Notes on the Lichens and Allied Fungi of British Columbia. II

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Abstract. Based on field studies and herbarium research, 46 species of lichens and lichenicolous fungi are reported new to British Columbia. The following 15 species are documented for Canada for the first time: Agonimia tristicha, Catapyrenium dacaleum, Cladonia luteocolla, Collema auriforme, Dactylospora lobariella, Fulgensia desertorum, Massalongsia microphylliza, Pannaria ahni, Petulina cuploca, Physcia callosa, Psora montana, Sicta wrightii, Usnea wirthii, Vester grenopis eclea, and Xanthoparmelia planiloba. An additional nine species are new to North America north of Mexico: Acrocyphon sphaerophoroides, Bistoreopsis usnaream, Hawksworthiana peligeroica, Leptogium brevissomii, L. schraderi, Lichenorhiza thallina, Scutula miliaris, Sphaerelothecium araneosum, and Trapelin corticola.

Recent herbarium studies and field work in British Columbia have brought to light several lichen species that are new to the province, including a number of species also new to Canada or North America. The following list supplements the checklist of Noble et al. (1987), and continues the series initiated by Goward and Thor (1992).

In the following list lichenicolous fungi are denoted by an asterisk (*).

ACROCYPHON SPHAEROPHOROIDES Léveillé—The ecology of this widespread, but apparently rare, lichen was recently summarized by Tibell (1984), who characterized it as occurring over rock in alpine habitats. Though the ecology of one of the two British Columbia specimens conforms with this description, the other, cited below, occurred "on top of and more or less encrusting the dead leader of a stunted Sitka Spruce, alone in a fen bordering a lake" (Jim Pajar, in litt.). The present report extends the known range of A. sphaerophoroides in the northern hemisphere from 43°N (Hokkaido) to 54°N; in North America it was previously known only from Mexico (Tibell 1984). New to North America, north of Mexico: Iksheenich River Basin, Amoth Lake, 70 km NE Prince Rupert, 420 m, 54°47'N, 129°36'W, Pajar s.n. (H, UBC, UPE). Agonimia tristicha (Nyl.) Zahlbr. — This lichen appears to be rather common as an epihyte of moss over calcareous outcrops in drier portions of the southern interior of British Columbia. In western North America it was previously reported only from Colorado (Anderson 1962), though an additional specimen was seen by us from Oregon (Goward 90-144). New to Canada: Okanagan River Basin, 1 km W Osoyoos, 500 m, 49°02'N, 119°27'W, Goward 91-402 (UBC).

ANAFCYCHIA SETIFERA Rääßen—Though presently known from only two localities in British Columbia, A. setifera is nevertheless a dominant epihyte of Picea in the lower valley of the Tatshenshini River, where it is apparently favored by wind-blown lime dust originating from the adjacent floodplain. In western North America this species was previously reported (as A. kaspica Geyl.) only from Alaska (Krog 1968). No lichen substances were detected by TLC. New to British Columbia: Tatshenshini River Basin, near confluence with Basement Creek, 200 m, 59°27'N, 137°27'W, Goward 92-531 (CANL, UBC).

ASPICILLIA REPTANS (Logman) Wetm.—This is a rather common species of treeless wind-swept ridges at lower elevations in the semi-arid interior of British Columbia. The local material conforms well with the type specimen in WSI (McCune, pers. comm.). Previous reports in western North America are from Idaho (McCune, unpubl.), North Dakota (Wetmore

**Biatropis usnearum Räsänen**—This cosmopolitan lichenicolous heterobasidiomycete is common over much of its range (Diederich & Christiansen 1993). It forms pale pinkish to dark brown convex gall-like basidiomata on the thallus of various Usnea species. New to North America: Thompson River Basin, 0.5 km S Philip Creek, 650 m, parasitic on Usnea barbata s.l., 51°52'N, 120°01'W. Goward 91-13 (UBC).

**Catapyrenium cinereum** (Pers.) Körber—See the discussion under C. daeadulum. The specimen reported here was tericolous over an alpine limestone outcrop. New to British Columbia: Aletsch River Basin, 18 km N confluence with Tatschsheni River, 1,100 m, 59°44'N, 137°45'W, Goward 92-476 (UBC).

