F. Schumm (2026):

Images of Lichens *from Japan 11*

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With this volume I document a collection of images mainly out of the Exsiccats of Kashiwadani, Kurokawa and Ohmura from Japan 11. The main names are always the names that are written on the Exsiccats. That is the reason why Parmelia, Punctelia, Flavoparmelia etc appear on different places. New synonyms can be found in the Index. I mostly omitted the search for description from the literature because most of them could be found in the earlier Vols. of Vezda

For the descriptions of europaean species I recomend the excellent descriptions that are provided in Prof. Nimis ITALIC 8 under the URL:
https://italic.units.it/

and the Australian Lichenslist under the Url:
https://www.anbg.gov.au/abrs/lichenlist/lichenchecklist_e_o.html

F. Schumm, 2026

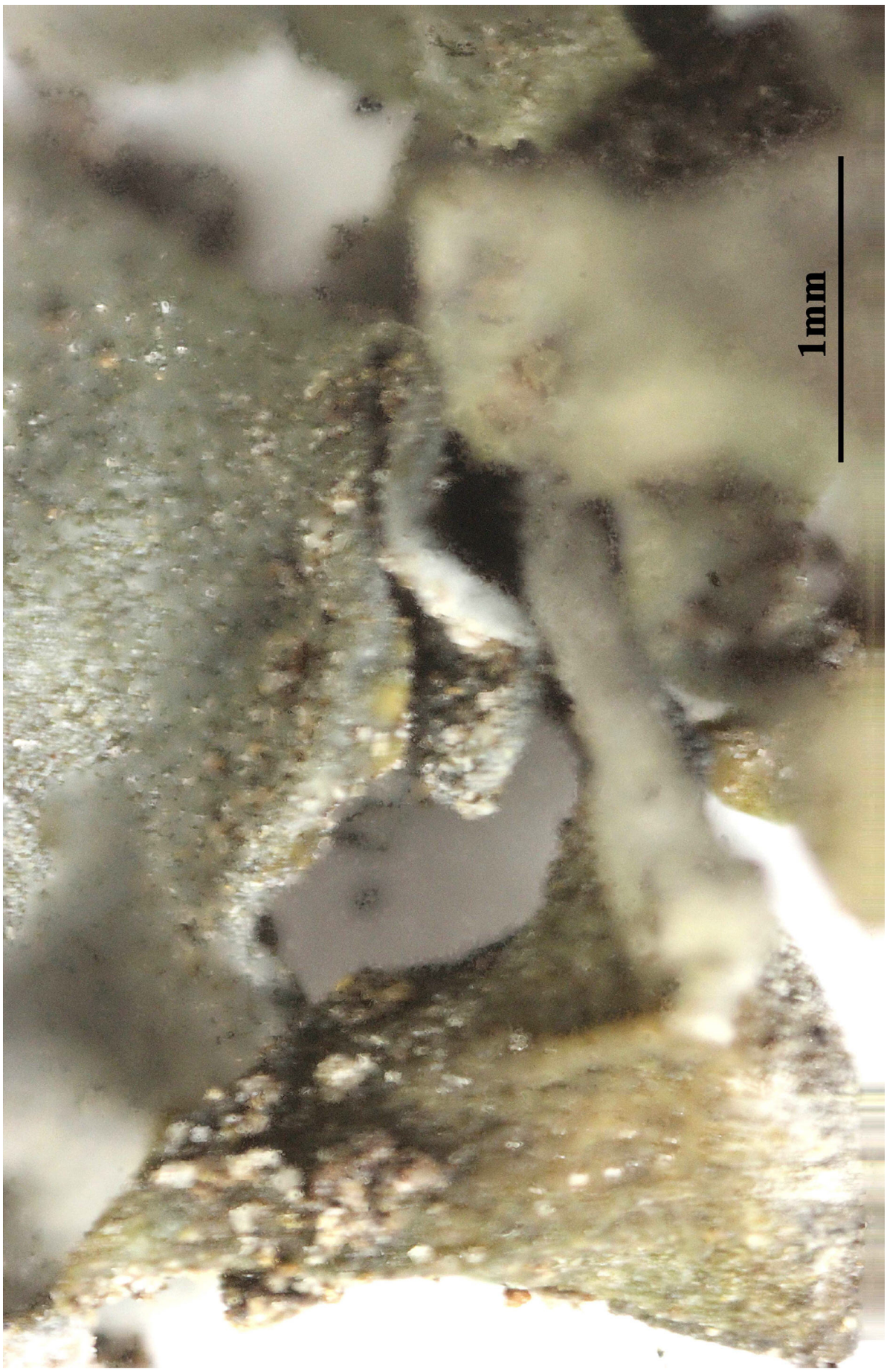
Thyrea confusa Henssen, in Henssen & Jørgensen, Lichenologist 22(2): 146 (1990)

[OH642], Japan. Honshu. Prov.Shinano (pref.Nagano): Todai, Ina-city (35°46'21" N, 138°09'47" E). On calcareous rock, 1170 m. Leg. Y, Ohmura (mo. 11715), M. Sugimoto & H. Kashiwadani,det.Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 642.

Thallus foliose to subfruticose, polyphyllous, gelatinous when wet, forming small cushions or up to 2 cm wide rosettes. Squamules 2-5 mm wide, to 1 cm long, erect or ascending, flat or weakly channelled on lower surface, irregularly branched, broadly rounded at apex, black but most often bluish-grey pruinose, often with small, globose, granular isidia, otherwise smooth; lower surface plicate, often paler than upper surface. Thallus ecorticate, 250-500 µm thick; medulla 200-300 µm thick, of irregularly arranged, lax hyphae, in the upper and lower parts consisting of mainly anticlinally oriented hyphae enclosing the photobiont cells. Apothecia rare, immersed or semi-immersed, hemiangiocarpic, forming pycnoascocarps from ascogonia beneath pycnidia, small, the disc punctiform, slightly depressed, brownish, with a persisting thalline margin. Proper exciple colourless, up to 10 µm wide; epithecium poorly differentiated; hymenium colourless, up to 150 µm high, K/I+ blue; paraphyses distinctly septate, sparingly branched and anastomosing, the apical cells slightly thickened, up to 3 µm wide; hypothecium colourless. Asci 8-spored, prototunicate, cylindrical-clavate, thin-walled, with an external, I+ blue cap. Ascospores 1-celled, hyaline, globose to broadly ellipsoid, thin-walled, (7.5-)8-12(-15) x 5-7.5(-10) µm. Pycnidia immersed, globose, unilocular, 90-120 µm across. Conidia cylindrical, 2-3 x 1-1.5 µm. Photobiont cyanobacterial, chroococcoid, with a few cells measuring (4-)6-8(-10) µm, surrounded by a brownish gelatinous sheath. Spot test: all negative. Chemistry: without lichen substances. -
Note: on steeply inclined, sunny faces of calcareous rocks with short periods of water seepage after rain.



Thyrea confusa

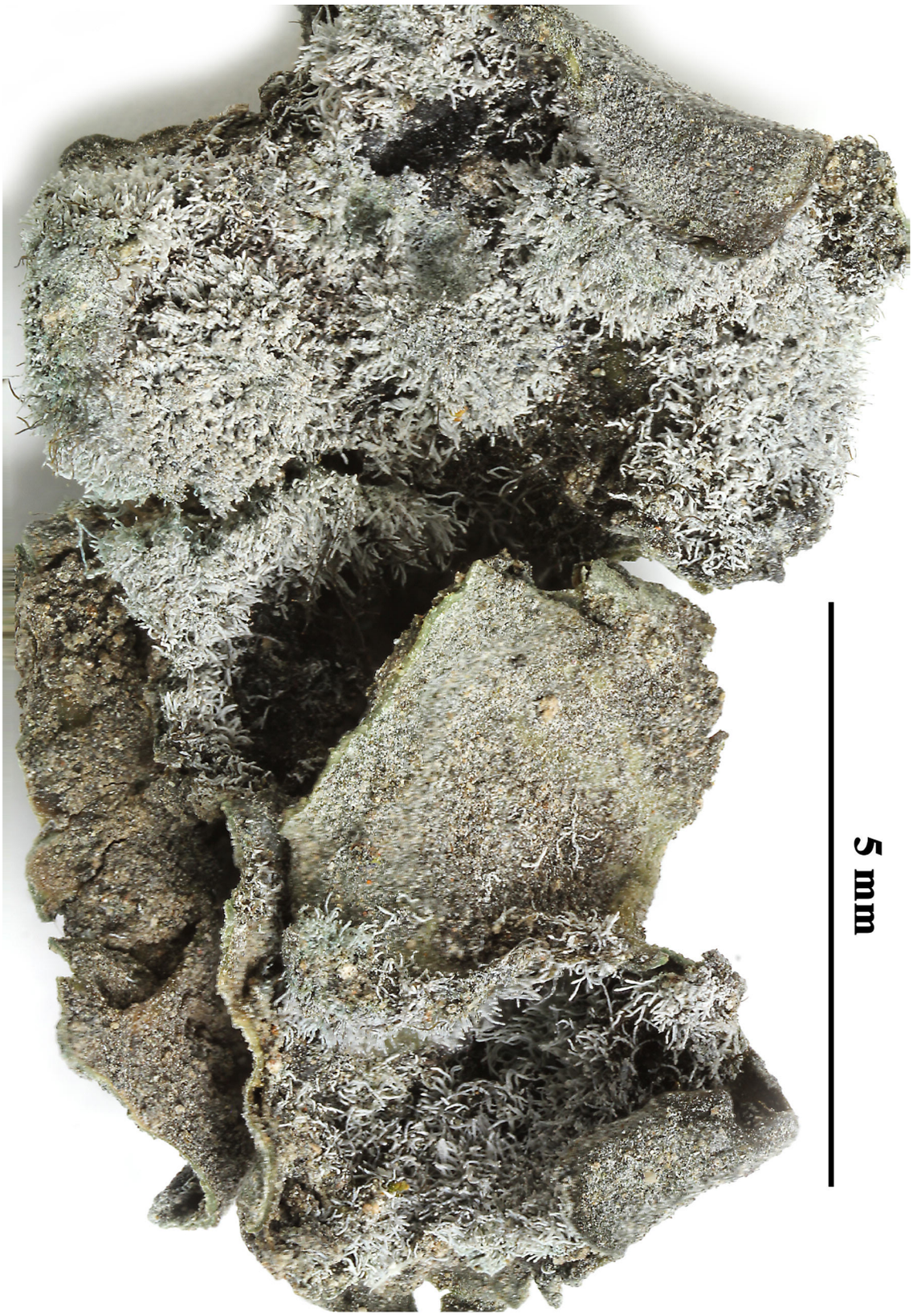


Thyrea confusa

Thyrea confusa Henssen, in Henssen & Jørgensen, Lichenologist 22(2): 146 (1990)

[ABL56996], China, Yunnan Prov., Yunnan Co., Stone Forest, Parkland with limestone outcrops, c.. 2000 m, 24°49'01'' N, 103°19'27'' E, on limestone. Leg. A. Aptroot (no 56996), 27.10.2002, det. A. Aptroot, 2003, conf. M. Schulz, 2005.

Thallus foliose to subfruticose, polyphyllous, gelatinous when wet, forming small cushions or up to 2 cm wide rosettes. Squamules 2-5 mm wide, to 1 cm long, erect or ascending, flat or weakly channelled on lower surface, irregularly branched, broadly rounded at apex, black but most often bluish-grey pruinose, often with small, globose, granular isidia, otherwise smooth; lower surface plicate, often paler than upper surface. Thallus ecorticate, 250-500 µm thick; medulla 200-300 µm thick, of irregularly arranged, lax hyphae, in the upper and lower parts consisting of mainly anticlinally oriented hyphae enclosing the photobiont cells. Apothecia rare, immersed or semi-immersed, hemiangiocarpic, forming pycnoascocarps from ascogonia beneath pycnidia, small, the disc punctiform, slightly depressed, brownish, with a persisting thalline margin. Proper exciple colourless, up to 10 µm wide; epithecium poorly differentiated; hymenium colourless, up to 150 µm high, K/I+ blue; paraphyses distinctly septate, sparingly branched and anastomosing, the apical cells slightly thickened, up to 3 µm wide; hypothecium colourless. Asci 8-spored, prototunicate, cylindrical-clavate, thin-walled, with an external, I+ blue cap. Ascospores 1-celled, hyaline, globose to broadly ellipsoid, thin-walled, (7.5-)8-12(-15) x 5-7.5(-10) µm. Pycnidia immersed, globose, unilocular, 90-120 µm across. Conidia cylindrical, 2-3 x 1-1.5 µm. Photobiont cyanobacterial, chroococcoid, with a few cells measuring (4-)6-8(-10) µm, surrounded by a brownish gelatinous sheath. Spot test: all negative. Chemistry: without lichen substances. - Note: on steeply inclined, sunny faces of calcareous rocks with short periods of water seepage after rain.



Thyrea confusa



Thyrea confusa



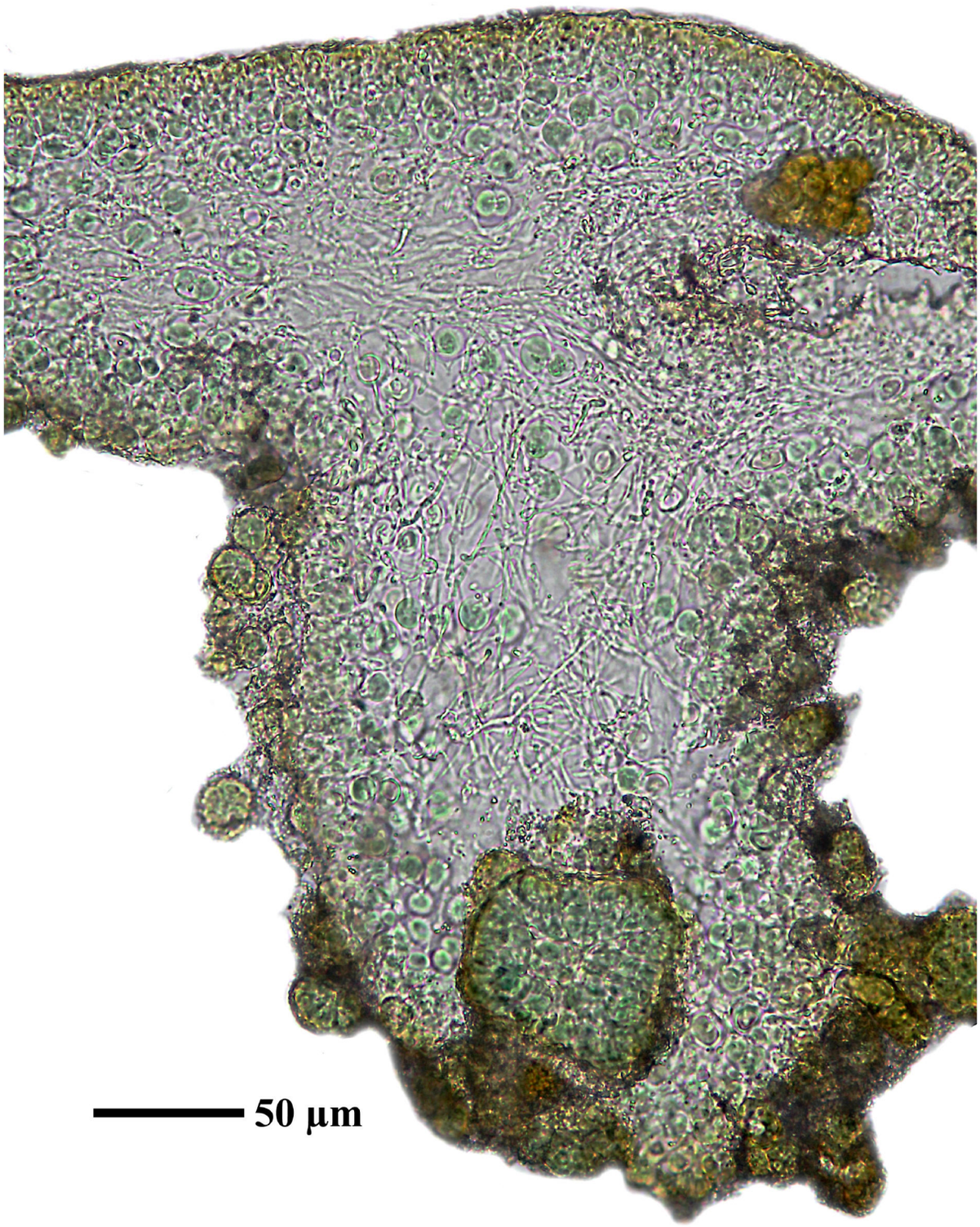
Thyrea confusa



Thyrea confusa



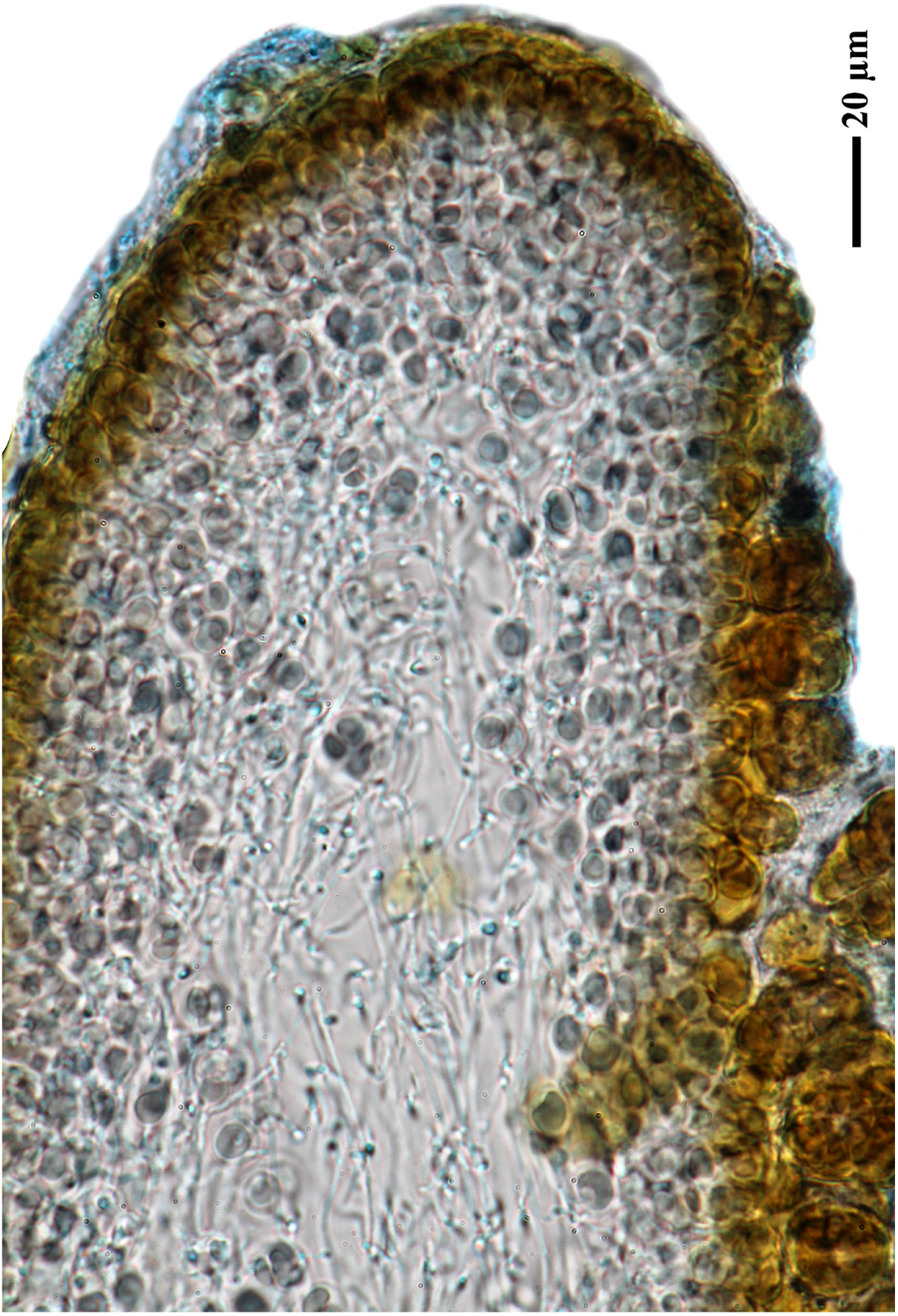
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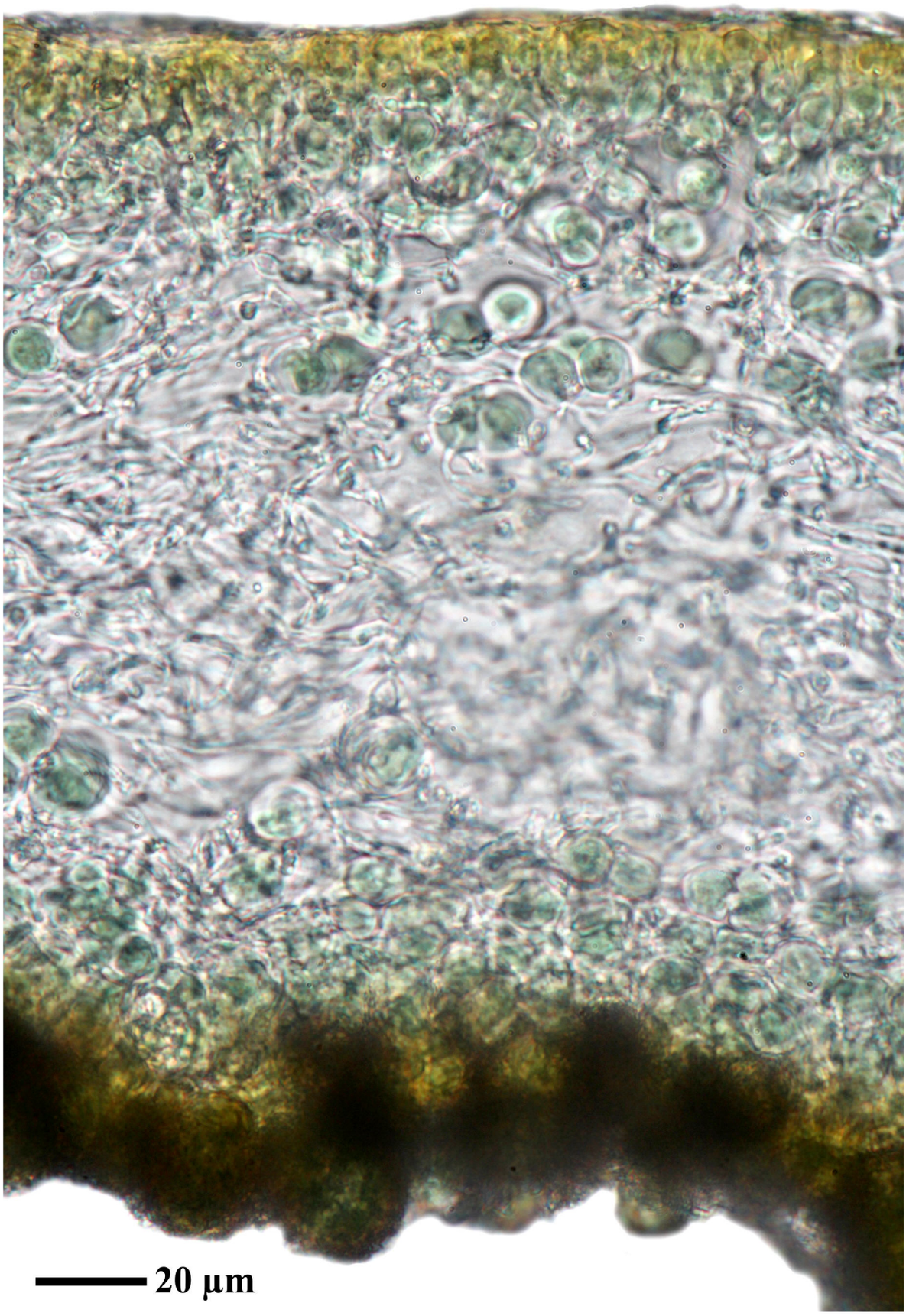
Thyrea confusa



Thyrea confusa



Thyrea confusa



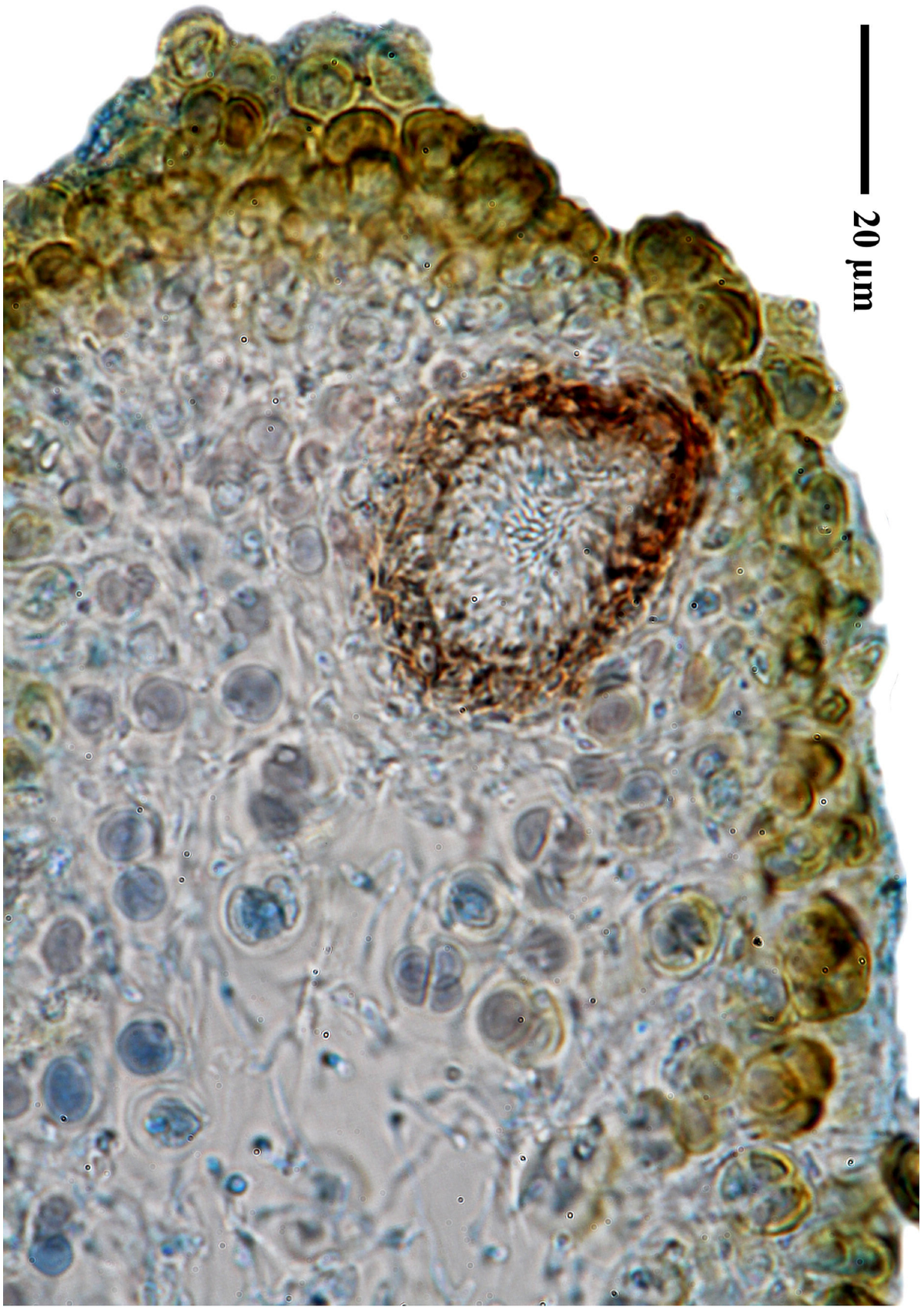
Thyrea confusa



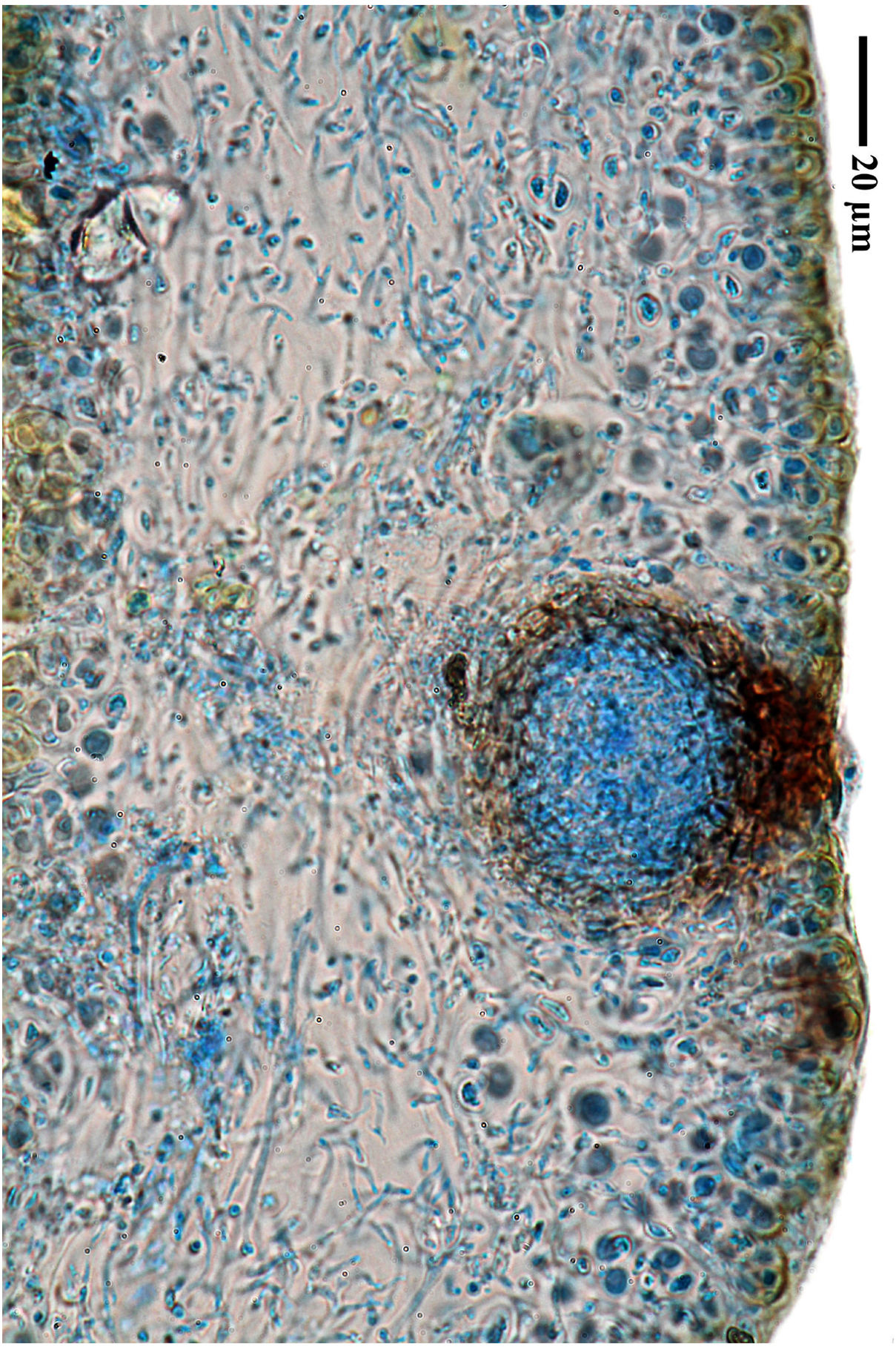
Thyrea confusa



Thyrea confusa



Thyrea confusa



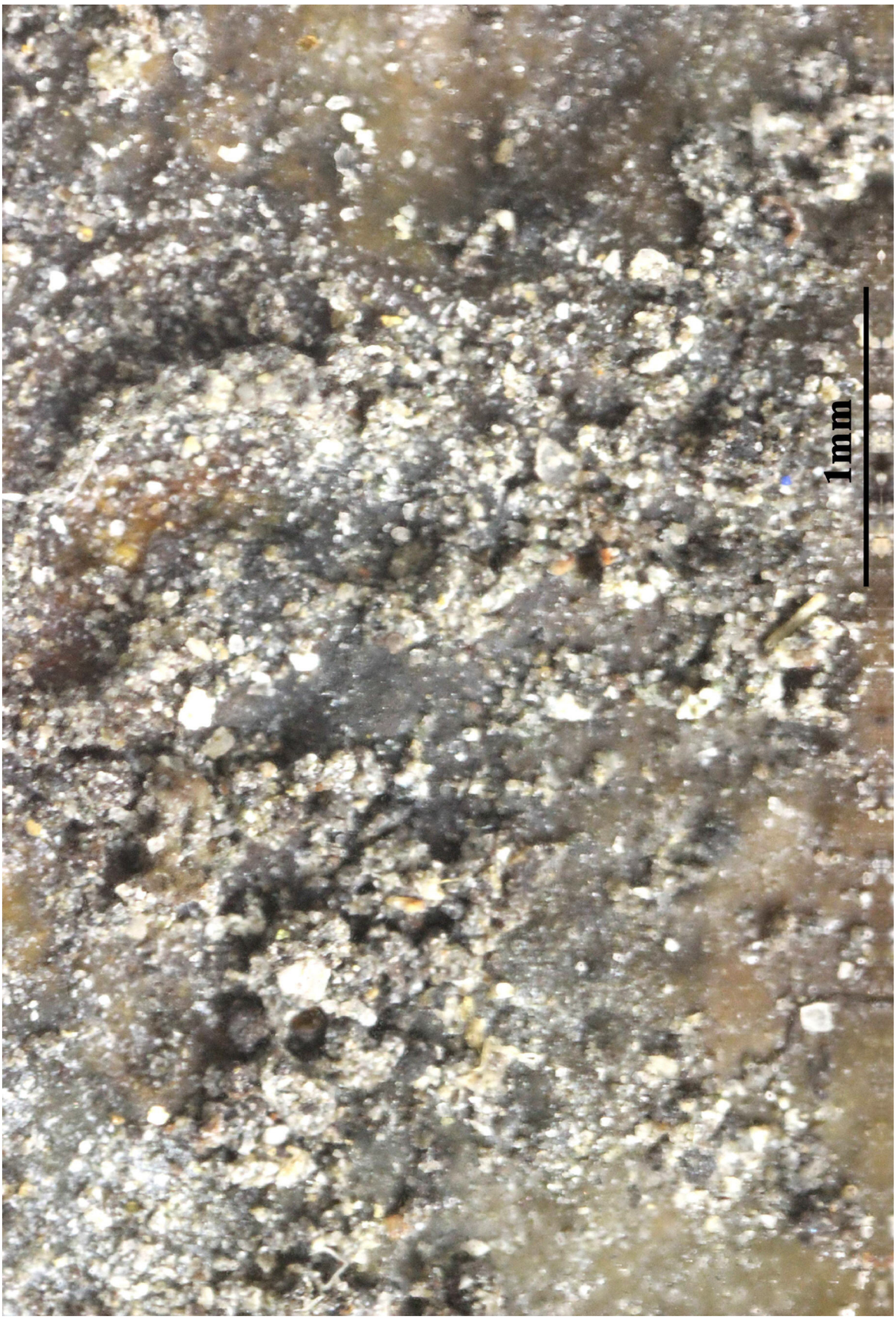
Thyrea confusa

Thyrea latissima Asahina, J. Jap. Bot. 33(3): 67 (1958)

[KU442], Japan. Honshu. Prov. Bitchu: Miyagouchi, Tetsuta-cho, Atetsu-gun. On calcareous rocks, 200 m. Leg. H. Kashiwadani (no. 16737) & H. Doei, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 542.



Thyrea latissima



Thyrea latissima

Thyrea pulvinata (Schaer.) A. Massal., Flora, Regensburg 39: 211 (1856)
= *Parmelia stygia var. pulvinata* Schaer. 1842

[KU398], Japan. Shikoku. Prov. Awa: Tsurarano-kannon, Naka-gun. On calcareous rocks, 60 m. Leg. H. Kashiwadani (no. 14500), 24.3.1978, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 398.

Thallus squamulose-umbilicate, small-foliose to subfruticose, gelatinous when wet, black, usually smooth, sometimes becoming uneven, the squamules 10-15(-20) mm wide, forming rosettes or cushions, at first flat and lobulate, soon becoming divided into erect, adpressed or ascending, 2-4 mm wide and 0.4-0.8 mm thick lobes with a narrow base, rounded tips and down-turned margins; lower surface attached by a central holdfast. Thallus 0.6-0.8 mm thick, the outer part formed by short-celled, 1.5-2.5 µm thick, mainly anticlinally oriented hyphae enclosing the photobiont cells, the medullary part of loosely arranged, 1-1.5 µm thick hyphae with cylindrical cells, lacking photobionts. Apothecia thallinocarps, hemiangiocarpous, the ascogonia arising freely beneath the thallus surface, sunken in thallus and difficult to recognize unless when wet, marginal to submarginal, filling the entire lobe tip, 2-4(-6) mm across, round to irregularly shaped, with a slightly flat to convex, dotted or fissured disc and a 50-100 µm thick thalline margin. Proper exciple indistinct or very thin; epithecium brownish, 20-30 µm high; hymenium 80-100 µm high, finally incompletely separated into partial hymenia by intrusions of wedge-shaped, sterile thalline tissue, covered by a continuous layer of sterile tissue separated only by the pore-like discs of the partial hymenia, K/I+ blue turning wine-red; paraphyses short-celled, 2-3 µm thick, not or only slightly capitate; subhymenium compact, 30-40 µm high, K/I+ blue. Asci 16-32-spored, subcylindrical to obclavate, prototunicate, with a thin, one-layered, non-amyloid wall, an amyloid external apical cap, and passive spore discharge via apical rupturing, Lichina-type. Ascospores 1-celled, hyaline, broadly ellipsoid, 5-9 x 3-5 µm. Pycnidia globose to broadly pyriform, immersed, unilocular, up to 0.2 mm wide. Conidia ellipsoid, 2-3 x 1-1.5 µm. Photobiont cyanobacterial, chroococcoid, with a few cells measuring 5-9 x 3-5 µm, penetrated by haustoria and surrounded by a brownish gelatinous sheath. Spot tests: all negative. Chemistry: without lichen substances. - Note: on steeply inclined to vertical seepage tracks of more or less calcareous or basic siliceous rocks, most common in the Mediterranean belt.



Thyrea pulvinata



Thyrea pulvinata

Thyrea pulvinata (Schaer.) A. Massal., Flora, Regensburg 39: 211 (1856)
= *Parmelia stygia* var. *pulvinata* Schaer. 1842

[VZ1157], Gallia. Hérault. Mireval, Creux de Miege, 50 m. Ad saxa calcarea. Leg. G. Clauzade et Cl. Roux, 7.7.1972. Ex A. Vězda Lichenes Selecti Exsiccati Nr. 1157.

Thallus squamulose-umbilicate, small-foliose to subfruticose, gelatinous when wet, black, usually smooth, sometimes becoming uneven, the squamules 10-15(-20) mm wide, forming rosettes or cushions, at first flat and lobulate, soon becoming divided into erect, adpressed or ascending, 2-4 mm wide and 0.4-0.8 mm thick lobes with a narrow base, rounded tips and down-turned margins; lower surface attached by a central holdfast. Thallus 0.6-0.8 mm thick, the outer part formed by short-celled, 1.5-2.5 µm thick, mainly anticlinally oriented hyphae enclosing the photobiont cells, the medullary part of loosely arranged, 1-1.5 µm thick hyphae with cylindrical cells, lacking photobionts. Apothecia thallinocarps, hemiangiocarpous, the ascogonia arising freely beneath the thallus surface, sunken in thallus and difficult to recognize unless when wet, marginal to submarginal, filling the entire lobe tip, 2-4(-6) mm across, round to irregularly shaped, with a slightly flat to convex, dotted or fissured disc and a 50-100 µm thick thalline margin. Proper exciple indistinct or very thin; epithecium brownish, 20-30 µm high; hymenium 80-100 µm high, finally incompletely separated into partial hymenia by intrusions of wedge-shaped, sterile thalline tissue, covered by a continuous layer of sterile tissue separated only by the pore-like discs of the partial hymenia, K/I+ blue turning wine-red; paraphyses short-celled, 2-3 µm thick, not or only slightly capitate; subhymenium compact, 30-40 µm high, K/I+ blue. Asci 16-32-spored, subcylindrical to obclavate, prototunicate, with a thin, one-layered, non-amyloid wall, an amyloid external apical cap, and passive spore discharge via apical rupturing, Lichina-type. Ascospores 1-celled, hyaline, broadly ellipsoid, 5-9 x 3-5 µm. Pycnidia globose to broadly pyriform, immersed, unilocular, up to 0.2 mm wide. Conidia ellipsoid, 2-3 x 1-1.5 µm. Photobiont cyanobacterial, chroococcoid, with a few cells measuring 5-9 x 3-5 µm, penetrated by haustoria and surrounded by a brownish gelatinous sheath. Spot tests: all negative. Chemistry: without lichen substances. - Note: on steeply inclined to vertical seepage tracks of more or less calcareous or basic siliceous rocks, most common in the Mediterranean belt.



Thyrea pulvinata



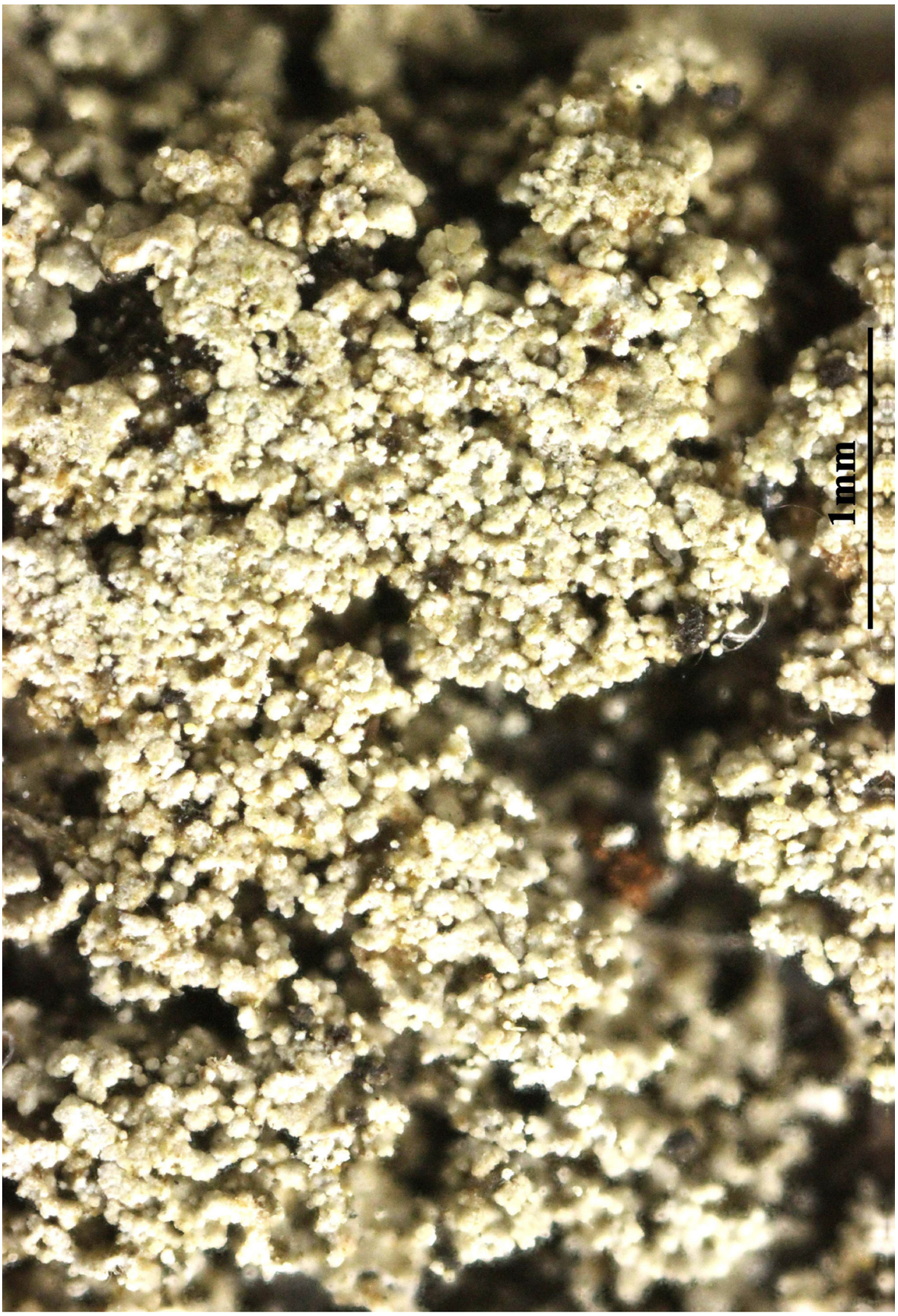
Thyrea pulvinata

Thysanothecium casuarinarum* subsp. *nipponicum (Asahina) Asahina, J. Jap. Bot. 32(2): 35 (1957)
= *Thysanothecium nipponicum* Asahina 1956

[KU445], Japan. Shikoku. Prov. Awa: Mt.Tairyuji, Anan-city. Onbark of *Cryptomeria japonica*, 550 m. Leg. H. Kashiwadani (no. 15078), 6.5.1979, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 445.



Thysanothecium casuarinarum* subsp. *nipponicum



Thysanothecium casuarinarum* subsp. *nipponicum

Thysanothecium scutellatum (Fr.) D.J. Galloway, in Galloway & Bartlett, Nova Hedwigia 36(2-4): 390 (1983) [1982]
= *Cladonia scutellata* Fr. 1846

[OH625], Japan. Honshu. Prov. Bizen (Pref. Okayama): Ohtahara, Wake-cho, Wake-gun (34°48'37" N, 134°08'52" E). On bark of weathered coniferious tree, 157 m. Leg. M. Sugimoto (no. 581), 19.3.2019, det. M. Sugimoto & Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 625.

Primary squamules attached to substratum, forming a spreading, diffract or areolate crust, minute, whitish or pale green to green-yellow, white below; cortex distinctly grooved-striate, yellow-green to brownish; spaces between cartilaginous strands exposing corticate granules. Pseudopodetia terete, uniformly corticate, becoming fissured at maturity, grooved, ±canaliculate or partly hollow, 1–2 mm wide at base expanding to 2–6 mm wide at apex, 0.1–10 mm tall. Apothecia terminal, often also subterminal and lateral, simple becoming compound and aggregate, rarely proliferating from exciple; disc surface smooth, pale yellow to pinkish brown. Ascospores ellipsoidal, straight or curved, 5–8 × 2–3 µm. Pycnidia 1–2.5 mm tall; ostiole apical, 0.05–0.08 mm wide. CHEMISTRY: usnic, divaricatic, nordivaricatic (trace) and stenosporic (trace) acids. - Occurs in Australia, Tasmania, in New Zealand, Papua New Guinea, New Caledonia, Indonesia, Vietnam and Japan. Grows on bark and wood.



Thysanothecium scutellatum



Thysanothecium scutellatum

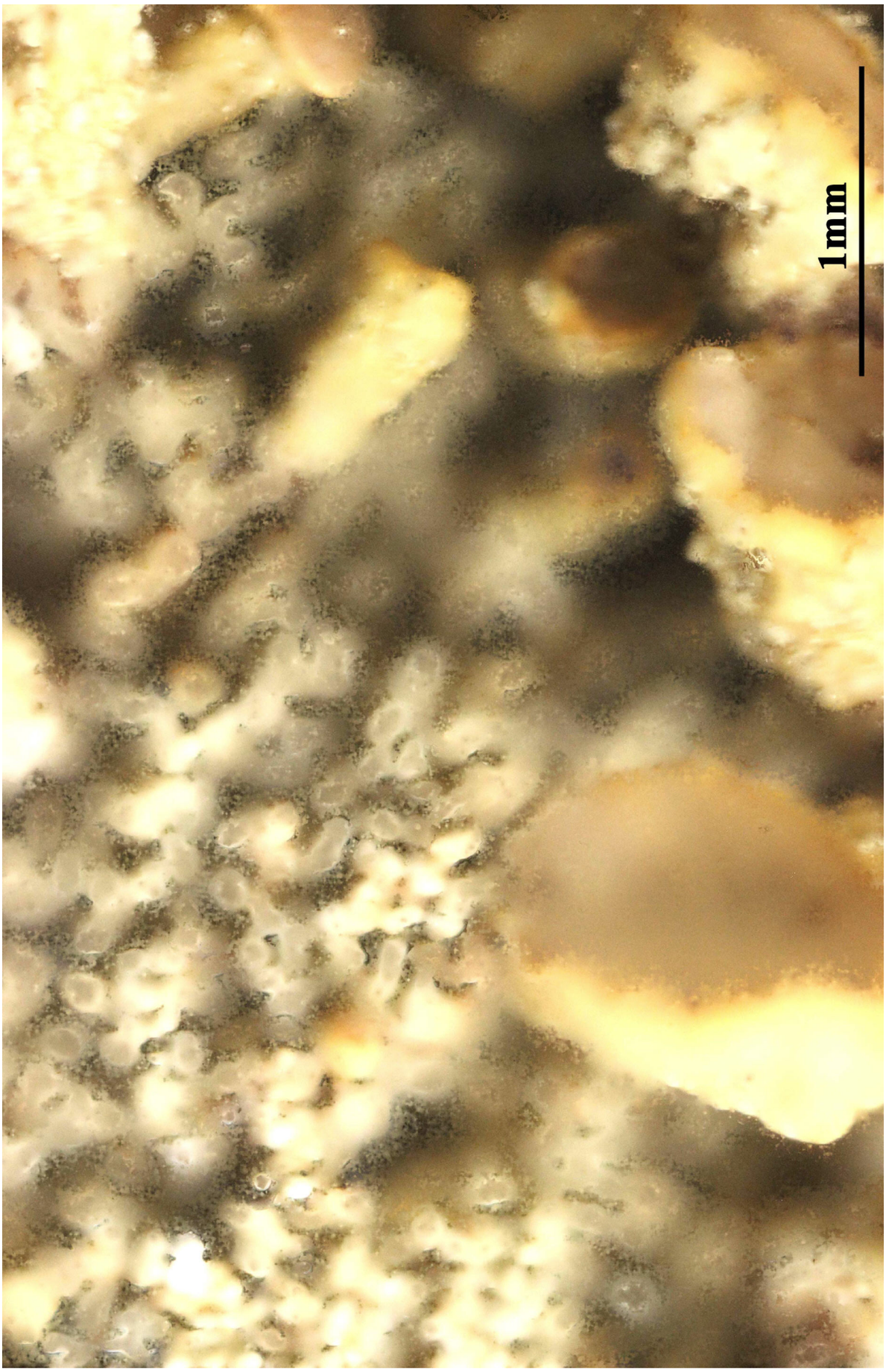
Thysanothecium scutellatum (Fr.) D.J. Galloway, in Galloway & Bartlett, Nova Hedwigia 36(2-4): 390 (1983) [1982]
= *Cladonia scutellata* Fr. 1846

[KA372], Japan. Kyushu. Prov. Hyuga)pref. Miyazuki): Around Aya-kawa-so, Aya-cho, Higashimorokata-gun. On bark of *Cryptomeria japonica*, 30 m. Leg. H. Kashiwadani (no. 47548), 25.2.2004, det. H. Kashiwadani. EX H. KASHIWADANI LICHENES MINUS COGNITI RXSICCATI NR. 372.

