

FUNGI SILVICOLAE NOVAZELANDIAE: 1

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ABSTRACT

The 20 fungi described in this paper have not previously been recorded in New Zealand. The fungi described are:

Caulicolous Ascomycota: *Cryptodiaporthe salicina*, *Stictis stellata*, *Xenomeris abietis*;
Corticolous Ascomycota: *Lachnellula hahniana*, *L. pseudotsugae*, *L. subtilissima*,
Lophium mytilinum, *Sarea resinea*;

Foliicolous Ascomycota: *Meloderma desmazierii*, *Mycosphaerella pittospori*,
Rosenscheldiella pullulans, *R. styracis*;

Caulicolous Mitosporic fungi, Coelomycetes: *Melanconium oblongum*;

Foliicolous Mitosporic fungi, Coelomycetes: *Coma circularis*, *Diploceras dilophosporum*,
Hainesia lythri, *Readeriella mirabilis*, *Septoria unedonis*, *Sigmia thujina*, *Strasseria geniculata*.

The host plants are:

Arbutus unedo, *Callistemon* sp., *Chamaecyparis lawsoniana*, *Cyathodes fraseri*,
Eucalyptus fastigata, *E. fraxinoides*, *E. nitens*, *E. regnans*, *Juglans nigra*, *Kunzea ericoides*,
Larix sp., *Olearia traversii*, *O. virgata*, *Pinus radiata*, *P. strobus*, *Pittosporum umbellatum*,
Pseudotsuga menziesii, *Salix fragilis*, *Thuja plicata*.

Keywords: fungi; New Zealand; new record.

INTRODUCTION

The Forest Research Institute Herbarium–Mycology (NZFRI-M) contains specimens of many fungi associated with various trees and shrubs. The presence of these fungi in New Zealand is unrecorded in the literature. This paper is the first of a series in which some of these fungi will be described.

Herbarium material was rehydrated by incubation in a damp chamber. Sections were cut using a freezing microtome, and sections and squash preparations were mounted in water. For detailed examination, for example, of conidiogenous cells, the material was treated with 3% KOH, followed by staining with 1% aqueous phloxine. In the descriptions given below, the New Zealand distribution of the organism is based on the data recorded on the Forest Health database maintained by the Forest Research Institute and is presented for each biological region (Crosby *et al.* 1976), with the number of records in that region given in parentheses. The location record is followed by a two-letter code (Table 1) identifying the biological region to which it belongs.

TABLE 1—Codes identifying the biological regions from which the specimens originated

| | |
|----|-------------------|
| AK | Auckland |
| BP | Bay of Plenty |
| BR | Buller |
| HB | Hawke's Bay |
| MC | mid-Canterbury |
| MK | Mackenzie Country |
| NC | North Canterbury |
| NN | Nelson |
| RI | Rangitikei |
| SL | Southland |
| TK | Taranaki |
| TO | Taupo |
| WI | Wanganui |
| WO | Waikato |

DESCRIPTIONS OF FUNGI

Caulicolous Ascomycota

Cryptodiaporthe salicina (Currey) Wehmeyer 1933

University of Michigan Studies, Science series 9: 194.

Perithecia scattered, immersed, black, ostiolar beaks emerging through splits in the bark, 0.3–0.5 mm in diameter. Asci clavate, 8-spored, $50\text{--}70 \times 12\text{--}15 \mu\text{m}$. Ascospores biseriate, one-septate, fusiform, hyaline, $15\text{--}20 \times 5\text{--}7 \mu\text{m}$.

Specimen examined: on dead twig of *Salix fragilis* Linnaeus, Mackenzie Country (MK), 26.ix.1963, R.M.J.MacKenzie, NZFRI-M 2104.

New Zealand distribution: Mackenzie (1 record)

This is one of two *Cryptodiaporthe* species causing minor dieback in willow (Bier 1959). The other is *C. salicella* (Fries) Petrak. According to Dennis (1978) *C. salicina* is distinguished by its wider ascospores but Sinclair *et al.* (1987) regarded *C. salicina* as a synonym of *C. salicella*. In New Zealand, *C. salicina* has been found associated with dieback of young shoots only in one locality.

