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A FLORISTIC ACCOUNT OF THE BRYOPHYTES OF BATHURST ISLAND, ARCTIC CANADA

NORTON G. MILLER[1] AND ROBERT R. IRELAND[2]

SUMMARY

Based primarily on collections made by the authors in 1973 and 1974, the bryophyte flora of the central part of Bathurst Island (ca. 75°43′N, 98°25′W), Northwest Territories, Canada, is reported to consist of 21 species of Hepaticae (including 4 represented by varieties) and 112 species of Musci (11 of which are represented by one or more varieties). The flora of the entire island is known to consist of 131 species of Musci. This is the first report of liverworts for Bathurst Island, and 55 moss taxa are here reported as new to the flora. *Bryum algovicum* var. *rutheanum* (Warnst.) Crundw. is new to North America and *Bryum aeneum* Blytt *ex* B.S.G., *Cephaloziella uncinata* Schust. *in* Schust. & Dams., *Drepanocladus sendtneri* (Schimp.) Warnst., *Metacalypogeia schusterana* Hatt. & Mizut., *Orthothecium chryseum* var. *cochlearifolium* (Lindb.) Limpr., *Orthotrichum jamesianum* Sull. *ex* James, *Pterygoneurum ovatum* (Hedw.) Dix., and *Seligeria campylopoda* Kindb. *ex* Mac. & Kindb. are reported as new to the Queen Elizabeth Islands. Because geological evidence indicates that the study area was freed of ice or marine waters only relatively recently, the two mainly temperate zone mosses found in the area, viz. *Pterygoneurum ovatum* and *Seligeria campylopoda*, are viewed as postglacial immigrants rather than indicating the presence of iceless areas on the island during the Pleistocene.

INTRODUCTION

The authors spent approximately five weeks in 1973 and 1974 studying bryophytes in the central portion of Bathurst Island in the vicinity of the National Museum of Natural Sciences High Arctic Research Station. Collecting was carried out by the senior author from June 28–July 22, 1974, and by the junior author from July 17–23, 1973.

Location. Bathurst Island is located in the south-central part of the Queen Elizabeth Islands, Northwest Territories, Canada (see maps). All of the collecting was done within an 8 km radius of a permanent research station established by the National Museum of Natural Sciences, National Museums of Canada. The station is situated 16 km west of Goodsir Inlet (75°43′N, 98°25′W) on a bluff overlooking the Goodsir River.

Previous Studies. Although we are the first bryologists to collect mosses and liverworts on Bathurst Island, there have been three other researchers who have made significant contributions toward understanding the bryoflora of the island. In 1961 a small collection of mosses was made by J. S. Tener and C. R. Harington near Bracebridge Inlet on the western coast of the island (75°09′N, 99°44′W). A much larger collection of mosses, including peat samples containing subfossil moss fragments, was made by W. Blake, Jr. in 1963 and 1964 from

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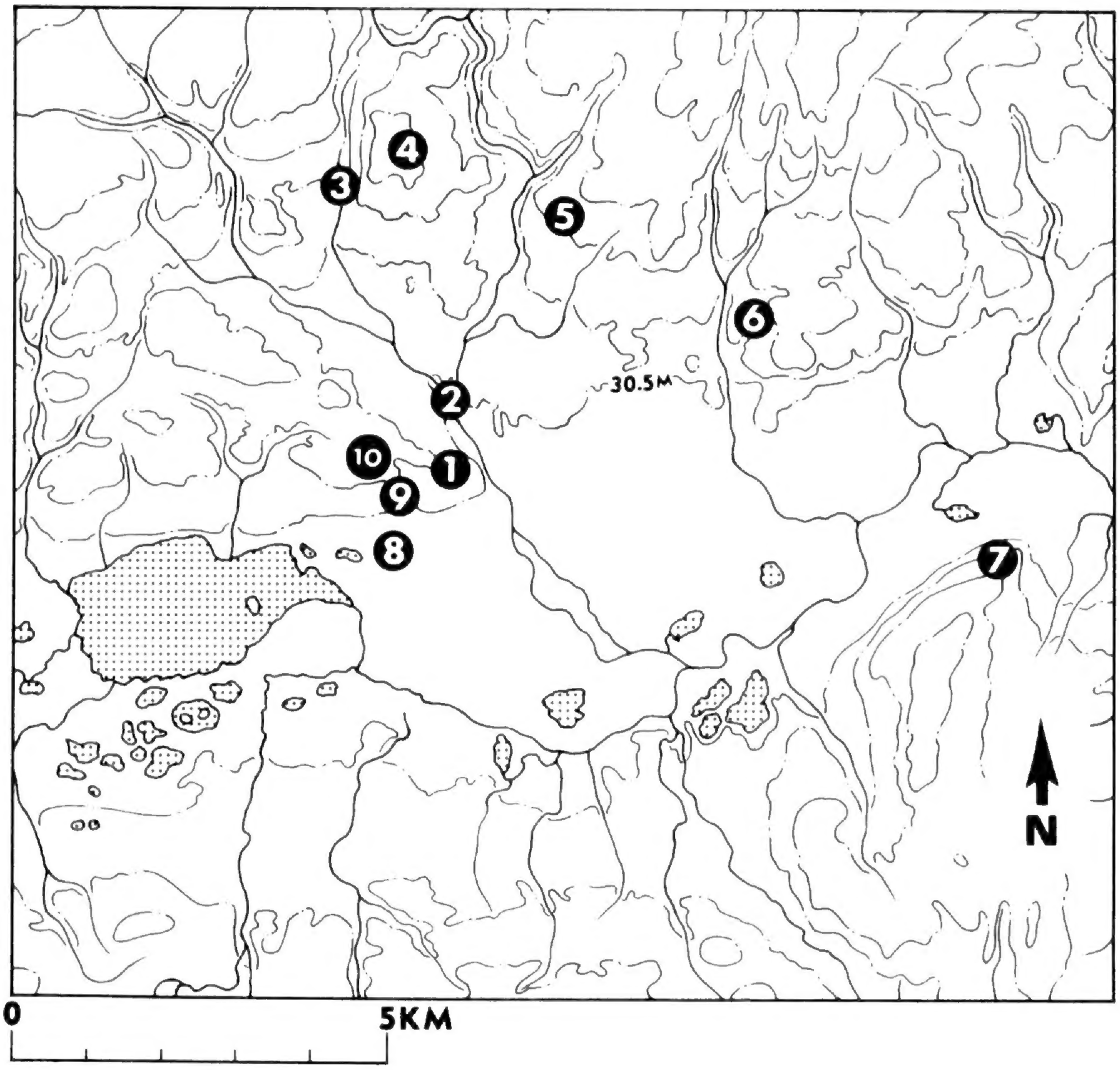
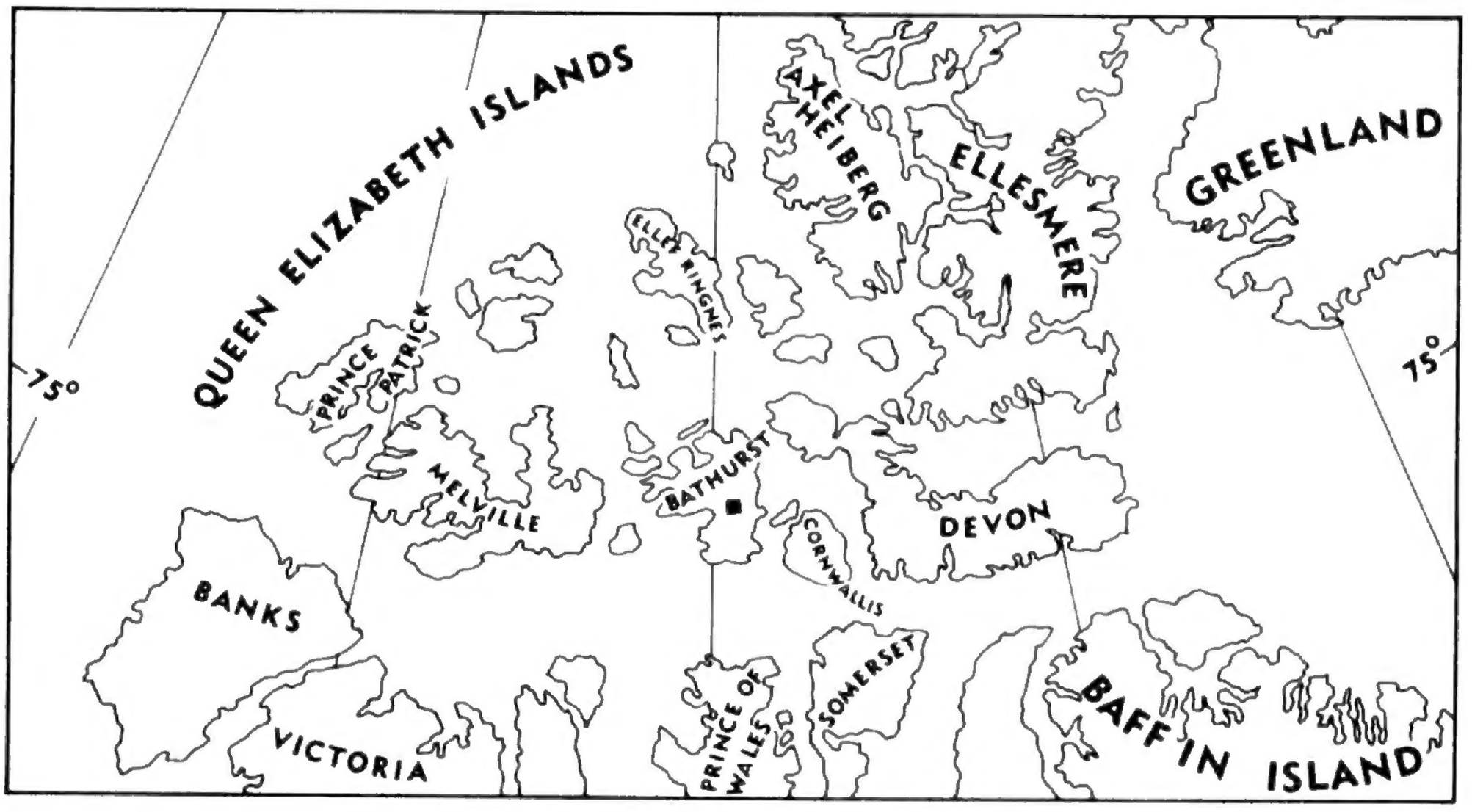




(**upper**) Map of central Bathurst Island with collecting localities indicated (base redrawn from McDougall Sound Quadrangle, Army Survey Establishment, Ottawa); (**lower**) location of Bathurst Island and study area (**black square**) in the Canadian Arctic Archipelago.

20 localities spread throughout the island, as well as some of the smaller surrounding islands (Loney, Lowther, Massey, Moore). One of Blake's collecting sites was at ca. 75°43′N, 98°29′W, which is just west of the NMNS Research Station. All collections made by these researchers were reported on by Brassard and Steere (1968). Many of the specimens cited are in the herbarium of the Museum of Natural Sciences (CANM), including those specimens originally at DAO which came to the Museum by donation in 1973.

Topography and Soil. The Research Station is on a plateau overlooking a broad valley that extends eastward and westward. The valley meadowland is dotted by small lakes and tundra ponds, and the Goodsir River and a number of small creeks meander through it. The land to the north rises to a number of hills and plateaus that scarcely reach above 150 m. Persisting snowbanks are sometimes present, but no glaciers occur in the area nor anywhere on the island.

Most soil in the vicinity of the Research Station is decidedly calcareous. Limestone, dolomite, calcareous or dolomitic shale and siltstone, Ordovician to Devonian in age, comprise the bedrock of the area (Kerr, 1974). Along the Goodsir River occur gravel beds and adjacent clay, silt, and sand banks, and otherwise much of the valley is mantled with Quaternary deposits. While a few tundra ponds and peat hummocks in the area are acidic, there was only one acidic boulder (gneiss or granite) seen by either of us on the collecting forays. No bryophytes were found on it.

Climate. Weather data gathered at the Station show that mean daily temperatures in general are above freezing only during June, July, and August (Table 1). Snowmelt normally begins in June and by mid-July the ground is bare except for persisting snowbeds. Snow again covers the ground beginning early in September. At Resolute on Cornwallis Island, the nearest station with a long-term meteorological record, mean annual precipitation was 13 cm during the period 1951 to 1960 with the greatest amount in any year falling from June to October. Precipitation measurements at the Research Station averaged 6.1 cm for the three warmest months of each year during the period 1973 to 1975.

Collecting Localities. The numbers on the map correspond to the collecting localities listed and described below. A complete set of Ireland's collections is in CANM and that of Miller is in FH.

1. Base camp and nearby areas:
   a. Grounds NMNS base camp. 7 July 1974 (*Miller*, #7522)
   b. Rivulets, frost wedges, moist limy soil, slope immediately east of base camp. 28–30 June, 2 July 1974 (*Miller*, #7359–7429, 7466–7468)
   c. Along Goodsir River, ca. 0.4 km southeast of base camp. 1,

TABLE 1. SELECTED WEATHER DATA, NMNS HIGH ARCTIC RESEARCH STATION, BATHURST ISLAND, N.W.T.[1]

	1973 Mean Temperature °C				1974 Mean Temperature °C				1975 Mean Temperature °C			
	max.	min.	daily	Precip. (cm)*	max.	min.	daily	Precip. (cm)*	max.	min.	daily	Precip. (cm)*
May	−7.8	−14.7	−11.2	0.48	−9.4	−16.7	−13.1	1.02	—	—	—	—
June	4.0	−0.9	1.6	3.28	−1.8	−7.9	−4.9	0.86	4.8	0.6	2.7	0.58
July	8.1	2.6	5.4	1.73	6.4	0.6	3.8	2.51	5.6	−1.3	3.1	1.60
August	5.7	1.1	3.4	2.16	5.4	−0.1	2.7	3.07	4.2	−1.4	1.4	2.49
September	−2.3†	−6.8†	−4.5†	2.06†	2.4§	−6.8§	−4.6§	1.78§	—	—	—	—

[1]Data from Monthly Record, Meteorological Observations in Canada. Environment Canada.
*Water equivalent of snowfall included.
†First 24 days of month only.
§First 15 days of month only.

2, 6, 20 July 1974 (*Miller,* #7430–7434, 7456–7465, 7521, 7734)

d. Soil mound used as bird perch, "The Knuckle," ca. 0.4 km west of base camp. 4, 10 July 1974 (*Miller,* #7492–7494, 7571–7577)

e. Wet slope with small, low hummocks, ca. 0.8 km north of base camp. 17 July 1973 (*Ireland,* #16429–16453); 11 July 1974 (*Miller,* #7578–7594)

2. Frost heaved soil mounds and polygon area near confluence of "Jaeger Creek" and Goodsir River, ca. 1.5 km north-northwest of base camp. 19 July 1973 (*Ireland,* #16527–16542); 11, 12 July 1974 (*Miller,* #7595–7614, 7616)

3. "Inca Head" and "Inca Head Valley," exposed limestone and soil, 3.5 km north-northwest to 5.5 km north of base camp. 12 July 1974 (*Miller* #7617a–7652)

4. "Ookpik Hill" and vicinity, ca. 4 km north of base camp. 20 July 1973 (*Ireland,* #16543–16598)

5. "Stonehenge" and vicinity, ca. 3 km northeast of base camp. 18 July 1973 (*Ireland,* #16454–16525)

6. "Davey's Lake" and vicinity, ca. 5 km east-northeast of base camp. 22 July 1973 (*Ireland,* #16628–16678)

7. "Eastwind Point," ca. 6 km east-northeast of base camp. 23 July 1973 (*Ireland,* #16680–16694)

8. Wet tundra meadow east and northeast of "Hunting Camp Lake," 0.8–2.5 km south and southwest of base camp. 21 July 1973 (*Ireland,* #16599–16627); 2–9, 13, 14, 17–20 July 1974 (*Miller,* #7435–7455, 7469–7490, 7495–7520, 7529–7562, 7655, 7656, 7665–7669, 7709–7720, 7726, 7733, 7735)

9. Abandoned beach ridge, 1.2 km southwest of base camp. 7, 13, 15, 18, 20 July 1974 (*Miller,* #7523–7528, 7653, 7654, 7657–7664, 7670–7708, 7721–7725, 7736–7741)

10. Ridge top, ca. 0.8–1.5 km west of base camp. 4, 10, 11, 22 July 1974 (*Miller,* #7491, 7563–7570, 7615, 7742, 7743)

ANNOTATED LIST

The nomenclature of the Hepaticae is basically that of Schuster (1966, 1969, 1974) and the Musci is that of Crum, Steere, and Anderson (1973). An asterisk preceding a species or variety indicates that it is reported as new to Bathurst Island. Collection numbers with five digits are Ireland's; those with four are Miller's.