Primary squamules attached to substratum, forming a spreading, diffract or areolate crust, minute, whitish or pale green to green-yellow, white below; cortex distinctly grooved-striate, yellow-green to brownish; spaces between cartilaginous strands exposing corticate granules. Pseudopodetia terete, uniformly corticate, becoming fissured at maturity, grooved, ±canaliculate or partly hollow, 1–2 mm wide at base expanding to 2–6 mm wide at apex, 0.1–10 mm tall. Apothecia terminal, often also subterminal and lateral, simple becoming compound and aggregate, rarely proliferating from exciple; disc surface smooth, pale yellow to pinkish brown. Ascospores ellipsoidal, straight or curved, 5–8 × 2–3 µm. Pycnidia 1–2.5 mm tall; ostiole apical, 0.05–0.08 mm wide. CHEMISTRY: usnic, divaricatic, nordivaricatic (trace) and stenosporic (trace) acids. - Occurs in Australia, Tasmania, in New Zealand, Papua New Guinea, New Caledonia, Indonesia, Vietnam and Japan. Grows on bark and wood.



Thysanothecium scutellatum



Thysanothecium scutellatum

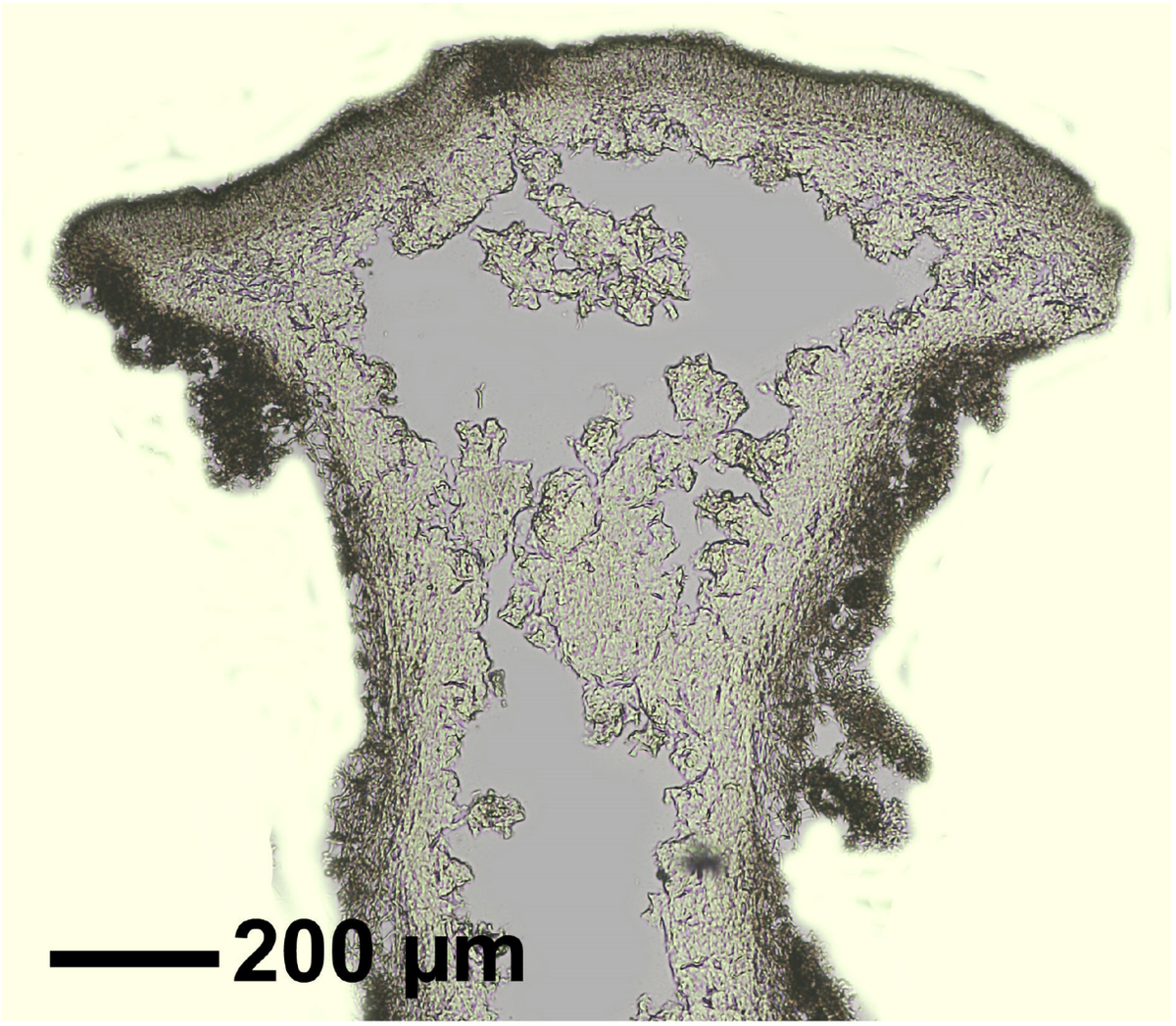
Thysanothecium scutellatum (Fr.) D.J.Galloway

[15652], Australia, Western Australia, east of Perth, Perth Hills, c. 32 km west of York, 31.882° S, 116,456° E, 345 m, dry *Eucalyptus* forest, growing on charred wood. Leg. F. Schumm & E. Stocker-Wörgötter, 21.10.2009. Chemistry: usnic acid, divaricatic acid, sekikaic acid by HPTLC, anal. F. Schumm, det. J.A. Elix. - EX HERBARIO F. SCHUMM NR.15652.

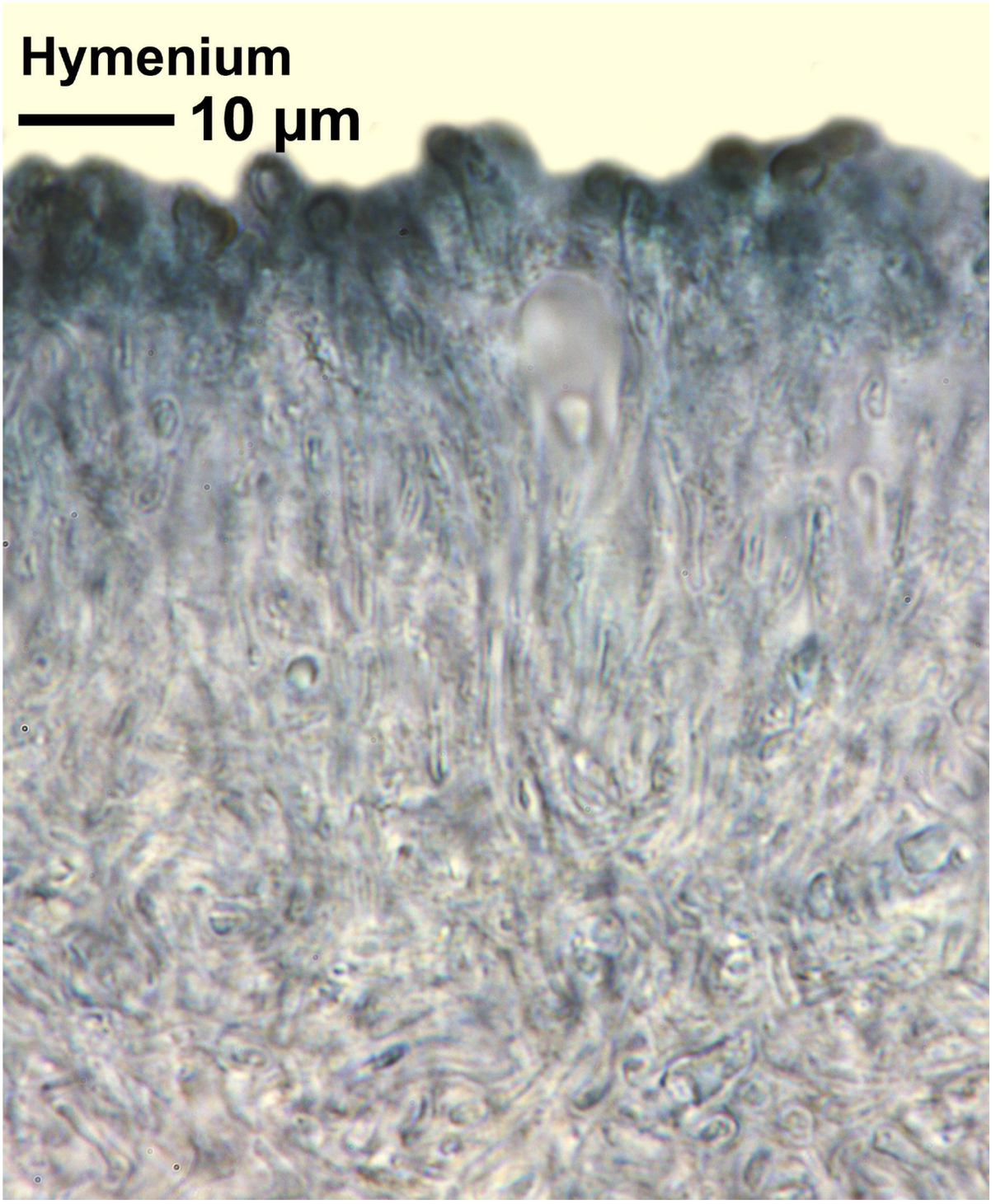
Pseudopodetia with a grooved, striate cortex, exposing corticate granules; growing on bark. Primary squamules, indented, closely attached or somewhat erect on one side. Upper surface yellow-green to brown. Lower surface white. Pseudopodetia very variable, 1-10 mm high, at the base 1-2 mm wide, at the top 2-6 mm wide, hollow inside. Apothecia terminal, subterminal or lateral, peltate or composed discs. Discs pale yellow or pinkish-brown. Paraphyses ± conglutinate, tips swollen with pigmented-cups. Ascospores hyaline, 1-celled, 5-8 x 2-3 µm. Chemistry: K-, C-, KC-, P-; usnic acid (major), divaricatic acid (major), sekikaic acid (trace), stenosporic acid (trace).



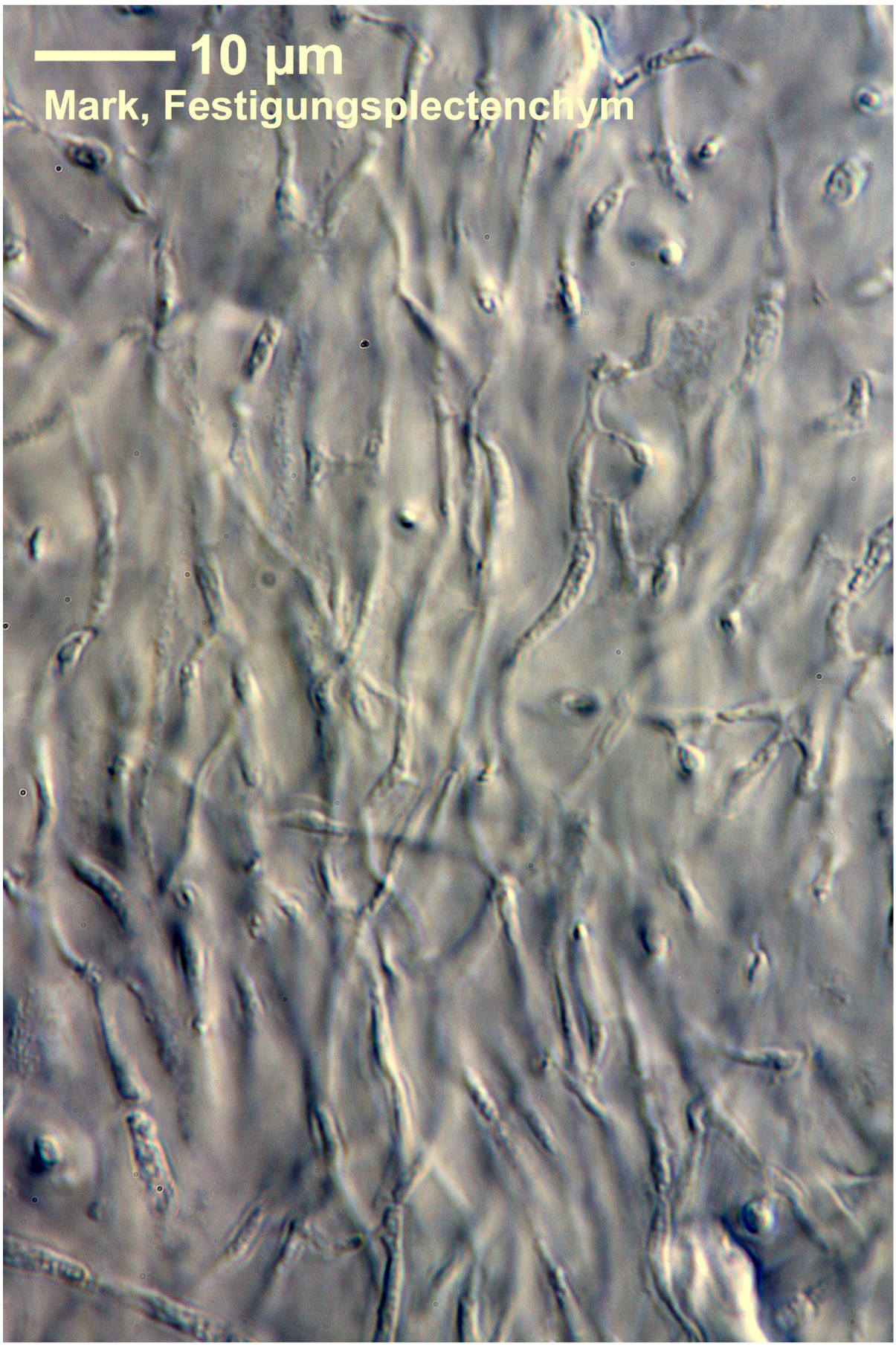
Thysanothecium scutellatum



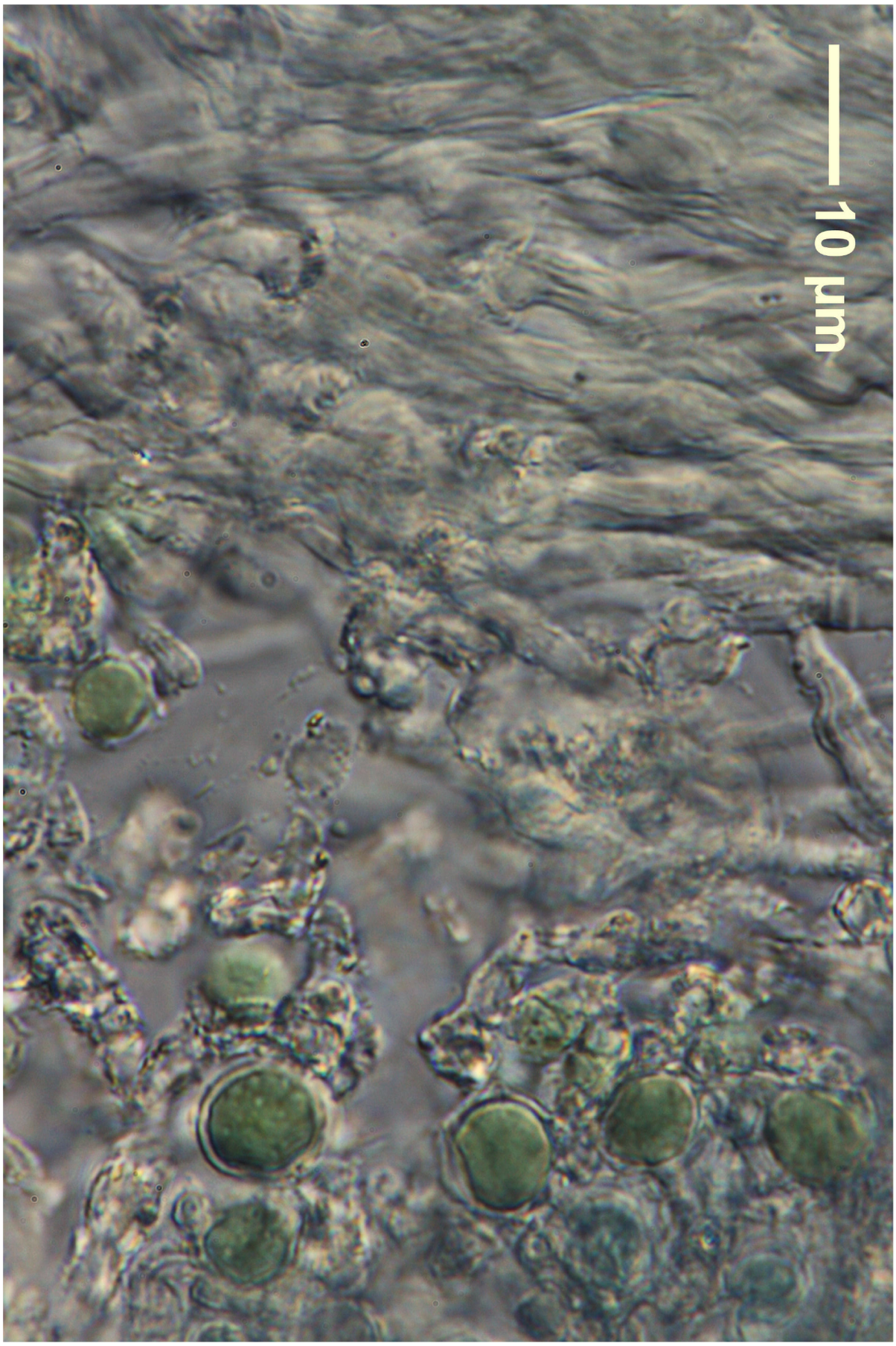
Thysanothecium scutellatum



Thysanothecium scutellatum



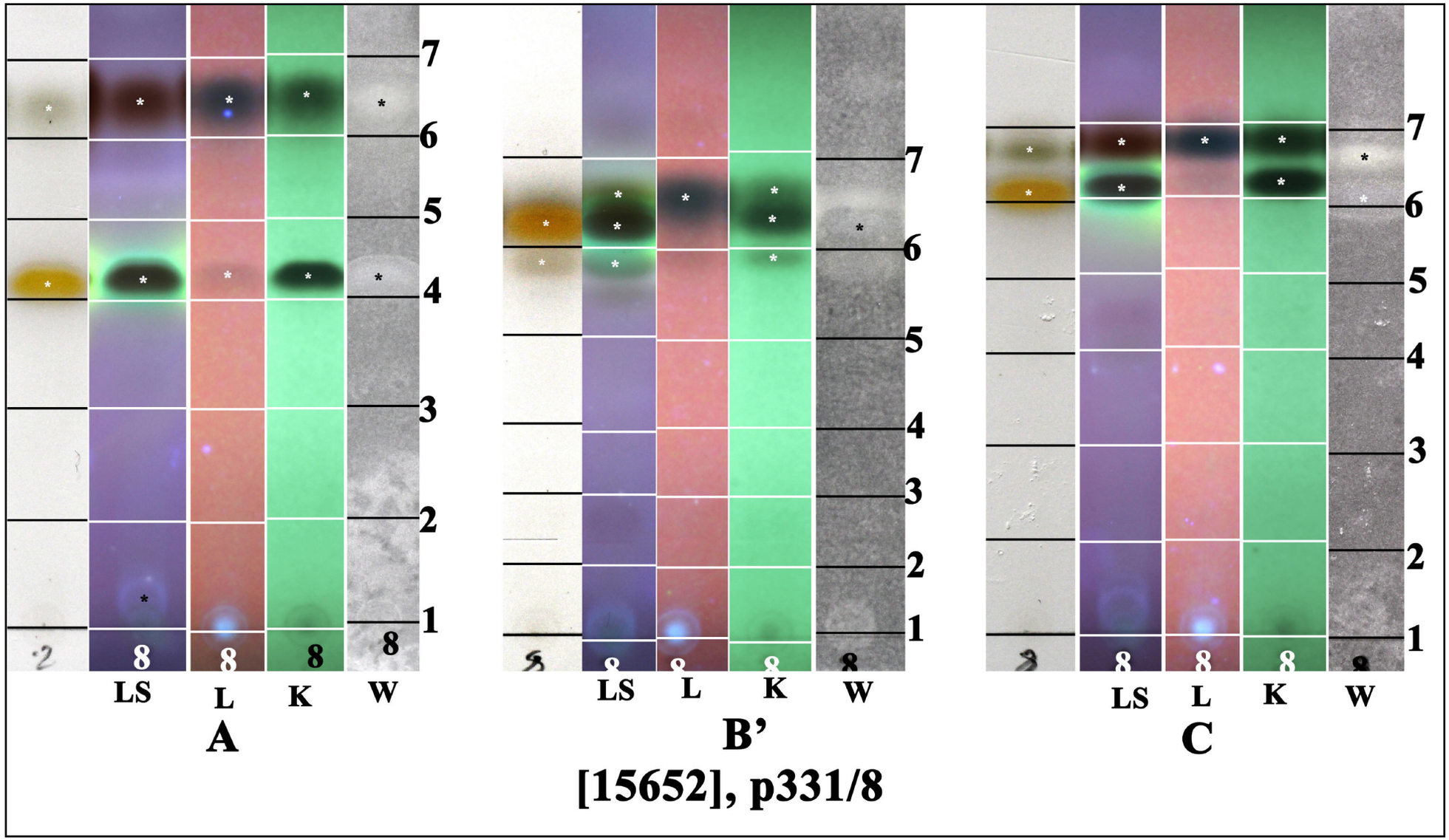
Thysanothecium scutellatum



Thysanothecium scutellatum



Thysanothecium scutellatum

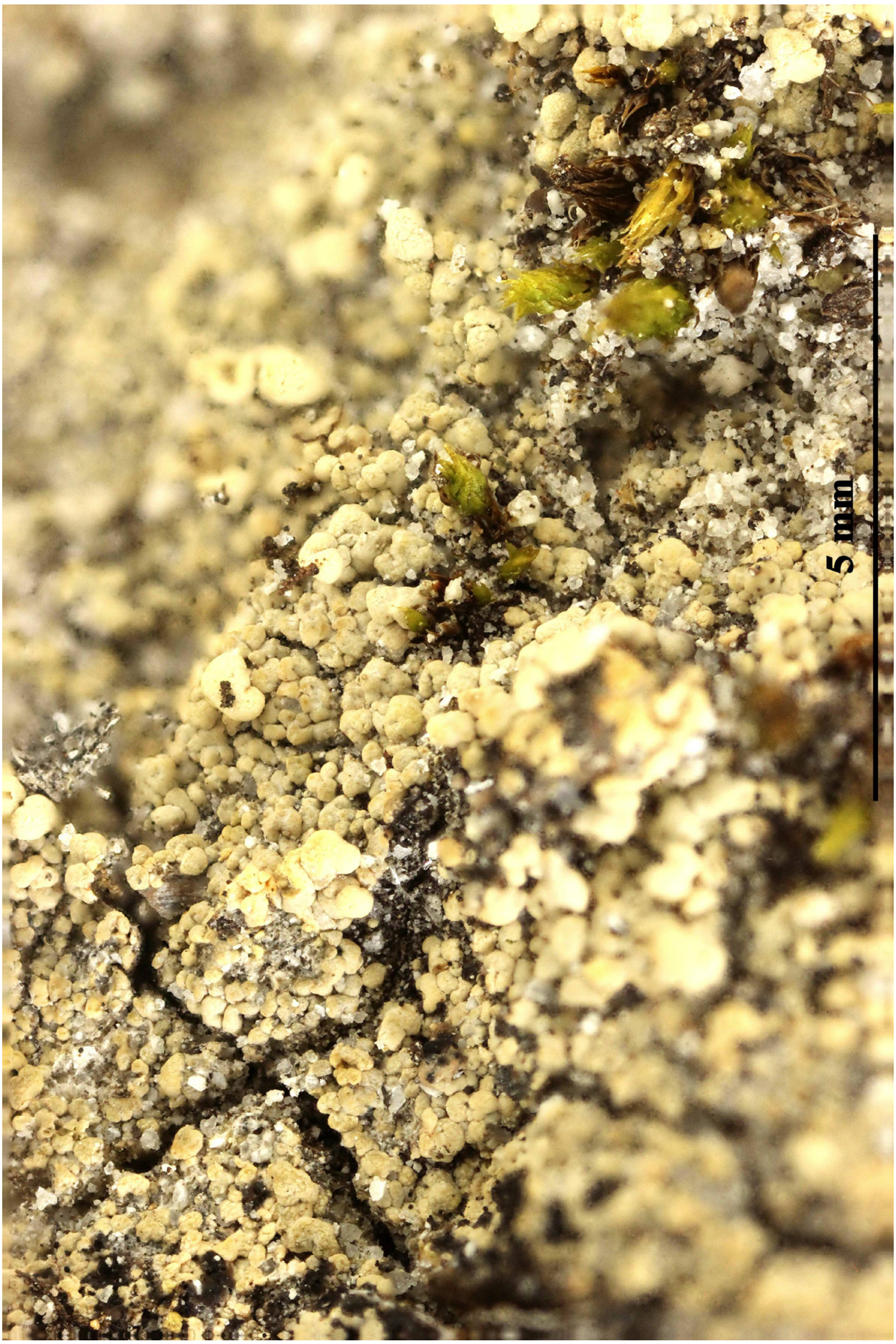


us: usnic acid, d: divaricatic acid, n: sekikaic acid

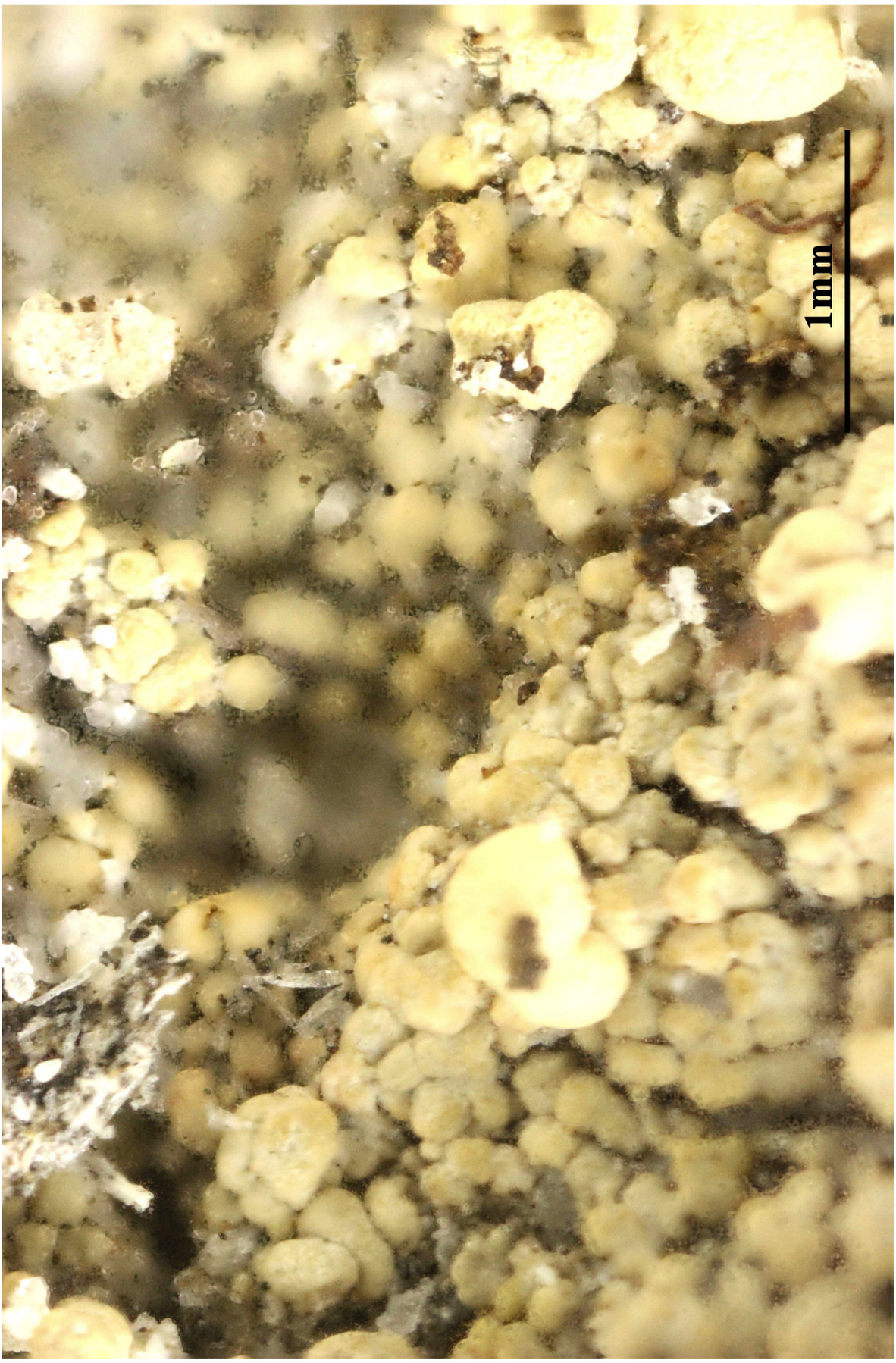
Trapelia granulosa (Hoffm.) V. Wirth, Die Flecht. Baden-Württembergs. Verbreitungsatlas (Stuttgart): 511 (1987)
= *Verrucaria granulosa* Hoffm. 1791
= *Trapeliopsis granulosa* (Hoffm.) Lumbsch, in Hertel, Lecideaceae exsiccatae, Fascicle V (München) 5: no. 99 (1983)

[OH495], Japan. Honshu. Prov. Kai (Pref. Yamanashi): the top area of Mt. Kinpu, Kofi-city (35°52' N, 138°38' E). On the ground, 2576 m. Leg. G. Thor (no. 27973), 4.7.2012, det. G. Thor. Ex Y. Ohmura Lichenes Minus Cogniti Exsiccati Nr. 495.

Thallus crustose, episubstratic, whitish, pale grey or rarely pale ochre, thick, areolate, the areoles convex, contiguous, granular to verrucose, to 0.5 mm wide, the marginal ones often somewhat elongate. Soredia diffuse, granular, whitish to brownish yellow or with a faint pinkish hue, sometimes absent. Apothecia frequent, lecideine, sessile, up to 1.5(-1.7) mm across, often of different colours on the same thallus, varying from pale pink, reddish brown, dark grey-green to almost black, with an initially flat, then rapidly convex disc and a thin, flexuose proper margin. Proper exciple grey or colourless in outer part, grey to brown within, of densely entangled hyphae; epithecium pale grey, greenish or pale brown; hymenium colourless or yellowish, 50-80 µm high; paraphyses coherent, 1-2.5 µm thick, slender, branched and anastomosing, only slightly thickened at apex; hypothecium colourless to pale brown. Asci 8-spored, clavate-cylindrical, thin-walled, I+ pale blue, with a small I+ blue cap inside the thickened apex. Ascospores 1-celled, hyaline, ellipsoid, thick-walled, 8-15 x 4-7 µm. Photobiont chlorococcoid. Spot tests: thallus and soredia K-, C+ red, KC+ red, P-, UV+ bluish white. Chemistry: gyrophoric acid. - Note: an arctic-alpine to cool-temperate, circumpolar lichen mostly found on rotting wood, more rarely on soil rich in humus, bryophytes and peat, mostly in clearings of grasslands and scrublands, with optimum near treeline; most common in the Alps.



Trapelia granulosa



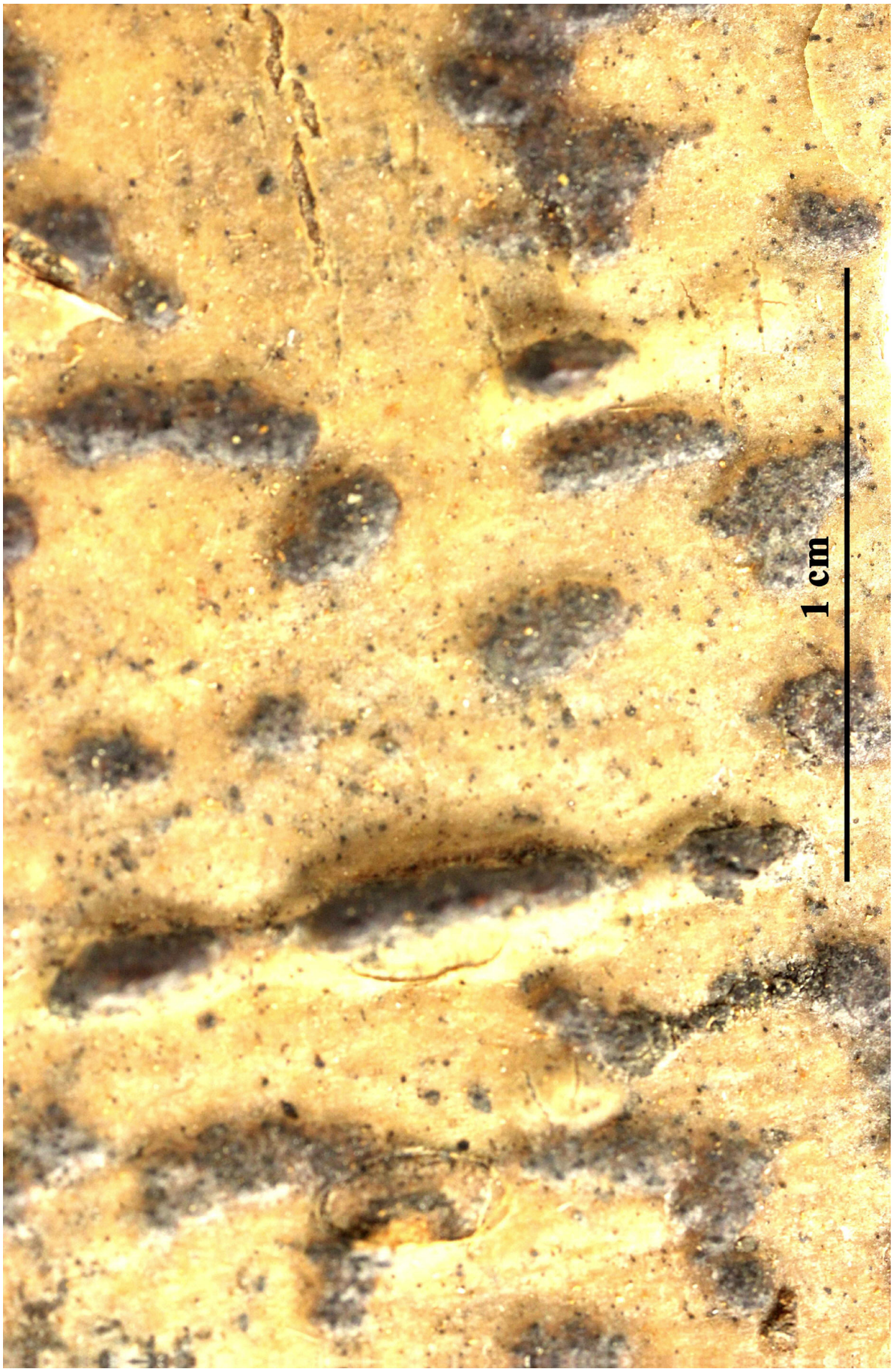
Trapelia granulosa

Trypethelium virens Tuck. ex E. Michener, in Darlington, Fl. Cestrica, Edn 3 (Philadelphia): 453 (1853)

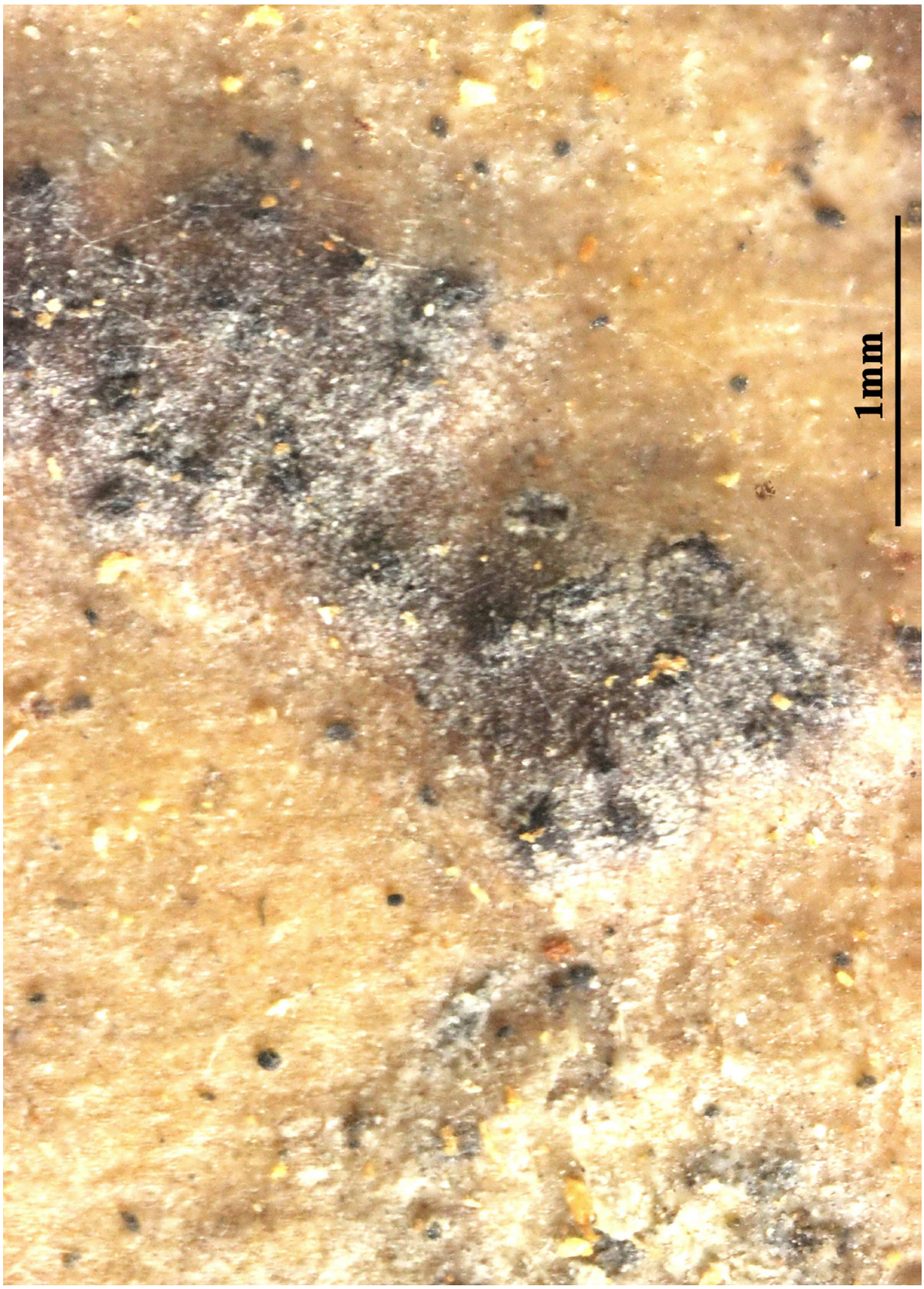
= *Viridothelium compositum* (Schwein. ex Halsey) Lendemer, in Lendemer, J. Torrey Bot. Soc. 151(4): 261 (2024)

[OH699], Japan. Honshu. Yamashiro Prov. (Kyoto Pref.): Kibune, Kyoto. On tree bark. Leg. S. Kurokawa (no. 57266), 5.11.1957, det. A. Aptroot. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 699.

Thallus crustose, endophloedal, smooth, yellow-green, no prothallus; vegetative diaspores absent; in section heteromerous, including cortex and medulla, most prominent in raised warts (pseudostromata); photobiont Trentepohlia. Ascomata perithecia, clustered in low to raised pseudostromata, appearing as aggregations of black dots (ostioles); wall carbonized, black; hamathecium colorless, clear; paraphysoids thin, anastomosing. Asci clavate with a distinct foot, 8-spored. Ascospores colorless, 8-12-celled, locules diamond-shaped, 38-52 x 7-10 µm, I- or weakly I+ violet-blue. Pycnidia occasional, scattered; conidia not described. Chemistry. Spot tests: UV-, K-; secondary metabolites not detected. Substrate and Habitat. On smooth bark trees in forests. Distribution. Eastern North America and eastern Asia (Japan, Thailand). - Notes: *Virodothelium virens* is the northernmost member of an otherwise mostly tropical lichen family. It was recently split from the genus *Trypethelium* into a new genus by molecular and morphological data in an overall revision of the family Trypetheliaceae (Aptroot & Lücking 20116, Lücking et al. 2016).



Trypethelium virens



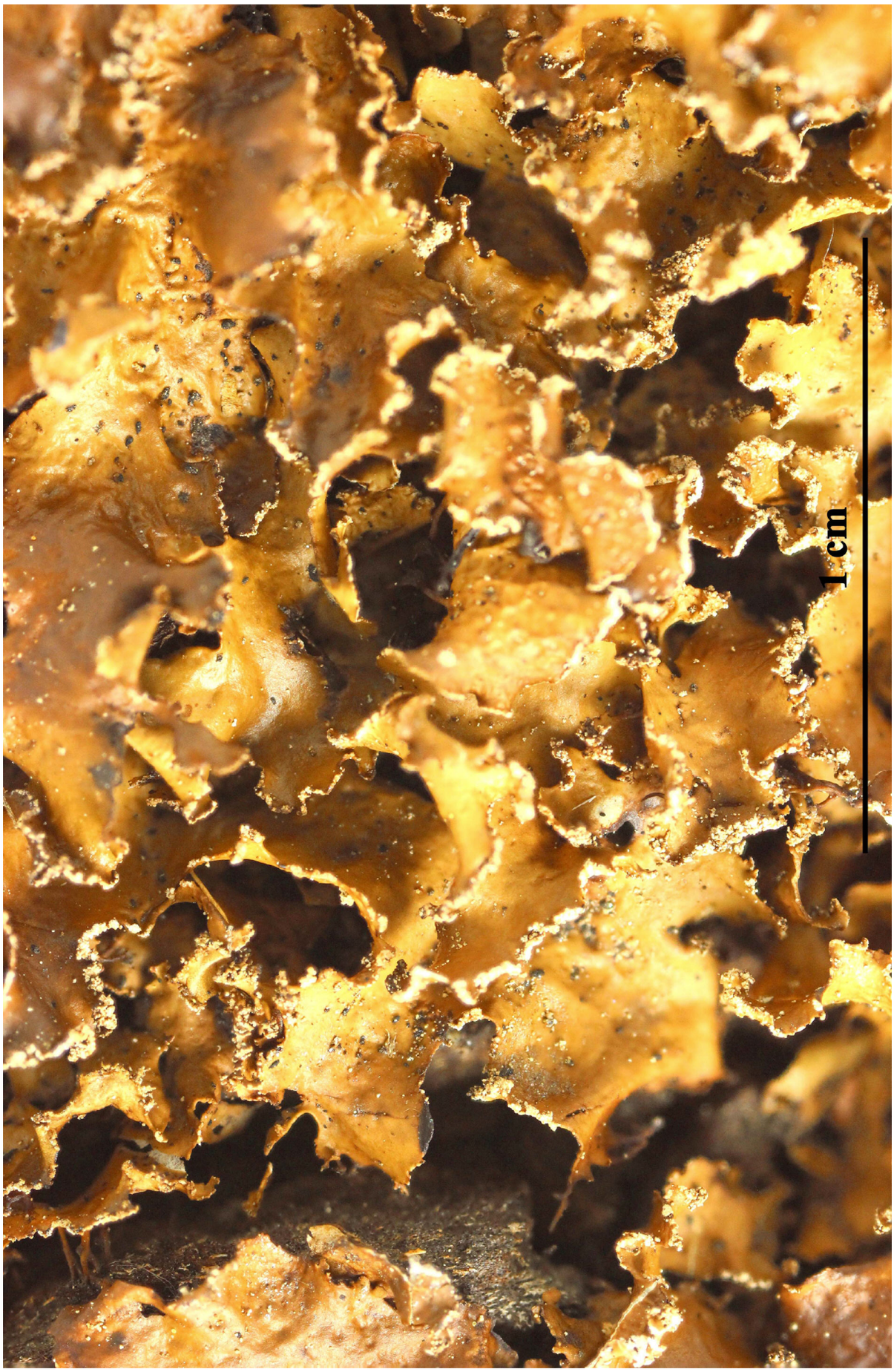
Trypethelium virens

Tuckermannopsis gilva (Asahina) M.J. Lai, Quarterly Journal of the Taiwan Museum 33(3 & 4): 225 (1980)

= *Cetraria gilva* Asahina 1953

= *Nephromopsis gilva* (Asahina) Divakar, A. Crespo & Lumbsch, in Divakar, Crespo, Kraichak, Leavitt, Singh, Schmitt & Lumbsch, Fungal Diversity 84: 112 (2017)

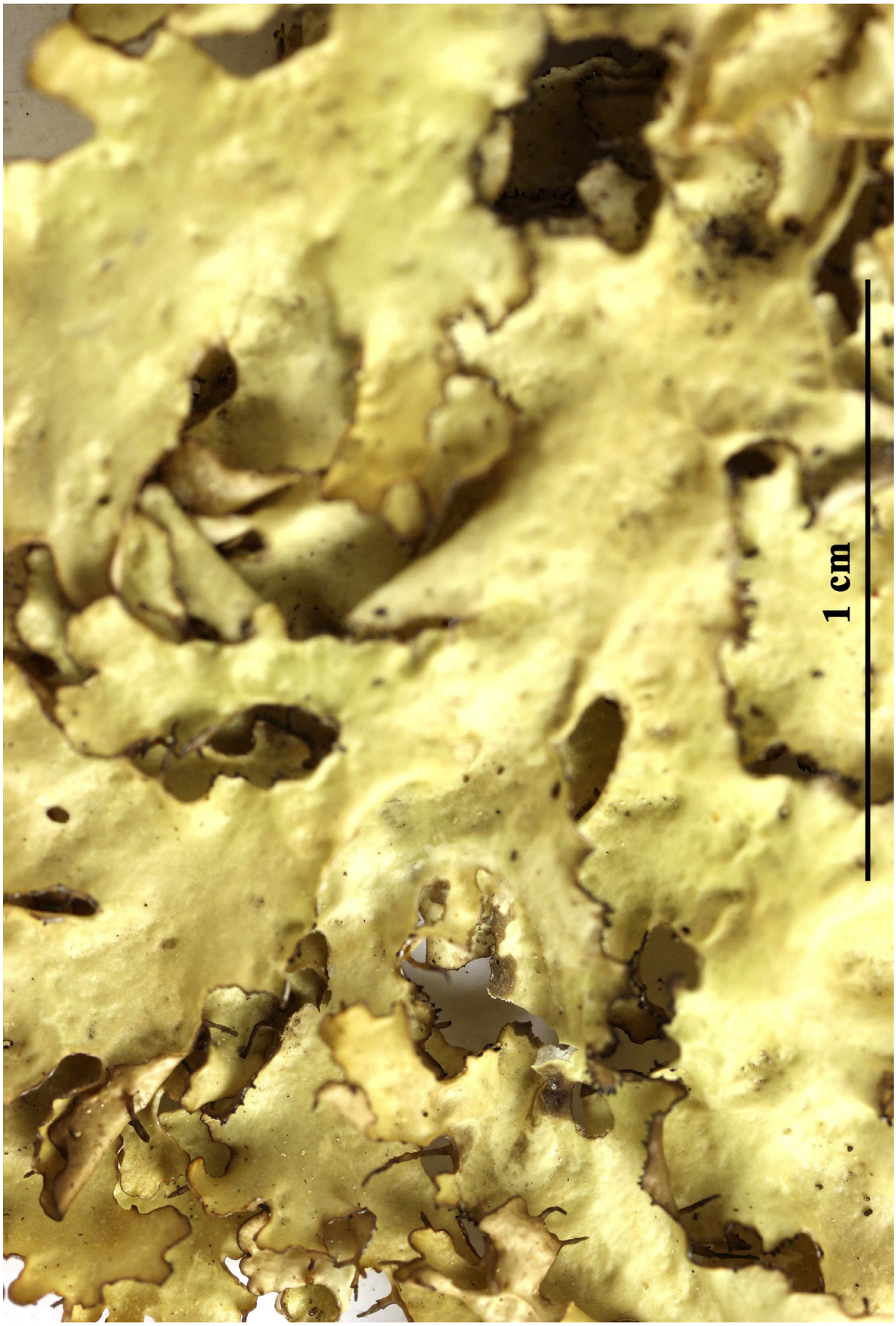
[OH444], Japan, Honshu. Prov. Shinano (Pref. Nagano): Kawahake, Kawakami-mura, Minamisaku-gun. On bark of *Larix kaempferi*, 1980 m. Leg. Y. Ohmura (no. 8256), 19.7.2011. EX Y. OHMURA LICHENES MIUS COGNITI EXSICCATI NR. 444.



Tuckermannopsis gilva

Tuckneraria pseudocomplicata (Asahina) Randlane & Saag, in Randlane, Saag, Thell & Kärnefelt, Acta bot. fenn. 150: 150 (1994)
= *Cetraria pseudocomplicata* Asahina 1936

[OH391], Taiwan. Nantou Co.: Mt Diasheue . On bark of *Pinus* sp., 2595 m. Leg. Y. Ohmura (no. 6065), 2.9.2008, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI NR. 391.



Tuckneraria pseudocomplicata



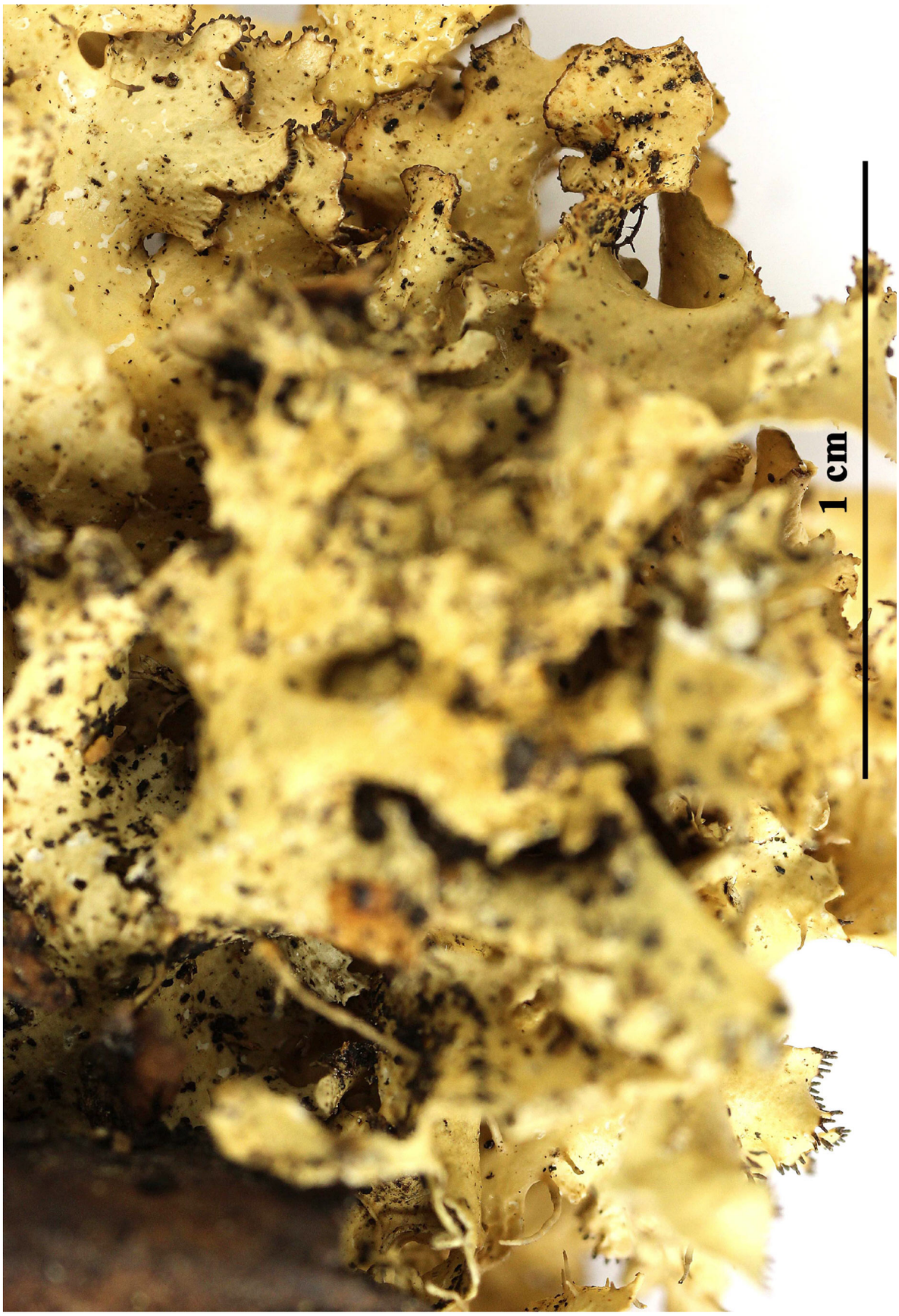
Tuckneraria pseudocomplicata

Tuckneraria pseudocomplicata (Asahina) Randlane & Saag, in Randlane, Saag, Thell & Kärnefelt, Acta bot. fenn. 150: 150 (1994)
= *Cetraria pseudocomplicata* Asahina 1936

[OH522], Taiwan. Taichung Co.: Tashueshan Forest Park, above Hsiaoshuehshan Hostel (upper parking lot), on road to summit of Mt. Tashueshan, Hopen (24°17' N, 121°02' E). On bark of Pinus taiwanensis, 2600-2800 m. Leg. K. H. Noon (no. 6301), 29.11.2002, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 522.