**Catapyrenium daeadulum** (Krempelh.) B. Stein—The specimen upon which the present record is based was previously reported (Goward & Thorp 1992) as *C. cinereum*; the determination was revised by O. Breuss. Thomson (1989) comments on the morphological resemblance of these two species. Previous records of *C. daeadulum* from western North America are from Colorado and Wyoming (Thomson 1989), as well as from Utah (St. Clair et al. 1993). New to Canada: Thompson River Basin, Cook Creek, mossy south-facing slope above Surprise Lake, 1,700 m, 52°10'N, 119°20'W, Goward 79-1427 (Goward).

**Catapyrenium squamulosum** (Ach.) O. Breuss—This species was recently reported as new to British Columbia on a specimen from Wells Gray Provincial Park (Goward & Ahti 1992). Dr. O. Breuss subsequently examined the material and referred it to "Psora s.l." The following specimen was, however, assigned by Dr. Breuss to *C. squamulosum*. New to British Columbia: Fraser River Basin, 25 km SW Williams Lake, tericolous over limestone summit of Doc English Bluffs, 700 m, 51°55'N, 122°07'W, Goward 81-2163 (UBC).

**Chesaethica cinerea** (Pers.) Tibell—Though previously reported for North America from Ontario and Michigan (Tibell 1980), *C. cinerea* was overlooked by Egan (1987) in his checklist of North American lichens. The British Columbia material is corticolous over *Populus trichocarpa* in a humid, old-growth conifer forest in the Interior Cedar-Hemlock Zone. New to British Columbia: Thompson River Basin, S end of Clearwater Lake, near boat launch, 650 m, 52°08'N, 120°12'W, Goward 79-1395 (Goward).

**Cladonia lutaeolba** Wheldon & A. Wilson—Based on Wilson and Wheldon (1909), the author citation is usually given as "C. lutaeolba A. Wilson & Wheldon," though actually the first valid description appeared two years earlier in Wheldon and Wilson (1907). This is a primarily sterile, nonpodeiate species, easily recognized by its large revolute squamules and fine, pale lemon-yellow spongy tissue (Stenroos 1960). The local material contained usnic, barbatic, and 4-O-demethylbarbatic acids (TLC). In North America *C. lutaeolba* has previously been reported from Alaska (Dahl & Krog 1970), Idaho (Stenroos 1990), and Montana (DeBolt & McCune 1993). The material cited below is representative of two localities in the south-central interior of British Columbia. Both specimens were collected from mossy rock crevices. New to Canada: Columbia River Basin, Kokanee Glacier Provincial Park, Jocker Creek, 1,500 m, ca. 49°50'N, 117°10'W, M. Bell & J. Davison s.n., 1957 (UBC).

**Collema auriforme** (With.) Coppins & Lauden—The present material conforms well with authentic European specimens but the record is nevertheless suspect owing to a possible error in labeling; Macoun's collections are notorious in this regard (Godfrey 1977). In North America, *C. auriforme* was previously reported only from Alaska (Degelius 1974). New to Canada: Vancouver Island, Victoria (Burnside Road), J. Macoun s.n., 1893 (CANL).

**Dactylolepora lobariella** (Nyl.) Haelln—This lichenicolous ascomycete is known from several different species of Lobaria. The present material occurred on *L. pulmonaria*. In North America *D. lobariella* has previously been reported only from the state of Virginia (Haellner 1979). New to Canada: Skeena River Basin, 16 km NE Terrace, Cleanza Creek Provincial Park, humid coniferous forest, 50 m, 54°55'N, 128°23'W, Goward 91-1049 (UBC).

**Endocarpon pulchrum** Ach.—This species was reported from British Columbia by Henssen 1963b but inadvertently omitted from both the British Columbia and North American checklists.

