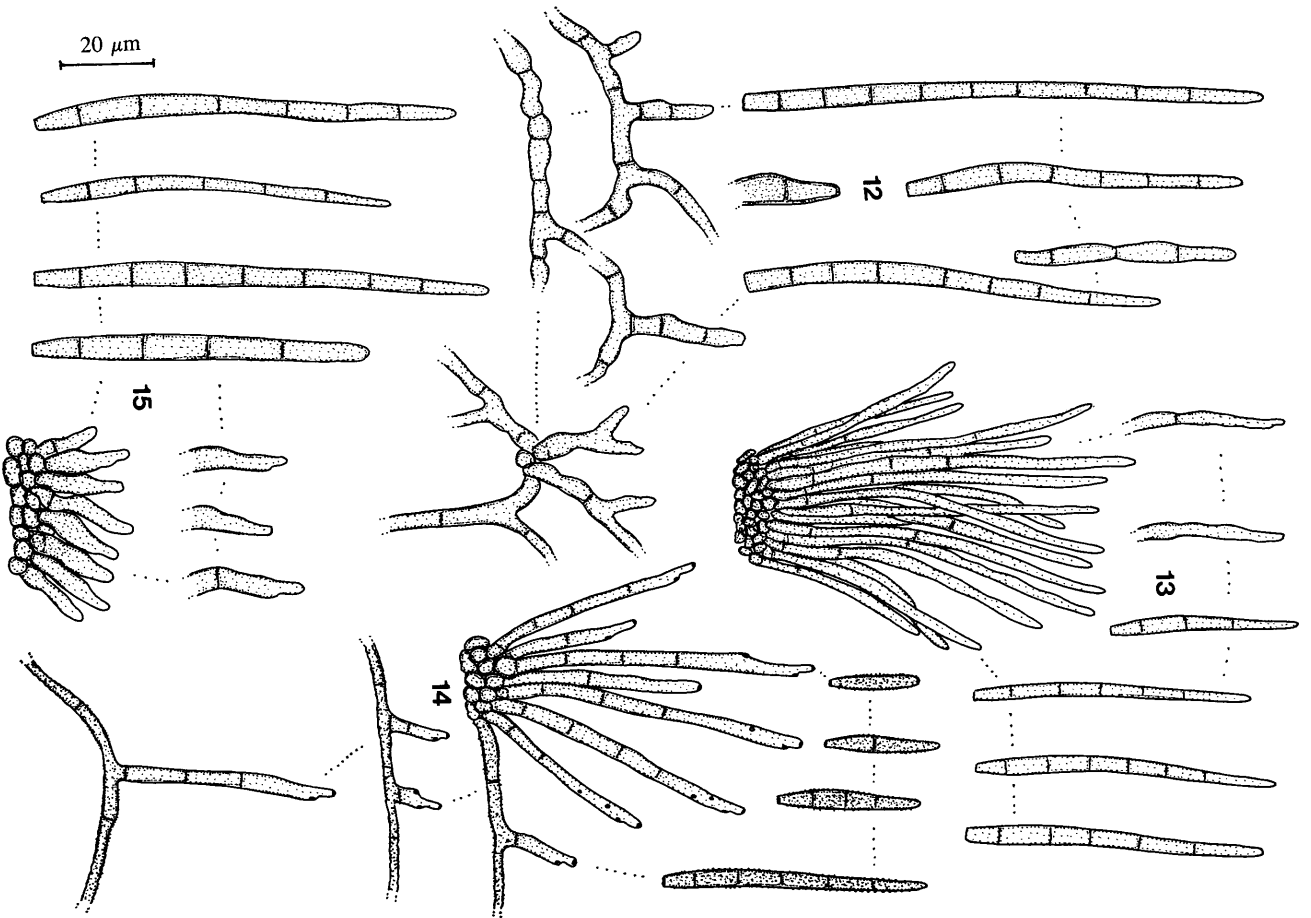
Holotype: on *Premna pubescens* (Verbenaceae), Indonesia, Java, Bogor, Botanical Garden, 26 May 1950, K.B. Boedijn (L 53871; isotype IMI 91601).