Stictis stellatta Wallroth 1833

Flora Cryptogamica Germaniae 2: 444.

Apothecia aggregated, deeply immersed in wood, disc pale yellow, surrounded by a broad, white-lobed sterile margin which protrudes from the substrate, 0.2–0.4 mm in diameter. Asci cylindrical, apex rounded, 8-spored, $170\text{--}200 \times 5\text{--}7 \mu\text{m}$. Ascospores filiform, multiseptate, $130\text{--}150 \times 2 \mu\text{m}$. Paraphyses slender.

Specimen examined: on dead branch of *Juglans nigra* Linnaeus, Morrinsville (WO), 20.v.1985, M.C.Williams, NZFRI-M 3061.

New Zealand distribution: Waikato (1).

The snow-white border surrounding the sunken disc gives a striking appearance to this fungus. It was found fruiting on wood exposed by the cankering of the overlying bark. Its pathogenic status is not known.

***Xenomeris abietis* Barr 1968**

Canadian Journal of Botany 46: 842.

Basal stroma erumpent, on hypostroma in host tissue, 0.6–1.5 mm in diameter, 0.25–0.3 mm high. Ascigerous locules densely clustered on basal stroma, globose, dark brown to black, 170–200 µm wide, 80–90 µm high, ostiole 10–15 µm in diameter. Asci bitunicate, saccate, 8-spored, 35–50 × 10–15 µm. Ascospores pale green becoming olivaceous, ellipsoid, 1-septate, upper cell broader than the lower cell, 13–17 × 5–7 µm.

Specimen examined: on dead branch of *Pseudotsuga menziesii* (Mirbel) Franco, Golden Downs Forest near Nelson (NN), 30.x.1992, D.Cooper, NZFRI-M 3465.

New Zealand distribution: Nelson (1).

This fungus is associated with dieback after drought in young *Ps. menziesii* in North America (Funk & Shoemaker 1971) and with damage to *Abies nordmanniana* (Steven) Spach in Christmas tree plantations in Europe (Donaubauer 1993). It has been found only on dead material in New Zealand and its pathogenicity has not been ascertained.

Corticolous Ascomycota

***Lachnellula hahniana* (Seaver) Dennis 1962**

Persoonia 2:184.

Apothecia erumpent, solitary or grouped, short-stipitate, cup-shaped, excipulum densely covered in white long thin hairs, disc orange, up to 3.0 mm in diameter. Asci cylindrical-clavate, 8-spored, 100–150 × 8–10 µm. Ascospores 0-septate, elliptic-oblong, smooth, 14–20 × 6–8 µm. Paraphyses filiform, interspersed with others with swollen extremities, 2–4 µm thick.

Specimens examined: on bark of *Pinus radiata* D.Don, Kaingaroa State Forest (BP), ii.1951, J.W.Gilmour, NZFRI-M 2136; on bark of *Pinus* sp. Balmoral State Forest (NC), vi.1946, G.B.Rawlings, NZFRI-M 2133.

Additional record: on twigs of *Larix* sp., Conical Hill State Forest near Tapanui (SL), 29.ix.1942, J.M.Osborne, NZFRI-M 2135.

New Zealand distribution: Bay of Plenty (1), Taupo (1), North Canterbury (2), Southland (1).

Dennis (1978) regarded this species as a “harmless saprophyte”. In his pathogenicity trials, Oguchi (1981) found that *L. hahniana* produced small numbers of apothecia on the dead bark around inoculated portions of *Larix* stems. It has been found only on dead bark in New Zealand and is not regarded as a pathogen.

***Lachnellula pseudotsugae* (Hahn) Dennis 1962**

Persoonia 2: 184.

Apothecia erumpent, solitary or grouped, short-stipitate, cup-shaped, excipulum covered with short hyaline-white hairs, disc orange to orange-yellow, 1–2 mm in diameter. Asci clavate, 8-spored, 50–60 × 4–5 µm. Ascospores 0-septate, ellipsoid, smooth, 4–6 × 2–3 µm. Paraphyses filiform.

