

FUNGI SILVICOLAE NOVAZELANDIAE: 2

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ABSTRACT

The 17 fungi and the new combination described in this paper have not previously been recorded in New Zealand. The fungi described are:

Caulicolous Mitosporic fungi, Coelomycetes: *Cryptosporiopsis hoheriae* comb. nov., *Sarcostroma mahinapuense* sp. nov.;

Caulicolous Mitosporic fungi, Hyphomycetes: *Chalara myrsines* sp. nov.;

Foliicolous Basidiomycota: *Uromycladium alpinum*;

Foliicolous Ascomycota: *Acrospermum* sp., *Cashiella sticheri* sp. nov.;

Foliicolous Mitosporic fungi, Coelomycetes: *Catenophoropsis eucalypticola*, *Coleophoma cylindrospora*, *Cryptosporiopsis eucalypti*, *Discula* sp., *Monostichella robergei*, *Sarcostroma arbuti*, *Seiridium eucalypti*, *Septoria typica* sp. nov., *Vermisporium acutum*, *V. brevicentrum*, *V. eucalypti*;

Foliicolous Mitosporic fungi, Hyphomycetes: *Harzia acremonioides*.

The host plants are:

Acacia dealbata, *A. mearnsii*, *A. melanoxylon*, *Corokia cotoneaster*, *Cupressus lusitanica*, *Eucalyptus calophylla*, *E. delegatensis*, *E. fastigata*, *E. ficifolia*, *E. leucoxydon*, *E. muelleriana*, *E. nitens*, *E. regnans*, *E. saligna*, *Hoheria populnea*, *Lagunaria patersonii*, *Myrsine chathamica*, *Pinus radiata*, *Prumnopitys ferruginea*, *Pseudopanax crassifolius*, *Pteris tremula*, *Sticherus cunninghamii*.

Keywords: fungi; New Zealand; new record.

INTRODUCTION

In this second paper in the series, descriptions are provided of a further 17 fungi previously unrecorded on trees and shrubs in New Zealand. One new combination is also recorded. Methods of examination were described in the first paper (Gadgil & Dick 1999). The New Zealand distribution given in the descriptions below is based on 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 a 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 were collected

AK	Auckland
BP	Bay of Plenty
BR	Buller
GB	Gisborne
ND	Northland
NN	Nelson
TK	Taranaki
TO	Taupo
WD	Westland
WI	Wanganui
WN	Wellington

DESCRIPTIONS OF FUNGI

Caulicolous Mitosporic Fungi: Coelomycetes

Cryptosporiopsis hoheriae (Atkinson) comb. nov.

(*Myxosporium hoheriae* Atkinson) *New Zealand Journal of Science and Technology* 22: 120A

Conidiomata acervular 2–4 × 0.2–0.5 mm, salmon-pink, pulvinate, subperidermal, erumpent, separate but occasionally confluent, formed of hyaline, thin-walled cells, basal layer up to 100 µm thick. Conidiophores absent. Conidiogenous cells phialidic, occasionally branched near the base, hyaline, 35–65 µm long, 3–4 µm wide. Macroconidia hyaline, ellipsoid, 0-septate, apex rounded, base truncate, 24–30 × 6–9 µm. Microconidia hyaline, filiform, 0-septate, 13–15 × 1–2.5 µm.

Specimens examined: on dying branches of *Hoheria populnea* A. Cunningham, Belmont, Lower Hutt (WN), 28.iv.1999, B.J.Rogan, NZFRI-M 3953; on dying branches of *Lagunaria patersonii* (Andrews) G. Don, Wellington (WN), 12.xii.1997, M.Esson, NZFRI-M 3788; on dying branches of *Lagunaria patersonii*, Port of Nelson (NN), 12.xii.1994, B.D.Getz, NZFRI-M 3523.

New Zealand distribution: Auckland (3 records), Waikato (1), Wellington (2), Nelson (1), mid-Canterbury (2).

This fungus was first recorded in New Zealand as a species of *Myxosporium* (Atkinson 1940). The genus *Myxosporium* was described by Link (1825) with *M. croceum* (= *Naemospora crocea* Persoon) as the only, and therefore the type species. Desmazières (1830) considered that *Naemospora crocea* was based on a mixture of different fungi and Höhnelt (1915) thus recommended that *Myxosporium* be rejected as a generic name. Weindlmayr (1963, 1964) revised *Myxosporium* and redispersed the species placed in this genus to other genera. He, however, did not consider *M. hoheriae* in his work. Pennycook (1989) recorded *M. hoheriae* as *Nectria* sp. as he considered that some collections of the fungus had a *Nectria* teleomorph. Dingley (1989) described the teleomorph as *Nectria hoheriae* Dingley and made a new combination for the anamorph, *Tubercularia hoheriae* (Atkinson) Dingley.

The relatively large, non-septate, hyaline, ellipsoid conidia, abruptly tapering to a truncate base, the presence of microconidia, and the enteroblastic phialidic conidiogenous

cells indicate that this species, in common with many other species described in *Myxosporium*, belongs to the genus *Cryptosporiopsis*. Atkinson (1940) has recorded *C. hoheriae* in association with branch dieback in *Hoheria populnea*, *H. sexstylosa* Colenso, and *Plagianthus betulinus* A. Cunningham; he also established that the fungus was a wound pathogen. We have found the fungus to be also associated with extensive branch dieback of *Lagunaria patersonii* (Norfolk Island hibiscus) in Wellington and Nelson. Numerous bright salmon-pink conidiomata form on colonised branches and are very conspicuous. The colour fades to buff on dried specimens.

***Sarcostroma mahinapuense* sp. nov. (Fig. 1)**

Caulicola. Conidiomata acervularia, solitaria, origine subepidermalia, innato-erumpentia, ambitu elangato-ovali, 300–350 μm lata, 90–100 μm alta, atra, per fissuram irregularem in tela hospitis dehiscentia; stroma basale 10–20 μm crassum. Conidiophora ex cellulis superis stromatis basalis enascentia, confertim in vallo aggregata, hyalina, 15–40 μm longa. Cellulae conidiogenae subcylindratae, hyalinae, 8–10 μm longae. Conidia fusiformia, recta vel leviter curvata, 40–57 μm \times 8.5–11 μm , 5-septata, appendices ferentia; cellula basalis obconica, basi truncata, hyalina; cellulae mediana quatuor, cylindratae, pallide brunnae, crassitunicatae, 32–42 μm longae; cellula apicalis conica, hyalina; appendix apicalis singula, obliqua, non-ramosa, 8–19 μm longa, 2 μm lata; appendix basalis singula, excentrica, non-ramosa, 11–21 μm longa, 2 μm lata. Ratio longitudinis:latitudinis conidii 4.6:1.