Leaf spots absent or only with diffuse yellowish to ochraceous or brownish discolorations. Colonies hypophyllous, effuse, rather inconspicuous, dull greyish olivaceous to brownish. Stromata lacking. Primary mycelium internal; secondary mycelium external; secondary hyphae superficial, creeping, branched,  $(1.5\text{--})2\text{--}(5\text{--}6) \mu\text{m}$  wide, septate, often with constrictions and swellings, pale olivaceous to yellowish brown, smooth. Conidiophores solitary, arising from creeping hyphae, lateral, erect, straight, subcylindrical to geniculate-sinuous, unbranched,  $10\text{--}60 \times 3\text{--}5 \mu\text{m}$ , continuous to pluriseptate, yellowish to pale brown throughout, smooth; conidigenous cells integrated, terminal,  $10\text{--}20 \mu\text{m}$  long, or conidiophores reduced to conidigenous cells; conidigenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, subacicular,  $30\text{--}160 \times 3\text{--}5 \mu\text{m}$ , 3-12-septate, pale olivaceous, smooth, apex obtuse, base truncate to somewhat obconically truncate, 2-3.5  $\mu\text{m}$  diam., hilum neither thickened nor darkened.

Based on inconspicuous conidigenous loci and conidia with unthickened, not darkened hila, this species has to be reallocated to *Pseudocercospora*.

1.16. ***Pseudocercospora rademacheræ*** (Boedijn) U. Braun, comb. nov. Fig. 13  
 = *Cercospora rademacheræ* Boedijn, Nova Hedwigia 3: 414 (1961).

Holotype: on *Rademachera glandulata* (Bignoniaceae), Indonesia, Java, Bogor, Botanical Garden, July 1950, K.B. Boedijn (L 53872; isotype IMI 91588).



Figs 12-15: Conidiophore fascicles, conidiophores, conidia, secondary hyphae (in 12 and 14). 12 - *Pseudocercospora premiticola*, 13 - *P. rademacheriae*, 14 - *Stenella schefflerae*, 15 - *Pseudocercospora stemonae*.

Leaf spots amphigenous, subcircular to angular-irregular, 1-7 mm diam., greyish green, brownish, later greyish white, margin narrow, dark brown to blackish. Caespituli amphigenous, punctiform, dark. Mycelium internal. On the upper leaf surface with well-developed stromata, up to 50 µm diam., intraepidermal, with numerous conidiophores in large, dense fascicles, often almost symmetrical; on the lower side stromata lacking or small, substomatal, conidiophores in small to moderately large fascicles, loose to moderately dense, rarely solitary. Conidiophores filiform, straight, subcylindrical to flexuous-sinuous, unbranched, 25-80 × 2-4 µm, olivaceous to medium-brown throughout or tips paler, pluriseptate, smooth; conidiogenous cells integrated, terminal, 10-30 µm long; conidiogenous loci inconspicuous. Conidia solitary, obclavate-subcylindrical, 30-70 × 2-4 µm, hyaline, subhyaline to pale olivaceous, 3-6-septate, smooth, apex subobtuse to subacute, base subtruncate, obconically truncate, 1-1.5 µm diam., hilum neither thickened nor darkened.

This species is a typical member of *Pseudocercospora* with inconspicuous conidiogenous loci and conidia with unthickened, non-pigmented hila.

1.17. ***Stenella schefflerae*** (Boedijn) U. Braun, comb. nov.

Fig. 14

≡ *Cercospora schefflerae* Boedijn, Nova Hedwigia 3: 413 (1961).

Holotype: on *Schefflera obovata* (Araliaceae), Indonesia, Java, Bogor, Botanical Garden, 17 Aug. 1953, K.B. Boedijn (L 53873; isotype IMI 91589).

