
New species of foliicolous Loculoascomycetes on *Dysoxylum*, *Melaleuca* and *Syzygium* from Queensland, Australia

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Four new species of foliicolous Loculoascomycetes, *Didymella melaleuca* sp. nov., *Rosenscheldiella dysoxyli* sp. nov., *Seynesiella melaleuca* sp. nov. and *S. syzygii* sp. nov. are described and illustrated from Queensland, Australia. The hosts are indicated by the specific epithet. Four *Discostromopsis* species are redispersed to *Discostroma* as *Discostroma callistemonis* (H.J. Swart) Sivan. comb. nov., *D. elegans* (H.J. Swart) Sivan. comb. nov., *D. leptospermi* (H.J. Swart) Sivan. comb. nov. and *D. stoneae* (H.J. Swart) Sivan. comb. nov.

Key words: ascomycetes, *Didymella*, *Discostroma*, *Discostromopsis*, *Dysoxylum*, *Melaleuca*, new species, *Rosenscheldiella*, *Seynesiella*, *Syzygium*.

Introduction

Only about eight genera of foliicolous ascomycetes are known to occur on *Melaleuca*. These genera are *Asteridiella*, *Discostromopsis*, *Meliolina*, *Microcyclus*, *Mycosphaerella*, *Phyllachora*, *Pleomassaria* and *Seynesia*. Of these genera, three species of *Phyllachora* (Pearce and Hyde, 1995), two species of *Discostromopsis* (Swart, 1979) and one species of *Mycosphaerella* (Sivanesan and Shivas, 2002) and *Seynesia* (Hansford, 1957) have been described from Australia. Two new species of ascomycetes on *Melaleuca*, as well as one new species on each of *Dysoxylum* and *Syzygium*, were found during investigations of undetermined specimens in Herbarium BRIP.

Materials and methods

Observations and measurements were made from dried preserved herbarium materials. Sections were cut using a freezing microtome, mostly at a thickness of 10 µm, mounted in lactofuchsin and observed using brightfield and Nomarski differential interference contrast microscopy. Photomicrographs were taken using a digital camera (Leica 200 with IM 1000 Multifocus Module).

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Taxonomy

Discostromopsis is regarded as a later synonym of *Discostroma* by Sivanesan (1983). Sivanesan (1983) did not redispense the *Discostromopsis* species described by Swart (1979) to *Discostroma* at that time. They are therefore redispensed as follows:

***Discostroma callistemonis* (H.J. Swart) Sivan., comb. nov.**

≡ *Discostromopsis callistemonis* H.J. Swart, Transactions of the British Mycological Society 73: 217, 1979.

***Discostroma elegans* (H.J. Swart) Sivan., comb. nov.**

≡ *Discostromopsis elegans* H.J. Swart, Transactions of the British Mycological Society 73: 217, 1979.

***Discostroma leptospermi* (H.J. Swart) Sivan., comb. nov.**

≡ *Discostromopsis leptospermi* H.J. Swart, Transactions of the British Mycological Society 73: 218, 1979.