Tuckneraria pseudocomplicata

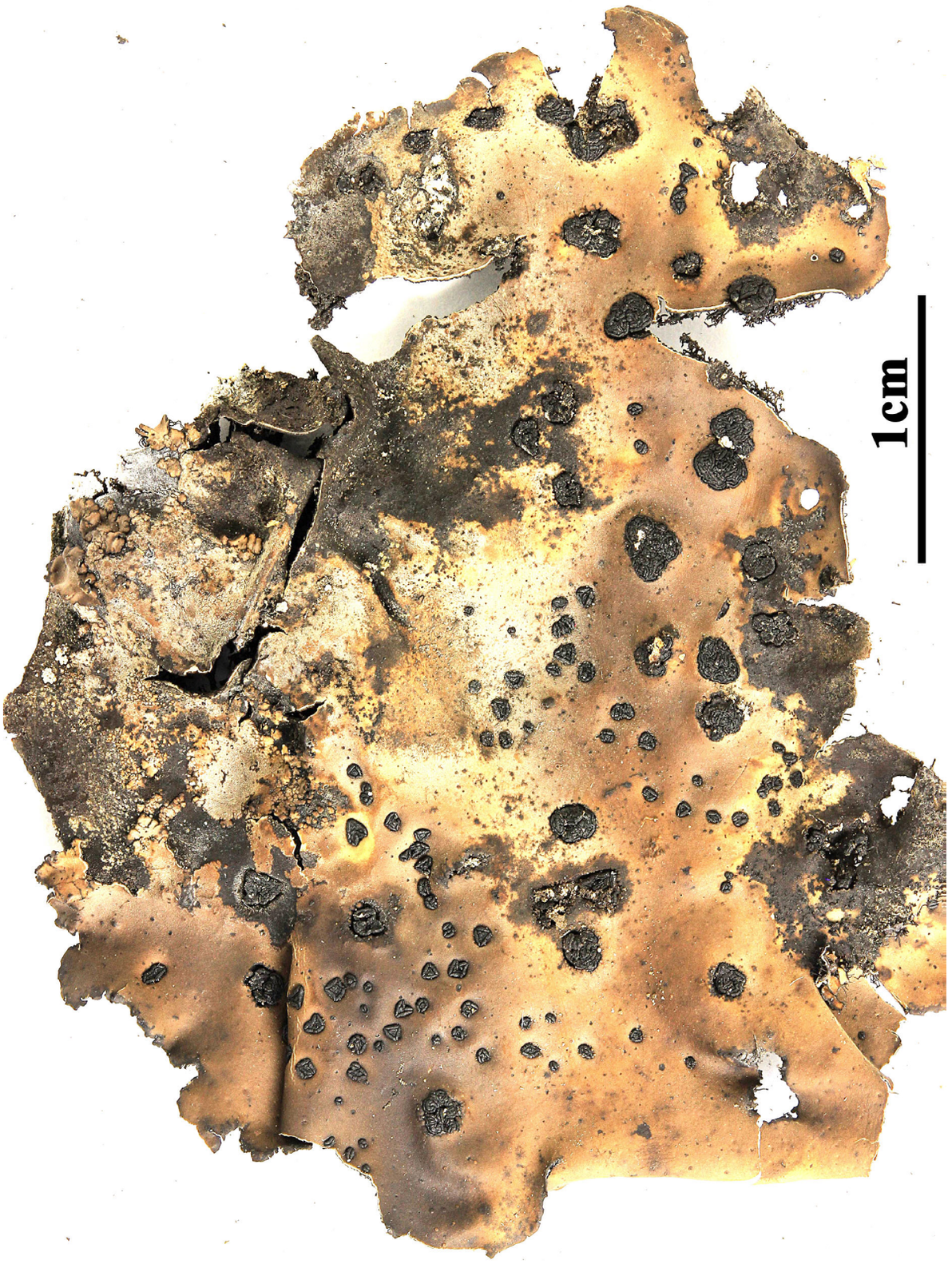


Tuckneraria pseudocomplicata

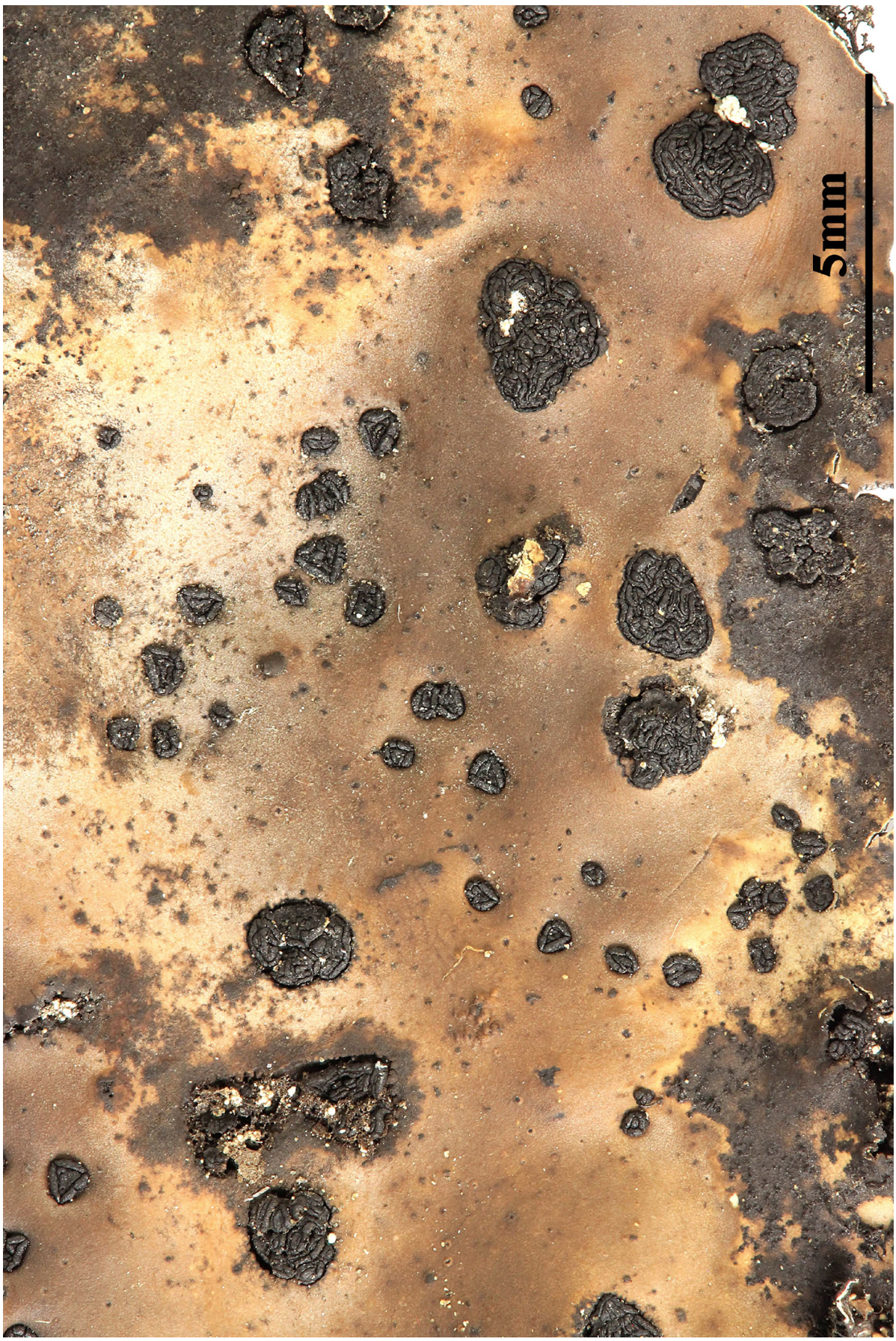
Umbilicaria angulata Tuck., Proc. Amer. Acad. Arts & Sci. 1: 266 (1848)

[KU289], Canada. British Columbia: Sand Lake, 39 miles north of Terrace. On rocks, 600 ft. Leg. S. Kurokawa (no. 8926), 17.08.1975, det. S. Kurokawa. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI NR. 289.

Thallus upper surface shiny; lower surface not granular; rhizines not forming a short, velvety mat. Lower surface covered with irregular plates of tissue with short, highly branched rhizines developing from the plate margins; rhizines confined to lower surface; apothecia abundant, flat, usually angular, with concentric ridges; western montane.



Umbilicaria angulata



Umbilicaria angulata



Umbilicaria angulata

Umbilicaria aprina Nyl., Syn. meth. lich. (Parisiis) 2: 12 (1869)
= *Gyrophora aprina* (Nyl.) Nyl., in Hue, Nouv. Arch. Mus. Hist. Nat., Paris, 3 sér. 3: 36 (1891)
= *Umbilicaria aprina var. andina* Hestmark, Nordic J. Bot. 34(3): 260 (2016)

[OH548], AQntarctica. Langhovde. On rocks, 170 m. Leg. M. Inoue (no. 18024), 17.12.1985, det. M. Inoue. EX Y. OHMURA: LICHENES MINUS COGNITI EXSICCATI NR. 548.

Thallus foliose-umbilicate, heteromerous, dorsiventral. monophyllous, rigid, up to 6 cm wide, c. 0.3 mm thick, attached by a central holdfast. Upper surface pale grey to grey-brown, weakly reticulately ridged, depressed, areolate and with radiating ridges in central parts; lower surface sooty black, pale grey along a 1-2 mm wide marginal rim, smooth, sometimes areolate near the holdfast, with cream-coloured, simple or sparingly branched, 2-3 mm long rhizinomorphs, which are usually lacking around the central holdfast; thalloconidia evenly produced on the lower surface, except on the rhizinomorphs and the marginal rim, 1-celled or rarely 2-celled, ovoid to globose, brown to black, 6-9 x 5-11 µm. Upper cortex palisade-plectenchymatous, 20-30 µm thick; medulla white, not always well-differentiated from lower cortex; lower cortex scleroplectenchymatous, 50-70 µm thick. Apothecia extremely rare, omphalodisc or rarely leiodisc, black, stipitate, up to 2.5 mm across. Ascospores usually poorly developed. Photobiont chlorococcoid. Spot tests: thallus K-, C-, KC-, P-; medulla C+ and KC+ red. Chemistry: medulla with gyrophoric and lecanoric acids. - Note: an arctic-alpine species of hard siliceous rocks above treeline, reaching the nival belt.



Umbilicaria aprina



Umbilicaria aprina



Umbilicaria aprina



Umbilicaria aprina

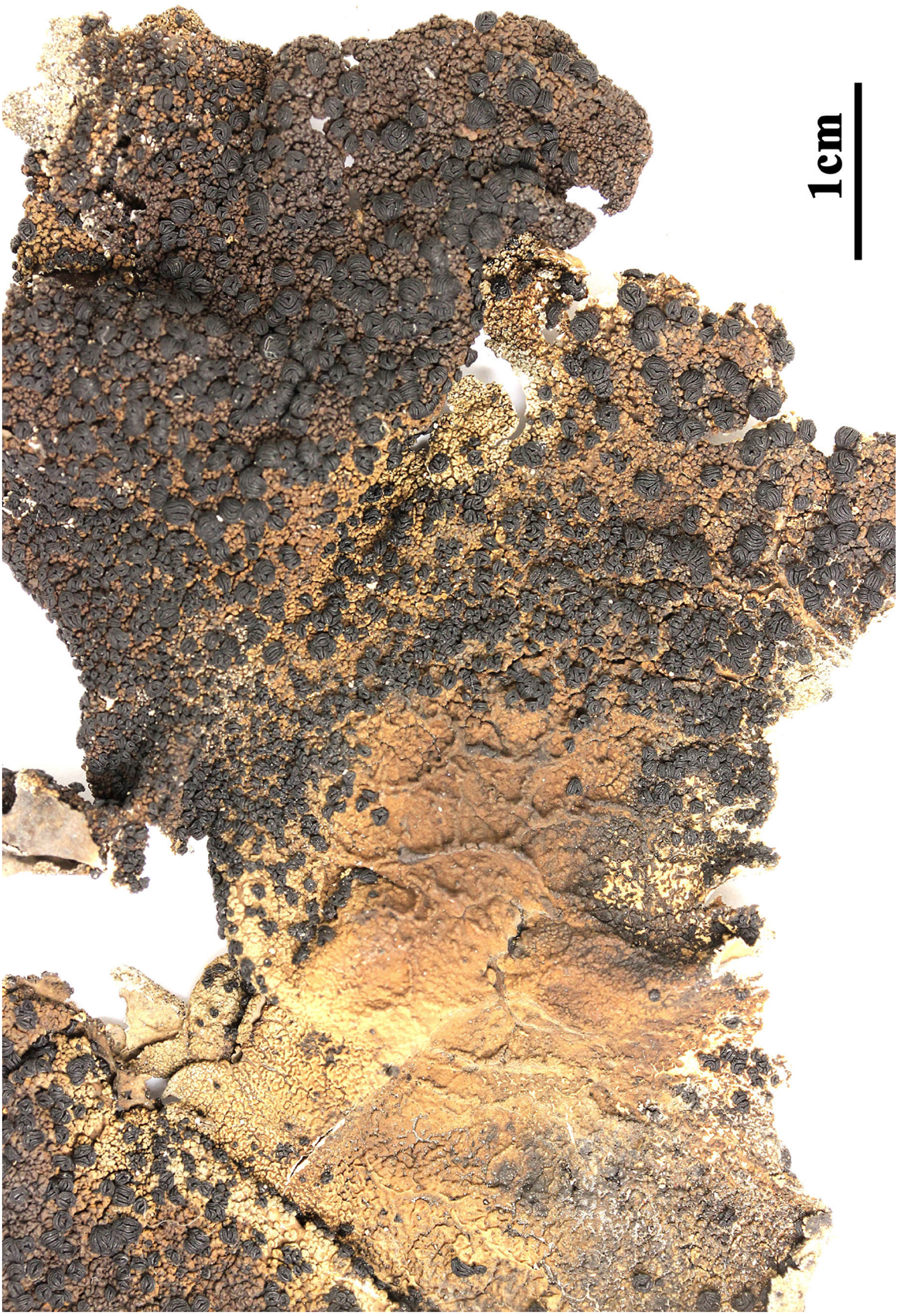
Umbilicaria arctica (Ach.) Nyl., in Nylander & Saelan, Herb. Mus. Fenn.: 84 (1859)
= *Gyromium proboscideum* var. *arcticum* (Ach.) Wahlenb., Fl. lapp.: 483 (1812)
= Gyrophora arctica Ach., Methodus, Sectio prior (Stockholmiæ): 106 (1803)
= *Gyrophora hyperborea* var. *arctica* (Ach.) Th. Fr., Lich. Scand. (Upsaliae)(1): 161 (1871)
= *Gyrophora hyperborea* ß *arctica* (Ach.) Mudd, Man. Brit. Lich.: 117 (1861)
= *Gyrophora polymorpha* f. *arctica* (Ach.) Schaer., Naturwiss. Anzeiger Allgem. Schweizer. Gesellsch. Naturwiss. 1: 7 (1818)
= *Gyrophora polymorpha* var. *arctica* (Ach.) Anzi, Cat. Lich. Sondr.: 34 (1860)
= *Gyrophora proboscidea* var. *arctica* (Ach.) Ach., Syn. meth. lich. (Lund): 65 (1814)
= *Lecidea polymorpha* var. *arctica* (Ach.) Spreng., Syst. veg., Edn 16 4(1): 263 (1827)
= *Umbilicaria hyperborea* var. *arctica* (Ach.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 107 (1858) [1857]
= *Umbilicaria polymorpha* var. *arctica* (Ach.) Schaer., Enum. critic. lich. europ. (Bern): 27 (1850)
= *Umbilicaria polymorpha* var. *exasperata* Boiss., Voy. bot. Espagne: 709 (1844)
= *Umbilicaria proboscidea* f. *arctica* (Ach.) Fr., Lich. eur. reform. (Lund): 355 (1831)
= *Umbilicaria proboscidea* subsp. *arctica* (Ach.) Nyl., Syn. meth. lich. (Parisiis) 2: 13 (1869)
= *Umbilicaria proboscidea* var. *arctica* (Ach.) Fr., Lich. eur. reform. (Lund): 355 (1831)
= *Umbilicaria varia* var. *arctica* (Ach.) Leight., Ann. Mag. nat. Hist., Ser. 2 18: 283 (1856)

[KU695], Svalvard. Spitsbergen. In gabbro area, Ossian Sarsfjellet, Kongsfjorden. On rocks, 0-100 m. Leg. H. Kashiwadani (nr. 23205) & H. Deguchi, 25.July.1985, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RARIORES ET CRITICI EXSICCATI NR. 695.

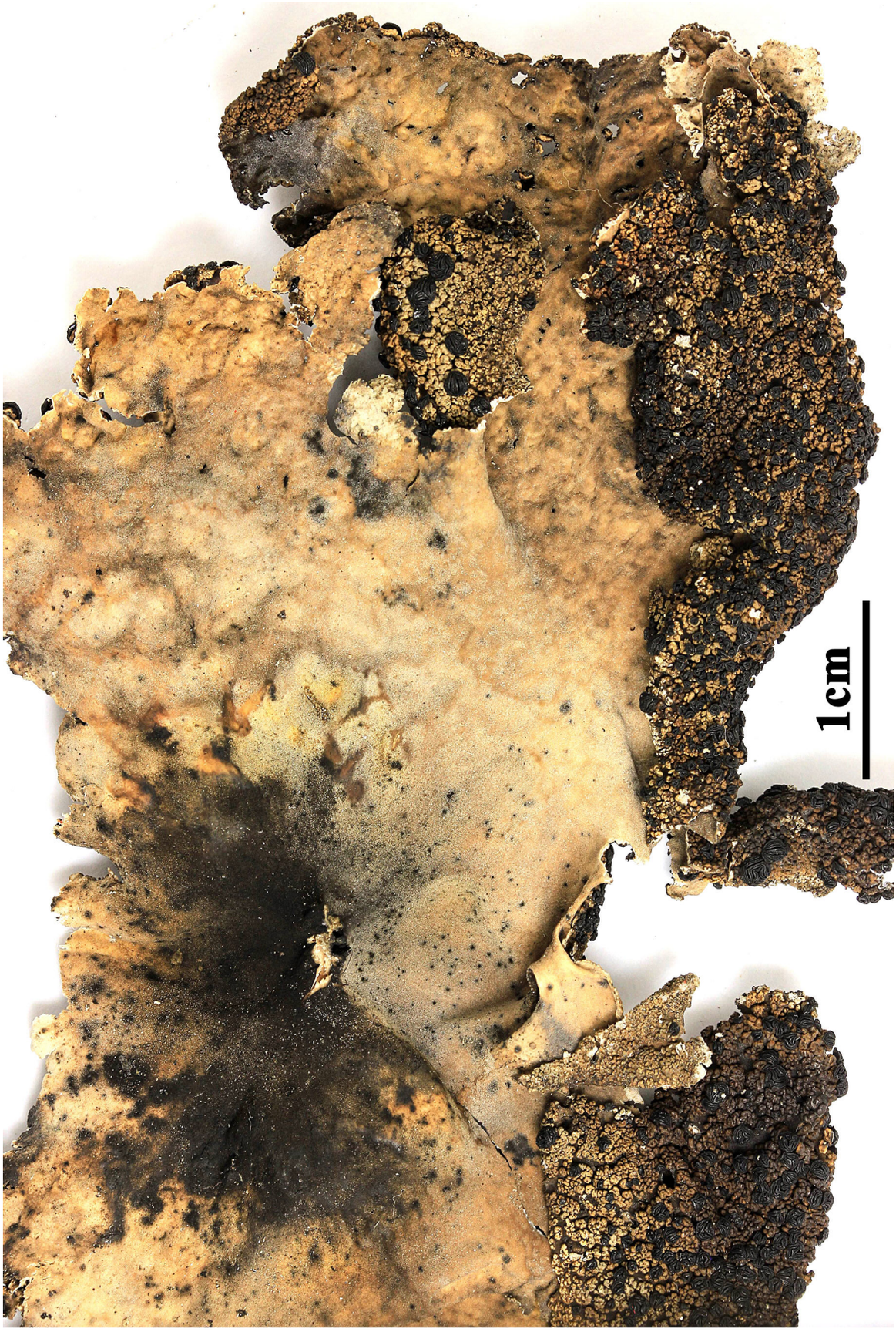
Thallus mono- vel polyphyllus, subtus glaber, planus vel lacunosus et trabeculis fimbriatis ornatus. Apothecia gyroso-plicata. -.
Thallus 6-15 and up to 20 cm. in diameter, monophyllous, coriaceous, upper surface corrugate- vermiform, extending to periphery, often cerebri form, umbo moderately elevated, with a few medium sized

ridges, outline irregular, or whole, torn to incised, lobes more or less crenate, occasionally perforated marginally, surface dull (though Arctic species often have a waxy appearance), margins fuscous or fuscous black, upper surface cinamon buff, clay color, to tawny olive, below smooth, bare, with a few strong to weak folds, wrinkled, or bullate, becoming obscurely areolate-papillate, black around the umbilicus which is compact, slightly extruding with veinlike structures fading into pinkish buff of the lower thallus, peripheral zone dark brown gray, Thallus about 1100 µm wide, necral zone evanescent, upper cortex, 115-130 µm scleroplectenchymatous, algal layer about 154 µm thick, continuous, protococcoid, medulla very loose, up to 630 µm thick, hyphae 6.6-9 µm in diameter, mesodermate, lower cortex about 210 µm thick, mostly parallel hyphae, becoming scleroplechtenchymatous, darker staining. Apothecia 1-2.5 mm. in diameter, black, gyrose, adnate, to sessile, strongly convex, almost spherical, numerous, scattered over thalli almost to umbo, parathecium about 56 µm thick, hypothecium about 210 µm thick, black, irregular, thecium about 66 µm thick, asci 40-80 µm long, 13-17 µm broad, paraphyses loose, simple or branched, septate, about 1.7 µm in diameter, spores hyaline, staining with a dark median band, 8.5 - 15.3 x 4.2 - 8.5 µm;spermogonia about 400 µm in diameter, dark walled, spermatia rod like 4.8-5.2 µm. Occasionally seen parasitized by Torula.

Umbilicaria arctica



Umbilicaria arctica



Umbilicaria arctica



Umbilicaria arctica

Umbilicaria arctica (Ach.) Nyl., in Nylander & Saelan, Herb. Mus. Fenn.: 84 (1859)
= *Gyromium proboscideum* var. *arcticum* (Ach.) Wahlenb., Fl. lapp.: 483 (1812)
= Gyrophora arctica Ach., Methodus, Sectio prior (Stockholmiæ): 106 (1803)
= *Gyrophora hyperborea* var. *arctica* (Ach.) Th. Fr., Lich. Scand. (Upsaliae)(1): 161 (1871)
= *Gyrophora hyperborea* ß *arctica* (Ach.) Mudd, Man. Brit. Lich.: 117 (1861)
= *Gyrophora polymorpha* f. *arctica* (Ach.) Schaer., Naturwiss. Anzeiger Allgem. Schweizer. Gesellsch. Naturwiss. 1: 7 (1818)
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= *Gyrophora proboscidea* var. *arctica* (Ach.) Ach., Syn. meth. lich. (Lund): 65 (1814)
= *Lecidea polymorpha* var. *arctica* (Ach.) Spreng., Syst. veg., Edn 16 4(1): 263 (1827)
= *Umbilicaria hyperborea* var. *arctica* (Ach.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 107 (1858) [1857]
= *Umbilicaria polymorpha* var. *arctica* (Ach.) Schaer., Enum. critic. lich. europ. (Bern): 27 (1850)
= *Umbilicaria polymorpha* var. *exasperata* Boiss., Voy. bot. Espagne: 709 (1844)
= *Umbilicaria proboscidea* f. *arctica* (Ach.) Fr., Lich. eur. reform. (Lund): 355 (1831)
= *Umbilicaria proboscidea* subsp. *arctica* (Ach.) Nyl., Syn. meth. lich. (Parisiis) 2: 13 (1869)
= *Umbilicaria proboscidea* var. *arctica* (Ach.) Fr., Lich. eur. reform. (Lund): 355 (1831)
= *Umbilicaria varia* var. *arctica* (Ach.) Leight., Ann. Mag. nat. Hist., Ser. 2 18: 283 (1856)

[KU694], Svalvard. Spitsbergen. In gabbro area, Ossian Sarsfjellet, Kongsfjorden. On rocks, 0-100 m. Leg. H. Kashiwadani (nr. 23204), 25.July.1985, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RARIORES ET CRITICI EXSICCATI NR. 694.

Thallus mono- vel polyphyllus, subtus glaber, planus vel lacunosus et trabeculis fimbriatis ornatus. Apothecia gyroso-plicata. -.
Thallus 6-15 and up to 20 cm. in diameter, monophyllous, coriaceous, upper surface corrugate- vermiform, extending to periphery, often cerebri form, umbo moderately elevated, with a few medium sized

ridges, outline irregular, or whole, torn to incised, lobes more or less crenate, occasionally perforated marginally, surface dull (though Arctic species often have a waxy appearance), margins fuscous or fuscous black, upper surface cinamon buff, clay color, to tawny olive, below smooth, bare, with a few strong to weak folds, wrinkled, or bullate, becoming obscurely areolate-papillate, black around the umbilicus which is compact, slightly extruding with veinlike structures fading into pinkish buff of the lower thallus, peripheral zone dark brown gray, Thallus about 1100 µm wide, necral zone evanescent, upper cortex, 115-130 µm scleroplectenchymatous, algal layer about 154 µm thick, continuous, protococcoid, medulla very loose, up to 630 µm thick, hyphae 6.6-9 µm in diameter, mesodermate, lower cortex about 210 µm thick, mostly parallel hyphae, becoming scleroplechtenchymatous, darker staining. Apothecia 1-2.5 mm. in diameter, black, gyrose, adnate, to sessile, strongly convex, almost spherical, numerous, scattered over thalli almost to umbo, parathecium about 56 µm thick, hypothecium about 210 µm thick, black, irregular, thecium about 66 µm thick, asci 40-80 µm long, 13-17 µm broad, paraphyses loose, simple or branched, septate, about 1.7 µm in diameter, spores hyaline, staining with a dark median band, 8.5 - 15.3 x 4.2 - 8.5 µm;spermogonia about 400 µm in diameter, dark walled, spermatia rod like 4.8-5.2 µm. Occasionally seen parasitized by Torula.

Umbilicaria arctica



Umbilicaria arctica



Umbilicaria arctica



Umbilicaria arctica



Umbilicaria arctica

Umbilicaria caroliniana Tuck., Proc. Amer. Acad. Arts & Sci. 12: 167 (1877)
= *Lasallia caroliniana* (Tuck.) Davydov, Peršoh & Rambold, Mycol. Progr. 9(2): 264 (2010)
= *Gyrophora caroliniana* (Tuck.) Schol., Nytt Mag. Natur. 75: 28 (1936)
= *Gyrophoropsis caroliniana* (Tuck.) Elenkin & Savicz, Trudy Bot. Muz. Imp. Akad. Nauk 8: 34 (1910)

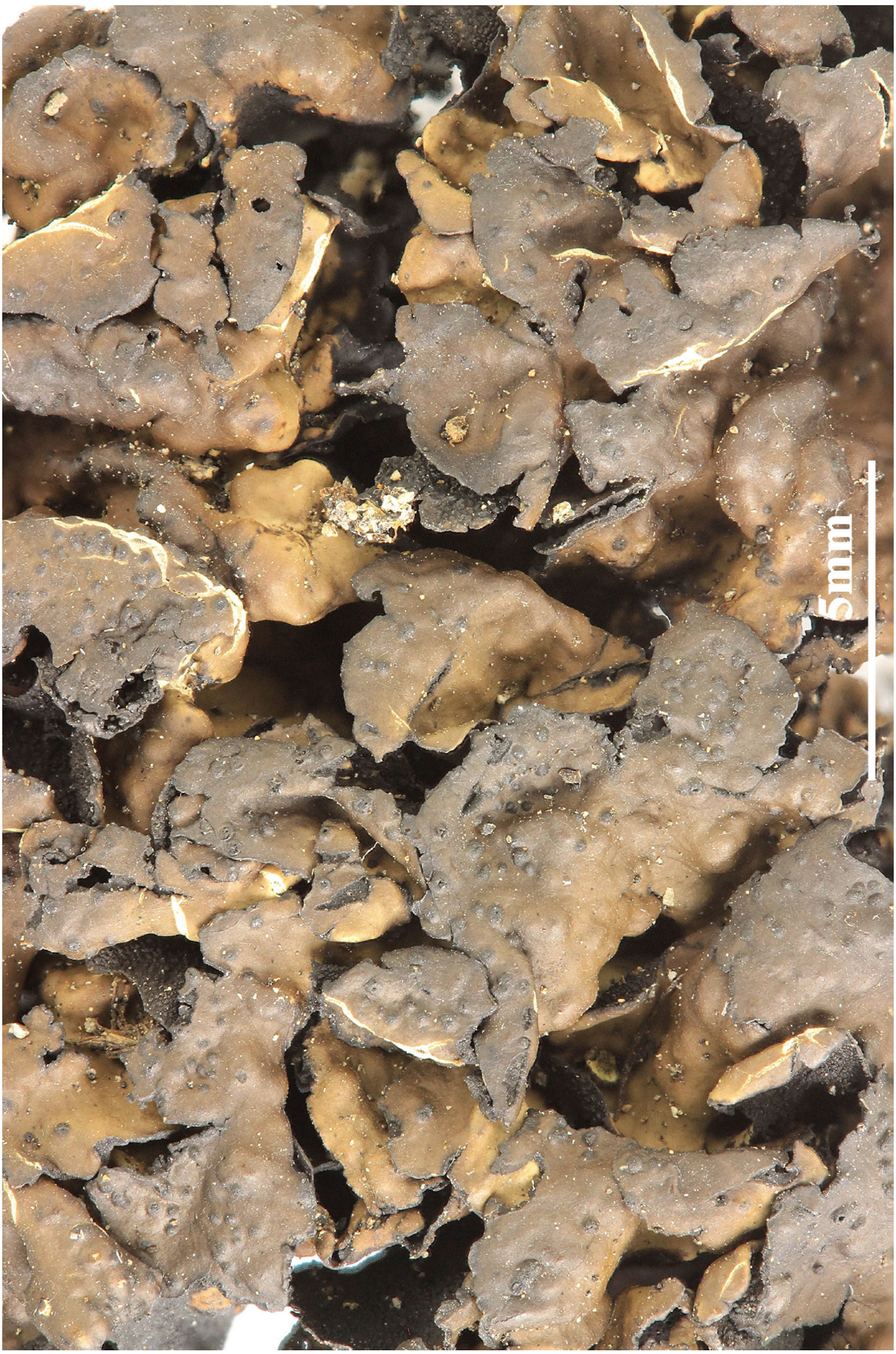
[KU446], Japan. Hokkaido. Prov. Ishikari: Mt. Tomuraushi. On rocks, 1700 m. Leg. M. Togashi, 20.July.1969, det. Y. Ashahina. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RARIORES ET CRITICI EXSICCATI NR. 446.

Thallus 2.5-6 cm. in diam. mono- or polyphyllous, membranous to fragile, thin, with overlapping lobes crowded over umbo about 1 cm. high, outline irregular, surface strongly undulating, margins mostly curled, upper surface with many broad, soft folds becoming crowded over umbo, margins rounded to crenate, frequently cleft, upper cortex smooth, dull to shining, Dresden brown to mummy brown with a strong olive cast, below black to rufous black, under surface irregularly lacunose or dimpled, umbilicus weak, indefinite to diffuse, under cortex uniformly granulose to verrucose, with scattered, sparse, black, shreddy rhizinae. Thallus 250-350 µm thick, upper cortex 16.5-33 µm thick, scleroplechtenchymatous, with an upper brown zone, algal layer continuous but thin, protococcoid, 50-66 µm thick, with a dense granular zone obscuring the algal layer extending up to 150 µm , medulla loose, about 165 µm thick, with cavities about 144-224 µm in diameter, dark lined, lower cortex paraplechtenchymatous with hyphae becoming parallel, with a lower black zone about 33 µm thick, hyphae 3.3-6.6 µm leptodermate. Apothecia up to 5 cm. in diameter, black, infrequent, scattered over thallus, sessile to subpedicellate, depressed, in thallus hollows, immature orbicular, poorly gyrate, with thick exciple, becoming convex, angular to laterally compressed, exciple moderate, gyri few, irregular, parathecium, 98-112 µm thick, dark, hypothecium about 140 µm thick, thecium about 85 µm hick, paraphyses branched, septate, 2.4 µm in diameter, apicis becoming in flated about 4.8 µm, asci with thick hyaline walls, 50-80 x l3.2-16.5 µm ascospores sparse, 30-50 x 19.8-26.4 µm , brown, muriform (finely divided), 6-8 in an ascus. The thallus was described by Tuckerman (1877) as being "papulose" by comparison with *U. pensylvanica* and *U. pustulata* var. *papulosa*. There is some similarity but the pus tules are not always clear in *U. caroliniana*, being irregular and appearing as impressions with no definite

pattern, as in the Lasallia. This was also apparent to Elenkin and Savicz (1911) when proposing *Gyrophoropsis* for which *U. caroIiniana* Tuck. is given as the type of *Gyrophoropsis*.



Umbilicaria caroliniana



Umbilicaria caroliniana



Umbilicaria caroliniana

Umbilicaria caroliniana Tuck., Proc. Amer. Acad. Arts & Sci. 12: 167 (1877)
= *Lasallia caroliniana* (Tuck.) Davydov, Peršoh & Rambold, Mycol. Progr. 9(2): 264 (2010)
= *Gyrophora caroliniana* (Tuck.) Schol., Nytt Mag. Natur. 75: 28 (1936)
= *Gyrophoropsis caroliniana* (Tuck.) Elenkin & Savicz, Trudy Bot. Muz. Imp. Akad. Nauk 8: 34 (1910)

[KU290], U.S.A. Tennesee: Roan Mts., Carter Co. Leg. A. J. Sharp, M. Tatewaki and I. Yoshimura (no. 650054), 11.09.1965. Det. I. Yoshimura. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI EXSICCATI NR. 290.

Thallus 2.5-6 cm. in diam. mono- or polyphyllous, membranous to fragile, thin, with overlapping lobes crowded over umbo about 1 cm. high, outline irregular, surface strongly undulating, margins mostly curled, upper surface with many broad, soft folds becoming crowded over umbo, margins rounded to crenate, frequently cleft, upper cortex smooth, dull to shining, Dresden brown to mummy brown with a strong olive cast, below black to rufous black, under surface irregularly lacunose or dimpled, umbilicus weak, indefinite to diffuse, under cortex uniformly granulose to verrucose, with scattered, sparse, black, shreddy rhizinae. Thallus 250-350 µm thick, upper cortex 16.5-33 µm thick, scleroplechtenchymatous, with an upper brown zone, algal layer continuous but thin, protococcoid, 50-66 µm thick, with a dense granular zone obscuring the algal layer extending up to 150 µm , medulla loose, about 165 µm thick, with cavities about 144-224 µm in diameter, dark lined, lower cortex paraplechtenchymatous with hyphae becoming parallel, with a lower black zone about 33 µm thick, hyphae 3.3-6.6 µm leptodermate. Apothecia up to 5 cm. in diameter, black, infrequent, scattered over thallus, sessile to subpedicellate, depressed, in thallus hollows, immature orbicular, poorly gyrate, with thick exciple, becoming convex, angular to laterally compressed, exciple moderate, gyri few, irregular, parathecium, 98-112 µm thick, dark, hypothecium about 140 µm thick, thecium about 85 µm hick, paraphyses branched, septate, 2.4 µm in diameter, apicis becoming in flated about 4.8 µm, asci with thick hyaline walls, 50-80 x l3.2-16.5 µm ascospores sparse, 30-50 x 19.8-26.4 µm , brown, muriform (finely divided), 6-8 in an ascus. The thallus was described by Tuckerman (1877) as being "papulose" by comparison with *U. pensylvanica* and *U. pustulata* var. *papulosa*. There is some similarity but the pus tules are not always clear in *U. caroliniana*, being irregular and appearing as impressions with no definite

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Umbilicaria caroliniana



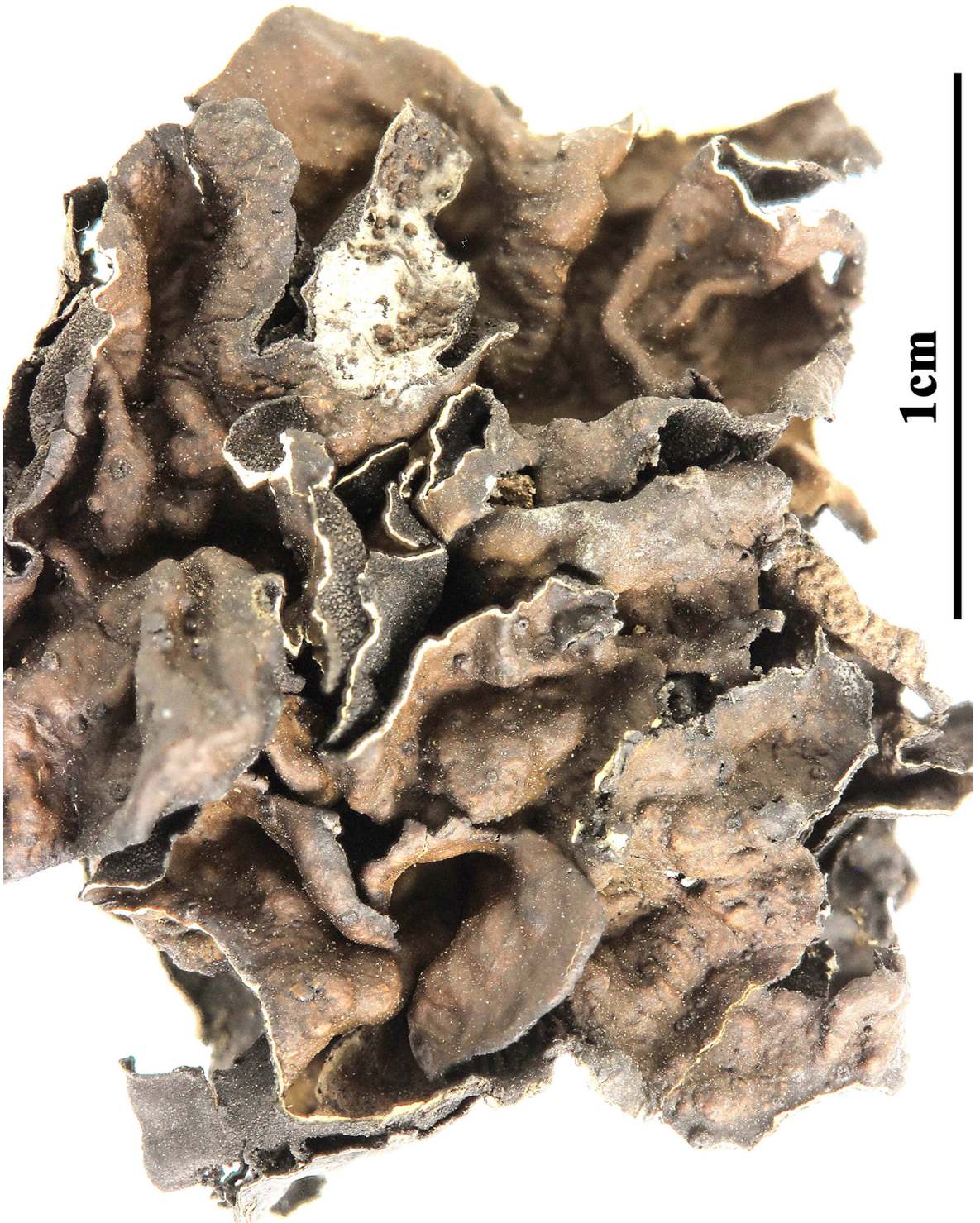
Umbilicaria caroliniana

Umbilicaria caroliniana Tuck., Proc. Amer. Acad. Arts & Sci. 12: 167 (1877)
= *Lasallia caroliniana* (Tuck.) Davydov, Peršoh & Rambold, Mycol. Progr. 9(2): 264 (2010)
= *Gyrophora caroliniana* (Tuck.) Schol., Nytt Mag. Natur. 75: 28 (1936)
= *Gyrophoropsis caroliniana* (Tuck.) Elenkin & Savicz, Trudy Bot. Muz. Imp. Akad. Nauk 8: 34 (1910)

[OH445], Saghalin. Mt. Suzuya. On rock. Leg. Y. Ashahina (s.n.), 19.07.1932, det. Y. Asahina. EX Y. OHMURA: LICHENES MINUS COGNITI EXSICCATI NR. 445.

Thallus 2.5-6 cm. in diam. mono- or polyphyllous, membranous to fragile, thin, with overlapping lobes crowded over umbo about 1 cm. high, outline irregular, surface strongly undulating, margins mostly curled, upper surface with many broad, soft folds becoming crowded over umbo, margins rounded to crenate, frequently cleft, upper cortex smooth, dull to shining, Dresden brown to mummy brown with a strong olive cast, below black to rufous black, under surface irregularly lacunose or dimpled, umbilicus weak, indefinite to diffuse, under cortex uniformly granulose to verrucose, with scattered, sparse, black, shreddy rhizinae. Thallus 250-350 µm thick, upper cortex 16.5-33 µm thick, scleroplechtenchymatous, with an upper brown zone, algal layer continuous but thin, protococcoid, 50-66 µm thick, with a dense granular zone obscuring the algal layer extending up to 150 µm , medulla loose, about 165 µm thick, with cavities about 144-224 µm in diameter, dark lined, lower cortex paraplechtenchymatous with hyphae becoming parallel, with a lower black zone about 33 µm thick, hyphae 3.3-6.6 µm leptodermate. Apothecia up to 5 cm. in diameter, black, infrequent, scattered over thallus, sessile to subpedicellate, depressed, in thallus hollows, immature orbicular, poorly gyrate, with thick exciple, becoming convex, angular to laterally compressed, exciple moderate, gyri few, irregular, parathecium, 98-112 µm thick, dark, hypothecium about 140 µm thick, thecium about 85 µm hick, paraphyses branched, septate, 2.4 µm in diameter, apicis becoming in flated about 4.8 µm, asci with thick hyaline walls, 50-80 x l3.2-16.5 µm ascospores sparse, 30-50 x 19.8-26.4 µm , brown, muriform (finely divided), 6-8 in an ascus. The thallus was described by Tuckerman (1877) as being "papulose" by comparison with *U. pensylvanica* and *U. pustulata* var. *papulosa*. There is some similarity but the pus tules are not always clear in *U. caroliniana*, being irregular and appearing as impressions with no definite pattern, as in the Lasallia. This was also apparent to Elenkin and Savicz

(1911) when proposing *Gyrophoropsis* for which *U. caroIiniana* Tuck. is given as the type of *Gyrophoropsis*.



Umbilicaria caroliniana



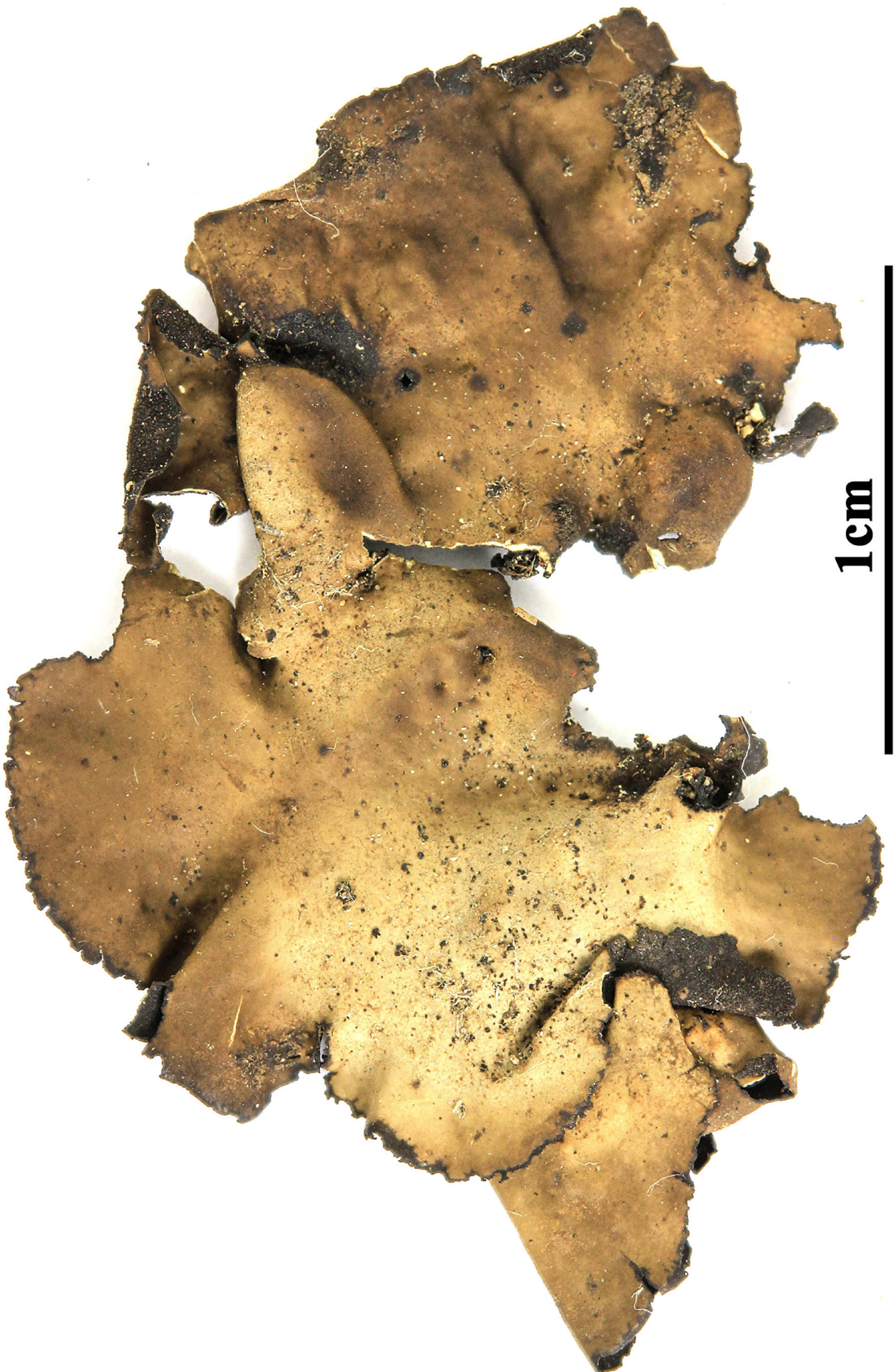
Umbilicaria caroliniana

Umbilicaria caroliniana Tuck., Proc. Amer. Acad. Arts & Sci. 12: 167 (1877)
= *Lasallia caroliniana* (Tuck.) Davydov, Peršoh & Rambold, Mycol. Progr. 9(2): 264 (2010)
= *Gyrophora caroliniana* (Tuck.) Schol., Nytt Mag. Natur. 75: 28 (1936)
= *Gyrophoropsis caroliniana* (Tuck.) Elenkin & Savicz, Trudy Bot. Muz. Imp. Akad. Nauk 8: 34 (1910)

[OH647], Japan. Honshu. Prov. Kai (Yamanashi Pref.) : around the summit of Mt. Mizugaki. Hokuto-city (35°53'36" N, 138°35'31" E). On rock (granite), 2230 m. Leg. M. Nuno & H. Izumi, 36.09.1976. Ex Y. Ohmura: Lichenes Minus Cogniti Nr. 647.

Thallus 2.5-6 cm. in diam. mono- or polyphyllous, membranous to fragile, thin, with overlapping lobes crowded over umbo about 1 cm. high, outline irregular, surface strongly undulating, margins mostly curled, upper surface with many broad, soft folds becoming crowded over umbo, margins rounded to crenate, frequently cleft, upper cortex smooth, dull to shining, Dresden brown to mummy brown with a strong olive cast, below black to rufous black, under surface irregularly lacunose or dimpled, umbilicus weak, indefinite to diffuse, under cortex uniformly granulose to verrucose, with scattered, sparse, black, shreddy rhizinae. Thallus 250-350 µm thick, upper cortex 16.5-33 µm thick, scleroplechtenchymatous, with an upper brown zone, algal layer continuous but thin, protococcoid, 50-66 µm thick, with a dense granular zone obscuring the algal layer extending up to 150 µm , medulla loose, about 165 µm thick, with cavities about 144-224 µm in diameter, dark lined, lower cortex paraplechtenchymatous with hyphae becoming parallel, with a lower black zone about 33 µm thick, hyphae 3.3-6.6 µm leptodermate. Apothecia up to 5 cm. in diameter, black, infrequent, scattered over thallus, sessile to subpedicellate, depressed, in thallus hollows, immature orbicular, poorly gyrate, with thick exciple, becoming convex, angular to laterally compressed, exciple moderate, gyri few, irregular, parathecium, 98-112 µm thick, dark, hypothecium about 140 µm thick, thecium about 85 µm hick, paraphyses branched, septate, 2.4 µm in diameter, apicis becoming in flated about 4.8 µm, asci with thick hyaline walls, 50-80 x l3.2-16.5 µm ascospores sparse, 30-50 x 19.8-26.4 µm , brown, muriform (finely divided), 6-8 in an ascus. The thallus was described by Tuckerman (1877) as being "papulose" by comparison with *U. pensylvanica* and *U. pustulata* var. *papulosa*. There is some similarity but the pus tules are not always clear in *U. caroliniana*, being irregular and appearing as impressions with no definite

pattern, as in the Lasallia. This was also apparent to Elenkin and Savicz (1911) when proposing *Gyrophoropsis* for which *U. caroIiniana* Tuck. is given as the type of *Gyrophoropsis*.