Habitat in caulibus *Eucalypti nitentis* (Deane & Maiden) Maiden, Mahinapua Forest (WD), 19.v.1999, P. Bradbury NZFRI-M 3972, holotypus.

(The specific epithet refers to Mahinapua Forest, the location of the holotype).

Caulicolous. Conidiomata acervular, solitary, originally subepidermal, later erumpent, elongate oval in outline, 300–350 μm wide, 90–100 μm deep, dull black, opening by an irregular rupture of the overlying host tissue, basal stroma 10–20 μm thick. Conidiophores arising from the upper cells of the stroma, densely aggregated in a

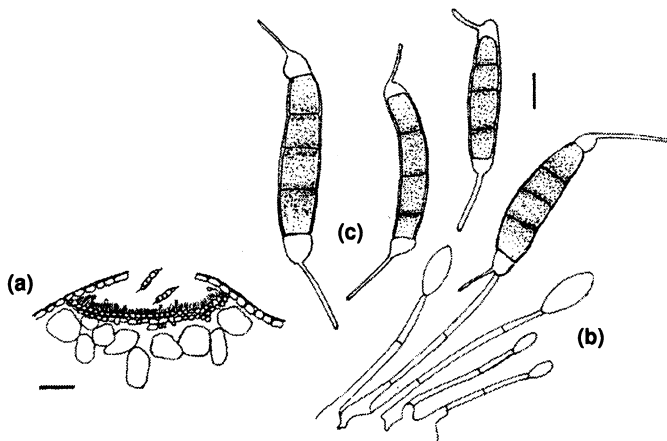


FIG. 1—*Sarcostroma mahinapuense*. (a) Vertical section of a conidioma (bar = 100 μm); (b) conidiogenous cells; (c) conidia (bar = 10 μm).

palisade, hyaline, 15–40 μm long. Conidiogenous cells subcylindrical, hyaline, 8–10 μm long. Conidia fusiform, straight or slightly curved, 40–57 $\mu\text{m} \times 8.5$ –11 μm , 5-septate, with appendages, basal cell obconic, base truncate, hyaline; four median cells cylindrical, pale brown, thick-walled, 32–42 μm long; apical cell conic, hyaline; apical appendage single, oblique, not branched, 8–19 μm long, 2 μm wide; basal appendage single, excentric, not branched, 11–21 $\mu\text{m} \times 2 \mu\text{m}$. Conidium length:width ratio 4.6:1.

Additional specimens examined: on twigs of *Eucalyptus regnans* F.J. Mueller, Forest Research Institute Nursery (BP), 7.vii.1998, M. Dick, NZFRI-M3264. The fungus has been isolated from *E. nitens*, Mahinapua Forest (the holotype), culture: NZFS 329.02.

The principal characters that separate *S. mahinapuense* from the other 5-septate *Sarcostroma* species are conidial length and the length:width ratio (Table 2).

New Zealand distribution: Bay of Plenty (1), Nelson (1), Westland (2).

TABLE 2—Conidial dimensions (mean values) of 5-septate *Sarcostroma* species

Species	Length (μm)	Width (μm)	Length:width ratio	Apical appendage length (μm)	Basal appendage length (μm)
<i>S. mahinapuense</i>	46	10	4.6:1	15	12.5
<i>S. coryneoideum</i>	34.5	10.2	3.4:1	5.7	4.5
<i>S. foliicola</i>	20.2	7.5	2.7:1	6	6.5
<i>S. insidens</i>	38	13	2.9:1	17.3	17.8
<i>S. kennedyae</i>	19	6.3	3:1	15	13
<i>S. leucopogonis</i>	20.7	8	2.6:1	2.2	3
<i>S. mariae</i>	25	5.7	4.4:1	11	13.5
<i>S. plagiochaetum</i>	32	9	3.6:1	10	7
<i>S. sinicum</i>	21.5	6.6	3.2:1	6.5	7

* Data for all species, except *S. mahinapuense*, are from Nag Raj (1993)

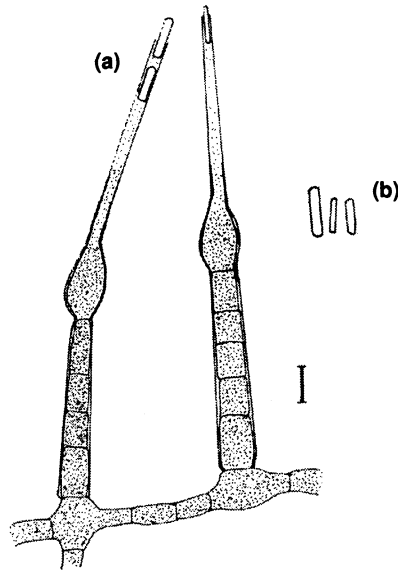
Sarcostroma mahinapuense has been consistently found on swollen, fissured cankers on branches of *Eucalyptus nitens* (14–19 years old) growing in Mahinapua Forest on the West Coast of the South Island. The cankers were first noticed in August 1998 and by June 1999 were to be found in about 60 ha of *E. nitens*. The number of cankers per affected tree had increased over this period and dieback, associated with cankers on smaller branches, was occurring. This fungus has also been recorded on *E. regnans* from Rotorua where it was associated with twig lesions and minor dieback. A further collection of the fungus was made in 1998 from the Nelson bioregion where it was associated with minor dieback of *Eucalyptus* sp. *Sarcostroma mahinapuense* appears to be acting as a pathogen on the West Coast. Its pathogenic status is being investigated.

Caulicolous Mitosporic Fungi: Hyphomycetes

Chalara myrsines sp. nov. (Fig. 2)

Mycelium in ligno ex hyphis brunneis, septatis, 5–7 μm crassis, irregulariter ramosis compositum. Coloniae in agar maltoso primum pallide griseae, demum atrogriseae, post

FIG. 2—*Chalara myrsines*. (a) Phialophores and phialides; (b) phialoconidia (bar = 10 μ m).



sporulationem aspectu pulverulento. Hyphae vegetativae hyalinae in culturis juvenibus (1–2 dies), pallide brunnae in culturis vetioribus; 3–6 μ m latae, septatae, paries hypharum levis. Phialophora ex hyphis vegetativis enascentibus, solitaria vel aggregata, erecta, numerosa, brunnea, levia, septata cum 4–6 cellis, 30–70 μ m longa (raro ad 105 μ m), ad basim 8–10 μ m lata, gradatim protracta ad apicem 5–8 μ m latum, phialis terminalis ferentia. Phialides 65–85 μ m longae, leves, brunnae, apicem versus pallide brunnae; venter obclavatum, 5–15 \times 6–10 μ m, gradatim decrescens in collum 50–70 μ m longis, ad apicem 3–4 μ m latis; ratio longitudinis colli et ventri 6:1. Phialoconidia unicellula, hyalina, levia, cylindracea, cum extremis subtiliter rotundatis, sine vacuolis, 7–15 \times 3–4 μ m.