***Discostroma stoneae* (H.J. Swart) Sivan., comb. nov.**

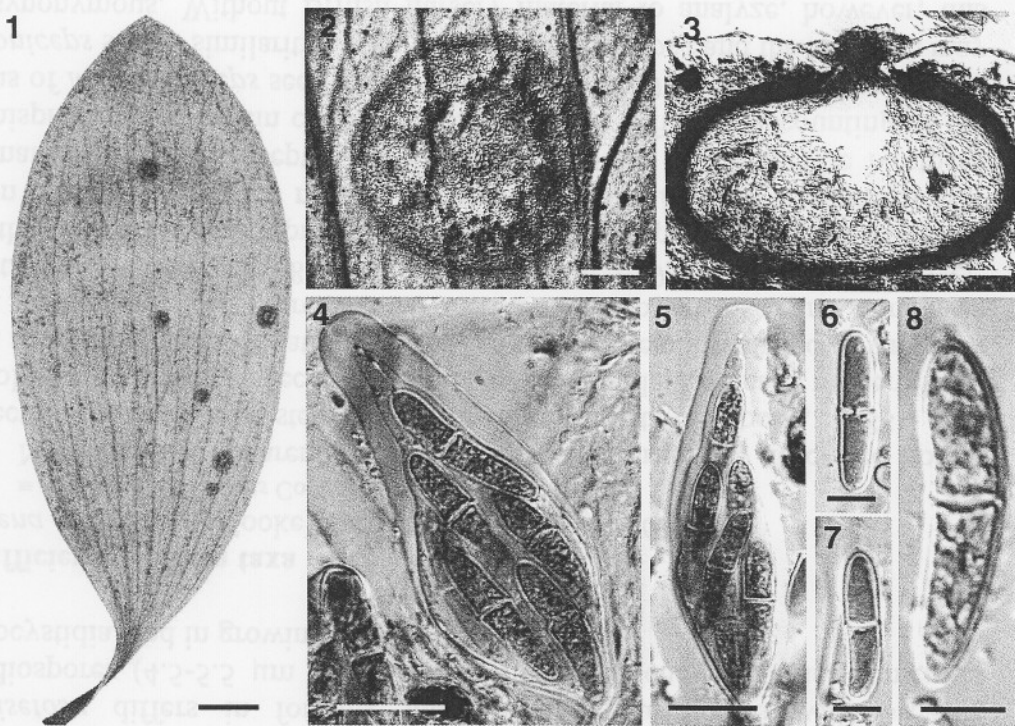
≡ *Discostromopsis stoneae* H.J. Swart, Transactions of the British Mycological Society 73: 217, 1979.

***Didymella melaleucae* Sivan. & R.G. Shivas, sp. nov. (Figs. 1-8)**

Etymology: based on *Melaleuca*, the name of the host genus.

Maculae epigenae, brunneae, dispersae, rotundatae, sine margine violaceus limitatae, usque 3 mm diam. *Ascomata* immersa, subepidermalia, nigra, hypogena, solitaria, subglobosa, ostiolata, 320-365 µm lata, 190-215 µm alta. Paries ascomati 15-23 µm lati, e cellulis crassitunicatis, atrobrunneus compositus, *textura angularis* formans. *Pseudoparaphyses* filiformes, hyalinae, septatae, ramosae, numerosae, usque 2 µm latae. *Asci* obclavati vel obclavati cylindrici, crassitunicati, bitunicati, octospori, brevi-pedicellati, 98-138 × 18-36 µm. *Ascospores* fusiformes vel late fusiformes, hyalinae, mediano uniseptatae vel inequaliter uniseptatae, cellulose superiore leviter latiore, crassitunicatae, laeves, non vel leviter constrictae, imbricate biseriatae, infra uniseriatae et supra uniseriatae, 24-40 × 7.5-10.5 µm.

Leaf spots epigenous, brown, scattered, rounded, delimited by a thin purplish margin, up to 3 mm diam. with raised to sunken immersed ascomata appearing as minute black dots in almost a ring-like fashion in and around the centre of the leaf spot. *Ascomata* immersed, subepidermal, black, hypogenous, solitary, subglobose, ostiolate, 320-365 µm wide, 190-215 µm high. *Peridium* 15-23 µm thick is composed of dark brown, thick-walled, pseudoparenchymatous cells forming a *textura angularis*. *Pseudoparaphyses* filiform, hyaline, septate, branched, up to 2 µm thick. *Asci* obclavate to obclavate cylindrical, thick-walled, bitunicate, 8-spored, short-stalked, 98-138 × 18-36 µm. *Ascospores* fusiform to broadly fusiform, hyaline, septate in the middle or slightly unequally septate, thick-walled, not or slightly constricted,



Figs. 1-8. *Didymella melaleuca* (holotype). 1. Leaf spots. 2. Ascomata on leaf. 3. Vertical section of ascoma. 4, 5. Ascus and ascospores. 6-8. Ascospores. Bars: 1 = 1 cm; 2 = 1 mm; 3 = 100 μ m; 4, 5 = 20 μ m; 6-8 = 10 μ m.

upper cell slightly wider in the middle, 24-40 \times 7.5-10.5 μ m, overlapping biseriate or biseriate below and uniseriate above.

Host: *Melaleuca viridiflora* Sol. ex Gaertner

Known distribution: Australia.