HEPATICAE

PSEUDOLEPICOLEACEAE

1. **Blepharostoma trichophyllum* (L.) Dumort. (1,4,8)
With *Scapania gymnostomophila,* wet peat mound, tundra meadow,

7547 p.p.; peaty soil between hummocks, *7590*. Soil under limestone ledge, *16546, 16559*. The specimens are referable to subsp. *brevirete* (Bryhn & Kaal.) Schust. which appears to be widespread in the eastern part of the Nearctic.

CALYPOGEJACEAE

2. °*Metacalypogeia schusterana* Hatt. & Mizut. (8)

With mosses on wet peat, tundra meadow, *7545*; with *Aneura pinguis, Cephaloziella arctica, Lophozia* sp., and *Scapania gymnostomophila,* low peat mound, tundra meadow, *7656 p.p.*; with *Myurella julacea* on peat, wet hollow, tundra meadow, *7713*. The plants grew scattered among other bryophytes but were recognizable in the field by their distinctive opaque yellowish color. This is the first report of the species from the Canadian Arctic. It is known otherwise only from west Greenland (Schuster and Damsholt, 1974), where it occurs under conditions similar to those of the Bathurst Island stations, Newfoundland, the type locality in Nova Scotia, and the arctic slope of Alaska. The plants were sterile.

JUNGERMANNIACEAE

3. °*Lophozia quadriloba* (Lindb.) Evs. (6)

Mossy hummock near lake, *16634, 16643*. Both collections contain well-developed plants that are typical of the species growing under mesic conditions. Schuster (1969) cites collections from only two other islands in the Queen Elizabeth group.

4. °*Lophozia rutheana* (Limpr.) Howe (8)

With mosses on wet peat, tundra meadow, *7669a.* The collection is represented by only a few plants which are unusually small and deep red in contrast to larger, greener plants from localities farther south. Brassard's report (1968) from Ellesmere Island is the only other station known to us from the Queen Elizabeth Islands.

5. °*Lophozia gillmanii* (Aust.) Schust. (8)

Wet peat, tundra meadow, *7435* (with perianths); with *Aneura pinguis, Cephaloziella arctica, Metacalypogeia schusterana,* and *Scapania gymnostomophila,* low peat mound, tundra meadow, *7656 p.p.* A number of plants in *Miller 7435* are clearly paroicous, a character of fundamental importance in this species. Perianths from plants in the same collection are variable with some showing a beak and others having the perianth mouth incised and puckered. Both fertile and sterile plants are unusual in having the underleaves fused at the base and to a height of one or two cells with the antical margin the nearest lateral leaf. This feature seems not to have been emphasized with respect to the arctic populations; it is rare (though not unknown) in plants from temperate and boreal areas (however, cf. illustrations

in Schuster, 1969, p. 374). The distribution of the species in the Nearctic has not been fully established.

6. **Lophozia heterocolpos* var. *harpanthoides* (Bryhn & Kaal.) Schust. (1,6)

With mosses on peaty soil, *7581*. With *Odontoschisma macounii*, mossy hummock at margin of lake, *16637a*. Gemmiparous plants were not found. Apart from numerous collections from Ellesmere Island, the frequency of var. *harpanthoides* in the New World High Arctic is unknown.

7. **Lophozia badensis* (Gottsche *ex* Gottsche & Rabenh.) Schiffn. (8)

Wet peat mound, tundra meadow, *7548* (♀), *7549* (with perianths); over peat, edge of fen, tundra meadow, *7661* (with perianths and sporophytes). As has been noted by Schuster (1969), arctic populations of *Lophozia badensis* are difficult to separate from *L. collaris*. The collections cited above have small cells (ca. 28 μm) in the leaf middle, a feature of *L. collaris*, but because the plants lack underleaves and have entire perichaetial leaves, the collections have been referred to *L. badensis*. The plants grew tightly appressed to peat in association with blue-green algae.

8. **Lophozia excisa* (Dicks.) Dumort. *s. lat.* (1)

Silty soil, side of frost heaved mound, *7612* (one young sporophyte seen). The variability of this species in arctic Greenland has been discussed by Schuster and Damsholt (1974) who proposed two new varieties which accompany another one earlier established by Schuster (1969). The Bathurst Island material, though abundant and well-developed, is difficult to place in any variety they recognize. The plants have fleshy, dorsi-ventrally flattened, densely branched stems, and leaves that are polystratose basally. The gemmae are large (35 × 41 μm), bright red, and 2-, 3-, or rarely 4-celled types occur intermixed. Marginal cells of leaves have a tangential width of 23–30 μm; median leaf cells measure 27–30 × 30–40 μm. Mature perianths are broadly ovoid, plicate-furrowed, and have wide mouths. Although apices of mature perianths were too eroded for detailed observation, in young perianths the mouth is unevenly denticulate. The single celled teeth are free for most of their length and are similar in size to cells immediately below. The mature perianths are polystratose (4–5 cell layers) for about one-alf their length. Only one individual in the collection could be shown to be paroicous. The Bathurst Island plants present an intermediate series of morphological features and combine certain characters used to define *L. excisa* var. *succulenta* Schust. & Dams. and var. *elegans* Schust. A detailed evaluation of the *L. excisa* complex in the Arctic is needed, but this must await the availability of more material of the varieties which at present are known from only a few collections. Schljakov (1974) has treated

var. *elegans* as a species of *Massula* and reported a collection of it from the High Arctic of the Soviet Union.

9. °*Lophozia polaris* (Schust.) Schust. & Dams. (1,3,8)

With mosses on peaty soil, *7587*; with mosses, dry slope of shattered calcareous rock, *7620*; over peat, low area, tundra meadow, *7727* (with juvenile perianths). Originally described as a variety of *Lophozia alpestris* from which it differs in having bright red gemmae and an unevenly denticulate perianth mouth (teeth 1–2 cells in length). Both of these features are apparent in the Bathurst Island material. The species was collected at both xeric and mesic sites. Known otherwise in the eastern New World High Arctic from Greenland and Ellesmere Island (Schuster, 1969).

10. °*Lophozia pellucida* Schust. (2,4)

With mosses on wet peat, *7489*; with mosses, tundra meadow, *7616*. This species is common in the central Bathurst Island area where it grows as conspicuous brownish, translucent mats over and among mosses in wet meadows. Lax-leaved plants predominate in such conditions. The gemmae were essentially unpigmented and in general were somewhat smaller in size (23 × 30 μm to 25 × 35 μm) than the measurements given by Schuster (1969) who cites High Arctic collections from only Greenland and Ellesmere Island.

11. °*Tritomaria quinquedentata* (Huds.) Buch (8)

With mosses in low hummock, tundra meadow, *7488*; over peat, low area, tundra meadow, *7726*. Abundant in wet tundra meadows but always growing as scattered plants among mosses. The specimens can be referred to the primarily arctic var. *turgida* (Lindb.) Weimark, which can be identified by its large marginal leaf cells (ave. length, 25 μm) and coarse trigones.

12. °*Solenostoma pumilum* subsp. *polaris* (Berggr.) Schust. (9)

With *Dicranella crispa* at mouth of lemming burrow, *7697* (with perianths and sporophytes). Plants paroicous. Probably widespread in the central Bathurst Island area because sterile but similar appearing plants were encountered at a number of places on raw soil. Schuster (1969) cites numerous collections from Peary Land southward and disjunctively to the Gaspé Peninsula and the upper Great Lakes.

SCAPANIACEAE

13. °*Scapania gymnostomophila* Kaal. (1,3,8)

Among mosses, moist calcareous soil, *7407, 7408, 7411*; with *Blepharostoma trichophyllum*, wet peat mound, tundra meadow, *7547 p.p.*; with *Cephaloziella arctica*, wet peat mound, tundra meadow, *7550 p.p.*; peaty soil between hummocks, *7592*; silty soil, side of frost heaved mound, *7613, 7614*; with mosses, dry slope of shattered

calcareous rock, *7643b*; with mosses over soil at base of limestone ledge, *7645*; with *Aneura pinguis*, *Cephaloziella arctica*, *Lophozia* sp., and *Metacalypogeia schusterana*, low peat mound, tundra meadow, *7656 p.p.* Probably the commonest hepatic encountered and occurring at both wet and dry sites. As in material described from Ellesmere Island by Schuster (1959), the leaves are antically secund, and the plants appear quite unlike those from more temperate areas which have leaves oriented in a flat plane.

PLAGIOCHILACEAE

14. **Plagiochila arctica* Bryhn & Kaal. (1)

With mosses on peaty soil, *7582*. This species may be more abundant in the area than the single collection indicates. The plants grew intermingled with mosses over ± dry soil and were inconspicuous. The characteristic well-developed stolon-like system of leafless branches was evident below the soil surface. The species is widespread on Ellesmere Island and has been reported from elsewhere in the Queen Elizabeth Islands (Schuster, 1959–60).

ARNELLIACEAE

15. **Arnellia fennica* (Gottsche) Lindb. (1,4,8,9)

Among mosses in moist rivulet, *7376*; with *Cephaloziella arctica*, *Ditrichum flexicaule*, and *Meesia uliginosa* on wet peat, tundra meadow, *7519 p.p.*; with mosses among dry limestone cobbles, *7705*. Soil under limestone ledge, *16589 p.p.* Common and in both wet and dry habitats and apparently widespread in the Arctic in calcareous districts.

CEPHALOZIACEAE

16. **Odontoschisma macounii* (Aust.) Underw. (6)

With *Lophozia heterocolpos* var. *harpanthoides*, mossy hummock at margin of lake, *16637a*. Plants light green and growing scattered among mosses. Apparently rare in the area. Numerous stations in Greenland and Ellesmere Island are cited by Schuster (1974). The species occurs disjunctively in the upper Great Lakes area.

CEPHALOZIELLACEAE

17. **Cephaloziella arctica* Bryhn & Douin (8)

With *Arnellia fennica*, *Ditrichum flexicaule*, and *Meesia uliginosa* on wet peat, tundra meadow, *7519 p.p.* (with perianths); with *Scapania gymnostomophila*, wet peat mound, tundra meadow, *7550 p.p.* (with perianths); with *Aneura pinguis*, *Lophozia*, *Metacalypogeia schusterana*, and *Scapania gymnostomophila*, low peat mound, tundra

meadow, *7656 p.p.* (with perianths). Plants in these collections have been referred to *C. arctica* because they possess crenulate perianth mouths and weakly toothed perichaetial bracts, even though they present some features that are transitional to *C. uncinata* Schust. & Dams. Also, the cortical cells are generally ca. 12 μm, a size that corresponds best to measurements presented by Schuster and Damsholt (1974) for *C. arctica.*

18. **Cephaloziella uncinata* Schust. *in* Schust. & Dams. (8)

Growing over *Tomenthypnum nitens,* peat mound, tundra meadow, *7544* (autoicous, with perianths and sporophytes). The collection consists of abundant material growing over wet *Tomenthypnum,* an association mentioned by Schuster and Damsholt (1974) in connection with some of the Greenland stations they cite. The plants have inwardly hooked leaf tips, denticulate perianth mouths (with the terminal cells much longer than broad), and perichaetial leaves with uncinate lobes. Although in the Bathurst Island material these features have proved somewhat variable from plant to plant, they appear to be the most constant diagnostic features of *C. uncinata.* Apart from several Greenland stations, this is the first collection known to us from elsewhere in the Arctic. R. M. Schuster has kindly confirmed the identification.

ANEURACEAE

19. **Aneura pinguis* (L.) Dumort. (1,8)

Wet peaty, calcareous soil, *7409*; with mosses on wet peat, tundra meadow, *7487* (♀); with *Cephaloziella arctica, Lophozia, Metacalypogeia schusterana,* and *Scapania gymnostomophila,* low peat mound, tundra meadow, *7656 p.p.* Wet ground at margin of lake, *16610.* Common and usually in wet situations. A calciphyte of wide distribution in North America and there extending from arctic to temperate latitudes.

CLEVEACEAE

20. **Athalamia hyalina* (Sommerf.) Hatt. (1,2,3)

With *Fissidens arcticus* on moist calcareous soil, *7375, 7410* (with old carpocephala), silty soil in crevice, southwest side of frost heaved soil mound, *7611* (♀), *7612* (♂,♀); with *Preissia quadrata,* soil on side of dissected polygon mound, *7646b* (♀). Apparently restricted to dry or damp soil; sometimes found in pioneer situations, but usually growing with other plants in advanced stages of vegetation development.

MARCHANTIACEAE

21. **Preissia quadrata* (Scop.) Nees (1,3)

Moist calcareous soil, *7406*; with *Athalamia hyalina* and *Fissidens*

arcticus, soil on side of dissected polygon mound, *7646a* (♀). Not rare. Several well-developed plants in one collection had only archegoniophores, and therefore were possibly unisexual. Schuster and Damsholt (1974) indicated that *Preissia quadrata* may be divided into a bisexual arctic population and a unisexual boreal and temperate one, a suggestion that should be followed up using culture studies.

MUSCI

FISSIDENTACEAE

22. *Fissidens adiantoides* Hedw. (8)

On wet ground at margin of lake, intermixed with other mosses, *16609a*. Wet peat, tundra meadow, *7451 p.p.*; edge of small pool, tundra meadow, *7473 p.p.*; small hummock at edge of pool, tundra meadow, *7518 p.p.* This species, which is uncommon in the central Bathurst area, was previously reported for the area by Brassard and Steere (1968) from a single collection made by Blake.

23. *Fissidens arcticus* Bryhn (1–3,8)

On clay bank along river, *16538b*. Wet slope with hepatics, *7410 p.p.*; with *Drepanocladus brevifolius* over wet peat, tundra meadow, *7449 p.p.*; wet peat, tundra meadow, *7715 p.p.*; with *Preissia quadrata*, soil, side of dissected polygon, *7646b p.p.* Probably found throughout the area but because of its small size, as well as its rare occurrence in pure colonies, it is easily overlooked. The species is endemic to North America where it is widespread throughout the Arctic. Steere and Brassard (1974) have recently summarized its geographical distribution and discussed its systematic position.

DITRICHACEAE

24. *Ditrichum flexicaule* (Schwaegr.) Hampe (1–6,8,9)

On soil on hummocks or on rock ledges, *16466, 16498, 16542, 16578, 16603, 16604, 16638*. Wet soil, *7361 p.p.*; wet soil, slope, *7389*; base of soil mound used as bird perch, *7465 p.p.*; summit of low hummock, tundra meadow, *7481*; tundra meadow, *7514 p.p.*; peat mound, tundra meadow, *7543 p.p.*; in hummock, edge of small pool, tundra meadow, *7554 p.p.*; soil, summit of low hill used as bird perch, *7576 p.p.*; soil depression between frost heaved mounds, *7598*; dense cushion below limestone outcrop, *7619*; moist soil, slope below limestone outcrop, *7640 p.p.*; area of frost sorted limestone cobbles, beach ridge, *7654 p.p.*; soil, beach ridge, *7700 p.p.*; with other mosses among dry limestone cobbles, beach ridge, *7706 p.p.*; low hummock, tundra meadow, *7712 p.p. Ditrichum flexicaule* is one of the most common mosses found in the central Bathurst region, as well as throughout the entire Canadian Arctic. Sporophytes were uniformly absent which is usual for this species.

25. **Saelania glaucescens* (Hedw.) Bomanss. & Broth. (6)

On ground beside lake, *16669*. This species, which is too distinctive to be overlooked, is apparently rare on Bathurst Island. Brassard (1971a) reports that it occurs only in the eastern part of the Queen Elizabeth Islands.

26. *Distichium capillaceum* (Hedw.) B.S.G. (1,4,5,8)

In dense cushions on slopes or on soil over limestone bluffs, *16438, 16492 (c.fr.), 16501 (c.fr.), 16558*. Edge of dung mound, *7383 (c.fr.);* tundra meadow, *7514 p.p. Distichium capillaceum* is extremely common in the central Bathurst area as well as the entire Arctic. Although it frequently produces sporophytes, which presumably contain viable spores, it may also reproduce by wind blown gametophytic fragments. Miller and Ambrose (1976) discovered an abundance of viable *Distichium* sp. fragments in their study of diaspores of the central Bathurst area.

27. *Distichium inclinatum* (Hedw.) B.S.G. (1,2,5,8)

On soil in depressions on the ground, *16463 (c.fr.)*. Moist rivulet, slope, *7368 (c.fr.);* edge of *Dryas integrifolia* clump in rivulet, *7419 (c.fr.);* wet peat, tundra meadow, *7436 (c.fr.);* soil, edge of small stream, *7601 p.p.* This species is much less common than *D. capillaceum* and it seems to prefer wetter sites in low lying areas. *Distichium hagenii* Ryan *ex* Philib., the only other species reported from the Arctic, probably occurs on Bathurst Island but it escaped detection because of its close similarity to *D. inclinatum*. Brassard (1971b) found *D. hagenii* to be rather common at Tanquary Fiord on Ellesmere Island.