Habitat in caulibus radicibusque *Myrsines chathamicae* F. Mueller, Smith's Reserve, Te One, Chatham Island, 25.ii.1996, M. Dick, NZFRI-M 3712 holotypus.

(The specific epithet is derived from the generic name of the host plant).

Mycelium in wood composed of brown, septate, irregularly branched, 5–7 μ m wide hyphae. Colonies on malt agar at first pale grey, later becoming dark grey. Vegetative hyphae hyaline in young cultures (1–2 days old), pale brown in older cultures; 3–6 μ m wide, septate, walls smooth. Phialophores arising from the vegetative hyphae, solitary and scattered or several arising close together, erect, numerous, wall brown, smooth, 3–5 septate in the basal part, 30–70 μ m long (rarely up to 105 μ m), 8–10 μ m wide at the base tapering slightly to an apex 5–8 μ m wide, bearing a phialide. Phialides 65–85 μ m long, smooth, brown, basal section (venter) obclavate, 5–15 μ m \times 6–10 μ m tapering gradually into an apical tube (collarete) 50–70 μ m long and 3–4 μ m wide at the tip; ratio of mean length of collarete to venter 6:1. Phialoconidia 0-septate, hyaline, smooth, cylindrical, with slightly rounded ends, without any vacuoles, 7–15 \times 3–4 μ m.

New Zealand distribution: Chatham Islands (1).

Chalara myrsines is distinct from all *Chalara* species described in the monograph by Nag Raj & Kendrick (1975), those noted by Morgan-Jones & Ingram (1976), Kile & Walker

(1987), Kowalski & Halmschlager (1996), and from the two species described from the Chatham Islands (*C. dracophylli* and *C. distans*) by McKenzie (1993). It is close to *Chalara australis* Walker & Kile and *C. neocaledoniae* Kiffer & Delon but differs from both in conidial size and particularly in the collarette:venter ratio (see Table 3 for a comparison).

Most of the remaining stands of indigenous forest on the Chatham Islands are in poor condition, attributable to disturbance by introduced grazing animals which have been permitted to range and browse freely. Exclusion of stock from such stands in recent years has generally led to an improvement in stand vigour. *Chalara myrsines* was isolated from discoloured wood from the roots and lower stem of dying *M. chathamica* trees in a mixed stand which were in a state of decline although the stand was fenced off as a reserve. The trees were also being colonised by the pinhole borer *Platypus apicalis* White and by a pit weevil (*Psepholax* sp.). *Chalara myrsines* was commonly but not always associated with the tunnels of these wood-boring insects. Many species of *Chalara* are known as wilt pathogens (Nag Raj & Kendrick 1975) and it is possible that infection by *C. myrsines* is one of the causes contributing to the decline of *M. chathamica* in the Chatham Islands.

Foliicolous Basidiomycota

Uromycladium alpinum McAlpine 1905

Annales Mycologici 3: 308

Pycnia dark red-brown to black, grouped in oval to circular patches up to 4 mm in diameter on pinnules, twigs, and shoots, becoming surrounded by sori. Urediniospores not seen. Telia on leaves and twigs, 350–400 µm wide, 220–280 µm high. Teliospores two on one sporophore, with one lateral vesicle. Teliospores globose to subglobose, wall smooth, ochraceous to fulvous, slightly thickened at the apex, with a pore, 22–25 × 28–30 µm. Vesicle globose, hyaline, 18–25 µm in diameter. Vesicles are readily seen on the sporophores in young telia. As they age, the vesicles collapse and cannot be easily recognised.

Specimens examined: on live leaves and twigs of *Acacia dealbata* Link, Hospital Hill, Gisborne (GB), 17.xii.1998, C.Barr, NZFRI-M 3936; on live leaves and twigs of *Acacia mearnsii* de Wildeman, Virginia Lake reserve, Wanganui (WI), 16.viii.1999, B.J.Rogan, NZFRI-M 4000; on live leaves and twigs of *A. mearnsii*, Span Farm, Auckland (AK), 10.x.1999, C.Barr, NZFRI-M 4018; on live leaves and twigs of *A. mearnsii*, Kericell Nursery, Kerikeri (ND), 18.x.1999. D.Bartram, NZFRI-M 4019.

New Zealand distribution: Northland (1), Auckland (6), Waikato (1), Gisborne (1), Wanganui (1).

Uromycladium alpinum was recorded by Cunningham (1923) on *Acacia dealbata* from Tauranga and on *A. decurrens* (Wendland) Willdenow from Hastings. However, in his monograph on the rust fungi of New Zealand (Cunningham 1931), he did not mention *U. alpinum* but appeared to record it as *U. acaciae* (Cooke) P.& H. Sydow which he described as having two teliospores in a head with or without a vesicle. Dingley (1969), Pennycook (1989), and McKenzie (1998) have treated Cunningham's record of *U. alpinum* as that of *U. acaciae*. *Uromycladium acaciae*, first recorded in New Zealand on *A. dealbata* in 1890 (Cooke 1890) has two teliospores per pedicel and no vesicle. McAlpine (1905)

TABLE 3—Morphological comparison of *C. myrsines* with similar *Chalara* species and with species of *Chalara* described from the Chatham Islands

Morphological characteristics		<i>C. myrsines</i>	<i>C. australis</i> *	<i>C. neocaledoniae</i> *	<i>C. dracophylli</i> †	<i>C. distans</i> †
Mycelium	Colour	Pale brown	Pale brown	—	Brown	Brown
	Width	3–6 µm	3–6 µm	—	1.5–2.5 µm	1.5–2.5 µm
Phialophores	Colour	Brown	Brown	Brown	Pale brown	Pale brown
	No. of septa	3–5	1–7	2–5	0–1	1–3
	Length	30–105 µm	30–110 µm	Up to 60 µm	30–50 µm	60–100 µm
Phialides	Length	65–85 µm	30–80 µm	50–60 µm	25–40 µm	60–80 µm
	Width at base	6–10 µm	4.5–6 µm	4–4.5 µm	4.5–6 µm	6–10 µm
	Width at apex	3–4 µm	2–2.5 µm	2–2.5 µm	2.5–3 µm	3–4 µm
	Collarette:venter ratio	6:1	2:1	2:1	2.5:1	1.7:1
Conidia	No. of septa	0	0	0	1	1
	Shape	Cylindrical	cylindrical	Cylindrical	Cylindrical	Cylindrical
	Size	7–15 × 3–4 µm	4.5–20 × 2–4.5 µm	5.34 × 2.5–4 µm	18–20 × 2–2.5 µm	18–22 × 3 µm

* Data from Kile & Walker (1987)

† Data from McKenzie (1993)

described *U. acaciae* (as *U. bisporum*) as lacking a vesicle, a description confirmed by Sydow & Sydow (1915). *Uromycladium acaciae* also lacks the pycnial stage. The severe defoliation, dieback, and distortion of the pinnae associated with *U. alpinum* infection in New Zealand since it was recorded in 1998 have not been observed with infection by *U. acaciae*.

