

---

## Taxonomic notes on some species of the *Cercospora* complex (VII)

---

### Uwe Braun

Martin-Luther-Universität, FB Biologie, Institut für Geobotanik und Botanischer Garten, Neuwerk 21, D-06099 Halle, Germany; e-mail: braun@botanik.uni-halle.de

Braun, U. (2001). Taxonomic notes on some species of the *Cercospora* complex (VII). Fungal Diversity 8: 41-71.

The taxonomy of various cercosporoid hyphomycetes is discussed and some new records and hosts are listed. The following new taxa are described: *Cercospora jatrophigena* sp. nov., *Entylomella premnigena* sp. nov., *Passalora ajrekari* var. *tenuispora* var. nov., *P. bauhiniicola* sp. nov., *P. tephrosiae-purpureae* sp. nov., *Pseudocercospora eucalyptigena* sp. nov., *P. metrosideri* sp. nov., *P. myrtacearum* var. *robusta* var. nov., *P. syzygiigena* sp. nov.; and the following new combinations are introduced: *Passalora ajrekari* comb. nov., *P. chaetocalycina* comb. nov., *P. paspalicola* comb. nov., *P. selini-gmelini* comb. nov., *Pseudocercospora barleriae* comb. nov., *P. barnadesiae* comb. nov., *P. haldibariensis* comb. nov., *P. herpestica* comb. nov., *P. palicoureina* comb. nov., *P. pavoniae* comb. nov., *P. pilicola* comb. nov., *P. rhynchosiarum* comb. nov., *Stenella alpiniae* comb. nov. and *S. aspiliae* comb. nov.

**Key words:** cercosporoid hyphomycetes, mitosporic fungi, new combinations, new species, parasitic fungi, taxonomy.

### Introduction

Chupp (1954) monographed the genus *Cercospora* Fresen. *s. lat.*, which is one of the largest genera of hyphomycetes with over 3000 names. Deighton (e.g. 1967, 1974, 1976), Pons and Sutton (1988), Braun (1993c), Braun and Melnik (1997) and other authors split *Cercospora s. lat.* into numerous smaller genera based on morphological characteristics. Surveys of *Cercospora* and its segregates have been published by Braun (1995), Braun and Melnik (1997) and Crous *et al.* (2000). Important re-evaluations of morphological features within the complex of cercosporoid hyphomycetes, including re-definitions of some genera, based on molecular data, have been published by Crous *et al.* (2000, 2001). The changed generic concepts of cercosporoid genera warrant comprehensive revisions of the *Cercospora* spp. described, but this process has not yet been finished. The number of described species in this complex is very large, and presently only a portion has been re-examined and re-assessed. Thus, comprehensive examinations are necessary to revise and monograph this

large complex of anamorphs. With the present paper, a series of contributions towards re-examinations of cercosporoid fungi is continued (Braun, 1992, 1993a,b, 1996, 1999a,b).

### 1. Cercosporoid hyphomycetes on *Myrtaceae* - some additions

Crous (1999) dealt with cercosporoid hyphomycetes occurring on *Myrtaceae*, excluding *Eucalyptus* spp., which were comprehensively treated in Crous (1998). Braun *et al.* (1999) added *Pseudocercospora eugeniicola* sp. nov. on *Eugenia operculata* and *Eugenia* sp. from Brazil and India. Recently, all undetermined collections of cercosporoid fungi from IMI have been examined. The results of these studies are summarised below.

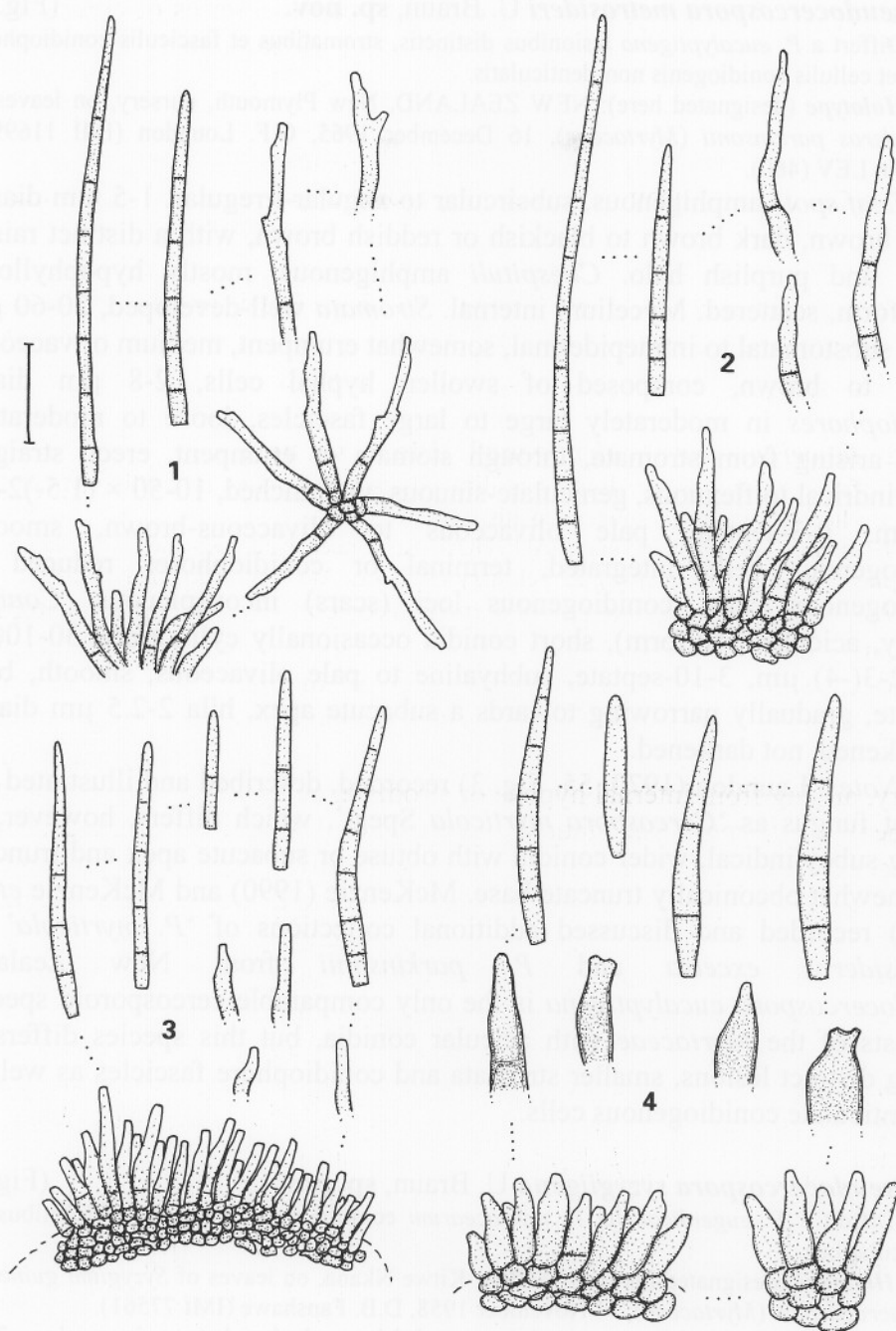
#### 1.1. *Pseudocercospora eucalyptigena* U. Braun, sp. nov. (Fig. 1)

Differt a *P. metrosideri* lesionibus distinctis, stromatibus et fasciculis conidiophoris parvis et cellulis conidiogenis subdenticulatis.

**Holotype** (designated here): AUSTRALIA, Queensland, Rocklea, on leaves of *Eucalyptus citriodora* (*Myrtaceae*), 22 February 1972, J.L. Alcorn 72-035 (IMI 164582).

*Leaf spots* amphigenous, 1-4 mm diam. or confluent and larger, angular-irregular, partly vein-limited, brown, margin indefinite. *Caespituli* hypophyllous, not very conspicuous. Mycelium internal. *Stromata* absent or small, 10-30 µm diam., substomatal, brown, composed of swollen hyphal cells, 3-6 µm diam. *Conidiophores* in small, loose to dense fascicles, occasionally solitary, arising from internal hyphae or stromata, emerging through stomata or erumpent, erect, geniculate-sinuous, unbranched, 10-45 × 2-4 µm, 0-2-septate, subhyaline to pale olivaceous or olivaceous-brown, tips paler, smooth or almost so, wall thin to slightly thickened; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-25 µm long, conidiogenous loci (scars) inconspicuous or almost denticle-like, but wall neither thickened nor darkened. *Conidia* solitary, acicular-filiform (-narrowly obclavate), (40-)60-100(-120) × 2-3 µm, (4-)6-10(-12)-septate, subhyaline, pale olivaceous, smooth, apex subacute, base truncate to subtruncate, rarely slightly obconically truncate, 1.5-2 µm diam., hila neither thickened nor darkened.

*Notes:* Crous (1998) published a monograph of cercosporoid hyphomycetes on *Eucalyptus* spp., but there is no comparable species with acicular conidia in his treatment. *Pseudocercospora metrosideri*, described in the present paper, is the only comparable species on hosts belonging to the *Myrtaceae* with acicular conidia. The latter species differs, however, in having distinct lesions, large stromata and fascicles of conidiophores as well as non-denticulate conidiogenous cells.



**Figs. 1-4.** Conidiophore fascicle, conidiophores, conidia. 1. *Pseudocercospora eucalyptigena*. 2. *P. metrosideri*. 3. *P. syzygiigena*. 4. *P. myrtacearum* var. *robusta*. Bar = 20  $\mu$ m.

1.2. *Pseudocercospora metrosideri* U. Braun, **sp. nov.** (Fig. 2)

Differt a *P. eucalyptigena* lesionibus distinctis, stromatibus et fasciculis conidiophoris magnis et cellulis conidiogenis non-denticulatis.

**Holotype** (designated here): NEW ZEALAND, New Plymouth, nursery, on leaves of *Metrosideros parkinsonii* (Myrtaceae), 16 December 1965, G.F. Loundon (IMI 116995). **Isotype** in LEV (460).

*Leaf spots* amphigenous, subcircular to angular-irregular, 1-5 mm diam., centre brown, dark brown to blackish or reddish brown, with a distinct raised border and purplish halo. *Caespituli* amphigenous, mostly hypophyllous, punctiform, scattered. Mycelium internal. *Stromata* well-developed, 20-60 µm diam., substomatal to intraepidermal, somewhat erumpent, medium olivaceous-brown to brown, composed of swollen hyphal cells, 2-8 µm diam. *Conidiophores* in moderately large to large fascicles, loose to moderately dense, arising from stromata, through stomata or erumpent, erect, straight, subcylindrical to flexuous, geniculate-sinuous, unbranched, 10-50 × (1.5-)2-3(-4) µm, 0-3-septate, pale olivaceous to olivaceous-brown, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, conidiogenous loci (scars) inconspicuous. *Conidia* solitary, acicular (-filiform), short conidia occasionally cylindrical, 30-100 × (1.5-)2-3(-4) µm, 3-10-septate, subhyaline to pale olivaceous, smooth, base truncate, gradually narrowing towards a subacute apex, hila 2-2.5 µm diam., unthickened, not darkened.

*Notes*: Laundon (1970: 55, Fig. 3) recorded, described and illustrated the present fungus as '*Cercospora myrticola* Speg.', which differs, however, in having subcylindrical, wider conidia with obtuse or subacute apex and truncate to somewhat obconically truncate base. McKenzie (1990) and McKenzie *et al.* (1999) recorded and discussed additional collections of '*P. myrticola*' on *Metrosideros excelsa* and *P. parkinsonii* from New Zealand. *Pseudocercospora eucalyptigena* is the only comparable cercosporoid species on hosts of the Myrtaceae with acicular conidia, but this species differs in having distinct lesions, smaller stromata and conidiophore fascicles as well as subdenticulate conidiogenous cells.

1.3. *Pseudocercospora syzygiigena* U. Braun, **sp. nov.** (Fig. 3)

Differt a *P. eugeniicola* et *P. myrtacearum* conidiis subcylindraceis-filiformibus vel subacicularibus.

**Holotype** (designated here): ZAMBIA, Kitwe Nkana, on leaves of *Syzygium guineense* ssp. *macrocarpum* (Myrtaceae), 14 November 1958, D.B. Fanshawe (IMI 77561).

*Leaf spots* amphigenous, shape variable, subcircular to irregular, 3-12 mm diam., dark brown, dingy brown, dull greyish brown, margin indefinite. *Caespituli* hypophyllous, punctiform, loose to dense, greyish. *Mycelium* internal. *Stromata* well-developed, large, 30-120 µm diam., intraepidermal to

erumpent. *Conidiophores* numerous, in dense fascicles, arising from stromata, erumpent, forming sporodochial conidiomata, erect, straight, subcylindrical to slightly geniculate-sinuous, unbranched,  $5-30 \times 2-3 \mu\text{m}$ , 0-1-septate, subhyaline to very pale olivaceous, smooth (conidia often remaining attached to the conidiophores for a long time, differentiation between conidiophores with and without attached conidia often difficult), conidiophores usually reduced to conidiogenous cells, conidiogenous loci (scars) inconspicuous. *Conidia* solitary, subcylindrical-filiform, subacicular,  $15-60 \times (1.5-2-3 \mu\text{m})$ , 1-5-septate, subhyaline, smooth, apex subacute to subobtuse, base truncate, hila  $1-2.5 \mu\text{m}$  diam., unthickened, not darkened.