SELIGERIACEAE

28. **Seligeria campylopoda* Kindb. *ex* Mac. & Kindb. (9)

Dry limestone cobbles and pebbles, beach ridge, *7664*. *Seligeria campylopoda* is rare in the Bathurst study area and probably throughout the Canadian Arctic since this represents the first report of the species for the Queen Elizabeth Islands. Like *Seligeria pusilla* (Hedw.) B.S.G. (Brassard, 1970), this species is predominately a temperate one, although it also occurs in the northern Rocky Mountains. The species grows mainly on limestone. Steere (1965) has discussed the disjunct arctic occurrence of *S. campylopoda* and several other bryophytes in arctic Alaska, and Vitt (1976) has recently mapped its distribution in North America.

29. **Seligeria polaris* Berggr. (4–6,9)

On wet rocks or mud at margin of ponds, *16524 (c.fr.), 16597 (c.fr.), 16672*. Sparse between limestone cobbles, beach ridge, *7660 (c.fr.);* bare patch of thin peat and attached to limestone pebble, junction

of tundra meadow and beach ridge, *7663 (c.fr.)*. In North America this predominantly High Arctic species has been reported from Greenland (Holmen, 1960), the Canadian eastern Arctic (Brassard, 1971a), the Yukon (Vitt, 1976), and Alaska (Worley and Iwatsuki, 1970). Its occurrence on Bathurst in small, blackish tufts on pebbles in frost-boil areas is the same as that reported for plants growing on Devon and Cornwallis Islands by Vitt (1975).

DICRANACEAE

30. **Dicranella crispa* (Hedw.) Schimp. (8)

Hummock used as bird perch, tundra meadow, *7551 p.p. Dicranella crispa* is rare on Bathurst Island and throughout most of the High Arctic. There are only two other reports of the species for the Queen Elizabeth Islands, namely Devon Island (Vitt, 1975) and northern Ellesmere Island (Brassard, 1971b).

31. *Oncophorus wahlenbergii* Brid. (6,8)

Mossy hummock near lake, *16633, 16666*. Dense cushion on wet peat, tundra meadow, *7474 p.p., 7475, 7516 (c.fr.);* cushion on wet peat, tundra meadow, *7719 (c.fr.)*. Localized but abundant wherever found in the central Bathurst area.

32. *Dicranum elongatum* Schleich. *ex* Schwaegr. (6)

In mossy hummock beside lake, *16637, 16665*. Surprisingly rare in the central Bathurst area, especially considering how abundant it is in other parts of the High Arctic.

ENCALYPTACEAE

33. *Encalypta alpina* Sm. (1,2,4,5)

Clay or sandy soil, *16441b, 16449, 16470, 16537, 16594*. Moist rivulet, slope, *7380 p.p.;* wet area, slope, *7402 p.p.* Not found with sporophytes in the central Bathurst area and throughout most of its range. It often grows intermixed with other bryophytes.

34. *Encalypta procera* Bruch (1,4–6,9,10)

Sandy soil associated with rock, i.e., in crevices of outcrops, under ledges, or between rocks on ground, *16471, 16486 (c.fr.),16500 (c.fr.), 16548, 16565, 16650, 16657*. Moist rivulet, slope, *7421;* wet peaty soil, interpolygon depression on ridge, *7565;* silty soil, wet slope, *7588 (c.fr.);* soil, beach ridge, *7695 p.p.;* soil, beach ridge slope, *7722;* interpolygon trough, ridge, *7742*. Quite common in the central Bathurst area but reportedly rare in other parts of the Arctic (Brassard, 1971b; Steere, 1947; Vitt, 1975).

35. *Encalypta rhaptocarpa* Schwaegr. (1–3,5,6,9)

Soil or soil over rock, *16447, 16455 (c.fr.), 16459a (c.fr.), 16478 (c.fr.), 16512 (c.fr.), 16516 p.p., 16541 (c.fr.), 16674 (c.fr.), 16677 (c.fr.).*

Moist rivulet, slope, *7364 (c.fr.)*, *7379 p.p. (c.fr.)*, *7380 p.p. (c.fr.)*; wet area, slope, *7404 (c.fr.)*; soil mound used as bird perch, *7463 p.p. (c.fr.)*; tundra meadow, *7496*; soil, summit of low hill used as bird perch, *7574 (c.fr.)*; soil, slope below limestone outcrop, *7635*; soil, beach ridge, *7704 (c.fr.)*; soil, beach ridge slope, *7724 (c.fr.)*. The most common species of *Encalypta* in the central Bathurst area. Sporophytes are generally present in most colonies.

36. **Encalypta vulgaris* Hedw. (1,5)

Rock outcrop, *16516 p.p. (c.fr.)*. Moist rivulet, slope, *7379 p.p. (c.fr.)*. By far the rarest species in the area and previously known only from the eastern Queen Elizabeth Islands (Brassard, 1971a).

37. **Bryobrittonia pellucida* Williams (5)

Soil in a wet hollow, *16496*. A circumpolar species that is sterile and apparently rare or overlooked in the Bathurst area. Its distribution was studied by Vitt (1974) who found that it occurs predominately in the western Arctic with an apparent continuous eastward extension into the Canadian High Arctic and Greenland.

POTTIACEAE

38. *Anoectangium tenuinerve* (Limpr.) Paris (1)

Dense mat in rivulet, *7423*; small cushion, wet slope, *7584 p.p.*; silty soil, wet slope, *7585*. A species that seems to be uncommon in the central Bathurst area but it has been reported from several localities on the island by Brassard and Steere (1968). Zander (1976) considers *Anoectangium tenuinerve* to be a taxonomic synonym of *Molendoa sendtneriana* (B.S.G.) Limpr.

39. *Gymnostomum recurvirostrum* Hedw. (9)

Wet peat among stones, beach ridge, *7664b*. Rare or overlooked in the central Bathurst area.

40. **Tortella arctica* (Arnell) Crundw. & Nyh. (1,4,5,8,9)

Mostly on sloping ground in cushions and tufts among rocks, *16448*, *16502*, *16585*. Wet slope, *7396*, *7397*; low cushion, wet slope, *7586*; in low cushion among wet cobbles, beach ridge, *7662*; low compact cushion, edge of late snowbed near tundra meadow, *7668*; soil between cobbles, beach ridge slope, *7721*. *Tortella arctica*, which is sterile on Bathurst as well as throughout its range, is widely distributed in the Canadian High Arctic. Crundwell and Nyholm (1963) have clarified the distinctions between it and *T. tortuosa* (Hedw.) Limpr. which apparently does not occur in the High Arctic but which was previously the only *Tortella* known from Bathurst Island. Although we have not seen the specimen of *T. tortuosa* reported by Brassard and Steere (1968), we assume that it is *T. arctica* or possibly *T. fragilis* since Brassard (1971a) does not list *T. tortuosa* for the Queen Elizabeth Islands.

41. **Tortella fragilis* (Drumm.) Limpr. (1,3)

Top of low hummock, wet slope, *7367*; moist rivulet, slope, *7370*, *7416 p.p.*; soil, slope below limestone outcrop, *7633*. More localized and not as abundant as *T. arctica*.

42. *Didymodon asperifolius* (Mitt.) Crum, Steere & Anders. (1,5–9)

Generally on soil but occasionally occurring on rock, *16446*, *16482*, *16655*, *16656*, *16684*. Wet soil, *7360*; soil mound used as bird perch, *7460*; soil, bird perch, *7495 p.p.*; organic soil, bird perch on beach ridge, *7527*; small cushion, wet slope, *7584 p.p.*; area of frost sorted limestone cobbles, beach ridge, *7654 p.p.*; soil, beach ridge, *7703*. Common in the central Bathurst area and widely distributed throughout the island.

43. **Bryoerythrophyllum alpigenum* (Vent.) Chen (8)

In clump of *Orthothecium strictum* on wet peat, tundra meadow, *7438 p.p.*; wet peat, tundra meadow, *7472 p.p.* This appears to be a weak segregate of *B. recurvirostrum* which some bryologists recognize (Holmen, 1960 as *Barbula alpigena*) and others do not (Brassard, 1971b). The plants are morphologically close to *B. recurvirostrum*, except the stems are more robust (up to 4 cm), the leaves are longer and have large teeth at the apex, and the margins are less recurved, often recurved only to the leaf middle or somewhat above. Its ecology is also somewhat different. The plants occur on wet peat in tundra meadows.

44. *Bryoerythrophyllum recurvirostrum* (Hedw.) Chen (2,4,5,7–9)

Soil, usually over rock, *16472*, *16593*, *16541a (c.fr.)*,*16694 (c.fr.)*. Wet soil, *7362 p.p. (c.fr.)*; wet slope, *7394*; peat mound, tundra meadow, *7546 p.p.*; soil, depression between frost heaved mounds, *7596*; drainage rivulet, beach ridge, *7696 p.p.*; soil, beach ridge slope, *7725 p.p.* Common and usually intermixed with other acrocarpous mosses.

45. *Barbula icmadophila* Schimp. *ex* C. Müll. (4,5)

Rock or soil over rock, *16487*, *16508*, *16563*, *16580*. Only found sterile in the central Bathurst area but this appears to be typical of the species throughout the Canadian Arctic.

46. **Geheebia gigantea* (Funck) Boul. (8)

Low cushion on wet peat, tundra meadow, *7482 p.p.* A species whose main center of distribution in North America is in the west. Reported from only two other localities in the Queen Elizabeth Islands, viz. Banks Island and Prince Patrick Island (Kuc, 1973b, as *Barbula gigantea*). Its distribution outside the Canadian Arctic is mapped by Schofield (1972).

47. **Stegonia latifolia* (Schwaegr. *ex* Schultes) Vent. *ex* Broth. var. *latifolia* (1,2,6,7,9)

Clay banks and among rocks, *16538a (c.fr.)*, *16653 p.p. (c.fr.)*, *16694a (c.fr.)*. Mound of silty soil, *7433 (c.fr.)*; thin soil, bird perch on beach ridge, *7524 (c.fr.)*; soil, summit of low hill used as bird perch, *7577*

p.p. (c.fr.). Usually with sporophytes and intermixed with other mosses.

**Stegonia latifolia* var. *pilifera* (Brid.) Broth. (6)

With var. *latifolia* on soil among rocks on slope, *16653a (c.fr.)*. A distinctive variety but apparently rare in the central Bathurst area.

48. **Pterygoneurum ovatum* (Hedw.) Dix. (3)

Dry soil over bedrock, summit of ridge, *7651 (c.fr.)*. This is the first report of *Pterygoneurum ovatum* from the Queen Elizabeth Islands. One other species of *Pterygoneurum*, *P. arcticum* Steere, which Steere (1959b) described from plants collected in arctic Alaska, has been reported for the northern part of Bathurst Island. Steere (1976), however, recently decided that *P. arcticum* is a form of *P. lamellatum* (Lindb.) Jur. which otherwise is known in North America only from southern Arizona and Utah.

49. **Desmatodon heimii* var. *arctica* (Lindb.) Crum (1,2,4,7,9)

On soil under rock ledges or on river banks, *16547 (c.fr.)*, *16692a (c.fr.)*. Wet clay soil, *7359 (c.fr.)*, *7362 p.p. (c.fr.)*, mound of silty soil, *7431 p.p. (c.fr.)*; soil mound used as bird perch, *7459 (c.fr.)*; silt, river bank, *7521a p.p. (c.fr.)*; silt among gravel and cobbles, *7522 (c.fr.)*; thin soil, bird perch on beach ridge, *7523 (c.fr.)*, *7524 (c.fr.)*; silty soil, side of frost heaved mound, *7602 (c.fr.)*, *7603 (c.fr.)*, *7608 p.p. (c.fr.)*; soil, lemming warren, beach ridge, *7694 p.p. (c.fr.)*; soil, beach ridge, *7695 p.p. (c.fr.)*. Common, especially on river banks and around lemming burrows, and nearly always with sporophytes.

50. **Desmatodon leucostoma* (R. Br.) Berggr. (1,2,4,6,7,9)

Soil on slopes, over limestone ledges and around lemming burrows, *16450*, *16453*, *16564*, *16674a*, *16692* (all *c.fr.*). Mound of silty soil, *7431 p.p. (c.fr.)*; silty soil, *7434 (c.fr.)*; soil mound used as bird perch, *7463 p.p. (c.fr.)*, *7464 (c.fr.)*; thin soil, bird perch on beach ridge, *7524 (c.fr.)*; hummock used as bird perch, tundra meadow, *7551 p.p.*; soil, summit of low hill used as bird perch, *7577 p.p. (c.fr.)*; raw silty soil of small hummock, *7591 (c.fr.)*; silty soil, side of frost heaved mound, *7606 (c.fr.)*, *7607 (c.fr.)*; soil, lemming warren, beach ridge, *7694 p.p. (c.fr.)*. Common and like the preceding, abundant around lemming burrows. Easily recognized by its white peristome teeth.

51. **Aloina brevirostris* (Hook. & Grev.) Kindb. (2,4,7,10)

Generally occuring on clay or mud banks, sometimes on soil over limestone, *16538*, *16566*, *16681* (all *c.fr.*). Mouth of lemming burrow, ridge top, *7569 (c.fr.)*; soil, edge of small stream, *7597 (c.fr.)*, *7601 p.p. (c.fr.)*; bare soil, ridge top, *7743 (c.fr.)*. Uncommon in the central Bathurst region.

52. **Aloina rigida* (Hedw.) Limpr. (1)

Silty soil, wet slope, *7589* (*c.fr.*, dioicous). Extremely rare or overlooked in the Bathurst area. Previously reported only for Ellesmere Island in the Canadian High Arctic based on a collection by Simmons

(Steere, 1947), but neither Brassard (1971a, 1971b) nor Delgadillo M. (1975) credit it to the Ellesmere flora. Often difficult to distinguish from *A. brevirostris* from which it is best recognized by its dioicous condition and yellow peristome. This is in contrast to *A. brevirostris* which has at least some plants that are synoicous and capsules with a red peristome.

53. **Tortula mucronifolia* Schwaegr. (1,3,4,6,9)

Predominately on wet soil, often mixed with other mosses, *16479, 16485, 16489, 16523 p.p., 16550, 16552, 16567, 16579, 16598, 16678,* (all *c.fr.*). Wet slope, *7388 (c.fr.)*; drainage rivulet, beach ridge, *7696 p.p. (c.fr.)*. Common and nearly always found with sporophytes in the central Bathurst area.

54. **Tortula norvegica* (Web.) Wahlenb. *ex* Lindb. (2,4)

Soil under limestone ledge, *16553b.* Soil, depression between frost heaved mounds, *7600 p.p.* A circumboreal species that is rare in the central Bathurst area. Sometimes difficult to distinguish from *T. ruralis.*

55. *Tortula ruralis* (Hedw.) Gaertn., Meyer & Scherb. (1–6,9)

In cushions, mainly on slopes among rocks, on hummocks but also on rock and in crevices of rock, *16433, 16511, 16518, 16544 p.p., 16590, 16648 p.p.* Wet soil, *7361 p.p.*; moist rivulet, slope, *7369, 7429 p.p. (c.fr.)*; soil, bird perch, *7458a p.p.*; soil of mound used as bird perch, *7494 p.p.*; thin soil, bird perch on beach ridge, *7528*; wet slope, *7594*; soil, slope below limestone outcrop, *7637.* One of the most common species in the central Bathurst area, as well as other parts of the Canadian Arctic. Usually sterile and occurring in a variety of habitats. Extremely variable in regard to size, as well as length and coloration of leaf awn.

GRIMMIACEAE

56. **Schistidium alpicola* var. *rivulare* (Brid.) Limpr. (Syn. *Grimmia alpicola* var. *rivularis* (Brid.) Wahlenb. (7)

On boulder along river, *16693 (c.fr.).* A distinctive variety of *S. alpicola* that is rare in the central Bathurst area. The plants are more typical of those occurring in western North America than in the east. The leaves are wider, more obtuse at the apex, and the margins are more recurved than most plants of eastern North America.

57. **Schistidium apocarpum* (Hedw.) B.S.G. var. *apocarpum* (Syn. *Grimmia apocarpa* Hedw.) (4,5,7–9)

Generally on rock, sometimes on soil among rocks, *16499 (c.fr.), 16513 (c.fr.), 16575 (c.fr.), 16591 (c.fr.), 16623, 16688 (c.fr.).* Flat lying limestone, outcrop, *7618 (c.fr.)*; ephemeral drainage channel, slope, *7652 (c.fr.)*; soil between cobbles, beach ridge slope, *7723 (c.fr.).* A ubiquitous species in the central Bathurst region, as well as the entire Canadian Arctic. Nearly always producing sporophytes.

°*Schistidium apocarpum* var. *gracile* (Röhl.) B.S.G. (Syn. *Grimmia apocarpa* var. *stricta* (Turn.) Hook. & Tayl.) (9)

With other mosses among dry limestone cobbles, beach ridge, *7708*. Circumboreal var. *gracile* is rare in the central Bathurst region as it is in other parts of the Arctic.

