Lecanostictopsis gen. nov., and related leaf-spotting fungi on Syzygium species

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The present study arose out of an attempt to name a Lecanosticta-like fungus occurring on leaves of Syzygium cordatum Hochst. from the Transvaal, South Africa. A survey of this and related genera and species described from Syzygium Gaertner in the literature demonstrated a confused and complex situation which was not simplified by collections of a number of related unnamed taxa on this host genus in the IMI and PREM herbaria. The resulting study revolved around two foci, one concerning species with coarsely roughened conidia similar to Lecanosticta and the other with species having finely verruculose conidia more closely related to Pseudocercospora and similar genera.

Lecanostictopsis

Lecanostictopsis B. Sutton & Crous, gen. nov.

Myzecium immersum, intercellulare, ramosum, septatum, atrum vel rubro brunneum, Conidiomata epidermalia vel subepidermalia, erumpentia, eustromaticia, acervularia vel sporodochialia, ex textura angulata crassitudicata, atrum vel rubro brunneum composita. Conidiophora atrum vel rubro brunneae, grossa verrucosa, cylindrica, non ramosa, septata, ex cellulis superioribus conidiomatum formata. Cellulariae conidiophoros incorporatae, atrum vel rubro brunneae, grossa verrucosae vel tuberculatae, cylindricae, aliquid proliferantibus et enteroblasticis percurrentibus. Conidinata holoblastica, atrum vel rubro brunneae, grossa verrucosae vel tuberculatae, sine aliquid euseptis, recta vel curvata, ad apicum obtusa vel acute, ad basim truncata, cylindrica vel fusiformia. Conidogenesis: conidia deinceps ex originibus holoblastiscis formata, sepiro transverso delimitata, secessione schizolytica, proliferatione percurrenti enteroblasticis cellula conidiogenea sequens origine holoblastica conidia, conidia successiva ad sequeares altiores crebriter delimitata et accedentia.

Typus generis: Lecanostictopsis kamalii (Ullasa) B. Sutton & Crous. Myzecium immersum, intercellulare, branched, septate, dark to reddish brown. Conidiomata epidermal to subepidermal, erumpent, eustromatic, acervular to sporodochial, composed of thick-walled, dark to reddish brown textura angularis. Conidiophores dark to reddish brown, coarsely verrucose, cylindrical, unbranched, septate, formed from the upper cells of the conidiomata. Conidiogenous cells integrated, dark to reddish brown, coarsely verrucose to tuberculate, cylindrical, with several percurrent enteroblastic proliferations. Conidia holoblastic, dark to reddish brown, coarsely verrucose to tuberculate, with 0-several eusepta, straight or curved, obtuse or acute at the apex, truncate at the base, cylindrical to fusiform. Conidogenesis: a succession of conidia is formed by holoblastic conidial ontogeny, delimitation by a transverse septum, schizolytic secession, replacement wall building apex leading to enteroblastic percurrent conidiogenous cell proliferation followed by holoblastic conidial ontogeny, successive conidia seceding at progressively higher levels.

The relationships of Lecanostictopsis are complex because the conidiomata are variable and different interpretations of their morphology linked to formally published names and to unpublished tentative herbarium names have resulted in placements in the hyphomycetes (Pucciniopsis Sp., Stigmata Sacc. and Hadromena Syd. & P. Syd.) or the coelomycetes (Stilbaspora Pers., and Sceliosporium Lib.) In searching literature for potential names for the species concerned in other genera, both Cercospora Fres. and Pseudocercospora Sp. (hyphomycetes), and Lecanosticta Syd. (coelomycetes) have also had to be considered.

There is now a substantial body of information negating the value of conidiomatal structure as being of primary taxonomic importance in the mitosporic fungi (Sutton, 1973a,
The relationships of these fungi on *Syzygium* are therefore determined by other criteria, the most important of which are the events surrounding conidiogenesis. Using this as a primary character it is only *Stigmina* and *Lecanosticta* which really come into consideration in deciding on a suitable generic placement. The other genera mentioned here can be eliminated for varying reasons. *Pucciniopsis* is an ambiguous generic name (Sutton, 1973b) of uncertain application. *Hadromena* has sympodially proliferating conidiogenous cells (Ellis, 1971). Although both *Stilbospora* and *Sclicosporium* do have percurrenty proliferating conidiogenous cells, *Stilbospora* has smooth conidia and the hyaline conidiogenous cells are mixed with paraphyses (Sutton, 1980), and *Sclicosporium* has versicoloured crescentic conidia (Spooner & Kirk, 1982). *Cercospora* has cicatrizated conidiogenous loci formed from enteroblastic sympodially proliferating conidiogenous cells (Pons, Sutton & Gay, 1985), and *Pseudocercospora* shows a combination of holoblastic sympodial and enteroblastic percurrent proliferation (Sutton, Pascoe & Sharma, 1987; Sutton & Pascoe, 1988).