Umbilicaria caroliniana



Umbilicaria caroliniana

Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KU422], Japan. Honshu. Prov. Musashi: Mt. Ryogami. On rocks. Leg. A Shiraishi, 10.1959, Det Y. Asahina. Ex S. Kurokawa and H. Kashiwadani: Lichenes Rariores Et Critici Exsiccati Nr. 422.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



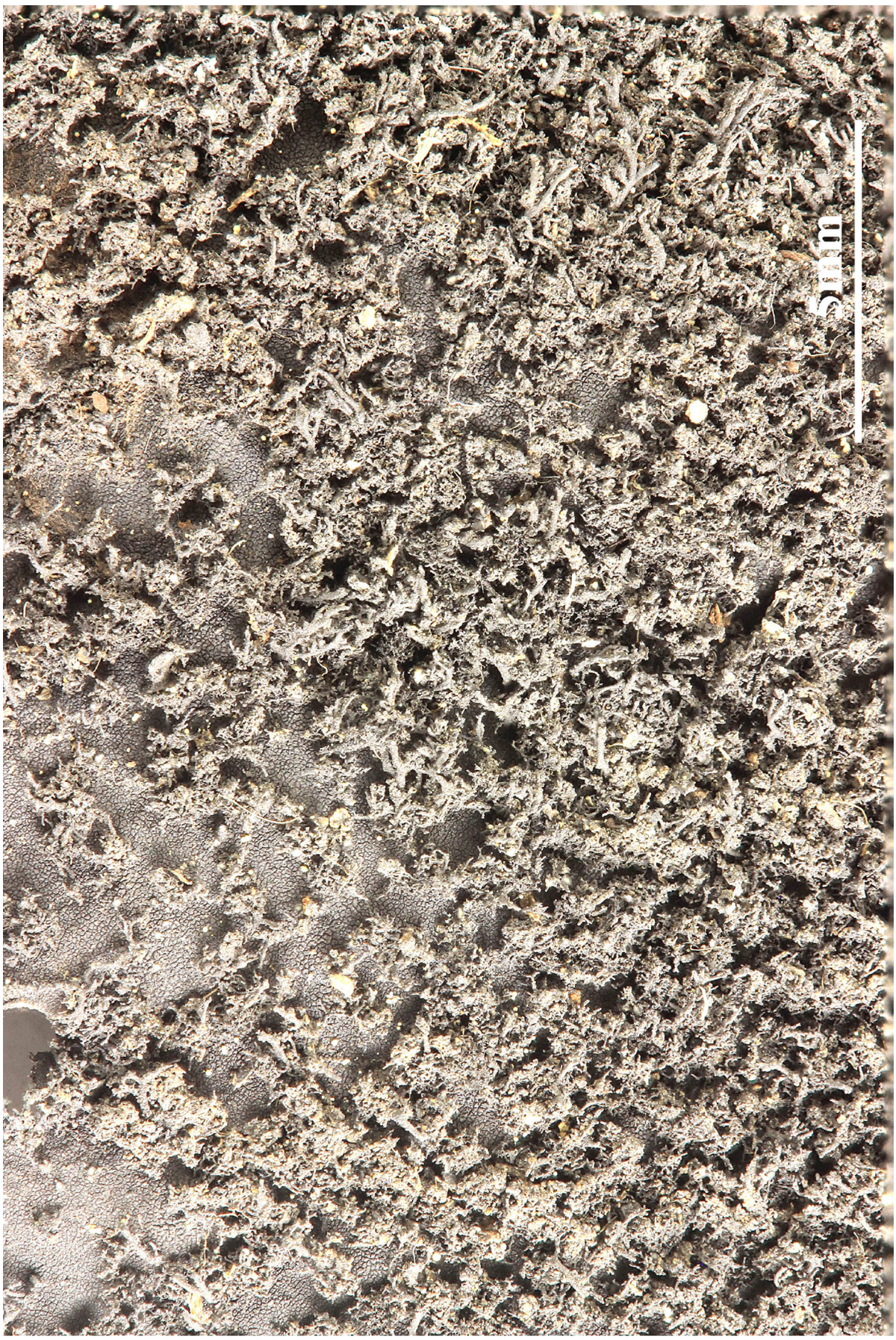
Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta

Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KA298], Japan. Kyushu. Prov. Tsushima (Pref. Nagasaki): Around the top of Mt. Shira-take, Shimo-Agata-gun. On rocks, 510 m. Leg. M. Togashi (s. n.), 10.05. 1975, det. H. Kashiwadani. Ex H. Kashiwadani: Lichenes Minus Cogniti Exsiccati Nr. 298.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



Umbilicaria esculenta



Umbilicaria esculenta

Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KA374], Korea. Prov. Gangwon: En route from Woljeong temple to Sangwon temple. Mt. Ohdae. Dongsan-ri, Jinbu-myun. Pyongchang-gun. On rocks, 600 m. Leg. K. H. Moon (no. 10001), 02.05.2007, det. K. H. Moob. Ex H. Kashiwadani: Lichenes Minus Cogniti Exsiccati Nr. 374.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



Umbilicaria esculenta

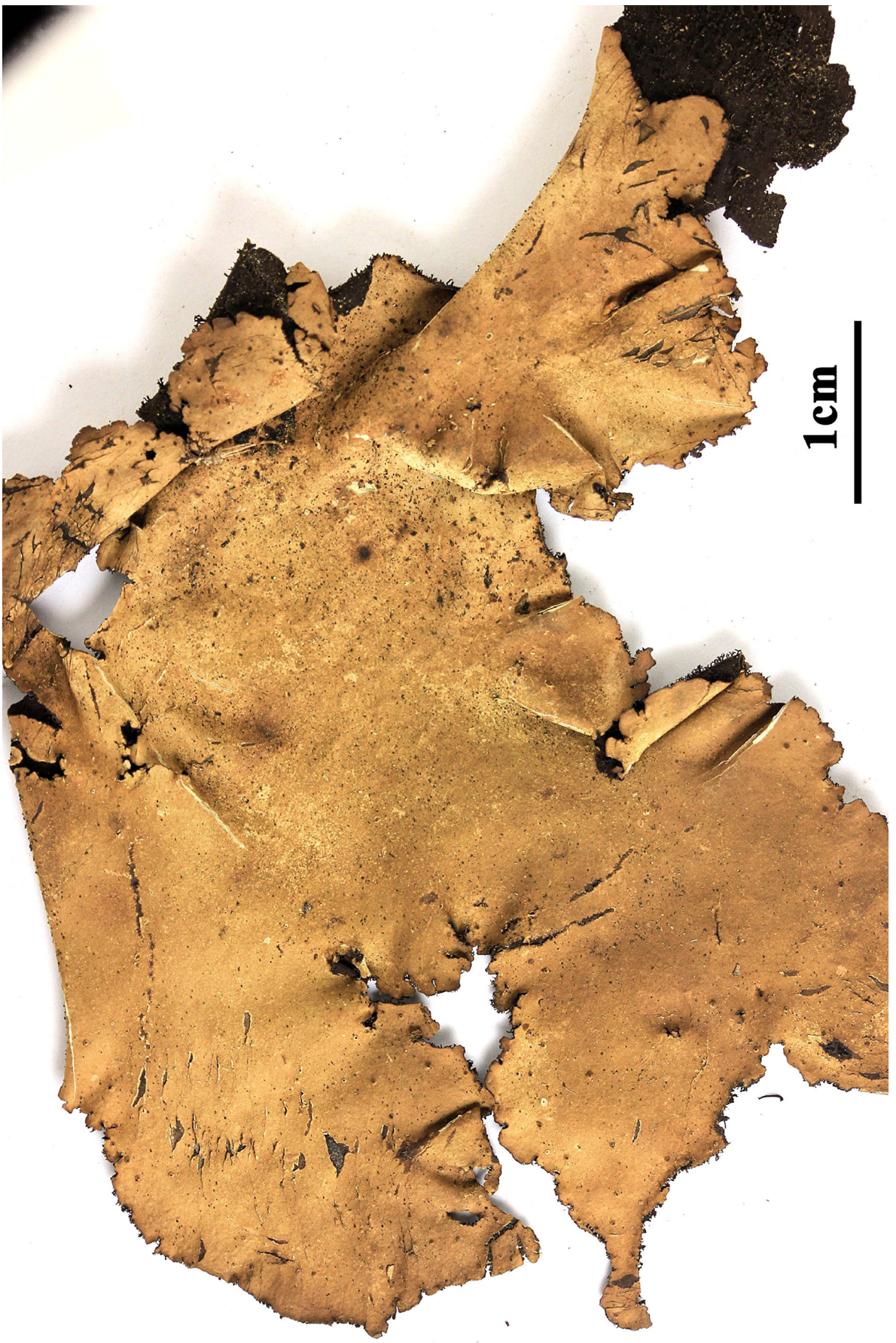


Umbilicaria esculenta

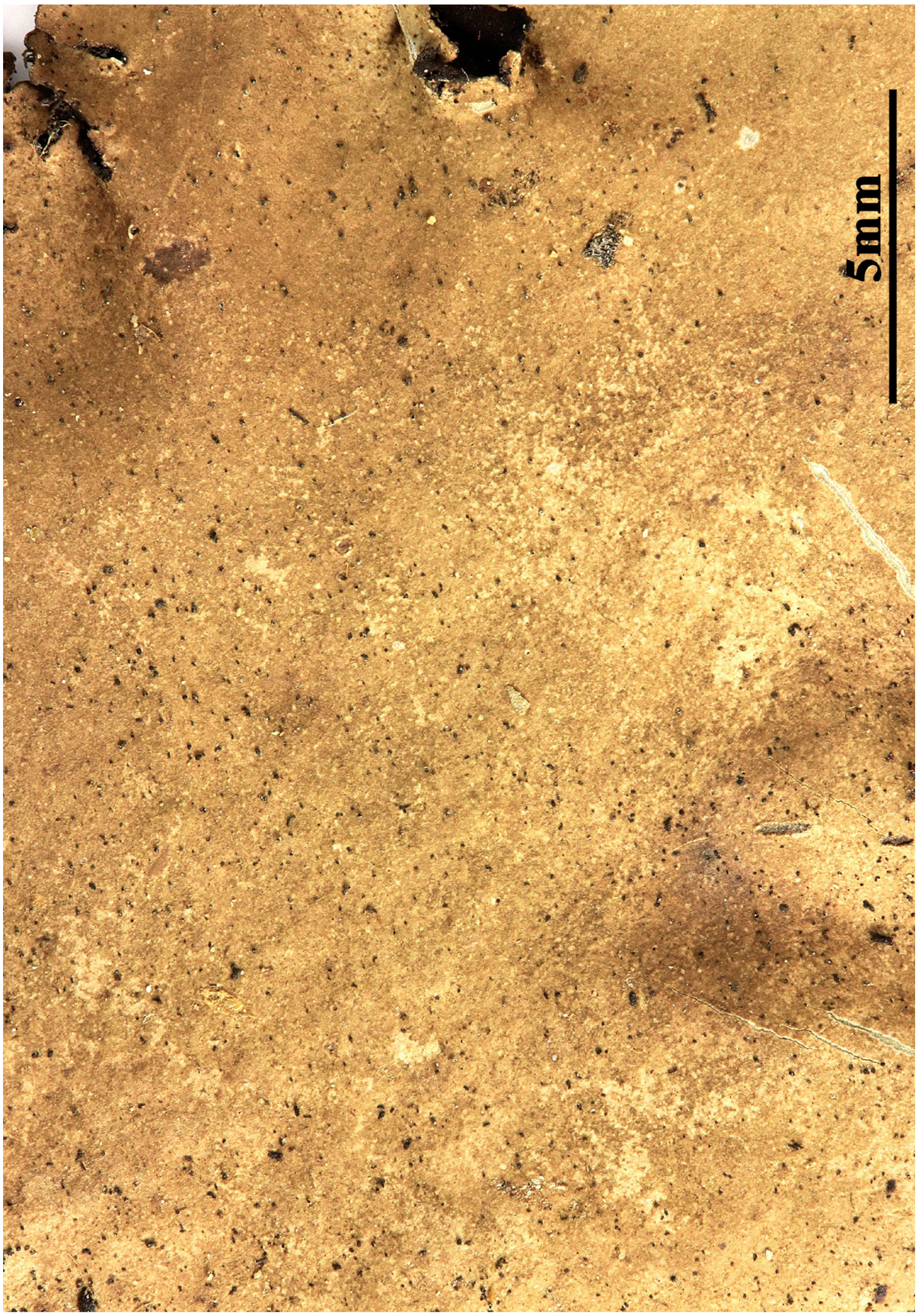
Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KU422], Japan. Honshu. Prov. Musashi: Mt. Ryogami. On rocks. Leg. A Shiraishi, 10.1959, Det Y. Asahina. Ex S. Kurokawa and H. Kashiwadani: Lichenes Rariores Et Critici Exsiccati Nr. 422.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



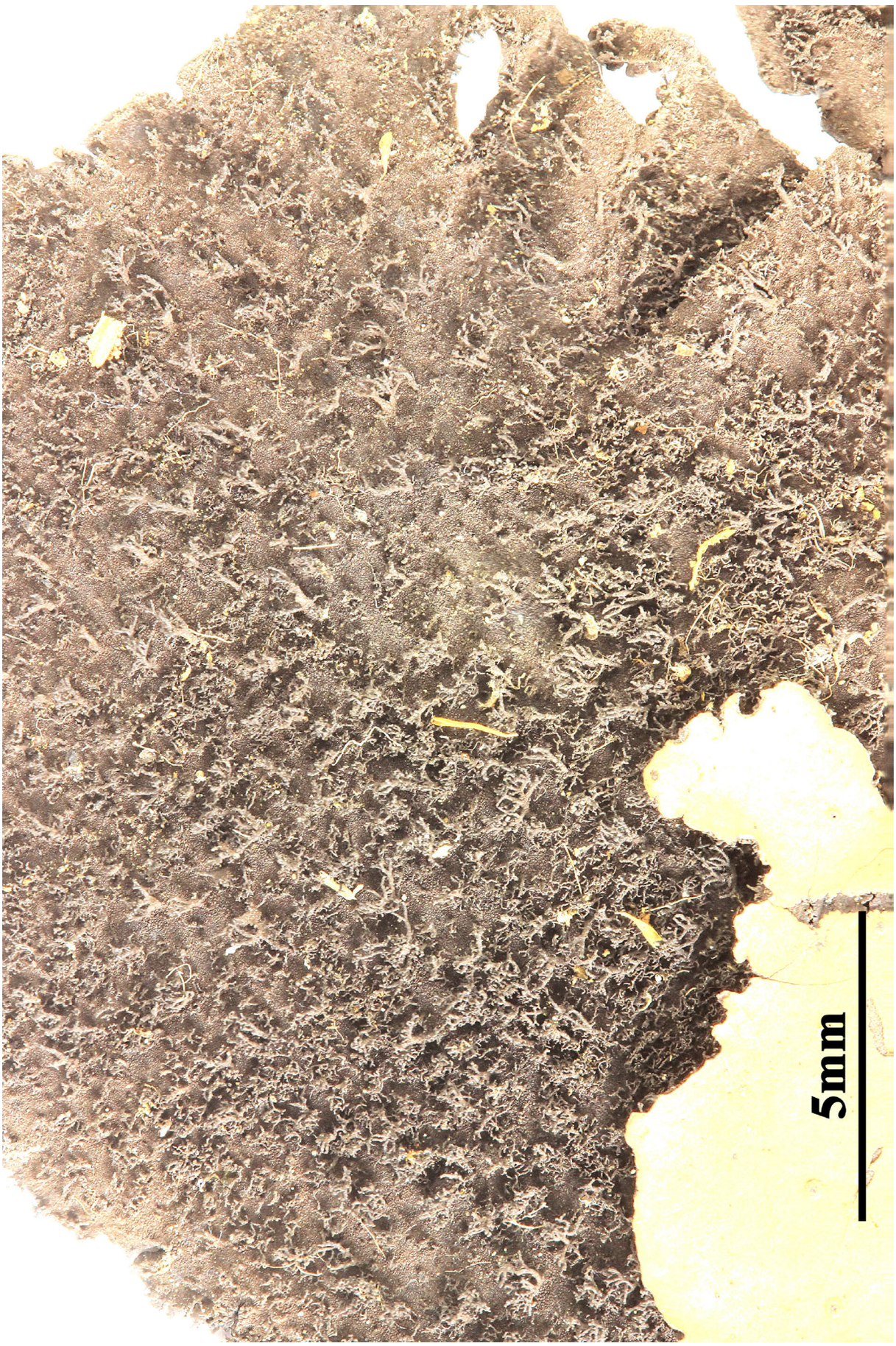
Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta

Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KU275], Japan. Honshu. Prov. Izumi: Mt. Iwawaki, Kawachi- Nagano city. On rocks, 300m. Leg. M. Togashi, 15.01.1972, det. H. Kashiwadani. Ex S. Kurokawa: Lichenes Rariores et Critici Exsiccati Nr. 275.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



Umbilicaria esculenta

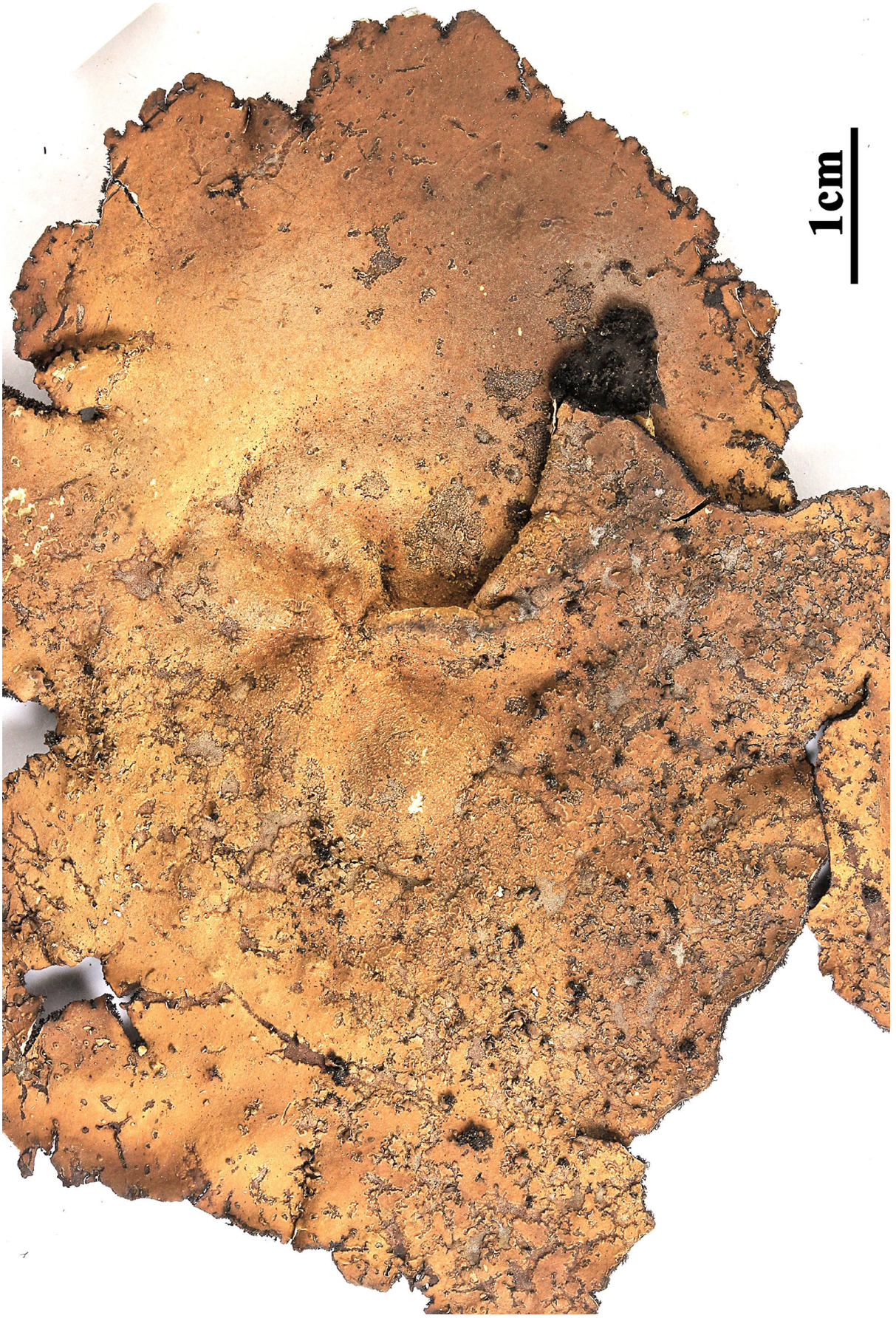


Umbilicaria esculenta

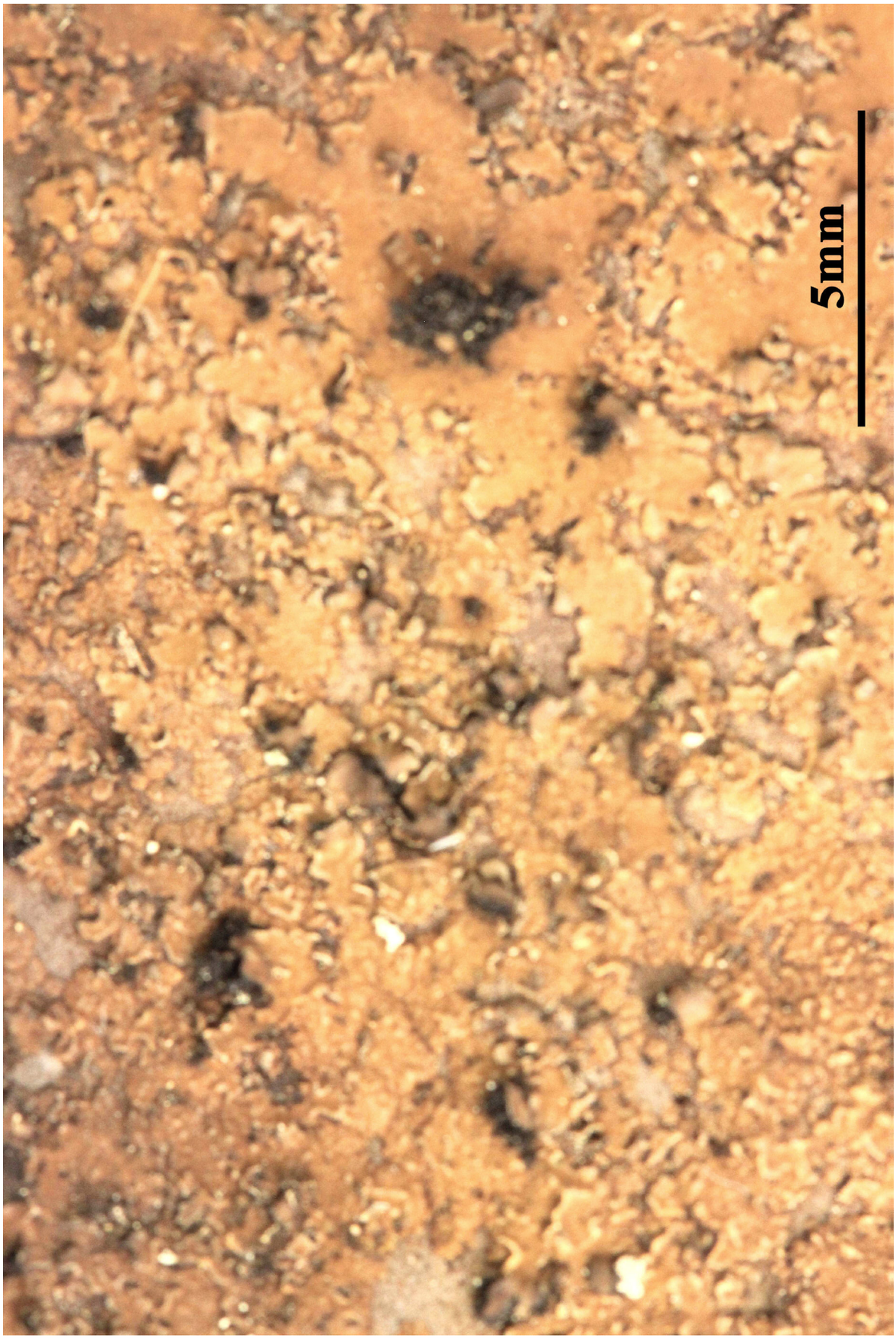
Umbilicaria esculenta (Miyoshi) Minks, Mém. Herb. Boissier 22: 22 (1900)
= *Gyrophora esculenta* Miyoshi, Botan. Zbl. 56(6): 162 (1893)

[KU315], Japan. Honshu. Prov. Shinanoi: Mt. Azusayama, Minami-Saku- gun. On rocks, q1200 m. Leg. M. Nuno, 8.8.1949, det. N. NUNO. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSIVVATI NR. 315.

Thallus monophyllous, 3-13 cm. in diameter, membranaceous, upper surface undulating with a few heavy folds extending peripherally, umbo slightly elevated, upper cortex smooth, margins whole, sinuate, to somewhat torn or crenate, frequently perforate, surface dull, cinnamon brown to bister, below with strong, fasciate umbilicus, lower cortex black to dark brown, finely verrucose, with a dense nap of short, highly branched rhizinae, occurring in patches or continuous and entangled, apothecia not seen. Thallus 250 - 300 µm thick, upper cortex palisadeplechtenchymatous, about 23.1 µm thick, algal layer discontinuous, about 36.3 µm thick, obscured by a dense zone of granules extending through the upper cortex and algal layer into upper part of medulla, medulla generally undifferentiated from lower cortex, occasionally divisible into a 33 µm thick scleroplechtenchymatous upper medulla, rest more or less parallel hyphae about 40 µm thick, lower cortex scleroplechtenchymatous about 72.6 µm thick, with a lower outer zone (black) about 33 µm thick, or lower cortex may be of parallel hyphae (pachydermatous) 6.6-9.9 µm in diameter. Miyoshi states that he observed numerous, adnate apothecia with short, slim paraphyses, asci clavate, 8-spored, ascospores simple, hyaline, ellipsoidal or pointed at ends, 2.5 x 8 µm, spermogonia oval or ellipsoid, spermatiophores branching, exobasidial, spermatia rod shaped. U. esculenta looks remarkably like *U. mammulata*; nevertheless both are excellent species.



Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta



Umbilicaria esculenta

Umbilicaria hyperborea (Ach.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 110 (1796) [1795]
= *Gyromium hyperboreum* (Ach.) Wahlenb., Fl. lapp.: 482 (1812)
= *Gyrophora aenea* var. *hyperborea* (Ach.) Schaer., Naturwiss. Anzeiger Allgem. Schweizer. Gesellsch. Naturwiss. 1: 7 (1818)
= *Gyrophora hyperborea* (Ach.) Ach., Methodus, Sectio prior (Stockholmiæ): 104 (1803)
= *Lecidea polymorpha* var. *hyperborea* (Ach.) Spreng., Syst. veg., Edn 16 4(1): 263 (1827)
= *Lichen hyperboreus* Ach., K. Vetensk-Acad. Nya Handl. 15(2): 89 (1794)
= *Lichen leiocarpus* * *hyperborea* (Ach.) Lam., Encycl. Méth. Bot., Suppl. (Paris) 3(2): 424 (1813)
= *Umbilicaria aenea* var. *hyperborea* (Ach.) Schaer., Lich. helv. spicil. 2: 91 (1826)
= *Umbilicaria polyphylla* var. *hyperborea* (Ach.) Schaer., Enum. critic. lich. europ. (Bern): 29 (1850)
= *Umbilicaria varia* var. *hyperborea* (Ach.) Leight., Ann. Mag. nat. Hist., Ser. 2 18: 282 (1856)

[KU499], Japan. Hokkaido.Prov. Ishikari: Tokachidake Hot spring, Furano-city. On rocks. 1450 m. Leg. H. Shibuichi (no. 6210) and K. Yosida, o7.08.1980, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RIRIORES ET CRITICI EXSICCATI NR. 499.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, attached by a central holdfast, rigid and fragile, irregular in outline, (2-)4–6(-10) cm wide, deeply dissected, the edges down-turned, lacerated and often with oval perforations. Upper surface uniformly dark brown, sometimes paler towards the centre, covered with narrow, irregular, vermiform ridges often extending to margins and not forming a network. Lower surface uniformly dark brown, darker and almost black around umbilicus, paler towards the margins, smooth or occasionally dimpled, erhizinate or with very few rhizinomorphs, without thalloconidia. Upper cortex dark brown, 6-15 µm thick; medulla white, very loose under the ridges; lower cortex scleroplectenchymatous, 15–25 µm thick. Apothecia common, gyrodisc, black, sessile, mainly located between ridges over the whole upper surface except around the umbilicus, 1-1.5(-2) mm across. Epithecium brown; hymenium colourless; paraphyses simple or sparingly branched, the apical cells more or less swollen; hypothecium dark. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-

celled hyaline, ellipsoid, (7-)13-16(-20) x (3-)5-8 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric and umbilicaric acids, plus small amounts of lecanoric acid.

Note: an arctic-alpine, probably circumpolar lichen found on siliceous boulders wetted by rain, usually near the ground, with optimum near treeline.



Umbilicaria hyperborea



Umbilicaria hyperborea

Umbilicaria hyperborea (Ach.) Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 110 (1796) [1795]
= *Gyromium hyperboreum* (Ach.) Wahlenb., Fl. lapp.: 482 (1812)
= *Gyrophora aenea* var. *hyperborea* (Ach.) Schaer., Naturwiss. Anzeiger Allgem. Schweizer. Gesellsch. Naturwiss. 1: 7 (1818)
= *Gyrophora hyperborea* (Ach.) Ach., Methodus, Sectio prior (Stockholmiæ): 104 (1803)
= *Lecidea polymorpha* var. *hyperborea* (Ach.) Spreng., Syst. veg., Edn 16 4(1): 263 (1827)
= *Lichen hyperboreus* Ach., K. Vetensk-Acad. Nya Handl. 15(2): 89 (1794)
= *Lichen leiocarpus* * *hyperborea* (Ach.) Lam., Encycl. Méth. Bot., Suppl. (Paris) 3(2): 424 (1813)
= *Umbilicaria aenea* var. *hyperborea* (Ach.) Schaer., Lich. helv. spicil. 2: 91 (1826)
= *Umbilicaria polyphylla* var. *hyperborea* (Ach.) Schaer., Enum. critic. lich. europ. (Bern): 29 (1850)
= *Umbilicaria varia* var. *hyperborea* (Ach.) Leight., Ann. Mag. nat. Hist., Ser. 2 18: 282 (1856)

[KU599], Japan. Honshu. Prov. Etchu: Mt. Etchusawa-dake. On rocks, 2400 m. Leg. H. Kashiwadani (no. 23434) & K. Yoshida, 27.07.1976, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RARIORES ET CRITICI EXSICCATI NR.599.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, attached by a central holdfast, rigid and fragile, irregular in outline, (2-)4–6(-10) cm wide, deeply dissected, the edges down-turned, lacerated and often with oval perforations. Upper surface uniformly dark brown, sometimes paler towards the centre, covered with narrow, irregular, vermiform ridges often extending to margins and not forming a network. Lower surface uniformly dark brown, darker and almost black around umbilicus, paler towards the margins, smooth or occasionally dimpled, erhizinate or with very few rhizinomorphs, without thalloconidia. Upper cortex dark brown, 6-15 µm thick; medulla white, very loose under the ridges; lower cortex scleroplectenchymatous, 15–25 µm thick. Apothecia common, gyrodisc, black, sessile, mainly located between ridges over the whole upper surface except around the umbilicus, 1-1.5(-2) mm across. Epithecium brown; hymenium colourless; paraphyses simple or sparingly branched, the apical cells more or less swollen; hypothecium dark. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-

celled hyaline, ellipsoid, (7-)13-16(-20) x (3-)5-8 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric and umbilicaric acids, plus small amounts of lecanoric acid.
Note: an arctic-alpine, probably circumpolar lichen found on siliceous boulders wetted by rain, usually near the ground, with optimum near treeline.



Umbilicaria hyperborea



Umbilicaria hyperborea

Umbilicaria leiocarpa DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 2: 410 (1805)

[KU291], Japan. Honshu. Prov. Etchu: Mt. Etchusawa-dake. On rocks; 2400 m. Leg. H. Kashiwadani (no. 13381) and K. Yoshida, 27. July,1976, det. H. Kahiwadani. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI EXSICCATI NR. 291.

Thallus foliose-umbilicate, heteromerous, dorsiventral, rigid, monophyllous but usually deeply dissected and often appearing polyphyllous, orbicular in outline, up to 10(-15) cm wide, the margins up-turned, fragile, with irregular to ovoid perforations. Upper surface yellowish grey to dirty white, dull, rimose, minutely areolate around center, with irregular, sharp, up to 1 cm high and 1.0-1.5 mm tall ridges around the umbilicus, the peripheral parts with a yellowish white reticulate pattern due to small patches of cortex separated by darker cracks, the marginal zone darker, greyish brown. Lower surface smooth, slightly undulating, black, except a grey-brown 2-3 mm wide marginal zone, erhizinate; thalloconidia simple or rarely 1-septate, globose, dark brown, 4-6 x 5-8 µm, sometimes covering the whole lower surface, but usually absent in a brownish, 2-4 mm wide peripheral zone. Upper and lower cortex scleroplectenchymatous; medulla white. Apothecia rare, leiodisc, black, stipitate, to 1 mm across, with a scabrous disc. Ascospores often not well-developed. Pycnidia mainly marginal on upper surface, immersed, bottle-shaped, with dark brown wall and ostiole. Conidia bacilliform 2.5-4.7 x 1-2 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C- or C+ red, KC- or KC+ red, P-. Chemistry: medulla with small amounts of gyrophoric and lecanoric acids, rarely with traces of norstictic acid. - Note: a mainly arctic-alpine, probably circumpolar lichen found on steeply inclined to vertical, wind- and sun-exposed surfaces of large siliceous boulders wetted by rain with a short snow-lie period, with optimum above treeline.



Umbilicaria leiocarpa



Umbilicaria leiocarpa

Umbilicaria leiocarpa DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 2: 410 (1805)

[KU292], Japan. Honshu. Prov.: Mt. Kinpu, Minami-Saku-gun. Leg. H. Shibuichi (no. 4667) and K. Yoshida, 23.07.1972, det. H. Kashiwadani. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI EXSICCATI NR. 292.

Thallus foliose-umbilicate, heteromerous, dorsiventral, rigid, monophyllous but usually deeply dissected and often appearing polyphyllous, orbicular in outline, up to 10(-15) cm wide, the margins up-turned, fragile, with irregular to ovoid perforations. Upper surface yellowish grey to dirty white, dull, rimose, minutely areolate around center, with irregular, sharp, up to 1 cm high and 1.0-1.5 mm tall ridges around the umbilicus, the peripheral parts with a yellowish white reticulate pattern due to small patches of cortex separated by darker cracks, the marginal zone darker, greyish brown. Lower surface smooth, slightly undulating, black, except a grey-brown 2-3 mm wide marginal zone, erhizinate; thalloconidia simple or rarely 1-septate, globose, dark brown, 4-6 x 5-8 µm, sometimes covering the whole lower surface, but usually absent in a brownish, 2-4 mm wide peripheral zone. Upper and lower cortex scleroplectenchymatous; medulla white. Apothecia rare, leiodisc, black, stipitate, to 1 mm across, with a scabrous disc. Ascospores often not well-developed. Pycnidia mainly marginal on upper surface, immersed, bottle-shaped, with dark brown wall and ostiole. Conidia bacilliform 2.5-4.7 x 1-2 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C- or C+ red, KC- or KC+ red, P-. Chemistry: medulla with small amounts of gyrophoric and lecanoric acids, rarely with traces of norstictic acid. - Note: a mainly arctic-alpine, probably circumpolar lichen found on steeply inclined to vertical, wind- and sun-exposed surfaces of large siliceous boulders wetted by rain with a short snow-lie period, with optimum above treeline.



Umbilicaria leiocarpa



Umbilicaria leiocarpa



Umbilicaria leiocarpa

Umbilicaria leiocarpa DC., in Lamarck & de Candolle, Fl. franç., Edn 3 (Paris) 2: 410 (1805)

[OH523], Japan. Honshu. Prov. Kai (Pref. Yumanashi): Mt. Kita-dake. On rock, 3000 m. Leg. M Togashi (s.n.), 04.08.1967, det. H. Kashiwadani. EX Y. OHMURA: LICHENES MINUS COGMITI EXSICCATI NR.523.

Thallus foliose-umbilicate, heteromerous, dorsiventral, rigid, monophyllous but usually deeply dissected and often appearing polyphyllous, orbicular in outline, up to 10(-15) cm wide, the margins up-turned, fragile, with irregular to ovoid perforations. Upper surface yellowish grey to dirty white, dull, rimose, minutely areolate around center, with irregular, sharp, up to 1 cm high and 1.0-1.5 mm tall ridges around the umbilicus, the peripheral parts with a yellowish white reticulate pattern due to small patches of cortex separated by darker cracks, the marginal zone darker, greyish brown. Lower surface smooth, slightly undulating, black, except a grey-brown 2-3 mm wide marginal zone, erhizinate; thalloconidia simple or rarely 1-septate, globose, dark brown, 4-6 x 5-8 µm, sometimes covering the whole lower surface, but usually absent in a brownish, 2-4 mm wide peripheral zone. Upper and lower cortex scleroplectenchymatous; medulla white. Apothecia rare, leiodisc, black, stipitate, to 1 mm across, with a scabrous disc. Ascospores often not well-developed. Pycnidia mainly marginal on upper surface, immersed, bottle-shaped, with dark brown wall and ostiole. Conidia bacilliform 2.5-4.7 x 1-2 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C- or C+ red, KC- or KC+ red, P-. Chemistry: medulla with small amounts of gyrophoric and lecanoric acids, rarely with traces of norstictic acid. - Note: a mainly arctic-alpine, probably circumpolar lichen found on steeply inclined to vertical, wind- and sun-exposed surfaces of large siliceous boulders wetted by rain with a short snow-lie period, with optimum above treeline.



Umbilicaria leiocarpa



Umbilicaria leiocarpa

Umbilicaria muhlenbergii (Ach.) Tuck., Boston J. Nat. Hist. 3: 296 (1841)
= *Actinogyra muhlenbergii* (Ach.) Schol., Nytt Mag. Natur. 75: 28 (1936)
= *Actinogyra muhlenbergii* var. *alpina* (Tuck.) Llano, Monograph of the Lichen Family Umbilicariaceae in the Western Hemisphere: 201 (1950)
= *Gyrophora muhlenbergii* Ach. [as 'mühlenbergii'], Lich. Univ.: 227 (1810)
= *Gyrophora muhlenbergii* var. *alpina* (Tuck.) Zahlbr., Cat. Lich. Univers. 4: 720 (1927)
= *Lecidea muhlenbergii* (Ach.) Spreng. [as 'mühlenbergii'], Syst. veg., Edn 16 4(1): 262 (1827)
= *Lichen leiocarpus* * *muhlenbergii* (Ach.) Lam., Encycl. Méth. Bot., Suppl. (Paris) 3(2): 424 (1813)
= *Umbilicaria muhlenbergii* var. *alpina* Tuck., Boston J. Nat. Hist. 3: 296 (1841)

[KU251], Japan. Honshu. Prov. Mutsu: Mt. Nuido-iwa, Fuku-ura, 628 m. Leg. S. Kurokawa (no. 72180), det. S. Kurokawa. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI EXSICCATI NR. 252.

Thallus dark brown to grayish brown, surface satiny and almost shiny, never pruinose, smooth to verruculose, pitted with shallow depressions especially when fertile, 6-15(—20) cm in diameter, often folded and undulating; lower surface pale brown to black, roughened with sharp papillae, covered with a network of overlapping plates parallel with the surface, without true rhizines, although the plates often narrow into short, slender filaments at their edges. Apothecia common, without margins, 1-4(—6) mm in diameter, consisting of radiating, branched ridges split by fissures, usually sunken into depressions in the thallus. Chemistry: Medulla P-, K-, KC+ red, C+ red (gyrophoric acid). Habitat: On boulders and steep rock walls in forests and in the' open. COMMENTS: Sterile specimens can be distinguished from *U. mammulata* by the lower surface.



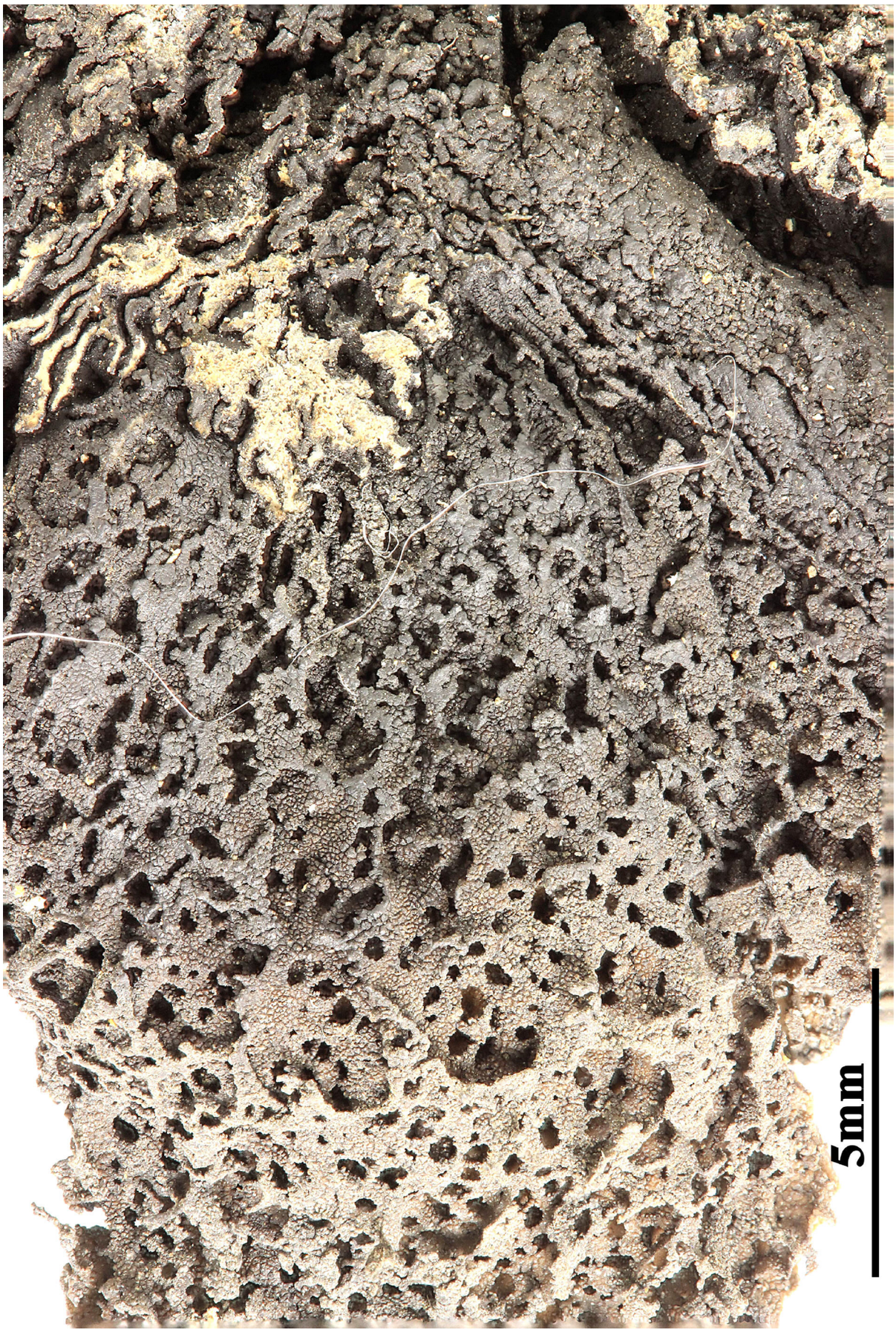
Umbilicaria muhlenbergii



Umbilicaria muhlenbergii



Umbilicaria muhlenbergii



Umbilicaria muhlenbergii

Umbilicaria muhlenbergii (Ach.) Tuck., Boston J. Nat. Hist. 3: 296 (1841)
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= *Gyrophora muhlenbergii* var. *alpina* (Tuck.) Zahlbr., Cat. Lich. Univers. 4: 720 (1927)
= *Lecidea muhlenbergii* (Ach.) Spreng. [as 'mühlenbergii'], Syst. veg., Edn 16 4(1): 262 (1827)
= *Lichen leiocarpus* * *muhlenbergii* (Ach.) Lam., Encycl. Méth. Bot., Suppl. (Paris) 3(2): 424 (1813)
= *Umbilicaria muhlenbergii* var. *alpina* Tuck., Boston J. Nat. Hist. 3: 296 (1841)

[KU252], Japan. Honshu. Prov. Mutsu: Mt. Nuido-iwa, Ushitaki Sai-mura, Shimokita-gun. On rocks, 520 m. Leg. S. Kurokawa (no. 72195), det. S. Kurokawa. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI EXSICCATI NR. 252.

Lobes not pustulate, smooth and even, wrinckled, humpy. or with a network of depressions and sharp ridges; if warty, rhe warts do not have corresponding depressions on the lower surfac. Rhizines absent. Isidia absent. Lower surface with a networkof rough papillate membranes. Margins of the thallus not perforated and lobed; apothecial disks with radiating ridges; medulla P-. K-.



Umbilicaria muhlenbergii



Umbilicaria muhlenbergii

Umbilicaria pensylvanica Hoffm., Descr. Adumb. Plant. Lich. 3(no. 4): 5 (1801)

[KU696, Japan. Honshu. Prov. Musashi: Mt. Ohama, Chichibu-gun: on rocks (chart), 2100 m. Leg. H. Shibuichi (no. 4719) 10.08.1972, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani: Lichenes Rariores Et Critici Exsiccati Nr. 696.

Thallus 9-25 an. in diameter, orbicular, monophyllous, membranaceous to rigid, margins undulating to crenate or subcrenate, frequently laciniate or irregularly incised torn, sometimes fenestrate, upper surface pustulate up to 2.5 cm. large, cortex smooth, umbo elevated, more or less areolate-papilate or dermato id, or with obscure vermiform pattern or veined, occasionally cracked, or with few weak folds extending radially from umbo, occasionally with lacinae on margins of holes and tears, or rarely in clusters on upper surface, surface dull to shiny, warm buff, wood brown, or Prout's brown over umbo, fading into fuscous black or light brownish olive, dark olive buff, or olive citrine margins, with a more or less persistent pruina; lower surface uniformly black with coarse papillae which may become lighter peripherally appearing as a light-edged zone (Japanese specimens deep mouse gray) umbilicus medium to compact or fasciate, becoming shaggy, stipe-like, or eroded, papillae in vicinity of umbilicus less regular, charred, interior of lacunae light brown and devoid of papillae, lower surface uneven. Thallus 250-300 µm thick, upper cortex brown, paraplechtenchymatous, 6- 14 µm, with a thin evanescent necral zone 9.9 µm high, occasionally developing into palisadeplechtenchymatous tissue 80 (X high; algal layer continuous, protococcoid, about 33 (X deep; medulla loose, about 135 µm , of mesodermate hyphae 6.6 µm, in diameter, densely impregnated with a granular zone below the algal layer; lower cortex about 120 µm, scleroplectenchymatous with a strong, black dentate outline. Apothecia 1-2 mm. in diameter, common, free or grouped, mostly marginal, black, sessile to subpedicellate, rarely adnate but occurring in shallow depressions, disk plane to subconcave, exciple prominent, parathecium of isodiametric cells 66-82.5 (X, hypothecium 66-140 µm(brown, irregular, thecium 99 µm, with a dark brown to black epithecium, paraphyses agglutinate, simple, rarely forked, brown tipped, septate, 1.4-3.4 µm in diameter, asci 68 x 22 µm, l-spored asoospores muriform, light to dark brown, 36-60 x 14.4-28.8 µm, spermogonia moderately protruding above thallus surface, spherical 210 x 210 µm,

with dark brown walls 14 µm thick, spermatiophores branched, spermatia rod shaped 2.4-4.5 x 15 µm. This common North American species extends throughout the north temperate zone into Asia and eastern Europe.