Uromycladium maritimum, the only other species of *Uromycladium* with two teliospores and a vesicle in a head, does not occur on *A. dealbata* or *A. mearnsii*.

The telia form pustules which rupture the epidermis and often run together forming open cankers up to 1 cm long. Large numbers of rusty brown teliospores are produced which, in wet weather, form a mucilaginous mass binding the pinnules together. Pinnae of developing leaf rachis become curled and distorted. Infected leaves and twigs are killed, leading to death of small seedlings and a partial dieback of the crown in older trees. *Acacia mearnsii* seedlings appear to be rather more prone to severe damage than *A. dealbata*. *Acacia dealbata* and *A. mearnsii* are also host to the gall-forming *U. notabile* which can cause serious damage by killing large branches (Gilmour 1966). The combination of *U. notabile* and *U. alpinum* has the potential to be very damaging to these two species of *Acacia*.

Follicolous Ascomycota

Acrospermum sp.

Perithecia hypophyllous, solitary, club-shaped with a conical tip, narrowed below to a short cylindrical stalk with its base immersed in the leaf epidermis; opening by an apical pore; dark brown but getting paler towards the base and towards the apex which is almost hyaline; 0.6–1.2 mm tall, 0.5 mm wide at the widest part, stalk 0.15 mm wide. Outer layer of perithecial wall formed of brown, polygonal cells 3–4 μm wide. Asci fasciculate, narrowly cylindrical, apex rounded, 170–250 \times 3–4 μm . Ascospores filiform, hyaline, 0-septate, 170–200 μm \times 0.5 μm .

Specimen examined: on living leaves of *Corokia cotoneaster* Raoul, Pouakani North, Kinleith Forest (TO), 24.vii.1984, R.M.J. MacKenzie, NZFRI-M 3212.

New Zealand distribution: Taupo (1).

Comparison of this *Acrospermum* sp. with other species of *Acrospermum* with clavate ascocarps shows it to be close to *A. viticola* Ikata (Table 4). Unfortunately, the conidial stage, which would have helped in the identification, could not be produced in culture.

Cashiella sticheri sp. nov. (Fig. 3)

Apothecia atra, cupulata denique patelliformia, sessilia, ad basim constricta, gregaria interdum solitaria, ambitus orbicularia, glabra, 300–500 μm diameters. Discus planus vel concavus. Excipulum pseudoparenchymaticum, ex cellulis atrobrunneis, muris tenuibus, cubicis, in series irregulariter distincte radiantes compositum. Paries interiorem apothecii ex hyphis brunneis vel hyalinis parallele compositus. Asci subnumerosi, clavati, 50–65 \times 8–12 μm . Ascospores monoseriatae, ellipsoidae, hyalinae, denique pallide brunnae, 0-septatae, rectae, 15–18 \times 6–8 μm . Paraphyses numerosae, filiformes, plerumque complures conglutinatae, sursum divergentes, atrobrunnae, ad apicem subglobosae. Epithecium ex apicibus paraphysibus conglutinatis compositum.

TABLE 4—*Acrospermum* species with clavate ascocarps

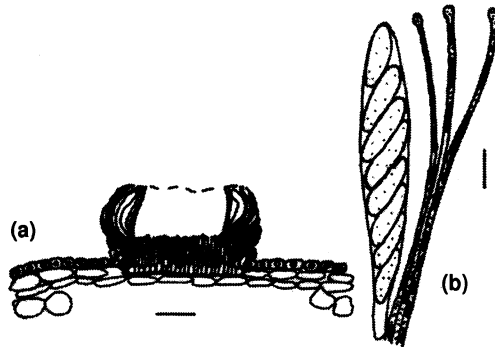
Species	Ascocarps	ASCI	Ascospores
<i>Acrospermum</i> sp.	0.6–1.2 × 0.5 mm, dark brown, outer layer of cells 3–4 µm diameter	Cylindrical 120–250 × 3–4 µm	Filiform 170–206 × 0.5 µm
<i>A. compressum</i> *	2–3 × 0.2–0.4 mm, pale yellow-brown, outer layer of cells 10 µm diameter	Cylindrical 250–500 × 3–4 µm	Filiform 100–400 × 1.0 µm
<i>A. graminum</i> *	1–1.2 × 0.2–0.3 mm, yellow-brown, outer layer of cells 3–4 µm diameter	Cylindrical 400–600 × 4–6 µm	Filiform 400–600 × 0.5 µm
<i>A. pallidulum</i> †	1.0 mm, pale cream	Cylindrical 250 × 3–4 µm	Filiform 300 × 1.0 µm
<i>A. viticola</i> ‡	0.9–2.1 × 0.2–0.4 mm, black	Cylindrical 200–350 × 2–3 µm	Filiform 110–250 × 1–2 µm

* Data from Eriksson (1967); Webster (1956)

† Data from Ellis & Ellis (1985)

‡ Data from Takahashi & Teramine (1986)

FIG. 3—*Cashiella sticheri*. (a) Vertical section of an apothecium (bar = 100 µm); (b) Ascus and paraphyses (bar = 10 µm).



Habitat in pinnulis vivis *Sticheri cunninghamii* (Heward) Ching, Big Huia Ridge, Orongorongo Forest (WN), 18.iii.1999, R.Blake & B.Rogan, NZFRI-M 3964 holotypus.

(The specific epithet is derived from the generic name of the host plant).

Apothecia black, cup-shaped, finally patelliform, sessile but narrowed at the base, gregarious, seldom solitary, circular in outline, glabrous, 300–500 µm in diameter. Excipulum pseudoparenchymatous, composed of dark brown cuboid, thin-walled cells arranged in irregularly radiating rows. Inner wall of apothecium of brown to hyaline parallel hyphae. Asci not numerous, clavate, 50–65 × 8–12 µm. Ascospores uniseriate, ellipsoid, hyaline, finally pale brown, 0-septate, straight, 15–18 × 6–8 µm. Paraphyses numerous, filiform, joined together at the base but divergent later, dark brown, apices sub-globose; the apices of the paraphyses join together to form an epithecium.