The status of *Stigmina* has been questioned by Sutton & Pascoe (1989) who suggested that as presently conceived it is heterogeneous. Species in *Stigmina sensu stricto* have distoseptate holoblastic conidia formed from percurrenty proliferating widely flared ragged conidiogenous cells borne on small sporodochial conidiomata which are always associated with stomata. The only similarity with *Lecanostictopsis* is in the basic mode of conidiogenesis. To place the *Syzygium* fungi in *Stigmina* would once again broaden the generic limits at a time when dismemberment of the genus is more appropriate (Sutton & Pascoe, 1989; Braun, 1993). *Lecanosticta* (Sutton, 1980; Evans, 1984) is much closer to *Lecanostictopsis* inasmuch as they share similar basic conidiomatal structure, conidial morphology and conidiogenesis. There are, however, major differences. Species of *Lecanostictosis on Syzygium*, unlike species of *Lecanosticta* which occur on other host substrata, form a discrete group of taxa in which the whole fungal structure is composed of thick-walled, dark to reddish brown cells and hyphae, except for the smaller elements in the deeper tissues of the leaf. The reddish brown, thick-walled verrucose to tuberculate conidiogenous cells are supported by similar conidiophores. This is in contrast to *Lecanosticta* where the conidiophores may or may not be present and they and the conidiogenous cells are pale brown to hyaline and minutely verruculose. In the same manner, the conidia in *Lecanostictopsis* are thick-walled and coarsely verrucose to tuberculate whereas in *Lecanosticta* they are comparatively thin-walled and only finely verruculose. That this group of species with unique ornamentation should only occur on *Syzygium* is an interesting phenomenon, suggesting the possibility that the fungi have co-evolved with their host substrata.

**Lecanostictopsis kamatii** (Ullasa) B. Sutton & Crous, comb. nov.  
(Figs 1–3)


**Figs 1–3. Lecanostictopsis kamatii** (IMI 147817). Fig. 1. Conidia. Fig. 2. Conidiophores with developing conidia. Fig. 3. Vertical median section of part of a conidioma.

Lesions variable in size, larger ones up to 0·5 cm diam., smaller ones 0·1 cm diam., more or less circular, separate, occasionally becoming confluent, on the upper surface when young creamish brown and with a blistered appearance, when older greyish brown with a thin purple margin, on the lower surface when young similar to appearance on the upper surface, when older then with a raised reddish brown margin. *Mycelium* immersed, intercellular, branched, septate, dark to reddish brown, 2·5 μm wide. *Conidiomata* basically hypogenous but occasionally in older infections 1–2 occurring on the upper surface, epidermal to subepidermal, erumpent, eustromatic, acervular to sporodochial, applanate, initially circular and separate then elongated to irregular and confluent, covering extensive areas of the lesion, composed of thick-walled, dark to reddish brown texture angularis, up to 120 μm deep (including the conidiophores), up to 500 μm diam. or wider when confluent, the ruptured epidermis peeling back and under the dissecting microscope appearing as a light brown margin surrounding the conidiomata. *Conidiophores* dark to reddish brown, coarsely verrucose, cylindrical, straight, parallel, unbranched, septate, formed from the upper cells of the conidiomata, 15–28 × 5–7 μm. *Conidiogenous cells* integrated, dark to reddish brown, terminal, coarsely verrucose to tuberculate, cylindrical, straight, with 1–3 percurrent slightly flared enteroblastic proliferations, 12–20 × 7–7·5 μm. *Conidia* in mass blackish brown, holoblastic, dark to reddish brown, coarsely verrucose to tuberculate, with 0–1(2)-eusepta.
straight, obtuse at the apex, truncate at the base, cylindrical, 17.5–32 × 8.5–11 μm.

*Specimen examined*: on living leaves of *Syzygium cariosiphylum* (as *S. aromaticum* in original publication), Bettigeri, Coorg, Mysore State, India, 15 Oct. 1968, B. A. Ulass, MACS 1239, IMI 147817. holotype of *Stigmatina kamatii*, on leaf of *Syzygium cumini*, Tamil Nadu, India, 22 Feb. 1983, V. B. Hosagoudar, HClO 37138, IMI 363242, holotype of *Hadronema verrucosum*.