58. °*Schistidium holmenianum* Steere & Brass. (1,3,7–10)

In tufts, often on sloping ground, *16437, 16624, 16687*. Wet peat, tundra meadow, *7451 p.p.*; wet area, tundra meadow, *7541 p.p.*; submerged in temporary runoff water, ridge top, *7615*; tight cushion, moist slope below limestone outcrop, *7624, 7625*; with other mosses among dry limestone cobbles, beach ridge, *7707*; shallow pool, tundra meadow, *7718*. A distinctive and common moss in the central Bathurst area that was previously confused with *S. apocarpum* var. *nigrescens* (Mol.) Loeske (Syn. *Grimmia apocarpa* var. *nigrescens* Mol.) primarily because of the blackish color of the otherwise different taxa. Steere and Brassard (1976) recently decided that the large size of the plants (stems 3–10 cm high), along with a number of important morphological features, and the distinctive habitat (wet, calcareous tundra fens) were sufficient reasons to propose a new species. The plants are almost always sterile as were all of the collections from Bathurst Island. Thus far, the species is known only from North America (Alaska, arctic Canada, and Greenland).

59. °*Schistidium tenerum* (Zett.) Nyh. (Syn. *Grimmia tenera* Zett.)(6)

Limestone outcrop, *16654*. An arctic-alpine species, rare in the central Bathurst area and the eastern Arctic, with its main center of distribution in western North America (Ireland, 1964). The only reported localities of the species in arctic North America are Greenland (Holmen, 1960), Ellesmere Island (Steere, 1959a, as *G. tenuicaulis*), Axel Heiberg Island (Kuc, 1973a), and Devon Island (Vitt, 1975).

60. °*Grimmia anodon* B.S.G. (5)

Rock outcrop, *16515* (*c.fr.*). A rare species of *Grimmia* in the central Bathurst area and other parts of the High Arctic. It is easily distinguished from the other Grimmias known from Bathurst Island because it is the only one whose leaves have long, hyaline hair points and whose capsules lack peristome teeth.

61. *Rhacomitrium lanuginosum* (Hedw.) Brid. (3)

Moist slope below limestone outcrop, *7621, 7626*. Surprisingly rare in the area considering how common it is in most of the Arctic. Its preference for somewhat acid substrates probably accounts for its scarcity in this predominately calcareous region.

FUNARIACEAE

62. °*Funaria arctica* (Berggr.) Kindb. (2,4)

Clay banks along river, *16536* (*c.fr.*), *16595* (*c.fr.*). Apparently sporadic and occurring only along rivers in the area.

SPLACHNACEAE

63. **Voitia hyperborea* Grev. & Arnott (1,4–6,8)

On dung, frequently on slopes among grass, *16429, 16431, 16458, 16587, 16675* (all *c.fr.*). Dung, slope, *7382* (*c.fr.*); musk-ox dung, slope, *7405 p.p.* (*c.fr.*); old dung, slope, *7413 p.p.*; moist rivulet, slope, *7422 p.p.* (*c.fr.*); old dung, tundra meadow, *7537*. A circumpolar species that is extremely abundant where found. Sporophytes are generally always produced. Steere (1974), who recently clarified the difference between *V. hyperborea* and the other North American species, *V. nivalis* Hornsch., has summarized the present geographical distribution of *V. hyperborea* which is the most common of the two species.

64. **Tayloria acuminata* Hornsch. (7)

With *Mnium thomsonii* in protected site on soil at base of bluff, *16691a*. Only a few sterile plants were collected of this species which is considered rare in the Arctic. Crum (1955) thoroughly studied its morphology and distribution in North America.

65. **Tetraplodon mnioides* var. *cavifolius* Schimp. (1,3–7)

Generally on dung or decayed animal remains, *16430, 16442, 16458a, 16467, 16503, 16588, 16668 p.p., 16686* (all *c.fr.*). Musk-ox dung, slope, *7405 p.p.* (*c.fr.*); well rotted dung, slope, *7430* (*c.fr.*); dense turf on bones and soil, tundra meadow, *7457* (*c.fr.*); old dung, tundra meadow, *7536*; soil, summit of low hill used as bird perch, *7572* (*c.fr.*), *7573* (*c.fr.*); soil, slope below limestone outcrop, *7631*. Probably the most common and abundant of all of the splachnaceous mosses in the central Bathurst region, as well as the entire Arctic. Like many of the mosses in the family, sporophyte production is abundant.

66. **Tetraplodon pallidus* Hag. (4)

Soil under limestone ledge, *16551*. A single small clump of what appears to be this species was found sterile. Steere (1977) has recently clarified that taxonomy and distribution of *T. pallidus* which was considered by many bryologists to be a synonym of *T. paradoxus* (R. Br.) Hag.

67. **Aplodon wormskjoldii* (Hornem.) R. Br. (4–6,8)

Apparently always occurring on dung, usually in grass, *16457* (*c.fr.*), *16570* (*c.fr.*), *16621, 16667* (*c.fr.*). Old dung on wet peat, tundra meadow, *7442* (*c.fr.*), *7499* (*c.fr.*), *7560 p.p.* (*c.fr.*). This species, a member of the High Arctic, circumpolar floristic element, produces sporophytes with a peculiar fleshy, whitish, translucent seta with an appearance like that of certain liverworts. Steere (1973) has illustrated this novel feature with some beautiful color photographs taken of plants in Alaska.

BRYACEAE

68. *Pohlia cruda* (Hedw.) Lindb. (1,4–6,8)

Soil over rock or under ledges in protected sites, sometimes in

hummocks in meadows, *16490, 16553, 16630a, 16640* (*c.fr.*). Wet rivulet, slope, *7403;* silty soil, side of frost heaved mound, *7605* (*c.fr.*); side of fissure in surface peat, tundra meadow, *7667.* An ubiquitous species throughout the Arctic. In the Bathurst area it seems to occur in wet habitats in tundra meadows as often as it does in drier habitats on soil under ledges.

69. **Pohlia wahlenbergii* (Web. & Mohr) Andr. (1,2)

On muddy bank of river, *16533a.* Silt, river bank, *7521a p.p.* Rare or perhaps overlooked in the Bathurst area and throughout the Arctic because of the constant sterility of the plants that grow intermixed with other mosses.

70. **Bryum aeneum* Blytt *ex* B.S.G. (8)

Forming a tight clump, tundra meadow, *7471 p.p.* Determined by A. C. Crundwell. New to the Queen Elizabeth Islands.

71. **Bryum algovicum* Sendtn. *ex* C. Müll. var. *algovicum* (5,6,8)

On soil over bluff beside river and in mossy hummock at margin of lake, *16494* (*c.fr.*), *16639* (*c.fr.*). Wet tundra meadow, *7443.* Determined by A. C. Crundwell. Plants autoicous.

**Bryum algovicum* var. *rutheanum* (Warnst.) Crundw. (1,8)

Rivulet, slope, *7378;* wet tundra meadow, *7444.* Determined by A. C. Crundwell. New to North America. Plants synoicous. (See Crundwell, 1970).

72. **Bryum arcticum* (R. Br.) B.S.G. (1)

On ground on grassy slope, *16432* (*c.fr.*). Determined by A. C. Crundwell. Belongs to the circumpolar, High Arctic floristic element.

73. **Bryum argenteum* Hedw. (1,2)

Soil mound used as bird perch, *7462;* silty soil, side of frost heaved mound, *7608 p.p.* A weedy moss, cosmopolitan in distribution, that is not very abundant in the area. It was found on bird perches on Bathurst Island, and Brassard (1971b) reports the same occurrence on Ellesmere Island. Birds perhaps account for its dispersal in the Arctic as man does in most regions of the world.

74. **Bryum calophyllum* R. Br. (8)

On ground at margin of lake, *16618.* Only a few sterile plants were found growing intermixed with *Scorpidium turgescens, Campylium stellatum, Orthothecium chryseum,* and *Drepanocladus* spp.

75. *Bryum cryophilum* Mårt. (1,2,5,7,8)

Generally occurring on soil in extremely wet habitats, especially on river banks, *16445* (*c.fr.*), *16469* (*c.fr.*), *16534, 16620* (*c.fr.*), *16689.* Very wet area, tundra meadow, *7501;* wet springy area at base of beach ridge, tundra meadow, *7530;* standing water, tundra meadow, *7710.* The reddish plants, which occur in large cushions in rivulets, standing water in tundra meadows, and other wet habitats, make this one of the easiest species to locate in the area. A member of the

circumpolar, High Arctic floristic element.

76. °*Bryum pallens* (Brid.) Sw. *ex* Röhl. (5,8)

On soil over bluff beside river, *16493* (with propagula). On small hummock, tundra meadow, *7561*. Determined by A. C. Crundwell.

77. °*Bryum pallescens* Schleich. *ex* Schwaegr. (5,6)

On river bank and on ground near lake, *16480* (*c.fr.*), *16670* (*c.fr.*). Determined by A. C. Crundwell.

78. °*Bryum pseudotriquetrum* (Hedw.) Gaertn., Meyer & Scherb. (2)

On muddy bank of river, *16532*. Apparently not very common in the central Bathurst area.

79. °*Bryum stenotrichum* C. Müll. (Syn. *B. inclinatum* (Brid.) Bland. *fide* Crum, Steere and Anderson, 1973) (1,2)

Wet slope, *7365;* silty soil, polygon area, *7604*. Determined by A. C. Crundwell as *B. inclinatum* (Brid.) Bland.

Bryum teres Lindb.

Reported for the area by Brassard and Steere (1968) from a collection made by Blake in 1963.

MNIACEAE

80. *Mnium blyttii* B.S.G. (6)

Among rocks on slope, *16651*. Rare in the central Bathurst region and elsewhere on the island according to Brassard and Steere (1968). Easy to confuse with *M. thomsonii* in the Arctic. Koponen's chemical test (1974), using the alcohol-KOH method to check for a blue coloration on the leaves, is one of the best means of distinguishing the two species.

81. °*Mnium medium* var. *integrifolium* Lindb. (1,3–6,8)

On humus or in hummocks intermixed with other mosses, sometimes on soil over rock, *16459, 16556, 16635, 16645, 16652*. Wet slope, *7401 p.p.;* tundra meadow, *7432 p.p.;* with other bryophytes in tundra meadow, *7470;* on bird perch at edge of meadow, *7552;* soil at base of limestone ledge, *7644*. This is a circumpolar variety of *M. medium* that replaces var. *medium* in the northern latitudes. The leaves are smaller and the marginal teeth are much reduced in comparison to those of var. *medium*. Because of the small size of the gametophytes the plants resemble *M. rugicum* Laur. (*Plagiomnium ellipticum* (Brid.) Kop.). The synoicous condition of the var. *integrifolium* is the best means of distinguishing it from dioicous *M. rugicum* which was reported by Brassard and Steere (1968) from several collections made by Blake in the central Bathurst region. Plants in one of these collections (*5b* in CANM) are synoicous and have therefore been revised to *M. medium* var. *integrifolium*.

82. *Mnium thomsonii* Schimp. (Syn. *M. orthorrhynchum* Brid.) (1,4–8,10)

On soil, rock or among boulders, often intermixed with other mosses, *16509, 16556a, 16592, 16655b, 16691.* Wet slope, *7386 p.p.;* moist rivulet, slope, *7420;* side of fissure in surface peat, tundra meadow, *7666 p.p.;* mineral soil, interpolygon depression on ridge, *7566.* Not uncommon but always sterile. Possible confusion between *M. thomsonii* and *M. blyttii* is discussed under the latter.

83. *Cyrtomnium hymenophyllum* (B.S.G.) Holmen (6,8,9)

On hummock on slope, *16645 p.p.* Edge of small pool, tundra meadow, *7473 p.p.;* peat mound, tundra meadow, *7543 p.p., 7546 p.p.;* soil, beach ridge, *7700 p.p.* A High Arctic moss that is rare in the central Bathurst area.

84. *Cinclidium arcticum* (B.S.G.) Schimp. (1,2,4,6,8)

Generally on wet ground or in wet depressions among other mosses beside lakes but also on mud banks or on hummocks, *16444, 16533, 16569, 16607, 16612, 16628, 16642.* Wet peat, edge of small pool, tundra meadow, *7446;* on hummock, tundra meadow, *7453 p.p.;* wet peat, tundra meadow, *7472 p.p., 7477 p.p.;* tundra meadow, *7512, 7535 p.p.;* wet peat, tundra meadow, *7715 p.p.* A common species in the central part of Bathurst Island.

85. *Cinclidium latifolium* Lindb. (5,8)

On wet ground at margin of lake with *C. arcticum* and other mosses, *16475a, 16611, 16616.* On hummock, tundra meadow, *7453 p.p.;* wet peat, tundra meadow, *7469 p.p.;* dense colony on wet peat, tundra meadow, *7502. Cinclidium latifolium* is much less common than *C. arcticum* with which it sometimes grows. The reflexed to nearly squarrose leaves with broadly recurved margins make *C. latifolium* the easiest species of *Cinclidium* to recognize.

Cinclidium subrotundum Lindb.

Reported by Brassard and Steere (1968) for the central Bathurst region from a single collection made by Blake in 1963.

AULACOMNIACEAE

86. *Aulacomnium acuminatum* (Lindb. & H. Arnell) Kindb. (1,3,8)

In hummocks intermixed with other mosses, generally *Tomenthypnum nitens, 16436 p.p., 16601 p.p.* Moist rivulet, slope, *7381;* wet slope, *7398, 7467;* low hummock, tundra meadow, *7476 p.p., 7485, 7508* (form with crisped leaves), *7509;* moist soil, slope below limestone outcrop, *7642.* Sporadic and never very abundant in the area. The one other report from the island (Brassard and Steere, 1968) is also from the central region.

87. **Aulacomnium palustre* (Hedw.) Schwaegr. (6)

In hummocks beside lake, intermixed with other mosses, *16668 p.p., 16670 p.p., 16673.* Extremely rare in the central Bathurst region

but common in many other parts of the Arctic. Holmen (1960) also found the species to be rare in Peary Land, Greenland, because of its avoidance of calcareous substrate that is so common there. This is probably the same reason for its rarity on Bathurst Island. In common with its occurrence elsewhere, the plants produced gemmae.

88. *Aulacomnium turgidum* (Wahlenb.) Schwaegr. (6)

Mossy hummock beside lake, *16629*. Rare in the central Bathurst area but reported to be common in the southern part of the island (Brassard and Steere, 1968). Like *A. palustre*, this species may also prefer somewhat acid or neutral substrates which perhaps accounts for its scarcity in the region.

MEESIACEAE

89. *Meesia triquetra* (Richt.) Ångstr. (8)

Wet ground beside lake, intermixed with other mosses, *16602 p.p.* Wet peat, tundra meadow, *7469 p.p.*; growing as a cushion, wet area, tundra meadow, *7533*. This species, which was not seen with sporophytes, was previously known from Bathurst only from subfossil material collected by Blake.

90. *Meesia uliginosa* Hedw. (5,6,8)

Wet ground, often intermixed with other mosses, *16496a*, *16609*, *16661*. Small hummock at edge of pool, tundra meadow, *7518 p.p.* (*c.fr.*); tundra meadow, *7519 p.p.* (*c.fr.*). *Meesia uliginosa*, like *M. triquetra*, was previously known from Bathurst only from subfossil material collected by Blake.

CATOSCOPIACEAE

91. *Catoscopium nigritum* (Hedw.) Brid. (1,2,5–8)

Generally in wet situations at lake margins, occasionally on clay banks, *16441*, *16497*, *16539*, *16614*, *16644*, *16683*. Wet peat, tundra meadow, *7474 p.p.*; dense cushion on wet peat, tundra meadow, *7483*, *7484*; tundra meadow, *7512 p.p.*; clump, edge of small pool, tundra meadow, *7515*; low hummock, tundra meadow, *7711*; wet peat, tundra meadow, *7715 p.p.*; low hummock, tundra meadow, *7720*. A calciphile that was always sterile but extremely abundant and widespread in the central Bathurst region.

BARTRAMIACEAE

92. *Philonotis fontana* var. *pumila* (Turn.) Brid. (Syn. *P. tomentella* Mol.) (1,2,8)

Occurring in tufts in wet situations, *16435*, *16528*. Forming cushions, moist rivulet, slope, *7372*; dense low cushion, wet slope, *7400 p.p.*;

wet peat, tundra meadow, *7500 p.p.* A circumboreal variety of the most common North American species of *Philonotis*. Var. *pumila* is a weak segregate of the *P. fontana* complex and is uniformly sterile in the central Bathurst area.