*Notes:* *Pseudocercospora syzygiigena* is well-characterised by having very large sporodochial conidiomata, large stromata and subcylindrical-filiform to subacicular subhyaline conidia. Crous (1999) dealt with cercosporoid hyphomycetes on hosts of the *Myrtaceae*. There are only two comparable species, viz., *Pseudocercospora myrtacearum* (A.N. Rai, B. Rai and Kamal) U. Braun and *P. eugeniicola* U. Braun, J. David and F. Freire, which are, however, well-distinguished by having obclavate-subcylindrical conidia.

1.4. *Passalora syzygii* (M. Mandal) B. Sutton and Crous, *Mycological Research* 101: 224 (1997).

*Material examined:* INDIA, U.P., Gorakhpur, on *Syzygium heyneanum*, 6 May 1970, P.K. Singhania 179 (IMI 228123) and 24 January 1988, S. Chandra 19 (IMI 330828).

*Notes:* This species is known from India on *Syzygium cumini* and *S. jambos*. *Syzygium heyneanum* is a new host species.

1.5. *Pseudocercospora deglupta* Crous, *Mycologia Memoir* 21: 127 (1999).

*Material examined:* PAPUA NEW GUINEA, Lae, Oonsis Nursery, on *Eucalyptus deglupta*, 12 July 1972, I.A.S. Gibson (IMI 174404).

This is the third collection of this species, which agrees well with the original description of Crous (1998). The conidiophores in the present collection are, however, somewhat shorter ( $30-60 \times 3-5 \mu\text{m}$ ) and the conidiophores and conidia are smooth or almost so.

1.6. *Pseudocercospora myrtacearum* (A.N. Rai, B. Rai and Kamal) U. Braun, A monograph of *Cercospora*, *Ramularia* and allied genera (phytopathogenic hyphomycetes), Vol. 1: 196, Eching 1995.

≡ *Pseudocercospora myrtacearum* A.N. Rai, B. Rai and Kamal, *Mycological Research* 97: 31 (1993).

= *Pseudocercospora syzygiorum* B. Sutton and Crous, *Mycological Research* 101: 223 (1997).

*Material examined:* NEPAL, Bardia, on *Syzygium cumini*, 23 February 1971, Keshari 1112 (IMI 157122); INDIA, U.P., Gorakhpur, on *S. jambolana*, 4 February 1979, P. Abbasi PA 26 (IMI 235478); INDIA, West Bengal, on *S. jambolana*, 28 February 1987, P. Gosh 4577 (IMI 317681); HONG KONG, Peak area, on *Rhodomyrtus tomentosus*, 30 April 1958, N.L.H. Kraus 343 (IMI 73068).

Crous (1998) re-described *P. myrtacearum* and pointed out that *P. syzygiorum* is indistinguishable. *Pseudocercospora myrtacearum* is new to Hong Kong and Nepal and *Rhodomyrtus tomentosus* as well as *Syzygium jambolana* represent new host species. In the collection on *Rhodomyrtus tomentosus* a few forked conidiophores and traces of superficial secondary hyphae with solitary conidiophores have been observed. A specimen on *Eugenia* sp. from Sarawak is close to *P. myrtacearum*, but the conidiophores are significantly wider. Therefore, this collection is tentatively described as a variety of the latter species.

***Pseudocercospora myrtacearum* var. *robusta* U. Braun, var. nov. (Fig. 4)**

*Conidiophora robusta*, 5-35 × 4-8 µm.

**Holotype** (designated here): SARAWAK, Kuching District, on *Eugenia* sp. (*Myrtaceae*), [without collector and date], FH 284 (IMI 115474).

*Notes:* This collection is close to *P. myrtacearum* var. *myrtacearum*, but in the typical variety the conidiophores are only 2-5 µm wide. The conidia are also somewhat wider in var. *robusta* (3-5 µm, 2-4(-4.5) µm in var. *myrtacearum*).

1.7. *Pseudocercospora myrticola* (Speg.) Deighton, Mycological Papers 140: 148 (1976).

= *Cercospora amadelpha* Syd., Annales Mycologici 30: 89 (1932).

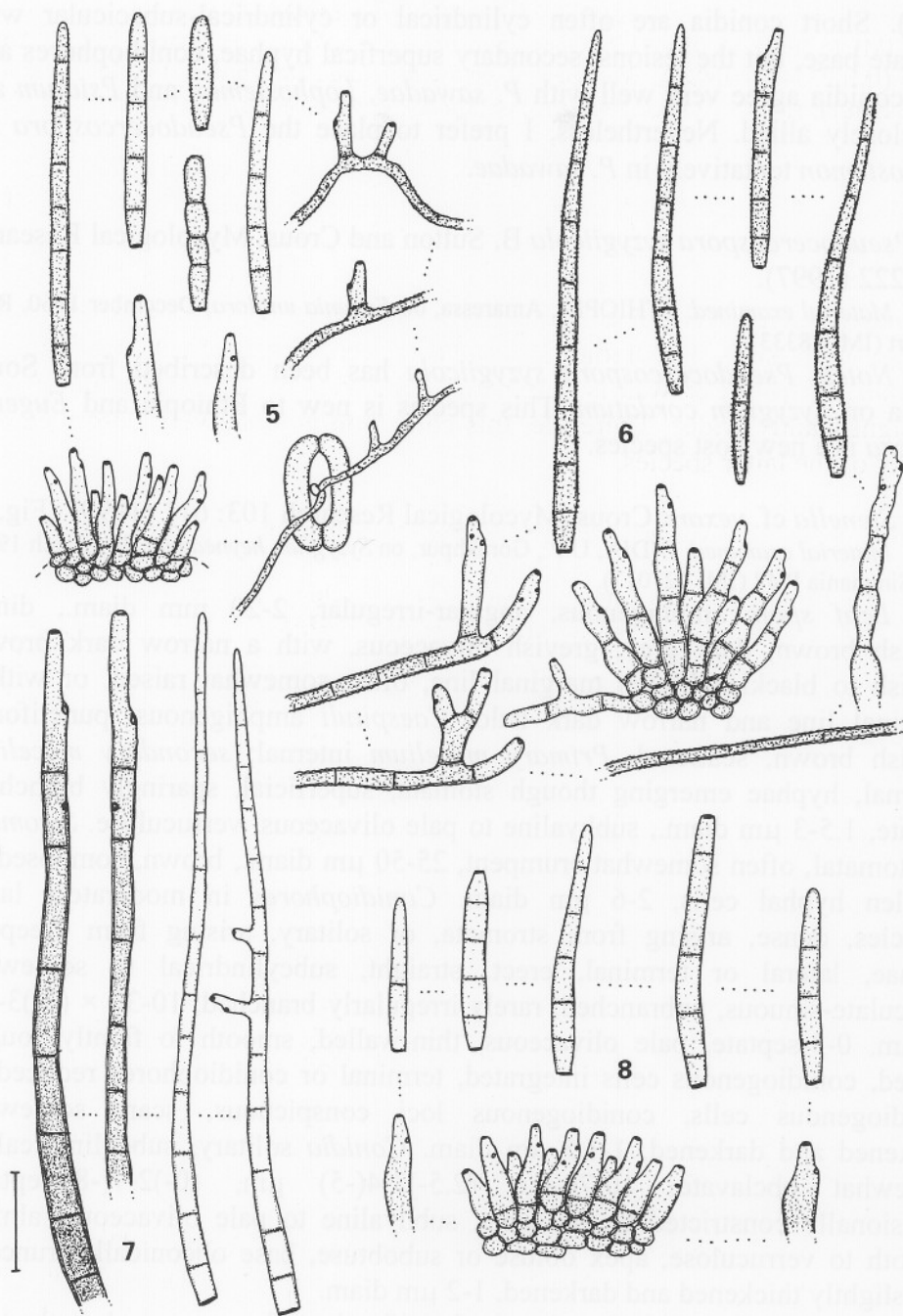
*Material examined:* CHILE, Valdivia, Panguipulli, on *Blepharocalyx divaricatus*, April 1924, E. Wedermann 1769, isotype of *C. amadelpha* (IMI 15610).

*Notes:* Crous (1998) examined numerous collections of this species, including type material of *Cercospora myrti* Erikss. and *C. saccardiana* Scalia, and re-described it. Braun (2000a) re-examined holotype material of *P. myrticola*. Chupp (1954) reduced *C. amadelpha* to synonymy with the latter species, which can be confirmed on the base of the present re-examination of type material.

1.8. *Pseudocercospora sawadae* (W. Yamam.) Goh and W.H. Hsieh, Transactions of the Mycological Society, Republic of China 1: 117 (1987).

*Material examined:* NEW ZEALAND, Auckland, Zoo, on *Lophostemon confertus*, 12 June 2001, C.F. Hill (HAL).

*Notes:* The genus *Lophostemon* is allied to *Tristania* and *Eucalyptus*. The present material is morphologically barely distinguishable from *Pseudocercospora sawadae* on *Psidium guajava* (Goh and Hsieh, 1990; Crous



**Figs. 5-8.** Conidiophore fascicles, conidiophores, conidia, secondary hyphae. **5.** *Stenella* cf. *vexans*. **6.** *Stenella ipomoeae-stoloniferae*. **7.** *Cercospora jatrophigena*. **8.** *Passalora ajrekari* var. *tenuispora*. Bar = 20  $\mu$ m.

1998). Short conidia are often cylindrical or cylindrical-subacicular with truncate base, but the lesions, secondary superficial hyphae, conidiophores and long conidia agree very well with *P. sawadae*. *Lophostemon* and *Psidium* are not closely allied. Nevertheless, I prefer to place the *Pseudocercospora* on *Lophostemon* tentatively in *P. sawadae*.

1.9. *Pseudocercospora syzygiicola* B. Sutton and Crous, Mycological Research 101: 222 (1997).

*Material examined*: ETHIOPIA, Amaressa, on *Eugenia uniflora*, December 1960, R.B. Stewart (IMI 88333).

*Notes*: *Pseudocercospora syzygiicola* has been described from South Africa on *Syzygium cordatum*. This species is new to Ethiopia and *Eugenia uniflora* is a new host species.

1.10. *Stenella* cf. *vexans* Crous, Mycological Research 103: 611 (1999) (Fig. 5)

*Material examined*: INDIA, U.P., Gorakhpur, on *Syzygium heyneanum*, 14 March 1978, P.K. Singhania P 48 (IMI 227017).

*Leaf spots* amphigenous, angular-irregular, 2-20 mm diam., dingy greyish brown, dark grey, greyish olivaceous, with a narrow dark brown, publish to blackish brown marginal line, often somewhat raised, or with a marginal line and narrow dark halo. *Caespituli* amphigenous, punctiform, greyish brown, scattered. *Primary mycelium* internal; *secondary mycelium* external, hyphae emerging though stomata, superficial, sparingly branched, septate, 1.5-3 µm diam., subhyaline to pale olivaceous, verruculose. *Stromata* substomatal, often somewhat erumpent, 25-50 µm diam., brown, composed of swollen hyphal cells, 2-6 µm diam. *Conidiophores* in moderately large fascicles, dense, arising from stromata, or solitary, arising from creeping hyphae, lateral or terminal, erect, straight, subcylindrical to somewhat geniculate-sinuous, unbranched, rarely irregularly branched, 10-30 × (2-)3-4(-5) µm, 0-3-septate, pale olivaceous, thin-walled, smooth to faintly rough-walled, conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, conidiogenous loci conspicuous, scars somewhat thickened and darkened, 1-1.5 µm diam. *Conidia* solitary, subcylindrical to somewhat obclavate, 10-70 × (2.5-)3-4(-5) µm, (0-)2-7(-8)-septate, occasionally constricted at the septa, subhyaline to pale olivaceous, almost smooth to verruculose, apex obtuse or subobtuse, base obconically truncate, hila slightly thickened and darkened, 1-2 µm diam.

*Notes*: Crous (1998) found some fructification of an anamorph in the type collection of *Mycosphaerella vexans* (Masse) Tomilin and described it as *Stenella vexans*. Superficial hyphae, solitary conidiophores and the conidial shape of the present collection agree well with the original description in Crous



(1998), but the conidia are wider and well-developed stromata with densely fasciculate conidiophores are present. Therefore, the Indian collection is only tentatively assigned to *S. vexans*.