Leaf spots amphigenous, subcircular to somewhat irregular, 1-3 mm diam., brownish, later centre greyish white and margin narrow, darker, often prominently raised. Caespituli amphigenous, punctiform, brown, scattered to dense. Primary mycelium internal; secondary mycelium external, secondary hyphae superficial, creeping, sparingly branched, septate, 1-3 µm wide, subhyaline, verruculose, only smooth or almost so and somewhat pigmented around lateral conidiophores; stromata almost lacking or 10-50 µm diam., brown. Conidiophores in small to moderately large fascicles, arising from stromata, loose, or solitary, arising from creeping hyphae, straight, subcylindrical to somewhat geniculate-sinuous, unbranched, 10-70 × 2-5 µm, aseptate to pluriseptate throughout, pale olivaceous-brown, tips often somewhat paler, smooth; conidiogenous cells integrated, terminal, 10-30 µm long, or conidiophores reduced to conidiogenous cells, conidiogenous loci conspicuous, with somewhat thickened, darkened scars, 1-1.5 µm diam. Conidia solitary, obclavate-subcylindrical, short conidia ellipsoid-ovoid, 10-55 × (1.5)-2.5-4 µm, 0-7-septate, verruculose, pale olivaceous, apex subobtuse, base obconically truncate, 1-2 µm diam., hilum slightly thickened and darkened.

This species is characterised by having verruculose secondary hyphae, thickened, darkened scars and verruculose conidia with thickened, darkened hila, so that it can be placed in *Stenella*.

1.18. ***Pseudocercospora stemonae*** (Boedijn) U. Braun, comb. nov.

Fig. 15

≡ *Cercospora stemonae* Boedijn, Nova Hedwigia 3: 430 (1961).

Holotype: on *Stemona* sp. (Stemonaceae), Indonesia, Java, Bogor, Botanical Garden, Apr. 1950, K.B. Boedijn (L 53874).

Leaf spots amphigenous, angular-irregular to oblong, 1-3 mm diam., sometimes confluent, dingy-greenish white, with a narrow dark margin or marginal line, sometimes with an additional diffuse darker halo. Caespituli amphigenous, mostly hypophyllous, punctiform, loose to dense, dark brown. Mycelium internal; stromata substomatal to intraepidermal, 10-50 µm diam., dark olivaceous-brown. Conidiophores in small to moderately large fascicles, arising from stromata, through stomata or erumpent through the cuticle, loose to moderately dense, straight and subcylindrical to geniculate-sinuous, unbranched, 5-30(-50) × 3-6 µm, 0-1-septate, smooth, pale olivaceous or olivaceous-brown throughout or tips paler; conidiophores mostly reduced to conidiogenous cells, conidiogenous loci inconspicuous. Conidia solitary, obclavate-cylindrical, 60-150 × 3-5.5 µm, 5-14-septate, pale olivaceous to olivaceous-brown, smooth, apex obtuse to subacute, base obconically truncate, about 2 µm wide, hilum neither thickened nor darkened.

*Cercospora semonae* is a typical member of *Pseudocercospora* with inconspicuous conidiogenous loci and conidia with unthickened, non-pigmented hila.

**1.19. *Pseudocercospora thunbergiae* (Boedijn) U. Braun & Sivapalan, Fungal Diversity 3: 21 (1999)**

≡ *Cercospora thunbergiae* Boedijn, Nova Hedwigia 3: 411 (1961).

Holotype: on *Thunbergia alata* (Acanthaceae), Indonesia, Java, Bogor, Botanical Garden, Apr. 1950, K.B. Boedijn (L 53879).

**2. Notes on some additional collections recorded by Boedijn (1961)**

**2.1. *Cercospora amorphophallica* U. Braun, sp. nov.**

Fig. 16A

≡ *Cercospora amorphophalli* sensu Boedijn (1961: 412).

A *Cercospora amorphophalli* conidis obclavatis-cylindraceis, 2-3.5 µm latis et cicatricibus conidialibus 1-2 µm latis differt. A *C. chevalieri* conidiis 2-3.5 µm latis differt.