Specimen examined: on bark of *Pinus radiata*, Conical Hill State Forest (SL), ii.1957, Ellis, NZFRI-M 2168.

New Zealand distribution: Southland (1).

Funk (1981) has recorded this fungus as causing perennial target cankers on young *Pseudotsuga menziesii* trees, especially on dry sites. It has not been found on *Ps. menziesii* in New Zealand.

***Lachnellula subtilissima* (Cooke) Dennis 1962**

Persoonia 2: 184.

Apothecia erumpent, solitary or grouped, short-stipitate, cup-shaped, excipulum covered with white persistent hairs, disc orange to orange-yellow, up to 3.0 mm in diameter. Asci narrowly cylindrical, pore stained blue with iodine, 8-spored, 45–60 × 4–6 µm. Ascospores 0-septate, fusiform-clavate, smooth, 6–12 × 2–3 µm. Paraphyses cylindrical.

Specimen examined: on bark of *Pinus radiata*, Gwavas Forest near Hastings (RI), 24.ix.1992, B.J.Rogan, NZFRI-M 3451.

D.Etheridge (unpubl. report) recorded *L. subtilissima* in Kaingaroa State Forest (BP) in 1967.

New Zealand distribution: Bay of Plenty (1), Rangitikei (1).

Weissenberg (1975) reported that *L. subtilissima* caused minor damage to 40- to 60-year-old stands of *Pinus contorta* Loudon in Finland. It appears to be purely a saprophyte in New Zealand. The taxonomy of *Lachnellula* has been treated in detail by Dharne (1965).

***Lophium mytilinum* (Persoon:Fries) Fries 1823**

Systema Mycologicum 2: 533.

Hysterothecia resembling mussel shells set on their edges, erect, scattered, black, opening by a longitudinal slit, 0.5–0.7 mm long. Asci cylindrical, 8-spored, 130–150 × 10 µm. Ascospores filiform, multiseptate, pale olivaceous, 110–120 × 2 µm.

Specimen examined: on bark of *Chamaecyparis lawsoniana* (Murray) Parlatores, Golden Downs State Forest (NN), 1.i.1957, J.B.Taylor, NZFRI(M) 2170.

Additional record: on resinous bark of *Pinus radiata*, Northcote, Auckland (AK), 7.viii.1998, I.A.Hood, NZFRI-M 3850.

New Zealand distribution: Wanganui (1), Nelson (1).

Lophium mytilinum is regarded as a saprophyte (Ellis & Ellis 1985). It has not been associated with damage to living trees in New Zealand.

***Sarea resinae* (Fries:Fries) Kuntze 1898**

Revisio Generum Plantarum 3: 515.

Apothecia erumpent, scattered, sessile, cup-shaped, excipulum composed of colourless hyphae, disc convex, pale yellow to pale orange, 0.3–0.5 mm in diameter. Hymenium blued by iodine. Asci clavate, multi-spored, 50–80 × 15–20 µm. Ascospores numerous,

unicellular, hyaline, spherical, 2–3 μm in diameter. Paraphyses numerous, filiform, apices cemented with a gel with orange granules forming an epithelial layer, 1–2 μm wide.

Specimen examined: on bark of *Pseudotsuga menziesii*, Te Wera Forest near Stratford (TK), 1.ix.1993, B.J.Rogan, NZFRI-M 3507.

New Zealand distribution: Bay of Plenty (1), Rangitikei (5), Taranaki (1), Wanganui (1), Wairarapa (2), Dunedin (1).

This resinicolous fungus (anamorph *Pycnidiella resinae* (Fries:Fries) Höhnelt) has been shown to cause small cankers on species of *Abies*, *Larix*, *Picea*, and *Pinus* (Smerlis 1973). It is commonly associated with wounds and canker exudates on various conifers (Mordue & Hawksworth 1980). In New Zealand, it is often found on resin exuded from small cracks in the bark of *Pinus radiata* and *Pseudotsuga menziesii* but it does not appear to be pathogenic. For a detailed taxonomic treatment of *S. resinae* and its synonymy, see Hawksworth & Sherwood (1981).