## 2. Cercosporoid hyphomycetes on *Ipomoea* spp. - some additions

García *et al.* (1996) studied numerous types of *Cercospora* spp. described from *Ipomoea* spp. and published a survey of the taxa concerned. Some additional types not treated by García *et al.* (1996) have been examined and are discussed and re-allocated in this chapter.

### 2.1. *Cercospora apii* Fresen. *s. lat.* (incl. *C. ipomoeae* G. Winter)

= *Cercospora ipomoeae-illustris* ('*ipomoeae-illustriae*') Chidd., Indian Phytopathology 12: 114 (1959), **syn. nov.**

*Material examined:* INDIA, Poona, Mulshi, on *Ipomoea illustris*, 11 January 1957, P.P. Chiddarwar, *holotype* of *C. ipomoeae-illustris* (IMI 83177).

*Notes:* Type material of *C. ipomoeae-illustris* is indistinguishable from *C. ipomoeae* which belongs to *C. apii s. lat.* The acicular, hyaline conidia are formed singly and are (20-)70-150 × 2.5-5 µm.

### 2.2. *Cercospora varanasiana* Pavghi and U.P. Singh, Mycopathologia et Mycologia Applicata 23: 195 (1964).

*Material examined:* INDIA, U.P., Varanasi, on *Ipomoea* sp., 20 December 1961, U.P. Singh MSP 128, *holotype* of *C. varanasiana* (IMI 113097).

*Notes:* Status unclear (no fructification found in the type collection).

### 2.3. *Pseudocercospora haldibariensis* (A.K. Kar and M. Mandal) U. Braun, **comb. nov.**

= *Cercospora haldibariensis* A.K. Kar and M. Mandal, Norwegian Journal of Botany 22: 105 (1975).

*Material examined:* INDIA, West Bengal, Haldibari, Coochbihar, on *Ipomoea grandiflora*, 8 November 1967, M. Mandal, *holotype* of *C. haldibariensis* (IMI 135143).

*Leaf spots* amphigenous, subcircular to angular-irregular, occasionally vein-limited, 2-15 mm diam., pale to dark greyish brown, with a narrow raised marginal line, occasionally with a narrow darker halo. *Caespituli* hypophyllous, conspicuous, brown, scattered to dense, coremioid. *Mycelium* internal. *Stromata* substomatal, subglobose, 20-40 µm diam., olivaceous brown. *Conidiophores* very densely fasciculate to synnematosus, filiform, flexuous, unbranched, 30-340 × 3-5.5 µm, pluriseptate throughout, pale to dark olivaceous-brown, tips paler, darker in mass, smooth; conidiogenous cells integrated, terminal, 10-50 µm long, conidiogenous loci inconspicuous. *Conidia* solitary, obclavate-cylindrical, 40-100 × (3-)4-7 µm, 2-10-septate,

subhyaline to olivaceous, smooth, apex obtuse or subacute, base subtruncate or obconically truncate, hila 2-3  $\mu\text{m}$  diam., unthickened, not darkened.

*Notes:* On account of conidiogenous cells with inconspicuous scars and conidia with unthickened, not darkened hila, this species has to be placed in *Pseudocercospora*. A good illustration of this species has been published by Kar and Mandal (1975: 107, Fig. 2).

2.4. *Stenella ipomoeae-stoloniferae* (J.M. Yen and Gilles) U. Braun, **comb. nov.** (Fig. 6)

$\equiv$  *Cercospora ipomoeae-stoloniferae* J.M. Yen and Gilles, Cahiers Maboké 8: 79 (1970).

*Material examined:* GABON, Libreville, on *Ipomoea stolonifera*, 6 February 1970, G. Gilles 48, *isotypes* of *C. ipomoeae-stoloniferae* (IMI 156221, 216334); BRAZIL, Belem, on *Ipomoea asarifolia*, 12 October 1977, H.C. Evans 51371 (IMI 217435).

*Leaf spots* lacking or almost so (on *I. stolonifera*) or with diffuse purplish violet discolorations (on *I. asarifolia*), 1-8 mm diam., or confluent and larger. *Caespituli* amphigenous, scattered to dense, subeffuse to distinctly punctiform, brown. *Primary mycelium* internal, *secondary mycelium* external, superficial; hyphae creeping, sparingly branched, septate, 2-4  $\mu\text{m}$  diam., subhyaline to pale olivaceous, verruculose. *Stromata* lacking or small, 10-20  $\mu\text{m}$  diam., substomatal, brown, reddish brown. *Conidiophores* in small to moderately large fascicles, arising from internal hyphae or stromata, loose to moderately dense, emerging through stomata or solitary, arising from creeping hyphae, lateral or terminal, erect, straight, subcylindrical to geniculate-sinuuous, simple or branched, 20-70  $\times$  2-6  $\mu\text{m}$ , 1-7-septate, usually closely pluriseptate, pale to dark olivaceous-brown, brown, reddish brown, tips paler, smooth to verruculose, wall thin to somewhat thickened; conidiogenous cells integrated, terminal, 10-30  $\mu\text{m}$  long, conidiogenous loci (scars) 1-1.5  $\mu\text{m}$  diam., slightly thickened and darkened. *Conidia* solitary, occasionally catenate, in simple or branched chains, narrowly obclavate, cylindrical (-subacicular), 15-135  $\times$  2.5-4  $\mu\text{m}$ , 1-12-septate, subhyaline to pale olivaceous, almost smooth to verruculose, apex obtuse to subacute or truncate in catenate conidia, base truncate to obconically truncate, hila 1-2  $\mu\text{m}$  diam., somewhat thickened and darkened.

*Notes:* Based on verruculose secondary hyphae with solitary conidiophores and thickened, darkened scars and hila, this species must be re-allocated to *Stenella*. Secondary mycelium has not been mentioned in the original description.

3. **Cercosporoid hyphomycetes on *Jatropha* spp.**

Several species of *Cercospora s. lat.* on *Jatropha* have been described. All collections of cercosporoid hyphomycetes deposited at IMI have been examined and compared with the species described.

3.1. *Cercospora jatrophiicola* (Speg.) Chupp, A monograph of the fungus genus *Cercospora*: 223 (1954).

*Material examined*: INDIA, U.P., Gouda, Harriya, on *Jatropha curcas*, 27 January 1987, K.S. Khan (IMI 254022); INDIA, U.P., Gorakhpur, on *J. gossypifolia*, 1 December 1980, R.P. Verma KV 98 (IMI 254022).

*Notes*: Braun (2000a) re-examined type material of *C. jatrophiicola* and discussed its taxonomy. The two Indian collections agree well with this species (conidiophores fasciculate, 20-150 × 3-6 µm, olivaceous to medium brown, pluriseptate, conidiogenous loci thickened and darkened, 1.5-3.5 µm diam.; conidia solitary, acicular to obclavate-cylindrical, 20-120 × 2-4.5 µm, hyaline, pluriseptate, base truncate to obconically truncate, 1.5-3 µm diam.). *C. jatrophiicola* is a member of *Cercospora s.str.*, but distinct from *C. apii s. lat.*

3.2. *Cercospora jatrophiigena* U. Braun, **sp. nov.** (Fig. 7)

Differt a *C. jatrophiicola* conidiophoris 150-400 µm longis et conidiis acicularis-filiformis, 100-300 × 2.5-5 µm et a *C. apii* conidiophoris 150-400 µm longis, non-geniculatis.

*Holotype* (designated here): INDIA, U.P., Gorakhpur, Anand Nagar, on *Jatropha* sp., 17 December 1989, A.S. Moses (IMI 337609). *Paratype*: INDIA, West Bengal, on *Jatropha curcas*, 23 October 1983, K.K. Sarbajna 3458 (IMI 284558).

*Leaf spots* amphigenous, irregular, large, 5-50 mm diam., brown, greyish brown, margin indefinite or with a narrow dark border. *Caespituli* hypophyllous, thin, subeffuse to dense, very dense colonies sometimes almost tomentose. *Stromata* lacking or small, 10-40 µm diam., brown, substomatal to intraepidermal. *Conidiophores* in small to moderately large fascicles, usually 2-12, divergent, arising from internal hyphae or stromata, through stomata or erumpent, erect, straight, stiff to flexuous, neither sinuous nor conspicuously geniculate, unbranched, 150-400 × 3-6 µm, pluriseptate throughout, olivaceous to medium brown throughout or tips paler, smooth; conidiogenous cells integrated, terminal or intercalary, 10-50 µm long, conidiogenous loci (scars) thickened and darkened, 2.5-4 µm diam. *Conidia* solitary, acicular-filiform, 100-300 × 2.5-5 µm, pluriseptate, distance between septa 5-15 µm, hyaline, smooth, apex subacute, base truncate or subtruncate, hila 2-3.5 µm diam., thickened and darkened (conidia occasionally germinating and forming short lateral secondary conidiophores).

*Notes*: *Cercospora jatrophiigena* differs from *C. jatrophiicola* in having distinct leaf spots, very long, non-geniculate conidiophores and much longer acicular-filiform conidia. The features of the lesion and the size of the conidiophores and conidia also discriminate this species from *C. apii s. lat.*

3.3. *Pseudocercospora jatrophae-curcas* (J.M. Yen) Deighton, Mycological Papers 140: 146 (1976).

*Material examined*: INDIA, West Bengal, Calcutta, Mankunda, on *Jatropha curcas*, 28 August 1986, K.K. Sarbajna 4953 (IMI 311117); MALAYSIA, Sabah, Tawan, Quoin Hill, on

*J. curcas*, 9 May 1964, T.W. Williams (IMI 107535); INDIA, West Bengal, Barrakpore, on *J. gossypifolia*, 21 January 1985, A.K. Das 3689 (IMI 293581).

*Notes:* *Pseudocercospora jatrophae-curcas* is new to India and Malaysia and *J. gossypifolia* is a new host species.

3.4. *Pseudocercospora jatrophae* (Speg.) U. Braun, *Schlechtendalia* 5: 64 (2000).

*Material examined:* CUBA, Bayamo, on *Jatropha integrifolia*, 23 July 1966, R. Urtiaga (IMI 120950).

*Notes:* Braun (2000a) examined holotype material of *Cercospora jatrophae* Speg. and placed this species in *Pseudocercospora*. The present material from Cuba agrees very well. This species is new to Cuba and *J. integrifolia* is a new host species.

#### 4. Cercosporoid hyphomycetes on *Lantana* spp.

4.1. *Pseudocercospora formosana* (W. Yamam.) Deighton, *Mycological Papers* 140: 144 (1976).

= *Cercospora lantanae-camarae* J.M. Yen and Gilles, *Cahiers Maboké* 9: 108 '1971' (1973), **syn. nov.**

*Material examined:* GABON, Tchibanga, on *Lantana camara*, 9 April 1971, G. Gilles, *isotype* of *C. lantanae-camarae* (IMI 183412).

*Notes:* Based on the original description and illustration, Braun *et al.* (1992) cited *C. lantanae-camarae* as a synonym of *P. formosana*. The examination of type material of this species showed that this treatment has been correct.

4.2. *Cercospora lantanae-indicae* Munjal *et al.*, *Indian Phytopathology* 12: 134 '1959' (1960).