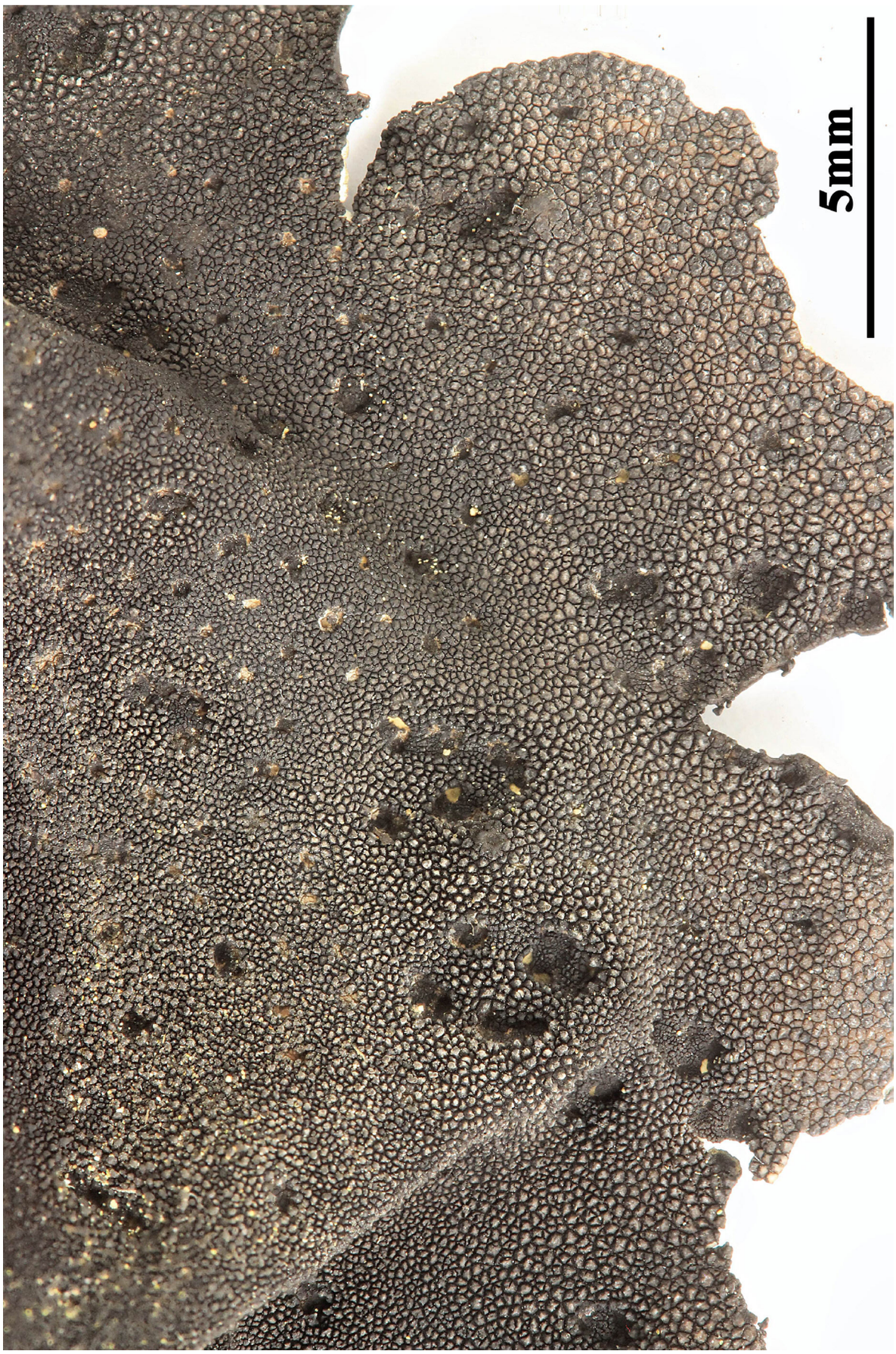
Umbilicaria pensylvanica



Umbilicaria pensylvanica



Umbilicaria pensylvanica



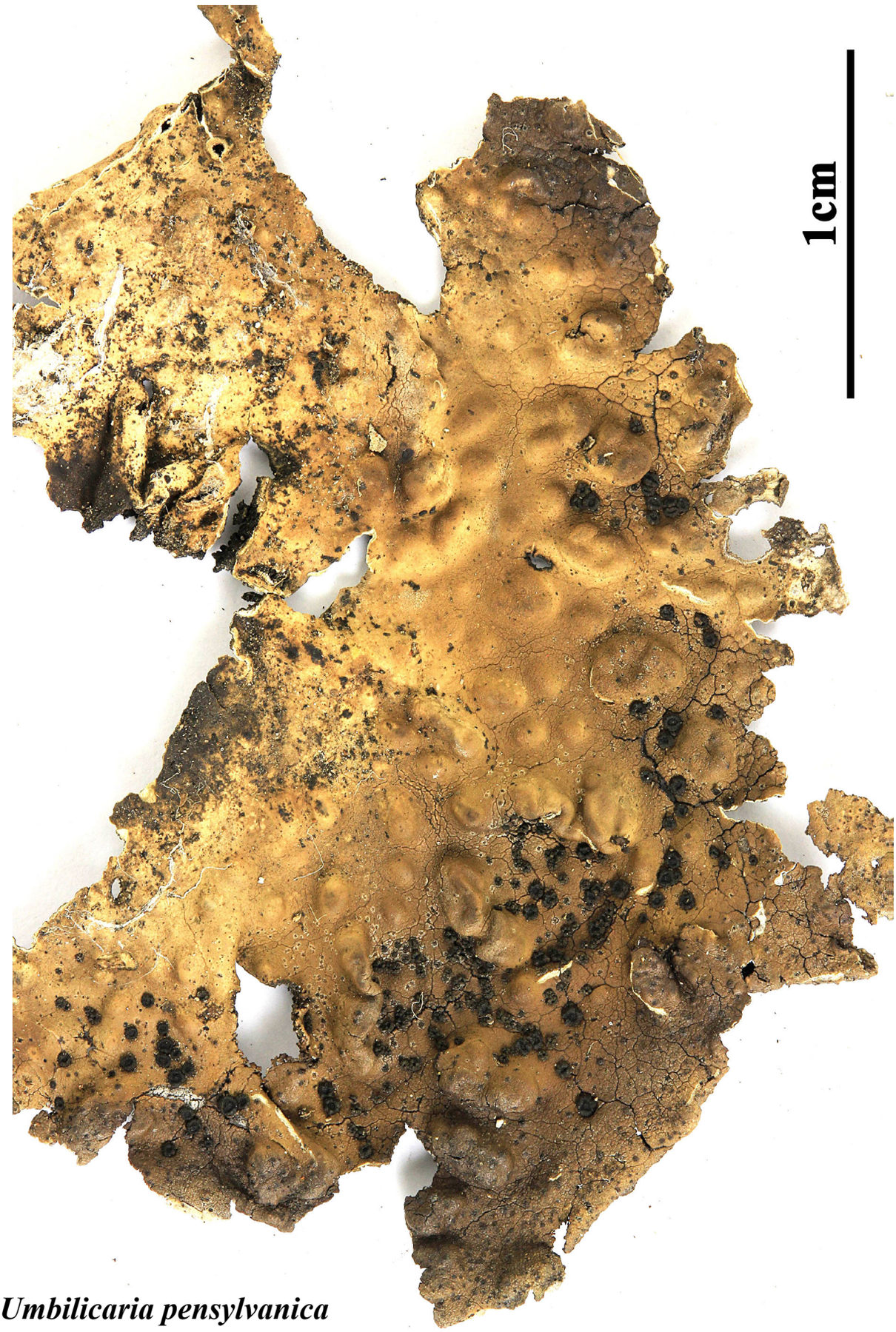
Umbilicaria pensylvanica

Umbilicaria pensylvanica Hoffm., Descr. Adumb. Plant. Lich. 3(no. 4): 5 (1801)

[OH648],Japan. Honshu. Prov. Kai (Yamanashi Pref.): around the summit of Mt. Mizugaki, Hokuto-city (35°53'36" N, 138°35'31" E). On rock (granite), 2230 m. Leg. M. Nuno & H. Izumi, 26.09.1976. EX Y. OHMURA: LICHENES MIUNUS COGNITI EYSICCATI NR. 648.

Thallus 9-25 an. in diameter, orbicular, monophyllous, membranaceous to rigid, margins undulating to crenate or subcrenate, frequently laciniate or irregularly incised torn, sometimes fenestrate, upper surface pustulate up to 2.5 cm. large, cortex smooth, umbo elevated, more or less areolate-papilate or dermato id, or with obscure vermiform pattern or veined, occasionally cracked, or with few weak folds extending radially from umbo, occasionally with lacinae on margins of holes and tears, or rarely in clusters on upper surface, surface dull to shiny, warm buff, wood brown, or Prout's brown over umbo, fading into fuscous black or light brownish olive, dark olive buff, or olive citrine margins, with a more or less persistent pruina; lower surface uniformly black with coarse papillae which may become lighter peripherally appearing as a light-edged zone (Japanese specimens deep mouse gray) umbilicus medium to compact or fasciate, becoming shaggy, stipe-like, or eroded, papillae in vicinity of umbilicus less regular, charred, interior of lacunae light brown and devoid of papillae, lower surface uneven. Thallus 250-300 µm thick, upper cortex brown, paraplechtenchymatous, 6- 14 µm, with a thin evanescent necral zone 9.9 µm high, occasionally developing into palisadeplechtenchymatous tissue 80 (X high; algal layer continuous, protococcoid, about 33 (X deep; medulla loose, about 135 µm , of mesodermate hyphae 6.6 µm, in diameter, densely impregnated with a granular zone below the algal layer; lower cortex about 120 µm, scleroplectenchymatous with a strong, black dentate outline. Apothecia 1-2 mm. in diameter, common, free or grouped, mostly marginal, black, sessile to subpedicellate, rarely adnate but occurring in shallow depressions, disk plane to subconcave, exciple prominent, parathecium of isodiametric cells 66-82.5 (X, hypothecium 66-140 µm(brown, irregular, thecium 99 µm, with a dark brown to black epithecium, paraphyses agglutinate, simple, rarely forked, brown tipped, septate, 1.4-3.4 µm in diameter, asci 68 x 22 µm, l-spored asoospores muriform, light to dark brown, 36-60 x 14.4-28.8 µm, spermogonia moderately protruding above thallus surface, spherical 210 x 210 µm,

with dark brown walls 14 µm thick, spermatiophores branched, spermatia rod shaped 2.4-4.5 x 15 µm. This common North American species extends throughout the north temperate zone into Asia and eastern Europe.



Umbilicaria pensylvanica



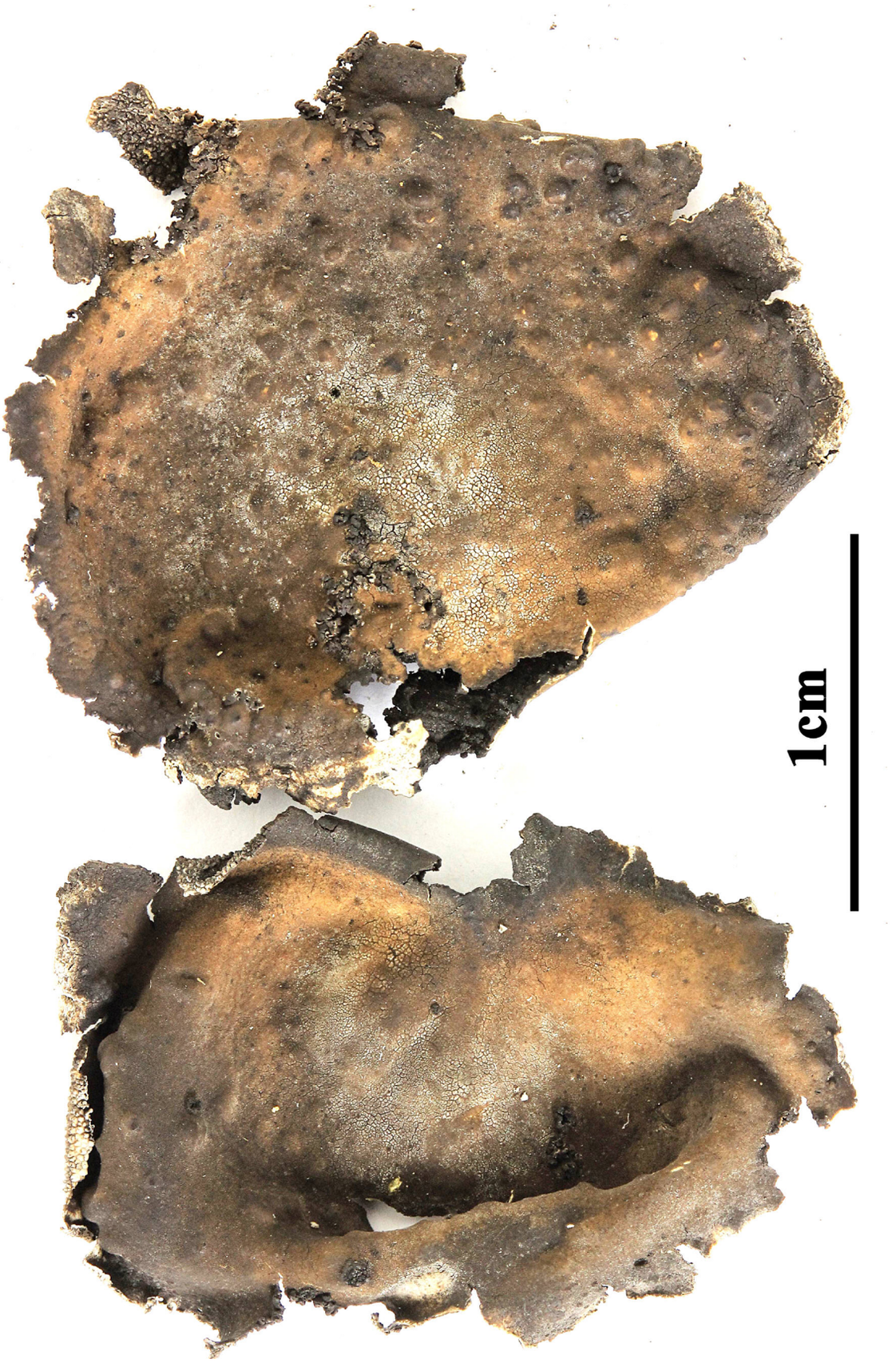
Umbilicaria pensylvanica

Umbilicaria pensylvanica Hoffm., Descr. Adumb. Plant. Lich. 3(no. 4): 5 (1801)

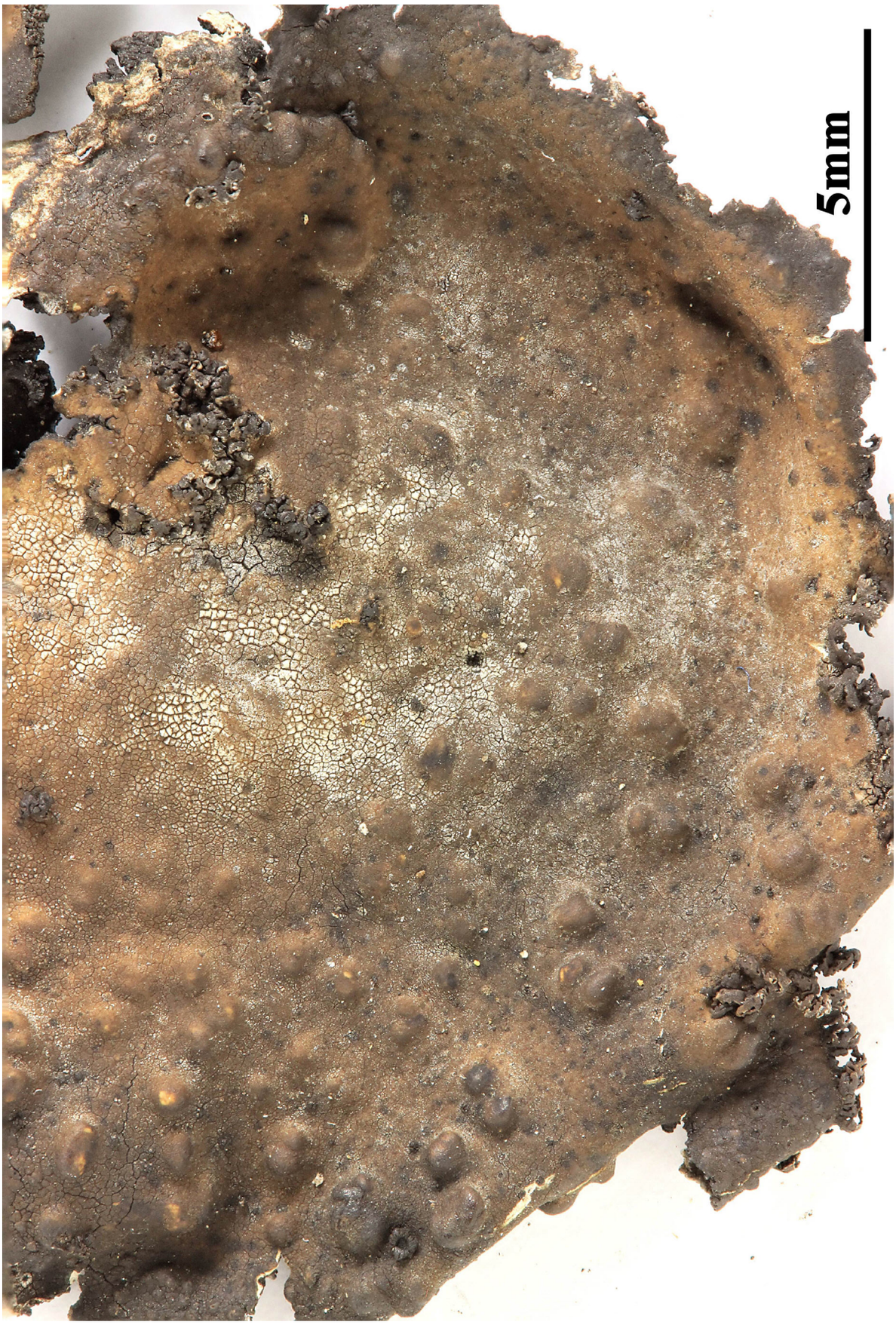
[KU293], Japan. Honshu. Prov. Etchu: Mt. Etchusawa-dake. On rocks, 2400 m. Leg. H. Kashiwadani (no. 13413) and K. Yoshida, 27. 07.1976, det. H. Kashiwadani. EX S. KUROKAWA: LICHENES RARIORES ET CRITICI ESICCATI NR. 293.

Thallus 9-25 an. in diameter, orbicular, monophyllous, membranaceous to rigid, margins undulating to crenate or subcrenate, frequently laciniate or irregularly incised torn, sometimes fenestrate, upper surface pustulate up to 2.5 cm. large, cortex smooth, umbo elevated, more or less areolate-papilate or dermato id, or with obscure vermiform pattern or veined, occasionally cracked, or with few weak folds extending radially from umbo, occasionally with lacinae on margins of holes and tears, or rarely in clusters on upper surface, surface dull to shiny, warm buff, wood brown, or Prout's brown over umbo, fading into fuscous black or light brownish olive, dark olive buff, or olive citrine margins, with a more or less persistent pruina; lower surface uniformly black with coarse papillae which may become lighter peripherally appearing as a light-edged zone (Japanese specimens deep mouse gray) umbilicus medium to compact or fasciate, becoming shaggy, stipe-like, or eroded, papillae in vicinity of umbilicus less regular, charred, interior of lacunae light brown and devoid of papillae, lower surface uneven. Thallus 250-300 µm thick, upper cortex brown, paraplechtenchymatous, 6- 14 µm, with a thin evanescent necral zone 9.9 µm high, occasionally developing into palisadeplechtenchymatous tissue 80 (X high; algal layer continuous, protococcoid, about 33 (X deep; medulla loose, about 135 µm , of mesodermate hyphae 6.6 µm, in diameter, densely impregnated with a granular zone below the algal layer; lower cortex about 120 µm, scleroplectenchymatous with a strong, black dentate outline. Apothecia 1-2 mm. in diameter, common, free or grouped, mostly marginal, black, sessile to subpedicellate, rarely adnate but occurring in shallow depressions, disk plane to subconcave, exciple prominent, parathecium of isodiametric cells 66-82.5 (X, hypothecium 66-140 µm(brown, irregular, thecium 99 µm, with a dark brown to black epithecium, paraphyses agglutinate, simple, rarely forked, brown tipped, septate, 1.4-3.4 µm in diameter, asci 68 x 22 µm, l-spored asoospores muriform, light to dark brown, 36-60 x 14.4-28.8 µm, spermogonia moderately protruding above thallus surface, spherical 210 x 210 µm,

with dark brown walls 14 µm thick, spermatiophores branched, spermatia rod shaped 2.4-4.5 x 15 µm. This common North American species extends throughout the north temperate zone into Asia and eastern Europe.



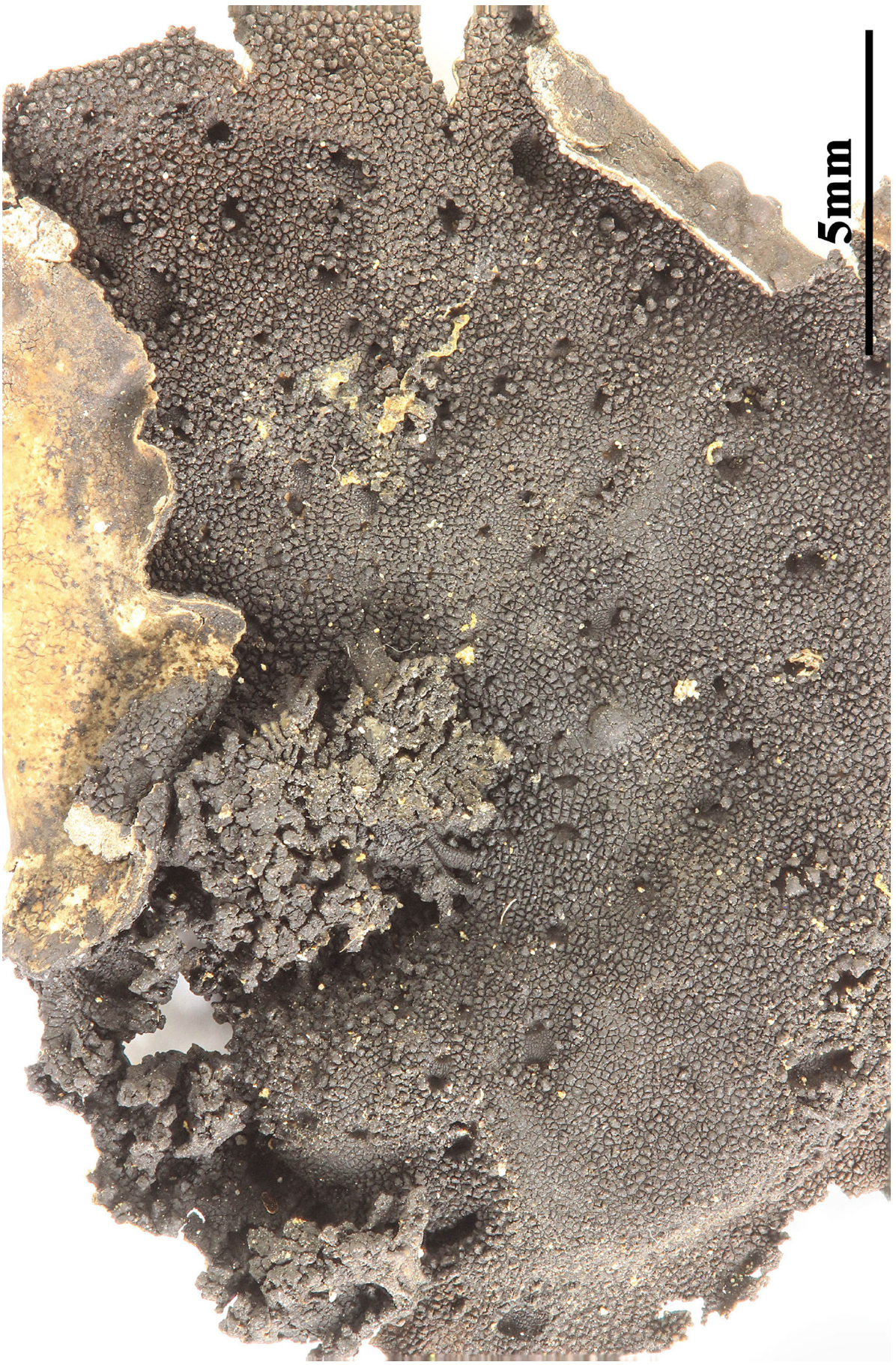
Umbilicaria pensylvanica



Umbilicaria pensylvanica



Umbilicaria pensylvanica

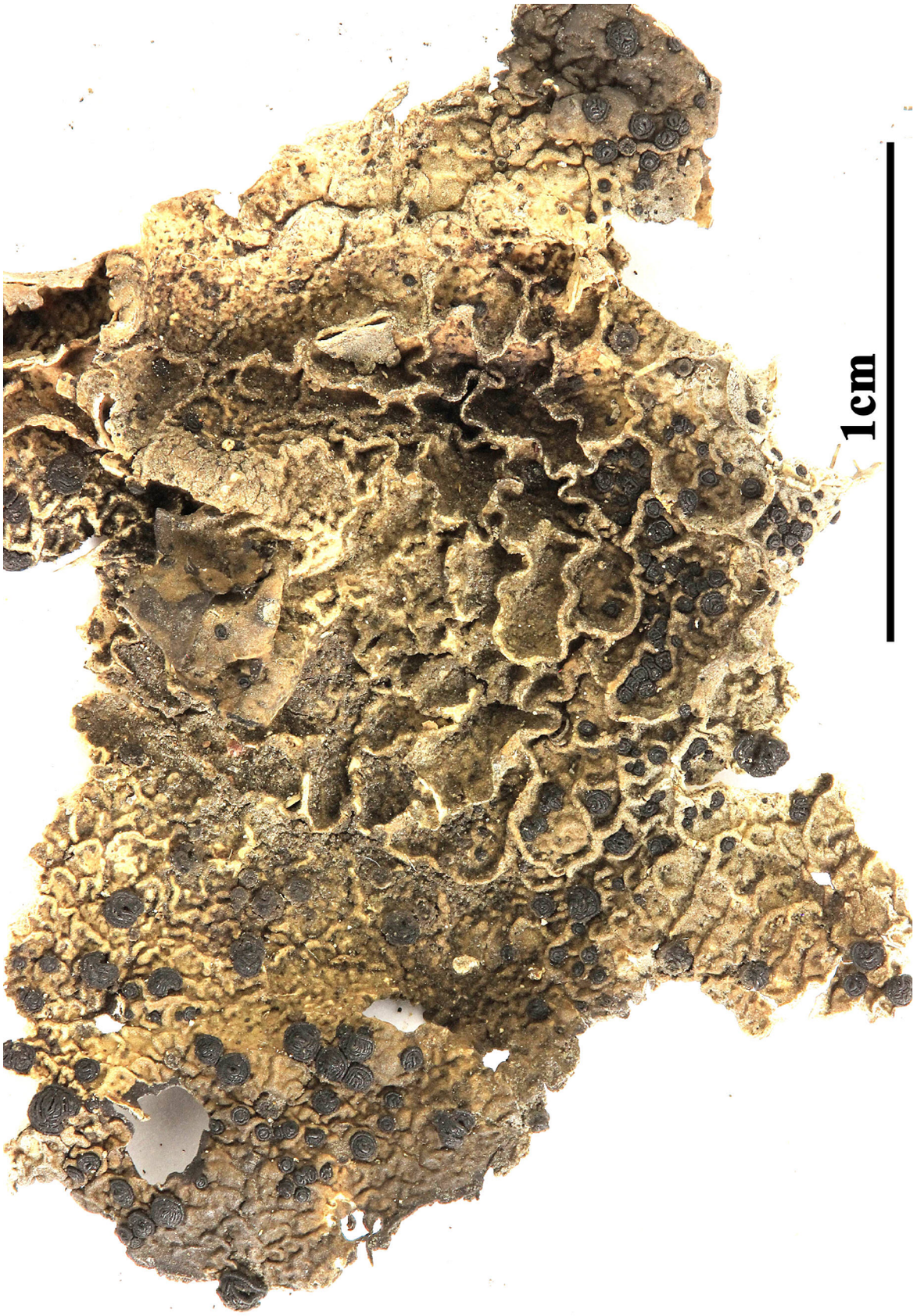


Umbilicaria pensylvanica

Umbilicaria proboscidea (L.) Schrad., Spicil. fl. germ. 1: 103 (1794)
= *Gyromium proboscideum* (L.) Wahlenb., Fl. lapp.: 483 (1812)
= *Gyrophora proboscidea* (L.) Ach., Methodus, Sectio prior (Stockholmiæ): 105 (1803)
= *Lichen proboscideus* L., Sp. pl. 2: 1150 (1753)

[KU697], Honshu. Prov. Shimotsuke: Mt. Shirane. On rocks, 2570 m. Leg. H. Shibuichi (no. 6513), 4.08.1981, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani: Lichenes Rariores Et Critici Exsiccati Nr. 697.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thin and fragile, strongly adpressed, orbicular or elliptic in outline, 2-5(-8) cm diam., with lacerate, shallowly incised, slightly up-turned margins, attached by a central holdfast. Upper surface dark brown to black, dull, with a reticulate pattern of ridges over the umbilicus, fading to vermiform ridges toward the margins, the central umbo raised and often white-pruinose. Lower surface pale brown, darker toward margins, even or with shallow depression around umbilicus, usually erhizinate or rarely with a few simple or sparsely branched rhizinomorphs; thalloconidia absent. Upper cortex 8-16 µm thick: medulla white, loose; lower cortex paraplectenchymatous, 14-24 µm thick. Apothecia rather rare, black, gyrodisc, sessile, to 1.5 mm across. Epithecium brown-black; hymenium colourless; paraphyses simple or sparingly branched, the terminal cells hardly swollen; hypothecium dark. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled hyaline, ovoid, (10-)12-15(-17) x (3.5-)5-7.5 µm. Photobiont chlorococcoid. Spot tests: medulla K- or K+ yellow turning red, C+ red, KC+ red, P- or P+ faintly yellow. Chemistry: medulla with variable amounts of norstictic acid, plus gyrophoric and lecanoric acids. - Note: a mainly arctic-alpine, circumpolar lichen found on siliceous rocks, often on small boulders, ecologically similar to U. cylindrica, but with a narrower range, with optimum in colder and less continental areas above treeline.



Umbilicaria proboscidea



Umbilicaria proboscidea

Umbilicaria proboscidea (L.) Schrad., Spicil. fl. germ. 1: 103 (1794)
= *Gyromium proboscideum* (L.) Wahlenb., Fl. lapp.: 483 (1812)
= *Lichen proboscideus* L., Sp. pl. 2: 1150 (1753)

[KU543], Japan. Honshu. Prov. Musashi. Mt. Ohyama, near Jumonji pass, Chichibu-gun. On rocks, 2200 m. Leg. K. Yoshida (no. 1619], 08.10.1974, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI NR. 543.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thin and fragile, strongly adpressed, orbicular or elliptic in outline, 2-5(-8) cm diam., with lacerate, shallowly incised, slightly up-turned margins, attached by a central holdfast. Upper surface dark brown to black, dull, with a reticulate pattern of ridges over the umbilicus, fading to vermiform ridges toward the margins, the central umbo raised and often white-pruinose. Lower surface pale brown, darker toward margins, even or with shallow depression around umbilicus, usually erhizinate or rarely with a few simple or sparsely branched rhizinomorphs; thalloconidia absent. Upper cortex 8-16 μm thick: medulla white, loose; lower cortex paraplectenchymatous, 14-24 μm thick. Apothecia rather rare, black, gyrodisc, sessile, to 1.5 mm across. Epithecium brown-black; hymenium colourless; paraphyses simple or sparingly branched, the terminal cells hardly swollen; hypothecium dark. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled hyaline, ovoid, (10-)12-15(-17) x (3.5-)5-7.5 μm. Photobiont chlorococcoid. Spot tests: medulla K- or K+ yellow turning red, C+ red, KC+ red, P- or P+ faintly yellow. Chemistry: medulla with variable amounts of norstictic acid, plus gyrophoric and lecanoric acids. - Note: a mainly arctic-alpine, circumpolar lichen found on siliceous rocks, often on small boulders, ecologically similar to U. cylindrica, but with a narrower range, with optimum in colder and less continental areas above treeline.



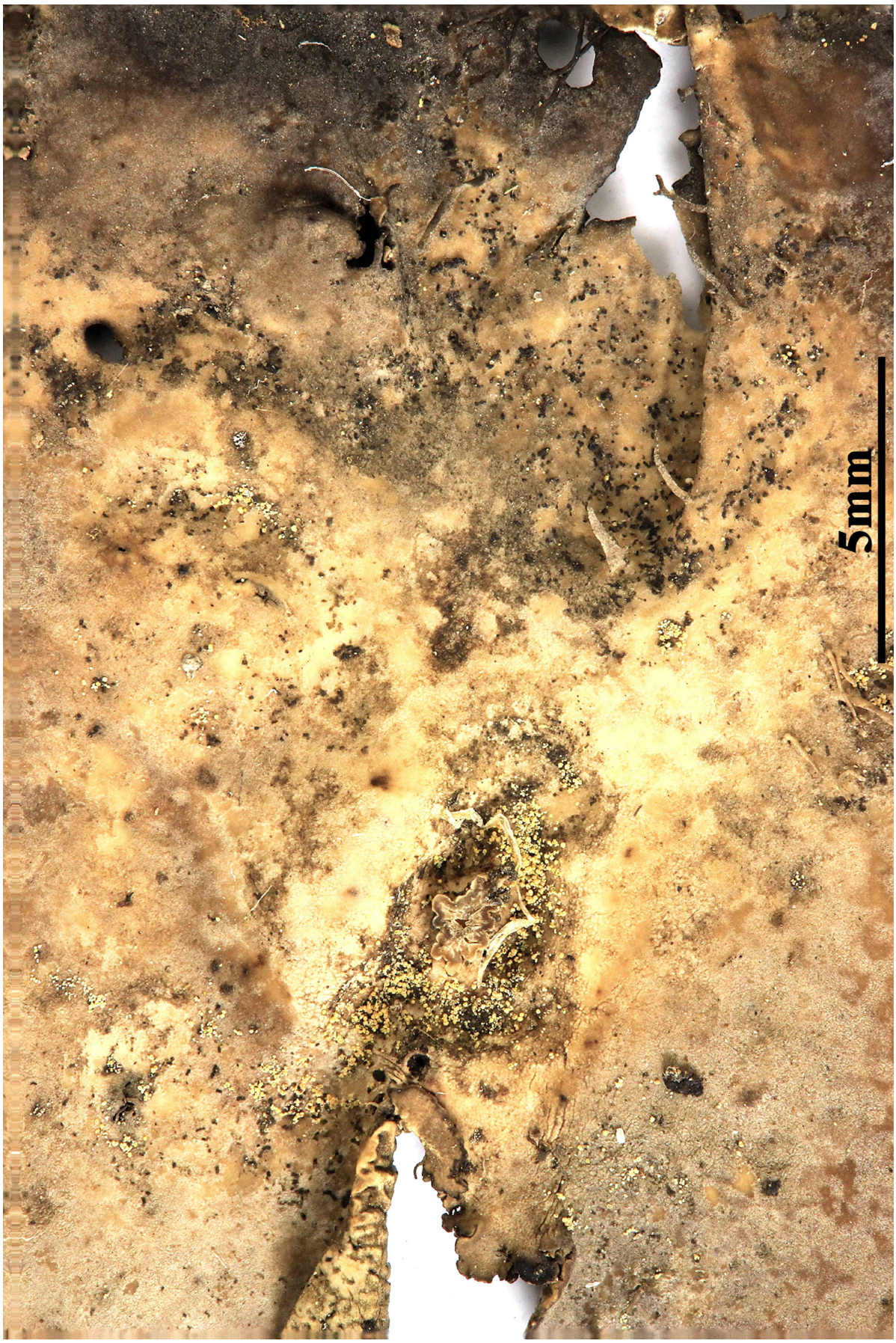
Umbilicaria proboscidea



Umbilicaria proboscidea



Umbilicaria proboscidea



Umbilicaria proboscidea

Umbilicaria proboscidea (L.) Schrad., Spicil. fl. germ. 1: 103 (1794)
= *Gyromium proboscideum* (L.) Wahlenb., Fl. lapp.: 483 (1812)
= *Lecidea proboscidea* (L.) L. Colla, Mém. R. Accad. Sci. Torino, Ser. 2 12: 17 (1852)
= *Lichen proboscideus* L., Sp. pl. 2: 1150 (1753)

[KU250], Japan. Hokkaido. Prov. Ishikari: Southern slope of Mt. Akadake, Daisetsu Mts. On rock, 2000 m. Leg. S. Kurokawa (no. 71133), 13.09.1971, det. S. Kurokawa. EX S. KUROKAWA LICHENES RARIORES ET CRITICI EXSICCATI NR. 250.

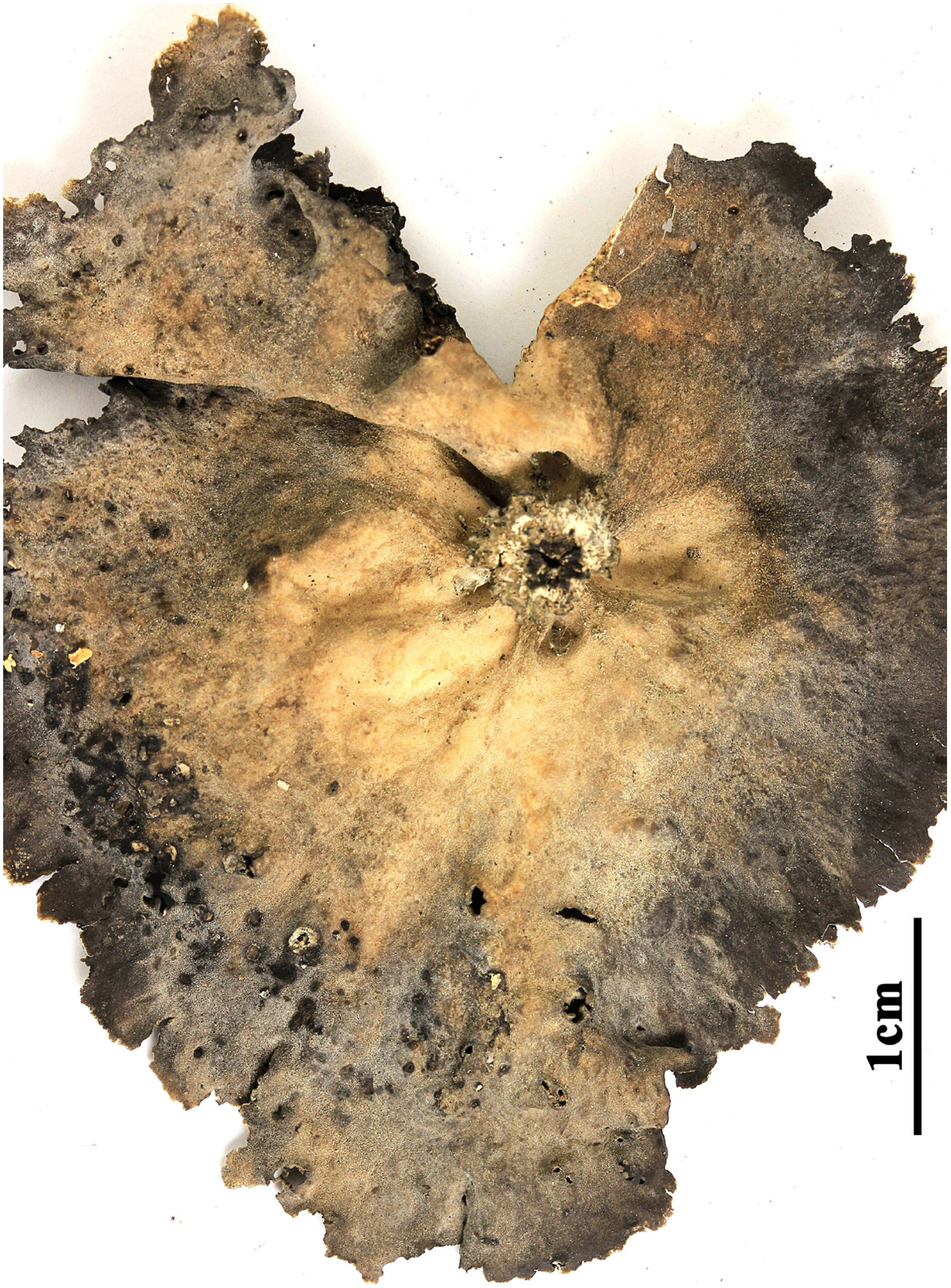
Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thin and fragile, strongly adpressed, orbicular or elliptic in outline, 2-5(-8) cm diam., with lacerate, shallowly incised, slightly up-turned margins, attached by a central holdfast. Upper surface dark brown to black, dull, with a reticulate pattern of ridges over the umbilicus, fading to vermiform ridges toward the margins, the central umbo raised and often white-pruinose. Lower surface pale brown, darker toward margins, even or with shallow depression around umbilicus, usually erhizinate or rarely with a few simple or sparsely branched rhizinomorphs; thalloconidia absent. Upper cortex 8-16 µm thick: medulla white, loose; lower cortex paraplectenchymatous, 14-24 µm thick. Apothecia rather rare, black, gyrodisc, sessile, to 1.5 mm across. Epithecium brown-black; hymenium colourless; paraphyses simple or sparingly branched, the terminal cells hardly swollen; hypothecium dark. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled hyaline, ovoid, (10-)12-15(-17) x (3.5-)5-7.5 µm. Photobiont chlorococcoid. Spot tests: medulla K- or K+ yellow turning red, C+ red, KC+ red, P- or P+ faintly yellow. Chemistry: medulla with variable amounts of norstictic acid, plus gyrophoric and lecanoric acids. - Note: a mainly arctic-alpine, circumpolar lichen found on siliceous rocks, often on small boulders, ecologically similar to U. cylindrica, but with a narrower range, with optimum in colder and less continental areas above treeline.



Umbilicaria proboscidea



Umbilicaria proboscidea



Umbilicaria proboscidea

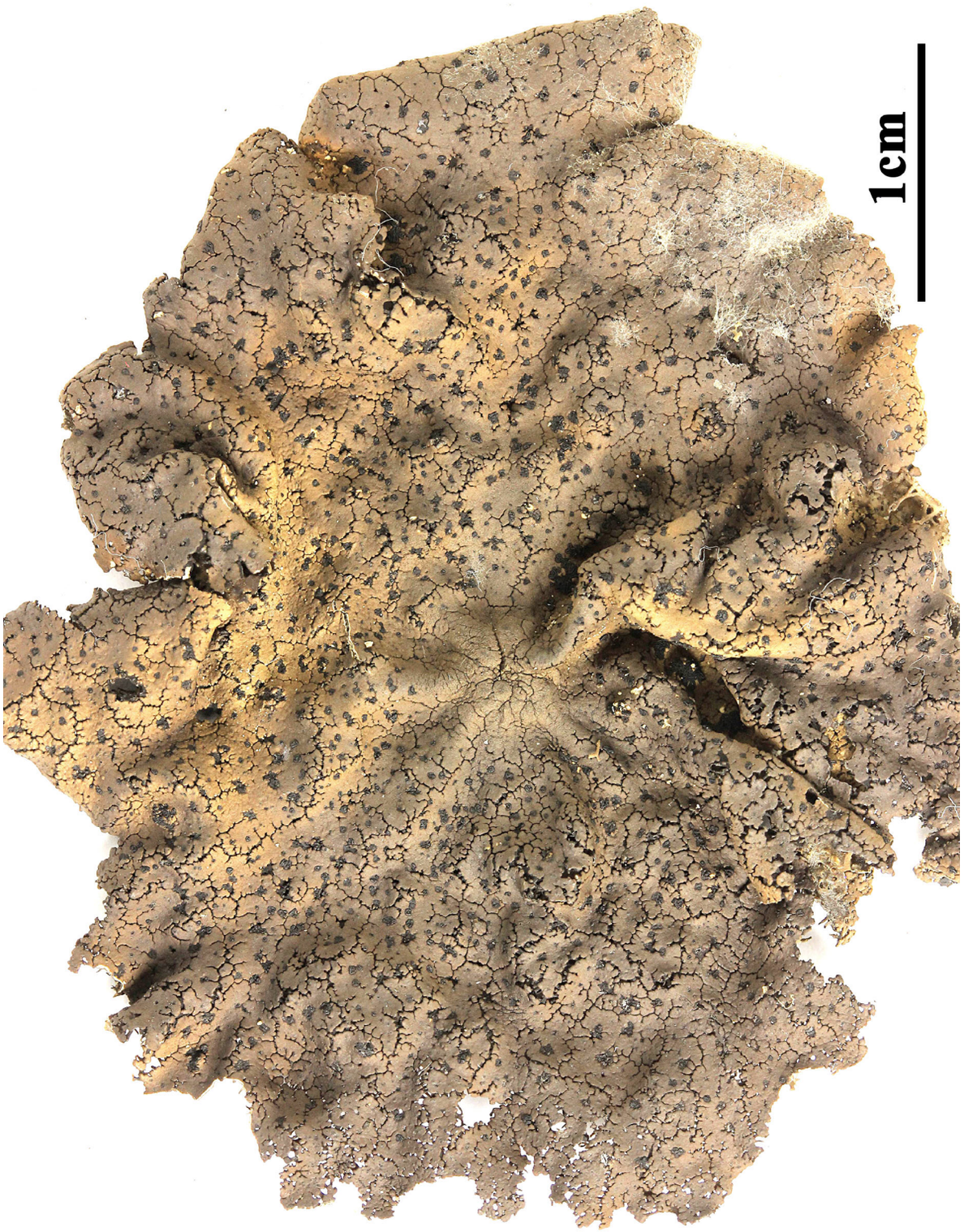


Umbilicaria proboscidea

Umbilicaria torrefacta (Lightf.) Schrad., Spicil. fl. germ. 1: 104 (1794)
= *Lichen torrefactus* Lightf. 1777

[KU448], Japan. Hokkaido. Prov. Tokachi: Mt. Hakuun. Kami-Shihoro-cho. Kato-gun. On rocks, 1100 m. Leg. H. Lashiwadani (no. 15466), 18.9.1979, det, H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani: Lichenes Rariores Et Critici Exsiccati Nr. 448

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thick, rigid, irregular in outline, deeply incised, (2-)6-7(-12) cm wide, 0.15-0.3 mm thick, with lacerate and distinctly perforate, undulating margins, the edges often up- or down-turned. Upper surface uniformly dark brown, smooth or rimose-warted, the umbo slightly raised and with a few radial folds. Lower surface pale brown to brown-black, smooth to scabrous, with well-developed trabeculae radiating from the umbilicus; rhizinomorphs sparse, simple, cylindrical; thalloconidia absent. Upper cortex 13-20 µm thick; medulla white; lower cortex , 30-46 µm thick. Apothecia common, circular to star-shaped, black, gyrodisc, 0.5-2(-3) mm across, semi-immersed in depressions of the upper surface, usually between ridges. Epithecium black-brown; hymenium colourless; paraphyses mostly simple, with enlarged apical cells; hypothecium brown. Asci 8-spored, elongate-clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled, hyaline, ellipsoid, 7-12 x 5-7 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric and umbilicaric acids. - Note: an arctic-alpine, circumpolar lichen found on siliceous rocks, most frequent above treeline.



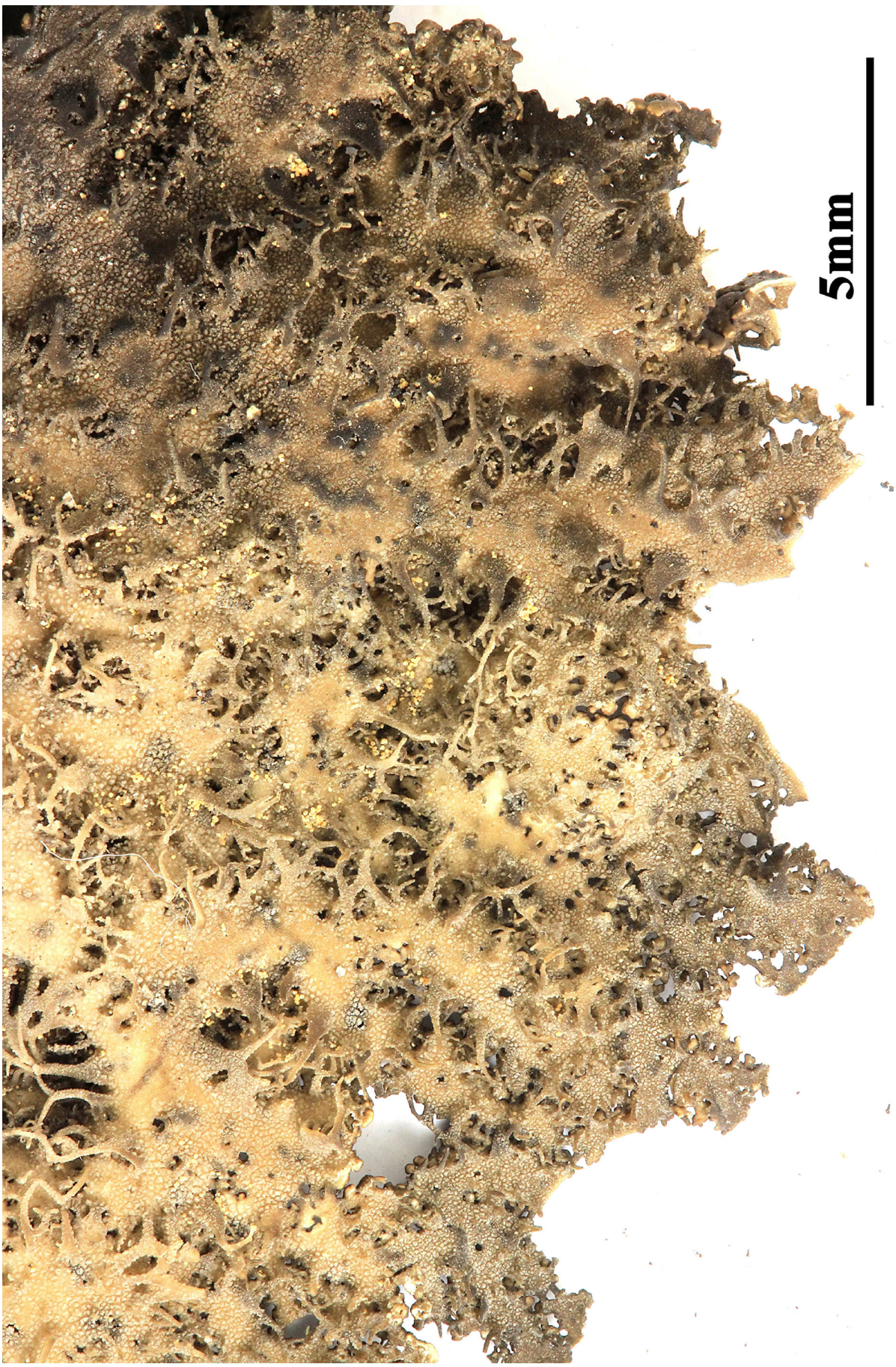
Umbilicaria torrefacta



Umbilicaria torrefacta



Umbilicaria torrefacta

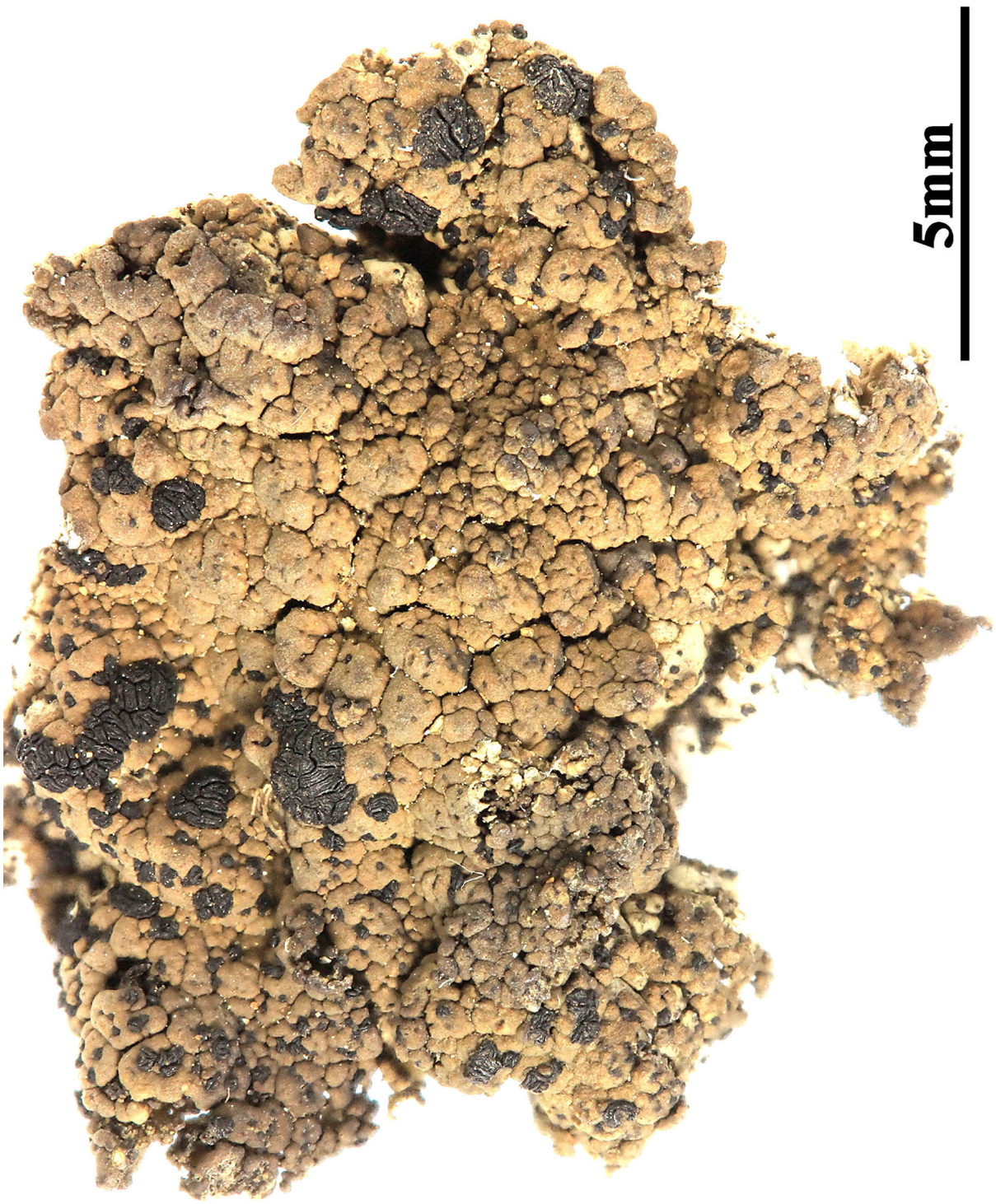


Umbilicaria torrefacta

Umbilicaria torrefacta (Lightf.) Schrad., Spicil. fl. germ. 1: 104 (1794)
= *Lichen torrefactus* Lightf., Flora Scotica (London) 2: 862 (1777)

[KU544], Japan. Hokkaido. Prov. Ishikari: Mt. Sandan, Tokachi Mts. On rocks, 1700 m. Leg. H. Shibuichi (no. 6270) & K. Yoshida, 07.08.1980, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 544.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thick, rigid, irregular in outline, deeply incised, (2-)6-7(-12) cm wide, 0.15-0.3 mm thick, with lacerate and distinctly perforate, undulating margins, the edges often up- or down-turned. Upper surface uniformly dark brown, smooth or rimose-warted, the umbo slightly raised and with a few radial folds. Lower surface pale brown to brown-black, smooth to scabrous, with well-developed trabeculae radiating from the umbilicus; rhizinomorphs sparse, simple, cylindrical; thalloconidia absent. Upper cortex 13-20 µm thick; medulla white; lower cortex , 30-46 µm thick. Apothecia common, circular to star-shaped, black, gyrodisc, 0.5-2(-3) mm across, semi-immersed in depressions of the upper surface, usually between ridges. Epithecium black-brown; hymenium colourless; paraphyses mostly simple, with enlarged apical cells; hypothecium brown. Asci 8-spored, elongate-clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled, hyaline, ellipsoid, 7-12 x 5-7 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric and umbilicaric acids. - Note: an arctic-alpine, circumpolar lichen found on siliceous rocks, most frequent above treeline.