This species has been formally described in two other hyphomycete genera, *Stigmatina* and *Hadronema*, but neither is appropriate. The status of *Stigmatina* has been the subject of comment by Sutton & Pascoe (1989) who suggested that as presently conceived it comprised at least three distinct groups of taxa which should be referred to other genera. Species in *Stigmatina sensu stricto* have distoseptate holoblastic conidia formed from percurrently proliferating widely flared ragged conidiogenous cells borne on conidiomata which are always associated with stomata. *L. kamatii*, though similar in some respects, does not conform to these generic criteria, neither does it agree with *Thrysostoma* Höhn., into which many species at present with names in *Stigmatina* will have to be placed. The superficial similarity with *Hadronema* was based on the heavy turbidity to warty ornamentation of conidia which is very distinctive in both *Lecanostictopsis* and *Hadronema*. In the latter genus the warts are arranged longitudinally. Ellis (1971) redescribed the type species of the genus, *H. orbicularis* Syd. & P. Syd., and showed that the conidia are formed from holoblastically proliferating sympodial conidiogenous cells produced on partly superficial, partly immersed stroma. Again, *L. kamatii* does not conform to these criteria.

It differs from both *L. syzygi* and *L. naniemaensis* by the diminutive conidia which do not exceed 32 μm in length. In the two other species conidia are 31–62 μm long. Conidia are always obtuse at the apex and mostly 1-septate though there is a proportion which is either aseptate or just occasionally 2-septate. In *L. naniemaensis* conidia are (1)2–3-septate but in *L. syzygi* septation is much more variable and similar proportions of 0-, 1-, and 2-septate conidia are found.

*Lecanostictopsis naniemaensis* B. Sutton & Crous, sp. nov. (Figs 4–6)

*Etym.*: from the geographic location of the type

*Laetecles* 0.2–0.3 cm diam., plus minutæ circulæres vel interdum irregularæs, separatae, raro confluentes, in epigene medio brunneæ, margine acute delimitatis, purpureæ, halonata circunincisae, in hypogena creneo brunneæ margine diffusa et non distincta. *Myeloium* immersum, intercellulare, ramosum, septatum, versus conidiasmatis acro vel rubro brunneum, albi pallidius, 2.5–4 μm latum. *Conidiosoma* hypogena, epidermalia vel subepidermalia, erumpentia, euctromatica, acervularia vel sporodochia, applanata, initio circularia et separata deinde elongata vel irregularia et confluentia, ex textura angulata acro vel rubro brunneae et crassihuncata in epidermidie et hypodermidie concentrita, usque ad 300 μm profunda (incl. conidiophora), usque ad 1500 μm diam. sed confluentia deinde latiora, margine periclinial vel euctromatica et textura conidiomatum composita. *Conidiophora* acro vel rubro brunneae, grossa verrucosa, cylindrica, recta, paralella, non ramosa, septata, ex cellulis superioribus conidiomatum formata, 36–60 × 7–8 μm. *Cellularia conidiogenae* in conidiophoris incorporated, acro vel rubro brunneae, terminales, grossa verrucosa vel tuberculatae, cylindricae, rectae, 1–2 proliferationibus percurrentibus, 10–30 × 7–7.5 μm. *Conidia* in massis nigro brunneae, holoblastica, acro vel rubro brunneae, grossa verrucosa vel tuberculata, (1)2–3-septata, plerumque curvata, praepice versus apicem, raro recta, versus apicem acutum gradatim deminuita, basis truncata abrupta deminuita, fusiformia, 36–55 × 6.5–8 μm.

In foliis vivis *Syzygium* lateriboni, Riv. de Thi, Noumea, 24 Nov. 1963, B. Huguenin. IFO-Noumea NC 63218, IMI 104086, holotypus.

*Lesions* 0.2–0.3 cm diam., more or less circular or sometimes irregular, separate, only occasionally becoming confluent, on the upper surface medium brown and with a sharply delimited margin surrounded by a purplish halo, on the lower surface creamish brown with a diffuse rather than a distinct margin. *Myeloium* immersed, intercellular, branched, septate, dark to reddish brown near the conidiomata but paler elsewhere, 2.5–4 μm wide. *Conidiosoma* hypogenous, epidermal to subepidermal, erumpent, euctromatic, acervular to sporodochial, applanate, initially circular and separate then elongated to irregular and confluent, covering extensive areas of the lesion, composed of thick-walled, dark conidiophores, up to 1500 μm diam. or wider when confluent, the ruptured epidermis peeling back together with some periclinal layers of
conidiomatal tissue and appearing under the dissecting microscope as a light brown margin surrounding the conidiomata. *Conidiophores* dark to reddish brown, coarsely verrucose, cylindrical, straight, parallel, unbranched, septate, formed from the upper cells of the conidiomata, 36–60 × 7–8 μm. *Conidigenous cells* integrated, dark to reddish brown, terminal, coarsely verrucose to tuberculate, cylindrical, straight, with 1–2 percurrent enteroblastic proliferations, 10–30 × 7–7.5 μm. *Conidia* in mass blackish brown, holoblastic, dark to reddish brown, coarsely verrucose to tuberculate, with (1)2–3-eusepta, usually curved, especially towards the apex, occasionally straight, gently tapered towards the acute apex, abruptly tapered to the truncate base, fusiform, 36–55 × 6.5–8 μm.