= *Cercospora lantanae-camarae* R.C. Rayak and R.K. Rayak, *Current Science* 50: 911 (1981), homonym, non *C. lantanae-camarae* J.M. Yen and Gilles, 1971, **syn. nov.**

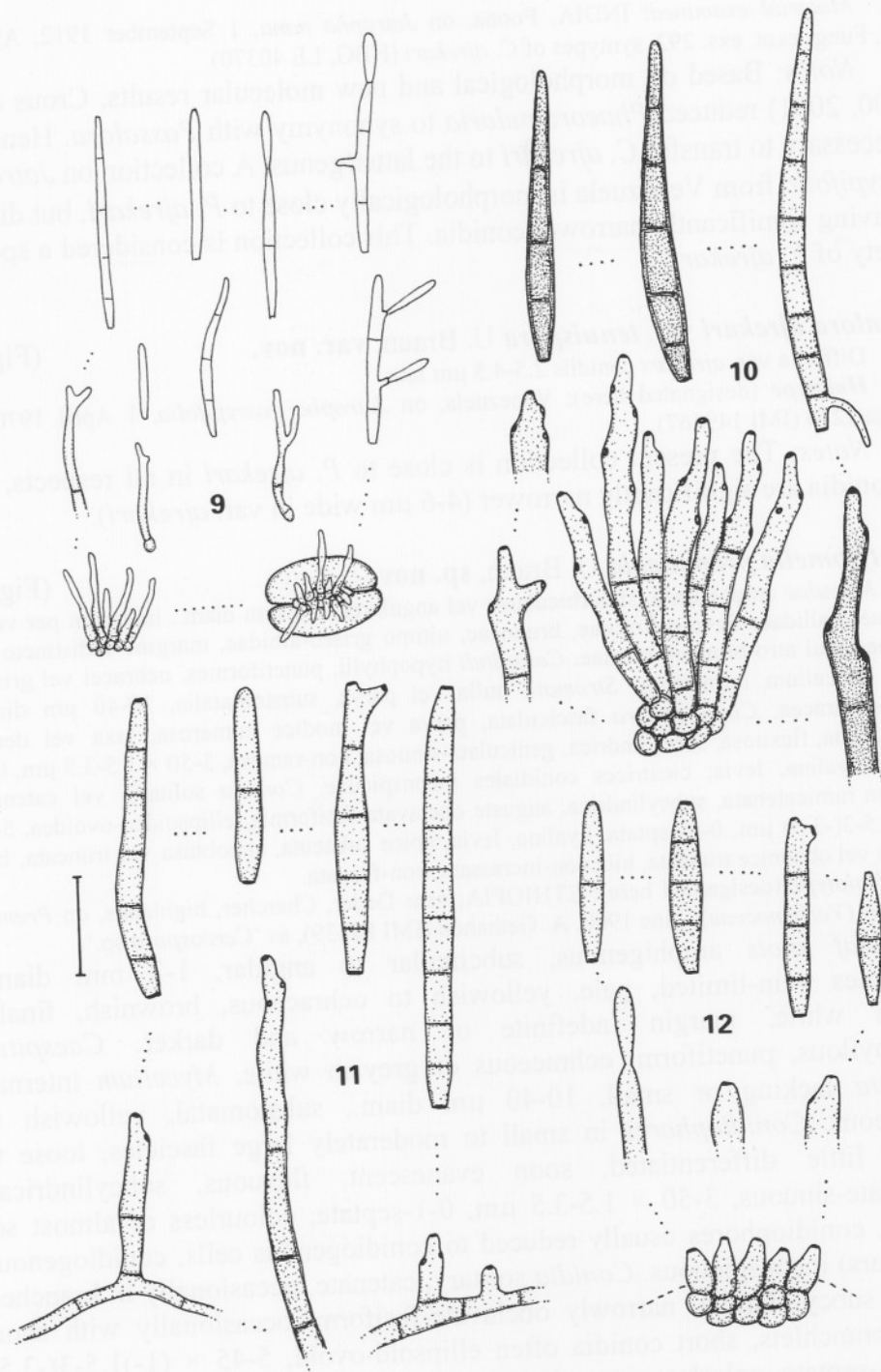
*Material examined:* INDIA, Jabalpur, on *Lantana camara*, 24 December 1977, R.C. Rayak, *holotype* of *C. lantanae-camarae* R.C. Rayak and R.K. Rayak (IMI 224099).

*Notes:* The type material examined agrees perfectly with the original description and illustration of *C. lantanae-indicae*, which is a true *Cercospora* *s.str.* distinct from *C. apii* *s. lat.* in having colorless acicular to obclavate-fusiform conidia, 30-250 × 2-5 µm, gradually attenuated towards the base.

4.3. *Passalora ajrekari* (Syd.) U. Braun, **comb. nov.**

= *Cercospora ajrekari* Syd., *Annales Mycologici* 12: 202 (1914).

= *Phaeoramularia ajrekari* (Syd.) Deighton, in Ellis, *More Dematiaceous Hyphomycetes*: 319 (1976).



**Figs. 9-12.** Conidiophore fascicles, conidiophores, conidia. **9.** *Entylomella prennicola*. **10.** *Passalora bauhiniicola*. **11.** *P. chaetocalycina*. **12.** *P. paspalicola*. Bar = 20  $\mu$ m.

*Material examined:* INDIA, Poona, on *Jatropha nana*, 1 September 1912, Ajrekar, Syd., Fungi exot. exs. 292, syntypes of *C. ajrekari* (HBG, LE 40370).

*Notes:* Based on morphological and new molecular results, Crous *et al.* (2000, 2001) reduced *Phaeoramularia* to synonymy with *Passalora*. Hence, it is necessary to transfer *C. ajrekari* to the latter genus. A collection on *Jatropha gossypifolia* from Venezuela is morphologically close to *P. ajrekari*, but differs in having significantly narrower conidia. This collection is considered a special variety of *P. ajrekari*:

***Passalora ajrekari* var. *tenuispora* U. Braun, var. nov.** (Fig. 8)

Differt a var. *ajrekari* conidiis 2.5-4.5  $\mu\text{m}$  latis.

*Holotype* (designated here): Venezuela, on *Jatropha gossypifolia*, 1 April 1970, R. Urtiaga 1210 (IMI 149467).

*Notes:* The present collection is close to *P. ajrekari* in all respects, but the conidia are significantly narrower (4-6  $\mu\text{m}$  wide in var. *ajrekari*).

**5. *Entylomella premnicola* U. Braun, sp. nov.** (Fig. 9)

*Maculae* amphigenae, suborbiculares vel angulares, 1-3 mm diam., interdum per venas limitatae, pallidae, flavo-ochraceae, brunneae, ultimo griseo-albidae, margine indistincto vel margine tenui atro-brunneo cinctae. *Caespituli* hypophylli, punctiformes, ochracei vel griseo-albidi. Mycelium immersum. *Stromata* nulla vel parva, substomatalia, 10-40  $\mu\text{m}$  diam., flavido-ochracea. *Conidiophora* fasciculata, parva vel modice numerosa, laxa vel densa, evanescentia, flexuosa, subcylindrica, geniculata-sinuosa, non-ramosa, 3-50  $\times$  1.5-3.5  $\mu\text{m}$ , 0-1-septata, hyalina, levia; cicatrices conidiales inconspicuae. *Conidia* solitaria vel catenata, interdum ramicatenata, subcylindrica, anguste obclavata-fusiformia, ellipsoidea-ovoidea, 5-45  $\times$  (1-)1.5-3(-3.5)  $\mu\text{m}$ , 0-5-septata, hyalina, levia, apice subacuta, subobtusa vel truncata, basi truncata vel obconice truncata, hila non-incrassata, non-fuscata.

*Holotype* (designated here): ETHIOPIA, near Deder, Chercher, highlands, on *Premna schimperi* (*Verbenaceae*), June 1960, A. Gethahon (IMI 88339), as '*Cercospora* sp.'.

*Leaf spots* amphigenous, subcircular to angular, 1-3 mm diam., sometimes vein-limited, pale, yellowish to ochraceous, brownish, finally greyish white, margin indefinite or narrow and darker. *Caespituli* hypophyllous, punctiform, ochraceous or greyish white. *Mycelium* internal. *Stromata* lacking or small, 10-40  $\mu\text{m}$  diam., substomatal, yellowish to ochraceous. *Conidiophores* in small to moderately large fascicles, loose to dense, little differentiated, soon evanescent, flexuous, subcylindrical, geniculate-sinuuous, 3-50  $\times$  1.5-3.5  $\mu\text{m}$ , 0-1-septate, colourless or almost so, smooth, conidiophores usually reduced to conidiogenous cells, conidiogenous loci (scars) inconspicuous. *Conidia* solitary, catenate, occasionally in branched chains, subcylindrical, narrowly obclavate-fusiform, occasionally with short lateral branchlets, short conidia often ellipsoid-ovoid, 5-45  $\times$  (1-)1.5-3(-3.5)  $\mu\text{m}$ , 0-5-septate, colorless, smooth, apex subacute, subobtuse to truncate, base truncate or obconically truncate, hila unthickened, not darkened.

*Notes:* There is no comparable species on hosts of *Premna* and allied genera. It has been very difficult to find an appropriate genus for this hyphomycete on *Premna*. Based on colorless conidiophores and conidia and inconspicuous conidiogenous loci, this fungus is reminiscent of *Pseudocercospora* spp., but because of very narrow, often evanescent conidiophores and catenate, narrow, very variable conidia, I prefer to assign it tentatively to *Entylomella*, although smut spores, the perfect stage, have not been observed. The differentiation between some smut anamorphs of *Entyloma* and *Pseudocercospora* is sometimes difficult.

6. *Passalora bauhiniicola* U. Braun, **sp. nov.** (Fig. 10)

*Maculae* amphigenae, suborbiculares vel angulares-irregulares, 1-15 mm diam. vel confluentes, pallide ochraceae, brunneae, margine tenui rubro-purpureo vel rubro-brunneo cinctae. *Caespituli* amphigeni, punctiformes, atro-brunnei, nigri, dispersi. Mycelium immersum. *Stromata* intraepidermalia, 10-50  $\mu\text{m}$  diam., interdum leviter erumpentia, brunnea. *Conidiophora* laxae vel dense fasciculata, parva vel modice numerosa, ex cellulis stromatibus oriunda, erecta, simplicia, recta, subcylindrica vel geniculata-sinuosa, 30-70  $\times$  3-7  $\mu\text{m}$ , continua vel septata, pallide olivacea, olivaceo-brunnea vel dilute brunnea, levia; cellulae conidiogenae integratae, terminales, 30-50  $\mu\text{m}$  longae; cicatrices conidiales conspicuae, incrassatae, fuscatae, 1-2  $\mu\text{m}$  diam. *Conidia* solitaria, obclavata, 35-70  $\times$  6-8  $\mu\text{m}$ , 3-8-septata, flavo-viridula, pallide olivacea, levia, apice subobtusata, basi distincte obconice truncata, hila 1.5-2  $\mu\text{m}$  diam., incrassata, fuscata.

*Holotype* (designated here): VENEZUELA, Lara, Carora, Quediche, on *Bauhinia benthaminiana* (*Fabaceae*), January 1990, R. Urtiaga (IMI 339516).

*Leaf spots* amphigenous, subcircular to angular-irregular, 1-15 mm diam. or confluent and larger, pale, ochraceous, brownish, with a narrow margin or marginal line, reddish-purplish or reddish brown. *Caespituli* amphigenous, punctiform, dark brown, blackish, scattered. Mycelium internal. *Stromata* intraepidermal, 10-50  $\mu\text{m}$  diam., occasionally somewhat erumpent, brown. *Conidiophores* in small to moderately large fascicles, loose to dense, arising from stromata, erumpent, erect, unbranched, straight, subcylindrical to geniculate-sinuuous, 30-70  $\times$  3-7  $\mu\text{m}$ , continuous to septate, pale olivaceous, olivaceous-brown, light brown, smooth; conidiogenous cells integrated, terminal, 30-50  $\mu\text{m}$  long; conidiogenous loci (scars) conspicuous, thickened and darkened, 1-2  $\mu\text{m}$  diam. *Conidia* solitary, obclavate, 35-70  $\times$  6-8  $\mu\text{m}$ , 3-8-septate, yellowish green, pale olivaceous, smooth, apex subobtusate, base distinctly obconically truncate, hila 1.5-2  $\mu\text{m}$  diam., thickened and darkened (occasionally with short germ tubes near the base).

*Notes:* There is no comparable species of *Passalora* on hosts of *Bauhinia* and allied genera.

7. *Passalora chaetocalycina* (Petr. and Cif.) U. Braun, **comb. nov.** (Fig. 11)

$\equiv$  *Cercospora chaetocalycina* Petr. and Cif., *Annales Mycologici* 30: 308 (1932).

*Reference:* Chupp (1954: 292).

*Material examined:* DOMINICAN REPUBLIC, Santiago, Valle de Ciboa, Hato del Yaque, on *Chaetocalyx pubescens*, 22 January 1931, R. Ciferri 4132, *lectotype* of *C. chaetocalycina*, selected here (W, Acqu. 1973, No. 10343), [*isolectotype:* PAV], and 23 December 1930, E.L. Ekman, *ex herb.* Ciferri 4017, *topotype* of *C. chaetocalycina* (W, Acqu. 1973, No. 10023).

*Leaf spots* absent or only with irregular, diffuse, yellowish discolorations on the upper leaf surface. *Colonies* hypophyllous, effuse, forming greyish to olivaceous-brown patches, dense, 2-6 mm diam. *Primary mycelium* internal, *secondary mycelium* external, hyphae superficial, creeping, septate, sparingly branched, 2-5  $\mu\text{m}$  diam., subhyaline, olivaceous to olivaceous-brown, smooth. *Stromata* lacking or small, substomatal, brown. *Conidiophores* solitary or in loose fascicles, emerging through stomata or arising from creeping hyphae, lateral, occasionally terminal, erect to decumbent, extremely variable, straight, subcylindrical to irregular, somewhat geniculate-sinuuous, simple, occasionally branched, 10-100  $\times$  3-5  $\mu\text{m}$ , width often irregular, pale olivaceous to olivaceous-brown, continuous to pluriseptate, smooth (differentiation between creeping secondary hyphae and long conidiophores often very difficult or almost impossible); conidiogenous cells integrated, terminal, occasionally conidiophores reduced to conidiogenous cells, 10-30  $\mu\text{m}$  long, conidiogenous loci conspicuous, thickened and darkened, 1.5-3  $\mu\text{m}$  diam. *Conidia* solitary or catenate, occasionally in branched chains, subcylindrical-filiform, 20-100  $\times$  3-5  $\mu\text{m}$ , 1-9-septate, subhyaline to pale olivaceous-brown, smooth, apex obtuse to truncate, base subtruncate to obconically truncate, 1.5-3  $\mu\text{m}$  diam., hila thickened and darkened.

