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P. D. GADGIL and MARGARET A. DICK

New Zealand Forest Research Institute,
Private Bag 3020, Rotorua, New Zealand

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ABSTRACT

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

Caulicolous Mitosporic fungi, Coelomycetes: *Cryptosporiopsis edgertonii* nom.nov. on *Acer davidii, Chamaecyparis lawsoniana, Eucalyptus regnans, Ilex* sp., *Liriodendron tulipifera, Nothofagus antartica, N. fusca, N. solandri, Podocarpus hallii*;

Foliicolous Mitosporic fungi, Coelomycetes: *Kabatina thujae* on *Chamaecyparis lawsoniana, Thuja plicata*; *Pestalotiopsis stevensonii* on *Abies* sp., *Pinus edulis, P. jeffreyi, P. radiata*; *Phyllosticta concentrica* on *Corynocarpus laevigatus*; *P. spinarum* on *Chamaecyparis lawsoniana, Cryptomeria japonica, Cupressus arizonica, C. macrocarpa, Juniperus chinensis, Thuja plicata*; *Septoria alnifolia* on *Alnus rubra.*

Keywords: fungi; New Zealand; new record.

INTRODUCTION

The first two papers in this series were published in 1999 (Gadgil & Dick 1999a, b). In this third paper, descriptions are provided of a further six fungi previously unrecorded on trees and shrubs in New Zealand. For examination, herbarium material was rehydrated 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 mounted in 3% erythrosin B in 10% ammonia. Drawings were made with the aid of a camera lucida.

The location record of specimens examined is followed by a two-letter code identifying the biological region to which it belongs (Table 1). The abbreviations of the names of the herbaria follow Holmgren *et al.* (1990) and those for culture collections are from Takishima *et al.* (1989). The account of the New Zealand distribution of an organism is based principally 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 that region given in parentheses. These records are not supported by voucher specimens.

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

AK	Auckland
BP	Bay of Plenty
BR	Buller
GB	Gisborne
HB	Hawke's Bay
MC	mid-Canterbury
ND	Northland
NN	Nelson
SC	South Canterbury
TK	Taranaki
TO	Taupo
WD	Westland
WN	Wellington

DESCRIPTIONS OF FUNGI

Caulicolous Mitosporic Fungi, Coelomycetes

Cryptosporiopsis edgertonii nom.nov. (Fig. 1)

(Replaced synonym: *Myxosporium longisporum* Edgerton 1908. *Annales Mycologici 21*: 53)

Conidiomata acervular, variable in size, up to 1 mm but generally 200–500 μm wide, 75–200 μm high in cross section, originating under the bark but later erumpent, discrete, scattered, basal layer of brown angular cells, 2 to 3 cells thick. Conidiophores absent. Conidiogenous cells enteroblastic, phialidic, hyaline, cylindrical to doliiform, tapering towards the apex, 10–15 × 3–5 μm. Macroconidia hyaline, 0-septate, ellipsoid, straight or slightly curved, apex rounded, base truncate, tapering abruptly, 32–48 × 10–15 μm. Germinating macroconidia become 2- to 4-septate and dark in colour. Germtubes are produced at the ends as well as laterally. Microconidia seen only in culture, hyaline, 0-septate, filiform, 12–14 × 1–1.5 μm.

Specimens examined: on cankers on dead stems of *Acer davidii* Franchet, Central Park, Wellington (WN), 9.xi.1998, B.J.Rogan, NZFRI-M 3894, culture NZFS 111.07; on dying twigs of *Chamaecyparis lawsoniana* (Murray) Parlatore, Waimea Forest (WD), 20.xi.1999, P. M.Bradbury, culture NZFS 111.11; on leaves and petioles of *Eucalyptus regnans* F.J.Mueller, Baron Road, Kinleith Forest, near Tokoroa (TO), 11.x.1995, M.A.Dick and K.Dobbie, culture NZFS 468; on dying twigs of *Ilex* sp., Botanic Gardens, Wellington (WN), 31.viii.2000, B.J.Rogan, NZFRI-M 4401; on small dying branches of *Nothofagus antarctica* Forster, Botanic Gardens, Christchurch (MC), 9.viii.1999, P.M.Bradbury, culture NZFS 111.10; on small dying branches of *Nothofagus fusca* (Hooker fil.) Oersted, Taramakau River (WD), 18.xi.1999, P.M.Bradbury, culture NZFS 111.12; on small dying branches of *Nothofagus solandri* (Hooker fil.) Oersted, Maungatapu track, Bryant Range, near Nelson (NN), 12.vi.2000, B.H.Doherty, culture NZFS 389; on dying twigs of *Podocarpus hallii* Kirk, Moeraki Hill, near Haast (WD), 29.viii.2000, P.Knightbridge, culture NZFS 469; on dying twigs of *Liriodendron tulipifera* Linnaeus, Poughkeepsie, New York, USA, ix.1906, F.C.Stewart, CUP-A 22354