Foliicolous Ascomycota

Meloderma desmazierii (Duby) Darker 1967

Canadian Journal of Botany 45: 1429.

Hysterothecia in rows, often confluent, subepidermal, elliptical, shining black, opening by a longitudinal slit, 0.3–0.7 mm long, 0.1–0.3 mm wide and 0.1–0.15 mm deep, black pseudoparenchymatous covering layer 15–20 μm thick, thinning out towards the margins. Asci cylindrical, rounded at the top, 8-spored, 110–130 \times 12–15 μm . Ascospores elliptic-fusiform, hyaline, 0-septate, surrounded by a gelatinous envelope, 25–30 \times 4 μm . Paraphyses filiform, swollen at the tip, 1–2 μm wide.

Specimen examined: on needles of *Pinus strobus* Linnaeus, Lismore State Forest near Wanganui (WI), 5.x.1979, M.A.Stoodley, NZFRI-M 2177.

New Zealand distribution: Wanganui (1).

Meloderma desmazierii occurs mainly on *Pinus strobus*, *P. monticola* D. Don, and other five-needled pines but it has also been recorded on *P. radiata* and *P. sylvestris* Linnaeus (Peace 1962).

Darker (1932) found that *M. desmazierii* was restricted to the edges of clearings and plantation edges and suggested that it may follow winter browning of foliage. Funk (1985) recorded the fungus as causing a rare needle-blight of *P. monticola* in Canada and it is regarded as a weak parasite of *Pinus* spp. in Europe (Smith *et al.* 1988). In China, however, studies have shown it to be a serious pathogen of *P. massoniana* Lambert (Hu 1983). In New Zealand, it has been found fruiting on the dead tips of green needles and is regarded as a minor pathogen of *P. strobus*.

Mycosphaerella pittospori (Cooke) Weiss 1950

“Index of Plant Diseases in the United States”, U.S.D.A., p.861.

Perithecia gregarious, minute, black, subepidermal, ostiolate, 80–100 μm in diameter. Asci clavate-cylindrical, 30–40 \times 15–20 μm . Ascospores 2-celled, elliptical, hyaline, 8–10 \times 3–4 μm .

Specimen examined: on living leaves of *Pittosporum umbellatum* Banks & Solander ex Gaertner, Little Barrier Island (AK), 30.vii.1958, J.M.Dingley, NZFRI -M 3126.

New Zealand distribution: Auckland (1).

This fungus was first recorded on *Pittosporum* sp. in North Carolina, United States. In New Zealand, it is associated with roughly circular, light brown to straw-coloured, necrotic leaf spots with a reddish brown margin, up to 6 mm in diameter, with the perithecia appearing as minute black dots. It seems to be very uncommon and to cause little damage.

***Rosenscheldiella pullulans* (Berkeley) Hansford 1957**

Proceedings of the Linnean Society of New South Wales 82: 219.

Stromata subepidermal, later erumpent, 50–75 µm thick. Ascigerous locules globose, completely immersed in the stromatic tissue, opening by an irregular fissure, 90–110 µm in diameter. Asci bitunicate, narrowly cylindrical, rounded at the apex, 8-spored, paraphysate, 45–60 × 10 µm. Ascospores hyaline, 1-septate, elliptical, 15–18 × 3–4 µm.

Specimen examined: on fronds of *Cyathodes fraseri* (A.Cunningham) Allan, Golden Downs State Forest near Nelson (NN), 21.xi.1984, A.Holloway, NZFRI-M 2995.

New Zealand distribution: Nelson (1).

Müller & von Arx (1962) considered this species to be very close to *R. orbis* (Berkeley) Petrak. The fungus is associated with scattered, small, angular, black, necrotic leaf spots up to 1 mm in diameter.

***Rosenscheldiella styracis* (P.Hennings) Theissen & Sydow 1915**

Annales Mycologici 13: 645.