*Notes:* This species is a typical '*Mycovellosiella*' with secondary hyphae, solitary conidiophores and conspicuous conidiogenous loci. However, based on new molecular data and morphological studies, *Mycovellosiella* has been reduced to synonymy with *Passalora* (Crous *et al.*, 2000, 2001).

8. *Passalora paspalicola* (Petr. and Cif.) U. Braun, **comb. nov.** (Fig. 12)

$\equiv$  *Cercospora paspalicola* Petr. and Cif., Annales Mycologici 30: 226 (1932).

*Reference:* Chupp (1954: 250).

*Material examined:* DOMINICAN REPUBLIC, Prov. Azua, Valle de San Juan, San Juan de la Maguana, on *Paspalum clavuliferum*, 22 August 1929, E.L. Ekman, Ciferri, Mycoflora Domingensis Exsiccata 331, *lectotype* of *C. paspalicola*, selected here (W, Acqu. 1978, No. 07621).

*Leaf spots* indistinct, later brown, irregular, usually 1-3 mm diam. *Caespituli* amphigenous, punctiform, subcircular to oblong in outline, blackish. *Mycelium* internal. *Stromata* immersed, large, 30-350  $\mu\text{m}$  diam., dark brown. *Conidiophores* numerous or very numerous, densely fasciculate, forming well-developed sporodochial conidiomata, conidiophores little differentiated,



reduced to conidiogenous cells, only developed as elongated peripheral cells of the stromata, subcylindrical-conical, simple,  $5-15 \times 3-6 \mu\text{m}$  (sometimes with persistent conidiophores, resembling longer conidiophores), aseptate, brownish, smooth; conidiogenous loci conspicuous, slightly thickened and darkened,  $1-1.5 \mu\text{m}$  diam. *Conidia* solitary to catenate, occasionally in branched chains, cylindrical, obclavate-subcylindrical, ellipsoid-ovoid,  $15-60 \times 4-6.5 \mu\text{m}$ , 1-4-septate, subhyaline to pale olivaceous, smooth to faintly rough-walled, apex obtuse, base rounded to obconically truncate,  $1-1.5 \mu\text{m}$  diam., hila slightly thickened and darkened.

*Notes:* Because of the catenate conidia and conspicuous scars, this species is a typical '*Phaeoramularia*'. However, based on new morphological and molecular examinations, *Phaeoramularia* has been reduced to synonymy with *Passalora* (Crous *et al.*, 2000, 2001).

9. *Passalora selini-gmelini* (Sacc. and Scalia) U. Braun, **comb. nov.** (Fig. 13)

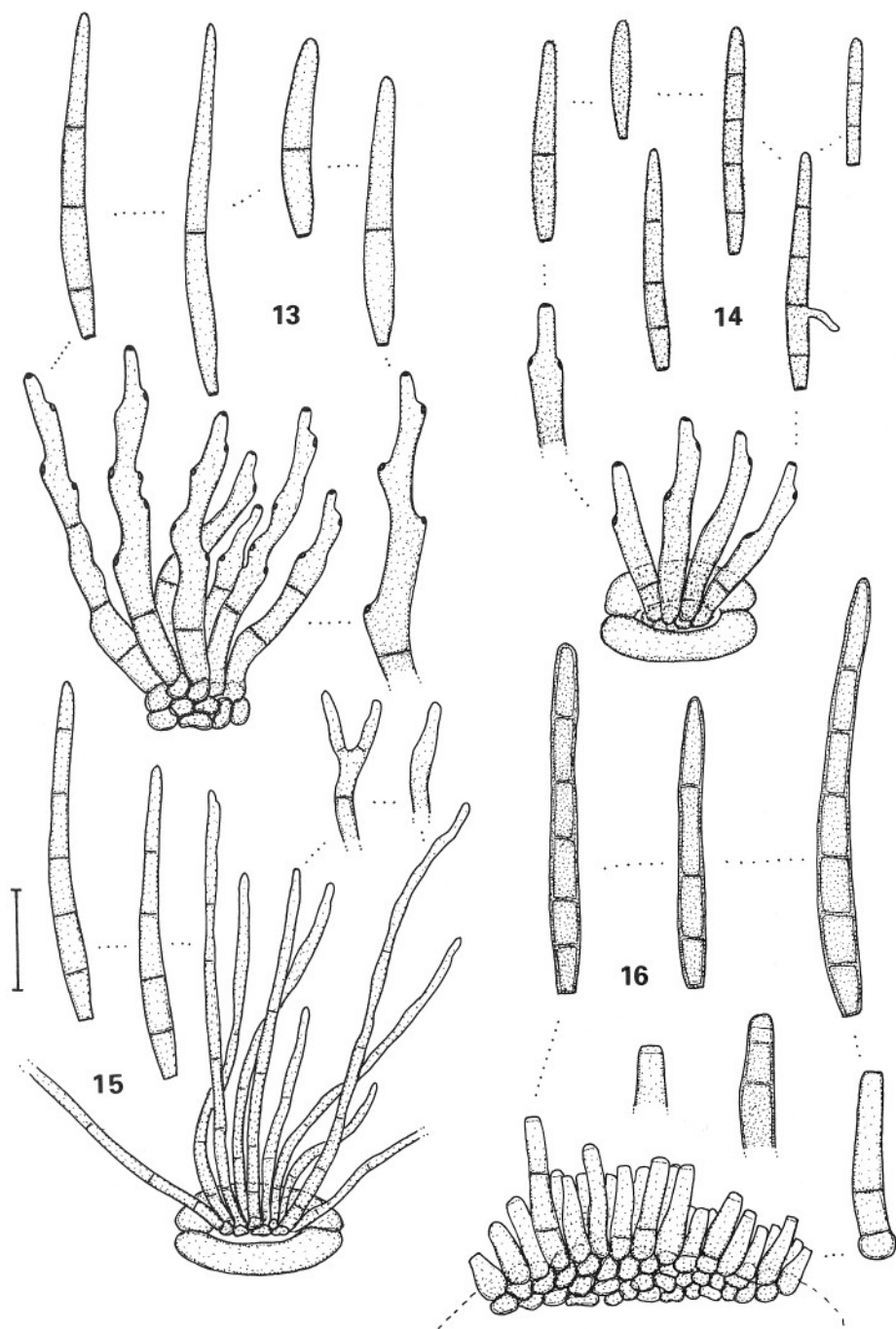
≡ *Cercospora apii* var. *selini-gmelini* Sacc. and Scalia, Harriman Alaska Expedition, (Crypt. Bot.): 16 (1904).

≡ *Cercospora selini-gmelini* (Sacc. and Scalia) Chupp, A monograph of the fungus genus *Cercospora*: 579 (1954).

*Material examined:* JAPAN, Aomori Pref., Hirosaki City, Zatoishi, on *Conioselinum univittatum*, 16 July 1972, Y. Harada (IMI 170537).

*Leaf spots* inconspicuous or small, 0.5-2 mm diam., angular, yellowish to ochraceous discolorations, greyish olivaceous on the lower surface, margin indefinite. *Caespituli* hypophyllous, punctiform, dense, greyish olivaceous. Mycelium immersed. *Stromata* substomatal, 10-40  $\mu\text{m}$  diam., brown. *Conidiophores* in small to large fascicles, loose to dense, arising from stromata, emerging through stomata, erect, strongly geniculate-sinuous, unbranched,  $40-100 \times (3-4)4-8(-10) \mu\text{m}$ , usually septate, pale olivaceous to olivaceous-brown, smooth, thin-walled; conidiogenous cells integrated, terminal, conidiogenous loci (scars) conspicuous,  $2-2.5 \mu\text{m}$  diam., somewhat thickened and darkened. *Conidia* solitary, obclavate-cylindrical,  $30-80 \times (4-5)5-7 \mu\text{m}$ , 1-3-septate, subhyaline to pale olivaceous, smooth, thin-walled, apex obtuse, base obconically truncate, hila  $2-2.5 \mu\text{m}$  diam., slightly thickened and darkened.

*Notes:* This species was originally described from Alaska on *Conioselinum gmelini*. Type material could not be traced at PAD, but the present material from Japan agrees very well with the original diagnosis and Chupp's (1954) re-description. Based on the structure of the conidiogenous loci and the shape and septation of the conidia, this species has to be placed in *Passalora*. *P. selini-gmelini* resembles *P. cnidii* (Constant.) Poonam Srivast. on



Figs. 13-16. Conidiophore fascicles, conidiophores, conidia. 13. *P. selini-gmelini*. 14. *P. tephrosiae-purpureae*. 15. *Pseudocercospora barleriae* 16. *P. bernardiae*. Bar = 20  $\mu$ m.

*Cnidium* spp. in Europe, but differs in having smaller stromata and strongly geniculate-sinuous conidiophores.

10. *Passalora tephrosiae-purpureae* U. Braun, **sp. nov.** (Fig. 14)

Differt a *P. tephrosiae* conidiophoris 10-30  $\mu\text{m}$  longis, non-septatis et conidiis 4-6  $\mu\text{m}$  latis.

**Holotype** (designated here): INDIA, Bihar, Topchachi, on *Tephrosia purpurea* (*Fabaceae*), 14 November 1986, Khan (IMI 312399).

*Leaf spots* amphigenous, small, 0.5-2 mm diam., subcircular to somewhat irregular, brown, margin indefinite. *Caespituli* hypophyllous, punctiform, dark brown. Mycelium internal. *Stromata* substomatal, 10-40  $\mu\text{m}$  diam., brown. *Conidiophores* in small to moderately large fascicles, more or less dense, arising from stromata, emerging through stomata, erect, straight, subcylindrical to somewhat geniculate-sinuous, unbranched, 10-30  $\times$  4-6  $\mu\text{m}$ , 0(-1)-septate, pale olivaceous to olivaceous-brown, almost smooth to verruculose; conidiophores usually reduced to conidiogenous cells, conidiogenous loci subconspicuous to conspicuous, unthickened to very slightly thickened and somewhat darkened-refractive, 1.5-2  $\mu\text{m}$  diam. *Conidia* solitary, obclavate-cylindrical, short conidia occasionally ellipsoid-ovoid, (10-)20-50  $\times$  4-6  $\mu\text{m}$ , (0-)1-4(-5)-septate, pale olivaceous to olivaceous-brown, almost smooth to verruculose, apex obtuse or subobtuse, base subtruncate to obconically truncate, hila 1.5-2  $\mu\text{m}$  diam., unthickened or almost so, not darkened to slightly darkened-refractive.

*Notes:* It has been rather difficult to find an appropriate genus for this new species, which seems to be intermediate between *Asperisporium* (conidia verruculose), *Pseudocercospora* (conidigenous loci ranging from being unthickened to very slightly thickened) and *Passalora* (scars conspicuous, conidia obclavate-cylindrical). On account of visible scars and the conidial shape, this species is, however, tentatively placed in *Passalora*. *P. tephrosiae-purpureae* reminds one of *P. tephrosiae* S.A. Khan and Kamal (Ellis, 1976), but the latter species differs in having very long, septate conidiophores and wider conidia with broadly rounded apex and rounded to subtruncate base.

11. *Pseudocercospora acalyphae* (Lacy and Thirum.) Raghu Ram, Mallaiah and U. Braun, in Braun, A monograph of *Cercospora*, *Ramularia* and allied genera (phytopathogenic hyphomycetes), Vol. 1: 100, Eching 1995.

= *Phaeoramularia indica* S.K. Singh, R.K. Chaudhary and Meenu, Mycological Research 101: 863 (1997), **syn. nov.**

*Material examined:* INDIA, U.P., Gorakhpur, on *Acalypha indica*, 1994, Kamal, holotype of *P. indica* (IMI 366370).

*Notes:* Based on the original description, Braun (2000b: 49) supposed that *Phaeoramularia indica* is identical with *Pseudocercospora acalyphae*.

Type material of *P. indica* has recently been traced and examined and the identity supposed could be confirmed.

12. *Pseudocercospora anomala* (Berk. and M.C. Curtis) de Hoog, Persoonia 15: 68 (1992).

≡ *Cladosporium anomalum* Berk. and M.C. Curtis, in Sacc., Syll. Fung. 4: 363 (1886) [Cub. Fungi, No. 639].

*Material examined*: CUBA, on 'Malva sp.', C. Wright, *holotype* of *C. anomalum* (K); DOMINICAN REP., Santiago, Valle de Ciboa, Hato del Yaque, on *Sida* sp., 21 March 1932, leg.? (IMI 59305).