**Fulgensia desertorum** (Tomlin) Poelt—This is a calciphilous terricole hitherto recorded in North America from Colorado (Poelt 1971), Idaho (McCune, unpubl.), and Arizona and Utah (St. Clair et al. 1993). The British Columbia material is fertile and contains two-celled spores. New to Canada: Okanagan River Basin, Okanagan Mountain Provincial Park, Commando Bay, 350 m, tericolous over exposed silt terrace, 49°42'N, 119°42'W, Goward 92-216 (UBC).

**Hawsworthia peligericola** (D. Hawksw.) U. Braun (Syn.: Ramularia peligericola D. Hawksw.)—This rare hyphomycete occurs on various Peligera species. It was previously reported only from the British Isles and Luxembourg (Diede-
rich et al. 1988). New to North America: Thompson River Basin, S end Clearwater Lake, 700 m, over P. praetextata in open, mixed forest, 52°16′N, 120°14′W, Goward 79-1383 (UCB).

HEPIA LUTOSA (Ach.) Nyl. — This lichen is widely distributed in temperate North America. Wetmore (1971) reported it from all western states except Idaho, Oregon, and Washington, but including Alaska, where it is known from a single locality. In Canada it was previously reported only from Saskatchewan (Looman 1962). The specimen cited below is representative of two localities in the semiarid southern interior of British Columbia. New to British Columbia: Thompson River Basin, 5 km E Kamloops city center, 450 m, 50°40′N, 120°11′W, Rosentretter 6349 (SRP, UBC).

HYPOCENOMYCE CASTANEOCINEREA (Räsänen) Timdal—Though previously reported in North America only from Arizona and Washington (Timdal 1984), H. castaneocinerae is common in humid portions of British Columbia, where it colonizes charred wood. New to British Columbia: Vancouver Island, Stamp River Falls, 200 m, 49°20′N, 123°55′W, Goward 91-628 (UBC).

*ILLOSPORIUM CARNEUM* Fr.—This common and widespread hyphomycete occurs on various *Peltigera* species. The following record, on *P. didactyla*, is representative of several collections from southern British Columbia. In Canada *I. carneum* has previously been reported from Ontario (Hawkesworth 1979). New to British Columbia: Squamish River Basin, Whistler, 700 m, 50°08′N, 123°00′W, Goward 90-1271b (GOWARD).

LECANORA MUGHICOLA Nyl.—This lichen was reported for British Columbia by Brodo et al. (1987) but did not appear in the British Columbia checklist of Noble et al. (1987).

LECANORA PERSIMILIS (Th. Fr.) Nyl.—This lichen was previously reported for British Columbia by Brodo et al. (1987) but did not appear in the British Columbia checklist of Noble et al. (1987).

LICIOPTHISSMA FINMARKICUM Th. Fr.—This is primarily an arctic species (Thomson 1984), notwithstanding that Ryan (1985) recently reported it from northern Washington. The British Columbia material derives entirely from the northwestern portion of the province, where this species is apparently rather common over most limy soils at subalpine elevations. New to British Columbia: Tatshenshini River Basin, over exposed heath, opposite confluence with Basement Creek, 900 m, 59°28′N, 137°30′W, Goward 92-533 (UBC).

LEPTOGIUM BREBissoni Mor. — This species is anomalous among the local Leptogium in possessing a very thick, gelatinous thallus more reminiscent of *Collema* than of *Leptogium*. The material cited below, from *Rhamnus purshiana*, is representative of two collections from the very humid outer coast of British Columbia. New to North America: Vancouver Island, Ucluelet, 5 m, 48°55′N, 125°35′W, Goward 83-230 (UBC).

LEPTOGIUM SCHRADERI (Ach.) Nyl.—This tiny, heavily wrinkled, essentially fruticose species appears to be a rare lichen of mossy soil in the semiarid southern interior of British Columbia. Though Egan (1987) considers previous reports of *L. schraederi* for North America to be erroneous, P. M. Jorgensen (in litt.) assures that the present record is correct. New to North America: Okanagan River Basin, slope above Waterdog Lake, E Okanagan Lake, 350 m, 49°04′N, 119°26′W, Goward 91-214 (UBC). An additional specimen has been seen by us from Utah (Rosentretter 6505, UBC).