New Zealand distribution: Wellington (1).

Only two other species of *Cashiella* have been described. The main morphological characters of these and the new species are given in Table 5.

TABLE 5—Morphological characters and habitats of *Cashiella* species

	<i>C. monticola</i> *	<i>C. atra</i> †	<i>C. sticheri</i>
Apothecia	Black, 0.5 mm dia.	Black, 0.2–0.8 mm dia.	Black, 0.3–0.5 mm dia.
Excipulum	Isodiametric, rounded to angular, brown cells	Pseudoparenchymatous, rounded to angular, dark brown cells, arranged in more or less radiating rows.	Pseudoparenchymatous, cuboid, dark brown cells in irregularly radiating rows.
Asci	Clavate, 65–70 × 9–10 µm	Clavate-cylindrical, 80–90 × 12–15 µm	Clavate, 50–65 × 8–12 µm
Ascospores	Biseriate above, uniseriate below, ellipsoidal, hyaline, 0-septate, 9–11 × 3–4 µm	Uniseriate above, indistinctly biseriate below, ovoid to ellipsoidal, hyaline, 0-septate, 10–13 × 5–6 µm	Uniseriate, ellipsoid, hyaline, 0-septate, 15–18 × 6–8 µm
Paraphyses	Slender, pyriform, forked tips forming an epithecium	Slender, forked, olive-brown at tips, forming an epithecium	Filiform, swollen at the tips, forming an epithecium
Habitat	On decaying <i>Montia fontana</i> (Portulacaceae), Ahuriri, Hawke's Bay, New Zealand	On decorticated stems of <i>Acomastylis turbinata</i> (Rosaceae), Medicine Bow Mountains, Wyoming, USA	On living pinnules of <i>Sticherus cunninghamii</i> (Gleicheniaceae), Wellington, New Zealand

* Data from Dennis (1961)

† Data from Petrak (1951)

This fungus was found in a patch of about 1 ha where dieback of *S. cunninghamii* was occurring. It is unlikely that *C. sticheri* was responsible for the condition as it was not consistently associated with plants suffering from dieback.

Foliicolous Mitosporic Fungi: Coelomyces

Catenophoropsis eucalypticola Nag Raj & Kendrick 1988

Canadian Journal of Botany 66: 898

This fungus was isolated from small galls on twigs of *Eucalyptus nitens*. It was not seen fruiting on the plant material. The description that follows is of the fungus in culture.

Conidiomata stromatic, acervular. Conidiophores branched, brown, size variable, up to 30 µm long. Conidiogenous cells cylindrical, sub-hyaline, 15–20 × 4–6 µm. Conidia holoblastic, fusiform, hyaline, 0-septate, guttulate, 26–30 × 3.5–4 µm, with appendages. Apical appendage single, unbranched, 1.5–4 µm long; basal appendage single, unbranched, excentric, 2–5 µm long.

Specimen examined: fungal culture isolated from small galls on twigs of *Eucalyptus nitens*, Gregory Block, Bay of Plenty (BP), 29.v.1997, C.Barr, Culture NZFS 303.

New Zealand distribution: Bay of Plenty (1).

Catenophoropsis eucalypticola was originally described from leaves of *Eucalyptus* sp., Townsville, Queensland, Australia. In New Zealand, the fungus has also been isolated from necrotic leaf spots on *E. saligna* Smith, Rotoehu Forest (BP). Its pathogenic status is not known.

***Coleophoma cylindrospora* (Desmazières) von Höhnel 1919**

Berichte der Deutschen Botanischen Gessellschaft 37: 114

Conidiomata mainly epiphyllous, pycnidial, sub-cuticular, aggregated, conical in vertical section, 90–115 µm high, 150–170 µm in diameter; basal wall well-developed, 15–20 µm thick, of *textura angularis*, composed of dark brown irregular cells in 3–5 layers; lateral wall 3–5 µm thick, composed of 1–2 layers of dark brown cells. Paraphyses hyaline, non-septate, clavate, slightly curved, 50–60 µm long, 5–7 µm wide, formed among the conidiophores. Conidiophores hyaline, branched, 1–2 septate, formed from the inner layer of the basal wall. Conidiogenous cells discrete, terminal or lateral, ampulliform. Conidia hyaline, 0-septate, cylindrical with rounded ends, 18–28 × 2–4 µm.

Specimens examined: on live leaves of *Pseudopanax crassifolius* (Solander ex A.Cunningham) Koch, Orongorongo Forest (WN), 18.ii.1999, B.J.Rogan, NZFRI-M 3965; on dead and dying needles of *Pinus radiata* D. Don, Endean Forest, Ngongotaha (BP), 1.vii.1998, M.R.Twaddle & M.Dick, NZFRI-M 3829; on dead and dying leaves of *Cupressus lusitanica* Miller, Granville Forest (BR), 9.xii.1999, B.H.Doherty, NZFRI-M 4054.

New Zealand distribution: Bay of Plenty (1), Taupo (1), Wellington (1), Buller (1).

Coleophoma cylindrospora is distinguished from *C. oleae* (de Candolle) Petrak & Sydow principally on the basis of conidium width, conidia of *C. cylindrospora* being 2–3 µm wide and those of *C. oleae* 3–4 µm wide (Sutton 1980; Wu *et al.* 1996). The conidia from our collection on *Pinus radiata* were 2–2.8 µm wide, whereas those from *Pseudopanax crassifolius* and *Cupressus lusitanica* were 3–4 µm wide. In all other characters, such as length, shape, and guttulation, the conidia from all collections were identical. We consider that the small difference in conidial width is not sufficient to regard the *Coleophoma* from *P. radiata* as a distinct species.

Leaf lesions on *Pseudopanax crassifolius* were 3–15 × 3–4 mm, straw coloured with dark purple margins, with the conidiomata appearing as small black dots. No distinct lesions were apparent on needles of *Pinus radiata* or *Cupressus lusitanica*. *Coleophoma cylindrospora* has been recorded on species of *Juniperus*, *Picea*, and many angiosperms in the United Kingdom (Sutton 1980). Its pathogenic status has not been established but its ability to form lesions on living leaves of *Ps. crassifolius* and association with dying needles of *P. radiata* show that it is capable of invading living plant tissue.