Umbilicaria torrefacta

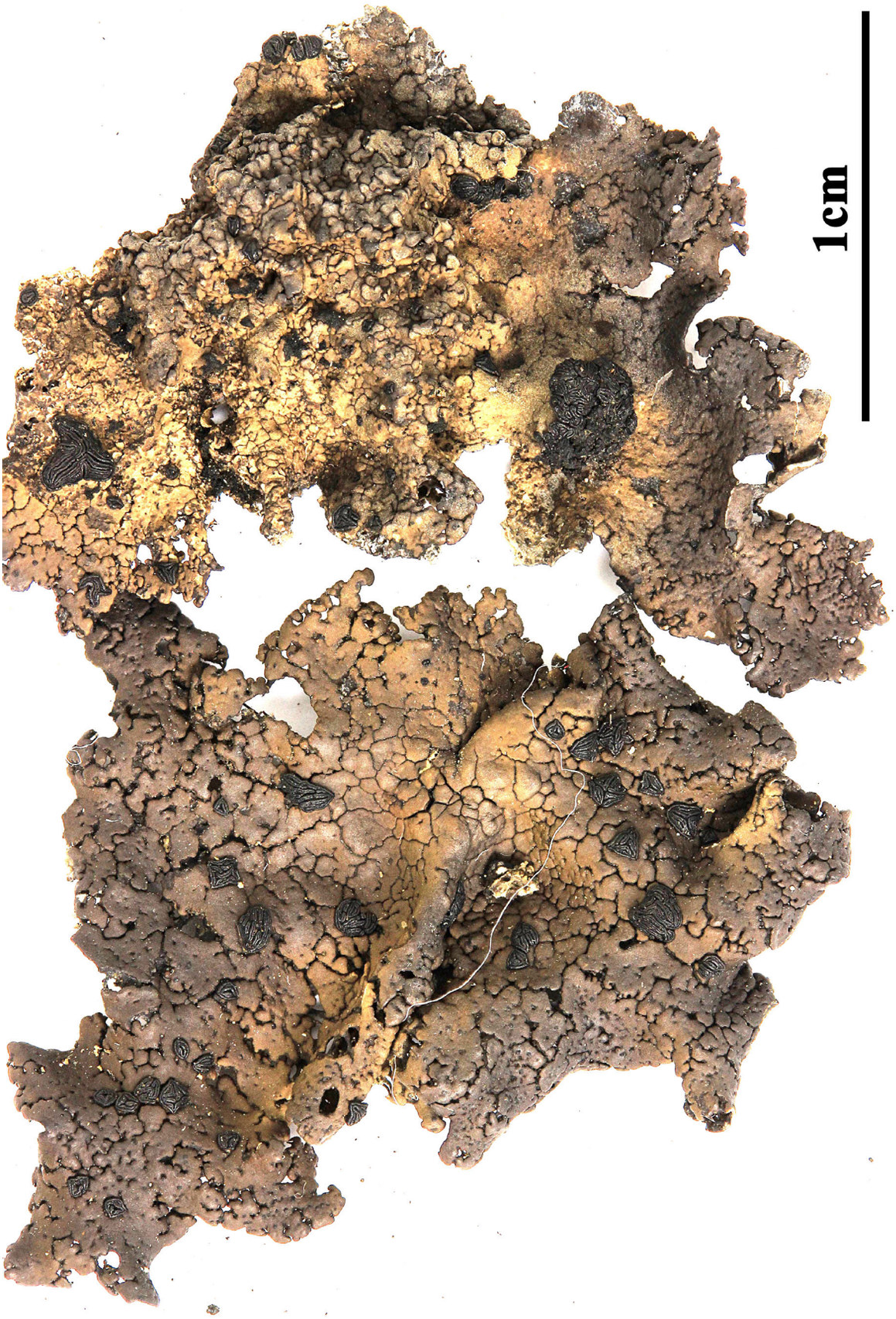


Umbilicaria torrefacta

Umbilicaria torrefacta (Lightf.) Schrad., Spicil. fl. germ. 1: 104 (1794)
= *Lichen torrefactus* Lightf., Flora Scotica (London) 2: 862 (1777)

[KU447], Japan. Honshu. Prov. Shinano: Mt. Oh-yama, Minami-Saku-gun. On rocks, 2200 m. Leg. H. Shibuichi (no. 5852) and K. Yoshida, 12.07.1979, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 447.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, thick, rigid, irregular in outline, deeply incised, (2-)6-7(-12) cm wide, 0.15-0.3 mm thick, with lacerate and distinctly perforate, undulating margins, the edges often up- or down-turned. Upper surface uniformly dark brown, smooth or rimose-warted, the umbo slightly raised and with a few radial folds. Lower surface pale brown to brown-black, smooth to scabrous, with well-developed trabeculae radiating from the umbilicus; rhizinomorphs sparse, simple, cylindrical; thalloconidia absent. Upper cortex 13-20 µm thick; medulla white; lower cortex , 30-46 µm thick. Apothecia common, circular to star-shaped, black, gyrodisc, 0.5-2(-3) mm across, semi-immersed in depressions of the upper surface, usually between ridges. Epithecium black-brown; hymenium colourless; paraphyses mostly simple, with enlarged apical cells; hypothecium brown. Asci 8-spored, elongate-clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled, hyaline, ellipsoid, 7-12 x 5-7 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric and umbilicaric acids. - Note: an arctic-alpine, circumpolar lichen found on siliceous rocks, most frequent above treeline.



Umbilicaria torrefacta



Umbilicaria torrefacta

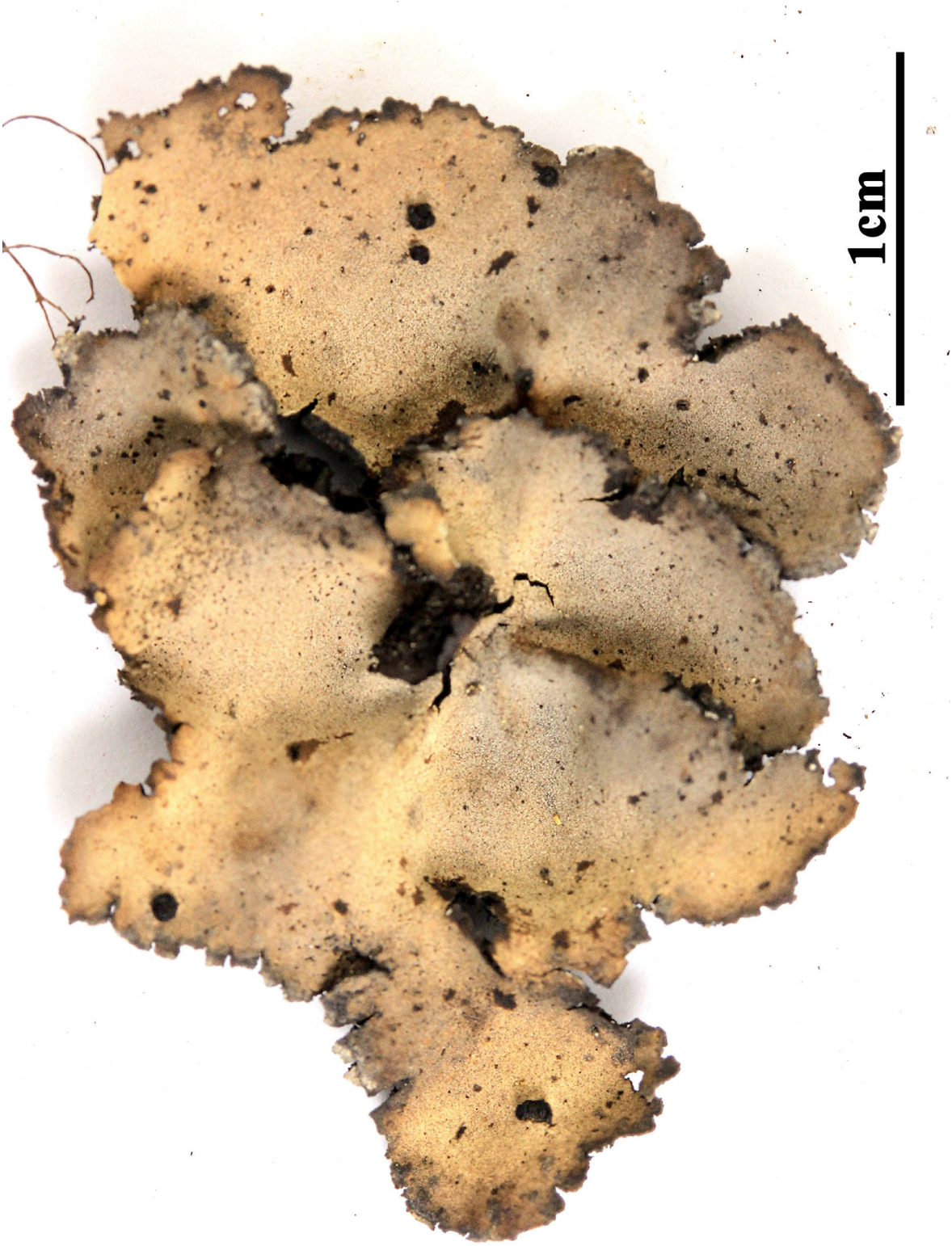


Umbilicaria torrefacta

Umbilicaria vellea (L.) Michx., Fl. Boreali-Americ. (Paris) 2: 323 (1803)
= *Gyromium velleum* (L.) Wahlenb., Fl. lapp.: 484 (1812)
= *Gyrophora depressa* f. *vellea* (L.) Schaer., Naturwiss. Anzeiger Allgem. Schweizer. Gesellsch. Naturwiss. 1: 6 (1818)
= *Gyrophora vellea* (L.) Ach., Methodus, Sectio prior (Stockholmiæ): 109 (1803)
= *Lecidea vellea* (L.) Spreng., Syst. veg., Edn 16 4(1): 264 (1827)
= *Lichen velleus* L., Sp. pl. 2: 1150 (1753)

[KU600], Japan. Honshu. Prov. Shinano: Mt. Ohyama, near Jyumonji Pass, Minamisaku-gun. On rocks (granite), 2200 m.Leg. H. Shibuichi (mo. 5854) & K. Yoshida, 12.07.1079, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI: LICHENES RARIORES ET CRITICI EXSICCATI NR. 600.

Thallus foliose-umbilicate, heteromerous, dorsiventral, mainly monophyllous, rigid, 4-8(-20) cm wide, 0.2-0.3(-0.4) mm thick, with entire to incised, slightly up- or down-tuned margins, attached by a thick, dark, more or less central holdfast. Upper surface pale brown to greyish violet, dull, smooth to scabrous, distinctly rimose with dark cracks, slightly raised over the umbilicus and with a few trabeculate folds. Lower surface black, more or less scabrous, with a dense felt of rhizinomorphs except around the umbilicus and in the marginal zone. Rhizinomorphs of two types: black, short, stout and ball-tipped, immixed with others which are pale brown to ivory white, cylindrical, simple or branched. Thalloconidia large, 22-40 x 31-60 µm, multiseptate, 50-300-celled, dark brown to black, irregular, arising both on the lower cortex and in clusters on the tips of rhizinomorphs. Upper cortex palisade-plectenchymatous, 11-30 µm thick; medulla white, dense, 45-130 µm thick; lower cortex brown, scleroplectenchymatous, 20-60 µm thick. Apothecia rare, gyrodisc, black, to 3 mm across. Epithecium black-brown; hymenium colourless; paraphyses mostly simple, with enlarged apical cells; hypothecium brown. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled, hyaline, broadly ellipsoid, 9-12 x 6-8 µm. Photobiont chlorococcoid. Spot tests: medulla K-, C+ red, KC+ red, P-. Chemistry: medulla with gyrophoric, lecanoric, hiascic and umbilicaric acids. - Note: an arctic-alpine, probably circumpolar lichen found on steeply inclined to vertical, exposed surfaces of siliceous rocks with some water seepage, especially along fissures, with optimum above treeline.



Umbilicaria vellea



Umbilicaria vellea

Umbilicaria virginis Schaer., Lich. helv. spicil. 11: 564 (1842)
= *Umbilicaria virginis* Schrad., Bibl. Univ. Genève 36: 153 (1841)

[KU698], Svalbard. Spitzbergen. Ny-London, the opposite shore of Ny-Ålesund, Kongsfjorden. On rocks, 0-50 m. Leg. H. Kashiwadani (no. 23041), 20.07.1985, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI IICHENES RARIORES ET CRITICI EXSICCATI NR. 698.

Thallus foliose-umbilicate, heteromerous, dorsiventral, monophyllous, rigid, more or less circular in outline, 1.5-4(-20) cm wide, attached by a more or less central holdfast. Upper surface ivory to light grey or brownish grey, dull, with sharp radiating ridges and coarsely pruinose near the umbilicus. Lower surface white to pink, smooth to minutely roughened, usually brown-black around the umbilicus, with dense, long, slender, white, branched rhizinomorphs; thalloconidia absent. Apothecia common, black, weakly omphalodisc, sometimes with several circular elevations, sessile to substipitate, up to 3 mm across. Epithecium black-brown; hymenium colourless; paraphyses mostly simple, with enlarged apical cells; hypothecium brown. Asci 8-spored, clavate, thick-walled, with an amyloid apical dome, Umbilicaria-type. Ascospores 1-celled, hyaline, ellipsoid, 10-15 x 5-8 µm. Photobiont chlorococcoid. Spot tests: medulla K- or K+ red, C+ red, KC+ red, P- or P+ orange. Chemistry: medulla with gyrophoric acid and variable amounts of stictic acid. - Note: an arctic-alpine, probably circumpolar lichen found on wind-exposed siliceous cliffs, often in small niches and under overhangs.



Umbilicaria virginis



Umbilicaria virginis



Umbilicaria virginis



Umbilicaria virginis

Usnea aciculifera Vain., Bot. Mag., Tokyo 35: 45 (1921)

[OH549], Japan. Honshu. Prov Kai (Pref. Yamanashi): Hirano, Lake-side of Yamanak, Mt. Fuji (35°24' N, 138°52' E). On tree bark, 1000m. Leg. M. Togashi, 6.5.1956, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 549.

The species is characterized by a shrubby thallus growth form, the presence of soralia, a yellow central axis and/or the presence of red dots on the cortex.



Usnea aciculifera



Usnea aciculifera

Usnea aciculifera Vain., Bot. Mag., Tokyo 35: 45 (1921)

[OH574], Japan. Honshu. Prov. Kai (Pref. Yamanashi): Lake Yamanaka, Mt. Fuji. On tree bark. Leg. Y. Ashina, 16.8.1952, det. Y. Asahina. Ex Y. Ohmura Lichenes Minus Cogniti Exsiccati Nr. 574.

The species is characterized by a shrubby thallus growth form, the presence of soralia, a yellow central axis and/or the presence of red dots on the cortex.



Usnea aciculifera



Usnea aciculifera

Usnea aciculifera Vain., Bot. Mag., Tokyo 35: 45 (1921)

[OH446], Japan. Honshu. Prov. Yamashiro (Pref. Kyoto): Koshihata, Ukyo-ku, Kyoto. Leg.Y. Asahina, 29.6.1958., det. Y. Ohmura. - Cemiytry Usnic acid, Norstictic acid, Menegazzaic acid, Stictic acid, Consticitic acid, TLC from Y.Ohmura - EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 446.

The species is characterized by a shrubby thallus growth form, the presence of soralia, a yellow central axis and/or the presence of red dots on the cortex.



Usnea aciculifera



Usnea aciculifera

Usnea antarctica Du Rietz, Svensk bot. Tidskr. 20: 93 (1926)
= *Neuropogon antarcticus* (Du Rietz) I.M.Lamb

[OH599], Antarctica. South Shetland Islands. King George Island. Fildes Peninsula. On rock (bed rock), 40 m. Leg. M. Inoue (no. 21365), 26.12.1988, det. Y. Ohmura. Ex Y. Ohmura Lichenes Minus Cogniti Exsiccati Nr.599.

Thallus fruticose, tufted, to 8 cm tall. Branches sparingly to copiously divided, becoming entangled-complex at apices. Surface yellow or brownish-yellow at base, variegated yellow and black apices, without annulations, distinctly papillate or coarsely warted towards base. Soralia blackened, granular. Apothecia not seen in New Zealand material. Chemistry: Cortex K-; medulla K+ brown, C-, KC-, Pd+ red. Fumarprotocetraric and usnic acids.



Usnea antarctica



Usnea antarctica

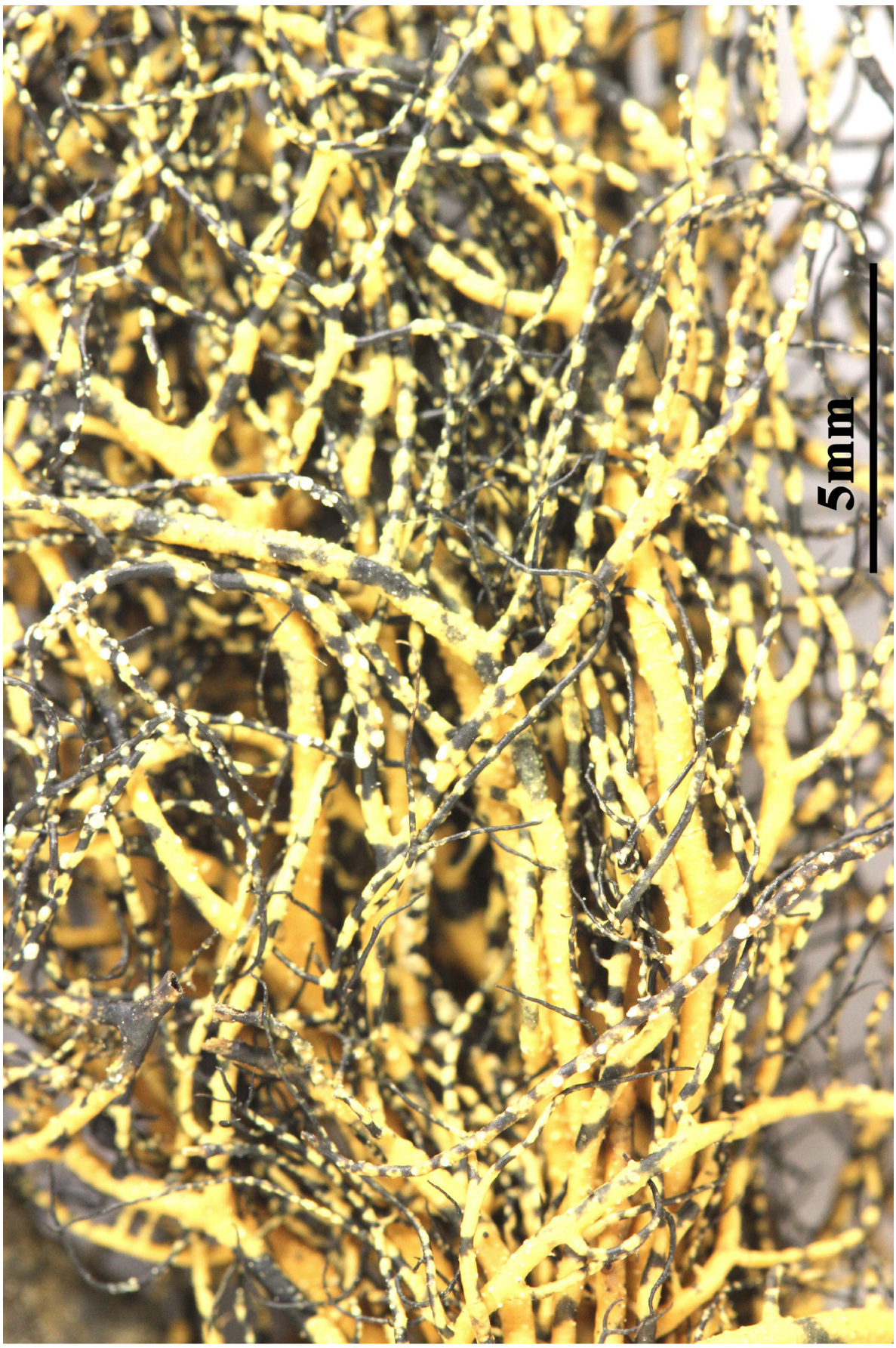
Usnea antarctica Du Rietz, Svensk bot. Tidskr. 20: 93 (1926)
= *Neuropogon antarcticus* (Du Rietz) I.M.Lamb

[OH598], Antarctica. South Shetland Islands, Nelson Island, Harmony Cove. On ground, 70 m. Leg. M. Inoue (no. 20510), 29.1.1989, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 598.

Thallus fruticose, tufted, to 8 cm tall. Branches sparingly to copiously divided, becoming entangled-complex at apices. Surface yellow or brownish-yellow at base, variegated yellow and black apices, without annulations, distinctly papillate or coarsely warted towards base. Soralia blackened, granular. Apothecia not seen in New Zealand material. Chemistry: Cortex K-; medulla K+ brown, C-, KC-, Pd+ red. Fumarprotocetraric and usnic acids.



Usnea antarctica



Usnea antarctica

Usnea asahinae Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica (Leopoli) 2: 388, 393 (1937)

[KU294], Japan. Honshu. Prov. Rikuzen: Kitagama Seashore. Leg. M. Togashi, 20.5.1967, det. A. Asahina. EX S. KUROKAWA LICHENES RARIORES ET CRITICI EXSICCATI NR. 294.



Usnea asahinae



Usnea asahinae

Usnea baileyi (Stirt.) Zahlbr., Denkschr. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 83: 182 (1909)
= *Eumitria baileyi* Stirt. 1881
= *Eumitria baileyi* Stirt., Scott. Natural. 6(3): 100 (1881) [1881-1882]

[KU147], Japan. Honshu. Prov.Rikuzen: Kitakama, prope Yuriage, Natori-gum. Leg. M. Togashi, 20.5.1967, det. Y. Asahina. EX S. KUROKAWA ;ICHENES RARIORES ET CRITICI EXSICCATI NR. 147.

Thallus erect to subpendulous, 5–15 (–20) cm long, grey to greenish grey; branching subdichotomous to irregular; trunk usually black, rarely pale; branches terete or somewhat ridged, 1.0–1.5 mm wide; apices attenuate, straight or arcuate; fibrils sparse to dense on main branches, to 5 mm long. Isidia sparse to dense, solitary or clustered, papilla-like when immature, becoming cylindrical and easily dislodged, eroding to leave pseudocyphellae; pseudocyphellae punctiform, scattered; soralia absent. Cortex cracked, matt. Medulla dense, with a yellow, pink, red-brown, maroon or chocolate-brown layer around axis; axis hollow, 3/4 width of branch. Apothecia rare, terminal on short lateral branches; disc plane; margin and lower surface bearing fibrils. Ascospores 8–10 × 5–6 μm. CHEMISTRY: Cortex containing usnic acid. Medulla K+ red (difficult to see because of the pigment); containing eumitrin A, ±eumitrin B, norstictic acid (major), ±salazinic acid (minor or trace), connorstictic acid (trace), galbinic acid (trace) and hyposalazinic acid (trace); zeorin and secalonic acid A may also be present. - Common in open forest, on the branches in rainforest canopies, on fence posts and on rock in Australia. It is known from other tropical and warm-temperate regions of the world.



Usnea baileyi



Usnea baileyi

Usnea baileyi (Stirt.) Zahlbr., Denkschr. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 83: 182 (1909)
= *Eumitria baileyi* Stirt. 1881
= *Eumitria baileyi* Stirt., Scott. Natural. 6(3): 100 (1881) [1881-1882]

[KU197], Australia. Queensland: Beechmont. On trees,540 m. Leg. S. Kurokawa (no.5541), 2.11.1965, det. Y. Asahina. EX S. KUROKAWA LICHENES RARIORES ET CRITICI EXSICCATI NR. 197.

Thallus erect to subpendulous, 5–15 (–20) cm long, grey to greenish grey; branching subdichotomous to irregular; trunk usually black, rarely pale; branches terete or somewhat ridged, 1.0–1.5 mm wide; apices attenuate, straight or arcuate; fibrils sparse to dense on main branches, to 5 mm long. Isidia sparse to dense, solitary or clustered, papilla-like when immature, becoming cylindrical and easily dislodged, eroding to leave pseudocyphellae; pseudocyphellae punctiform, scattered; soralia absent. Cortex cracked, matt. Medulla dense, with a yellow, pink, red-brown, maroon or chocolate-brown layer around axis; axis hollow, 3/4 width of branch. Apothecia rare, terminal on short lateral branches; disc plane; margin and lower surface bearing fibrils. Ascospores 8–10 × 5–6 μm. CHEMISTRY: Cortex containing usnic acid. Medulla K+ red (difficult to see because of the pigment); containing eumitrin A, ±eumitrin B, norstictic acid (major), ±salazinic acid (minor or trace), connorstictic acid (trace), galbinic acid (trace) and hyposalazinic acid (trace); zeorin and secalonic acid A may also be present. - Common in open forest, on the branches in rainforest canopies, on fence posts and on rock in Australia. It is known from other tropical and warm-temperate regions of the world.



Usnea baileyi



Usnea baileyi

Usnea baileyi (Stirt.) Zahlbr.

[19289], Australia, Queensland, Crediton State Forest, 16 km south-west of Finch Hatton, 21°15' S, 148°31' E, 700 m, growing on dead logs in *Eucalyptus grandis* dominated woodland. Leg. J.A. Elix (21074) & H. Streimann, 01.07.1986. Chemistry: norstictic acid (major), eumitrin A (major), usnic acid (major), secalonic acid A (minor), eumitrin B (trace), salazinic acid (trace), connorstictic acid (trace), consalazinic acid (trace) by TLC, HPLC, anal. J. Johnston & G.A. Jenkins. Ex J. A. Elix LICHENES AUSTRALASICI EXSICCATI NO. 169.- IN HERBARIO F. SCHUMM NR. 19289.

Thallus erect to subpendulous, 5-15 cm long, grey to greenish grey; trunk usually black; branches terete or somewhat ridged, 1-1.5 mm wide; fibrils sparse to dense on main branches, to 5 mm long; papillae like projections are young isidia; isidia sparse to dense, solitary or clustered, cylindrical, easily dislodged, eroding to leave pseudocyphellae; pseudocyphellae punctiform, scattered; soredia absent. Medulla dense, with yellow, pink or brown layer around axis; axis ¾ width of branch. Apothecia rare. Ascospores 8-10 x 5-6 µm. Chemistry usnic acid, eumitrin A, ±eumitrin B, norstictic acid (major), ±salazinic acid (minor/trace), connorstictic acid (trace), galbinic acid (trace), hyposalazinic acid (trace); zeorin and secalonic acid A may also be present. Lit. G.N. Stevens (1999, Bibl. Lich. 72)



Usnea baileyi



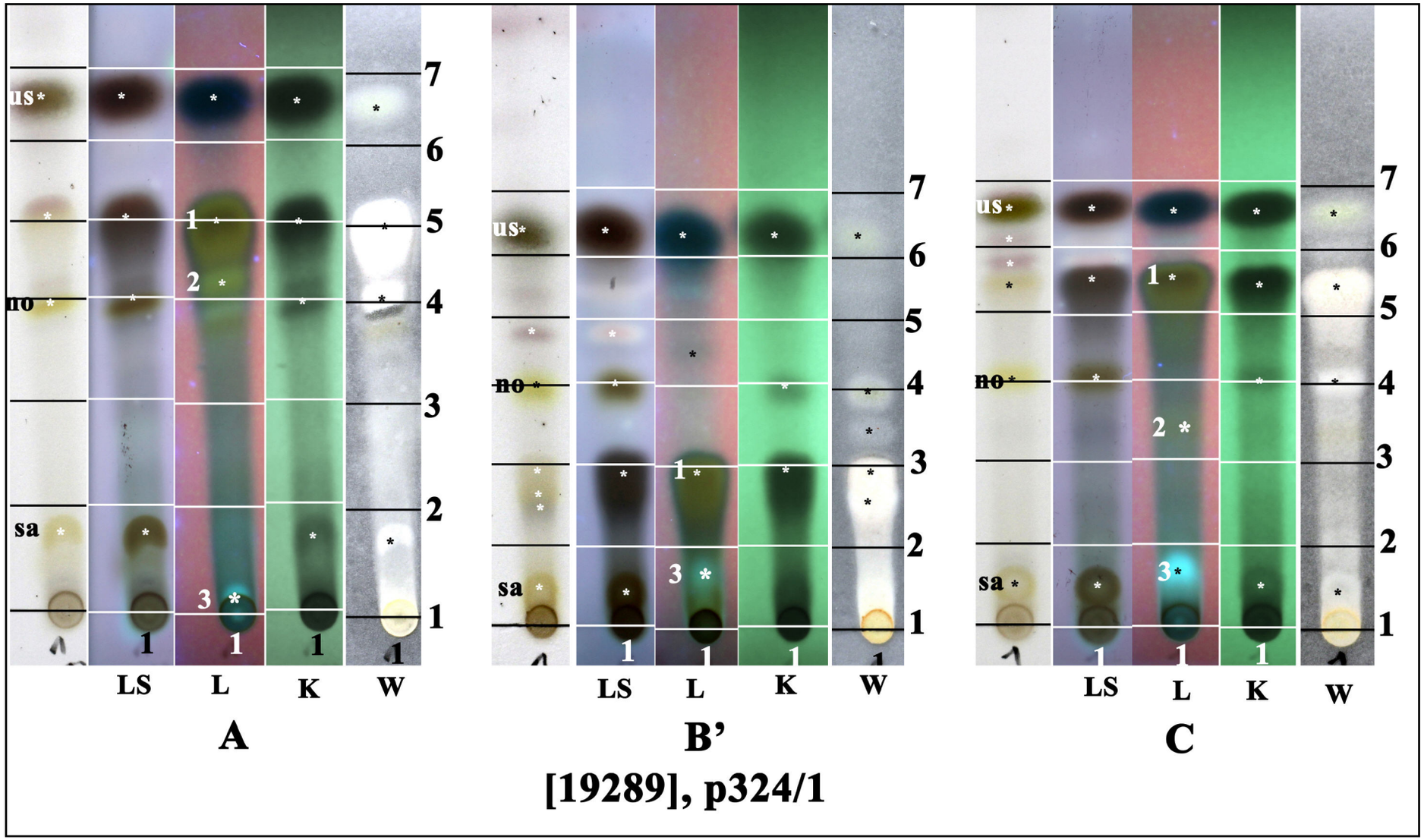
Usnea baileyi



Usnea baileyi



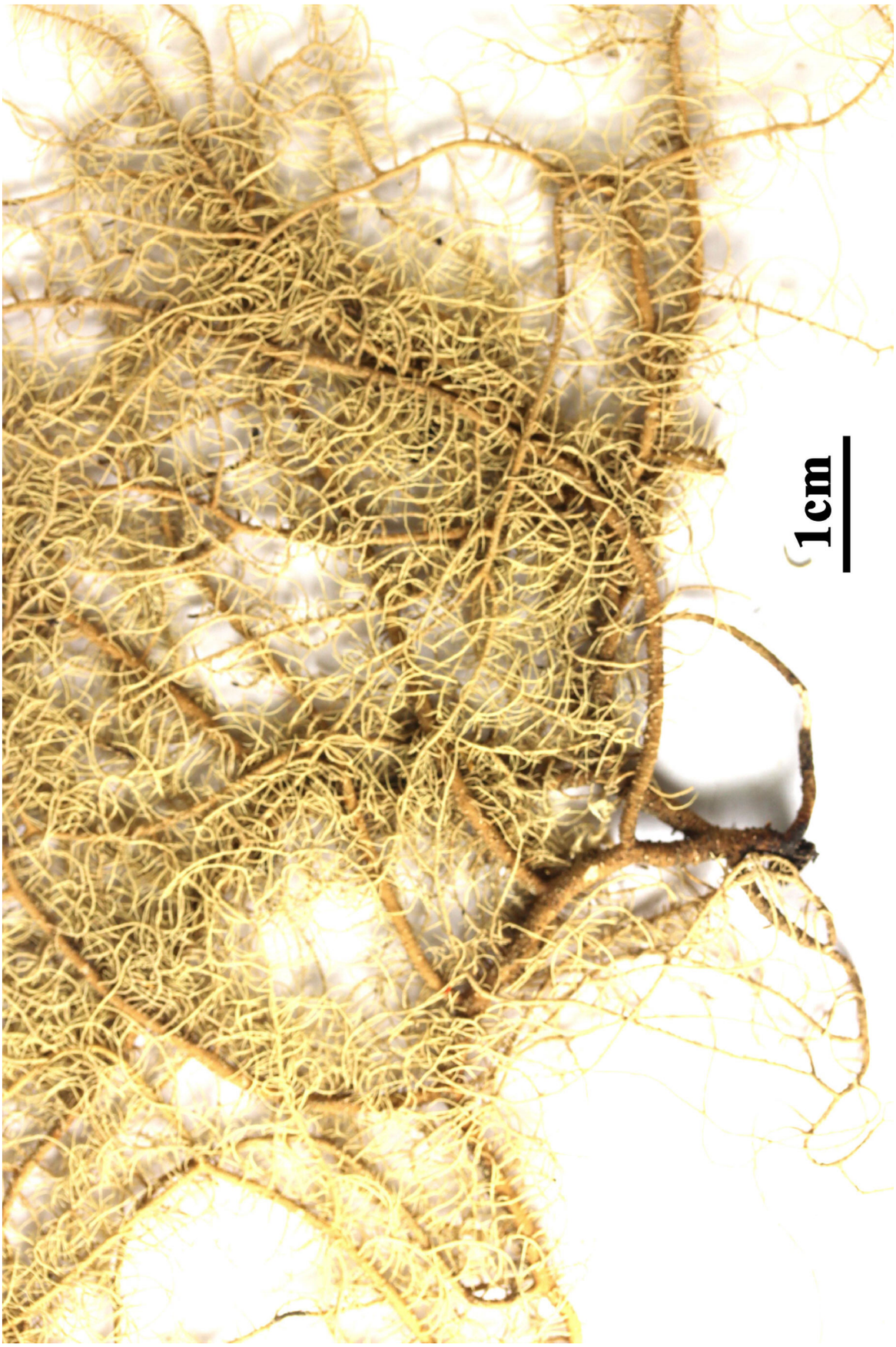
Usnea baileyi



us: usnic acid, no: norstictic acid, sa: salazinic acid, 1: eumitrin A, 2:secalonic acid A, 3: unknown

Usnea baileyi* subsp. *chrysopoda (Stein) Asahina, J. Jap. Bot. 42(1): 7 (1967)
= *Usnea chrysopoda* Stein 1882

[KU198], New Guinea. Eastern Highland District: Andandara loggig area, 25 miles south of Kainantu. On trees, 1600 m. Leg. S. Kurokawa (no. 6045), 17.11.1965, det. Y. Asahina. Ex S. Kurokawa Lichenes Rarioers Et Critici Exsiccati Nr. 198.



Usnea baileyi* subsp. *chrysopoda



Usnea baileyi* subsp. *chrysopoda

Usnea bismolliuscula Zahlbr., Cat. Lich. Univers. 6: 542 (1930)

[KU295], Japan. Honshu. Prov. Kazusa: Ichinomiya. Leg. Y. Asahina (no. 52330), 30.3.1952, det. Y. Asahina. Ex S. Kurokawa Lichenes Rariores Et Critici Exsiccati Nr.295.

Thallus subpendulous to shrubby-erect, 8–12 cm long, pale yellow-green; branching subdichotomous, irregular; trunk absent, with branches arising from the base; branches terete, 0.7–1.0 mm wide, inflated, sparsely perforate in basal region; apices tapered, sometimes forked; branchlets fusiform; fibrils rare, confined to basal region; papillae small, pointed. Isidia numerous, but often eroding to leave round to elongate pseudocyphellae; pseudocyphellae numerous, mainly on secondary branches, largest on branchlets and apices; soralia absent. Cortex matt, thin, soft. Medulla lax, sparse; axis 1/4 width of branch, hyaline. Apothecia uncommon, lateral or subterminal, to 5 mm diam.; disc concave to plane; fibrils sparse on margin; lower surface smooth. Ascospores 6.5–8.0 × 5 μm. CHEMISTRY: Cortex containing usnic acid. Medulla K+ yellow: stictic acid (major), constictic acid (minor or trace), cryptostictic acid (trace), menegazziaic acid (trace), ±diffractaic acid (minor), norstictic acid (trace), connorstictic acid (trace) and accessory scabrosin 4-acetate-4’-butyrate, scabrosin 4-acetate-4’-hexanoate, scabrosin 4,4’-dibutyrate, scabrosin 4,4’-diacetate, or rarely protocetraric acid only; medulla K+ yellow → red (rare): salazinic acid (major) and norstictic acid (major). This species produces diffractaic acid in the tropics. Found in Australia; occurs from sea level (mangroves) to rainforest, open forest and on fence posts at elevations above 1000 m. Also in Japan, Taiwan and Papua New Guinea.



Usnea bismolliuscula



Usnea bismolliuscula

Usnea bismolliuscula Zahlbr., Cat. Lich. Univers. 6: 542 (1930)

[OH425], Japan. Honshu. Prov. Awa (Pref. Chiba): Yomogi, Kamogawa-city. On bark of *Cryptomeria japonica*, 162 m. Leg.Y. Ohmura (no. 7244), 5.9.2010, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 425.

Thallus subpendulous to shrubby-erect, 8–12 cm long, pale yellow-green; branching subdichotomous, irregular; trunk absent, with branches arising from the base; branches terete, 0.7–1.0 mm wide, inflated, sparsely perforate in basal region; apices tapered, sometimes forked; branchlets fusiform; fibrils rare, confined to basal region; papillae small, pointed. Isidia numerous, but often eroding to leave round to elongate pseudocyphellae; pseudocyphellae numerous, mainly on secondary branches, largest on branchlets and apices; soralia absent. Cortex matt, thin, soft. Medulla lax, sparse; axis 1/4 width of branch, hyaline. Apothecia uncommon, lateral or subterminal, to 5 mm diam.; disc concave to plane; fibrils sparse on margin; lower surface smooth. Ascospores 6.5–8.0 × 5 μm. CHEMISTRY: Cortex containing usnic acid. Medulla K+ yellow: stictic acid (major), constictic acid (minor or trace), cryptostictic acid (trace), menegazziaic acid (trace), ±diffractaic acid (minor), norstictic acid (trace), connorstictic acid (trace) and accessory scabrosin 4-acetate-4’-butyrate, scabrosin 4-acetate-4’-hexanoate, scabrosin 4,4’-dibutyrate, scabrosin 4,4’-diacetate, or rarely protocetraric acid only; medulla K+ yellow → red (rare): salazinic acid (major) and norstictic acid (major). This species produces diffractaic acid in the tropics. Found in Australia; occurs from sea level (mangroves) to rainforest, open forest and on fence posts at elevations above 1000 m. Also in Japan, Taiwan and Papua New Guinea.



Usnea bismolliuscula



Usnea bismolliuscula

Usnea cirrosa Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica 2(1): 514 (1937)

[KU336], USA. North Carolina: Wayah Bald, Macon Co. On bark of trees, 5499 ft. Leg. S. Kurokawa (no. 6858), 25.9.1966, det. Y. Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 336.

Thallus: erect-shrubby, tufted, 2-7 cm long; branching the whole thallus anisotomic-dichotomous; basal part paler than or concolorous to branches or ±pale brown; branches tapering; lateral branches distinctly narrowed at attachment point; segments terete, ±cylindrical to strongly sausage-like; papillae/tubercles verrucous, few to numerous, irregularly distributed; fibercles usually absent; fibrils few to numerous, short (< 3mm) and thick, spinulous, unevenly distributed on the whole thallus, often numerous on the apices, giving a spinulous aspect to the terminal part of the thallus; soralia and isidiomorphs absent; pseudocyphellae absent; cortex: thin (3-7%), shiny; medulla moderately thick to thick, lax to dense; central axis thin to moderately thick; Apothecia usually numerous, terminal or lateral; ascospores elliptical, 9-12 x 6-8 µm; Spot tests K+ dull yellow turning reddish orange, C-, KC-, P+ deep yellow; Secondary metabolites: norstictic acid (major), ±salazinic acid (major). Substrate and ecology: on bark, on *Abies* spp., *Quercus* spp. and *Pinus* spp. in the temperate forests in mountainous area between 1500 and 3650 m World distribution: North and South America - Notes: *Usnea cirrosa* is distinguished by its lateral branches that are distinctly constricted at ramification points, its swollen branch segments, its thin and shiny cortex and the numerous apothecia. *Usnea cirrosa* can be considered as the primary species of *U. cornuta*. It is closely related to if not identical to *U. ramillosa* Motyka that produces protocetraric acid in the medulla instead of norstictic acid in *U. cirrosa*. There is probably the same relationship between *U. cirrosa* and *U. ramillosa* as occurs between *U. cornuta* and U. *brasiliensis*.



Usnea cirrosa

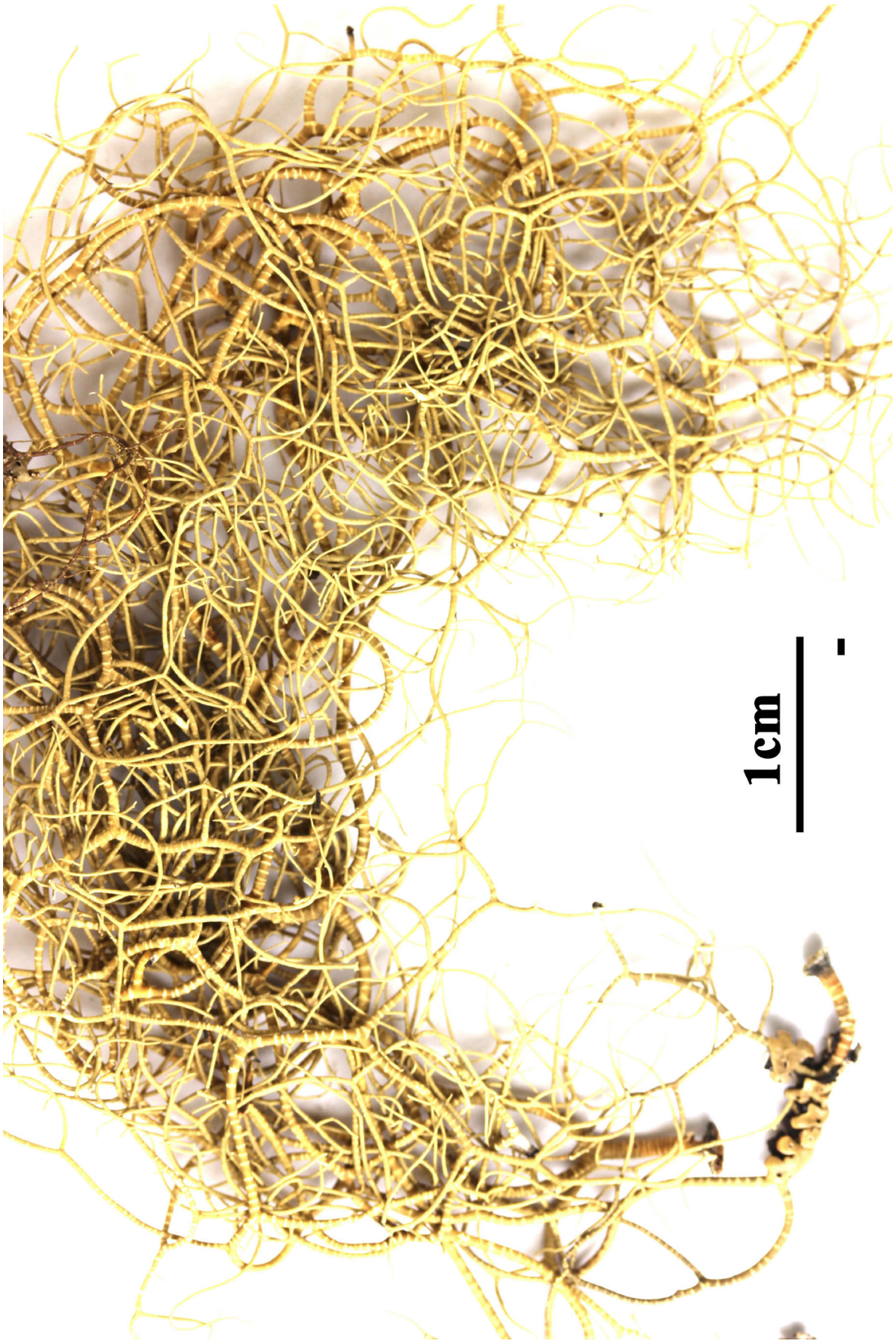


Usnea cirrosa

Usnea diffracta Vain., Bot. Mag., Tokyo 35: 45 (1921)
= *Dolichousnea diffracta* (Vain.) Articus, Taxon 53(4): 932 (2004)

[OH497], Japan. Shikoku. Prov. Awa (Prf. Tokushima): Mt. Tsurugi. On tree bark. Leg. T. Yanagisawa (no. 1718), 6.5.1952, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR.497.

Thallus pendulus, usque ad 70 cm longus, mollis, luteolo vel cinereo viridis, glaber, opacus, basi primaria firma, fuscoobscura, usque ad 1.5 mm crassa, basi secundaria tenuiori. Caulis principalis simplex, -1 pauci cm longus, ca 1mm crassus, iteratim regulariter dichotome interdum subsympoialiter ramosus. Omnes rami fere regulariter teretes, esti non raro deformatuli, infra distincte annulatim fracti, annulis cylindricis, fissuris albidis, rare in ramificatione lacunosi, supra capillaceo elongati, indistincte annulatim fracti, eramulosi. Cortex fragilié, 30-100 µm crassus; medulla sat crebra, alba, stuppea, 150-260 µm crassa; axis fere cylindricus, 250-570 µm crassus, ca 40%; diametri ramorum occupans. Apothecia non rara, ad ramos secundarios lateralia vel subterminalia, 5-15 mm lata ; receptaculum thallo concolor, laeve, leviter lacunoso inaequale, cortice in sectione valde inaequali, 60-150 µm crasso, infra dilacerato; margo crenulatus, ciliis paucis, 5-20 mm longis munitus; discus carneus vel rufofuscus, epruinosus. Hymenium 50-60 µm altum, hypothecium una cum excipulo 110-130 µm crassum; sporae ellipsoideae, cellulis in centro guttulatis, 5.5-6.5 x 4-4.51 µm magnae. Reaction.: med. K-, P-, I fuscescens, nec coerulea nec violacea ; axis I +sordide coerulescens. Mat. chim. propr.: acidum usnicum et diffractaicum. Distributio: Hokkaido, Hondo, Shikoku et Kiusiu. Sachalin, Corea, Formosa et China centralis (Lushan, Prov. Kiangsi).



Usnea diffracta



Usnea diffracta

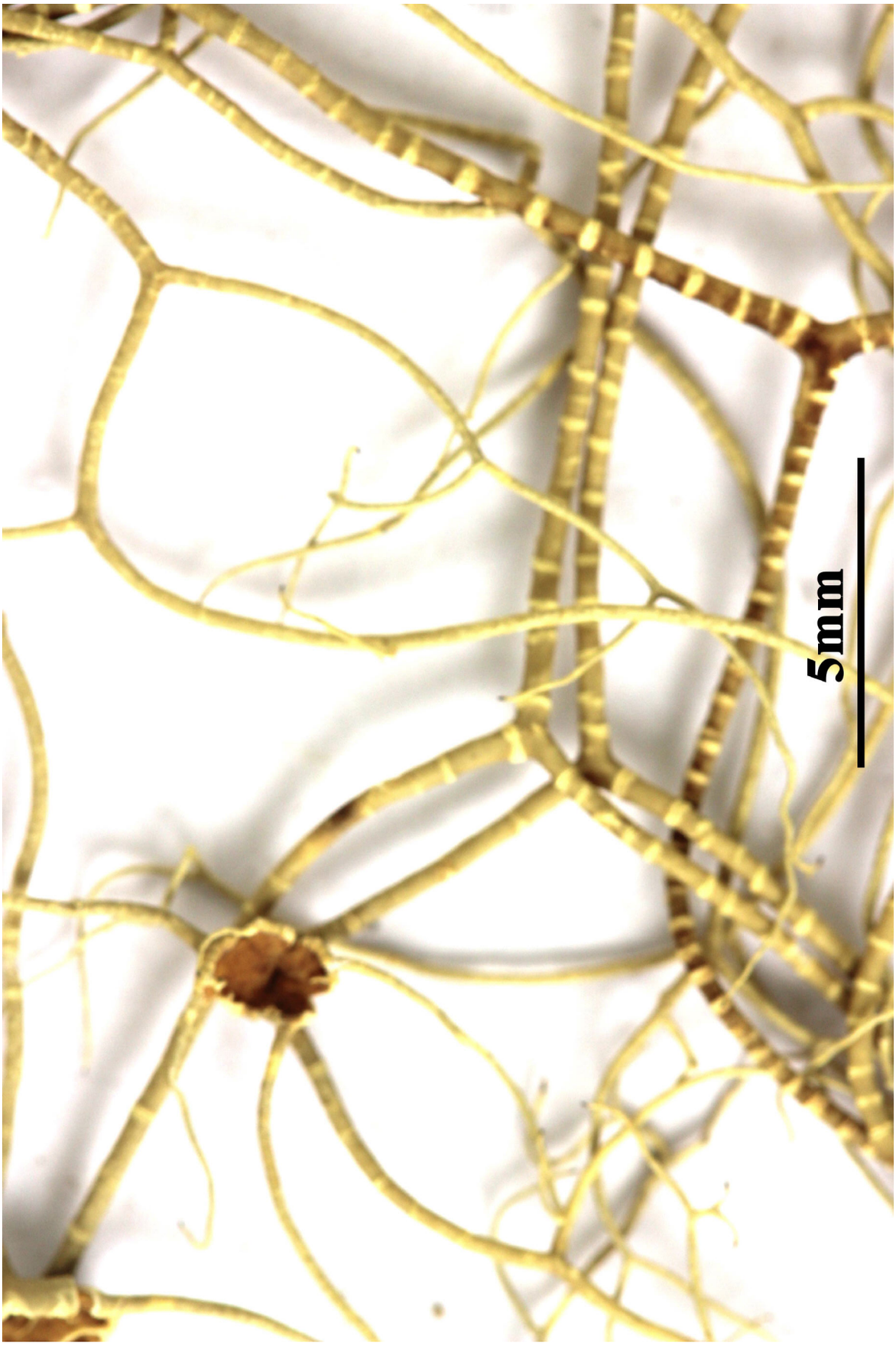
Usnea diffracta Vain., Bot. Mag., Tokyo 35: 45 (1921)
= *Dolichousnea diffracta* (Vain.) Articus, Taxon 53(4): 932 (2004)

[KU449}, Japan. Hokkaido. Prov. Tokachi: Lake-side of Nishi-Koma, Shikaoi-mura. Kato-gun, On bark of *Abies sachaliensis*, 900 m. Leg. H. Kashiwadani (no. 15193), 26.6.1979, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 449.