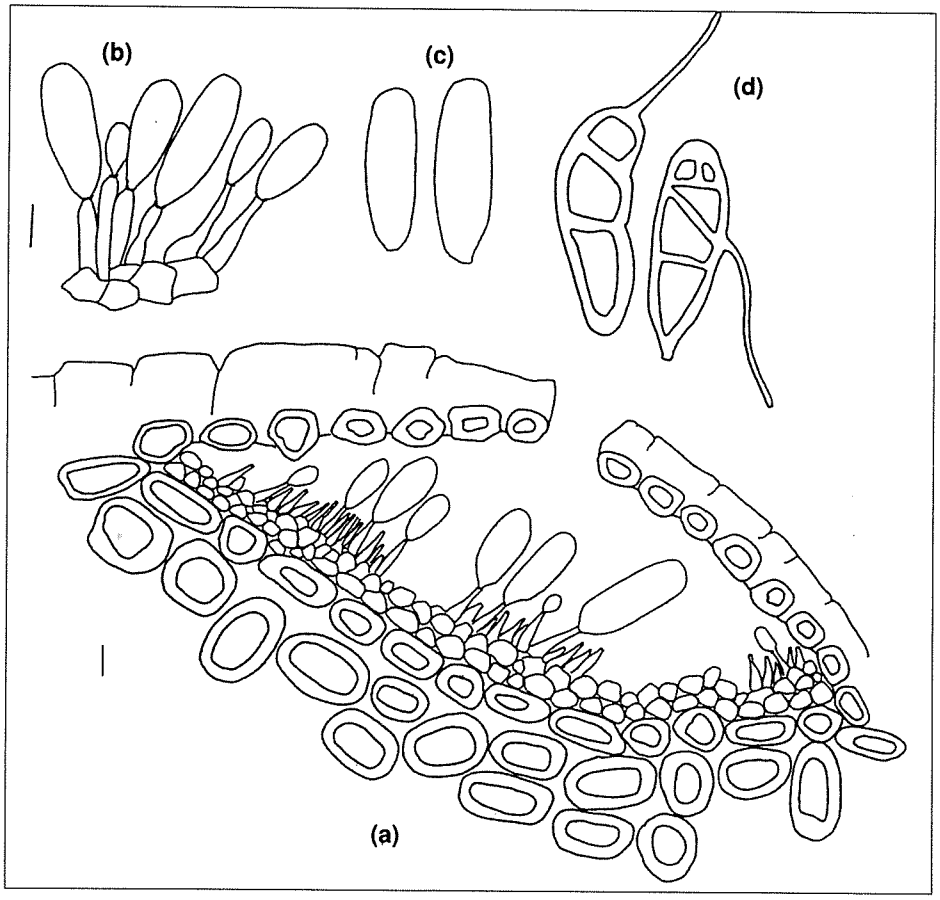

FIG. 1—*Cryptosporiopsis edgertonii*. (a) Vertical section through a conidioma, (b) condiogenous cells and immature conidia, (c) conidia, (d) germinating conidia. Bars = 10 μm.

(type of *Myxosporium longisporum* Edgerton); on twigs of *L. tulipifera*, Vassar College, Poughkeepsie, New York, USA, (no date), L.P.Gillespie, CUP-A (0029).

New Zealand distribution: Auckland (1 record), Bay of Plenty (3), Taupo (1), Gisborne (1), Rangitikei (1), Wanganui (1), Wairarapa (1), Wellington (3), Nelson (1), North Canterbury (1), mid-Canterbury (3), Buller (1), Westland (3).

Conidium size is the main character that distinguishes this species from other species of *Cryptosporiopsis*. A detailed search of the literature indicated that *Myxosporium longisporum*, first described by Edgerton in 1908, had conidia of a similar size and an examination of the type specimen (CUP-A 22354) showed that our fungus was conspecific with *M. longisporum*. Morphological characters of *M. longisporum*, our species, and *C. longispora* are given in Table 2.