*Leaf spots* lacking or irregular, not very conspicuous. *Colonies* hypophyllous, effuse, dark brown, angular-irregular, 1-3 mm diam. or confluent. *Primary mycelium* internal; *secondary mycelium* external; hyphae creeping, sparingly branched, septate, 1.5-5 µm diam., pale olivaceous to olivaceous-brown, smooth or almost so to distinctly rough-walled. *Stromata* lacking. *Conidiophores* little differentiated, often barely distinguishable from the superficial hyphae, lateral or terminal, 20-150 × (2-)3-6(-8) µm, occasionally even longer, continuous to pluriseptate, pale olivaceous to olivaceous-brown, smooth to rough-walled, above all apically verruculose, wall thin to slightly thickened; conidiogenous cells integrated, terminal, 10-50 µm long, often verruculose, conidiogenous loci inconspicuous, occasionally subdenticulate. *Conidia* solitary, cylindrical, obclavate-cylindrical, 30-85 × 3-5.5 µm, 3-8-septate, subhyaline, pale olivaceous, olivaceous-brown, verruculose, wall thin to slightly thickened, apex obtuse, base obconically truncate, 1-2 µm diam., hila unthickened, not darkened.

*Notes*: De Hoog (1992: 67-68, Fig. 3) examined type material of *C. anomalum*, transferred it to *Pseudocercospora*, described this species briefly and published a good illustration. The identity of the type host, originally given as 'Malva sp.' should rather be interpreted as 'on a host of the Malvaceae'. The present collection on *Sida* sp. agrees perfectly with the type of *P. anomala*.

13. *Pseudocercospora barleriae* (J.M. Yen and Lim) U. Braun, **comb. nov.**

(Fig. 15)

≡ *Cercospora barleriae* J.M. Yen and Lim, Cahiers du Pacifique 17: 100 (1973).

*Material examined*: SINGAPORE, on *Barleria cristata*, 3 March 1972, G. Lim No. 73 *holotype* of *C. barleriae* (PC).

*Leaf spots* amphigenous, angular, vein-limited, 1-5 mm diam. or confluent and larger, blackish on the upper leaf surface, dark brown below, sometimes forming large blackish brown patches, covering large leaf segments. *Caespituli* hypophyllous, effuse, dark brown, sometimes velvety. Mycelium internal. *Stromata* absent or almost so. *Conidiophores* in small to moderately large fascicles, loose, arising from internal hyphae, through stomata, erect to

decumbent, flexuous, simple or occasionally branched, somewhat geniculate-sinuuous,  $20-130 \times 4-7 \mu\text{m}$ , (0-)1-7-septate, olivaceous to olivaceous-brown, tips paler, smooth, thin-walled; conidiogenous cells integrated, terminal,  $10-40 \mu\text{m}$  long, conidiogenous loci (scars) inconspicuous or subconspicuous by being more rigid, subdenticulate and somewhat refractive, but wall always unthickened. *Conidia* solitary, obclavate, obclavate-subcylindrical, (10-)15-80  $\times$  4-5  $\mu\text{m}$ , 1-8-septate, subhyaline to pale olivaceous or olivaceous-brown, smooth, thin-walled, apex subacute to obtuse, base obconically truncate, 2-2.5  $\mu\text{m}$  diam., hila unthickened, not darkened, at most somewhat refractive.

*Notes:* Yen and Lim (1980) retained this species in *Cercospora* and described 'brown scars'. However, the examination of type material of *C. barleriae* showed that this species belongs in *Pseudocercospora*. The scars of the conidiogenous cells are inconspicuous or subconspicuous, but the wall of the loci is always unthickened.

14. ***Pseudocercospora bernardiae*** (F. Stevens) U. Braun, **comb. nov.** (Fig. 16)

$\equiv$  *Cercospora bernardiae* F. Stevens, Transactions of the Illinois Academy of Sciences 10: 213 (1917).

*Reference:* Chupp (1954: 213).

*Material examined:* PUERTO RICO, Guanica, on *Bernardia dichotoma*, 3 February 1913, F.L. Stevens No. 355a, *isotype* of *C. bernardiae* (PC).

*Leaf spots* amphigenous, subcircular to slightly angular-irregular, 0.5-3 mm diam., yellowish to ochraceous, finally greyish white, margin indefinite or narrow, darker. *Caespituli* epiphyllous, punctiform, dark to blackish brown. Mycelium internal. *Stromata* large, immersed, 100-300(-500)  $\mu\text{m}$  diam., circular in outline or oblong. *Conidiophores* numerous to very numerous, densely fasciculate, arising from stromata, forming large sporodochia, erumpent, straight, subcylindrical to slightly conical, unbranched, neither geniculate nor sinuous,  $10-40 \times 3-6 \mu\text{m}$ , 0-3-septate, pale yellowish, olivaceous to yellowish brown, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-25  $\mu\text{m}$  long, unilocal, determinate or percurrent, with 1-3 thin annellations, loci unthickened, not darkened, 2-4  $\mu\text{m}$  diam. *Conidia* solitary, subcylindrical, occasionally cylindrical-obclavate,  $30-90 \times (4-5-7(-8) \mu\text{m}$ , (1-)3-7(-10)-septate, subhyaline to pale olivaceous or yellowish olivaceous, smooth, wall thin to slightly thickened, apex obtuse, mostly broadly rounded, base truncate or obconically truncate, 3-5  $\mu\text{m}$  diam., hila unthickened, not darkened.

*Notes:* This species is a typical '*Cercostigmina*' with unilocal, percurrent conidiogenous cells and unthickened scars, but based on new molecular results (Crous *et al.*, 2000, 2001), *Cercostigmina* must be reduced to synonymy with *Pseudocercospora*.

15. *Pseudocercospora boedijniana* U. Braun, Nova Hedwigia 73(3-4) (2001), in press

≡ *Cercospora mitragynae* ('mitragynes') Boedijn, Nova Hedwigia 3: 428 (1961), non *Pseudocercospora mitragynae* (M.S. Pavghi, U.P. Singh and Deighton) U. Braun, 1995.

= *Cercospora mitragynae* Bhargava and Nath, Current Science 45: 672 (1976), homonym, non *C. mitragynae* Boedijn, 1961, **syn. nov.**

*Material examined*: INDIA, U.P., Gorakhpur, Kushmi and Madhulia forest, on *Mitragyna parvifolia*, November 1974, V. Nath, *holotype* of *C. mitragynae* Bhargava and Nath (IMI 191340); INDIA, West Bengal, Barnipur, on *M. parvifolia*, 29 November 1985, K.K. Sarbajna 3780 (IMI 3000695).

*Notes*: Braun (2001) examined type material of *C. mitragynae* Boedijn and re-allocated this species to *Pseudocercospora*. Bhargava and Nath (1976) only described epiphyllous caespituli with fasciculate conidiophores which agree well with those of *P. boedijniana*. The re-examination of type material and an additional Indian sample from West Bengal showed that the two species are identical and that secondary mycelium with solitary conidiophores may be formed, above all on the lower leaf surface. The description of *C. boedijniana* can be supplemented as follows: *Primary mycelium* internal, secondary mycelium almost absent to well-developed, hyphae superficial, creeping, sparingly branched, septate, smooth, 1-3 µm diam., subhyaline to pale olivaceous. *Conidiophores* fasciculate or solitary, arising from creeping hyphae, lateral or terminal.

16. *Pseudocercospora costina* (Syd. and P. Syd.) Deighton, Mycological Papers 140: 135 (1976).

*Material examined*: INDIA, Jabalpur, on *Hedychium* sp., 19 October 1977, R.C. Rajak (IMI 217586).

*Notes*: *Hedychium* is a new host genus for this species which is known from India, the Philippines and Taiwan on *Costus speciosus*. However, the present material consists of some leaf fragments, so that the correct identification of the host could not be proven.

17. *Pseudocercospora herpestica* (Petr. and Cif.) U. Braun, **comb. nov.**

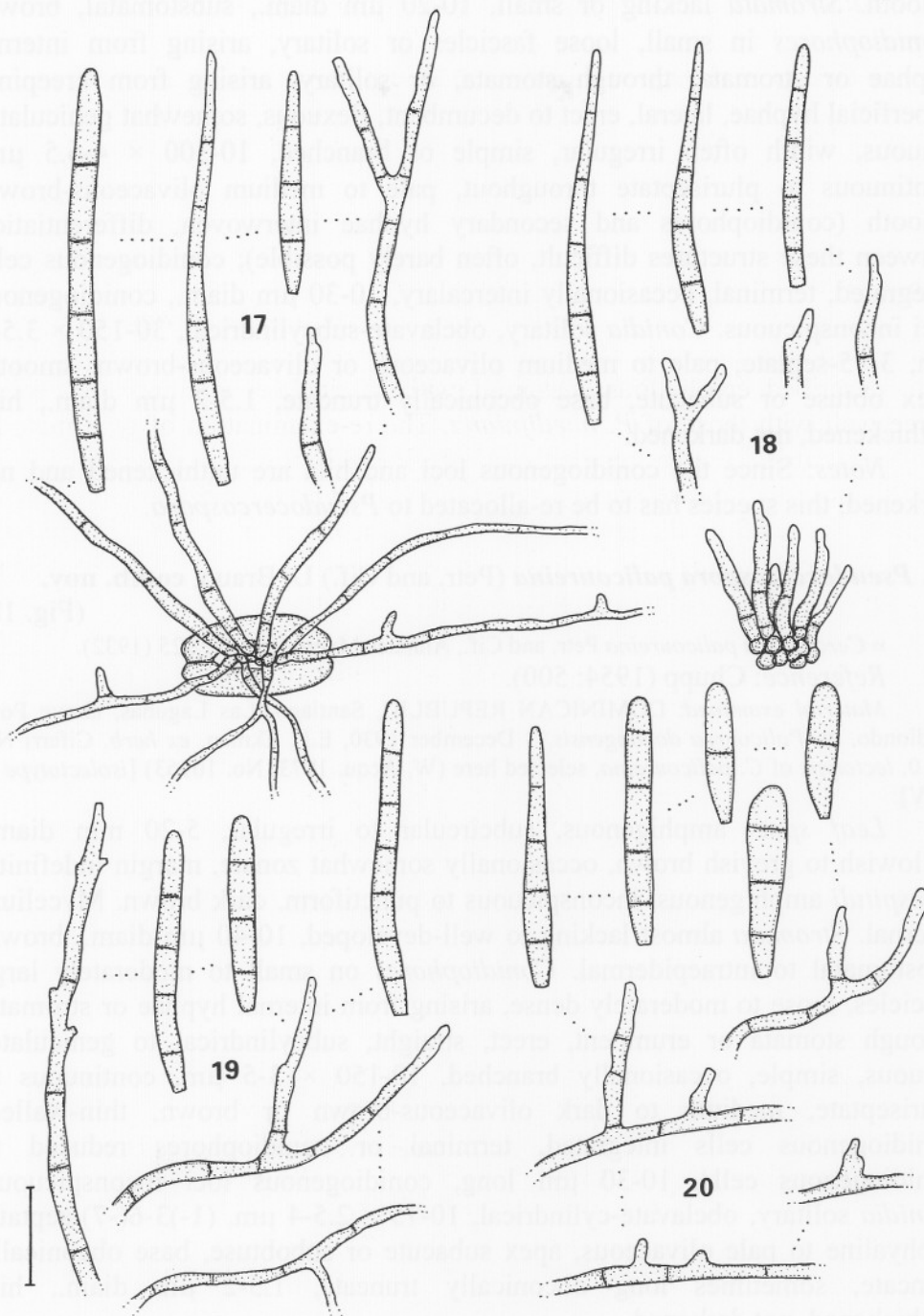
(Fig. 17)

≡ *Cercospora herpestica* Petr. and Cif., Annales Mycologici 30: 317 (1932).

*Reference*: Chupp (1954: 522).

*Material examined*: DOMINICAN REPUBLIC, Cordillera Central, La Cumbre, on *Herpestis stricta*, 3 March 1930, E.L. Ekman 367, *ex herb.* Ciferri No. 3760a, *lectotype* of *C. herpestica*, selected here (W, Acqu. 1978, No. 05307) [*isolectotype* in PAV].

*Leaf spots* indistinct. *Caespituli* hypophyllous, effuse, loose to dense, dark olivaceous, sooty. *Primary mycelium* internal; *secondary mycelium* external, superficial; hyphae creeping, emerging through stomata, sparingly branched, septate, 1.5-5 µm diam., subhyaline to pale olivaceous-brown.