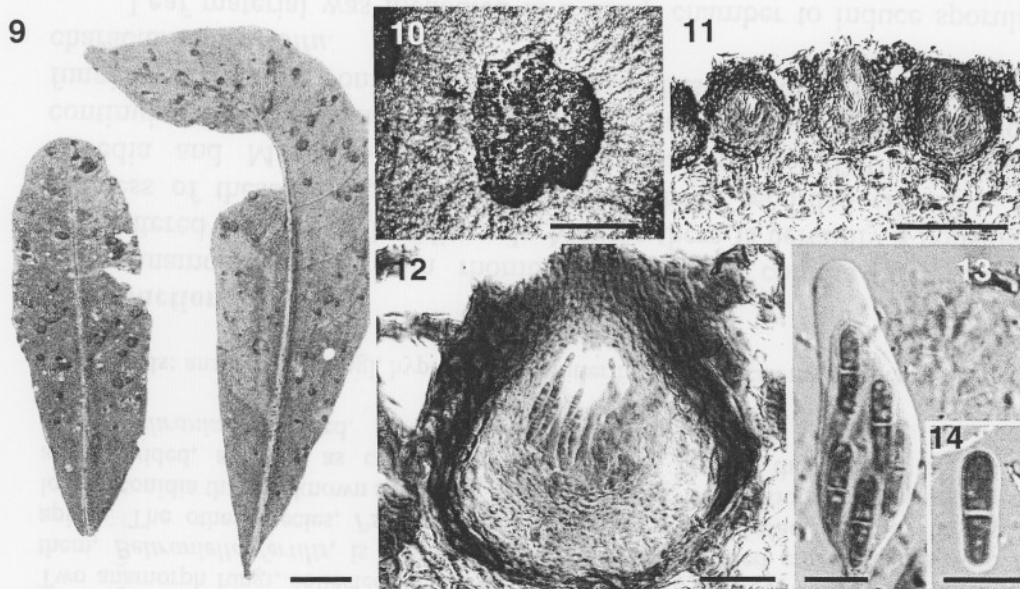
Holotype: AUSTRALIA, Queensland, Tully, Mission Road, on leaves of *Melaleuca viridiflora*, 4 Nov. 1993, H.Y. Yip 056 (BRIP 21455).

Notes: There is no comparable species of *Didymella* on *Melaleuca* and related genera.

***Rosenscheldiella dysoxyl* Sivan. & R.G. Shivas, sp. nov.** (Figs. 9-14)

Etymology: based on *Dysoxylum*, the name of the host genus.

Stromata amphigena, dispersa, nigra, erumpentia, plus vel minusve rotundata vel pulvinata vel lineares, usque 5 mm longa et 100 μ m lata. *Ascstromata* globosa, aggregata, subcuticularia, unilocularia, ostiolata, 85-100 μ m lata, usque 115 μ m alta. *Paries* ascostromati 9.5-20 μ m lati e cellulis brunneis, crassitunicatis compositi, *textura angularis* formans. *Asci* late saccati, bitunicati, octospori, longi vel brevi-pedicellati, 47-57 \times 15-17 μ m. *Ascospores* anguste obovoideae, hyalinae, mediano uniseptatae, nonconstrictae, laeves, guttulatae, biseriatae, cellula superiore apicibus rotundata, cellula inferiore leviter angustati et gradatim decrescendi, 16-17 \times 3.5-4.5 μ m.



Figs. 9-14. *Rosenscheldiella dysoxyli* (holotype). 9. Stromata on leaves. 10. Stroma on leaf. 11. Vertical section of ascostromata. 12. Vertical section of ascostroma. 13. Ascus with ascospores. 14. Ascospore. Bars: 9 = 1 cm; 10 = 1 mm; 11 = 100 μ m; 12 = 20 μ m; 13, 14 = 10 μ m.

Stromata amphigenous, scattered, black, erumpent, more or less rounded, pulvinate or linear, up to 5 mm long and 100 μ m high, completely destroying the leaf tissues by invasion of hyphae, sometimes fusing with adjacent stromata. *Ascostromata* globose, aggregated, unilocular, subcuticular, 85-100 μ m wide, up to 115 μ m high, ostiolate. *Peridium* 9.5-20 μ m thick, is composed of brown, thick-walled cells forming a *textura angularis*. *Hamathecium* absent. *Asci* broadly sacate, bitunicate, 8-spored, long to short-stalked, 47-57 \times 15-17 μ m. *Ascospores* narrowly obovoid, hyaline, 1-septate in the middle, not constricted, smooth, guttulate, biseriolate, upper cell with a rounded apex, lower cell slightly narrower than the upper cell gradually tapering towards the basal end, 16-17 \times 3.5-4.5 μ m.