TIMMIACEAE

93. *Timmia austriaca* Hedw. (1,2,4–6,8,9)

In hummocks on slopes or in tufts on soil often intermixed with other mosses, *16440, 16454, 16483, 16553a, 16562, 16589 p.p., 16606, 16646.* Wet slope, *7393 p.p.;* wet area, slope, *7399;* with other bryophytes, marshy area, *7432 p.p.;* soil of mound used as bird perch, *7493;* wet peat, tundra meadow, *7500 p.p.;* wet springy area at base of beach ridge, tundra meadow, *7534 p.p.;* soil, depression between frost heaved mounds, *7595;* soil, mouth of lemming burrow, beach ridge, *7699 p.p.* A widespread and variable species in the Arctic that is common in the central Bathurst area. The two varieties, var. *arctica* (Kindb.) Holmen and var. *imbricata* (Boul.) Holmen, recognized by other bryologists (Holmen, 1960; Vitt, 1975) in other parts of the Arctic are also present on Bathurst Island. We have made no attempt, however, to apply these names to specimens until a more detailed analysis is made.

94. *Timmia norvegica* Zett. (1,6–8)

On wet ground or soil, *16663, 16680.* Wet slope, *7390;* wet area, slope, *7401 p.p.;* low hummock on peat, tundra meadow, *7478, 7479;* wet peat, tundra meadow, *7540 p.p.* Much less common than *T. austriaca.* Both *Timmia* species are sterile in the central Bathurst area. Most collections included plants with caducous leaves.

ORTHOTRICHACEAE

95. **Orthotrichum jamesianum* Sull. *ex* James (5)

On limestone outcrop, *16517 (c.fr.).* Determined by D. H. Vitt. New to the bryoflora of the Queen Elizabeth Islands.

96. **Orthotrichum pallens* Bruch *ex* Brid. (3)

Flat lying limestone, outcrop, *7617a (c.fr.).* Determined by D. H. Vitt. The identity of this Bathurst collection must remain somewhat doubtful because of the odd subsidiary cells. Normally, the subsidiary cells scarcely cover the stomatal cavity in capsules of *O. pallens,* but the Bathurst plants have subsidiary cells that overarch the stomatal cavity, nearly concealing the opening. The plants seem to fit within the range of variation of *O. pallens* in other features.

The distribution of *O. pallens* in North America is still relatively uncertain. It was only recently reported for eastern North America (Miller and Vitt, 1970), where it must be considered rare, and its

main center of distribution appears to be in the west (Vitt, 1973).

97. *Orthotrichum speciosum* Nees *ex* Sturm. (1,3,4,6,8–10)

Limestone ledges and soil, frequently in *Dryas* heaths, *16573* (*c.fr.*), *16622, 16631.* Soil, bird perch, *7458a p.p., 7458b p.p.;* moist depression near runway, *7491 p.p.* (*c.fr.*); soil of mound used as bird perch, *7492* (*c.fr.*); flat lying limestone outcrop, *7617b* (*c.fr.*); soil, beach ridge, *7698 p.p.; 7702* (*c.fr.*). The most common species of *Orthotrichum* on Bathurst Island, as well as the rest of the High Arctic. The collections compare favorably with var. *killiasii* (C. Müll.) Vent., but Vitt (1973) believes that this variety is merely an environmental modification.

THELIACEAE

98. *Myurella julacea* (Schwaegr.) B.S.G. (1,4–6,8,9)

Generally on soil associated with limestone rock, occasionally on wet ground among other mosses at lake margins, *16487 p.p., 16555, 16561, 16655a, 16662.* Moist rivulet, slope, *7373 p.p.,* wet slope, *7386 p.p.;* edge of peaty pocket along rivulet, slope, *7415;* wet peat, tundra meadow, *7477 p.p.;* peat mound, tundra marsh, *7542;* soil, beach ridge, *7695 p.p.;* peat, wet hollow, tundra marsh, *7713 p.p.;* soil, beach ridge slope, *7725 p.p.* Common in the central Bathurst area, frequently occurring with *Ditrichum flexicaule* and *Distichium.*

99. *Myurella tenerrima* (Brid.) Lindb. (1,3,8)

Intermixed with other mosses on hummock on slope, *16441a.* Wet slope, *7386 p.p.;* wet area, slope, *7402 p.p.;* with other bryophytes, marshy area, *7432 p.p.;* wet peat, tundra meadow, *7472 p.p., 7715 p.p.;* moist soil, slope below limestone outcrop, *7627.* Much rarer than *M. julacea* on Bathurst Island. Several other collections reported by Brassard and Steere (1968) are also from the central part of the island.

LESKEACEAE

100. **Pseudoleskeella tectorum* (Funck *ex* Brid.) Kindb. *ex* Broth. (3–5)

On limestone outcrops and ledges, *16510, 16571.* Deep crevice of limestone outcrop, *7623, 7629 p.p.* Rare in the Canadian High Arctic according to Vitt (1975) who summarized its present distribution in the Queen Elizabeth Islands as Cornwallis, Devon, and Ellesmere Islands. The species is always sterile throughout its range in North America.

THUIDIACEAE

101. *Thuidium abietinum* (Hedw.) B.S.G. (Syn. *Abietinella abietina* (Hedw.) Fleisch.) (1,6)

Among rocks on slope, intermixed with other mosses, *16648 p.p.* Wet slope, *7395, 7414 p.p.;* moist rivulet, slope, *7424;* soil mound used as bird perch, *7461, 7494 p.p.;* soil, summit of low hill used as bird perch, *7575 p.p., 7576 p.p.;* moist soil, slope below limestone outcrop, *7639.* A circumboreal species that is widespread throughout the Canadian Arctic but apparently rarely abundant where it occurs.

AMBLYSTEGIACEAE

102. **Cratoneuron arcticum* Steere (9)

Among stones on damp peat, *7664a.* Rare and occurring in drier habitats than *C. filicinum.* The distinctness of *C. arcticum* has been questioned in the past, some considering it the same as *Amblystegium varium* (Hedw.) Lindb. or a form of *C. filicinum,* but recent workers now agree that it is a distinct taxon (Kuc, 1973a; Vitt, 1975; Brassard, 1976).

103. *Cratoneuron filicinum* (Hedw.) Spruce (1,4,8)

Soil under limestone ledge, *16546a.* Old dung, slope, *7413 p.p.;* moist rivulet, slope, *7422 p.p.;* side of fissure in surface peat, tundra meadow, *7665, 7666 p.p.* An easily overlooked species in the Bathurst bryoflora due to its sterility and straggly nature. It is reportedly widespread throughout the Queen Elizabeth Islands (Brassard, 1971a).

104. **Campylium polygamum* (B.S.G.) C. Jens. (6)

Wet ground at margin of lake, *16659a.* This is a widespread, circumboreal species that is evidently rare on Bathurst Island. Only sterile plants were seen.

105. *Campylium stellatum* (Hedw.) C. Jens. (5,8)

In wet habitats at lake margins and on sandy banks, *16457a, 16473, 16462, 16615, 16626.* On hummock, tundra meadow, *7453 p.p.;* tundra meadow, *7514 p.p.;* low hummock, tundra meadow, *7529;* edge of pool, tundra meadow, *7553 p.p.;* in hummock, edge of small pool, tundra meadow, *7554 p.p. Campylium arcticum* (Williams) Broth., sometimes recognized as a variety, is reported to be common in the Arctic, but it was not found in the central Bathurst area. It seems to be a weak segregate of *C. stellatum* and perhaps we have failed to recognize it as distinct from this widespread and variable species.

106. *Platydictya jungermannioides* (Brid.) Crum (3,4,8)

On soil over limestone outcrop, *16560, 16572, 16596.* Soil, bird perch, *7495 p.p.;* moist slope below limestone outcrop, *7622;* crevice of limestone outcrop, *7629.* An extremely small pleurocarpous moss that is always sterile in the central Bathurst area.

107. *Drepanocladus aduncus* (Hedw.) Warnst. (2,8)

On mud beside river, *16529.* Low cushion on wet peat, tundra

meadow, *7482 p.p.;* wet tundra meadow, *7532.* Rare and localized in the central Bathurst area as it is reported to be in other parts of the Canadian Arctic.

Drepanocladus badius (C. J. Hartm.) Roth

Known only from collections, including peat samples, made by Blake (Brassard and Steere, 1968).

108. *Drepanocladus brevifolius* (Lindb.) Warnst. (4,8)

In water at edge of ponds and on ground at lake margins, *16584, 16605, 16617.* Peat in shallow pool, tundra meadow, *7437 p.p.;* wet peat, tundra meadow, *7439*; loose colony in wet peat, tundra meadow, *7447;* wet peat, *7448 p.p., 7449 p.p., 7450 p.p.; 7490;* in clump at edge of small water pool, tundra meadow, *7486 p.p.;* low mound, tundra meadow, *7556;* edge of pool, tundra meadow, *7558 p.p.;* wet tundra meadow, *7716.* A common moss in tundra meadows in the central Bathurst area. Since Kucyniak's study (1955) of its North American distribution, *Drepanocladus brevifolius* has become known as one of the most common and widespread mosses in the Canadian Arctic. Kucyniak indicated that it is a circumpolar, high arctic species that apparently avoids areas of strong continental climate.

109. *Drepanocladus revolvens* (Sw.) Warnst. var. *revolvens* (5,6,8)

On ground in wet depressions and in water at margin of small ponds, *16474, 16475 p.p., 16660.* Edge of pool, tundra meadow, *7553 p.p.;* submerged in pool, tundra meadow, *7557*; edge of pool, tundra meadow, *7558 p.p., 7562.* This circumboreal species is not as common in the central Bathurst area as it is in other parts of the High Arctic. This is probably due to its preference for acid substrates which are scarce in the region.

**Drepanocladus revolvens* var. *intermedius* (Lindb. *ex* C. Hartm.) Grout (5,8)

In water or at margins of lakes and ponds, *16477, 16613.* Wet peat, tundra meadow, *7477 p.p.;* wet area, tundra meadow, *7510 p.p.;* tundra meadow, *7535 p.p.* More common than var. *revolvens* because of its preference for calcareous conditions (Holmen, 1960; Brassard, 1971b; Vitt, 1975). The absence or near absence of reddish pigmentation in the var. *intermedius* appears to be one main distinction from the entirely red plants of the var. *revolvens.*

110. **Drepanocladus sendtneri* (Schimp.) Warnst. (8)

Tight clump in water, tundra meadow, *7511.* This is a poorly understood circumboreal species whose North American distribution is relatively unknown. The species is new to the Queen Elizabeth Islands.

111. *Drepanocladus uncinatus* (Hedw.) Warnst. (1–6,8,9)

Primarily in tufts and cushions in somewhat dry habitats, *16464,*

16484, 16543, 16599, 16630. Moist rivulet, slope, *7366 p.p., 7417, 7429 p.p.;* at base of soil mound used as bird perch, *7465 p.p.;* soil, summit of low hill used as bird perch, *7575 p.p.;* soil, depression between frost heaved mounds, *7599*; depression at base of frost heaved mound, *7609 p.p.;* moist soil, slope below limestone outcrop, *7638, 7641;* with other mosses among dry limestone cobbles, beach ridge, *7706 p.p.* The most common species of *Drepanocladus* in the central Bathurst area and probably throughout the Arctic. Many of the plants were sparsely branched and some were even unbranched which gives them a different appearance from the irregular to nearly pinnately branched stems exhibited by typical plants of the species in the southern part of its range. A similar phenomenon was observed by Kuc (1973a) in plants of *Rhytidium rugosum* (Hedw.) Kindb.

112. *Calliergon giganteum* (Schimp.) Kindb. (2,5,6,8)

In wet depressions, often on mud beside river, *16475 p.p., 16530, 16531, 16535, 16641.* Wet peat, tundra meadow, *7441, 7469 p.p., 7504;* dense cushion, low hummock, tundra meadow, *7445;* on hummock, tundra meadow, *7453;* trailing at edge of pool, tundra meadow, *7503;* tundra meadow, *7539*; emergent from pool of water, tundra meadow, *7709.* A common species in the area and exhibiting a wide range of variation, especially in branching pattern. Several varieties and forms are recognized by Karczmarz (1971) in his monograph of *Calliergon* but we prefer to view the species as a single, variable taxon.

113. *Calliergon sarmentosum* (Wahlenb.) Kindb. (6)

On wet ground at lake margins, *16660a, 16671.* Rare in the Bathurst area. The plants approach the var. *fallaciosum* (Milde) Roth which Karczmarz (1971) recognizes and indicates is a common and widespread variety known from several Canadian Low Arctic localities.

114. *Scorpidium scorpioides* (Hedw.) Limpr. (8)

On peat in shallow pool, tundra meadow, *7437 p.p.* A circumboreal calcicole that is rare in the central Bathurst area. It was previously known from Bathurst only from subfossil material collected by Blake, (Brassard and Steere, 1968; Blake, 1974b).

115. *Scorpidium turgescens* (T. Jens.) Loeske (1,4–8)

Generally on soil in wet situations, e.g., on seepage slopes, in depressions, on river banks, and at lake margins, *16443, 16460, 16468, 16582, 16586, 16618a, 16658, 16681a.* Peat in shallow pool, tundra meadow, *7437 p.p.;* lax colony on wet peat, tundra meadow, *7439 p.p.;* dense cushion on wet peat, tundra meadow, *7440;* wet peat, tundra meadow, *7448 p.p., 7450 p.p., 7455;* in clump at edge of small water pool, tundra meadow, *7486 p.p.;* dense low cushion, tundra meadow, *7555;* edge of pool, tundra meadow, *7559.* A circumpolar calcicole; extremely abundant in wet areas.

BRACHYTHECIACEAE

116. *Tomenthypnum nitens* (Hedw.) Loeske (1,2,8,9)

Generally in hummocks in wet habitats, intermixed with other mosses, *16436 p.p., 16452 p.p., 16527, 16601 p.p.* Moist rivulet, slope, *7366 p.p., 7425, 7429 p.p.;* wet slope, *7414 p.p.;* low hummock on wet peat, tundra meadow, *7476 p.p., 7498;* with other mosses among dry limestone cobbles, beach ridge, *7706 p.p.* A circumboreal species that is common throughout the Arctic.

Brachythecium salebrosum (Web. & Mohr) B.S.G.

Reported by Brassard and Steere (1968) from four collections made by Blake in 1963. One of these collections (No. *44y* in CANM) was examined but it was impossible to determine whether the plants were *B. salebrosum* or small plants of *B. turgidum.*

117. **Brachythecium turgidum* (C. J. Hartm.) Kindb. (1,5,6,8)

Beside lakes or rivers, intermixed with other mosses, *16491, 16495, 16627, 16659 p.p.* Soil, among mosses, *7377.* A circumboreal calciphile that is rather rare in the area.

118. *Cirriphyllum cirrosum* (Schwaegr. *ex* Schultes) Grout (1,2,4,5,8,9)

In hummocks in wet situations, such as pond margins and river banks, *16461, 16465, 16476, 16481, 16521, 16557.* Wet slope, *7393 p.p., 7400 p.p., 7466;* wet peat, tundra meadow, *7452 p.p., 7454 p.p.;* dense cushion, wet area, tundra meadow, *7505, 7506;* depression at base of frost heaved mound, *7609 p.p.;* soil, mouth of lemming burrow, beach ridge, *7699 p.p.* Common in the central Bathurst area as one would expect from its known circumboreal distribution and calciphilous nature. Always sterile as it is elsewhere in the Arctic.

ENTODONTACEAE

119. *Orthothecium chryseum* (Schwaegr. *ex* Schultes) B.S.G. var. *chryseum* (1,5,8,9)

Extremely common, especially in wet habitats on river banks and at pond margins, *16439, 16452 p.p., 16456, 16616 p.p.* Moist rivulet, slope, *7373, 7428;* wet slope, *7400 p.p.;* wet peat, tundra meadoa, *7454 p.p., 7500 p.p., 7540 p.p.;* forming a clump, low hummock on peat, tundra meadow, *7480;* wet springy area at base of beach ridge, tundra meadow, *7534 p.p.;* low mat over peat, tundra marsh, *7669;* soil, mouth of lemming burrow, beach ridge, *7699 p.p.;* low hummock, tundra meadow, *7712 p.p.* One of the most common species in the area and certainly the most common *Orthothecium* in the Arctic.

**Orthothecium chryseum* var. *cochlearifolium* (Lindb.) Limpr. (4,7,8)

In cushions in wet habitats on slopes or at margins of ponds and lakes, *16568, 16608, 16682.* In hummock in wet tundra meadow, *7453 p.p.;* at edge of pool in wet tundra meadow, *7497 p.p.* A common and distinct variety in the central Bathurst area that has not been reported previously for the Queen Elizabeth Islands. The variety is easily recognized by its leaves which are shortly acuminate to acute and strongly recurved at the apex (Figs. 1–8). An examination of herbarium specimens of *O. chryseum* has revealed a number of other records of var. *cochlearifolium* in the Canadian Arctic.