Myxosporium is a nomen confusum, being based on a mixture of different fungi (Höhnel 1915), and many species of *Myxosporium* have been redisposed to other genera (Weindlmayr 1963, 1964). *Myxosporium longisporum*, with its large, 0-septate, hyaline, ellipsoid conidia,

TABLE 2–Morphological characters of *Myxosporium longisporum*, *Cryptosporiopsis edgertonii*, and *Cryptosporiopsis longispora*.

Species	Conidiomata	Conidiogenous cells	Conidia	Microconidia
*M. longisporum**	0.5–1.5 × 0.5 mm	Doliiform, 9–11 × 3 µm	Ellipsoid, 30–48 × 10–15 µm, milky white in mass	Not seen
C. edgertonii †	0.3–1.0 × 0.2 mm	Cylindrical to doliiform, 10–15 × 3–5 µm	Ellipsoid, 32–48 × 10–15 µm, milky white in mass	Only in culture, 12–14 × 1–1.5 µm
C. longispora ‡ Culture only	Not known in culture	Cylindrical, 60 × 8–10 µm	Ellipsoid, 22–42 × 8–12 µm, yellowish-red to rose in mass	

* Data from Edgerton (1908) and from examination of the type.
† Our data.
‡ Data from van Beyma (1929).

tapering abruptly to a truncate base and enteroblastic, phialidic conidiogenous cells is, in common with many other species of *Myxosporium*, clearly a *Cryptosporiopsis* and should be transferred to that genus. A simple transfer would, however, result in a binary name (*Cryptosporiopsis longispora*) which would be a later homonym of *Cryptosporiopsis longispora* (van Beyma) von Arx, a name validly published for a different species by van Beyma in 1929 (as *Gloeosporium longisporum*, later transferred to *Cryposporiopsis* by von Arx in 1957). It is therefore necessary to assign a nomen novum or avowed substitute for the combination. We have proposed that the species be named after the author (C.W.Edgerton) who first described it.

[Note: Verkley (1999) mentioned that "CBS 191.39, the ex-type strain of *Myxosporium longisporum*, is identical with all its ITS and NS patterns with the type strain of *Pezicula sporulosa*". This is an obvious *lapsus calami*, as CBS 191.39 is the neotype of *Gloeosporium longisporum* (= *Cryptosporiopsis longispora*). That the substitution of *Myxosporium* for *Gloeosporium* was an inadvertent error has been confirmed by the author (G.J.M.Verkley, pers. comm.).

The neotype culture of *Gloeosporium longisporum* (CBS 191.39) was selected by van Beyma in 1939, ten years after the original description was published. It is assumed that the original culture was lost. The neotype culture was isolated from *Pseudotsuga menziesii* (Mirbel) Franco in the New Forest, England, whereas the original description was based on a culture from *Hydnocarpus heterophylla* in Buitenzorg (Bogor) in Java. From an examination of the neotype, Verkley (1999) concluded that *Cryptosporiopsis longispora* was conspecific, and therefore synonymous, with the earlier *Cryptosporiopsis quercina* Petrak. His description differs in some particulars from the original description of van Beyma (1929) but his species can be distinguished from the New Zealand species by the size range of the macroconidia and the length of the conidiogenous cells.]

Our records on the Forest Health database of this large-spored species of *Cryptosporiopsis* date back to 1978. Most of these records concern isolates obtained during examination of a variety of host plants with dieback of twigs and branches. Generally *C. edgertonii* was one of several fungi isolated from dead or dying tissue and whether it had any pathogenic role or was behaving solely as a coloniser of dead tissue, remains uncertain. Unfortunately, specific identification of the fungus was not attempted until recently and most of the cultures were not kept. Our old records, which unfortunately are not supported by cultures or herbarium material and are not verifiable, show that this fungus was isolated from shoots of young (< 3-year-old) plants of *Pinus radiata* D. Don, from stained sapwood of *Acacia melanoxylon* R. Brown, *Eucalyptus nitens* (Deane & Maiden) Maiden, *Pinus strobus* Linnaeus, and *Pseudotsuga menziesii*, and from small dying branches of *Prumnopitys ferruginea* (Bennett ex Don) de Laubenfels, *Thujopsis dolabrata* (Linné fil.) Siebold & Zuccarini, and *Weinmannia racemosa* Linné fil.