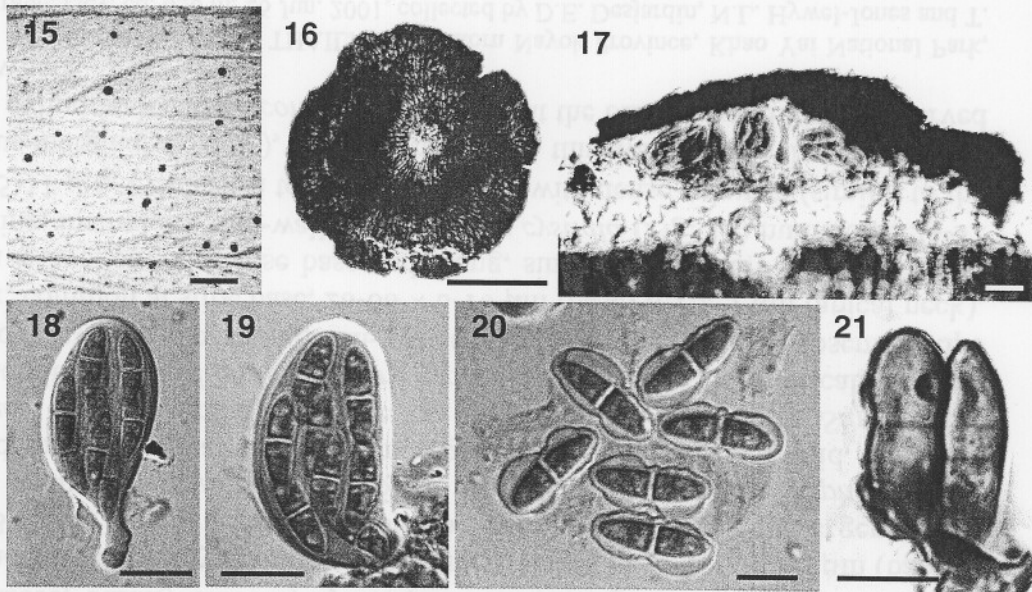
Anamorph: unknown.

Host: *Dysoxylum fraserianum* (A.L. Juss.) Benth.

Known distribution: Australia.

Holotype: AUSTRALIA, Queensland, Goombura State Forest near Cunningham's Gap, on leaves of *Dysoxylum fraserianum*, 13 Mar. 1988, J. Tierney (BRIP 16122).

Notes: About 18 species of *Rosenscheldiella* have been described from various tropical areas of Africa, Asia, America, Australia and New Zealand



Figs. 15-21. *Seynesiella melaleucaae* (holotype) 15. Thyriothecia on leaf. 16. Thyriothecium. 17. Vertical section of thyriothecium. 18, 19. Asci. 20. Sheathed ascospores. 21. Mature ascospores. Bars: 15 = 1 cm; 16 = 100 μ m; 17-19 = 20 μ m; 20, 21 = 10 μ m.

(Petch, 1925; Hansford, 1946, 1957; Müller and von Arx, 1962; Swart, 1972; Sivanesan and Nair, 1988) on different host genera but none on *Dysoxylum* or any other members of the host family *Meliaceae*. The genus is characterised by ascostromata anchored individually in the substrate by a hypostroma or growing on a dense mat on a flat basal stromata and is placed in the family *Mycosphaerellaceae* because the asci develop in a fascicle in a locule devoid of hamathecium. In ascospore size *R. dysoxylis* is close to *R. pullulans* (Berk.) Hansf. (1957) with slightly longer and narrower, 15-19 \times 3-4 μ m ascospores and smaller asci and occurring on *Astroloma* and *Leucopogon* (*Epacridaceae*) in Australia and New Zealand (Müller and von Arx, 1962). *Rosenscheldiella oleariae* H.J. Swart (1972) is the other species described from Australia occurring on *Olearia* (*Compositae*). *Rosenscheldiella dysoxylis* is the third species reported from Australia.