Stromata hypophyllous, subepidermal, later erumpent. Ascigerous locules grouped, flask-shaped, projecting from the stromatic tissue, with a papillate ostiole, 115–140 µm in diameter. Asci bitunicate, clavate, 8-spored, paraphysate, 70–90 × 14–18 µm. Ascospores hyaline, 1-septate, elliptical, 25–30 × 8–10 µm.

Specimens examined: on leaves of *Olearia traversii* (F. Mueller) Hooker f., Karamea (NN), 31.vii.1984, A.Holloway, NZFRI-M 2549; on leaves of *O. virgata* Hooker f., Taringamotu, near Taumarunui (TO), 18.ix.1984, R.M.J.MacKenzie, NZFRI-M 2973.

New Zealand distribution: Waikato (3), Taupo (1), Nelson (1).

On *O. traversii*, *R. styracis* is associated with angular, generally scattered but sometimes confluent, rusty brown, necrotic leaf spots up to 5 mm in diameter. On *O. virgata*, the spots are darker and much smaller, only up to 1 mm in diameter.

Caulicolous Mitosporic Fungi, Coelomycetes

***Melanconium oblongum* Berkeley 1873–74**

Grevillea 2: 153.

Conidiomata acervular, abundant, subepidermal, erumpent, opening by an irregular fissure, 1.0–1.5 mm in diameter, top of mature fruiting body covered in a mass of

conidia. Conidiophores borne on a basal stroma formed by immersed hyphae, hyaline, filiform. Conidiogenous cells hyaline, with 1–3 annellations. Conidia 0-septate, brown, smooth, ellipsoid, $15\text{--}20 \times 5\text{--}7 \mu\text{m}$.

Specimen examined: on dead branch of *Juglans nigra*, Palmerston North (WI), 31.x.1984, M.A.Stoodley, NZFRI-M 2985.

New Zealand distribution: Bay of Plenty (3), Taupo (1), Waikato (2), Gisborne (1), Wanganui (1), Nelson (1), Westland (1).

Melanconium oblongum (teleomorph *Melanconis juglandis* (Ellis & Everhart) Graves) is associated with dieback in *Juglans* spp. (chiefly in butternut *J. cinerea* Linnaeus) in the United States (Sinclair *et al.* 1987). The fungus is a weak pathogen causing slow deterioration in attacked trees. On infected trees, dead limbs appear sprinkled with small, black acervular fruiting bodies of *M. oblongum* from which dark conidia are exuded in tendrils in damp weather. The fungus causes little damage in New Zealand.

Foliicolous Mitosporic Fungi, Coelomycetes

Coma circularis (Cooke & Masee) Nag Raj & Kendrick 1972

Canadian Journal of Botany 50: 614.

Conidiomata stromatic, acervular, solitary, subcuticular, partly erumpent, dark brown, $100\text{--}150 \mu\text{m}$ in diameter, opening by an irregular fissure. The stroma forms a thin basal layer on which the conidiogenous cells are borne. Conidiogenous cells doliiform, hyaline. Conidia 2-celled, with the basal cell much shorter than the apical cell, pale brown, cylindrical-clavate, apical appendage single, non-septate, $15\text{--}20 \mu\text{m}$ long, lateral appendages (two to three) inserted just below the septum, $15\text{--}20 \mu\text{m}$ long. Conidia $35\text{--}40 \times 5\text{--}9 \mu\text{m}$.

Specimen examined: on living leaves of *Kunzea ericoides* (A.Richard) J.Thompson, Opataka, Lake Rotoaira (TO), 12.vi.1984, R.M.J.MacKenzie, NZFRI-M 3211.

New Zealand distribution: Taupo (1).

This species has been reported from Australia on *Eucalyptus* sp. (Hansford 1956) and on *E. pauciflora* Siebold ex Sprengel (Swart 1986). This is the first record of its presence on *Kunzea* sp. There appears to be no visible host reaction to infection by the fungus. Swart (1986), who has described this fungus in detail, also found no host reaction in *E. pauciflora* and remarked that the fungus appeared to be a typical biotroph.