Thallus pendulus, usque ad 70 cm longus, mollis, luteolo vel cinereo viridis, glaber, opacus, basi primaria firma, fuscoobscura, usque ad 1.5 mm crassa, basi secundaria tenuiori. Caulis principalis simplex, -1 pauci cm longus, ca 1mm crassus, iteratim regulariter dichotome interdum subsympoialiter ramosus. Omnes rami fere regulariter teretes, esti non raro deformatuli, infra distincte annulatim fracti, annulis cylindricis, fissuris albidis, rare in ramificatione lacunosi, supra capillaceo elongati, indistincte annulatim fracti, eramulosi. Cortex fragilié, 30-100 µm crassus; medulla sat crebra, alba, stuppea, 150-260 µm crassa; axis fere cylindricus, 250-570 µm crassus, ca 40%; diametri ramorum occupans. Apothecia non rara, ad ramos secundarios lateralia vel subterminalia, 5-15 mm lata ; receptaculum thallo concolor, laeve, leviter lacunoso inaequale, cortice in sectione valde inaequali, 60-150 µm crasso, infra dilacerato; margo crenulatus, ciliis paucis, 5-20 mm longis munitus; discus carneus vel rufofuscus, epruinosus. Hymenium 50-60 µm altum, hypothecium una cum excipulo 110-130 µm crassum; sporae ellipsoideae, cellulis in centro guttulatis, 5.5-6.5 x 4-4.51 µm magnae. Reaction.: med. K-, P-, I fuscescens, nec coerulea nec violacea ; axis I +sordide coerulescens. Mat. chim. propr.: acidum usnicum et diffractaicum. Distributio: Hokkaido, Hondo, Shikoku et Kiusiu. Sachalin, Corea, Formosa et China centralis (Lushan, Prov. Kiangsi).



Usnea diffracta

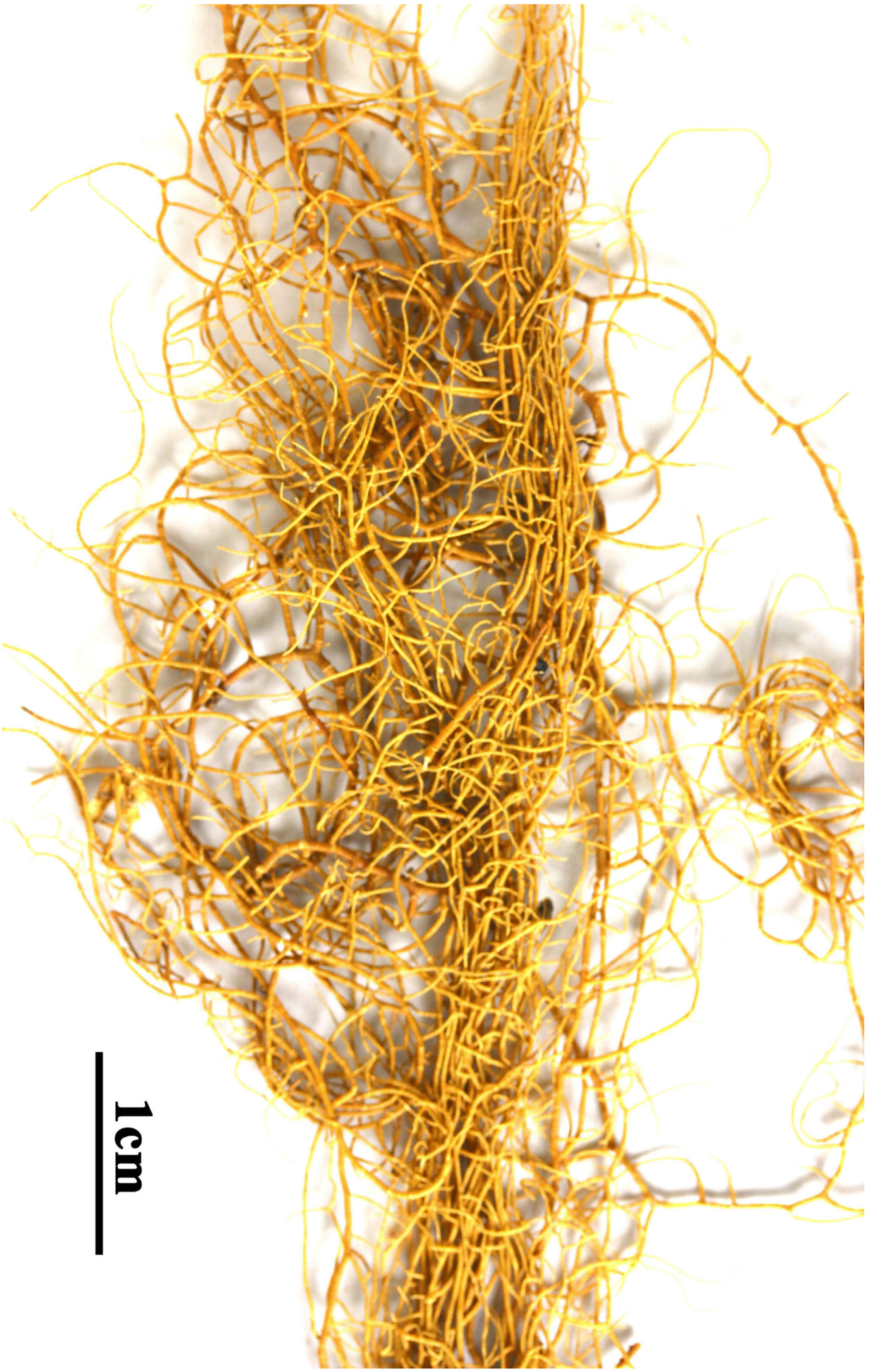


Usnea diffracta

Usnea japonica Vain., Bot. Mag., Tokyo 32: 154 (1918)

[KU343], Japan. Shikoku. Prov. Iyo: Mt. Onigajo, Kita-Uwa-gun, On bark of Pinus densiflora, 1000 m. Leg. S. Kurokawa (no. 72279), 18.11.1972, det. H. Kashiwadani. EX S. KUROKAWA AND H, KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 343.

Thallus pendulus, 15-30 (-60) cm longus, flexibilis, in vivo pallide viridis vel stramineo viridis, ad basin paulo attenuatus, viridis vel stramineo viridis, nitidulus, in herbario post longum tempus intensive fuscus, opacus. Ramus principalis ad basin paulo attenuatus, supra dichotome et sympodialiter increbre ramosus, per totam longitudinem laevis, foveolatus. Rami crassiores in parte inferiore saepe valde inflati, usque ad 2.7 mm lati, indistincte papillati, papillis valde humilibus. Omnes rami subarticulatim fracti, articulis vulgo deformatulis, deinde fracturis irregularibus, pseudocyphellis albidis punctiformibus vel linearibus indistincte notati. Rami angustiores attenuati, teretes, apicem versus soraliis albidis praediti. Ramuli perpendiculares parci, flexuosi, 0.5-2.0 cm longi, rare in apice ramorum nidulatim excrescentes. Apothecia rarissima," in apice rami secundarii terminalia, 5 mm lata (in specim. viso), margine flexuoso, ciliis 5-10 mm longis munita, disco concavo albopruinoso ; soredia isidiosa, e soraliis parvis ad ramos tenuioribus sedentibus nascentia. Cortex tenuis, chartaceus, 30-60 µm crassus, fere aequalis., infra bene limitatus ; medulla 300-400 µm crassa, laxissima, hyphis arachnoideis ; axis sat tenuis, 200-400 µm crassus, 20-30% diametri thalli occupans. Reaction.: med. K+flavens, mox sanguineorubens, PD aurantiacolutescens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. *U. japonica* shows a restricted distribution in Japan. The type locality is Gamo in the pacific coast of Prov. Rikuzen (prope Sendai).



Usnea japonica



Usnea japonica

Usnea himalayana C. Bab., J. Bot. (Hooker) 4: 243 (1852)

[KU337], East Nepal. En route from Hati Sar to Mangalbare. On bark of Trees, 2000 m. Leg. M. Togashi, 28.10.1963, det. Y. Asahina. Ex S. Kurokawa and H. Kasiwadani Lichenes Rariores Et Critici Exsiccati Nr. 337.

Thallus corticolous, pendulous, to 25 cm long, longer in nature, pale grey, greyish green; yellow brown to dark brown in herbarium, branching dichotomous throughout; branches articulate, inflated to 3 mm diam. in between articulations, branches attenuate; lateral branch lets as a rule absent, (but rarely present in older parts of branches); surface annularly, sparsely cracked, pseudocyphellae orbicular, linear, elongate or effigurate, plane or slightly raised, white; isidia and soredia absent; central axis solid, white. Apothecia very rare, terminal, to 3 mm in diam., margin ciliate; ascospores 12 x 6 µm. Medulla K + red, P+ orange-red. Three chemical strains present; (1) Norstictic acid, (2) Salazinic acid, and (3) Stictic acid complex. Reported mainly from temperate regions [alt. (600) 1800-3300m] o findia (Himachal Pradesh. Manipur. Nagaland. Sikkim. Tamil Nadu-Nilgiri and Palni Hills, Uttaranchal, West Bengal-Darjeeling District), and Nepal (E. Nepal).



Usnea himalayana



Usnea himalayana

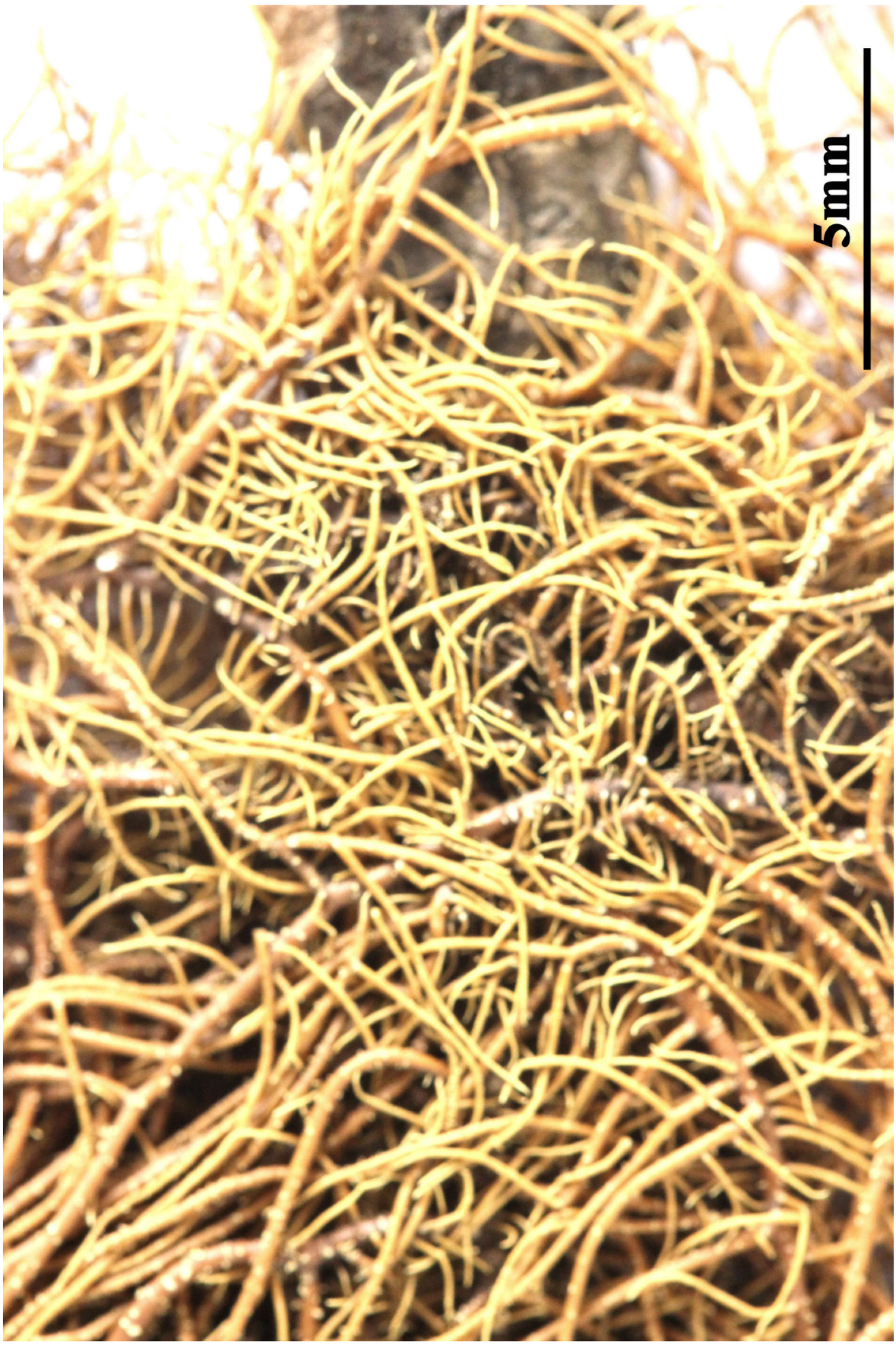
Usnea hakonensis Asahina, Lichens of Japan, 3. Genus Usnea: 77 (1956)

[OH448], Jaoan. Honshu. Prov. Settsu (Pref. Hyogo): Mt. Rokko. Leg. M. Togashi (Herb. Y. Asahina, no. 21631), 18.11.1958, det Y. Ohmura. - TLC Usnic acid, Norsticti acid, anal. Y. Ohmura 2012. - Ex Y. Ohmura Lichenes Minus Coniti Exsiccati Nr. 449.

Thallus suberectus, fruticulosus, usque ad 10 cm longus, pallide viridis, in sicco stramineoglaucescens, in herbario post longum tempus fuscescens, basi brevissime obscurata, indistincta. Caulis principalis ca 1 mm crassus, teres, glaber, supra repetite dichotome et sympodialiter ramosus, nitidulus, parce articulatim fractus, superficie verruculis mox in soraliis fatiscentibus dispersus. Rami crassiores patentes, saepe sordide fusciduli, soraliis tuberculosis crebre muniti, rami angustiores manifeste pallidiores, comiforme elongati, fere uniformes, soraliis minutis punctiformibus crebre muniti. Apothecia ignota. Soredia isidiosa, spinuliformia, ad soralia excrescentia. Ramuli perpendiculares ad ramos crassiores adsunt. Cortex chondroideus, durus, 50-180 µm crassus, lumine indistincto, infra inaequalis sed bene limitatus; medulla sat laxa, 240-400 µm crassa, hyphis 4 µm latis; axis cylindricus vel applanatus, in sectione purus, 180-300 µm crassus, 20-28 µm diametri thalli occupans. Reaction.: med. K+flavens mox rubens, P+flavens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. Typus: Ashinoko, Hakone, Hondo, leg. M. Tagashi, 1952. In herbario Asahina asserv. Distributio: Hondo media et Shikoku et Kiusiu. Corticola rare saxicola.



Usnea hakonensis



Usnea hakonensis

Usnea hakonensis Asahina, Lichens of Japan, 3. Genus Usnea: 77 (1956)

[OH448], Taiwan. Taichung Co.: Mt. Yanzuei. On twigs of Rhododendron sp., 2300 m. Leg. Ohmura /no. 7110), 4.10.2009, det. Y. Ohmura (TLC Usnic acid, Nostictic acid, 2013). - . Ex Y. Ohmura Lichenes Minus Cogniti Exsiccati Nr.448.

Thallus suberectus, fruticulosus, usque ad 10 cm longus, pallide viridis, in sicco stramineoglaucescens, in herbario post longum tempus fuscescens, basi brevissime obscurata, indistincta. Caulis principalis ca 1 mm crassus, teres, glaber, supra repetite dichotome et sympodialiter ramosus, nitidulus, parce articulatim fractus, superficie verruculis mox in soraliis fatiscentibus dispersus. Rami crassiores patentes, saepe sordide fusciduli, soraliis tuberculosis crebre muniti, rami angustiores manifeste pallidiores, comiforme elongati, fere uniformes, soraliis minutis punctiformibus crebre muniti. Apothecia ignota. Soredia isidiosa, spinuliformia, ad soralia excrescentia. Ramuli perpendiculares ad ramos crassiores adsunt. Cortex chondroideus, durus, 50-180 µm crassus, lumine indistincto, infra inaequalis sed bene limitatus; medulla sat laxa, 240-400 µm crassa, hyphis 4 µm latis; axis cylindricus vel applanatus, in sectione purus, 180-300 µm crassus, 20-28 µm diametri thalli occupans. Reaction.: med. K+flavens mox rubens, P+flavens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. Typus: Ashinoko, Hakone, Hondo, leg. M. Tagashi, 1952. In herbario Asahina asserv. Distributio: Hondo media et Shikoku et Kiusiu. Corticola rare saxicola.



Usnea hakonensis



Usnea hakonensis

Usnea himalayana* f. *major Asahina, J. Jap. Bot. 42(9): 258 (1967)

[KU339], India. Phalut, Darjeeling. On bark of trees, 3000 m. Leg. M. Togashi, 9.5.1960, det. Y. Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 339.



Usnea himalayana* f. *major



Usnea himalayana* f. *major

Usnea japonica Vain., Bot. Mag., Tokyo 32: 154 (1918)

[KU342], Japan. Honshu. Prov. Hitachi: Suda-Shinden, Wakabayashi-mura, Kashima-gun. On bark of trees, 20 m. Leg. M. Togashi, 2.4.1968, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 342.

Thallus pendulus, 15-30 (-60) cm longus, flexibilis, in vivo pallide viridis vel stramineo viridis, ad basin paulo attenuatus, viridis vel stramineo viridis, nitidulus, in herbario post longum tempus intensive fuscus, opacus. Ramus principalis ad basin paulo attenuatus, supra dichotome et sympodialiter increbre ramosus, per totam longitudinem laevis, foveolatus. Rami crassiores in parte inferiore saepe valde inflati, usque ad 2.7 mm lati, indistincte papillati, papillis valde humilibus. Omnes rami subarticulatim fracti, articulis vulgo deformatulis, deinde fracturis irregularibus, pseudocyphellis albidis punctiformibus vel linearibus indistincte notati. Rami angustiores attenuati, teretes, apicem versus soraliis albidis praediti. Ramuli perpendiculares parci, flexuosi, 0.5-2.0 cm longi, rare in apice ramorum nidulatim excrescentes. Apothecia rarissima," in apice rami secundarii terminalia, 5 mm lata (in specim. viso), margine flexuoso, ciliis 5-10 mm longis munita, disco concavo albopruinoso ; soredia isidiosa, e soraliis parvis ad ramos tenuioribus sedentibus nascentia. Cortex tenuis, chartaceus, 30-60 µm crassus, fere aequalis., infra bene limitatus ; medulla 300-400 µm crassa, laxissima, hyphis arachnoideis ; axis sat tenuis, 200-400 µm crassus, 20-30% diametri thalli occupans. Reaction.: med. K+flavens, mox sanguineorubens, PD aurantiacolutescens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. *U. japonica* shows a restricted distribution in Japan. The type locality is Gamo in the pacific coast of Prov. Rikuzen (prope Sendai).



Usnea japonica

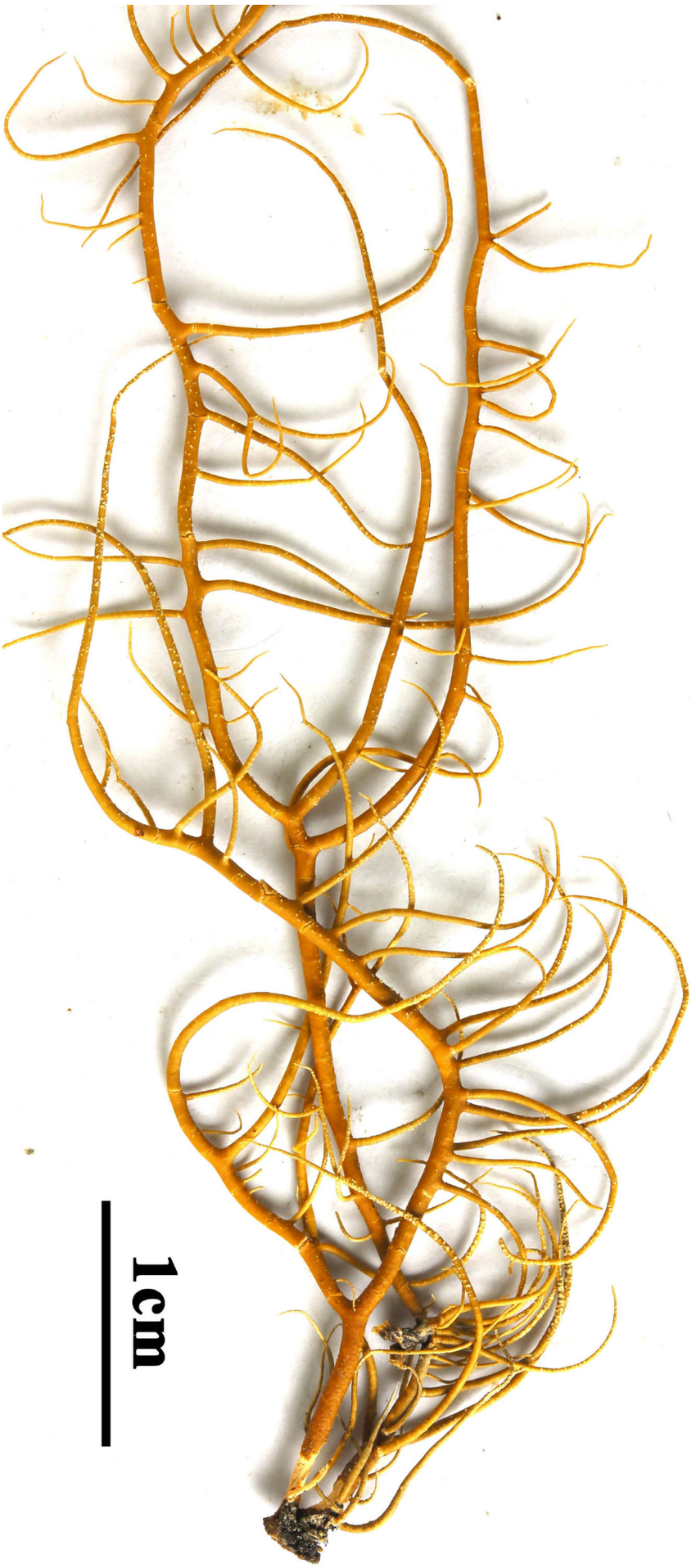


Usnea japonica

Usnea japonica Vain., Bot. Mag., Tokyo 32: 154 (1918)

[KU400], Formosa. Prov. Pingtung: Kontei. Leg. H. Izumi, 29.10.1976, det. Y. Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 400.

Thallus pendulus, 15-30 (-60) cm longus, flexibilis, in vivo pallide viridis vel stramineo viridis, ad basin paulo attenuatus, viridis vel stramineo viridis, nitidulus, in herbario post longum tempus intensive fuscus, opacus. Ramus principalis ad basin paulo attenuatus, supra dichotome et sympodialiter increbre ramosus, per totam longitudinem laevis, foveolatus. Rami crassiores in parte inferiore saepe valde inflati, usque ad 2.7 mm lati, indistincte papillati, papillis valde humilibus. Omnes rami subarticulatim fracti, articulis vulgo deformatulis, deinde fracturis irregularibus, pseudocyphellis albidis punctiformibus vel linearibus indistincte notati. Rami angustiores attenuati, teretes, apicem versus soraliis albidis praediti. Ramuli perpendiculares parci, flexuosi, 0.5-2.0 cm longi, rare in apice ramorum nidulatim excrescentes. Apothecia rarissima," in apice rami secundarii terminalia, 5 mm lata (in specim. viso), margine flexuoso, ciliis 5-10 mm longis munita, disco concavo albopruinoso ; soredia isidiosa, e soraliis parvis ad ramos tenuioribus sedentibus nascentia. Cortex tenuis, chartaceus, 30-60 µm crassus, fere aequalis., infra bene limitatus ; medulla 300-400 µm crassa, laxissima, hyphis arachnoideis ; axis sat tenuis, 200-400 µm crassus, 20-30% diametri thalli occupans. Reaction.: med. K+flavens, mox sanguineorubens, PD aurantiacolutescens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. *U. japonica* shows a restricted distribution in Japan. The type locality is Gamo in the pacific coast of Prov. Rikuzen (prope Sendai).



Usnea japonica

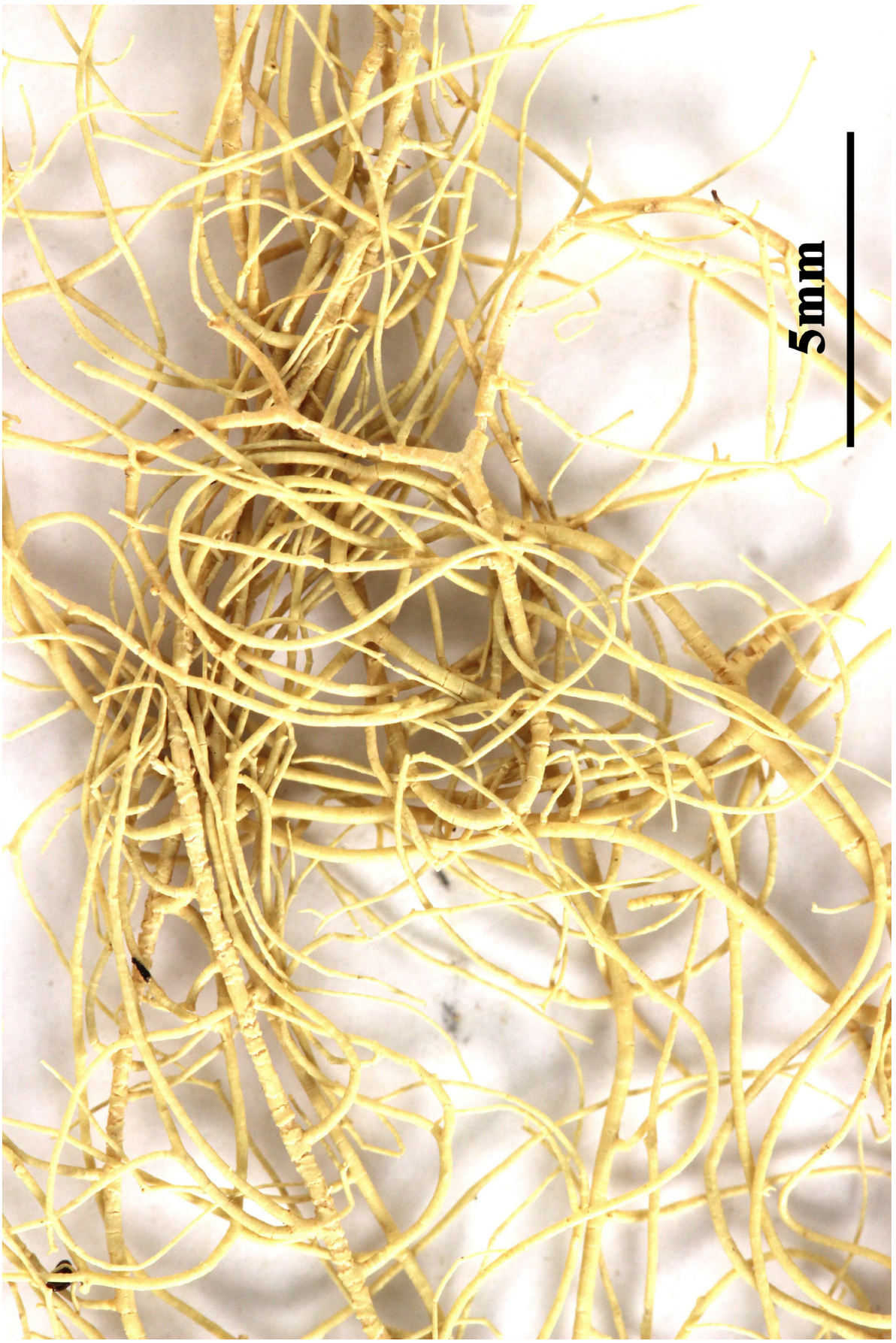


Usnea japonica

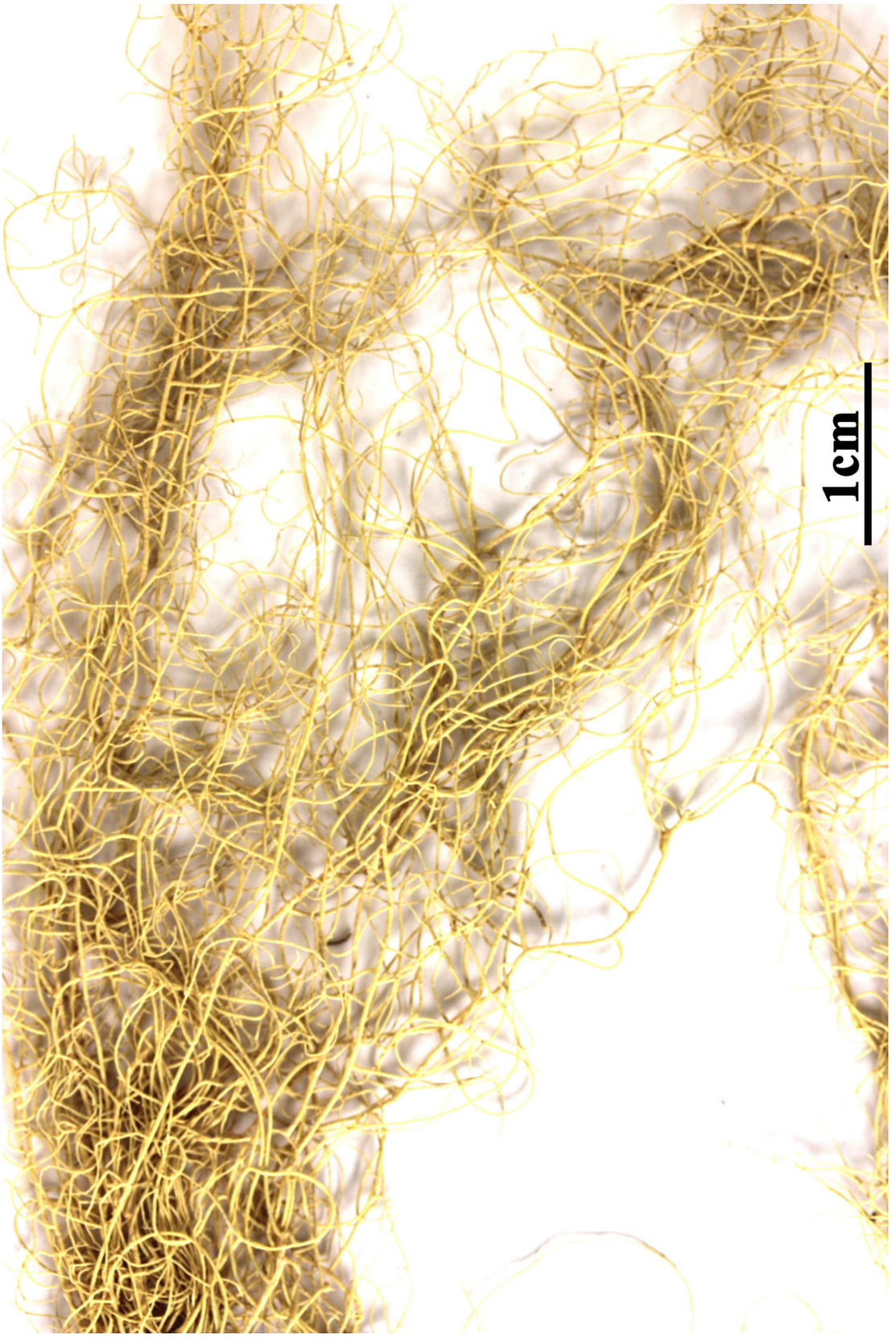
Usnea misaminensis (Vain.) Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica 2(1): 418 (1937)
= *Usnea longissima var. misaminensis* Vain. 1909
= *Eumitria pectinata* (Taylor) Articus, Taxon 53(4): 932 (2004)

[KU548], Papua New Guinea. Eastern Highland District: Andandara logging area, 25 miles south of Kainantu, 1600 m. Leg. S. Kurokawa (no.6058), 17.11.1965, det. Y- Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 548.

Thallus ca. 30 em longus, pendulus, ‘mollis, stramineo uniformiter pallidus,´opacus, glaber, basi sat distinctum, rigida, prope basin crebrius, alibi rarissime ramosus, axillis subrectis, ramis arcu gracioso pendentibus, infra subparallelis.Rami prope basin ca. 0.6 mmcrassi, infra sensissime regulariter attenuescentes et fere capillacei, longe paulo flexuosi, teretes aut indistinetissime deformatuli, exacle laeves, crassiores indistincte annulatim et etiam, sed minus crebre, areolatim fracti, fissuris paulo profundis, mox regeneratis, tenuiores omnino conlinui. Ramuli crebri, tenues, 1-3 cm longi, patentes, graciose attenuescentes et dein fere capillacei, glabri et subnitidi, exacte laeves. Summitates indistinctae. Apothecia non rara, ad ramulos sublarealiter sita, parvula, 5 mm lata. Excipulum paulo convexum, opacum, leviter deforematulum, cilio longo vulgo adivatum. Cilia marginalia pauca sed valde, ultra 1 cm longa, tenuia, thallinis simila. Discus fere planus, carneo fuscus indistincte tantum pruinosus, Hymenium ca. 70µm altum. Epithecium fuligineum, Sporae 6-7 x 9-10 µm, inascis sat inflatis. Cortex ca, 30 µm crassus, extus viridulus, mollis. Medulla ca. 70 µm crassa, crebra, alba, K indistincte lutescens. Axis ca. 300 µmcrassus, hyphis sordidis parce intersrinctusm I coerulescens. (Ex J. Motyka,1938: Lichenum Generis Usnea Studium Monographicum. Pars Systematica)



Usnea misaminensis

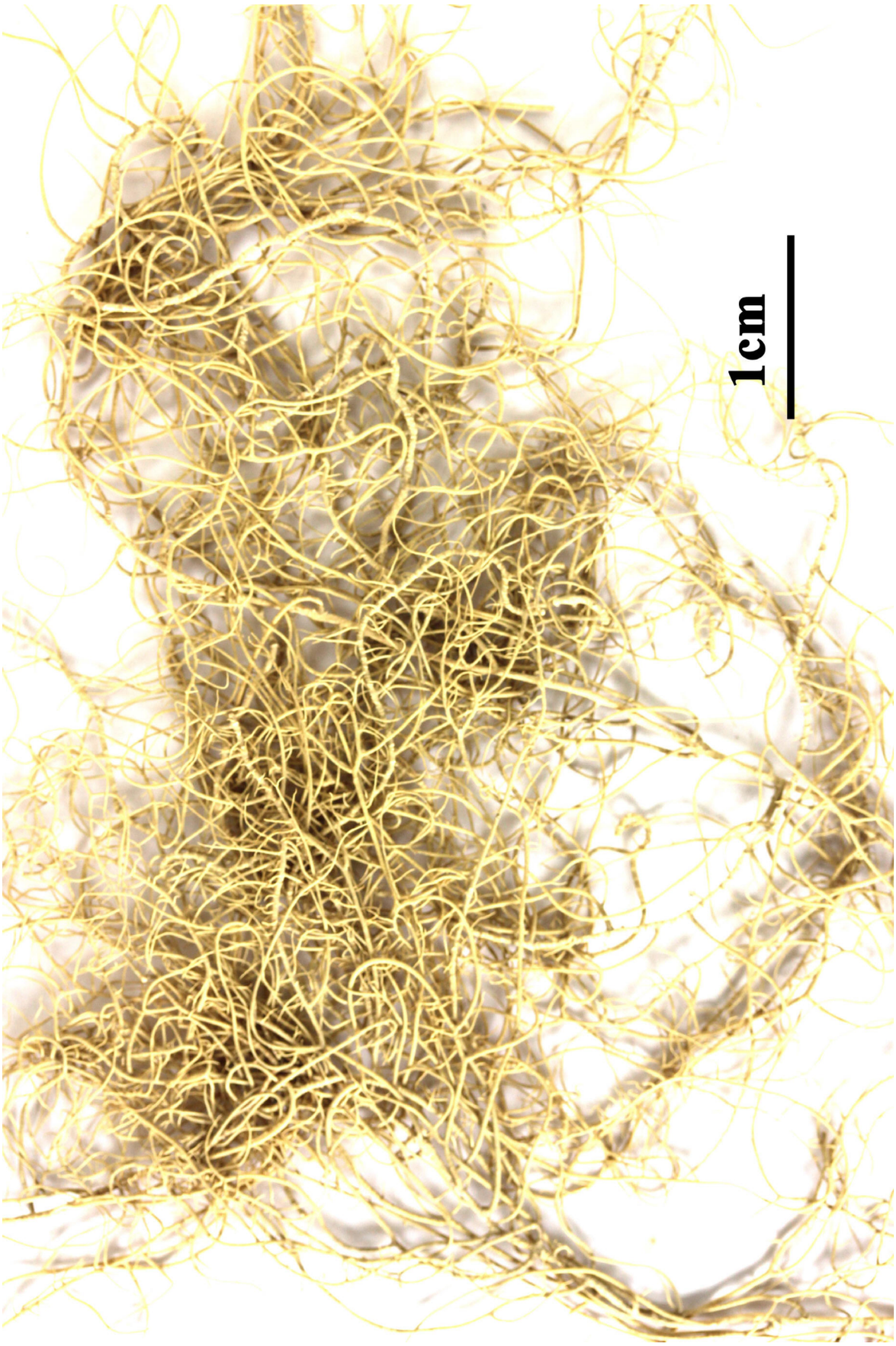


Usnea misaminensis

Usnea misaminensis (Vain.) Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica 2(1): 418 (1937)
= *Usnea longissima var. misaminensis* Vain. 1909
= *Eumitria pectinata* (Taylor) Articus, Taxon 53(4): 932 (2004)

[KU547], Formosa. Prov. Chiayi: En route from Su-Su-Lu to Mt. Ali, 2000-2200 m. Leg. S. Kurokawa (no. 673), 7.1.1964, det. Y Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 547.

Thallus ca. 30 em longus, pendulus, ‘mollis, stramineo uniformiter pallidus,´opacus, glaber, basi sat distinctum, rigida, prope basin crebrius, alibi rarissime ramosus, axillis subrectis, ramis arcu gracioso pendentibus, infra subparallelis.Rami prope basin ca. 0.6 mmcrassi, infra sensissime regulariter attenuescentes et fere capillacei, longe paulo flexuosi, teretes aut indistinetissime deformatuli, exacle laeves, crassiores indistincte annulatim et etiam, sed minus crebre, areolatim fracti, fissuris paulo profundis, mox regeneratis, tenuiores omnino conlinui. Ramuli crebri, tenues, 1-3 cm longi, patentes, graciose attenuescentes et dein fere capillacei, glabri et subnitidi, exacte laeves. Summitates indistinctae. Apothecia non rara, ad ramulos sublarealiter sita, parvula, 5 mm lata. Excipulum paulo convexum, opacum, leviter deforematulum, cilio longo vulgo adivatum. Cilia marginalia pauca sed valde, ultra 1 cm longa, tenuia, thallinis simila. Discus fere planus, carneo fuscus indistincte tantum pruinosus, Hymenium ca. 70µm altum. Epithecium fuligineum, Sporae 6-7 x 9-10 µm, inascis sat inflatis. Cortex ca, 30 µm crassus, extus viridulus, mollis. Medulla ca. 70 µm crassa, crebra, alba, K indistincte lutescens. Axis ca. 300 µmcrassus, hyphis sordidis parce intersrinctusm I coerulescens. (Ex J. Motyka,1938: Lichenum Generis Usnea Studium Monographicum. Pars Systematica)



Usnea misaminensis



Usnea misaminensis

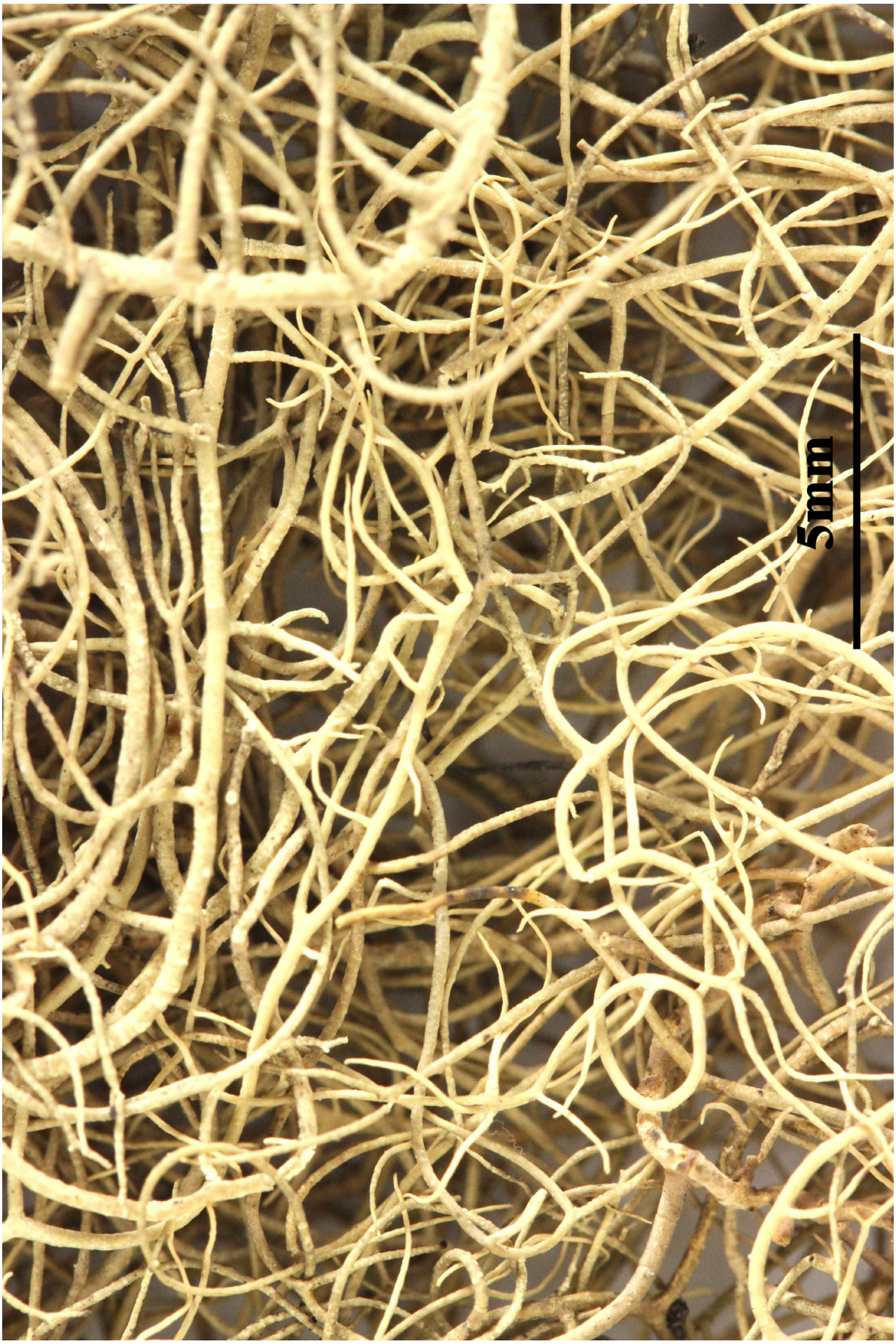
Usnea misaminensis* var. *subtrichodea (Asahina) Asahina, J. Jap. Bot. 40(1): 2 (1965)
= *Usnea hossei* f. *subtrichodea* Asahina 1956

[KU199], Japan. Honshu. Prov. Settsu: Sengari, Dohjo-machi, Kobe. On exposed rocks, 300 m. Leg. M. Togashi, 30.11.1952, det. Y. Asahina. Ex S.Kurokawa Lichenes Rariores Et Critici Exsiccati Nr. 199.

Thallus pendulus, usque ad 20 cm longus, stramineo viridis, opacus, flexibilis, basi incrassata, nigra, ad 1 mm crassa. Caulis principalis brevis, ca 0.6mm crassus, teres, ad basin denigratus, superficie continuus, glaber, rare transversim fractus, fissuris indisdinctis, dichotome et sympodialiter ramosus, rami primarii secundariique graciliter glabri, 0.5-0.3 mm lati, sensissime attenuescentes, ramulis perpendicularibus 0.5-1.5 cm longis increbre muniti, sed ramis filamentosis veris nullis. Apothecia non visa. Soredia nulla. Cortex rami primarii 80-150 µm, crassus, sat mollis, infra inaequalis; medulla 50 µm crassa, creberrima; axis cylindricus, 200-400 µm crassus, hyphis sordidis interstinctis, 40-552 µm; diametri ramorum occupans. Reaction.: med. K+flavens; PD+miniatorubens. Mat. chim. propr.: acidum usnicum, sticticum et in parte basali materia flava, K purpurascente. Distributio: Hondo media. Shikoku. Kiusiu. Saxicola et corticola. (Ex Asahina 1956: Usnea, Lichens of Jpan III)



Usnea misaminensis* var. *subtrichodea



Usnea misaminensis* var. *subtrichodea

Usnea mutabilis Stirt., Scott. Natural. 6(3): 107 (1881) [1881-1882]

[KU500], Japan. Honshu. Prov. Kai: Uchino, Oshino-mura, Minami-Tsuru-gun. On bark of *Larix leptolepis*, 950 m. Leg. H. Kashiwadani (no.16028), H. Inoue and T. Nakamura, 5.6.1980, det. H. Kashiwadani. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR.500.

Thallus fruticose-filamentous, greenish, shrubby, 3-7 cm long, rarely subpendulous and up to 14 cm long, branching mainly anisotomic-dichotomously with divergent branches. Main branches cylindrical, 0.5-1 mm thick, often foveolate or with transverse cracks especially toward the base, which is greenish to ochraceous. Lateral branches not constricted at attachment point, progressively tapering towards apices. Papillae and tubercles absent; fibrils mainly present on the main branches, spinulose, 1-2 mm long. Soralia punctiform, irregular, occupying less than half the diameter of the branch, originating from the cortex on the lateral branches (in which case they are flat), or from fibercles on the main branches (and then slightly stipitate), finally confluent into large, irregular soralia which cover the entire branch; isidiomorphs numerous in the soralia, 0.1-0.3 mm long, giving the branches a spinulose appearance. Cortex shiny in longitudinal section, moderately thick (6-12% of total branch thickness); medulla heterogeneous, with a compact layer below the cortex, otherwise loose to compact, rather thin (21-26%), wine-red; central axis white to wine-red, of variable thickness (28-34%). Apothecia usually absent. Photobiont chlorococcoid. Spot tests: cortex K-, C-, KC-, P-; medulla K-, C+ yellow-orange, KC+ yellow-orange, P-. Chemistry: cortex with usnic acid; medulla with eumitrin A2 and different fatty acids of the murolic acid complex. Note: a Mediterranean-Atlantic species, found on bark of ancient deciduous and evergreen, isolated trees in semi-natural, open forests subject to frequent humid winds, mostly in the Mediterranean belt.



Usnea mutabilis



Usnea mutabilis

Usnea mutabilis Stirt., Scott. Natural. 6(3): 107 (1881) [1881-1882]

[KU297],Japan. Honshu. Prov. Rikuzen: Kitagama Seashore. Leg. M. Togashi, 20.5.1967, det. Y. Asahina. Ex S. Kurokawa Lichenes Rariores Et Critici Exsivvati Nr. 297.

Thallus fruticose-filamentous, greenish, shrubby, 3-7 cm long, rarely subpendulous and up to 14 cm long, branching mainly anisotomic-dichotomously with divergent branches. Main branches cylindrical, 0.5-1 mm thick, often foveolate or with transverse cracks especially toward the base, which is greenish to ochraceous. Lateral branches not constricted at attachment point, progressively tapering towards apices. Papillae and tubercles absent; fibrils mainly present on the main branches, spinulose, 1-2 mm long. Soralia punctiform, irregular, occupying less than half the diameter of the branch, originating from the cortex on the lateral branches (in which case they are flat), or from fibercles on the main branches (and then slightly stipitate), finally confluent into large, irregular soralia which cover the entire branch; isidiomorphs numerous in the soralia, 0.1-0.3 mm long, giving the branches a spinulose appearance. Cortex shiny in longitudinal section, moderately thick (6-12% of total branch thickness); medulla heterogeneous, with a compact layer below the cortex, otherwise loose to compact, rather thin (21-26%), wine-red; central axis white to wine-red, of variable thickness (28-34%). Apothecia usually absent. Photobiont chlorococcoid. Spot tests: cortex K-, C-, KC-, P-; medulla K-, C+ yellow-orange, KC+ yellow-orange, P-. Chemistry: cortex with usnic acid; medulla with eumitrin A2 and different fatty acids of the murolic acid complex. Note: a Mediterranean-Atlantic species, found on bark of ancient deciduous and evergreen, isolated trees in semi-natural, open forests subject to frequent humid winds, mostly in the Mediterranean belt.