Holotype: on living leaves of *Amorphophallus* sp. (Araceae), Indonesia, Java, Bogor, Botanical Garden, May 1950, K.B. Boedijn (L 53844).

Leaf spots amphigenous, subcircular to angular-irregular, 1-15 mm diam., pale greenish, later pale to dark brown, blackish or reddish brown, finally greyish brown to dingy-grey, margin indefinite or with a narrow dark brown to black border or marginal line, sometimes somewhat raised or surrounded by darker veins, occasionally with a diffuse halo. Caespituli amphigenous, punctiform, dark, mostly scattered. Mycelium internal; stromata lacking or small, 10-30 µm diam., dark brown, intraepidermal, rarely substomatal. Conidiophores in small to moderately large fascicles, arising from internal hyphae or stromata, emerging through stomata, becoming erumpent, loose to dense, erect, straight, subcylindrical, in the upper part becoming conspicuously geniculate-sinuous, unbranched, 20-120 × 3-7 µm, pluriseptate throughout, pale to medium dark brown or olivaceous-brown, paler towards the tip, wall somewhat thickened, smooth, conidiogenous cells integrated,

terminal, occasionally intercalary, 10-30 µm long, conidiogenous loci conspicuous, thickened and darkened, 1-2 µm diam. Conidia solitary, narrowly obclavate-subcylindrical, 25-100 × 2-3.5 µm, 1-8-septate, hyaline or subhyaline, smooth, apex subobtuse to subacute, base obconically truncate to subtruncate, hila thickened and darkened, 1-2 µm wide.

The type collection of *C. amorphophallica* was recorded by Boedijn (1961) under '*C. amorphophalli* Henn.'. Type material of the latter species (on *Amorphophallus* sp., Indonesia, Buitenzorg, Dec. 1901, Zimmermann, B), which was also cited by Boedijn (1961), and a second collection (on *Amorphophallus variabilis*, Indonesia, Java, Tjanten, 31 Jan. 1932, K.B. Boedijn, L) have been examined (Fig. 16B). *Cercospora amorphophalli* is characterised by having acicular conidia, 3-5 µm wide, and larger conidiogenous loci, (2-)-3-4 µm diam., and belongs to *C. apii* s.lat. *Cercospora chevalieri* Sacc. (type material examined: on *Amorphophallus* sp., Sudan, Lake Tehad, Territoire de L'Oubangui at Mission Chari, 15 Oct. 1902, A. Chevalier, PC, lectotype, and B, isoelectotype, selected here), which is also characterised by having obclavate-subcylindric conidia, possesses much wider conidia, 3-6 µm diam., and larger loci, 2-3 µm diam.

**2.2. *Stenella pseudoramularia* U. Braun, sp. nov.**

Fig. 17

Maculae amphigenae, angulares-irregulares, 2-20 mm diam., saepe confluentes, primo flavido-ochraceae, deinde brunneae, ultimo griseo-albidae, margine tenui brunneo cinctae. Coloniae hypophyllae, inconspicuae. Mycelium primum immersum; mycelium secundarium externum, sparsum; hyphae repentes, ramosae, septatae, 1-3 µm latae, subhyalinae vel pallide olivaceae vel olivaceo-brunneae, subleves vel verruculosae; stromata nulla vel minuta, olivaceo-brunnea. Conidiophora solitaria, ex hyphis immersis vel hyphis externis oriunda, interdum laxe aggregata, subfasciculata, non-numerosa, ex hyphis immersis vel cellulis stromaticis oriunda, erumpentia, erecta, recta, subcylindrica vel apicem versus attenuata, leviter sinuosa, vix geniculata, non-ramosa, 10-50 × 1-5 µm, 0-3-septata, subhyalina vel pallide olivaceo-brunnea, levia vel verruculosa; cellulae conidiogenae integritate terminales vel cellulae singulae, 10-30 µm longae, cicatrices conidiales numerosae, ad apicem aggregatae, conspicuae, terminales et laterales, leviter incrassatae et fuscatae, 0.7-1.0 µm latae. Conidia catenata, fusiformia-subcylindrica, 6-35 × 1-3 µm, 0-1(-2)-septata, subhyalina vel pallidissime olivacea, levia vel verruculosa, sursum leniter attenuata, hila leviter incrassata et fuscata, 0.5-1.0 µm lata.