*LICHENOCHORA THALLINA* (Cooke) Hafellner—This ascomycete is very common in Europe on *Phaeophyscia orbicularis*, but has also been collected on *Physcia* as well as on other species of *Phaeophyscia*. The present record, from *Phaeophyscia scista*, represents a new host for this species. New to North America: Thompson River Basin, N shore of Murtle Lake, 1,000 m, 52°06′N, 119°40′W, Goward 78-704a (UBC).

*LICHENOSTICTA ALCICORNARIA* (Lindsay) D. Hawksw.—This common coelomycete occurs on *Cladonia*, and was previously reported for North America (Newfoundland) by Keissler (1910). The present record is from *C. bocyllarlis* Nyl. New to British Columbia: Fraser River Basin, Richmond (Burns Bog), ca. 30 m, 49°10′N, 123°20′W, Goward 82-238 (UBC).

MASSALONGIA MICROPHYLLIZA (Nyl. ex Hasse) Henssen—Originally described from California (Hasse 1913), *M. microphylliza* has not hitherto been reported outside that state (Henssen 1963a). Its occurrence in the semiarid southern Okanagan Valley of British Columbia suggests that it may be more widespread than previously thought. Whereas previous material was collected over soft sandstone (Henssen 1963a), the two collections from British Columbia occurred on thin soil over rock. New to Canada: Okanagan River Basin, near Wolfech Creek, 400 m, 49°11′N, 119°28′W, Goward 91-240a (UBC).

PANNARIA AHNERTI P. M. Jorg. — Though rather common over conifer twigs along the humid inner north coast of British Columbia, *P. ahnereti* has hitherto been reported for North America only in the east (Jorgensen 1978). New to Canada: Skeena River Basin, 7 km NW of Kispiox, near Date Creek, 450 m, 53°19′N, 127°47′W, Goward 91-936 (UBC).

PeltulA EUPOILOCA (Ach.) Ozenda & Clauz.—According to Wetmore (1971), *P. eupoica* has a primarily “arid southwestern distribution in North America”; it is also known, however, from southwestern Idaho (McCune, unpubl.), eastern Wash-
ington (Rosentretre, unpubl.), and central Washington (Wetmore 1971). In British Columbia it appears to be restricted to the southern portions of the semiarid Okanagan Valley, where it is rather rare over south-facing vertical granitic outcrops. New to Canada: Okanagan River Basin, Mud Lake, S Vaseux Lake, 340 m, 49°14′N, 119°32′W, Goward 91-365 (UBC).

Physciophyllum hispidula (Arch.) Essl.—The present material consists of two specimens, one from mossy soil over a cliff face, and the other from Salsify. These appear to represent different subspecies, i.e., subsp. hispidula and subsp. limbatum Poelt respectively. In western North America P. hispidula was previously reported from Arizona, Colorado, New Mexico, and South Dakota (Esslinger 1978), as well as from Utah (Nash & Sigal 1981). New to British Columbia: subsp. hispidula: Fraser River Basin, 30 km W Queene, 340 m, 52°58′N, 122°47′W, Goward 81-1537 (UBC); subsp. limbatum: Liard River Basin, Toad River, 700 m, 58°51′N, 125°15′W, Goward 82-1390c (UBC).

Physcia callosa NyL.—Thomson (1963) characterized P. callosa as a “distinctly western species, ranging from Colorado south to Texas and west to California and Oregon.” The present record, based on two specimens, extends that range north into the semiarid southern Okanagan valley of British Columbia, where it is rare over sheltered granitic outcrops. New to Canada: Okanagan River Basin, Mud Lake, S Vaseux Lake, 340 m, 49°14′N, 119°32′W, Goward 91-365 (UBC).

Poeltinula cerebrina (DC.) Hafellner—This lichen was tentatively reported from British Columbia by Brodo et al. (1987) but did not appear in the ensuing British Columbia checklist (Noble et al. 1987).