Foliicolous Mitosporic Fungi: Coelomycetes

Kabatina thujae Schneider & v. Arx 1966 (Fig. 2)

Phytopathologische Zeitschrift 57: 180.

Conidiomata acervular, subepidermal in origin, finally erumpent, 120–150 µm in diameter, discrete, occasionally confluent, formed of brown, thick-walled angular cells. Conidiophores pale brown, formed from the upper cells of the pseudoparenchyma.

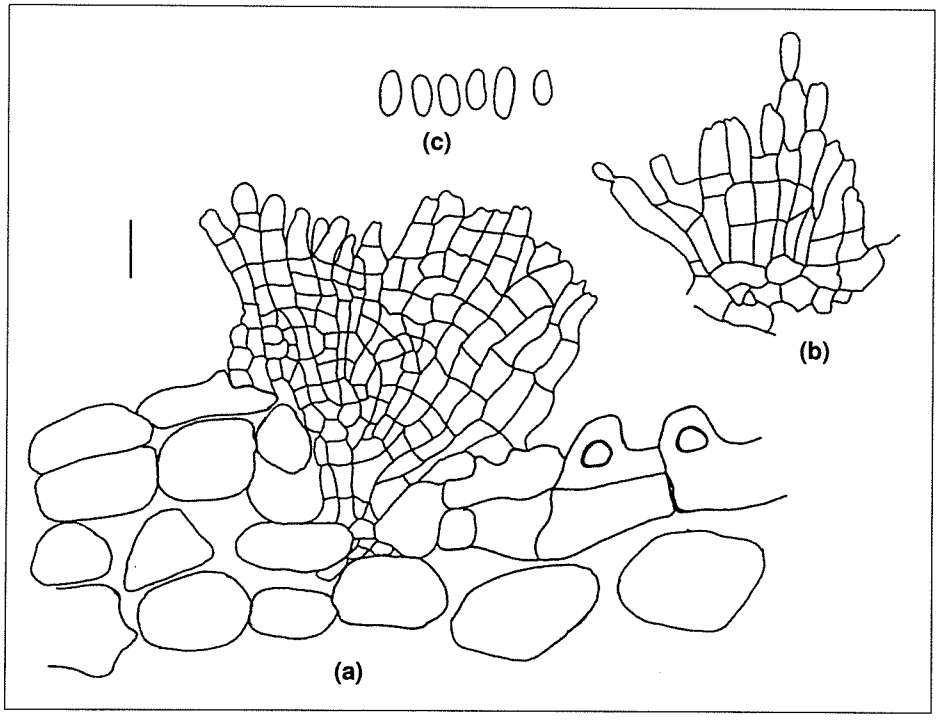

FIG. 2–*Kabatina thujae*. (a) Vertical section through a conidioma, (b) conidiophores and conidiogenous cells, (c) conidia. Bar = 10 µm.

Conidiogenous cells enteroblastic, phialidic, cylindrical to doliiform, 6–9 × 3.5–5 μm. Conidia hyaline, 0-septate, ellipsoid, 5–8 × 2.5–4 μm.

Specimens examined: on dying foliage of *Chamaecyparis lawsoniana*, Hagley Park, Christchurch (MC), 27.xi.2000, P.M.Bradbury, NZFRI-M 4330; on dying foliage of *Thuja plicata* Donn ex D. Don, Botanical Gardens, Timaru (SC), 14.ix.2000, P.M.Bradbury, NZFRI-M 4268; on dying foliage of *T. plicata*, Hagley Park, Christchurch (MC), 27.xi.2000, P.M.Bradbury, NZFRI-M 4331.

New Zealand distribution: mid-Canterbury (2), South Canterbury (2).

In all of the specimens examined, dieback was restricted to the tips of the foliage and was more severe in the lower part of the crown. *Kabatina thujae* has been reported causing shoot dieback of *Thuja occidentalis* Linnaeus in Europe (Schneider & von Arx 1966), shoot blight and canker of *Chamaecyparis nootkatensis* (D. Don) Spach in Canada (Funk 1981), and tip blight of species of *Chamaecyparis, Cupressus*, and *Thuja* in North America (Ostrofsky & Peterson 1986; Hansen & Lewis 1997). An epidemic on ornamental varieties of *C. nootkatensis* has been reported from a nursery by Funk & Molnar (1972) but generally the fungus is not regarded as a major pathogen. Inoculation tests in Italy showed that *Pinus halepensis* Miller, *P. pinea* Linnaeus, and *P. radiata* were slightly susceptible to infection by *K. thujae* (Magnani 1979), but there are no records of natural infection of *Pinus* species.