Holotype: on *Nyctanthes arbor-tristis* L. (Oleaceae), Indonesia, Java, Bogor, Botanical Garden, Oct. 1949, K.B. Boedijn (L 245674).

Leaf spots amphigenous, angular-irregular, 2-20 mm diam., often confluent, at first yellowish to ochraceous, later brown, finally greyish white, margin narrow, brown. Colonies hypophyllous, inconspicuous. Primary mycelium internal; secondary mycelium external, sparingly developed; hyphae creeping, branched, septate, 1-3 µm wide, subhyaline to pale olivaceous or olivaceous-brown, almost smooth to verruculose; stromata absent or small, olivaceous-brown. Conidiophores solitary, arising from internal hyphae or creeping superficial hyphae, occasionally in small, loose groups (subfasciculate), arising from internal hyphae or stromata, erumpent, erect, straight, subcylindrical or attenuated towards the apex, somewhat sinuous, but hardly geniculate, unbranched, 10-50 × 1-5 µm, 0-3-septate, subhyaline to pale olivaceous-brown, smooth to verruculose; conidiogenous cells terminally integrated,

or conidiophores reduced to conidiogenous cells, 10-30 µm long, conidiogenous loci with conspicuous scars, usually numerous, apically aggregated, flat, hardly connected with conspicuous sympodial proliferations (geniculations), slightly thickened and darkened, 0.7-1.0 µm diam. Conidia catenate, fusiform-subcylindrical, 6-35 × 1-3 µm, 0-1(-2)-septate, subhyaline to very pale olivaceous, smooth to verruculose, ends somewhat attenuated, hila slightly thickened and darkened, 0.5-1 µm diam.

The leaf spots in the type material show mixed infections of *Stenella pseudoramularia*, *Cercospora api* s.lat. (incl. *C. putremansii* Henn.) and *Pseudocercospora nyctanthis* (A.K. Roy) U. Braun, Bagyan. & Jagad. Boedijn (1961) recorded this collection as *Cercospora putremansii*. A second sample (on *N. arbor-tristis*, Indonesia, Java, Bogor, Botanical Garden, Apr. 1950, K.B. Boedijn (L 245675) mainly contains *Pseudocercospora nyctanthis*, together with some traces of *C. api*. A *Ramularia* sp. has been recorded on *Nyctanthes arbor-tristis* from India (Bilgrami et al. 1991). It is possible that this record refers to the present new species. *Stenella pseudoramularia* is the first *Stenella* described on a host belonging to the Oleaceae and is well-characterised by having relatively small, colourless conidia with few septa.

**2.3. *Pseudocercospora cladophora* Goh & W.H. Hsieh, Trans. Mycol. Soc. Republic of China 1: 129 (1987).**

= '*Cercospora rufula* Syd.' sensu Boedijn (1961: 425).

Material examined: on *Ficus* sp., Indonesia, Sumatra, near Brastagi, May 1927, K.B. Boedijn (L 245676).

Stromata almost absent. Conidiophores in small fascicles, emerging through stomata, erect, straight, subcylindrical to somewhat geniculate-sinuous, above all in the upper half, unbranched, 50-120 × 3-7 µm, pluriseptate, wall somewhat thickened, pale to medium dark brown, paler towards the tips which are sometimes subhyaline, smooth, conidiogenous cells integrated, terminal, sometimes subdentate, scars inconspicuous. Conidia solitary, subcylindrical-obelavate, 25-45 × 2-5 µm, 1-4(-5)-septate, subhyaline to pale olivaceous, smooth.