Diploceras dilophosporum (Cooke) Saccardo 1892

Sylloge Fungorum 10: 484.

Conidiomata stromatic, acervular, scattered, subepidermal, partly erumpent, brown to black, $150\text{--}450 \mu\text{m}$ in diameter, $60\text{--}80 \mu\text{m}$ deep, opening by an irregular fissure. Conidiophores arising from the upper cells of the basal stroma, smooth, hyaline, $10\text{--}30 \mu\text{m}$ long. Conidiogenous cells smooth with three to five annellations. Conidia fusiform, straight or slightly curved, 4-septate, slightly constricted at the septa, base truncate, basal cell hyaline, median cells pale brown, apical cell hyaline, conical, $25\text{--}35 \times 4\text{--}6 \mu\text{m}$, with basal and apical branched appendages. Basal appendage excentric, tubular, branched close to the point of origin, $10 \mu\text{m}$ long. Apical appendage tubular, branched close to the point of origin, $10\text{--}12 \mu\text{m}$ long.

Specimen examined: on leaves of *Callistemon* sp., Alexandra Park, Napier (HB), 17.ix.1996, B.J.Rogan, NZFRI-M 3613.

New Zealand distribution: Auckland (1), Hawke's Bay (1).

In Australia, *D. dilophosporum* is common locally on *Melaleuca squarrosa* Donn ex Smith and it has also been found on leaf spots on *Callistemon pallidus* (Bonpland) de Candolle, *C. citrinus* (Curtis) Stapf, and *C. macropunctatus* (Dumont de Courset) A.B. Court (Swart 1979). The fungus has been fully illustrated and described by Nag Raj (1993).

In New Zealand, *D. dilophosporum* is associated with necrotic leaf spots in *Callistemon* sp. The leaf spots are roughly circular, straw-coloured with an irregular dark brown margin. The partly erumpent, oblong-oval, fruiting bodies have a flap of concolorous host tissue on the top.

Hainesia lythri (Desmazières) Höhnelt 1906

Sitzungsberichten der Kaiserliche Akademie der Wissenschaften in Wien, Abteilung I, 115: 687.

Conidiomata acervular, initially partly immersed, finally superficial, cupulate to discoid, disc margin fimbriate, pale brown, 150–300 µm in diameter, 70–75 µm high with the hymenium lining the inner wall of the conidioma. Conidiophores hyaline, branched. Conidiogenous cells phallic, hyaline, producing terminal conidia. Conidia hyaline, 0-septate, falcate in side view, ellipsoid in face view, thin walled, acute at each end, 7–12 × 2 µm.

Specimens examined: on living leaves of *Eucalyptus regnans* F.J.Mueller, Forest Research Institute nursery, Rotorua (BP), 5.v.1995, C.Barr, NZFRI-M 3546; on living leaves of *Eucalyptus nitens* (Deane & Maiden) Maiden, Te Kapua near Taneatua (BP), 2.iv.1996, C.Barr, NZFRI-M 3591.

New Zealand distribution: Northland (1), Bay of Plenty (14), Gisborne (1), mid-Canterbury (2).

This fungus has been recorded as a parasite on a very wide variety of host plants (Sutton & Gibson 1977). Lundquist & Foreman (1986) reported heavy losses in four nurseries in South Africa from *H. lythri*. They showed that many commercially important eucalypt species (e.g., *E. fastigata* Deane & Maiden, *E. nitens*) were susceptible to attack by the fungus and that infection occurred only when the leaves were wounded and when free moisture was present. Ferreira (1998) has recorded the fungus as a wound pathogen causing lesions on leaves of *E. citriodora* Hooker and *E. grandis* Hill ex Maiden in Brazil.

In New Zealand, *H. lythri* is associated with large (up to 20 mm in diameter), roughly circular, confluent, mainly hypophyllous, light brown, necrotic leaf spots with a purplish brown margin. It has been found only once in a plantation and is regarded as a minor nursery pathogen.

Readeriella mirabilis H. & P. Sydow 1908

Annales Mycologici 6: 484.