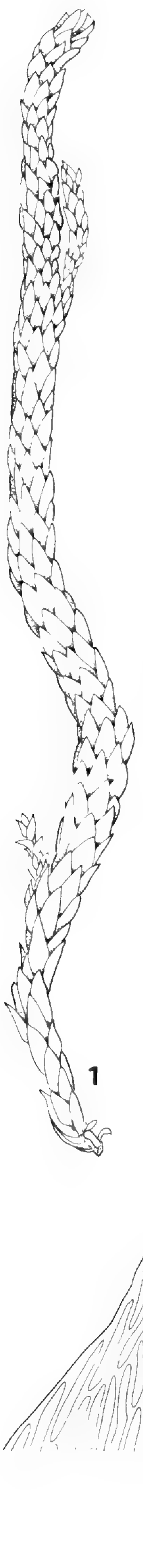
Northwest Territories. Vicinity of Virginia Falls, South Nahanni River, 61°37′N, 125°44′W., *Scotter 13444* (CANM); vicinity of Eldorado Mine, Port Radium, east end of McTavish Arm, Great Bear Lake, 66°05′N, 118°02′W, *Steere 10681* (CANM); Melville Peninsula, Hall Lake, *Dunbar 4886* (CANM); Rankin Inlet, Itivia, north of Melvin Bay, *M. & E. Ohenoja,* 20 Aug. 1971 (CANM).**Baffin Island:** Camp Kungovik, Blue Goose Prairie, 65°35′N, *J. D. Soper 58a* (CANM); Cape Dorset, *J. D. Soper 903* (CANM); Admiralty Inlet, *J. D. Soper 877* (CANM); Pond's Inlet, *J. D. Soper 881* (CANM); head of Clyde Inlet, Falcon River, ca. 69°50′N, 70°40′W, *Wynne-Edwards 9275* (CANM). **Banks Island:** ca. 71°59′N, 125°17′W, *Dickson B14* (CANM). **Bathurst Island:** 75°42′N, 98°16′W, *Blake 44u* (CANM); north of Stuart River Valley, 76°33′N, 98°55′W, *Blake 8p* (CANM); east of Bracebridge Inlet, 75°38′N, 99°20′W, *Blake 28w* (CANM). **Cornwallis Island:** Resolute Bay, *Brassard 2508* (CANM), *Schofield 390* (CANM), *Foster & Bateman 4894, Ritchie* 30 July 1954 (CANM), *Collins 3* (CANM). **Devon Island:** Truelove Lowland, 75°40′N, 84°40′W, *Vitt 5451* (CANM). **Ellesmere Island:** Yelverton Bay, 82°07′N, 81°45′W, *Brassard 4225* (CANM), 82°01′N, 81°40′W, *Brassard 4248* (CANM); island in Disraeli Fiord, 82°53′N, 73°30′W, *Brassard 4105* (CANM); head of Tanquary Fiord, ca. 81°25′N, 76°55′W, *Brassard 3277* (CANM); vicinity of Lake Hazen, 82°N, 70°40′W, *Powell M17* (CANM). **Lowther Island:** Barrow Strait, 74°33′N, 97°30′W, *Blake 16f* (CANM). **Mackenzie King Island:** *Thorsteinsson* 12–20 July 1958 (CANM). **Meighen Island:** *Thorsteinsson* 3 June 1957 (CANM), *Kuc* 24 Aug. 1968 (CANM). **Melville Island:** 40 mi. N of Liddon Gulf, *Harington 496* (CANM); ca. 2 mi. N of Bailey Point, 75°00′N, 114°58′W, *Mosquin & Martin 6406d* (CANM). **Prince Patrick Island:** Mould Bay, *Kuc* 29 May 1968 (CANM). **Southampton Island:** Duke of York Bay, *D. K. Brown 1677* (CANM). **Somerset Island:** Aston Bay, 73°39′N, 94°45′W, *Savile 3749* (CANM); Union River, ca. 72°36′N, 94°00′W, *Shindman* 7 Aug. 1949 (CANM). **Ward Hunt Island:** 83°05′N, 75°30′W, *Hattersley-Smith 5* (CANM).

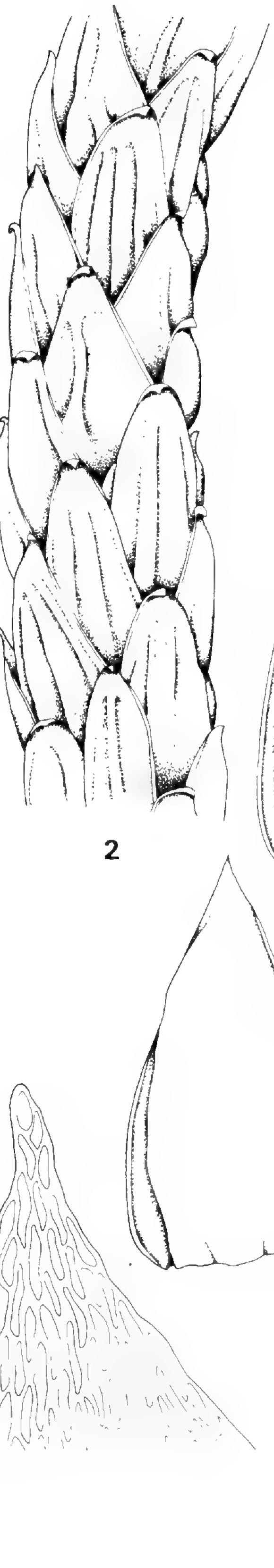
Specimens have been seen outside the Canadian Arctic from Alaska (determined as the variety by W.C. Steere), Greenland, Spitzbergen (Holotype! H), and Russia.

120. *Orthothecium strictum* Lor. (4,5,8,9)

On soil under limestone ledges and at lake margins, *16506, 16554, 16583, 16619.* Growing in cushion on wet peat, tundra meadow, *7438 p.p.;* wet peat, tundra meadow, *7454 p.p.;* soil, beach ridge, *7700 p.p.;* wet peat, tundra meadow, *7717.* Much less common than *O. chryseum* but, like that species, always sterile in the central Bathurst area.

FIGS. 1–8. *Orthothecium chryseum* var. *cochlearifolium* (Lindb.) Limpr. FIG. 1, habit x3, *Ireland 16608;* FIG. 2, stem leaves showing recurved apices x12, *Ireland 16608;* FIG. 3, stem leaves x25, *Ireland 16608;* FIG. 4, stem leaf x25, *Ireland 16608;* FIG. 5, stem leaf x25, *Malagren,* 1861; FIG. 6, apical cells of leaf x340, *Malagren,* 1861; FIG. 7, median-marginal cells of leaf x340, *Malagren,* 1861; FIG. 8, alar cells of leaf x340, *Malagren,* 1861. [Drawings by Linda Ley.]


1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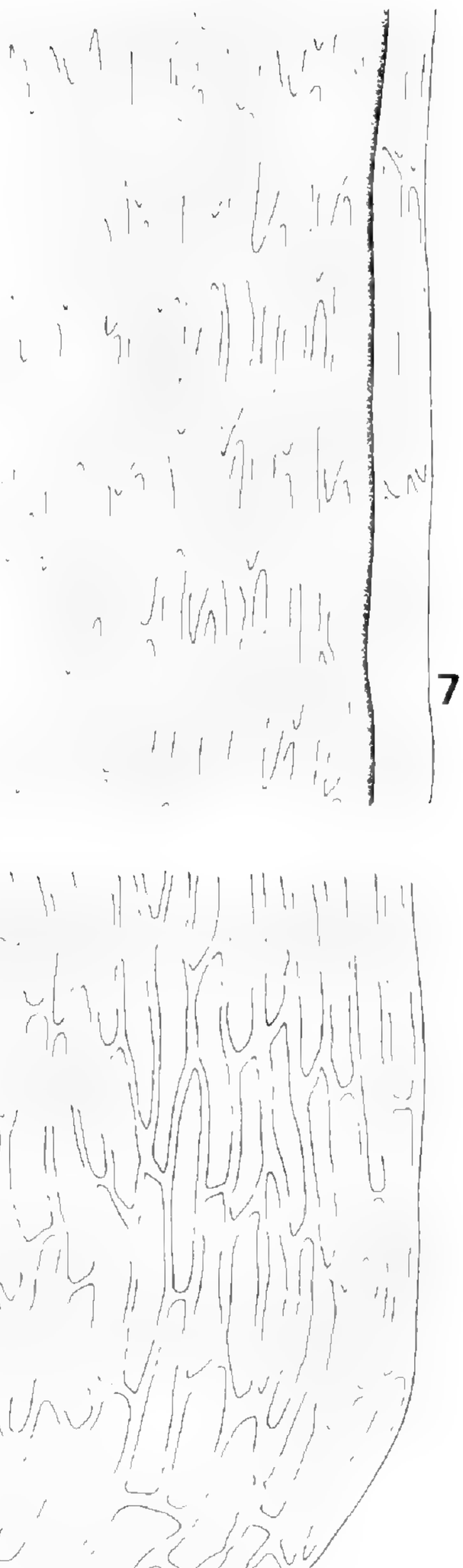
7

8

HYPNACEAE

121. *Hypnum bambergeri* Schimp. (1,8,9)

Small hummock, slope, *7387 p.p.*; wet slope, *7392*; moist rivulet, *7416 p.p.*, *7429 p.p.*; wet peat, tundra meadow, *7452 p.p.*; wet area, tundra meadow, *7541 p.p.*; soil, beach ridge, *7700 p.p.*, *7701 p.p.*; low hummock, tundra meadow, *7712 p.p.* Not uncommon in the central Bathurst area but considered by Brassard (1971a) to be a ubiquitous moss in the Queen Elizabeth Islands. Easy to confuse with forms of *Drepanocladus brevifolius* as Holmen (1960) has observed.

122. **Hypnum lindbergii* Mitt. (8)

Wet tundra meadow, *7441*. Rare in the Bathurst area as it is throughout the Canadian High Arctic. Determined by H. Ando.

123. *Hypnum pratense* Koch *ex* Brid. (6)

On wet ground at margin of lake with *Brachythecium turgidum*, *16659 p.p.* Rare and localized.

124. *Hypnum procerrimum* Mol. (1,4,5,9,10)

On limestone or under ledges, sometimes on soil around cracks in ground, *16522*, *16545*, *16576*. Moist rivulet, slope, *7363 p.p.*, *7418*; wet soil, slope, *7426*; among limestone cobbles, dry scree on side of low hill, *7564*; with bryophytes, interpolygon depression on ridge, *7567*, *7568 p.p.*; area of frost sorted limestone cobbles, beach ridge, *7654 p.p.* Rare and localized. The easiest to recognize of all the arctic Hypna because of its pinnately branched stems.

125. *Hypnum revolutum* (Mitt.) Lindb. (1,3–6,9,10)

In crevices of bluffs, on rocks, on soil under ledges, and on ground among other mosses, *16488*, *16505*, *16507 p.p.*, *16514*, *16544 p.p.*, *16549*, *16649*, *16676*. On limy soil along rivulet, *7374*; soil, bird perch, *7458b p.p.*; with bryophytes, interpolygon depression on ridge, *7568 p.p.*; soil, summit of low hill used as bird perch, *7571*; crevice of limestone outcrop, *7629 p.p.*; soil, slope below limestone outcrop, *7636*; soil, beach ridge, *7698 p.p.*, *7701 p.p.* A common calciphile occurring throughout the Arctic.

126. **Hypnum vaucheri* Lesq. (8)

On hummock on ground beside lake, *16600*. Rare or overlooked.

HYLOCOMIACEAE

127. *Hylocomium splendens* var. *obtusifolium* (Geh.) Paris (Syn. *H. alaskanum* (Lesq. & James) Kindb.) (3,6,8,9)

In mossy hummock at margin of lake, *16632*. Moist soil, slope below limestone outcrop, *7643a*; with other mosses in low hummock, *7655*; low hummock, tundra meadow, *7712 p.p.* Rare and always sterile.

POLYTRICHACEAE

128. *Pogonatum alpinum* (Hedw.) Röhl. (1,3,4,6,7,8)

Usually in dense cushions, often occurring on soil over rocks on slopes, *16434, 16581, 16602 p.p., 16664 (c.fr.), 16685.* Wet slope, *7386 p.p.;* small hummock, slope, *7387 p.p.;* growing in low hummock with mosses, tundra meadow, *7507;* soil, depression between frost heaved mounds, *7600 p.p.;* moist soil, slope below limestone outcrop, *7632, 7640 p.p.* Localized but abundant wherever found. Quite variable in regard to the size of the teeth on the leaf margins and the dorsal surface. Usually sterile but one colony was found with young sporophytes.

129. **Polytrichum strictum* Brid. (6)

In mossy hummock beside lake, *16636.* Rare and localized.

ADDITIONAL MOSSES REPORTED FROM BATHURST ISLAND

The following mosses have been reported from other parts of Bathurst Island, or nearby Moore Island, but they have not been found in the central region (i.e., region 12 of Brassard and Steere, 1968) in the vicinity of NMNS Research Station.

Andreaeaceae
- *Andreaea rupestris* Hedw.

Dicranaceae
- *Dicranum angustum* Lindb. (as *D. laevidens* Williams)

Pottiaceae
- *Tortella tortuosa* (Hedw.) Limpr. (See note under *Tortella arctica.)*
- *Pterygoneurum lamellatum* (Lindb.) Jur. (as *P. arcticum* Steere)

Grimmiaceae
- *Grimmia torquata* Hornsch. *ex* Grev.
- *Rhacomitrium canescens* (Hedw.) Brid.

Splachnaceae
- *Splachnum vasculosum* Hedw. (Reported only from Moore Island.)

Mniaceae
- *Mnium rugicum* Laur. (See note under *Mnium medium* var. *integrifolium.*)

Bartramiaceae
- *Bartramia ithyphylla* Brid.

Amblystegiaceae
- *Cratoneuron commutatum* (Hedw.) Roth (Subfossil material from peat sample.)
- *Amblystegium varium* (Hedw.) Lindb.
- *Drepanocladus exannulatus* (B.S.G.) Warnst.
- *Hygrohypnum polare* (Lindb.) Loeske (Subfossil material from peat sample.)
- *Calliergon richardsonii* (Mitt.) Kindb. *ex* Warnst. (Subfossil material from peat sample.)

Brachytheciaceae
- *Eurhynchium pulchellum* (Hedw.) Jenn. (Reported from Moore Island only.)

Hypnaceae
- *Hypnum cupressiforme* Hedw.
- *Hypnum plicatulum* (Lindb.) Jaeg. & Sauerb.

Polytrichaceae
- *Psilopilum cavifolium* (Wils.) Hag.
- *Polytrichum piliferum* var. *hyperboreum* (R. Br.) C. Müll. (as *P. hyperboreum* R. Br.)

DISCUSSION

The authors collected 21 species of Hepaticae and 108 species of Musci (some of both groups represented by one or more varieties) in the vicinity of the NMNS Research Station in the central Bathurst area. Adding a few other species listed by Brassard and Steere (1968) and not recollected by us, 112 species are now reported for this region. A total of 131 species of mosses (including three species represented only as subfossils) are known to occur on Bathurst Island, which is about the same number reported for some of the other Queen Elizabeth Islands (Table 2).

The present paper reports 21 liverwort taxa and 55 moss taxa as new to the flora of Bathurst Island. Among these are *Bryum algovicum* var. *rutheanum* (Warnst.) Crundw., which is new to North America, and seven that are new to the Queen Elizabeth Islands, namely *Bryum aeneum* Blytt *ex* B.S.G., *Cephaloziella uncinata* Schust. *in* Schust. & Dams., *Drepanocladus sendtneri* (Schimp.) Warnst., *Metacalypogeia schusterana* Hatt. & Mizut., *Orthothecium chryseum* var. *cochlearifolium* (Lindb.) Limpr., *Orthotrichum jamesianum* Sull. *ex* James, *Pterygoneurum ovatum* (Hedw.) Dix., and *Seligeria campylopoda* Kindb. *ex* Mac. & Kindb.

The bryophyte flora of the study region around the Research Station is predominately calcicolous. A striking feature of the Bathurst moss flora is the localized occurrence of many of the species. One collecting site in particular, "Davey's Lake," was important in emphasizing this fact. Conditions in and around the lake (perhaps greater acidity than elsewhere in the immediate area) evidently accounted for the presence of a group of species, including *Aulacomnium palustre*, *A. turgidum*, *Saelania glaucescens*, and *Polytrichum strictum*, that was not found anywhere else during the field studies. Because of localized species distribution, it is obvious that a considerable amount of field work

TABLE 2. MOSSES REPORTED FROM THE QUEEN ELIZABETH ISLANDS AND THE NUMBER IN COMMON WITH BATHURST ISLAND.

Region	Number reported	Number in common with Bathurst Island
Northern Ellesmere I.	155	99 (64%)
Devon I.	133	93 (70%)
Axel Heiberg I.	131	75 (57%)
Cornwallis I.	98	65 (66%)
Prince Patrick I.	96	70 (73%)
Melville I.	79	66 (84%)

will be necessary to obtain a satisfactory understanding of the ecology and distribution of the bryophytes of the island. Probably the same is true for the entire New World Arctic where extensive areas remain unexplored bryologically. The closer similarity (Table 2) of the Bathurst moss flora to that of Melville Island (84%) on the west, than to that of Cornwallis Island (66%) on the east, is probably a result of inadequate collecting and shows little phytogeographic significance. Crum (1966) has commented, with reference to the entire Canadian bryoflora, "any attempt to analyze the bryophytic composition of the various floristic regions or to work out phytogeographic affinities with precision seems premature and doomed to failure."