Psora montana Timd—This western North American endemic was previously reported from Colorado, Montana, Oregon, Utah, Washington, and Wyoming (Timdal 1986). The specimen cited below is representative of several collections from the semiarid interior of British Columbia, north to 52°N. Though chemically consistent with P. montana, much of this material is morphologically very close to P. pacifica Timd (Timdal, in litt.). New to Canada: Okanagan River Basin, SE of Osoyoos on S slopes of Anarchist Mountain, ca. 800 m, 49°02′N, 119°23′W, Goward 90-552 (UBC).

Psora rubiformis (Arch.) Hook.—Notwithstanding that earlier reports of this species in British Columbia appear to have been based on misidentified specimens of P. nipponica (Zahlbr.) G. Schneider, recent collections from the northwestern corner of the province clearly belong to P. rubiformis. In western North America P. rubiformis was previously reported from Alaska, Colorado, and the Yukon (Timdal 1986), New to British Columbia: Tatshenshini River Basin, unnamed mountain N of Siments Creek, ca. 1,600 m, 59°43′N, 137°19′W, Goward 92-965 (UBC).

Scutula miliaris (Walt.) Trevisan—This ascomycete is common in Europe on various Peltigera species. In British Columbia it has been collected on P. canina (present record) and P. lepidophora. New to North America: Thompson River Basin, near Helmcken Falls (Murtle River), 700 m, 51°57′N, 120°11′W, Goward 80-598 (UBC).

Solorinella asteriscus Anzi—Though widespread in Europe (Ahlner 1949), S. asteriscus was hitherto reported in North America only from southwestern Alberta (Bird 1973). The specimen cited below is representative of two collections from the semiarid southern interior of British Columbia. Both occurred over soil in undisturbed grassland communities. New to British Columbia: Thompson River Basin, 5 km E Kamloops, Valleyview, 450 m, 50°40′N, 120°11′W, Rosentretre 6354 (SRP, UBC).

Sphaerellothecium araneum (Rehm ex Arnold) Zopf—This ascomycete forms a superficial dark brown mycelium on the thallus of several unrelated groups of lichens, including, for example, Ochrolechia and Parmelina s.l. The perithecia measure only about 50 μm in diameter, and may therefore be difficult to observe. In British Columbia S. araneum has been observed on Xanthoparmelia coloradoensis (present record), X. cumberlandia, and X. wyomingica: all of these represent new hosts for this species. New to North America: Thompson River Basin, 15 km WNW Kamloops city center, Dewdrop Range, 1,000 m, 50°47′N, 120°34′W, Goward 88-120 (UBC).

Sticta wrightii Tuck.—This is primarily an Asian species (see Wei 1992), previously reported in North America only from coastal Alaska (Krog 1968). It may be characterized as an ascending, nonsorciad, nonsinistral species, with a green photobiont, a K+ upper cortex, and somewhat lobulate lobe margins. According to Yoshimura (1974), the Japanese material also gives a K+ medullary reaction, though in the local material the medulla is clearly K−. On the other hand, Gylén (1931) reports that the upper cortex in this species is K+ yellow! The single British Columbia specimen comes from the east-central interior, where it occurred over Tsuga heterophylla in an open old-growth forest. New to Canada: Fraser River Basin, 80 km NW McBride, Slim Creek, ca. 800 m, 53°39′N, 121°12′W, Goward 93-1214 (UBC).

Toniina candida (Web) Fr.—In North America T. candida is restricted to the western states and provinces, having been reported by Tiroldal (1991) from Alberta, Arizona, Colorado, Montana, Nevada, New Mexico, South Dakota, Utah, and...
Wyoming. Though previous reports for British Columbia were considered unreliable by Noble et al. (1987), T. candida does in fact occur here over limestone outcrops in semi-arid regions. New to British Columbia: Chilcotin River Basin, 25 km SW of Williams Lake on Doc English Bluff, ca. 675 m, 51°55'N, 122°07'W, Goward 81-2150 (UBC).