Pestalotiopsis stevensonii (Peck) Nag Raj 1993

"Coelomycetous Anamorphs with Appendage-bearing Conidia", p.655

Conidiomata acervular, subepidermal, later partly erumpent, scattered to gregarious, 160–500 μm wide, 100–130 μm high, acervular stroma composed of brown angular cells, 8–15 μm thick. Conidiogenous cells annelidic, hyaline, subcylindrical to lageniform, up to 30 μm long, 2–3 μm wide. Conidia fusiform, 3-septate, straight or slightly curved, 20–22 × 7–8 μm, bearing apical appendages, basal cell obconic, hyaline, 4–6 μm long, 2 median cells subcylindrical, brown, together 12–15 μm long, apical cell conical, hyaline, 2–4 μm long, apical appendages arising in a crest of 1–3 (mostly 3), tubular, filiform, flexuous, up to 15 μm long.
(Illustrated by Nag Raj (1993) p.657).

Specimens examined: on dead needle tips of *Abies* sp., Linton Military Camp, Palmerston North (WN), 15.ix.2000, B.J.Rogan, NZFRI-M 4261; on browning needles of *Pinus edulis* Engelmann, Hagley Park Pinetum, Christchurch (MC), 6.ix.2000, P.M.Bradbury, NZFRI-M 4269; on dead needles of *Pinus jeffreyi* Greville & Balfour, Hagley Park Pinetum, Christchurch (MC), 4.x.1998, M.R.Twaddle, NZFRI-M 3883; on leading shoots of *P. radiata*, Peka Mai Forest, near Wairoa (GB), 1.vii.2000, L.Renney, culture NZFS 410.

New Zealand distribution: Gisborne (1), Wellington (1), mid-Canterbury (2).

Pestaliopsis stevensonii has been reported on cones of *Abies, Picea*, and *Pinus* species from Byelorussia and U.S.A. (Nag Raj 1993). It is not regarded as a pathogen. Our observations suggest that the fungus is more widespread than the records show. As it is often found in conjunction with other fungi of greater pathological significance, its presence has been noted but seldom formally recorded.

Phyllosticta concentrica Saccardo 1876 (Fig. 3)
Nuovo Giornale Botanico Italiano 8: 203.

Conidiomata pycnidial, amphigenous but more numerous on the upper leaf surface, discrete, often arranged in concentric rings on the leaf spot, unilocular, up to 300 μm in diameter, usually 120–160 μm, depressed globose, in cross section up to 280 μm wide, 220 μm high; ostiole 15–20 μm in diameter. Pycnidial wall composed of brown, flattened, angular cells, cells much darker around the ostiole, 15–20 μm thick at the sides, 10–15 μm at the bottom. Conidiogenous cells holoblastic, hyaline, cylindrical, 8–12 (up to 20) × 3–5 μm. Conidia 0-septate, obovoid to pyriform, apex rounded, 13–20 × 8–10 μm, guttulate, sometimes with a large vacuole, with a 2- to 3-μm-thick mucilaginous coat and a mucilaginous, slender (1.5 μm wide), apical appendage, hardly widening at the base, 13–21 (up to 40) μm long.

Specimens examined: on dead leaves of *Corynocarpus laevigatus* J.R. et G.Forster, Tauranga (BP), 20.i.1924, G.H.Cunningham, PDD 1576; on leaves of *C. laevigatus*, Mt Albert, Auckland (AK), 1980, P.R.Johnston, PDD 41675; on leaves of