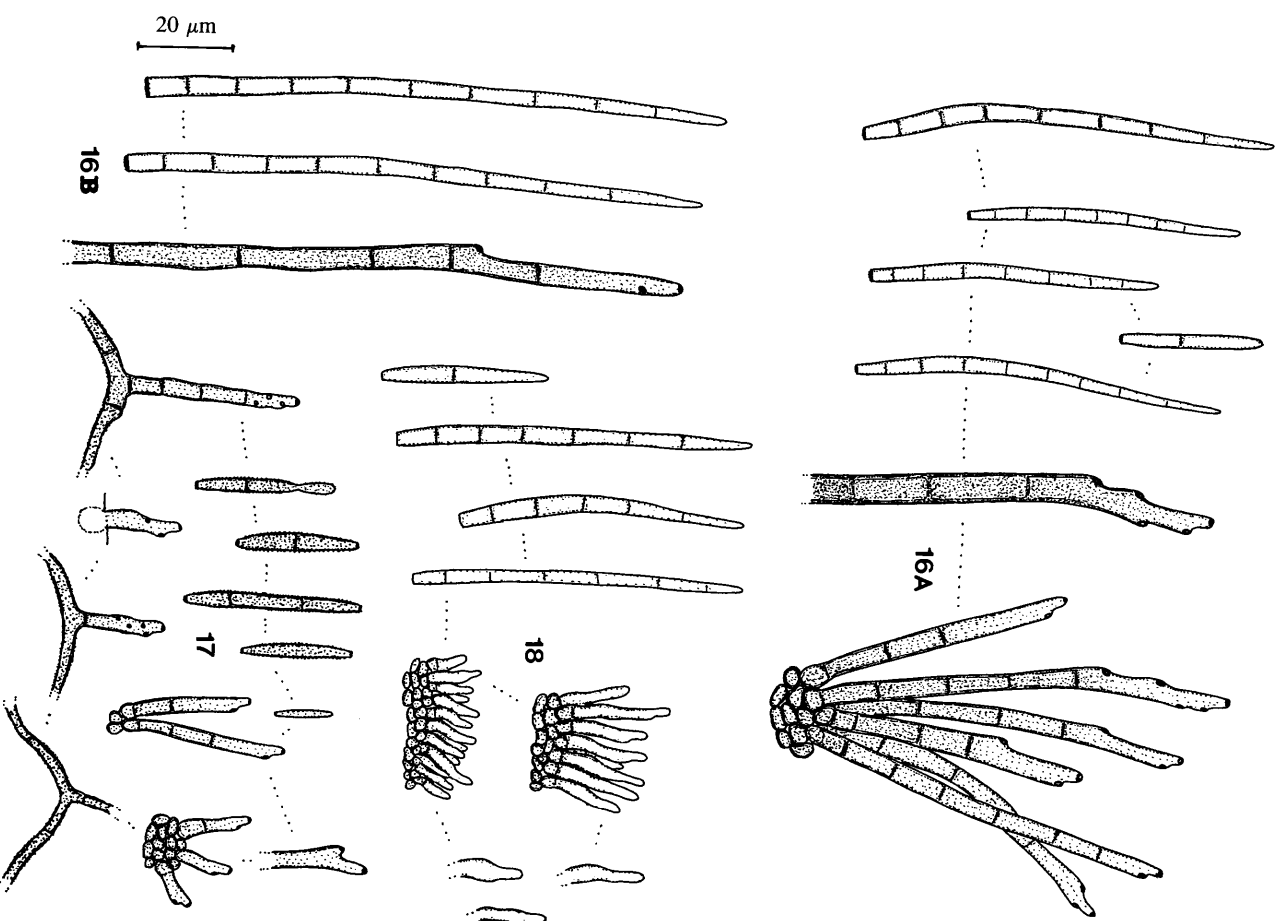
Boedijn (1961) assigned this collections to '*C. rufula*', but a revision of his material shows that it perfectly agrees with the description and illustration of *P. cladophora* published by Hsieh & Goh (1990).