This species is close to *L. syzygi* because conidia are of similar length, but in *L. novaezelandiae* they are narrower and frequently 2–3-septate, only occasionally 1-septate. Conidia are consistently tapered to the apices and often curved to one side, a feature sometimes shown by conidia in *L. syzygi*. The ornamentation in *L. novaezelandiae* is coarse but of a finer nature than in either *L. syzygi* or *L. kamatii*. It differs from *L. kamatii* in having longer conidia which are tapered towards the apices instead of being obtuse.

*Lecanostictopsis syzygi* (Ciccar.) B. Sutton & Crous, comb. nov. (Figs 7–14)

*Scolicosporium syzygi* Ciccar., *Mycoopathol.* 5: 230 (1951), as ‘*Scolicosporium syzygi*’.

In some collections associated with lesions caused by *Kamatella apiopora* (Cooke & Massee) Melnik & B. Sutton and *Mycohypallage congesta* (Berk. & Broome) B. Sutton or associated with *Microsetria syzygi* Ciccar. *Mycelium* immersed, intercellular, branched, septate, dark to reddish brown near the conidiomata but paler elsewhere, 2.5–3.5 μm wide. *Conidiomata* mostly hypogenous, rarely epigenous, epidermal to subepidermal, erumpent, eustromatic, acervular to sporodochial, planate, initially circular and separate then elongated to irregular and frequently confluent, solitary or in groups of up to 12, composed of thick-walled, dark to reddish brown texture angularis concentrated in the epidemis and immediate hypoderms, up to 200 μm deep (including the conidiophores), up to 1200 μm diam. or wider when confluent, the ruptured epidemis peeling back sometimes together with some periclinal layers of conidiomatal tissue and appearing under the dissecting microscope as a light brown margin surrounding the conidiomata. *Conidiophores* dark to reddish brown, coarsely verrucose, cylindrical, straight, parallel, unbranched, 1–3-septate, formed from the upper cells of the conidiomata, 45–75 × 6–8 μm. *Conidigenous cells* integrated, dark to reddish brown, terminal, coarsely verrucose to tuberculate, cylindrical, straight, with 1–3 percurrent enteroblastic slightly flared proliferations, 26–45 × 6–8 μm. *Conidia* in mass blackish to medium brown, holoblastic, dark to reddish brown, coarsely verrucose to tuberculate, with 0–2 eusepta, usually curved, especially towards the apex, occasionally straight, gently tapered towards the obtuse or acute apex, abruptly tapered to the truncate base, fusiform to obovoid or clavate, 30–62 × 8–10 μm.

Ciccarone (1951) placed this species in *Scolicosporium* but it does not belong there on account of the distinctive ornamented
conidial and conidiophore morphology and acervular conidiomata. Spooner & Kirk (1982) redescribed Scolicosporum and its type species, S. macrosporum (Berk.) B. Sutton, which is characterized by crescentic smooth versicoloured conidia formed in discoid to pulvinate conidiomata. L. syzygi is similar to L. naumanni but differs in the conidia being wider and not developing more than two septa. It is distinct from L. kamati which has much smaller conidia. The collections of the species share similar symptoms, dimensions and morphological features, but vary in conidial morphology. In the type of S. syzygi, wide variation is shown with conidia 0–1 and 2-septate and either obtuse or tapered towards the apices. The longer conidia appear to be more attenuated. In IMI 451649 they are attenuated to an acute apex whereas in IMI 899876 they are rounded at the apex and not markedly tapered. A unifying feature for the species is the development in some conidia of a protuberance either above or below the septa, almost like the start of branch formation, Ciccarone (1951) described S. syzygi with conidia 2–6 celled. He gave no illustration and preparations from his type show only conidia up to 2-septate. The conidial dimensions he gave of 40–60 × 6–8 μm are also not in agreement for the type showed conidia to measure 31–62 × 6–10 μm.