Most of the bryophytes collected on Bathurst Island are circumpolar or circumboreal in distribution and are typical of the flora of the Canadian High Arctic. However, two species, *Pterygoneurum ovatum* and *Seligeria campylopoda*, are in general more characteristic of temperate areas, and their presence in the High Arctic is of considerable phytogeographic interest. *Seligeria campylopoda* is known otherwise in the far north from the unglaciated foothill area north of the Brooks Range in Alaska (Steere, 1965) where this species and other co-occurring, primarily North Temperate Zone bryophytes are believed to represent distributions attained prior to Pleistocene cooling and glaciation. The distribution of *S. campylopoda*, as recently mapped by Vitt (1976), extends southward through the Yukon and the mountains of British Columbia and Alberta to the states of Washington and Montana. The species is also found disjunctively in eastern North America from Minnesota and Iowa eastward to Newfoundland. In North America *Pterygoneurum ovatum* is a species of wide distribution primarily in prairies, plains, and desert areas of the western United States, but with sporadic stations eastward to Ontario (Williams, 1959) and northward to Alberta, Saskatchewan, and the Yukon. In the Arctic it joins *P. subsessile* (Brid.) Jur., recently reported from arctic Alaska (Steere and Iwatsuki, 1974), and *P. lamellatum* (Lindb.) Jur., which appears to be fairly widespread in the New World Arctic, two other members of the genus that in North America occur mainly in the arid western United States.

Although the occurrence of North Temperate Zone species of bryophytes in the Arctic has been used as evidence for postulating that certain areas escaped Pleistocene glaciation, the central part of Bathurst Island clearly shows the effects of both glacier activity and postglacial marine submergence (Blake, 1974a). Polar Bear Pass, the valley in which the research station is situated, was flooded by sea water to a depth exceeding 45 m beginning about 8500 years ago. The valley remained water filled, though at progressively lower levels, until approximately 4500 years ago, at which time the northern and

southern portions of the island became joined. The collecting site for *Seligeria campylopoda* was the first beach ridge above the tundra meadow that now fills part of Polar Bear Pass. This beach was exposed perhaps 5000 years ago. The collection of *Pterygoneurum ovatum* was made in the upland north of the Pass. Deglaciation of Bathurst Island is believed to have begun prior to 10,000 years ago and by 9000 B.P. extensive areas were ice-free (Blake, 1964). Thus, the occurrence of both species reflects immigration at some time(s) during the Postglacial.

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NEW OSTROPALES FROM THE COLLECTIONS OF THE FARLOW HERBARIUM

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ABSTRACT

Biostictis chroodiscoides, *Lillicoa thaxteri*, and *L. speciosa* from Trinidad, and *Schizoxylon spiraeae*, from New Hampshire, are described as new. The imperfect stages of *B. chroodiscoides* and *B. psychotriae*, the type species of *Biostictis*, are discussed, and *Erinella bicolor* is transferred to *Lillicoa*.

INTRODUCTION

In a survey of the unidentified discomycetes in the collections of the Farlow Herbarium, specimens were encountered which appeared to represent undescribed species of Ostropales. The four new taxa appeared unambiguously to belong to the genera *Biostictis*, *Lillicoa*, and *Schizoxylon*, genera described in more detail in an earlier paper (Sherwood, 1977), and are described under the appropriate generic headings below. The obvious association of an imperfect hyphomycete with the lesions induced by *Biostictis chroodiscoides* led to re-examination of the type of *B. rubiacearum* (= *B. psychotriae*). The type of *Erinella bicolor* was examined and found to be conspecific with *Lillicoa palicoureae*.

All observations were made on dried specimens rehydrated in water, imbedded in dilute mucilage, sectioned at 15μm on a freezing microtome, and mounted in Melzer's reagent. Illustrations are freehand renditions of individual specimens. Additional notes on methods and an explanation of the terminology can be found in a previous paper (Sherwood, 1977).

BIOSTICTIS PETRAK, SYDOWIA 4:357 (1950)

Biostictis chroodiscoides Sherwood, spec. nov. Figure 1

Ascocarpi gregatim hypophylli in phyllis viventibus, 0.2–0.8 mm diam.; discus ascocarpi pallide porphyreus, margine pruinoso lacerato, profunde modice immersus in phyllum. Margo in sectione transversali c. 50–80 μm crassus, siccus ab hymenio se abrumpens. Stratum crystallinum c. 50–80 μm crassum. Paraphyses filiformes, ramosae, 75 × 1.0 μm, in iodo non caerulescentes. Asci 61–70 × 6(-8) μm, apice 3 μm crassi, 8-spori. Sporae 23–33 × 2.0–3.0 μm, cellulis 6–8 μm longis.

Status imperfectus illo Rhinocladiellae similis. Conidiophora 25–35 × 3–4.5 μm, simplicia solitaria, percurrenter prolifera, conidia 18–35 × 1.5–3 μm hyalina blastica simplicia efferentia.

Etymology: From *Chroodiscus* (Müll. Arg.) Müll. Arg., a foliicolous lichen with similar gross morphology.

Holotypus: FH—On leaves, Maraval Valley, Port of Spain, Trinidad,

[1]Present address: Farlow Herbarium, Harvard University, Cambridge, MA 02138

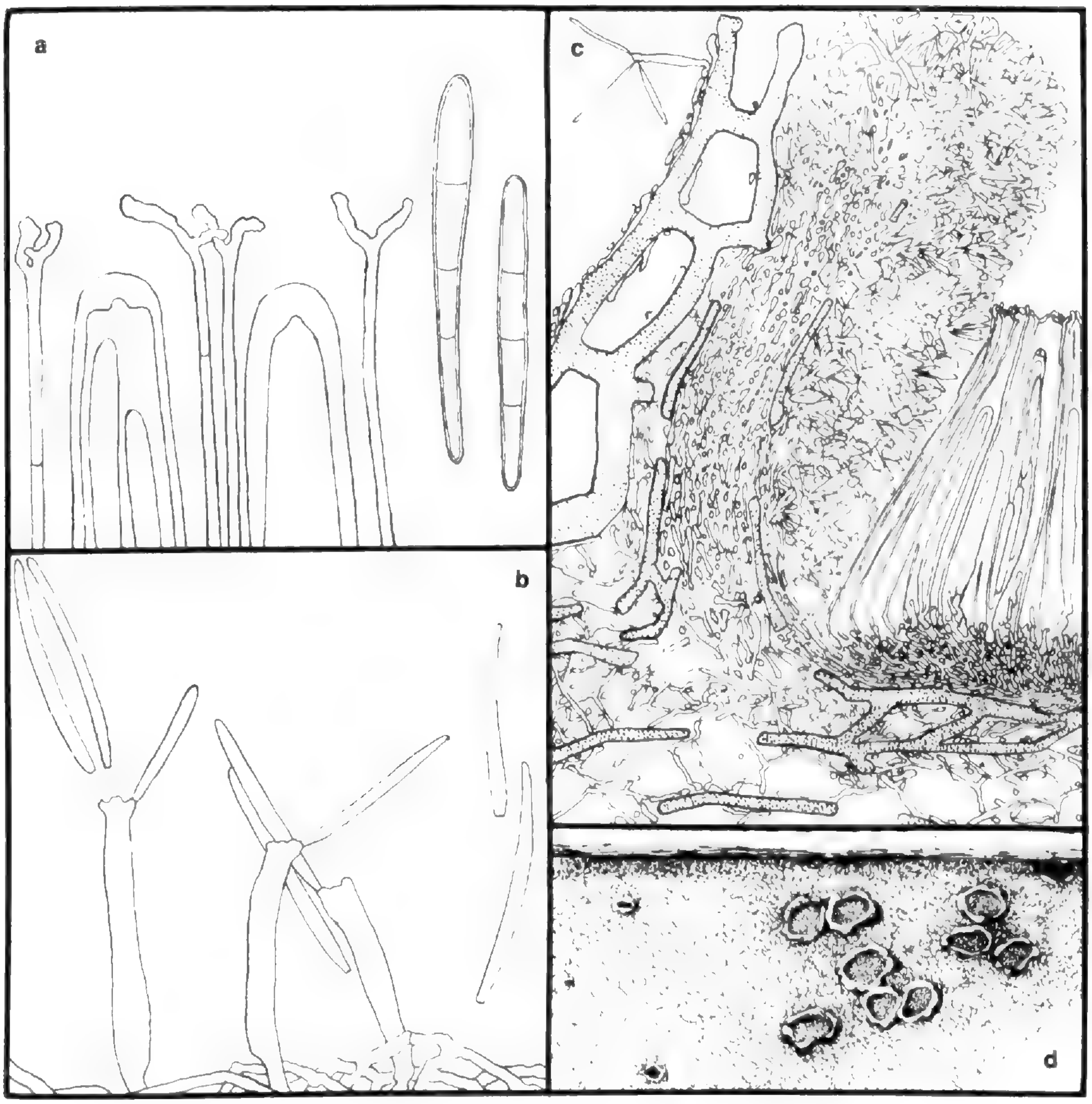

FIG. 1. *Biostictis chroodiscoides*. **a.** Detail of apices of asci, paraphyses, and spores, x1500. **b.** Imperfect stage, x750. **c.** Cross section of margin, x375. **d.** Habit sketch, x7.5. Drawn from the holotype.

British West Indies, R. Thaxter, n.d. *Isotypi:* C, NY, CUP, UC, DAOM, BUCM, GB.

Colonies hypophyllous on living leaves, 1–5 cm diam., at first causing a yellowish discoloration, the center reddening and becoming necrotic. Mycelium endophyllous and hypophyllous, forming a conspicuous white mat on the lower surface of the lesion.

Apothecia hypophyllous, gregarious, at first immersed, subepidermal, opening by splitting the overlying substrate into 3–6 irregular lobes, the margin reflexed, stellate, white-pruinose, the disc moderately deeply immersed, at first pale reddish brown, darkening with age, the color due to discoloration of the underlying substrate. Margin consisting almost entirely of colorless rosettiform crystals. Thalline margin prominent, consisting of epidermal cells filled with hyphae.

Subhymenium colorless, 25–30 μm thick. Asci 61–70 × 6 (-8) μm, the cap 3 μm thick, indented. Ascospores 8, irregularly 4-seriate, 23–33 × 2.0–3.0 μm, 3-septate. Paraphyses colorless but secreting a brown amorphous substance at their apices, 1 μm broad, propoloid, not blueing in iodine.

Imperfect stage hypophyllous, hyphomycetous, accompanying the apothecial stage, resembling *Rhinocladiella*. Condiophores arising singly or in small clusters from the superficial mycelium, simple, colorless, 25–35 × 3–4 μm, cylindrical, proliferating percurrently. Conidia blastic, simple, colorless, 18–30 × 1.5–3 μm, budded off successively from the apex of the conidiophore.

On living leaves, causing an obvious disease, Trinidad, British West Indies. According to Dr. R. Howard of the Arnold Arboretum the host may well be Rubiaceous, although the material is too fragmentary to determine with certainty. *Biostictis chroodiscoides* differs from the other species in the genus in having shorter, 4-seriate, 3-septate ascospores.

Since the imperfect stage associated with *Biostictis chroodiscoides* resembled descriptions of *Fusidium violaceum* Pat., alleged by Patouillard and Lagerheim (1895) and Petrak (1950) to be the imperfect stage of *Stictis rubiacearum* Pat. (= *B. psychotriae* (Mont.) Sherw.), I re-examined the type specimens of both *F. violaceum* and *S. rubiacearum* (FH-Patouillard 5036, San Jorge, Lagerheim, 1892). The superficial fungus described by Patouillard as *F. violaceum* is remarkably similar to the imperfect stage of *B. chroodiscoides*, differing primarily in having longer, narrower conidia 30–40 × 1.5–2.0 μm. The additional evidence presented here suggests that *F. violaceum* is indeed the imperfect stage of *B. psychotriae*, contrary to the opinion expressed earlier (Sherwood, 1977), although this was by no means obvious from the original material. If the fruitbodies of *B. psychotriae* are long-lived in nature, as are those of many Ostropalean fungi, this would account for the variable development of the imperfect stage among natural collections, since the superficial phase would be more suceptible to environmental conditions than the immersed phase.

LILLICOA SHERWOOD, MYCOTAXON 5:57 (1977)

Among specimens collected on living leaves by R. Thaxter in Trinidad were several belonging to the genus *Lillicoa*, including two apparently undescribed species. In all cases the apothecia were superficial and were associated neither with obvious disease symptoms nor with the mycelium of other fungi. Leaves of Leguminosae colonized by *L. speciosa* were also attacked by scale insects and supported

numerous other fungi, including Meliolineae and *Aschersonia*, as well as a number of foliicolous lichens. Leaves of *Casearia* (?) colonized by *L. thaxteri* likewise supported a diverse flora, but no resident insects. *Lillicoa* spp. evidently occur under conditions favorable to epiphyllous fungi. The occurrence of three morphologically distinct species on unrelated hosts within a small area in Trinidad suggests that the species are host specific.

Lillicoa thaxteri Sherwood, spec. nov. Figure 2

Apothecia hypophylla, sessilia, parva, cylindrica, 0.2–0.4 mm diam., margine integro, albo, disco pallide ochraceo. Margo in sectione transversali 45 μm crassus, siccus ab hymenio se non abrumpens, hypharum pariete 1.5 μm diam., achromo. Stratum crystallinum internum abest. Periphysoidea 15 × 1.5 μm, non ramosa. Paraphyses filiformes, simplices vel ramosae, 300 × 1.0–1.5 μm, in iodo non caerulescentes. Asci 250–300 × 10–13 μm, apice 7–9 μm crassi, 8-spori. Sporae 225–275 × 4–4.5 μm, cellulis 4–5 μm longis.

Etymology: After R. Thaxter, the collector and former curator of the Farlow Herbarium.

Holotypus: FH—On leaves of Flacourteaceae (*Casearia*?), Port of Spain,

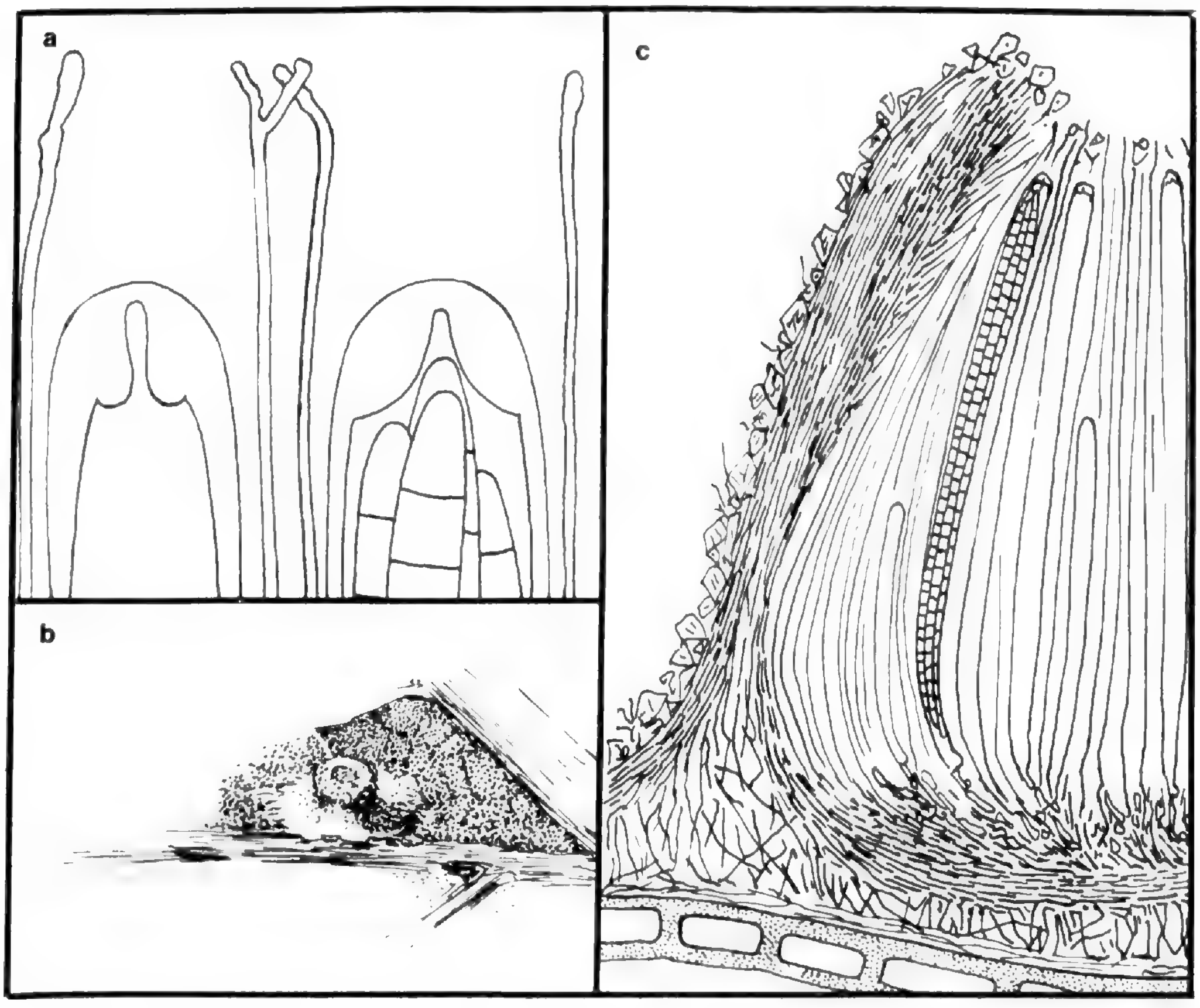

FIG. 2. *Lillicoa thaxteri*. **a.** Detail of apices of asci, paraphyses, and spores, x1500. **b.** Habit sketch, x15. **c.** Cross section of margin, x225. Drawn from the holotype.