Conidiomata pycnidial, globose, dark brown, immersed, thick-walled, 130–170 µm in diameter, ostiolate. Conidiophores absent. Conidiogenous cells arising directly from

the wall of the pycnidium, ampulliform, hyaline, 5–7 μm long. Conidia pale brown, deltoid, unicellular, base truncate, apex more or less rounded, smooth, 7–10 \times 6–9 μm .

Specimen examined: on living leaves of *Eucalyptus fraxinoides* Deane & Maiden, Palmerston North (WI), 16.i.1998, B.J.Rogan, NZFRI-M 3806.

Additional records: on living leaves of *Eucalyptus fastigata*, Te Kuiti (WO), 21.xii.1988, C.Barr, NZFRI-M 3272; on living leaves of *E. nitens*, Rangiora nursery (MC), 15.i.1998, P.Bradbury, NZFRI-M 3594.

New Zealand distribution: Northland (5), Auckland (1), Bay of Plenty (9), Taupo (7), Waikato (4), Hawke's Bay (4), Wanganui (2), Wellington (4), Nelson (3), Marlborough (2), North Canterbury (1), mid-Canterbury (1), South Canterbury (2), Dunedin (1), Buller (1), Westland (1).

Readeriella mirabilis is associated with various types of necrotic leaf spots. On *Eucalyptus fraxinoides*, the leaf spots are amphigenous, corky, roughly circular, confluent, light brown with a dark brown irregular margin, up to 10 mm in diameter. Other fungi (for example, species of *Vermisporium*) are invariably found on the leaf spots with which *R. mirabilis* is associated and the fungus is regarded as a secondary invader of tissue killed by other agencies (Park & Keane 1982). *Readeriella mirabilis* has been described in detail by Macauley & Thrower (1965).

***Septoria unedonis* Robillard & Desmazières 1847**

Annales des Sciences Naturelles, Botanique 8: 20.

Conidiomata pycnidial, subepidermal, globose-ellipsoid, brown, ostiolate 90–95 \times 60–70 μm . Conidiophores absent. Conidiogenous cells arising directly from the pycnidial wall, doliiform, hyaline, simple. Conidia hyaline, elongated cylindrical, flexuous, base truncate, 2-septate, not constricted at the septa, 40–50 \times 2–3 μm .

Specimen examined: on living leaves of *Arbutus unedo* Linnaeus, Whenuapai (AK), 12.viii.1996, C.A.Scott, NZFRI-M 3616.

New Zealand distribution: Auckland (1), Wanganui (1), Wellington (1), Nelson (1), mid-Canterbury (1), South Canterbury (2), Dunedin (3).

The conidia of *S. unedonis* were originally described as aseptate, measuring 25 \times 1.5 μm . Migula (1921) recorded the conidia as indistinctly septate but gave the same measurements as the original description. Grove (1935) described the conidia as "without apparent septa" and noted that the conidia in a specimen from Cyprus measured 25–65 \times 2–3 μm . In the New Zealand collection, the conidia had two septa and measured 40–50 \times 2–3 μm . Pennisi and Agosteo (1995) have described *S. unedonis* var. *vellanensis* as a new variety characterised by pleuriseptate conidia which are up to 80 μm long.

Septoria unedonis is associated with small (up to 1.5 mm diameter), epiphyllous, angular, frequently confluent necrotic leaf spots with a whitish centre and a broad purple margin.

***Stigmina thujina* (Dearness) Sutton 1972**

Transactions of the British Mycological Society 58: 166.

Conidiomata sporodochial, black, scattered, stroma immersed, semi-erumpent, rupturing the cuticle, dark brown, 100–200 μm wide. Conidiophores arising from the upper cells

of the 20–30 μm thick stroma, forming a dense pallisade, septate, brown, 30–40 μm long including the conidiogenous cell. Conidiogenous cells annellidic, smooth, light-brown, cylindrical. Conidia dark-brown, curved, cylindrical-obclavate, flexuous, distoseptate with 5–10 (mostly 7–10) septa, rounded at the apex and truncate at the base with a marginal frill, 40–60 \times 5–7 μm .