***Cryptosporiopsis eucalypti* Sankaran & Sutton 1995**

Mycological Research 99: 828

Conidiomata amphigenous, acervular, mostly globose, subepidermal, solitary, 150–450 µm wide, up to 190 µm deep, wall of 1–2 layers of pale brown angular cells. Dehiscence irregular, by rupture of overlying host tissue which appears as a flap hinged

on one side. Conidiophores none. Conidiogenous cells discrete, cylindrical or doliiform, straight or slightly curved, smooth, occasionally branched, 12–14 µm long, 2–4 µm wide, arising from the top layer of the conidiomatal wall. Conidia holoblastic, hyaline, guttulate or not, ellipsoid. 0-septate, apex rounded, base abruptly tapering to a truncate scar, 15–17 µm long, 7–8 µm wide. Microconidia not seen.

Specimens examined: on living leaves of *Eucalyptus ficifolia* F.J.Mueller, Albany (AK), 23.iv.1999, M.D.Wilcox, NZFRI-M 3990; on living leaves of *Eucalyptus calophylla* R.Brown, Auckland airport (AK), 2.vii.1992, D.J.Hayes, NZFRI-M 3544.

New Zealand distribution: Northland (2), Auckland (21), Bay of Plenty (5), Taupo (1), Gisborne (3), Hawke's Bay (1), Taranaki (2), Wanganui (4), Rangitikei (2), Wairarapa (1), Wellington (6), North Canterbury (1), mid-Canterbury (3), Buller (1).

Cryptosporiopsis eucalypti has been recorded from Australia, India, and Hawaii and its pathogenicity to *Eucalyptus grandis* Hill ex Maiden and *E. tereticornis* Smith has been established (Sankaran, Sutton & Balasundaran 1995). The New Zealand examples of this species lack microconidia and the acervuli are larger than those described for *C. eucalypti* but these are regarded as minor differences. The fungus is widespread in New Zealand with records from Napier, Palmerston North, New Plymouth, Wellington, and Dunedin as well as from Auckland. It is associated with light brown, discrete (up to 10 mm in diameter) leafspots; affected leaves are shed prematurely.

Discula sp.

Conidiomata acervular, amphigenous, intra- or sub-epidermal, finally erumpent with an irregular rupture of the overlying host tissue; conidiomatal wall thin, formed of pale brown cells; conidiomata 150–350 µm in diameter. Conidiophores hyaline, usually simple but occasionally branched, rarely septate, cylindrical, arising from the basal wall of the conidioma, 18–22 µm long. Conidiogenous cells phialidic, hyaline, smooth. Conidia hyaline, ellipsoid, 0-septate, sometimes with a narrow truncate base, prominently guttulate, 10–17 × 7–10 µm, creamy in mass.

Specimen examined: on dying needles of *Prumnopitys ferruginea* (Bennett ex Don) de Laubenfels, Western Park, New Plymouth (TK), 15.ix.1994, B.J.Rogan, NZFRI-M 3988.

New Zealand distribution: Taranaki (1).

The large size, particularly the width, of the conidia of this *Discula* sp. does not agree with the published description of any other species of *Discula* (von Arx 1970; Redlin & Stack 1988; Redlin 1991; Toti *et al.* 1992; Stanosz 1993; Carris 1995) but with only a single collection available for examination, it was not possible to determine whether or not it is a distinct species. Nevertheless, it is recorded here because of its possible pathogenic association with *P. ferruginea* (miro). The fungus was fruiting profusely on dying needles on a tree which showed considerable twig dieback. Many species of *Discula* are parasites, causing leaf spots, necrosis, and wilt of twigs (von Arx 1970).

Monostichella robergei (Desmazières) von Höhnelt 1916

Sitzungsberichten der Kaiserliche Akademie der Wissenschaften in Wien 125: 95

Conidiomata hypophyllous, acervular, subcuticular, generally aggregated but occasionally solitary, dehiscence irregular; fungal tissue forms a thin brown crust on the underside of the cuticle, seen as a brown line in a cross-section, 160–350 μm in diameter, 80–100 μm deep. Conidiophores none. Conidiogenous cells arising from the upper cells of the 10- to 12-mm-thick basal stroma, phialidic, doliiform, hyaline, smooth, 8–16 \times 4–5 μm . Conidia ellipsoid, with a truncate base; hyaline, 0-septate, smooth eguttulate, thin walled, 14–17 \times 7–8 μm .

Specimen examined: on living leaves of *Eucalyptus leucoxylo* F.J.Mueller, Auckland airport golf course (AK), 9.iii.1992, D.J.Hayes, NZFRI-M 3987.

New Zealand distribution: Auckland (3).

This fungus is associated with angular, raised, brown, necrotic leaf spots. The leaf spots are usually discrete (3–5 mm in size) but are occasionally confluent, forming necrotic areas 1 to 1.5 cm long. It has also been found on *E. cinerea* F.Mueller ex Bentham at Auckland airport but has not been recorded from any other locality. *Monostichella robergei* has been recorded as a pathogen on *Carpinus betulus* Linnaeus in Europe (Schneider & Sauthoff 1972) but its pathogenicity to *Eucalyptus* spp. has not been investigated.

***Sarcostroma arbuti* (Bonar) Nag Raj 1993**

“Coelomycetous Anamorphs With Appendage-bearing Conidia”, Mycologue Publications. p. 774.

Conidiomata acervular, epiphyllous, usually gregarious, occasionally solitary, erumpent, 250–500 μm wide, black, covered in a black mass of exuded conidia. Basal stroma 30–50 μm thick, conidiophores arising from the upper cells of the basal stroma, hyaline, up to 30 μm long. Conidiogenous cells subcylindrical, hyaline, smooth. Conidia fusiform, straight or slightly curved, 15–19 \times 6–8 μm , 4-septate, with an apical and a basal appendage. Basal cell obconical, hyaline, with a truncate base, 2–3 μm long; three median cells short cylindrical, brown, thick walled, slightly constricted at the septa, 10–12 \times 3–4.5 μm ; apical cell conical, hyaline, 2–4 μm long. Apical appendage single, unbranched, hyaline, 5–7 μm long; basal appendage single, unbranched, excentric, 10–14 μm long.

Specimens examined: on living leaves of *Eucalyptus delegatensis* Baker, Lake Taupo Forest (TO), 27.viii.1986, A.Zandvoort, NZFRI-M 3178; on living phyllodes of *Acacia melanoxylon* R. Brown, Totara Forest, near Ross (WD), 4.ix.1986, P.Bradbury, NZFRI-M 3182.

New Zealand distribution: Bay of Plenty (1), Taupo (1), Buller (1), Westland (4).