**Stenella**


A re-examination of the type specimen of *Pseudocercospora marasasii* Crous & M. J. Wingf., which is the anamorph of *M. marasasii* (PREM 50637), showed that this taxon cannot be accommodated in *Pseudocercospora* Speg. Some aspects of its morphology were omitted from the original description and in fact the type specimen has verrucose external hyphae, as well as thickened, darkened, refractive conidiogenous loci and conidial hila. The latter features are not in agreement with the circumscription of *Pseudocercospora* and determine the genus *Stenella* Syd., as more suitable to accommodate the anamorph (Ellis, 1971, 1976). Several other specimens treated by Crous & Wingfield (1993) as paratypes of *P. marasasii* (PREM 5138 (IMI 36312), PREM 50638 (IMI 362338) and PREM 50639 (IMI 332125)) were found to represent a species of Ceratostigma U. Braun which will be discussed below. The type of *P. marasasii* (PREM 50637), however, is similar to one paratype specimen (PREM 50640), which consists of dried carnation leaf material obtained from culturing single asciopores of *M. marasasii*. For these reasons the species is now moved to *Stenella*.

**Stenella marasasii** (Crous & M. J. Wingf.) B. Sutton & Crous, comb. nov. (Figs 16–19)


*Lesions* variable in size and shape, circular to elongated or irregular, separate, sometimes vein-limited, 0.2–1.4 cm diam., on the upper surface medium brown and blistered with a distinct raised, dark brown margin, surrounded by a thin red-purple halo, on the lower surface light brown, with raised, darker brown margin. *Mycelium* internal and external; hyphae verrucose, medium brown, septate, branched, 1.5–2.5 μm diam. *Conidiophores* predominantly hygophanous; stroma absent. *Conidiophores* reduced to conidiogenous cells. *Conidiogenous cells* solitary on secondary mycelium, medium brown, verrucose, cylindrical to irregular, tapering to rounded apices, polyblastic, sympodial, 5–33 × 2–5 μm, with thickened, refractive, darkened loci. *Conidia* solitary or in simple or branched chains, medium brown, verruculose, guttulate, subcylindrical to obclavate with obtuse apices and subtruncate bases, indistinctly 1–4 septate, 35–110 × 2–3.5 μm, hila thickened, darkened, refractive.

**Cultural characteristics**: The type culture of *M. marasasii* (STE-U 348) has spreading colonies, which after 6 wk on 2%
malt extract agar (MEA) under n°v are up to 12 mm in diam.,
dark green to black, warty, with limited aerial mycelium.

Specimens examined: on living leaves of *Syzygium cordatum*, Barberton,
E.Tvl, South Africa, 1 Feb. 1988, M.J. Wingfield, PREM 50637,
IMI 369014, holotype (ex type culture STE-U 348), dried cultures on
carnation leaf agar (CLA) derived from single conidia; dried cultures
on CLA derived from single ascospores of *M. marassii* on leaves of
*S. cordatum*, Trance, N.Tvl, South Africa, 26 Sep. 1989, M.J.
Wingfield, PREM 50640 (paratype).

**Cercostigmina**

*Cercostigmina* was introduced by Braun (1993) with
*C. concentrica* (Cooke & Ellis) U. Braun (syn. *Cercospora
concentrica* Cooke & Ellis, *Stigmina concentrica* (Cooke & Ellis)
Deighton) as the type species. The names of a further six
species, *C. collinsiae* (U. Braun & Rogerson) U. Braun &
Rogerson (syn. *Stigmina collinsiae* U. Braun & Rogerson),
*C. dictammi* (Fuckel) U. Braun (syn. *Septoria dictammi* Fuckel,
*Stigmina dictammi* (Fuckel) U. Braun), *C. heteromelis* (Harkn.) U.
Braun (syn. *Cercospora heteromelis* Harkn., *Stigmina heteromelis*
(Harkn.) Deighton), *C. theae* (Deighton) U. Braun (syn. *Stigmina
theae* Deighton), *C. thermopsisis* (Earle, *Stigmina earlei* Deighton),
and *C. lineae* (Sacc.) U. Braun (syn. *Cercospora lineae* Sacc.,
*Cercospora lineae* (Sacc.) Deighton, *Stigmina lineae* (Sacc.) M. B.
Ellis), were transferred to the genus. It was distinguished from
*Pseudocercospora* Speg mainly because: ‘conidiogenous cells
are monoblastic, percurrent, often with annellations. They are
more or less straight, neither geniculate nor irregularly
sinuous. Conidiogenous cells in *Pseudocercospora* are symphodial,
polyblastic, more or less geniculate-sinuous, but occasionally
also percurrent, especially in young conidiophores. Symphodial
and percurrent proliferation is, however, always to be seen in
one and the same conidiophore’ (Braun, 1993).