***Seynesiella melaleucaae* Sivan. & R.G. Shivas, sp. nov.** (Figs. 15-21)

Etymology: based on *Melaleuca*, the name of the host genus.

Mycelium sparsim, superficiale, ex hyphis hyalinis, septatis, ramosis, 1.5-2 μ m latis compositum. *Thyriothecia* nigra, superficialia, amphigena, dispersa, orbicularia, 250-450 μ m diam., 40-57 μ m alta. *Scutellum* usque 16 μ m lati, ex cellulis brunneis, quadrilateris, crassitunicatis, margine plus vel minusve sinuatum, non fimbriatum, ostiolum 9-17 μ m diam., collo crasso brunneae e cellulis brunneis, minus crassitunicatis compositum. *Pseudoparaphyses* filiformes, hyalinae, septatae, ramosae, deliquescentes. *Asci* clavati, longi vel brevi-pedicellati,

bitunicati, crassitunicati, octospori, 50-60 × 20-29 µm, pedicel usque 13.5 µm longi. *Ascospores* anguste ellipsoideae, primus hyalinae demum pallide brunneae vel brunneae, striatae, mediano uniseptatae, non vel leviter constrictae, 17-21 × 4.5-5.5 µm.

Mycelium scanty, superficial, composed of hyaline, septate, branched 1.5-2 µm thick hyphae. *Thyriothecia* black, superficial, amphigenous, scattered, orbicular, 250-450 µm diam., 40-57 µm high. *Scutellum* (upper wall) up to 16 µm wide is composed of brown, thick-walled, quadrilateral cells, margin somewhat wavy and non-fimbriate. The basal wall is thin-walled and closely adpressed to the cuticle and hyaline hyphae intermittently originate from this basal wall piercing the cuticle and invading the epidermal cells and leaf tissues below. Ostiole 9-17 µm diam. is surrounded by slightly raised and less thick-walled, brown cells. *Pseudoparaphyses* filiform, hyaline, septate, branched, deliquescent. *Asci* clavate, long to short-stalked, bitunicate, thick-walled, 8-spored, 50-60 × 20-29 µm. *Ascospores* narrowly ellipsoidal, hyaline, becoming pale brown to brown, striate, 1-septate in the middle, not or slightly constricted, 17-21 × 4.5-5.5 µm.

Anamorph: unknown.

Host: *Melaleuca quinquenervia* (Cav.) S.T. Blake

Known distribution: Australia.

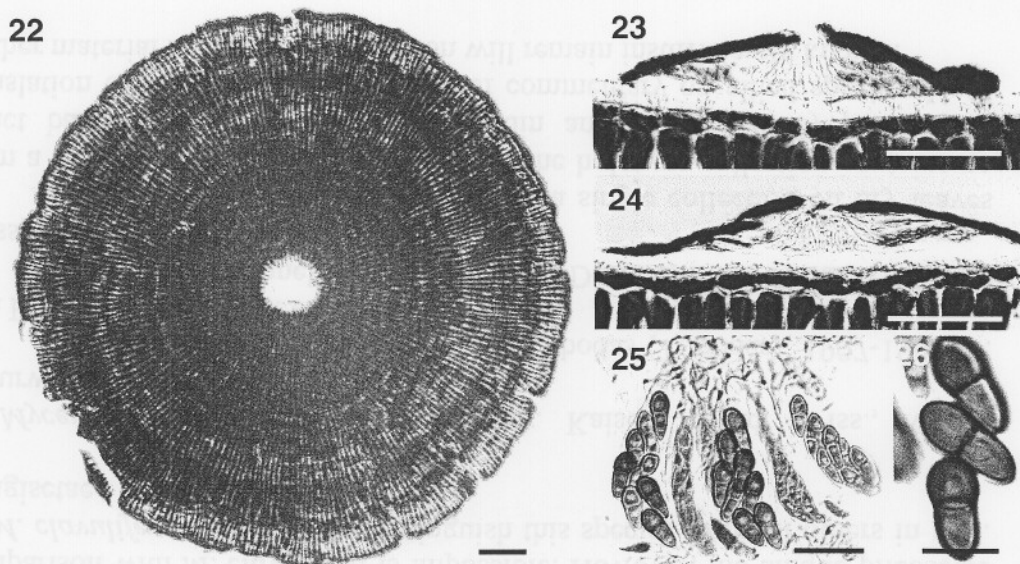
Holotype: AUSTRALIA, Queensland, Peregian Beach, on leaves of *Melaleuca quinquenervia*, 7 May 1975, J.L. Alcorn 75-038 (BRIP 8965).