This fungus was associated with large (10–25 mm), roughly circular, pale brown to reddish brown leaf spots on which the conidiomata appeared as concentrically arranged black dots. Its pathogenic status is not known. *Sarcostroma arbuti* has been recorded on leaves of *Arbutus menziesii* Pursch, *Cistus* sp., *Ledum glandulosum* Nuttall, *Phillyrea media* (Linnaeus) Schneider, and *Rhododendron* sp. from Portugal, Spain, Algeria, and the United States (Sutton 1980; Nag Raj 1993).

***Seiridium eucalypti* Nag Raj 1993**

“Coelomycetous Anamorphs With Appendage-bearing Conidia”, Mycologue Publications. p. 862.

The following description is of the fungus in culture.

Conidiomata acervular. Conidiophores variable in length, cylindrical, up to 25 μm long \times 3 μm wide, hyaline, smooth. Conidiogenous cells ampulliform, 5–7 \times 3 μm , hyaline, smooth. Conidia cylindrical-fusiform, slightly curved, 30–34 \times 8–10 μm , with an apical and a basal appendage. Basal cell conical, hyaline with truncate base; four median cells short, cylindrical, brown, slightly constricted at the septa; apical cell conical, hyaline. Apical appendage single, not branched, 8–14 μm long; basal appendage single, not branched, centric, 6–10 μm long.

Fungal cultures on MEA slow growing, 2.8–3.5 mm after 2 weeks at 18°C, white to salmon-pink, reverse reddish brown. Aerial mycelium sparse.

Specimen examined: isolated in culture from living leaves of *Eucalyptus* sp., Mahinapua Forest (WD), 25.i.1996, P. Bradbury, Culture NZFS 284.

New Zealand distribution: Westland (1).

This fungus was associated with prematurely cast leaves on a tree showing defoliation and branch dieback. *Seiridium eucalypti* has been recorded on leaves of *Eucalyptus* sp. from South Australia (Nag Raj 1993) and from dead branches of *E. delegatensis* in Tasmania (Yuan & Old 1995). Its pathogenicity to young plants of five species of *Eucalyptus* was demonstrated by Yuan & Old (1995). In their inoculation tests, infection by the fungus led to the formation of lenticular lesions on the stems, with some longitudinal cracks surrounding the dead areas.

Septoria typica sp. nov. (Fig. 4)

Maculae amphigenae, irregulariter rotundatae, discrete interdum confluentes, elevatae, suberosae, usque ad 10 mm diameterae. Conidiomata pycnidialia, immersa, separata, globosa, pallide brunnea, 80–90 μm lata \times 100–120 μm alta; pariete 1–2 cellularum crassi, 5–8 μm lati, ex textura angulari pallide brunnea compositi. Ostiolum singulare, non-papillatum, usque ad 12 μm dia. Conidiophora absentia. Cellulae conidiogenae discretiae, hyalinae, cylindratae, 6–10 μm altae, ex celluli interioribus parietis conidiomatorum enatae. Conidia holoblastica, hyalina, 1-septata, filiformia, sigmoidea vel falcata, laevia, minute guttulate, extrema rotundata, 65–70 \times 2–3 μm .

Habitat in foliis vivis *Eucalypti muellerianae* A. Howitt, Kaikohe (ND), 28.iii.1998, C. Inglis, NZFRI-M 3880 holotypus.

(The specific epithet refers to the typical Septorial appearance of the fungus with its long filiform conidia produced holoblastically from short conidiogenous cells).

Leafspots amphigenous, roughly circular, discrete but occasionally confluent, raised, corky, up to 10 mm in diameter. Conidiomata pycnidial, immersed, separate, globose, light brown, 80–90 μm wide \times 100–120 μm deep; walls 1–2 cells thick, composed of light brown, thin-walled textura angularis. Ostiole single, non-papillate, up to 12 μm diameter. Conidiophores absent. Conidiogenous cells discrete, hyaline, short cylindrical, 6–10 μm high, formed from the inner cells of the conidiomatal wall. Conidia holoblastic, hyaline, 1-septate, filiform, sigmoid or falcate, with rounded ends, minutely guttulate, 65–70 \times 2–3 μm .

Additional specimen examined: on living leaves of *Eucalyptus regnans*, Manawahe (BP), 20.x.1998, J.A. Bartram, NZFRI-M 3888.

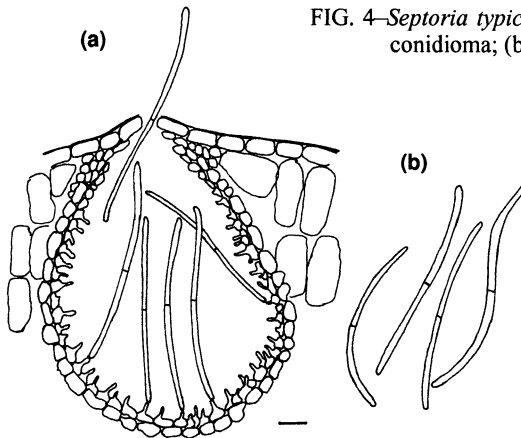


FIG. 4—*Septoria typica*. (a) Vertical section of a conidioma; (b) conidia (bar = 10 μm).

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

Sankaran, Sutton & Minter (1995) did not record any recognised species of *Septoria* on *Eucalyptus*. One other species of *Septoria* (*S. pulcherrima* Gadgil & Dick) has been described on *Eucalyptus* in New Zealand (Gadgil & Dick 1983). *Septoria pulcherrima* conidia are hyaline to very pale brown, 30–60 \times 3–4 μm and the conidiogenesis is of two types: holoblastic with enteroblastic proliferation of the conidiogenous cell, and holoblastic with sympodial proliferation (Swart 1988). These characteristics distinguish it from *S. typica* which has hyaline conidia, 60–70 \times 2–3 μm , with simple holoblastic conidiogenesis without any proliferation of the conidiogenous cells. The binomial *Septoria pulcherrima* has been subject to several name changes and is now variously known as *Kirramyces eucalypti* or *Phaeophleospora eucalypti*. This is a pity as *S. pulcherrima* causes a serious leaf blight in *E. nitens* and a stable nomenclature would help those investigating the disease.

Septoria typica is associated with necrotic leaf spots. Fruiting bodies of *Cryptosporiopsis eucalypti* are also frequently seen on these spots. It is likely that *C. eucalypti*, which is pathogenic to species of *Eucalyptus* (Sankaran, Sutton & Balasundaran 1995), is the primary agent responsible for the necrotic spots, with *S. typica* as a secondary invader.