Viewed in the context of the known variability in
conidiogenous behaviour of *Pseudocercospora* species these
distinctions between the two genera are very slight. The
separation of the genera is further blurred by the fact that in *C. concentrica* the conidiogenous cells are occasionally found with sympodial geniculate holoblastic proliferations. That this should occur at all, albeit infrequently, casts doubt on the acceptability of *Cercostigma*. However, a succession of authors has excluded these taxa from *Cercospora* Fres. and *Cercosporia* Petr. and opted for placement in *Stigmina* Sacc. (Deighton, 1973, 1976, 1983; Ellis, 1976; Braun, 1992; Braun & Rogerson, 1993). That *Stigmina* is no way appropriate for these taxa is evident from the work of Sutton & Pascoe (1989).

Since the closest affinities of these species lie with *Pseudocercospora*, the introduction of *Cercostigma* based on a species that shows lability in conidiogenous events again revives the controversy surrounding *Cercosporidium*. Species in *Cercosporidium* show similar variations and at first Deighton (1976, 1983) accepted the genus as distinct but later (Deighton, 1987) sunk it into synonymy with *Pseudocercospora*. A comparable fate may remain for *Cercostigma* because of similar reasons.

For the present, however, *Cercostigma* is provisionally accepted to accommodate species with sporodochial brown conidiomata, integrated conidiogenous cells which predominantly proliferate in a percurrent rather than sympodial manner, and euseptate verrucose conidia, and it is this genus to which another pathogen of *Syzygium* is referred.

**Cercostigma syzygii** B. Sutton & Crous, sp. nov.

(Figs 15, 20–23)

**Etym:** from the host substrate, *Syzygium*

*Lusiones variabiles, circulares ad elongatae vel irregulares, interdum venis limitatae, plurumque separatae sed interdum confluentes, 0.2–1.7 cm diam., in epigena pallide vel medio brunnea, margine distincta atro brunea lata, halonata purpureo brunnea diffusa circumcinctae, in hypogena atriora medio brunnea, venis limitata et modice elevata, halonata purpureo brunnea partim circumcinctae. Mycelium immersum, inter- et intracellulare, ramosum, septatum, pallide brunneum. 2.5–3 μm latum. Conidiomata hypogena, epidermata, erumpentia, estromatica, accellularia, applanata, circularia, separata, ex textura angulares pallide brunneae et teratoblasticae, usque ad 40 μm profunda (includ. conidiophora), usque ad 130 μm diam. Conidiophora pallide brunnea, verruculosa, særpe cylindrica et recta, non ramosa vel ad basim ramosa, 1–2-septata, ex cellulis superiores conidiofurnatata formata, 16–24 × 3–4.5 μm. Cellulae conidiogenae discreteae vel in conidiophoris incorporatae, pallide brunneae, terminales verruculosae, cylindricae, rectae, ad apicem abrupte deminutae, 1–4 proliferationibus percurrentibus, 10–19 × 3–4.5 μm. Conidia in massas medio brunnea, holoblastica, pallide brunnea, verruculosa, 0–3-septata, recta, apicem obtusam versus lemniter attenuata, basim truncatum versus abrupte vel lemniter deminuta, 23–42 × 4–4.5 μm.

Cultural characteristics: colonies are warty, erumpent, and after 6 wk on MEA under nuv they attain 10–12 mm in diam. and in height, black in reverse, white to pink on the surface, and sporulate with numerous, dense conidiomata that form on the upper surface of the colonies.


In some collections of C. syzygii (IMI 362338, PREM 50638) the conidiophores proliferate percurrenty, are tightly packed, uniformly cylindrical and are abruptly tapered at the apex. Furthermore, conidia of the latter are predominantly cylindrical, straight, 1-septate, and also taper abruptly at the base. In contrast, several collections (PREM 5138, 50637, 50639) have conidiophores which are slightly irregularly arranged, proliferating percurrenty or sometimes sympodially, and also taper more gradually towards the apex. Conidia are generally 1–3-septate, frequently curved, have a more gradual basal taper, are slightly longer, and can be narrower than those of IMI 362338 and PREM 50638. Although it was originally suspected that these two groups may represent two different species, fresh material and cultures showed that conidia become cylindrical in culture, are 1–3-septate, and mainly proliferate enteroblastically and percurrenty. These observations suggest that the variation observed between these collections is acceptable within C. syzygii.

Pseudocercospora

An undescribed species of Pseudocercospora was also found on leaves of S. cordatum bearing lesions of M. marasasi (PREM 50636). This taxon can easily be distinguished from C. syzygii by its larger conidia, and from S. marasasi by its unthickened conidial hilum and conidiogenous loci. This species is therefore described as new.