Toniinia Tristis (Th. Fr.) Th. Fr.—The local material represents subsp. asiatica-centralis (Magnusson) Timdal, which was recently reported to be widespread in western North America, from Alaska and the Northwest Territories to New Mexico and Arizona (Timdal 1991). The two British Columbia specimens were collected from limestone outcrops in the semi-arid southern interior. New to British Columbia: Chilcotin River Basin, 25 km SW of Williams Lake on Doc English Bluff, ca. 675 m, 51°55'N, 122°07'W, Goward 81-2157b (UBC).

Trapaelia CORTICOLA Coppens & P. James—This lichen, the only corticolous member of its genus, was previously reported from western Europe (Coppens & James 1984; Tønsberg 1992), Macaronesia, and Chile (Purvis et al. 1992). The single British Columbia specimen was corticolous over Picea sitchensis in an open, forested, seaside meadow. New to North America: Vancouver Island, Brooks Peninsula, outlet of Nasport Creek, 0-10 m, 50°07'N, 127°37'W, on Picea sitchensis, Thor 9937 (s).

Trapaelia viridis (Schrad.) Coppens & P. James—This is a colonizer of decaying wood. In western North America it was previously reported from Alaska and Arizona (Brodo 1968), as well as California (Tucker & Jordan 1978). New to British Columbia: Clearwater River Basin, southern Wells Gray Provincial Park, Placid Lake trail, 700 m, 51°56'N, 120°06'W, Rosenreuter 6320 (snp).

Umbilicaria aprina Nyl.—Though apparently rare throughout its range, U. aprina has been reported from every continent except Australia (Elvsbakk & Tønsberg 1992). In North America it was previously reported from Baffin Island in the North-west Territories (Hale 1954). The single British Columbia specimen, from a somewhat sheltered siliceous boulder bed above tree-line, conforms well with the Baffin Island material, which was later described by Lano (1956) as var. lala Lano. Subsequent authors, however, have stressed the morphological heterogeneity of U. aprina (e.g., Hestmark 1990). New to British Columbia: Liard River Basin, 3 km E of Summit Lake, ca. 1,850 m, 58°37'N, 124°50'W, Goward 82-1287 (UBC).

Umbilicaria cinereorufescens (Schwent.) Frye—This is a taxonomically somewhat problematic lichen (Lano 1950); several British Columbia specimens were seen which might be interpreted as transitional between U. cinereorufescens (pruinose sparsely) and U. vellea (L.) Ach. (pruinose dense). The specimen cited below, from a rock outcrop in the alpine zone, is perhaps the most convincing local record. Umbilicaria cinereorufescens was previously reported in North America from Alaska, Arizona, and the Yukon (Thomson 1984). New to British Columbia: Liard River Basin, near Kutchuk Creek, 1,600 m, 58°15'N, 128°38'W, Rosie 543 (CAN).}

Usnea Wirthii Clerc—This lichen was recently reported from western North America by Clerc and Diederich (1991), who characterized it as occurring along the Pacific coast “from southern California to Washington State.” The specimen cited below is representative of about a dozen British Columbia collections, north at least to the Queen Charlotte Islands (Brodo, pers. comm.). New to Canada: Vancouver Island, Ucluelet, sheltered bay, ca. 5 m, 48°55'N, 125°32'W, Goward 82-1800 (UBC).

Vestergrennisisjella Ina (Wahlenb. in Ach.) Gyelnik—This lichen was previously reported for North America on the basis of a single specimen from Alaska (Thomson 1984). However, it appears to be rather common over intermittently wetted siliceous and calcareous rock at alpine and subalpine elevations in extreme northwestern British Columbia. New to Canada: Tatshenshini River Basin, Range Lake, 1,100 m, 59°25'N, 137°50'W, Goward 92-871 (UBC).

Xanthoparmelia planilobata (Gyelnik) Hale—The British Columbia specimens conform chemically and morphologically with X. planilobata, differing only in having slightly broader lobes and a more densely rizinate lower surface than was described for that species by Hale (1990). The specimen cited below is representative of two collections from the semi-arid interior of the province. New to Canada: Okanagan River Basin, S slope of Anarchist Mountain, ca. 500 m, 49°01'N, 119°24'W, Goward 90-942 (UBC).

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Literature Cited


WETMORE, C. M. 1970(1971). The lichen family Hep-