**2.4. *Pseudocercospora polysciatis* (Sun) J.M. Yen, Bull. Trimestriel Soc. Mycol. France 94: 383 (1978)**

= '*Cercospora panacis* Thrum. & Chupp.' sensu Boedijn (1961: 413) *pro parte*.

Material examined: on *Polyscias* sp. [as *Nothopanax* sp.] (Araliaceae), Indonesia, Java, Bogor, Botanical Garden, May 1950, K.B. Boedijn (L 245651).

Boedijn (1961) recorded this collection under '*C. panacis*', a species that differs, however, from *P. polysciatis* in having short, narrow, 0-1-septate, unbranched



Figs 16-18. Conidiophore fascicles, conidiophores, conidia, secondary hyphae (in 17). 16A - *Cercospora amorphophallicola*, 16B - *C. amorphophalli*, 17 - *Stenella pseudoramularia*, 18 - *Pseudocercospora sterculiatae*.



conidiophores and conspicuous conidiogenous loci. Type material of *C. panacis* has been examined (on *Panax fruticosum*, India, Bangalore, 5 Aug. 1944, M. J. Thirumalachar. BPI 439221, IMI 31842). Crous & Braun (2001) proposed to place *C. panacis* in *Passalora* Fr.

2.5. **Pseudocercospora polysciatis-pinnatae** U. Braun & Mouch., in Braun et al., New Zealand J. Bot. 37: 319 (1999).

= '*Cercospora panacis* Thirum. & Chupp' sensu Boedijn (1961: 413) pro parte.

Material examined: on *Nothopanax 'primatum'* [misprint, correct name: *pinnatum*, = *Polyscias pinnata*] (Araliaceae), Indonesia, Java, Bogor, Botanical Garden, 8 Dec. 1949, K.B. Boedijn (L 245670).

Boedijn (1961) referred the present collection also to '*C. panacis*', which differs, however, from *P. polysciatis-pinnatae* in having narrower conidia.

2.6. **Pseudocercospora sterculiae** (O.A. Drumm.) U. Braun, A monograph of *Cercospora*, *Ramularia* and allied genera (phytopathogenic hyphomycetes), Vol. 1: 190, Eching 1995

Fig. 18

= '*Cercospora helicteris* Syd. & P. Syd.' sensu Boedijn (1961: 430).

Material examined: on *Helicteres hirsuta* (Sterculiaceae), Indonesia, Java, Bogor, Botanical Garden, May 1950, K.B. Boedijn (L 245669).

Leaf spots at first lacking, later with diffuse ochraceous to brownish discolorations of variable size, finally expanded, covering large parts of the leaves. Caespituli amphigenous, punctiform to subeffuse, whitish. Mycelium internal; stromata substromatal to intraepidermal, 20-60 µm diam. Conidiophores in moderately large, dense fascicles, arising from stromata, emerging through stomata or erumpent through the cuticle, erect, straight, subcylindrical-conical to slightly geniculate-sinuous, unbranched, 5-20 × 2-4 µm, 0-1-septate, hyaline or subhyaline, smooth, scars inconspicuous. Conidia solitary, cylindrical-filiform, narrowly fusiform, 30-80 × 2-3.5 µm, 1-7-septate, hyaline, smooth, apex subacute to subobtuse, base truncate to obconically truncate, 1-2.5 µm wide, hila unthickened, not darkened.

The colourless conidiophores and conidia in the material on *Helicteres hirsuta* are quite distinct from those of *C. helicteris*, which, according to Chupp (1954), has pigmented conidiophores, but agree well with those of *P. sterculiae* which was described on *Sterculia* sp. from Brazil.

2.7. **Stenella extremorum** (Syd.) U. Braun, comb. nov.

Fig. 19

= *Cercospora extremorum* Syd., Ann. Mycol. 15: 264 (1917).