Pseudocercospora syzygiicola B. Sutton & Crous, sp. nov. (Figs 24, 25)

Etyym.: from the host substratum, Syzygium

Laeisions irregulares, angulares, in venis limitatis, 0-2-0-7 cm diam., separate, demum confluentes, in epigyna superiore pallide brunneae, in pagina inferiore atiores. Mycelium internum et externum; hypheae laeves, olivaceae, ramosae, septatae, 1-5-2-5 μm laeae, stroma et conidiophora singula producentes; stroma medio brunnea, 20-40 μm diam. Caeospitidi plerumque hypogeri, pallide brunnee vel grisei, 40-90 μm crassi, 30-40 μm alti (incl. conidiophora). Conidiophora fasciculata, ex strтомatus oriunda, vel solitaria in mycelio externo formata, 0-1 septata vel simpliciter pro cellulis conidiogenis, olivacea, laeaves, cylindrica vel geniculata-sinuosa, 15-30 x 3-5 μm. Cellulae conidiogenae in conidiophoris incorporatae, laeaves, olivaceae, cylindraceae, rectae vel geniculata-sinuoseae, apicem truncatam versus
deminitae, polyblasticae, sympodiales, 12–22 × 2.5–3.5 μm, cica-tricibus conidiis non incrassatis. Conidia pallide olivacea, laevia, cylindrica, ad apicem obtusa vel subacuta et ad basim truncata, gutulata, recta vel curvata, 1–11 septata, 40–80 × 2–3 μm, cica-tricibus non incrassatis.


Lesions irregular in shape, angular, vein-limited, 0.2–0.7 cm diam., separate, becoming confluent, light brown on the upper surface, darker on the lower surface. Mycelium internal and external; hyphae smooth, olivaceous, branched, septate, 1.5–2.5 μm wide, giving rise to stromata or single conidiophores; stromata medium brown, 20–40 μm diam. Caespituli predominantly hypogenous, light brown to grey, 40–90 μm wide, 30–40 μm high (including the conidiophores). Conidiophores fasciculate, arising from a stroma, or solitary on external mycelium, 0–1 septate or reduced to conidiogenous cells, olivaceous, smooth, cylindrical to geniculate-sinuous, 15–30 × 3–5 μm. Conidiogenous cells integrated, smooth, olivaceous, cylindrical, straight to geniculate-sinuous, tapering to a truncate apex, polyblastic, sympodial, 12–22 × 2.5–3.5 μm, with unthickened conidial scars. Conidia pale olivaceous, smooth, cylindrical, with an obtuse or subacute apex and truncate base, gutulata, straight or curved, 1–11 septate, 40–80 × 2–3 μm, with unthickened hila.

Cultural characteristics: Colonies are spreading, and after 6 wk on MEA under nuv they grow up to 37 mm diam., dark green in reverse; aerial mycelium white to green in colour and sparsely distributed, but more prominent than in Stenella marasasi.

Specimen examined: on living leaves of Syzygium cordatum, Sabie, E. Tvl, South Africa, 2 Nov. 1989, P. W. Crous, IMI 369016, holotype (culture STE-U 204), occurring on leaves with lesions of M. marasasi.

A collection on Syzygium cumini from West Bengal, India (IMI 136008), was found to be colonized by another species of Pseudocercospora. Although the conidial dimensions of this collection are similar to those of P. syzygiola, there are several other distinct features separating these taxa. P. syzygiola has fasciculate and solitary conidiophores on superficial mycelium, as well as mildly tapered conidia with truncate bases. Conidia of IMI 135008, however, are abruptly tapered to a more subtruncate end, and the caespituli tend to be more acervular and have a prominent stroma, which is less obvious in P. syzygiola. A new species name is introduced for this Pseudocercospora, typified by IMI 136008.

Pseudocercospora syzygiorum B. Sutton & Crous, sp. nov. (Figs 26, 27)

Etym.: from the host substratum, Syzygium
Lesions variable in size and shape, elongated to irregular, veinlimited in places, separate, 0.2−0.7 cm diam., medium brown and blistered on the upper surface with a raised margin surrounded by a dark red to red halo, slightly lighter brown on the lower surface. Mycelium mostly internal, hyphae smooth, olivaceous, branched, septate, 2.5−3 μm wide. Caeapsitidi epigenous, epidermal, erumpent, eustromatic, acervular to sporodochial, circular, discrete, composed of thinwalled, medium brown textura angularis, up to 40 μm deep (including the conidiophores), up to 100 μm wide. Conidiophores olivaceous brown, finely verruculose, cylindrical, straight to geniculate-sinuous, unbranched, 1−2 septate, formed from the upper cells of the conidioma, 15−25 × 4−5 μm. Conidiogenous cells terminal, integrated, olivaceous, finely verruculose, cylindrical, straight or geniculate-sinuous, tapering to a rounded or subtruncate apex, 10−15 × 3−5 μm, polyblastic, proliferating sympodially or enteroblastically with 1−3 percurrent proliferations. Conidia solitary, holoblastic, subcylindrical to obclavate with an obtuse apex and subtruncate base, straight to gently curved, guttulate, finely verruculose, 3−7 septate, 35−60 × 3−4 μm.