***Seynesiella syzygii* Sivan. & R.G. Shivas, sp. nov.** (Figs. 22-26)

Etymology: based on *Syzygium*, the name of the host genus.

Mycelium sparsim, superficiale. *Hyphae* hyalinae, septatae, ramosae, 1-2 µm latae. *Thyriothecia* epigena, superficialia, laxe irregulariter dispersa, orbicularia, ostiolata, 170-280 µm diam., 30-38 µm alta. *Scutellum* 7.5-11.5 µm lati, e cellulis atrobrunneis, crassitunicatis, quadrilaterus, 9.5-19 × 2-3 µm compositum, margine plus vel minusve sinuatum non-fimbriatum. Ostiolum 25-30 µm diam., collo crasso et leviter elevato quasi atrobrunneo. *Pseudoparaphyses* filiformes, septatae, hyalinae, ramosae, deliquescentes, usque 1.5 µm latae. *Asci* cylindrici vel late cylindrici, bitunicati, octospori, brevi-pedicellati, 64-68 × 17-19 µm. *Ascospores* oblongi ellipsoidei, modo supra uniseptatae, leviter constrictae, laeves, primus hyalinae demum pallide brunneae vel brunneae, cellula superiore leviter latiore, infra biseriatae supra uniseriatae, 15-16 × 4.5-6 µm.

Mycelium sparse, superficial. *Hyphae* hyaline, septate, branched, 1-2 µm thick. *Thyriothecia* epigenous, superficial, loosely and irregularly scattered, orbicular, ostiolate, 170-280 µm diam., 30-38 µm high. *Scutellum* (upper wall) 7.5-11.5 µm thick is composed of dark brown, thick-walled, quadrilateral, 9.5-19 × 2-3 µm cells, margin more or less wavy and non-fimbriate. Ostiole 25-30 µm diam. forming a distinct, slightly raised collar consisting of less dark brown cells. Basal wall thin up to 1.5 µm thick is composed of a single layer that is closely adpressed to the cuticle. Hyphae are formed at intervals from the basal wall, penetrate the cuticle and invade the epidermal cells and leaf tissues



Figs. 22-26. *Seynesiella syzygii* (holotype). **22.** Thyriothecium. **23, 24.** Vertical section of thyriothecia. **25.** Ascus and ascospores. **26.** Ascospores. Bars: 22, 25 = 20 μm ; 23, 24 = 100 μm ; 26 = 10 μm .

below. *Pseudoparaphyses* filiform, septate, hyaline, branched, deliquescent, up to 1.5 μm . *Asci* cylindrical to broadly cylindrical, bitunicate, 8-spored, short-stalked, 64-68 \times 17-19 μm . *Ascospores* oblong ellipsoidal, 1-septate just above the middle, initially hyaline becoming pale brown to brown, slightly constricted, smooth, upper cell wider with acute end, lower cell narrower with obtuse end, biseriolate below and uniseriate above, 15-16 \times 4.5-6 μm .

Anamorph: unknown.

Host: *Syzygium rubiginosum* Merr. and Perry.

Known distribution: Australia.

Holotype: AUSTRALIA, Queensland, Hinchinbrook Island, on leaves of *Syzygium rubiginosum* [*S. forte* (F. Muell.) B. Hyland subsp. *forte*], Aug. 1973, J.H. Simmonds (BRIP 8980).

Notes: Three species of *Seynesiella* are known, each restricted to members of *Coniferae* from Europe and North America (Müller and von Arx, 1962; Bigelow and Barr, 1969). *Seynesiella melaleucae* and *S. syzygii* are additional new species reported from Australia. *Seynesiella* has ascospores that ultimately become brown which distinguishes it from *Microthyrium* which has hyaline ascospores.

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