Figs. 17-20. Conidiophore fascicles, conidiophores, conidia. 17. *Pseudocercospora herpestica*. 18. *P. palicoureina*. 19. *P. pavoniae*. 20. *P. pilicola*. Bar = 20  $\mu$ m.

smooth. *Stromata* lacking or small, 10-20  $\mu\text{m}$  diam., substomatal, brown. *Conidiophores* in small, loose fascicles or solitary, arising from internal hyphae or stromata, through stomata, or solitary, arising from creeping, superficial hyphae, lateral, erect to decumbent, flexuous, somewhat geniculate-sinuuous, width often irregular, simple or branched, 10-300  $\times$  4-6.5  $\mu\text{m}$ , continuous to pluriseptate throughout, pale to medium olivaceous-brown, smooth (conidiophores and secondary hyphae interwoven, differentiation between these structures difficult, often barely possible); conidiogenous cells integrated, terminal, occasionally intercalary, 10-30  $\mu\text{m}$  diam., conidiogenous loci inconspicuous. *Conidia* solitary, obclavate-subcylindrical, 30-150  $\times$  3.5-6  $\mu\text{m}$ , 3-15-septate, pale to medium olivaceous or olivaceous-brown, smooth, apex obtuse or subacute, base obconically truncate, 1.5-2  $\mu\text{m}$  diam., hila unthickened, not darkened.

*Notes:* Since the conidiogenous loci and hila are unthickened and not darkened, this species has to be re-allocated to *Pseudocercospora*.

18. *Pseudocercospora palicoureina* (Petr. and Cif.) U. Braun, **comb. nov.**

(Fig. 18)

$\equiv$  *Cercospora palicoureina* Petr. and Cif., *Annales Mycologici* 30: 325 (1932).

*Reference:* Chupp (1954: 500).

*Material examined:* DOMINICAN REPUBLIC, Santiago, Las Lagunas, above Pozo Hediondo, on *Palicourea domingensis*, 3 December 1930, E.L. Ekman, *ex herb.* Ciferri No. 3910, *lectotype* of *C. palicoureina*, selected here (W, Acqu. 1973, No. 10963) [*isolectotype* in PAV].

*Leaf spots* amphigenous, subcircular to irregular, 5-20 mm diam., yellowish to greyish brown, occasionally somewhat zonate, margin indefinite. *Caespituli* amphigenous, inconspicuous to punctiform, dark brown. Mycelium internal. *Stromata* almost lacking to well-developed, 10-40  $\mu\text{m}$  diam., brown, substomatal to intraepidermal. *Conidiophores* on small to moderately large fascicles, loose to moderately dense, arising from internal hyphae or stromata, through stomata or erumpent, erect, straight, subcylindrical to geniculate-sinuuous, simple, occasionally branched, 10-150  $\times$  3-5  $\mu\text{m}$ , continuous to pluriseptate, medium to dark olivaceous-brown or brown, thin-walled; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-30  $\mu\text{m}$  long, conidiogenous loci inconspicuous. *Conidia* solitary, obclavate-cylindrical, 10-75  $\times$  2.5-4  $\mu\text{m}$ , (1-)3-6(-7)-septate, subhyaline to pale olivaceous, apex subacute or subobtuse, base obconically truncate, sometimes long obconically truncate, 1.5-2  $\mu\text{m}$  diam., hila unthickened, not darkened.

*Notes:* The conidiogenous loci and hila are neither thickened nor darkened, so that this species belongs in *Pseudocercospora*.



19. *Pseudocercospora pavoniae* (Petr. and Cif.) U. Braun, **comb. nov.** (Fig. 19)

≡ *Cercospora pavoniae* Petr. and Cif., Annales Mycologici 30: 327 (1932).

Reference: Chupp (1954: 375).

Material examined: DOMINICAN REPUBLIC, Santiago, Valle de Ciboa, on *Pavonia* sp., 2 March 1931, R. Ciferri No. 4156, lectotype of *C. pavoniae*, selected here (W, Acqu. 1978, No. 05583) [isolectotype in PAV].

Leaf spots lacking or only with diffuse, irregular discolorations, yellowish to ochraceous, later becoming brown, necrotic, size variable, 1-20 mm diam. or confluent. Colonies hypophyllous, effuse, loose to dense, olivaceous. Stromata lacking. Primary mycelium internal; secondary mycelium external, superficial; hyphae creeping, branched, subhyaline to olivaceous or olivaceous-brown, 1.5-5 µm diam., smooth. Conidiophores in small, loose fascicles or solitary, arising from internal hyphae, erect to decumbent or arising from creeping hyphae, lateral or terminal, flexuous, geniculate-sinuous, width irregular, simple or branched, 10-150 × (3-)4-6(-8) µm, aseptate to pluriseptate, pale to medium olivaceous-brown or brown, smooth (conidiophores and secondary hyphae interwoven, differentiation between these structures often difficult or barely possible); conidiogenous cells integrated, terminal or intercalary, 10-30 µm long, conidiogenous loci inconspicuous or subdenticulate, but wall neither thickened nor darkened. Conidia solitary, cylindrical, 20-100 × 4-6.5 µm, 3-9-septate, subhyaline to pale olivaceous, smooth, apex obtuse, usually broadly rounded, base obconically truncate, 1.5-2 µm diam., hila unthickened, not darkened.

Notes: The conidiogenous loci and hila are unthickened and not darkened. Therefore, this species must be transferred to *Pseudocercospora*.

20. *Pseudocercospora pilicola* (Petr. and Cif.) U. Braun, **comb. nov.** (Fig. 20)

≡ *Cercospora pilicola* Petr. and Cif., Annales Mycologici 30: 330 (1932).

Reference: Chupp (1954: 567).

Material examined: DOMINICAN REPUBLIC, Santiago, Valle de Ciboa, Hato del Yaque, on *Piriqueta ovata*, 15 December 1930, E.L. Ekman, ex herb. Ciferri No. 3904, lectotype of *C. pilicola*, selected here (W, Acqu. 1973, No. 10077) [isolectotype in PAV]; USA, Florida, Gainesville, on *Piriqueta caroliniana*, 14 July 1935, G.F. Weber No. 10612 (NY), as '*Cercospora turnerae*'.

Leaf spots lacking or almost so, sometimes with pale discoloration on the upper leaf surface. Colonies amphigenous, mainly hypophyllous, effuse, loose to dense, dull olivaceous, greyish brown, sooty. Primary mycelium internal; secondary mycelium external; hyphae emerging through stomata, creeping, sparingly branched, septate, 2-5 µm diam., subhyaline to brownish, smooth. Stromata lacking. Conidiophores solitary, arising from creeping hyphae, lateral, occasionally terminal, erect, straight, subcylindrical to somewhat geniculate-sinuous, unbranched, 5-50 × 2-6 µm, sometimes longer, 0-3-septate,

subhyaline to pale olivaceous or olivaceous-brown, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 5-30  $\mu\text{m}$  long, conidiogenous loci inconspicuous. *Conidia* solitary, mostly cylindrical, occasionally obclavate-cylindrical or subclavate, 20-70  $\times$  4-7  $\mu\text{m}$ , 1-6(-8)-septate, subhyaline, pale olivaceous or olivaceous-brown, smooth, apex obtuse, base obconically truncate, 1-2  $\mu\text{m}$  diam., hila unthickened, not darkened, sometimes denticle-like.

*Notes:* Since the conidiogenous loci and hila are unthickened and not darkened, this species must be placed in *Pseudocercospora*.

21. *Pseudocercospora premnicola* (Boedijn) U. Braun, Nova Hedwigia 73(3-4) (2001), in press.

$\equiv$  *Cercospora premnicola* Boedijn, Nova Hedwigia 3: 431 (1961).

$\equiv$  *Cercospora premnicola* D.N. Shukla, A.K. Singh, P. Kumar and Kamal, Indian Phytopathology 35: 89-90 (1982), homonym, **syn. nov.**

*Material examined:* INDIA, U.P., Gorakhpur, on *Premna mucronata*, March 1979, R.P. Singh 7, *holotype* of *C. premnicola* D.N. Shukla *et al.* (IMI 236159).

*Notes:* Braun (2001) examined type material of *C. premnicola* Boedijn and transferred this species to *Pseudocercospora*. *C. premnicola* D.N. Shukla *et al.* is indistinguishable and has to be reduced to synonymy with the latter species.

22. *Pseudocercospora rhynchosiarum* (Petr. and Cif.) U. Braun, **comb. nov.**

(Fig. 21)

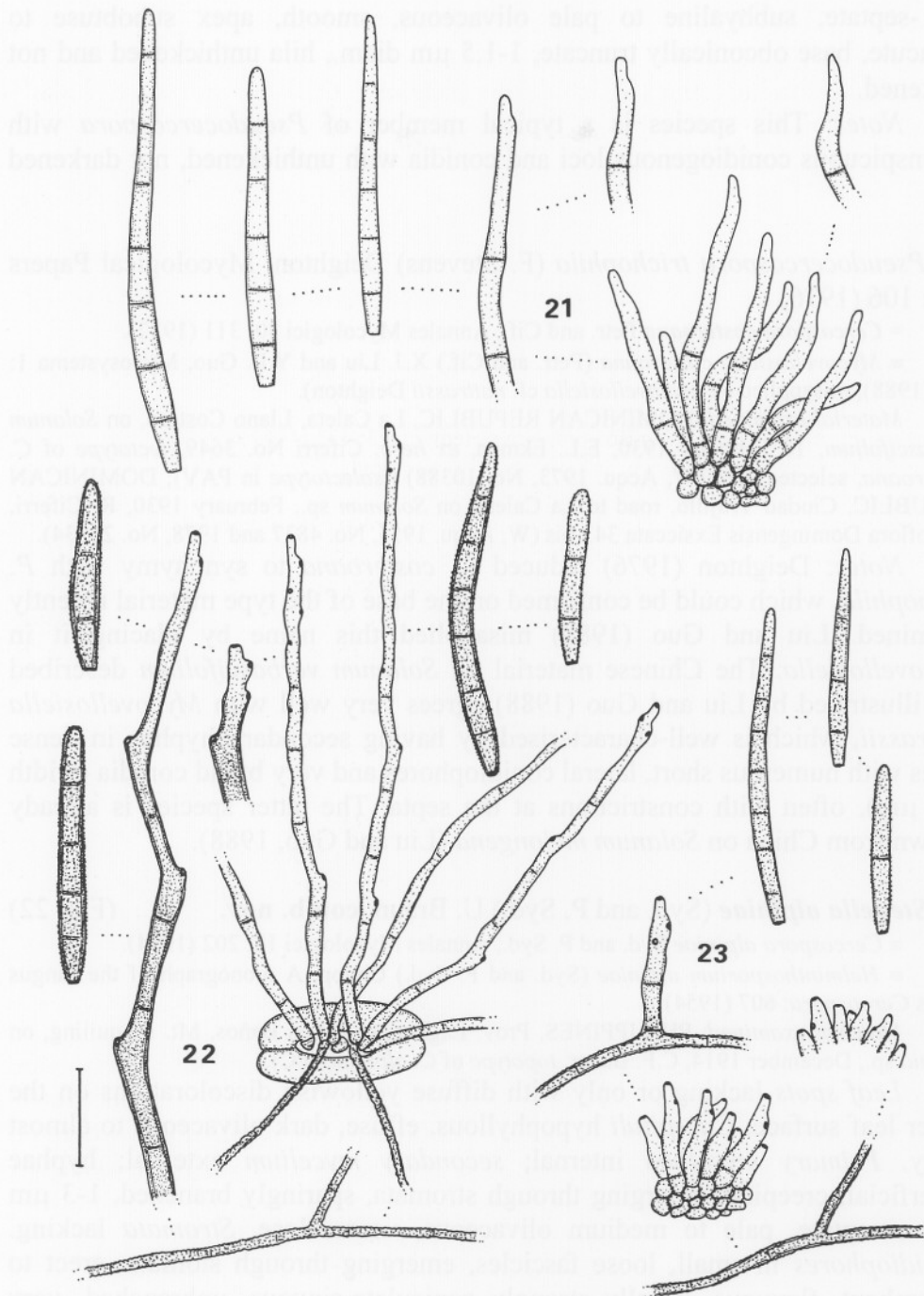
$\equiv$  *Cercospora rhynchosiarum* Petr. and Cif., Annales Mycologici 30: 332 (1932).

$\equiv$  *Cercospora apii* var. *rhynchosiarum* (Petr. and Cif.) Siboe, in Seyani and Chikuni, Proceedings of the Thirteenth Plenary Meeting of AETFAT, Zomaba, Malawi, April 1991, 1: 633 (1994).

*Reference:* Chupp (1954: 329).

*Material examined:* DOMINICAN REPUBLIC, Santiago, Cuesta de Piedras, on *Rhynchosia reticulata*, 9 December 1930, E.L. Ekman, *ex herb.* Ciferri No. 3849, *lectotype* of *C. rhynchosiarum*, selected here (W, Acqu. 1973, No. 10007) [*isoelectotype* in PAV].