Specimens examined: on living leaves of Syzygium cumini, Daspur (Midnapur), West Bengal, India, 30 Oct. 1968, M. Mandal, IMI 136008, holotype.

The type collection of P. syzygiorum is morphologically similar to that of IMI 234833 on S. heynianum. However, the latter collection tends to have more diffuse lesions and slightly longer conidia (40−70 × 2.5−3 μm).

Passalora

Cercospora syzygiii M. Mandal was originally described from India on leaves of S. cumini (IMI 226658, holotype). Another collection from India on S. jambos (IMI 351222) was found to be similar to that of the type in symptomatology and general morphology. However, both specimens have brown, verruculose conidia with thickened hila, which exclude them from Cercospora and suggest that they would be better placed in

Figs. 28, 29. Passalora syzygi ii (IMI 226658). Fig. 28. Conidia. Fig. 29. Conidiophores.

Passalora Fr. Braun (1995) refers to this species incidentally as Pseudocercosporella syzygiii (Mandal) Raghu Ram & Mallai, but this name has not been formally published. The thickened hila exclude it from Pseudocercosporella.

Passalora syzygi ii (M. Mandal) B. Sutton & Crous, comb. nov.

Cercospora syzygiii M. Mandal, Ind. J Mycol. Res. 16: 313 (1978), as 'syzygiiae'.


Lesions angular, vein-limited, separate, becoming confluent, 0.1−0.5 cm diam., red brown on the upper surface, and light brown with a diffuse margin on the lower surface. Mycelium internal, hyphae finely verruculose, olivaceous brown, septate, branched, inter- and intracellular, 1.5−2.5 μm wide. Caeapsitidi hypogenous, brown; stromata absent, or substomal and minute. Conidiophores arising through stomata in fascicles of 2−6, divergent, brown, verruculose, thick-walled, 4−8 septeate, unbranched or branched near the apex, cylindrical, straight to geniculate-sinuous, tapering towards a subtruncate or obtuse apex, 50−90 × 4.5−6 μm; frequently regenerating enteroblastically near the apex. Conidiogenous cells terminal, integrated, verruculose, cylindrical, straight to geniculate-sinuous, brown, becoming lighter and tapering towards a subtruncate or obtuse apex, 10−17 × 5−6 μm, polyblastic, sympodial with thickened, darkened, protruding scars. Conidia single, medium brown, verruculose, guttulate, obclavate, straight or slightly
curved, tapering to an obtuse apex and subtruncate base, 1–7
septate, 35–80 × 3–5 μm, hila thickened, darkened and
refractive.

Specimens examined: on living leaves of Spicygium camini, Panchara,
India, 26 Feb. 1978, M. Mandal, IMI 226656, holotype; on living
leaves of S. jambos, Andhra Pradesh, Guntur, India, 26 Nov. 1991, M.
Raghu Ram, IMI 351222.

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REFERENCES

(II). Cryptogamic Botany 3, 235–244.


(Phytopathogenic Hyphomycetes) 3, 1–333. HW-Verlag, München.


Ciccovici, A. (1951). Primo contributo alla conoscenza dei Micromicetii dell' 

Crous, P. W. & Wingfield, M. J. (1991). Mycophaeaella marasasi sp. nov. and
its Pseudocerospora anamorph on leaves of Spicygium cordatum. Mycological Research 95, 1108–1112.

of the British mycological Society 61, 107–120.


Institute: Kew, U.K.

Institute: Kew, U.K.


London.

Conidiophores. Mycologue Publications, Canada.


Soper, B. M. & Kirk, P. M. (1982). Taxonomic notes on Exzipularia and
Scolicosporium. Transactions of the British Mycological Society 78, 247–257.


London.

Institute: Kew, U.K.

another leaf pathogen of Correa species from Australia. Australian Systematic
Botany 1, 87–94.

and Batschelomyces and description of Hypothecromyce gen. nov. Mycological
Research 92, 210–222.

nov., a leaf pathogen of Correa species from Australia. Australian Journal of

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