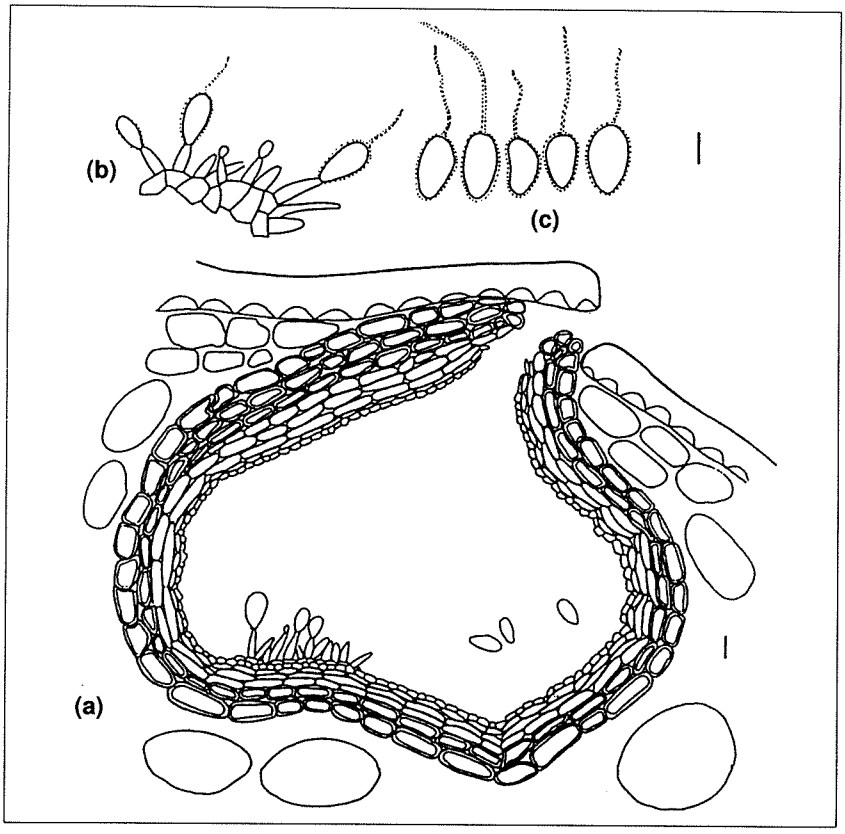

FIG. 3–*Phyllosticta concentrica*. (a) Vertical section through a conidioma, (b) condiogenous cells and immature conidia, (c) conidia. Bars = 10 μm.

C. laevigatus, Hapupu Reserve, Chatham Islands, 9.iii.1983, E.H.C.McKenzie, PDD 46732; on leaves of *C. laevigatus*, Mt Albert, Auckland (AK), 22.xi.1984, G.I.Robertson, PDD 46879; on leaves of *C. laevigatus*, Matuku Reserve, Waitakere Ranges, Auckland (AK), 27.xii.1987, E.H.C. McKenzie, PDD 53231; on leaves of *C. laevigatus*, Maunganui Bluff, near Dargaville (ND), 19.x.1987, E.H.C.McKenzie and P.R.Johnston, PDD 48038; on leaves of *C. laevigatus*, Te Henga Bush, Chatham Islands, 18.xi.1992, P.R.Johnston, PDD 61827; on leaves of *C. laevigatus*, Hapupu Reserve, Chatham Islands, 20.xi.1992, P.R.Johnston and E.H.C.McKenzie, PDD 62623; on leaves of *C. laevigatus*, Cape Pattison Reserve, Chatham Islands, 23.xi.1992, P.R.Johnston and E.H.C.McKenzie, PDD 62695; on leaf spots on living leaves of *C. laevigatus*, Napier Botanic Gardens, Napier (HB), 29.vii.1998, B.J.Rogan, NZFRI-M 3864; on leaves of *C. laevigatus*, Waitemata Golf Course, Devonport, North Shore City (AK), 3.iii.2000, J.A.Bartram, NZFRI-M 4105; on leaves of *C. laevigatus*, Blake Park, Mt Maunganui (BP), 30.iii.2000, L.Renney, NZFRI-M 4165; on leaves of *C. laevigatus*, Glenbrooke Steel Mill surrounds, near Pukekohe (AK), 7.iv.2000, C.A.Scott, NZFRI-M 4164; on leaves of *C. laevigatus*, Centennial Park, Tauranga (BP), 19.iv.2000, C.Barr, NZFRI-M 4163; on leaves of *C. laevigatus*, Killarney Reserve, North Shore, Auckland (AK), 11.vi.2000, D.J.Hayes, NZFRI-M 4162.

New Zealand distribution: Northland (1), Auckland (6), Bay of Plenty (3), Hawke's Bay (1), Wellington (1), Chatham Islands (4).

This distinctive species of *Phyllosticta* on *Corynocarpus laevigatus* (karaka) has been collected from different regions in the North Island and from the Chatham Islands. It was first recorded (as *Phyllosticta* sp.) by McKenzie (1991) on *C. laevigatus* from the Chatham Islands. He mentioned that the fungus was also found in Auckland. The large conidia and the thin mucilaginous appendage, which is as long as or longer than the conidium, distinguish it from other *Phyllosticta* species (van der Aa 1973). The fungus has been recorded as a pathogen on leaves of plants belonging to a number of angiospermous families and on needles of *Taxus baccata* Linnaeus (van der Aa 1973).