Specimen examined: on twigs of *Chamaecyparis lawsoniana*, Mawhera Forest near Greymouth (BR), 12.ix.1997, P.M.Bradbury, NZFRI-M 3743.

Additional record: on leaves of *Thuja plicata* D. Don, Hurakia, near Bennydale (TO), 11.xi.1996, J.Pascoe, NZFRI-M 3630

New Zealand distribution: Bay of Plenty (5), Taupo (5), Waikato (2), Hawke's Bay (1), Wanganui (1), Wellington (1), Nelson (2), Marlborough (1), mid-Canterbury (1), Buller (11), Westland (9).

The genus *Stigmia* is a large and heterogeneous one and Sutton & Pascoe (1989) have proposed a restricted concept of the genus. According to these authors, *Stigmia sensu stricto* should include only those species which, in common with the lectotype (*S. platani* (Fuckel) Saccardo), are foliicolous, always associated with stomata, with effuse to sporodochial conidiomata and holoblastic, distoseptate, brown conidia typically formed from percurrently proliferating verruculose, ragged conidiogenous cells. *Stigmia thujina* differs from this limited concept in that it is foliicolous as well as caulicolous, is not always associated with stomata, and has smooth conidiogenous cells. These differences are minor and, although the species does not fit the narrow description of *Stigmia* proposed by Sutton & Pascoe (1989), the use of the current name is retained.

Stigmia thujina was first described (as *Coryneum thujinum*) from dead leaves of *Thuja plicata* in Oregon, United States (Dearness 1924). It is widely distributed in North America over the natural range of *T. plicata* but apparently does little damage (Hedgecock 1932). In Hawaii, the fungus causes severe damage to plantations of *Chamaecyparis lawsoniana* (Hodges 1982). In New Zealand, the first record of *S. thujina* was on *C. lawsoniana* from Nelson in 1963. Since then, most of the records have been from the west coast of the South Island where the fungus is associated with death and casting of foliage. The oldest foliage in the lower and middle crown is affected first and as this is cast the trees develop a hollow crown, with only an outer fringe of green needles. Continued defoliation over several years has led to the death of some trees on the west coast of the South Island. Elsewhere in New Zealand, the disease has not proved to be serious.

***Strasseria geniculata* (Berkeley & Broome) Höhnelt 1919**

Berichte der Deutschen Botanischen Gessellschaft 37: 158.

Conidiomata stromatic, gregarious, immersed, globose to subglobose, unilocular or plurilocular, dark brown to black, 60–300 μm wide, 40–300 μm high, ostiolate. Conidiophores lining the wall of the conidioma, hyaline, short. Conidiogenous cells phialidic, hyaline. Conidia allantoid, unicellular, hyaline, 10–14 \times 3–4 μm with a basal appendage. Appendage simple, filiform, flexuous, often inserted obliquely, 10–15 μm long.

Specimen examined: on fallen needles of *Pinus radiata*, Matahina Forest near Te Teko (BP), 23.ix.1991, A.Zandvoort, NZFRI-M 3411.

New Zealand distribution: Northland (13), Auckland (7), Coromandel (2), Bay of Plenty (40), Taupo (52), Gisborne (2), Hawke's Bay (2), Rangitikei (5), Taranaki (1), Wanganui (2), Wellington (12), Nelson (5), Marlborough (1), North Canterbury (1), mid-Canterbury (4), Dunedin (4), Buller (4), Westland (6).

Strasseria geniculata has been reported from a wide variety of plants (Sutton 1980) but it is particularly associated with members of the Pinaceae (Parmelee & Cauchon 1979). Nag Raj (1993) has recorded it as associated with branch and twig cankers and necrotic needles of *Abies*, *Picea*, and *Pinus* spp. in Canada. In New Zealand it does not appear to act as a pathogen although it is very common as an endophyte in *P. radiata* needles. It has been recorded as a secondary invader, without any pathogenic significance, in needles of *P. radiata* trees suffering from spring needle-cast in Tasmania (Podger & Wardlaw 1990).

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