*Leaf spots* amphigenous, subcircular to angular-irregular, 2-12 mm diam., brown, with a dark marginal line. *Caespituli* epiphyllous, punctiform, scattered, dark brown, blackish. Mycelium internal. *Stromata* intraepidermal, 10-40  $\mu\text{m}$  diam., brown. *Conidiophores* in small to moderately large fascicles, loose to dense, arising from stromata, erumpent, erect, straight, subcylindrical to geniculate-sinuous, often narrowed towards the apex, unbranched, 20-70  $\times$  3-4  $\mu\text{m}$ , 0-3-septate, pale to medium olivaceous-brown or brown, tips paler, often subhyaline, smooth; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, conidiogenous loci inconspicuous. *Conidia* solitary, obclavate-subcylindrical, 20-105  $\times$  2-3.5  $\mu\text{m}$ ,



Figs. 21-23. Conidiophore fascicles, conidiophores, conidia, secondary hyphae. 21. *Pseudocercospora rhynchosiarum*. 22. *Stenella alpiniae*. 23. *S. aspiliae*. Bar = 20  $\mu$ m.

3-11-septate, subhyaline to pale olivaceous, smooth, apex subobtuse to subacute, base obconically truncate, 1-1.5 µm diam., hila unthickened and not darkened.

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

23. *Pseudocercospora trichophila* (F. Stevens) Deighton, Mycological Papers 140: 106 (1976)

= *Cercospora costeroana* Petr. and Cif., Annales Mycologici 30: 311 (1932).

≡ *Mycovellosiella costeroana* (Petr. and Cif.) X.J. Liu and Y.L. Guo, Mycosystema 1: 246 (1988), misapplied (= *Mycovellosiella* cf. *nattrassii* Deighton).

*Material examined:* DOMINICAN REPUBLIC, La Caleta, Llano Costero, on *Solanum verbascifolium*, 10 February 1930, E.L. Ekman, *ex herb.* Ciferri No. 3649, *lectotype* of *C. costeroana*, selected here (W, Acq. 1973, No. 10388) [*isolectotype* in PAV]; DOMINICAN REPUBLIC, Ciudad Trujillo, road to La Caleta, on *Solanum* sp., February 1930, R. Ciferri, Mycoflora Domingensis Exsiccata 343 bis (W, Acq. 1955, No. 4837 and 1978, No. 25534).

*Notes:* Deighton (1976) reduced *C. costeroana* to synonymy with *P. trichophila*, which could be confirmed on the base of the type material recently examined. Liu and Guo (1988) misapplied this name by placing it in *Mycovellosiella*. The Chinese material on *Solanum verbascifolium* described and illustrated by Liu and Guo (1988) agrees very well with *Mycovellosiella nattrassii*, which is well-characterised by having secondary hyphae in dense ropes with numerous short, lateral conidiophores and very broad conidia (width > 5 µm), often with constrictions at the septa. The latter species is already known from China on *Solanum melongena* (Liu and Guo, 1988).

24. *Stenella alpiniae* (Syd. and P. Syd.) U. Braun, **comb. nov.** (Fig. 22)

≡ *Cercospora alpiniae* Syd. and P. Syd., Annales Mycologici 12: 202 (1914).

≡ *Helminthosporium alpiniae* (Syd. and P. Syd.) Chupp, A monograph of the fungus genus *Cercospora*: 607 (1954).

*Material examined:* PHILIPPINES, Prov. Laguna, near Los Baños, Mt. Maquiling, on *Alpinia* sp., December 1914, C.F. Baker, *topotype* of *C. alpiniae* (PC).

*Leaf spots* lacking or only with diffuse yellowish discolorations on the upper leaf surface. *Caespituli* hypophyllous, effuse, dark olivaceous to almost sooty. *Primary mycelium* internal; *secondary mycelium* external; hyphae superficial, creeping, emerging through stomata, sparingly branched, 1-3 µm diam., septate, pale to medium olivaceous, verruculose. *Stromata* lacking. *Conidiophores* in small, loose fascicles, emerging through stomata, erect to decumbent, flexuous, usually strongly geniculate-sinuuous, unbranched, very long, 50-300 × (3-)4-7(-8) µm, pluriseptate throughout, pale to medium dark brown, wall thin to slightly thickened; conidiogenous cells integrated, terminal

or intercalary, 10-50  $\mu\text{m}$  long, conidiogenous loci conspicuous, scars somewhat thickened and darkened, 1.5-2.5  $\mu\text{m}$  diam. *Conidia* solitary, rarely in short chains, obclavate-cylindrical, 20-80  $\times$  4-8  $\mu\text{m}$ , rarely longer, (1-)2-7(-9)-septate, pale to medium dark olivaceous-brown, wall slightly thickened, apex obtuse, base obconically truncate, hila somewhat thickened and darkened, about 2  $\mu\text{m}$  diam.

*Notes:* Based on verruculose secondary mycelium, thickened, darkened conidiogenous loci and verruculose conidia, this species has to be placed in *Stenella*.

25. *Stenella aspiliae* (J.M. Yen and Gilles) U. Braun, **comb. nov.** (Fig. 23)

$\equiv$  *Cercospora aspiliae* J.M. Yen and Gilles, Bulletin de la Société Mycologique de France 91: 90 (1975).

*Material examined:* IVORY COAST, Abidjan, on *Aspilia africana*, 24 February 1974, G. Gilles No. 107, *holotype* of *C. aspiliae* (PC).

*Leaf spots* amphigenous, subcircular to irregular, 2-8 mm diam., sometimes confluent, yellowish brown to brown. *Caespituli* amphigenous, punctiform to subeffuse, olivaceous-brown. *Primary mycelium* internal; *secondary mycelium* external; hyphae superficial, creeping, sparingly branched, 1-3  $\mu\text{m}$  diam., septate, subhyaline, almost smooth to verruculose. *Stromata* almost absent to well-developed, substomatal to intraepidermal, 10-50  $\mu\text{m}$  diam., brown. *Conidiophores* in small to moderately large fascicles, loose to dense, arising from stromata, emerging through stomata, or solitary, arising from creeping hyphae, lateral or rarely terminal, erect, straight, subcylindrical to somewhat geniculate-sinuuous, unbranched, 10-105  $\times$  3-4  $\mu\text{m}$ , 0-3-septate, subhyaline to brown, smooth to faintly rough-walled, thin-walled; conidiogenous cells integrated, terminal or conidiophores reduced to conidiogenous cells, 10-50  $\mu\text{m}$  long; conidiogenous loci conspicuous, scars thickened and darkened, 1-1.5  $\mu\text{m}$  diam. *Conidia* solitary, narrowly obclavate-cylindrical, filiform-subacicular, 10-100  $\times$  2-4  $\mu\text{m}$ , 1-8-septate, subhyaline, smooth or almost so to rough-walled, thin-walled, apex subacute or subobtuse, base truncate to obconically truncate, hila slightly thickened and darkened, 1-1.5  $\mu\text{m}$  diam.

*Notes:* This species is well characterised by having verruculose creeping superficial hyphae with solitary conidiophores and conspicuously thickened, darkened conidiogenous loci. Because of these characteristics, *C. aspiliae* pertains in *Stenella*.

#### Acknowledgements

I am grateful to the curators of IMI and PC for loaning type material and other collections of cercosporoid hyphomycetes in the course of the present study.

## References

- Bhargava, K.S. and Nath, V. (1976). An undescribed species of *Cercospora* causing leaf spot of *Mitragyna parvifolia* (Roxb.) Korth. *Current Science* 45: 671-672.
- Braun, U. (1992). Taxonomic notes on some species of the *Cercospora* complex. *Nova Hedwigia* 55: 211-221.
- Braun, U. (1993a). Taxonomic notes on some species of the *Cercospora* complex (II). *Cryptogamic Botany* 3: 235-244.
- Braun, U. (1993b). Taxonomic notes on some species of the *Cercospora* complex (III). *Mycotaxon* 48: 275-298.
- Braun, U. (1993). New genera of phytopathogenic Hyphomycetes. *Cryptogamic Botany* 4: 107-114.
- Braun, U. (1995). A monograph of *Cercosporiella*, *Ramularia* and allied genera (phytopathogenic hyphomycetes). Vol. 1. IHW-Verlag Eching
- Braun, U. (1996). Taxonomic notes on some species of the *Cercospora* complex (IV). *Sydowia* 48: 205-217.
- Braun, U. (1999a). Taxonomic notes on some species of the *Cercospora* complex (V). *Schlechtendalia* 2: 1-28.
- Braun, U. (1999b). Taxonomic notes on some species of the *Cercospora* complex (VI). *Cryptogamic Mycologie* 20: 155-177.
- Braun, U. (2000a). Annotated list of *Cercospora* spp. described by C. Spegazzini. *Schlechtendalia* 5: 57-79.
- Braun, U. (2000b). Miscellaneous notes on some micromycetes. *Schlechtendalia* 5: 31-56.
- Braun, U. (2001). Revision of *Cercospora* species described by K.B. Boedijn. *Nova Hedwigia* 75(3-4) (in press).
- Braun, U., Bagyanarayana, G. and Jagadeeswar, P. (1992). Notes on Indian Cercosporae and allied genera (II). *International Journal of Mycology and Lichenology* 4: 361-374.
- Braun, U., David, J. and Freire, F. (1999). Some cercosporoid hyphomycetes from Brazil. *Cryptogamic Mycologie* 20: 95-106.
- Braun, U. and Melnik, V.A. (1997). Cercosporoid fungi from Russia and adjacent countries. *Trudy Botanicheskogo Instituta Imeni V.L. Komarova, St. Petersburg*, 20: 1-130.
- Chupp, C. (1954). A monograph of the fungus genus *Cercospora*. Ithaca, New York.
- Crous, P.W. (1998). *Mycosphaerella* spp. and their anamorphs associated with leaf spot diseases of *Eucalyptus*. *Mycologia Memoir* 21: 1-170.
- Crous, P.W. (1999). Species of *Mycosphaerella* (Ascomycetes) and related anamorphs occurring on Myrtaceae (excluding *Eucalyptus*). *Mycological Research* 103: 607-621.
- Crous, P.W., Aptroot, A., Kang, J.-C., Braun, U. and Wingfield, M.J. (2000). The genus *Mycosphaerella* and its anamorphs. *Studies in Mycology* 45: 107-121.
- Crous, P.W., Kang, J.-C. and Braun, U. (2001). A phylogenetic redefinition of anamorph genera in *Mycosphaerella* based on ITS rDNA sequences and morphology. *Mycologia* 93: 1081-1101.
- Deighton, F.C. (1967). Studies on *Cercospora* and allied genera. II. *Passalora*, *Cercosporidium* and some species of *Fusicladium* on *Euphorbia*. *Mycological Papers* 112: 1-80.
- Deighton, F.C. (1974). Studies on *Cercospora* and allied genera. V. *Mycovellosiella* Rangel, and a new species of *Ramulariopsis*. *Mycological Papers* 137: 1-75.
- Deighton, F.C. (1976). Studies on *Cercospora* and allied genera VI. *Pseudocercospora* Speg., *Pantospora* Cif. and *Cercoseptoria* Petr. *Mycological Papers* 140: 1-168.

- Ellis, M.B. (1976). More dematiaceous hyphomycetes. CMI, Kew.
- García, C.E., Pons, N. and Rojas, C.B. de (1996). *Cercospora* y hongos similares sobre especies de *Ipomoea*. Fitopatología Venezolana 9: 22-36.
- Hoog, G.S. de (1992). Some *Ramularia*-like fungi on Malvaceae. Persoonia 15: 63-70.
- Holmgren, P.K., Holmgren, N.H. and Barnett, L.C. (1990). Index herbariorum. Part 1: The Herbaria of the World. 8th edn. Regnum vegetabile 120: 1-163.
- Hsieh, W.H. and Goh, T.K. (1990). *Cercospora* and similar fungi from Taiwan. Maw Chang Book Company.
- Kar, A.K. and Mandal, M. (1975). New *Cercospora* species from West Bengal (India) - V. Norwegian Journal of Botany 22: 105-110.
- Laundon, G.F. (1970). Records of fungal plant diseases in New Zealand. New Zealand Journal of Botany 8: 51-66.
- Liu, X.J. and Guo Y.L. (1988). Studies on the genus *Mycovellosiella* of China. Mycosystema 1: 241-268.
- McKenzie, E.H.C. (1990). New plant disease records in New Zealand: miscellaneous fungal pathogens II. New Zealand Journal of Crop and Horticultural Sciences 18: 65-73.
- McKenzie, E.H.C., Buchanan, P.K. and Johnston, P.R. (1999). Fungi on pohutukawa and other *Metrosideros* species in New Zealand. New Zealand Journal of Botany 37: 335-354.
- Pons, N. and Sutton, B.C. (1988). *Cercospora* and similar fungi on yams (*Dioscorea* spp.). Mycological Papers 160: 1-78.
- Yen, J.M. and Lim, G. (1980). *Cercospora* and allied genera of Singapore and the Malay Peninsula. Gardens' Bulletin, Singapore 33: 151-263.

(Received 20 June 2001, accepted 5 August 2001)