[Note: It has been pointed out that *P. concentrica* is unusual among *Phyllosticta* species in having a broad host range and that the forms on different hosts may, in fact, be separate species. This possibility, combined with the disjunct distribution, the different host, and the lack of records of *P. concentrica* on any of its European hosts in New Zealand, suggest that the New Zealand taxon may be a new species. We admit the force of these arguments but, given the close morphological similarity between *P. concentrica* and the New Zealand species, we are reluctant to conclude that the species on *C. laevigatus* is a new species. Further studies, including the use of molecular techniques, are required to reach a firm conclusion on this point.]

The fungus is associated with necrotic leaf spots on living leaves. The leaf spots are circular, large (20–50 mm in diameter), with a pale yellow centre (5–15 mm in diameter) and a wide dark-brown/yellow/brown margin. The dark pycnidia are arranged in more or less concentric circles on the central yellow region.

Phyllosticta spinarum (Diedicke) Nag Raj & Morelet 1979
Canadian Journal of Botany 57: 1297.

Conidiomata pycnidial, amphigenous, 140–200 μm wide, 200–250 μm high, ostiole 20–30 μm in diameter. Pycnidial wall 30–35 μm thick at the sides, 14–20 μm thick at the bottom, composed of irregular, dark brown cells in the outer layers and pale brown to hyaline cells towards the interior. Conidiogenous cells holoblastic, hyaline, cylindrical, 3–17 μm (mostly 4–10 μm) long. Conidia obovoid to almost globose, 12–17 × 8–10 μm, with a 2- to 3-μm-thick mucilaginous coat and a slender (1.5- to 2-μm-wide) mucilaginous apical appendage, 3–10 μm (mostly 6–10 μm) long.
(Illustrated by Nag Raj (1993) p. 687).

Specimens examined: on dying foliage and twigs of *Chamaecyparis lawsoniana*, Mt Richmond, Auckland (AK), 10.vii.2000, J.A.Bartram, NZFRI-M 4236; on dying foliage of *Cryptomeria japonica* (Linne fil.) D. Don, Kawatiri Golf Links, Carter's Beach, Westport (BR), 14.iv.1995, B.Getz, NZFRI-M 3553; on dead foliage of *C. japonica*, Waitemata Golf Course, Devonport, North Shore City (AK), 3.iii.2000, J.A.Bartram, NZFRI-M 4166; on dying branch tips of *C. japonica*, Karori Cemetery, Wellington (WN), 30.v.2000, J.A.Bartram, NZFRI-M 4200; on dying branch tips of *C. japonica,* Cornwall Park, Auckland (AK), 6.vi.2000, D.J.Hayes, NZFRI-M 4114; on dying twigs of *C. japonica*, Auckland Domain, Auckland (AK), 9.vii.2000, NZFRI-M 4235; on dying foliage and twigs of *Cupressus* sp., Chelsea Sugar Refinery surrounds, Birkenhead, North Shore City (AK), 10.vii.2000, J.A.Bartram, NZFRI-M 4237; on dying foliage and twigs of *Cupressus arizonica* Greene, Ngamotu Domain, New Plymouth (TK), 18.xii.1999, B.J.Rogan, NZFRI-M 4078; on dying foliage and twigs of *Cupressus macrocarpa* Hartweg, Devonport Naval Base, North Shore City (AK), 10.vii.2000, J.A.Bartram, NZFRI-M 4238; on dying branch tips of *C. macrocarpa*, Purewa Cemetery, Auckland (AK), 10.vii.2000, J.A.Bartram, NZFRI-M 4234; on dying branch tips of *C. macrocarpa*, Khandallah Park, Wellington (WN), 4.ix.2000, B.J.Rogan, NZFRI-M 4233; on dying branch tips of *Juniperus chinensis* Linnaeus, Karori Cemetery, Wellington (WN), B.J.Rogan, 5.ix.2000, NZFRI-M 4274; on dying branch tips of *Thuja plicata*, Government Gardens, Rotorua (BP), 9.i.2001, M.A.Dick, NZFRI-M 4384.

New Zealand distribution: Auckland (7), Bay of Plenty (1), Taranaki (1), Wellington (2), Nelson (2), Buller (1).