Material examined: on *Homalomena philippinensis* (Araceae), Philippines, Los Baños, Laguna, Luzon, Feb. 1914, C.F. Baker (S), lectotype (selected here); on *Homalomena rubra*, Indonesia, Java, Bogor, Botanical Garden, 25 Aug. 1950, K.B. Boedijn (L 245667); on *Homalomena* sp., Indonesia, Java, Diastanga, 30 Jan. 1955, K.B. Boedijn (L 245668).

Based on the presence of verruculose superficial hyphae and conidiogenous cells with somewhat thickened, darkened scars, this species has to be reallocated to *Stenella*.

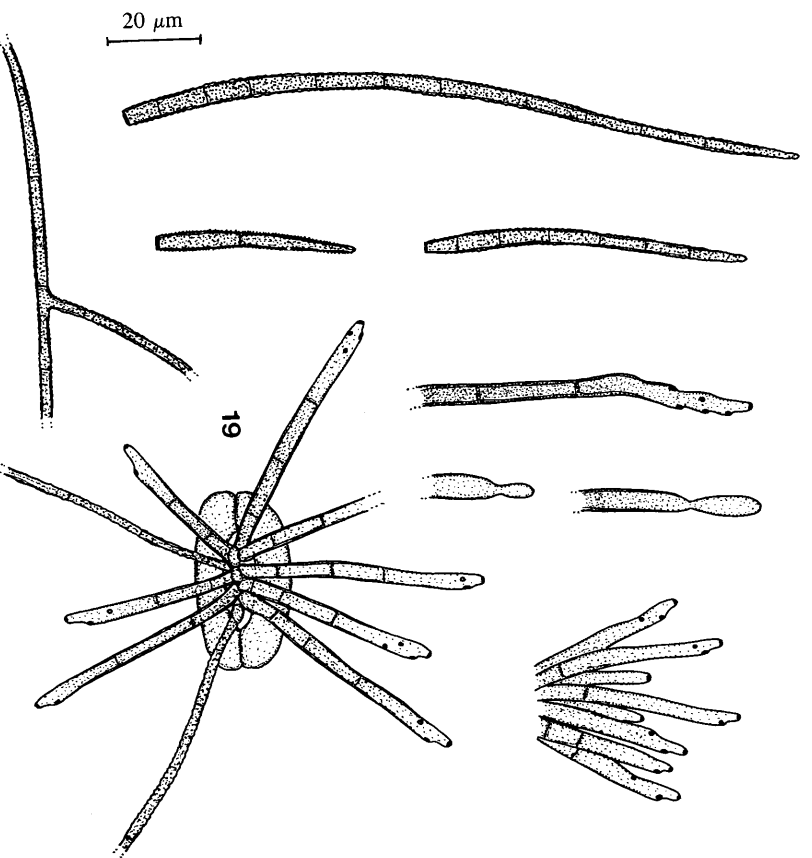


Fig. 19. *Stenella extremorum*, conidiophore fascicles, conidiophores, conidia, secondary hyphae.

The superficial hyphae are sparingly branched, subhyaline to pale olivaceous, 1-3 µm wide. The conidiophores are formed in small to moderately large, loose to dense fascicles, rarely solitary, straight, subcylindrical to slightly geniculate-sinuous, unbranched, 10-80 × 3-5 µm, continuous to pluriseptate throughout, pale olivaceous to olivaceous-brown, tips paler, wall thin to slightly thickened, smooth or almost so, with integrated, terminal conidiogenous cells, later sometimes intercalary, 10-40 µm long. The scars are 1-1.5(-2) µm wide. The conidia are formed singly, short conidia subcylindrical(-subclavate), long conidia acicular-filiform, (15-)40-300 × 2-5.5 µm, 1- to pluriseptate, pale olivaceous to very pale olivaceous-brown, verruculose to verrucose, apex subacute or subobtuse, base truncate, rarely slightly obconically truncate, hilum slightly thickened and darkened, 1.5-2 µm diam.

#### Acknowledgement

I am much obliged to the curators of L and IMI for the possibility to examine type material and other collections of K.B. Boedijn.

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Received 15 March 2001, accepted in revised form 30 April 2001.