Trinidad, British West Indies, Roland Thaxter, n.d. *Isotypi:* C, NY, CUP, UC, DAOM, BUCM, GB.

Apothecia scattered, hypophyllous, completely superficial, sessile on circular mats of hyphae and crystals c. 1 mm diam. merging into a fine hyaline subiculum at the margin, 0.2–0.4 mm diam., a little taller than broad, cylindrical, white-pruinose without, with a plane or slightly depressed pale ochraceous disc which does not split away from the margin when dry. Ascocarp initals developing beneath the mat of hyphae and crystals, becoming erumpent early in development. Margin in cross section 3-layered, the outermost layer continuous with the mycelial mat surrounding the apothecium, crystalliferous, the middle layer consisting entirely of colorless hyphae 1.5 μm diam. continous with the hyphae below the mat and ascocarp, the innermost layer of sparse periphysoids 15 × 1.5 μm, at least toward the summit of the margin, apparently continuous with subhymenial elements. The overall structure of the ascocarp resembles a perithecium.

Asci 250–300 × 10–13 μm, the cap 7–9 μm thick, with an obvious pore. Paraphyses filiform, 1.0 μm broad below, barely enlarged above, simple or branched, J-. Ascospores 8, nearly as long as the asci, 4–4.5 μm broad, the cells 4–5 μm long, showing a slight tendency to disarticulate at the septa.

On living leaves of Flacourteaceae (*Casearia*?), Trinidad, British West Indies. The species differs from *L. bicolor* and *L. speciosa* (below) in having much larger asci and spores, and in growing on an unrelated host. It is completely superficial and causes no visible symptoms.

ADDITIONAL SPECIMENS EXAMINED: FH—Port of Spain, Trinidad, B.W.I., R. Thaxter, n.d. (evidently not a duplicate of the holotype); FH-*Thaxter 7482*, Maraval Valley, Port of Spain, 1912–1913.

Lillicoa speciosa Sherwood, spec. nov. Figure 3

Apothecia hypophylla, superficialia, sessilia, parva, cyclindrica, 0.1–0.2 mm diam., margine integro, albo, disco pallide ochraceo. Margo in sectione transversali 20–30 μm crassus, siccus ab hymenio se non abrumpens, hypharum pariete 1.5–3 μm diam., achromo. Stratum crystallinum internum abest. Periphysoidea nulla. Paraphyses filiformes, ramosae, leniter circinatae, 230–250 × 1.0 μm, in iodo non caerulescentes. Asci 220–235 × 5.5–6 (-8) μm, apice 4.5 μm crassi, 8-spori. Sporae 200–220 × 1.5 μm, cellulis 6–10 μm longis.

Etymology: From Latin, *speciosus*, pretty or sightly, a rough translation of Thaxter's field note: "nice white disco".
Holotypus: FH—On leaves of Leguminosae (*Inga*), Maraval Valley, Port of Spain, Trinidad, British West Indies, R. Thaxter, n.d.

Apothecia scattered, hypophyllous, completely superficial, not seated on a crystalline mat but surrounded by a faint subiculum, small, cylindric-turbinate, 0.1–0.2 mm diam., 0.25–0.3 mm tall, white-pruinose without, the disc deeply immersed, pale ochraceous, visible from

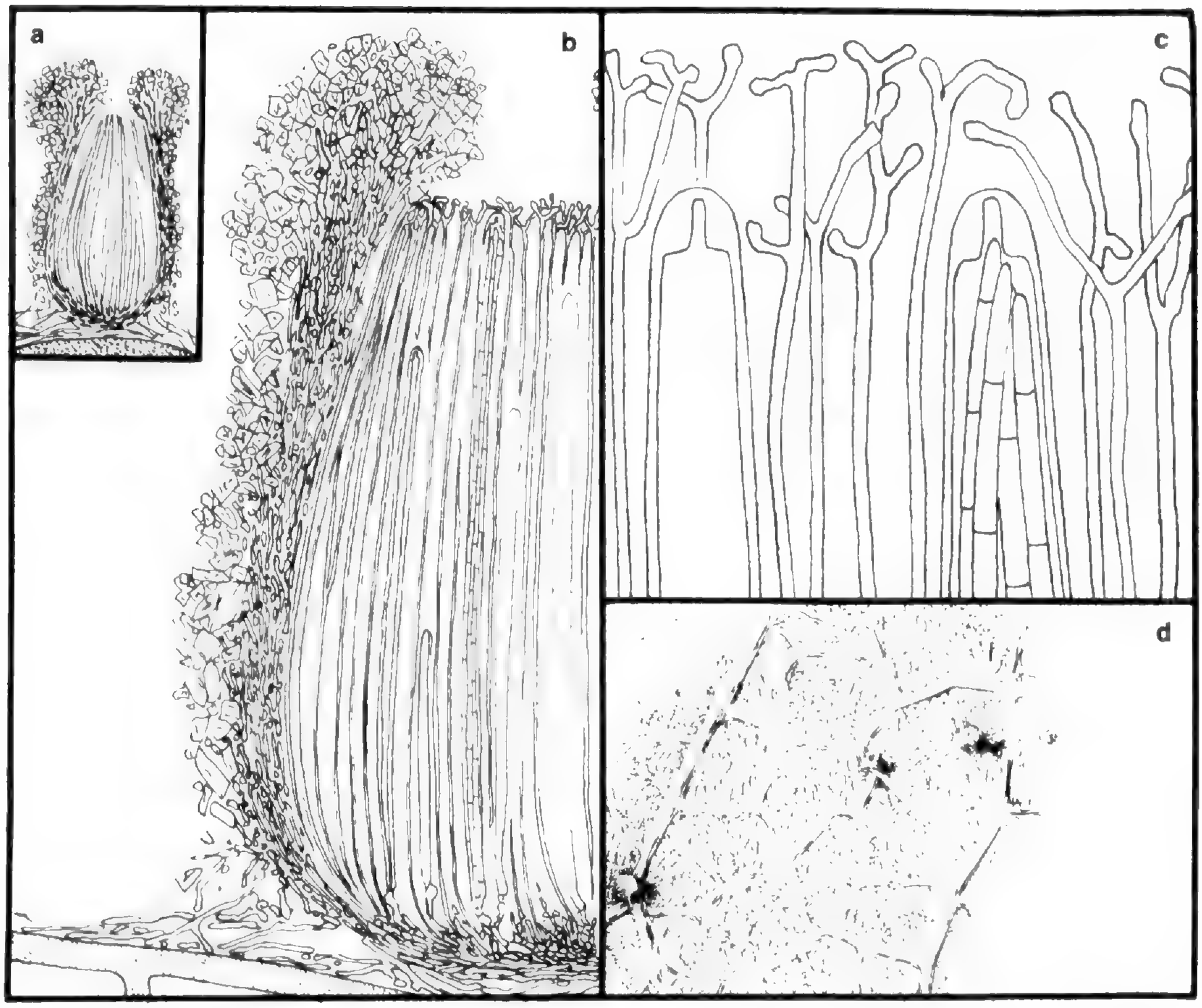

FIG. 3. *Lillicoa speciosa*. **a.** Cross section of entire ascocarp, x75. **b.** Cross section of margin, x300. **c.** Detail of apices of asci, paraphyses, and spores, x1500. **d.** Habit sketch, x7.5. Drawn from the holotype.

above as a minute punctiform ostiole when dry. Margin in cross section 20–30 μm thick, of interwoven colorless hyphae 1.5–2.0 μm diam., expanded to 3.0 μm diam. above, externally crystalliferous but devoid of internal differentiation. Periphysoids absent. Subhymenium colorless, c. 25 μm thick, small-celled, resting on a subiculum of hyphae 2.0 μm diam. Paraphyses numerous, filiform, 1.0 μm diam. below, scarcely enlarged above, branched and circinate, J-. Asci 220–235 x 5.5–6 (-8) μm, the cap 4.5 μm thick, with a distinct pore. Ascospores 8, nearly as long as the asci, 1.5 μm broad, not sheathed or coiling, the cells 6–10 μm long.

On living leaves of Leguminosae, Trinidad, British West Indies. The species differs from *L. bicolor* in having a different host, lacking a prominent orange disc, and having longer asci, more abundantly branched paraphyses, and more distantly septate spores.

Lillicoa bicolor (Pat.) Sherwood, comb. nov.

≡ *Erinella bicolor* Pat., Bull. Herb. Boissier **3**: 65 (1895)

= *Lillicoa palicoureae* (Seaver & Whetzel) Sherw., Mycotaxon **5**: 59 (1977)

The type specimen of *Erinella bicolor* (FH-Patouillard 5339, San Jorge, Ecuador, Juill. 1892, Lagerheim), on dead or dying leaves tentatively identified by Mr. Sandwith (K) as *Sloanea* (Tiliaceae), is fragmentary and contains two minute apothecia. Neither Dennis's (1954) redescription of the species nor its external appearance presents any character to separate *E. bicolor* from *L. palicoureae*. Since Patouillard's epithet is older I propose the above combination for the species.

ADDITIONAL SPECIMENS EXAMINED: FH—three specimens on undetermined hosts, Maraval Valley, Port of Spain, Trinidad, 1912–13; FH—I.M. Johnston, 11.I.1946, San Jose Island, Panama.

SCHIZOXYLON PERS., ANN. WETTERAUISCHE GES. GESSAMTE NATURK. **2**: 11 (1810)

Schizoxylon spiraeae Sherwood, spec. nov. Figure 4

Ascocarpi primum immersi, erumpescentes, non profunde cupulati, 0.3–0.6 mm diam., margine integro, nigro, disco nigro. Margo in sectione transversali 85 µm crassus, siccus ab hymenio se non abrumpens, ex hyphis intertextis achromis et brunneis constans. Paraphyses filiformes, ramosae, 450–480 × 1.0 µm diam., apice ad 2.5 µm incrassatae, brunneae, in iodo caerulescentes. Asci 375–450 × 7 (-10) µm, apice 3.0 µm crassi, 8-spori. Sporae 300–425 × 2.5 µm, cellulis 4–6 µm longis.

Etymology: Named after the host.
Holotypus: FH—On *Spiraea salicifolia,* Chocorua, New Hampshire, W. G. Farlow, July 20, 1909.

Apothecia at first immersed, becoming erumpent, 0.3–0.6 mm diam., the margin entire, black, shining, not pruinose, sometimes covered by adhering bits of host tissue, the disc plane, black, shining. Margin in cross section c. 85 µm thick, of interwoven colorless hyphae 2.0 µm diam. within, becoming pigmented without, not notably gelatinous, with a few scattered crystalline inclusions but not externally pruinose. Subhymenium 60–70 µm thick, colorless, resting directly on disintegrating host tissue. Asci 375–450 x 7 (-10) µm, the cap 3 µm thick, indistinct. Paraphyses filiform, abundantly branched apically, thickened to 2.5 µm above, brown, J+ blue apically. Ascospores 8, nearly as long as the asci, 2.5 µm broad, the cells 4–6 µm long, not disarticulating at the septa.

On small dead stems of *Spiraea,* New Hampshire, U.S.A. The substrate on which the *Schizoxylon* is growing is covered with small black pseudoparenchymatous pycnidia-like structures which contain

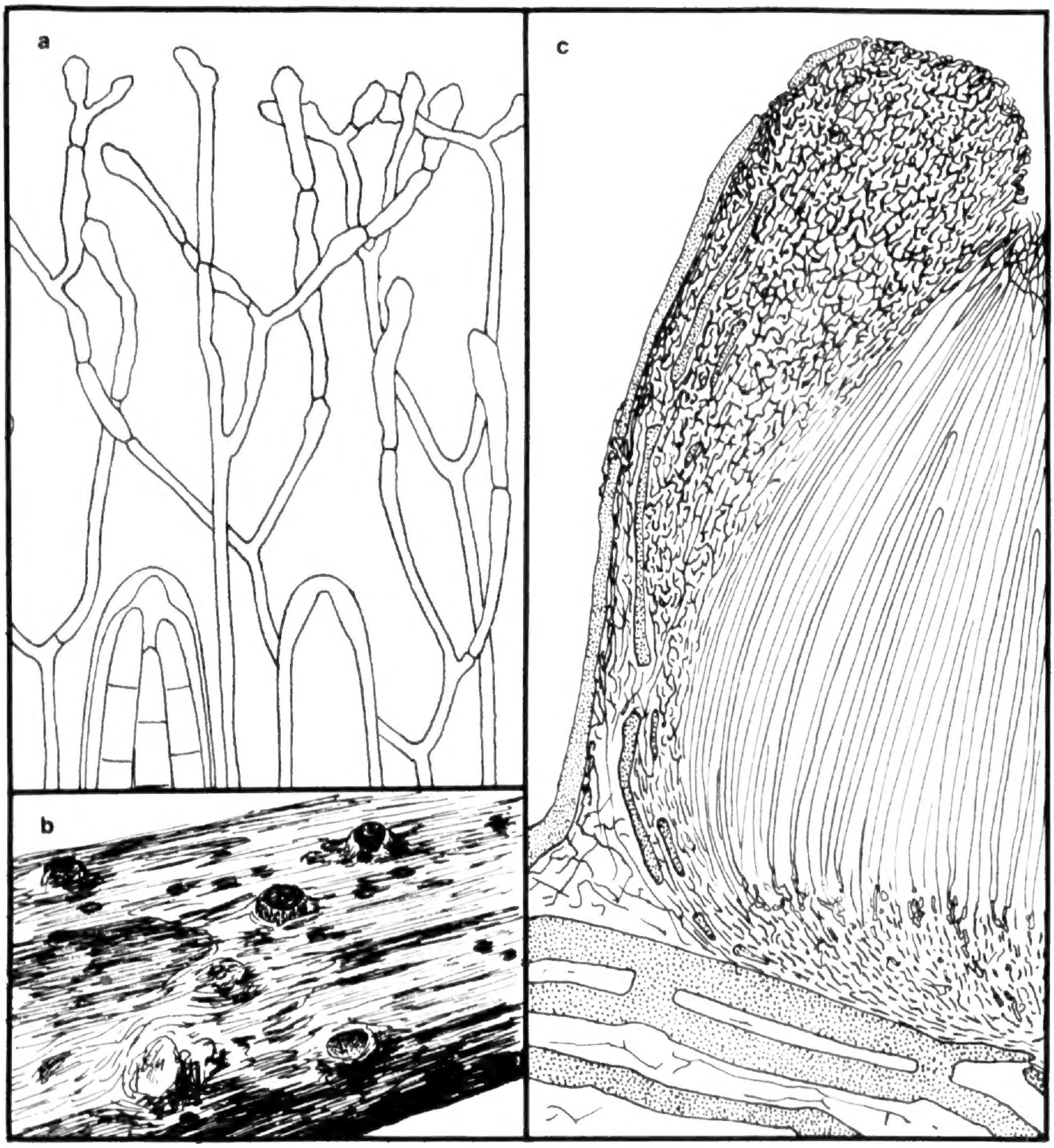

FIG. 4. *Schizoxylon spiraeae*. **a.** Detail of apices of asci, paraphyses, and spores, x1500. **b.** Habit sketch, x7.5. **c.** Cross section of margin, x150. Drawn from the holotype.

no spores. The structure is unlike that of *Schizoxylon;* I suspect they are an unconnected fungus. The species differs from *S. alboatrum* Rehm in the smaller apothecia, black, non-pruinose margin, slightly broader spores, and strong J+ blue reaction of the epithecium, and from *S. lantanae* (Tilak & Nanir) Sherw. in the non-gelatinous margin and in occurring in the eastern U.S. rather than in India.

ACKNOWLEDGEMENTS

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