The morphological characters and hosts of the seven *Phyllosticta* species recorded on coniferous hosts are given in Table 3.

The New Zealand taxon can be distinguished from *P. abietis* and *P. acicola* by its longer conidia and wider ostiole, from *P. cryptomeriae* by the length of the appendage, from *P. multicorniculata* by the single appendage, from *P. pini* by the bigger conidia, and from *P. thujae* by its greater pycnidium width and wider ostiole. It agrees closely with the description of *P. spinarum*, although the conidia of the New Zealand species are wider and slightly longer.

Although the first record of this fungus (on *Cryptomeria japonica* from Westport) dates back to 1995, no more specimens of *P. spinarum* were received in this laboratory until mid-1999. Most of the new records were from the North Island, which probably reflects greater

TABLE 3–Morphological characters and hosts of species of *Phyllosticta* recorded on conifers

Species	Host	Pycnidium width (μm)	Ostiole diameter (μm)	Conidiogenous cells (μm)	Conidia (μm)	Appendage (μm)
* *P. abietis*	*Abies grandis*	80–150	7–18	5–14	7–12 × 7–8	2–5, single
* *P. acicola*	*Araucaria* sp.	75–155	9–20	5–13	6–12 × 4–7	5–17, single
† *P. cryptomeriae*	*Cryptomeria* sp.	–	–	–	10–13 × 7–10	15–30, single
* *P. multicorniculata*	*Abies* spp.	150–260	5–11	4–14	10–14 × 9–11	1–7, 2–5 in number
‡ *P. pini*	*Pinus* spp.	-	-	-	9–12 × 5–7	4–7, single
* *P. thujae*	*Thuja* spp.	80–160	8–15	6–17	7–15 × 5–7	5–13, single
§ *P. spinarum*	*Juniperus* sp.	140–200	20–30	6–15	8–14 × 6–8	7–17, single
Our species	Cupressaceae	140–200	20–30	4–10	12–17 × 8–10	6–10, single

* Bissett & Palm (1989)
† Kobayashi & Sasaki (1975)
‡ Sivanesan (1979)
§ Nag Raj (1993)

collecting activity. *Phyllosticta spinarum* is associated with minor dieback which is often limited to the lower part of the crown.

Septoria alnifolia Ellis & Everhart 1894

Proceedings of the Academy of Natural Sciences of Philadelphia, part 3: 366.

Conidiomata pycnidial, epiphyllous, immersed, 90–150 μm wide, 50–70 μm high in cross section. Pycnidial wall 10–20 μm thick, composed of irregular pale brown cells. Conidiogenous cells holoblastic, hyaline, lageniform, 12–15 μm long. Conidia hyaline, cylindrical, curved, 2–5 septate, base truncate, apex rounded, 25–51 μm × 2.5–4.5 μm. (Illustrated by Constantinescu (1984) p. 387)

Specimens examined: on necrotic leaf spots on leaves of *Alnus rubra* Bongard, Butcher's Boundary Road, Kaingaroa Forest (BP), 16.ii.1990, D.J.Hayes, NZFRI-M 4100; on leaves of seedlings of *A. rubra*, Timberline Nursery, Hokitika (WD), 14.iv.1994, D.McIntosh, NZFRI-M 4103; on leaves of *A. rubra*, Marlborough Park, North Shore City (AK), 19.iii.2000, C.F.Hill, NZFRI-M 4102.

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

Leaf spots circular to irregular, pale brown with a dark brown margin, individually up to 10 mm in diameter but covering large areas (90 × 2–4 mm) when coalesced.

Constantinescu (1984), who adopted a broad generic concept and basically morphological approach to species delimitation, accepted six species of *Septoria* on members of the Betulaceae. Of these, two (*S. alni* Saccardo and *S. alnifolia*) have been recorded from *Alnus*. *Septoria alnifolia* is distinguished from *S. alni* in occasionally having annellidic condiogenous cells in addition to the usual sympodulae and by its wider conidia (>2 μm in *S. alnifolia*, 1–2 μm in *S. alni*) which have rounded apices (sub-acute in *S. alni*). Annellidic condiogenous cells were not seen in our specimens but the conidia conform to those of *S. alnifolia*.

Septoria alnifolia is regarded as a minor pathogen although it has been occasionally associated with severe defoliation of individual trees. In addition to *Alnus rubra*, it has also been recorded on *A. rhombifolia* Nuttall (Constantinescu 1984).

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