***Vermisporium acutum* Swart and Williamson 1983**

Transactions of the British Mycological Society 81: 495

Conidiomata stromatic, acervular, amphigenous, sub-epidermal to intra-epidermal, immersed in necrotic leaf spots, scattered to gregarious, up to 300 μm in diameter. Stroma of isodiametric brown cells, 20–30 μm thick. Conidiophores arising from the upper layer of the stroma, branched, hyaline, 15–20 μm . Conidiogenous cells flask-shaped, annelidic, hyaline, 5–12 μm long. Conidia narrowly fusiform, straight or curved, 53–68 \times 2–4 μm , 3-septate, hyaline, not constricted at the septa, apical cell tapering to a point, basal cell truncate with an exogenous appendage 7–8 μm long.

Specimen examined: on living leaves of *Eucalyptus* sp., Botanic Gardens, Wellington (WN), 31.x.1996, B.J.Rogan, NZFRI-M 3644.

New Zealand distribution: Wanganui (1), Wellington (2).

Associated with large, confluent, light brown necrotic spots on living leaves. *Vermisporium acutum* has been recorded causing large oval to irregular leafspots on *Eucalyptus* spp. in Australia (Swart & Williamson 1983).

***Vermisporium brevicentrum* Swart & Williamson 1983**

Transactions of the British Mycological Society 81: 493

Conidiomata stromatic, acervular, predominantly hypophyllous, sub-epidermal in origin, partly erumpent, brown, scattered to gregarious, up to 500 μm in diameter. Basal stroma of several layers of isodiametric yellow-brown cells, 20–30 μm thick. Conidiophores arising from the upper layer of the basal stroma, often reduced to conidiogenous cells. Conidiogenous cells flask-shaped, annelidic, hyaline, 8 \times 3 μm . Conidia narrowly fusiform, straight or curved, 60–72 \times 3–4 μm , 3-septate, hyaline, not constricted at the septa; apical cell 28–30 μm long, tapering gradually to a rounded apex; two median cells cylindrical, equal in length (10–14 μm), and together shorter than either the apical or basal cell; basal cell 22–28 μm long, cylindrical with a truncate base with an exogenous, cuneiform appendage tapering to an obtuse tip, 10–11 μm long.

Specimens examined: on living leaves of *Eucalyptus* sp., Karori Cemetery, Wellington (WN), 14.xi.1996, B.Rogan, NZFRI-M 3645; on living leaves of *Eucalyptus fastigata* Deane & Maiden, Catchpool Forest, Wellington (WN), 16.x.1997, B.J.Rogan, NZFRI-M 3756.

New Zealand distribution: Wellington (2).

This fungus is associated with large, confluent, light brown, necrotic spots on living leaves. In Australia, it is reported as causing leaf spots on *E. dumosa*, *E. ovata* Labillardiere, and *E. viminalis* Labillardiere (Swart & Williamson 1983).

***Vermisporium eucalypti* (McAlpine) Nag Raj 1993**

“Coelomycetous Anamorphs With Appendage-bearing Conidia”, Mycologue Publications. p. 966

Conidiomata stromatic, acervular, predominantly hypophyllous, intra-epidermal in origin, scattered to gregarious, up to 350 μm in diameter. Basal stroma of isodiametric brown cells, 20–30 μm thick. Conidiophores arising from the upper layer of the basal stroma, branched, hyaline. Conidiogenous cells cylindrical, annelidic, hyaline 6–15 μm long. Conidia narrowly fusiform, straight or curved, 55–62 \times 2–4 μm , 3-septate, hyaline, slightly constricted at the septa; apical cell gradually tapering to a rounded, acute apex, two median cells hyaline, equal in length, basal cell elongate-obconic with a truncate base with an exogenous, cuneiform appendage tapering to a point 5.5–7.5 μm long.

Specimens examined: on living leaves of *Eucalyptus saligna*, Rotoehu Forest (BP), 12.viii.1997, K.Dobbie, NZFRI-M 3740; on living leaves of *Eucalyptus delegatensis*, Waimea Forest (WD), 11.viii.1998, P.Bradbury, NZFRI-M 3867.

New Zealand distribution: Northland (4), Bay of Plenty (1), Westland (1).

This fungus is associated with large, confluent, brown necrotic spots on living leaves. In addition to the hosts recorded above, *V. eucalypti* has also been found on living leaves of

Eucalyptus camaldulensis Dehnhardt, *E. melliodora* A.Cunningham ex Schauer, and *E. nitens* (Nag Raj 1993).

The genus *Vermisporium* has 10 species (Nag Raj 1993), of which six have been recorded from New Zealand (Table 6). Three have been described in this paper and three others—*V. cylindrosporium* (as *Seimatosporium cylindrosporium*), *V. falcatum* (as *S. falcatum*), and *V. obtusum*—were described by Dick (1990).

TABLE 6—Key to the species of *Vermisporium* recorded in New Zealand (based on conidial characters)

A	Appendage on basal cell tapering to a point	B
A	Appendage on basal cell with a rounded/obtuse end	D
B	Mean conidium length:width ratio less than 10:1; pale brown; central cells longer than basal or apical	<i>V. falcatum</i>
B	Mean conidium length:width ratio greater than 10:1; colourless to almost colourless	C
C	Slightly constricted at the septa; median cells equal in length;	<i>V. eucalypti</i>
C	Not constricted at the septa; cells increasing in length from base to apex	<i>V. acutum</i>
D	Mean conidium length:width ratio less than 15:1	<i>V. cylindrosporium</i>
D	Mean conidium length:width ratio greater than 15:1	E
E	Basal cell shorter than the other cells	<i>V. obtusum</i>
E	Median cells far shorter than the two end cells	<i>V. brevicentrum</i>

Foliicolous Mitosporic Fungi: Hyphomycetes

Harzia acremonioides (Harz) Constantin 1888

“Les Mucédinées Simples” p. 42

Mycelium on fronds, superficial and immersed, hyaline, septate, 3–5 µm wide. Conidiophores many-branched, 5–6 µm wide at base, branches at right angles to one another, tapering to a point, hyaline, mostly without septa. Conidia solitary, borne at the tip of each tapered branch, oval, cinnamon brown, 0-septate, base truncate, thick-walled (2–3 µm), 24 × 18–20 µm.

Specimen examined: on living fronds of *Pteris tremula* R.Brown, Akatarawa Forest (WN), 17.iii.1998, B.J.Rogan, NZFRI-M 3989.

New Zealand distribution: Wellington (2).

Harzia acremonioides is recorded as an epiphyte on a very large number of host plants in most parts of the world (Ellis 1971, as *Acremoniella atra*). It is unusual to find it on living leaves.

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