Usnea mutabilis



Usnea mutabilis

Usnea orientalis Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica (Leopoli) 2: 536, 547 (1937)

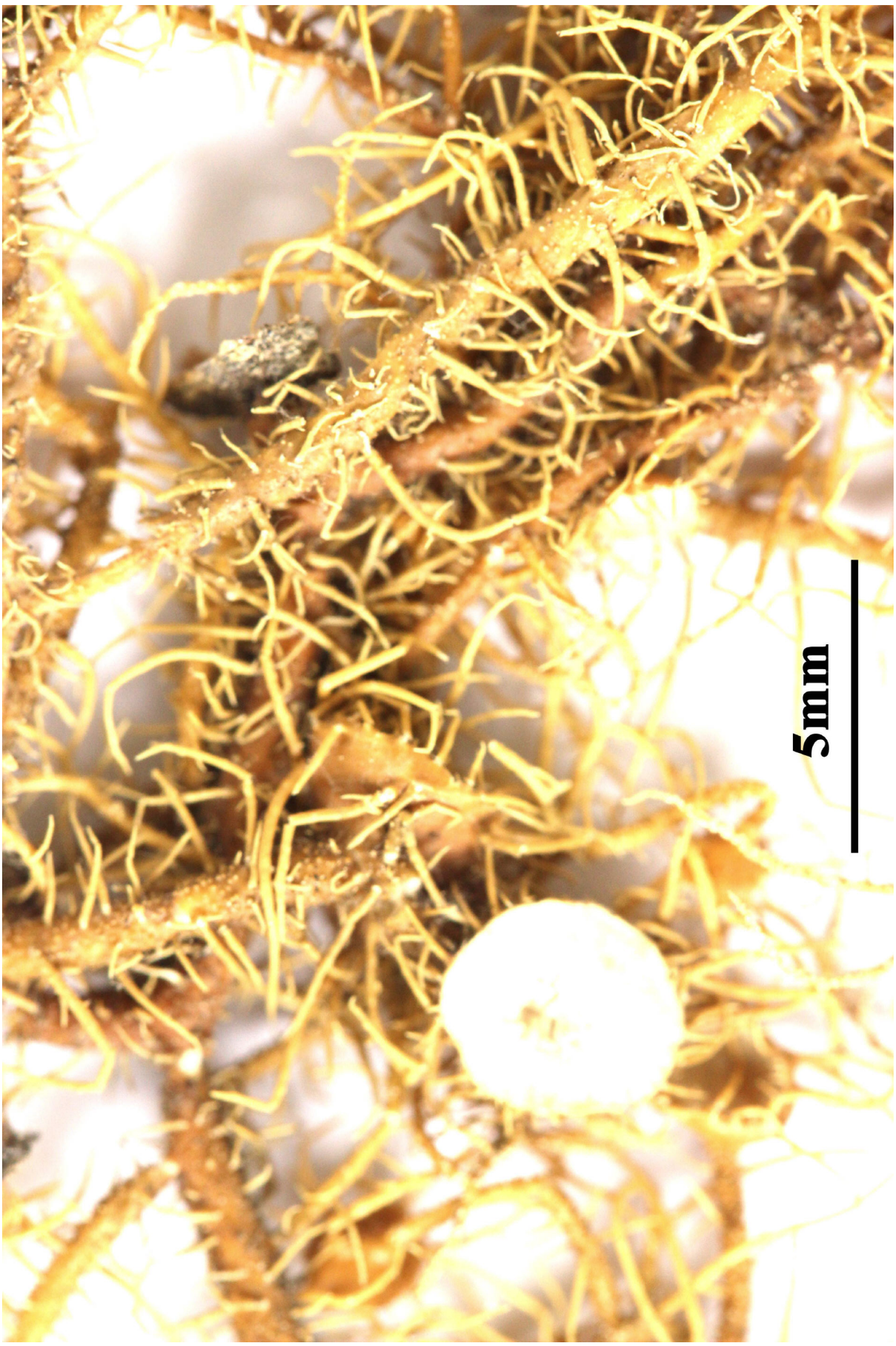
[KU150], Formosa. Prov. Ilan: Mt. Nanfuta-san. On twigs of *Osmanthus bioritsuensis*, 2400-26600 m, Leg. S. Kurokawa (no. 1099), 20.1.1964, det. Y. Asahina. Ex S. Kurokawa Lichenes Rariores Et Critici Exsiccati Nr. 150.

Thallus corticolous, erect, to 6 cm tall, greenish grey, deep yellow to yellowish brown; primary branching dichotomous, subsequent branching sympodial; main branches to 2 mm in diam., somewhat irregularly inflated and annularly cracked; lateral branch lets dense, 2 to to mm long; surface of branches waxy, densely papillate; pseudocyphellae, isidia and soredia absent; cortex single layered; central axis solid, colourless to orange, I-. Apothecia initially lateral becoming terminal, to to mm in diam.; margins densely ciliate; ascospores 10 x 8 µm. Medulla K+ yellow then red, P+ deep yellow. Salazinic acids present. Reported from temperate regions (alt. 21 00-370qrn) of India (Arunachal Pradesh, Manipur, Nagaland, Sikkim, Uttaranchal, West Bengal-Darjeeling District).

Motyka. Lich. Gen. *Usnea* Stud. Monogr. Pars Syst.: 547. 1936-38; G. Awasthi 1986: 377, fig. 73.Type: China, Provo Setschwan austro-occid. In regionis temperatae tergorum supra vicum Fumadi ad flumen Wolo-ho inter Yenyuen et Yungring Cotoneastere. Substr. Calceo et arenaceo; alt. s.m. ca. 3300m. 15.6.1914, *Dr. Heinr. Frh. V Handel-Mazzetti* 3035 (Diar. No. 559) (W-holotype).



Usnea orientalis



Usnea orientalis

Usnea pangiana Stirt., Scott. Natural. 7: 77 (1883)

[OH 397], Japan. Honshu. Prov. Kai (Pref. Yamanashi), Lakeside of Yamanaka, Mt. Fuji. On tree bark. Leg. M. Togashi, 8.7.1967, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 397.

Thallus corticolous, pendulous, 7-15 cm long, rigid, yellowish brown to grey-brown; branching subdichotomous to sympodial; branches convergent; main branches to 2 mm in diam., non-articulate, non-inflated; lateral branch lets sparse to dense, 0.5-2 cm long; surface of branches annularly cracked, verrucose and isidiate-pseudocyphellate; cortex palisadelike, rarely reddish pigmented, central axis solid, colourless, 1-. Apothecia not known. Medulla K + yellow then red, P+ yellow. Barbatic, diffractaic
and salazinic acids present. Reported from lower temperate regions (alt~ 1500-2400m) of India (Assam,
Meghalaya, Nagaland, Sikkim, Uttaranchal, West Bengal-Darjeeling District).



Usnea pangiana

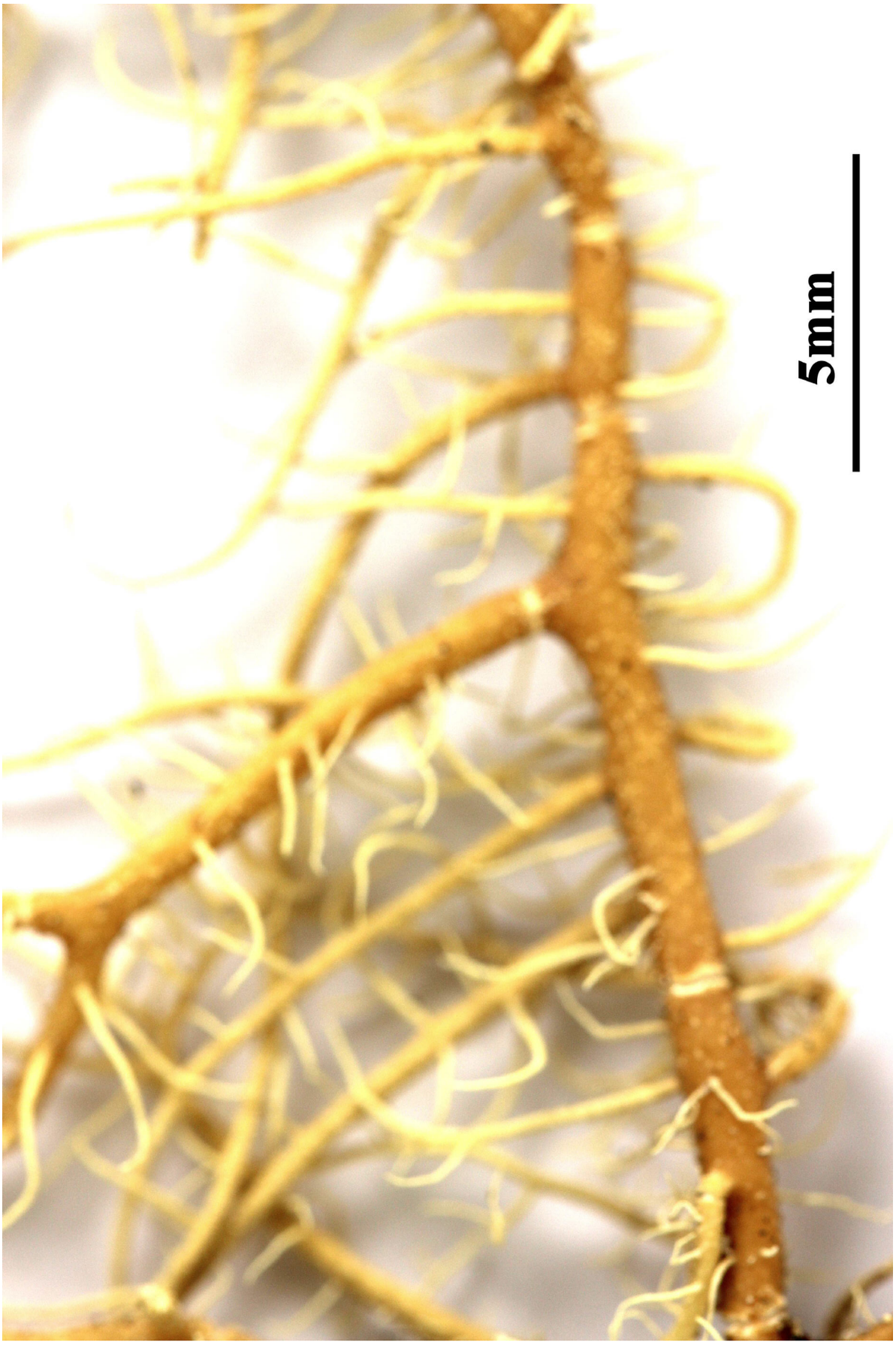


Usnea pangiana

Usnea pangiana Stirt., Scott. Natural. 7: 77 (1883)

[OH550], Japan. Kyushu. Prov. Hyuga (Prf. Miyazaki): Mt. Hirono, Shiiba Research Forest, Kyushu University, Shiiba-son, Higashi-usuki-gun (32°22'30" N, 131°10'41" E). On trunk of *Larix kaempferi*, 1070 m. Leg. Y. Ohmura (no. 11045), 12.11.2014, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR.550.

Thallus corticolous, pendulous, 7-15 cm long, rigid, yellowish brown to grey-brown; branching subdichotomous to sympodial; branches convergent; main branches to 2 mm in diam., non-articulate, non-inflated; lateral branch lets sparse to dense, 0.5-2 cm long; surface of branches annularly cracked, verrucose and isidiate-pseudocyphellate; cortex palisadelike, rarely reddish pigmented, central axis solid, colourless, 1-. Apothecia not known. Medulla K + yellow then red, P+ yellow. Barbatic, diffractaic
and salazinic acids present. Reported from lower temperate regions (alt~ 1500-2400m) of India (Assam,
Meghalaya, Nagaland, Sikkim, Uttaranchal, West Bengal-Darjeeling District).



Usnea pangiana



Usnea pangiana

Usnea pangiana* subsp. *hondoensis (Asahina) Asahina, J. Jap. Bot. 47(5): 134 (1972)
= *Usnea hondoensis* Asahina 1956

[KU200], Japan, Honshu. Prov. Shinano: Daimon Pass, Chiisagata-gun. On trunc of trees, 1400 m. Leg. Y. Asahina et al., 22.5.1959, det. Y. Asahina. Ex A. Kurokawa Lichenes Rariores Et Critici Exsiccati Nr. 200.

Thallus suberect or prostrate, branches dense and caespitose, near the base contiguously annulate cracked, med. white, stupeous Annular cracks distinct, verruculae and tuberculae present but epapillate, med. K+ red (salacinic acid)

Thallus erectus vel subpendulus, fruticulosus, vulgo 5-7cm (rare usque ad 10cm) longus, cinereo viridis, opacus, in herbario post longum tempus sordide fuscescens, ramulis tantum pallidioribus, flavescentibus, basi crassissima, rigida, ad 2mm crassa, non obscurata. Caulis principalis brevis, usque ad 1.8mm crassus, teres, ad basin annulatim fractus, annulis 0.3-0.6 mm longis, fissuris angustis sed prominentibus, caespitoso divergenter ramosus. Rami primarii in parte inferiore eodem modo annulatim fracti sed annulis longioribus, supra increbre dichotome et sympodialiter ramosi, sursum sensim attenuescentes. Omnes rami per totam longitudinem verruculis minutis, in soraliis transientibus crebre sparsi, interdum in parte subapicali congestis, albo pruinoso apparentibus, papillis veris perraris, humilibus vel fere nullis. Ramuli perpendiculares sat frequentes. Apothecia—in typo nulla—rarissima, lateralia, useque ad 5 mm lata, cupuliformia, receptaculo laevi, partim verruculoso, margine incurvo, parce ciliato, ciliis 1-3mm longis. Hymenijum 80z altum, cortex receptaculi 80 µm crassum, hypothecium una cum excipulo 80 µm crassum, sporae ellipsoideae, 10 x 6 µm magnae. Soredia isidiosa, ad verrucula nascentia. Cortex mollis, inaequalis, infra incisus, 70-150 µm crassus; medulla crebra, 100-330 µm crassa, alba; axis deformatulus, hyphis fuscidulis interstinctis, 30-45%; diametri ramorum occupans. Reaction.: med. K+mox rubens, P+ lutescens. Mat. chim. propr.: acidum usnicum, salacinicam et non semper barbaticum, quod materia secundaria est. Distributio: Hokkaido. Hondo borealis et media. Formosa.



Usnea pangiana* subsp. *hondoensis



Usnea pangiana* subsp. *hondoensis

Usnea pectinata Taylor**,** London J. Bot. 6: 191 (1847)
= *Eumitria pectinata* (Taylor) Articus, Taxon 53(4): 932 (2004)
= *Usnea misaminensis* (Vain.) Motyka, Usnea 2: 418 (1937)

[KU347], Thailand. Phu Kradung. On bark of trees, 1200-1300 m. Leg. S. Kurokawa (no. 1888), 25.2.1964, det. Y. Asahina. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR.347.

Thallus ca. 30 em longus, pendulus, ‘mollis, stramineo uniformiter pallidus,´opacus, glaber, basi sat distinctum, rigida, prope basin crebrius, alibi rarissime ramosus, axillis subrectis, ramis arcu gracioso pendentibus, infra subparallelis.Rami prope basin ca. 0.6 mmcrassi, infra sensissime regulariter attenuescentes et fere capillacei, longe paulo flexuosi, teretes aut indistinetissime deformatuli, exacle laeves, crassiores indistincte annulatim et etiam, sed minus crebre, areolatim fracti, fissuris paulo profundis, mox regeneratis, tenuiores omnino conlinui. Ramuli crebri, tenues, 1-3 cm longi, patentes, graciose attenuescentes et dein fere capillacei, glabri et subnitidi, exacte laeves. Summitates indistinctae. Apothecia non rara, ad ramulos sublarealiter sita, parvula, 5 mm lata. Excipulum paulo convexum, opacum, leviter deforematulum, cilio longo vulgo adivatum. Cilia marginalia pauca sed valde, ultra 1 cm longa, tenuia, thallinis simila. Discus fere planus, carneo fuscus indistincte tantum pruinosus, Hymenium ca. 70µm altum. Epithecium fuligineum, Sporae 6-7 x 9-10 µm, inascis sat inflatis. Cortex ca, 30 µm crassus, extus viridulus, mollis. Medulla ca. 70 µm crassa, crebra, alba, K indistincte lutescens. Axis ca. 300 µmcrassus, hyphis sordidis parce intersrinctusm I coerulescens. (EX J. MOTYKA,1938: LICHENUM GENERIS USNEA STUDIUM MONOGRAPHICUM. PARS SYSTEMATICA)



Usnea pectinata



Usnea pectinata

Usnea rubescens Stirt., Scott. Natural., N.S. 1 ('7'): 76 (1883) [1883-1884]
= *Usnea rubrotincta* Stirt., Scott. Natural. 6(3): 103 (1881) [1881-1882]
Motyka, Monogr., p. 346. Asahina, J. Japan. Bot., 28: 225 (1953).

[KU299], Japan. Honshu. Prov. Kii: Mt. Koya. Leg. Y. Asahina, 23.8.1952, det. Y. Asahina. EX S. KUROKAWA LICHENES RARIORES ET CRITICI EXSICCATI NR. 299.

Thallus pendulous, up to 30cm, in general ca. 15c¢m long, flexible, totally rubiginous or variegated with ash grey, base 1-1.5mm thick, pale brown. Principal stem beneath cracked annulate, readily dichotomously branched, primary branches a few times sympodially branched, secondary branches almost parellel and densely clustered with 0.2-1.0 cm long, perpendicular fibrils. All branches in the thicker part dispersed with sorediose verrucae or tubercles, among which indistinct papillae are rarely seen. Apothecia rare, orbicular, up to 8mm wide, ciliate, dise ochre yellow, white pruinose. Cortex of thallus 100-150 μm thick, stiff, in the middle part interwoven with rubiginous hyphae; medulla white, dense, 120-200 μm thick, hyphae 4 μm thick, which deposit whitish substance insoluble in alkali around the axis; axis 300~760 μm thick, deformed, in the transverse section spots of darker hyphae and fissures are seen. . Cortex of receptaculum 60 μm thick, medulla 150 μm thick, hyphae of the medulla deposit calcium oxalate in dense mass, gonidia under the subhymenial layer and inside of the cortex. Hymenium 55-60 μm high, hypothecium together with excipulum 40 μm thick, paraphyses conglutinate, 2 μm thick; ascus 8-spored; spores ellipsoid, 8 x 64 μm large, membrane thin. Reaction.: med. K+flavens, mox rubescens, P+lutescens. Mat. chim. propr.: acidum usnicum, norsticticum et salacinicum. Distributio: Hokkaido, Hondo, Shikoku, Kiusiu. Formosa.

U. var. *rubrotincta* (Stirt.)) Mot. in Monogr., p. 348. Thallus 4-6 (-8)cm long, erect or prostrate, base up to 1.2mm thick, principal stem repeatedly dichotomously branched and soon attenuated, without extending to hanging branches. Otherwise identical with the type, occurs often mixed with the type. Distributio: the same with the type.
Usnea rubescens is distinguished from Usnea rubicunda not only by the medullary reaction but also by the excurrent type of branching



Usnea rubescens



Usnea rubescens

Usnea rubicunda Stirt., Scott. Natural. 6(3): 102 (1881) [1881-1882]

[OH398], Japan. Honshu. Prov. Yamato (Pref. Nara): Dohgawa, Tenkawa-mura, Yoshino-gu. On tree Bark. Leg. M. Togashi, 12.6.1952, det. Y. Ohmura. - TLC Usnic acid, Nordtictic acid, Menegazziaic acid, Stictic acid, Constictic acid, anal. Y. Ohmura 2010. - EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 398.

Thallus fruticose-filamentous, reddish-brown at least in basal parts, otherwise greenish-grey with red-brown flecks at least in basal parts, at first shrubby, later becoming subpendulous, (3-)5-15(-20) cm long, branching anisotomic-dichotomously with divergent branches. Main branches up to 2 mm thick, not inflated, frequently transversally or longitudinally cracked, the basal parts darker or concolouruos, with conspicuous annular cracks; lateral branches not constricted at attachment point. Papillae absent to numerous but usually indistinct on main branches; tubercles absent to numerous on main and secondary branches, usually absent on terminal branches, short and verrucose, sometimes eroded at top; fibrils nearly absent to numerous, short and spinulose to long and slender, irregularly distributed on the whole thallus. Soralia punctiform, irregular in outline, even or slightly stipitate, flat to erumpent, developing initially from the cortex (on the whole thallus) or on top of tubercles (on main branches), or on fibercles (on the main and secondary branches), covered in abundant, clustered isidiomorphs. Cortex moderately thick to thick (9-13% of total branch thickness), shiny to vitreous in longitudinal section; medulla white, dense to compact; central axis white, rather thick (40-56%). Apothecia very rare, lecanorine. Asci 8-spored, Lecanora-type. Ascospores 1-celled, hyaline, ellipsoid. Photobiont chlorococcoid. Spot tests and chemistry: cortex K-, C-, KC-, P-, with usnic acid; medulla with 2 chemotypes: 1) K+ yellow slowly turning orange, C-, KC-, P+ deep orange, with stictic acid (main) and norstictic and psoromic acids (accessory); 2) K+ yellow turning red, C-, KC-, P+ orange, with salazinic acid (main) and norstictic acid (accessory). Note: a mild-temperate, chiefly Mediterranean-Atlantic species found on ancient specimens of *Quercus cerris, Q. suber*, and other acid-barked broad-leaved trees in open, but semi-natural, warm-humid forests below the montane belt.



Usnea rubicunda



Usnea rubicunda

Usnea rubicunda Stirt., Scott. Natural. 6(3): 102 (1881) [1881-1882]

[OH348], Australia. Queensland: Beechmont. On bark of trees, 540 m. Leg. Kurokawa (no 5537], 2.11.1965, det. Y. Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 348.

Thallus shrubby to straggly, erect to subpendulous, 6–15 (–30 cm) long, mottled green and red to shades of red only; branching subdichotomous to irregular; base black; trunk cracked, pale to red; branches terete, 0.5–1.0 mm wide; branchlets numerous; fibrils dense, rarely sparse, 3–5 mm long, with or without pseudocyphellae; papillae, if present, numerous and small, usually on primary and/or secondary branches only. Isidia arising directly from cortex or erupting from pseudocyphellae, sparse to dense, short; pseudocyphellae small, plane or punctiform and raised, becoming large with eruption of isidia; soralia absent. Cortex thick, glassy in appearance. Medulla dense; axis 1/2–3/4 width of branch, hyaline. Apothecia uncommon, terminal on small lateral branches, to 4 mm diam.; disc plane; fibrils sparse on margin; lower surface with fibrils, with or without isidia. Ascospores 8–10 × 5–6 µm. CHEMISTRY: Cortex containing usnic acid. Medulla K+ yellow; containing stictic acid (major), constictic acid (minor), norstictic acid (minor), menegazziaic acid (trace), cryptostictic acid (trace) and ±gyrophoric acid (trace). Occurs in Australia, grows on bark in rainforest and open forest, on fence posts; rarely on rocks. Cosmopolitan.



Usnea rubicunda



Usnea rubicunda

Usnea rubrotincta Stirt., Scott. Natural. 6(3): 103 (1881) [1881-1882]

[OH575], Japan. Honshu. Prov. Yamato (Pref. Nara): Ryusenji Temple, Dohgawa, Yoshino-gun. On bark of *Cryptomeria japonica*, 850 m. Leg-M. Togashi, 12.6.1952, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 575.

Thallus fruticose, sub-pendent, up to 4 cm long, red to reddish brown when fresh, pale to dark brown at the base; branching anisotomic-dichotomous; branches terete, uninflated, less than 1.5 mm in diam., gradually tapering, papillate, lacking pseudocyphellae and maculae; abundant fibrils and lateral branches, lateral branches cylindrical at the base; soralia common, formed mainly on thicker branches, developed from scars of detached fibrils or lateral branches, discrete, round, smaller than branch diam., sessile, lacking granular soredia; cortex thick, 13~18% of the radius, the ceratina-type plectenchymatous cortex, red pigmented; axis solid, 46~47% of the radius; apothecia not seen Chemistry**:** Cortex K−, C−, KC−, P−; medulla K+ (yellow to red), C−, KC−, P+ (orange); TLC: norstictic acid, salazinic acid, and usnic acid. Remarks**:** *U. rubrotincta* is the only species reported so far with red pigmented cortex in South Korea. The species is characterized by an erect to sub-pendent thallus with anisotomic dichotomous branching and the presence of a red pigment in the cortex, formation of sinuose soralia on lateral branches and fibrils, the ceratina-type plectenchymatous cortex, salazinic or stictic acids as the major substance, and the absence of granular soredia. **Ecology and distribution:** *U. rubrotincta* was recorded from a granite rock surface at Mt. Dalma . According to Asahina and Ohmura , this species is widely distributed in temperate regions of Asia, Europe, Africa, and South America.



Usnea rubrotincta



Usnea rubrotincta

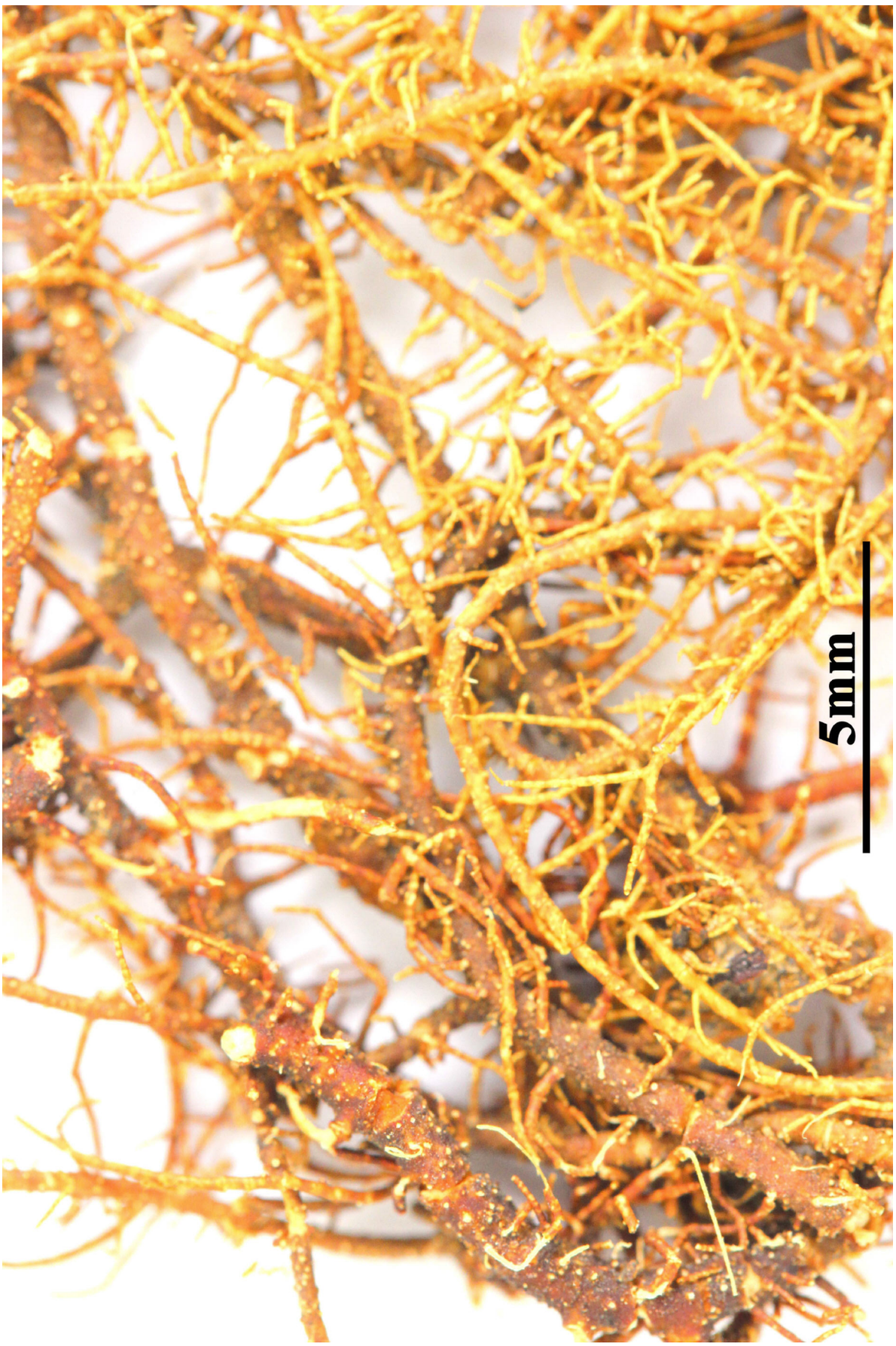
Usnea rubrotincta Stirt., Scott. Natural. 6(3): 103 (1881) [1881-1882]

[OH700], Formosa (Taiwan), Chiayi Prov. Nimandaira, Mt. Alishan. On tree bark. Leg. Y. Asahina (no. F286a), 25.12.1925, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 700.

Thallus fruticose, sub-pendent, up to 4 cm long, red to reddish brown when fresh, pale to dark brown at the base; branching anisotomic-dichotomous; branches terete, uninflated, less than 1.5 mm in diam., gradually tapering, papillate, lacking pseudocyphellae and maculae; abundant fibrils and lateral branches, lateral branches cylindrical at the base; soralia common, formed mainly on thicker branches, developed from scars of detached fibrils or lateral branches, discrete, round, smaller than branch diam., sessile, lacking granular soredia; cortex thick, 13~18% of the radius, the ceratina-type plectenchymatous cortex, red pigmented; axis solid, 46~47% of the radius; apothecia not seen Chemistry**:** Cortex K−, C−, KC−, P−; medulla K+ (yellow to red), C−, KC−, P+ (orange); TLC: norstictic acid, salazinic acid, and usnic acid. Remarks**:** *U. rubrotincta* is the only species reported so far with red pigmented cortex in South Korea. The species is characterized by an erect to sub-pendent thallus with anisotomic dichotomous branching and the presence of a red pigment in the cortex, formation of sinuose soralia on lateral branches and fibrils, the ceratina-type plectenchymatous cortex, salazinic or stictic acids as the major substance, and the absence of granular soredia. **Ecology and distribution:** *U. rubrotincta* was recorded from a granite rock surface at Mt. Dalma . According to Asahina and Ohmura , this species is widely distributed in temperate regions of Asia, Europe, Africa, and South America.



Usnea rubrotincta



Usnea rubrotincta

Usnea subintumescens* f. *olivaceoviridis Asahina, J. Jap. Bot. 47(5): 129 (1972)

[KU300], Japan. Honshu. Prov. Shinano: Nakamichi, Izumino-mura, Suwa gun. Leg. Y. Asahina and M. Togashi, 4.5.1948, det. Y. Asahina. Ex S. Kurokawa Lichenes Rariores Et Critici Exsiccati Nr. 300.



Usnea subintumescens* f. *olivaceoviridis



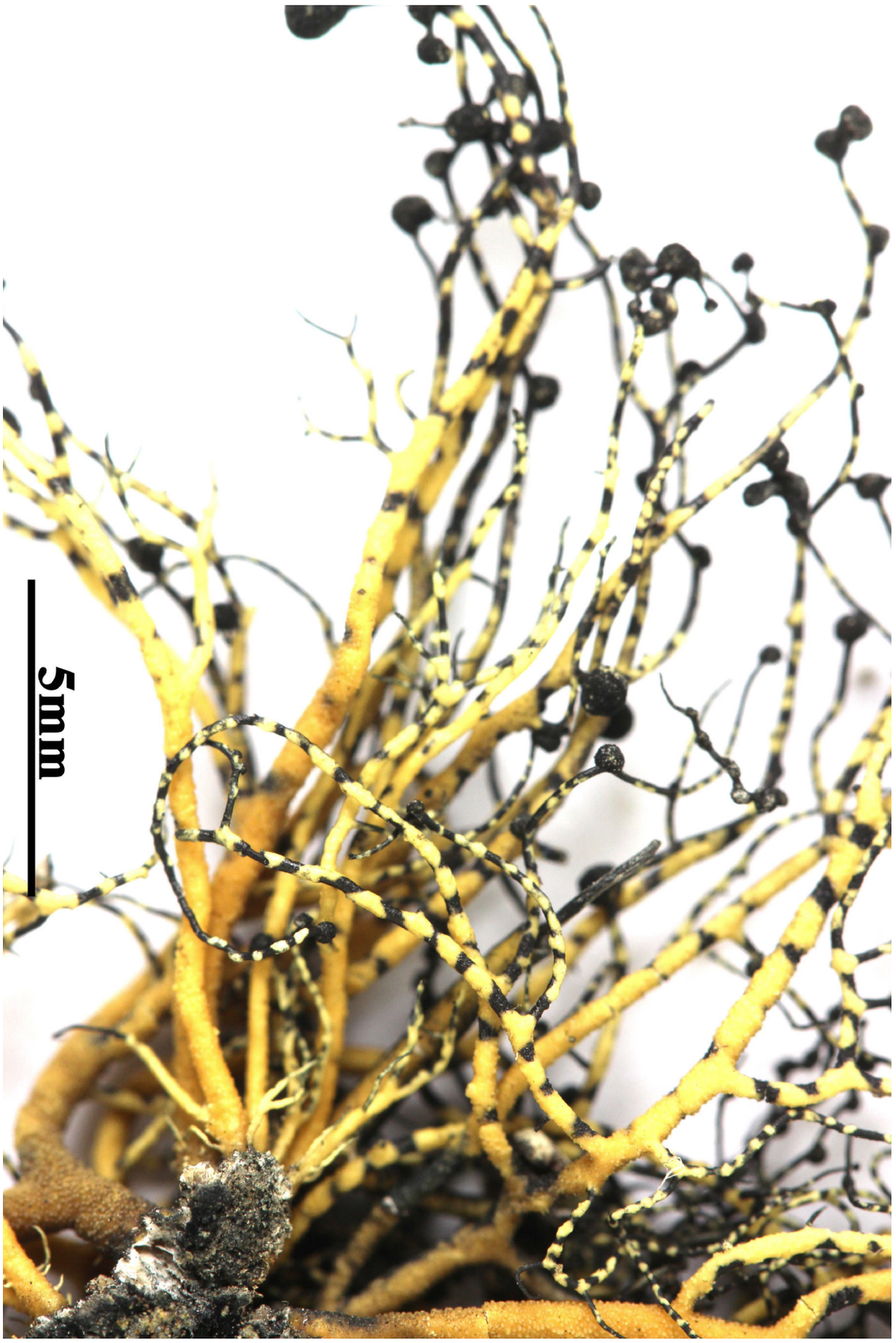
Usnea subintumescens* f. *olivaceoviridis

Usnea sphacelata R. Br., Chloris Melvilliana: 49 (1823) [1821]

[KU700], Svalbard. Spitzbergen. Breinosa, 10 km SE of Longyearbyen. On rocks, 300-500 m. Leg. Kashiwadani (no. 232521), 6.8.1985, det. H. Kashiwadani. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 700.



Usnea sphacelata

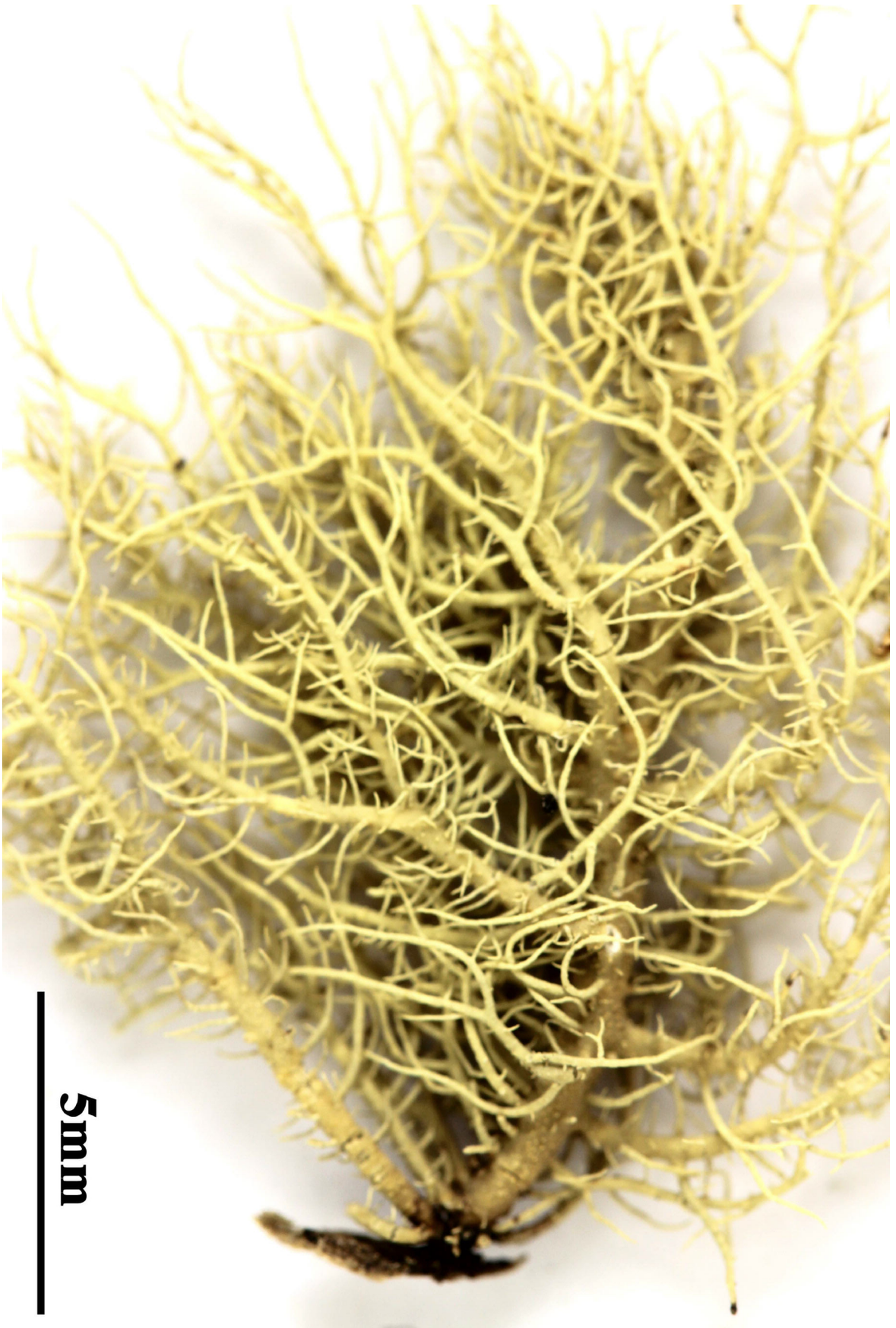


Usnea sphacelata

Usnea subfloridana Stirt., Scott. Natural. 6: 294 (1882) [1881-1882]

[OH498], Japan. Honshu. Prov. Shinano (Pref. Nagano): Azusayama, Kawakami-mura, Minamisaku-gun (35°57' N, 138°40' E). On bark of fallen wood, 1420 m. Leg. Y. Ohmura (no. 8678), K. Yoshida & A. Frisch, 28.5.2013, det. Y. Ohmura. - TLCUsnic acid, Thamnolic acid, anal. Y. Ohmura. - EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 498.

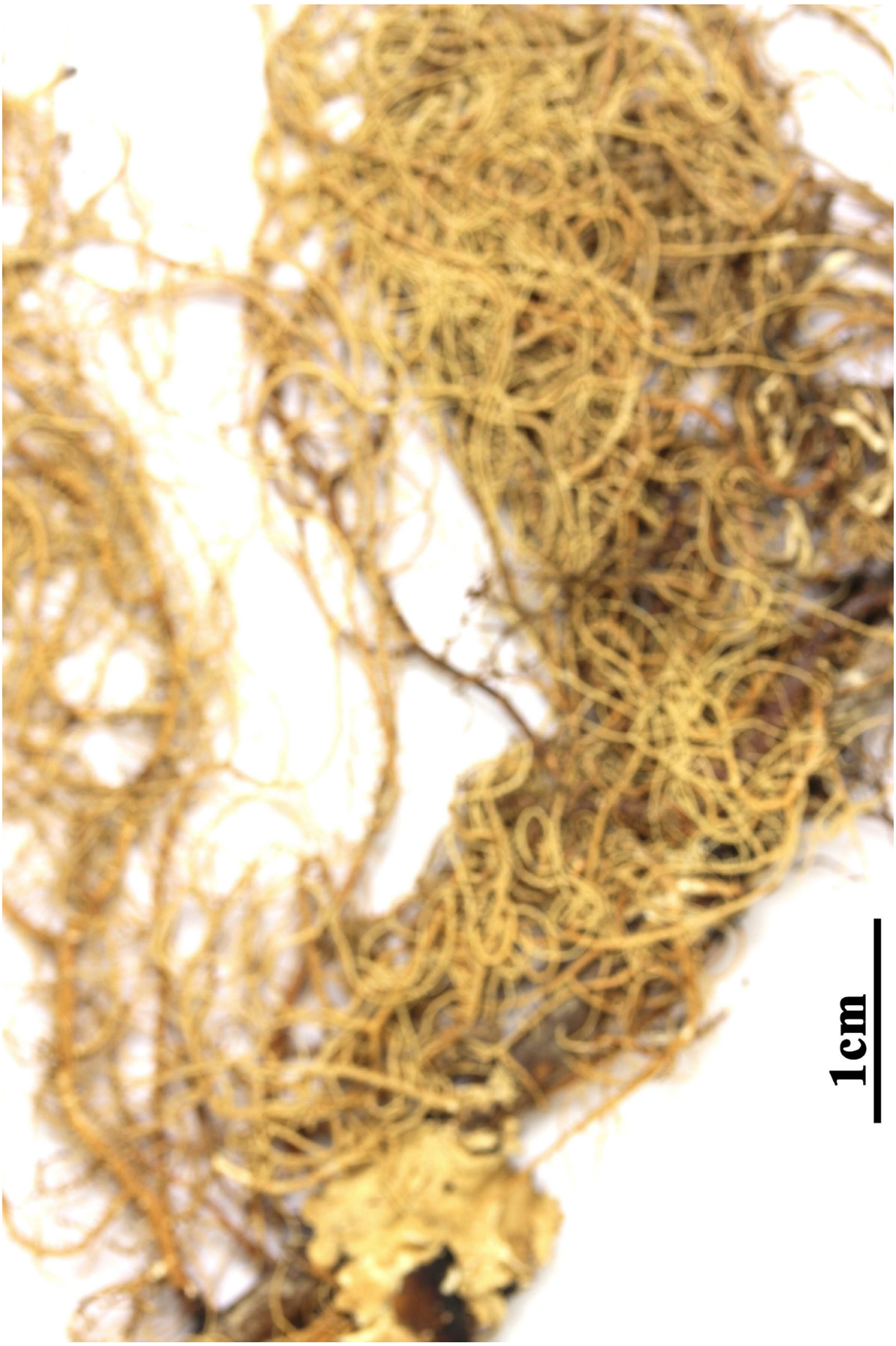
Thallus fruticose-filamentous, greenish, shrubby to subpendulous, 3-15(-20) cm long, richly and mainly isotomic-dichotomously branching, with divergent branches, very rarely pendulous and with subparallel branches. Main branches to 1.5 mm thick, tapering, the base blackened, the jet black pigmentation restricted to the very base, with few annular cracks; secondary branches not narrowed at attachment point. Papillae few to numerous, verrucose; fibrils few, not conspicuous, more abundant near the base and sparse terminally, not arranged in a fish-bone pattern. Soralia typically punctiform, <50% of the branch diameter, of irregular shape, flat to slightly stipitate, more rarely fusing together and looking like a large soralium or enlarging ± isodiametrically and then >50% of the branch diameter, of irregular shape, slightly excavate; isidiomorphs always present, usually numerous and conspicuous. Cortex rather thick (8-12% of branch thickness), matt in longitudinal section; medulla white, thin (11-20%), dense to compact; central axis white, moderately thick (36–56%); ratio central axis/medulla (1.5-)2-5.3. Apothecia very rare. Photobiont chlorococcoid. Spot tests and chemistry: cortex K-, C-, KC-, P-, with usnic acid; medulla with three chemotypes: 1) K+ bright lemon yellow slowly turning orange, P+ rapidly yellow-orange, with thamnolic acid (major); 2) K-, P-, UV+ whitish blue, with squamatic acid (major); 3) K+ bright lemon yellow slowly turning orange, P+ yellow-orange, UV+ whitish blue with both squamatic and thamnolic acids; alectorialic acid may occur as an accessory substance, especially in the apothecia (the disc reacting P+ yellow). Chemotype 1) is by far the most frequent. Note: on branches of trees in relatively closed forests (but then in the upper parts of the crowns), and on isolated trees, one of the few species of Usnea which, albeit with stunted specimens, is also found at low altitudes and in relatively disturbed habitats. Already Seaward & Hitch (1982) considered this as the “secondary” species of *U. florida*, and molecular data do not support the distinction between the two species (Articus & al. 2002, see also Degtjarenko & al. 2020).



Usnea subfloridana

Usnea tenuis Motyka, Lichenum Generis Usnea Studium Monographicum. Pars Systematica (Leopoli) 2: 306, 329 (1937)

[KU349], Mexico. Monte Ovand. Leg. E. Matuda, 3.1.1925, det. Y. Asahina. EX S. KUROKAWA AND H. KASHIWADANI LICHENES RARIORES ET CRITICI EXSICCATI NR. 349.



Usnea tenuis



Usnea tenuis

Usnea torquescens* var. *asahinae (Motyka) Asahina, J. Jap. Bot. 46(9): 262 (1971)
= *Usnea asahinae* Motyka 1937

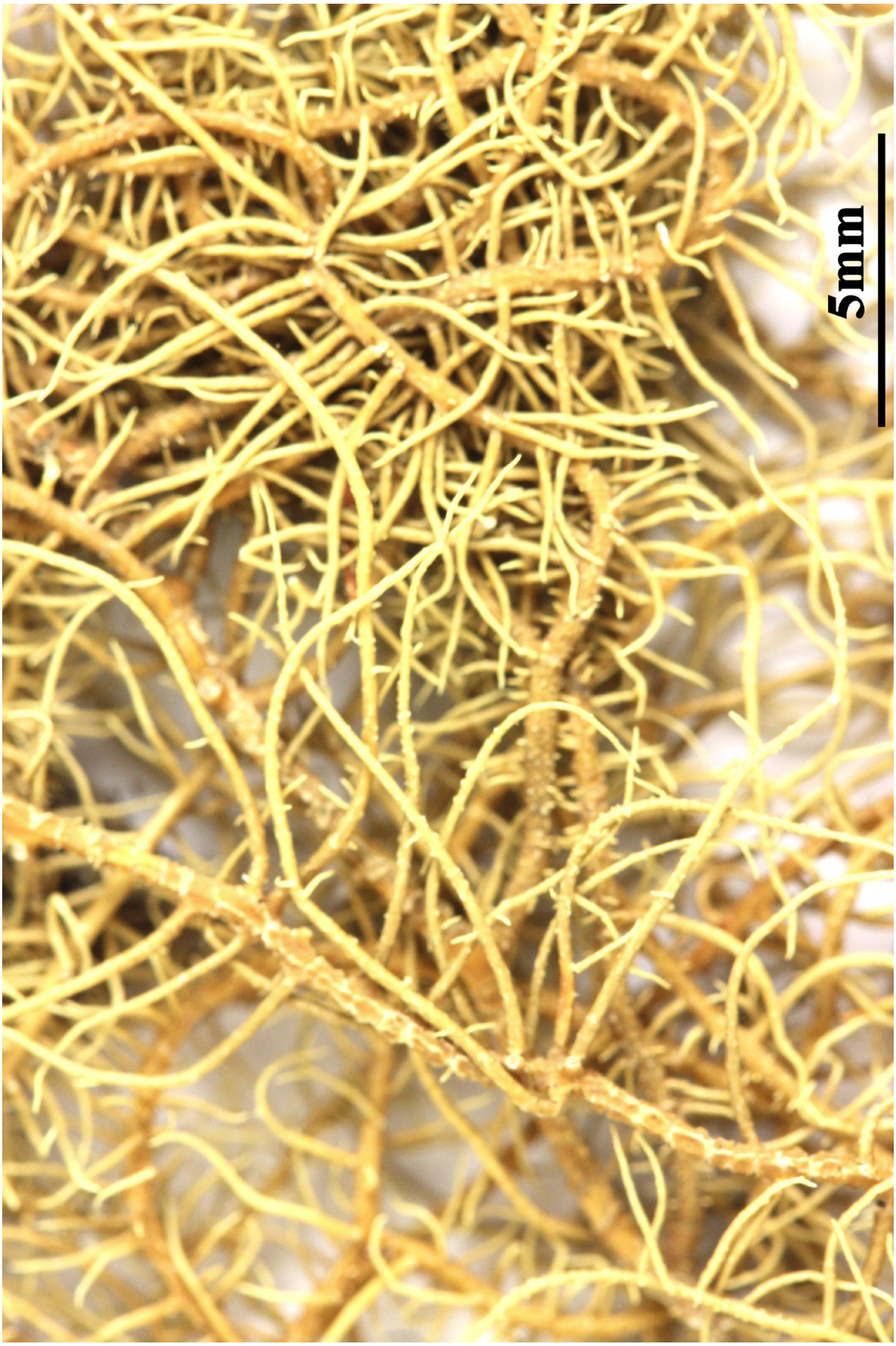
[KU550], Japan. Honshu. Prov. Kai: Lake-side of Yamanak, Mt. Fuji. On bark of Picea polita, 1000 m. Leg. Y. Asahina, 16.8.1952, det. Y. Asahina. Ex S. Kurokawa and H. Kashiwadani Lichenes Rariores Et Critici Exsiccati Nr. 550.

Thallus long, pendulous, glaucous or pale yellowish green, mat. Primary base very rare and doubtful, secondary bases frequent. Well grown primary branches up to 1.2mm, generally 0.6-0.7 mm thick, secondary branches at longer intervals. All branches distinctly tortuous, surface glabrous but lacunose, costate rugose, 4-5 angulate in the section, edges of angulation serrulate and often cracked, without papillae. Apical portion of all branches are almost smooth, angular edges being blunt. Fibrils frequent, patent, 0.5-1.5 (or more) cm long, growing from the angular edges, almost smooth, rarely with indistinct verruculae. Apothecia and soredia not seen. Cortex 30-60-90 µm thick, rather soft; medulla dense, 30-130 µm thick; axis solid, compressed, 40 x 60 µm thick. Reaction.: med. K+mox rubens, P lutescens. Mat. chim. propr.: acidum usnicum, norsticticum et materia alba

Distributio: Mt. Takao, Prov. Musashi (locus classicus); in Silvis Mt. Fuji, Prov. Kai; Mt. Koya, Prov. Kii.



Usnea torquescens* var. *asahinae



Usnea torquescens* var. *asahinae

Usnea wasmuthii Räsänen, Die Flecht. Estl. 1: 19 (1931)

[OH499], Japam. Honshu. Prov. Shinano (Prf. Nagano): Azusayama, Kawakami-mura, Minamisaku-gun (35°57' E, 138°40' E). On bark of fallen wood, 1420 m. Leg. Y. Ohmura (no. 9677), K. Yoshida & A. Frisch, 28.5.2013, det. Y. Ohmura. - TLC Usnic acid, Barbatic acid, Salazinic asid, anal. Y. Ohmura, 2013 - Ex Y. Ohmura Lichenes Minus Cogniti Exsiccati Nr. 499.

Thallus fruticose-filamentous, greenish, shrubby to rarely subpendulous, 3-7(-10) cm long, richly isotomic dichotomously branching, with divergent branches. Main branches cylindrical-tapering, 0.6-1.8 mm thick, the base black, with a few transverse cracks and usually also with tiny, lenticular, longitudinally oriented cracks visible at high magnification. Lateral branches not constricted at attachment point. Papillae few to numerous on the main branches, verrucose; tubercles rare to abundant on the main branches; fibrils few to numerous, especially in basal parts, slender, 2-4 mm long. Soralia conspicuous, well-delimited, at first punctiform, then lenticular and longitudinally oriented when mature, larger than half the branch diameter, flat (even with cortex) to more or less excavate, developing from the cortex or from the top of eroded tubercles in the apical branches; isidiomorphs usually present on young punctiform soralia (abraded in older ones), but inconspicuous and difficult to observe, up to 0.15 mm long. Cortex moderately thick to thick (8-12% of the total branch thickness) matt to slightly shiny in longitudinal section; medulla thin (10-18%), dense to compact, white; central axis thick (43-60%), white; ratio axis/medulla 1.5–5.3. Apothecia usually absent. Photobiont chlorococcoid. Spot tests and chemistry: cortex K-, C-, KC-, P-, with usnic acid; medulla with 5 chemotypes (only major substances specified here): 1) K-, P-, with barbatic acid; 2) K+ red, P+ yellow to orange, with salazinic acid; 3) K+ red, P+ yellow to orange, with both barbatic and salazinic acids; 4) K+ bright yellow, P+ orange, with thamnolic acid; 5) K-, P-, without medullary substances; different accessory compounds (protocetraric, 4-O-demethylbarbatic, psoromic acids) may occur in chemotypes 1) and 2), squamatic acid in chemotype 4). - Note: ecologically similar to *U. florida*, but more frequent at lower altitudes in warm-humid areas.



Usnea wasmuthii



Usnea wasmuthii

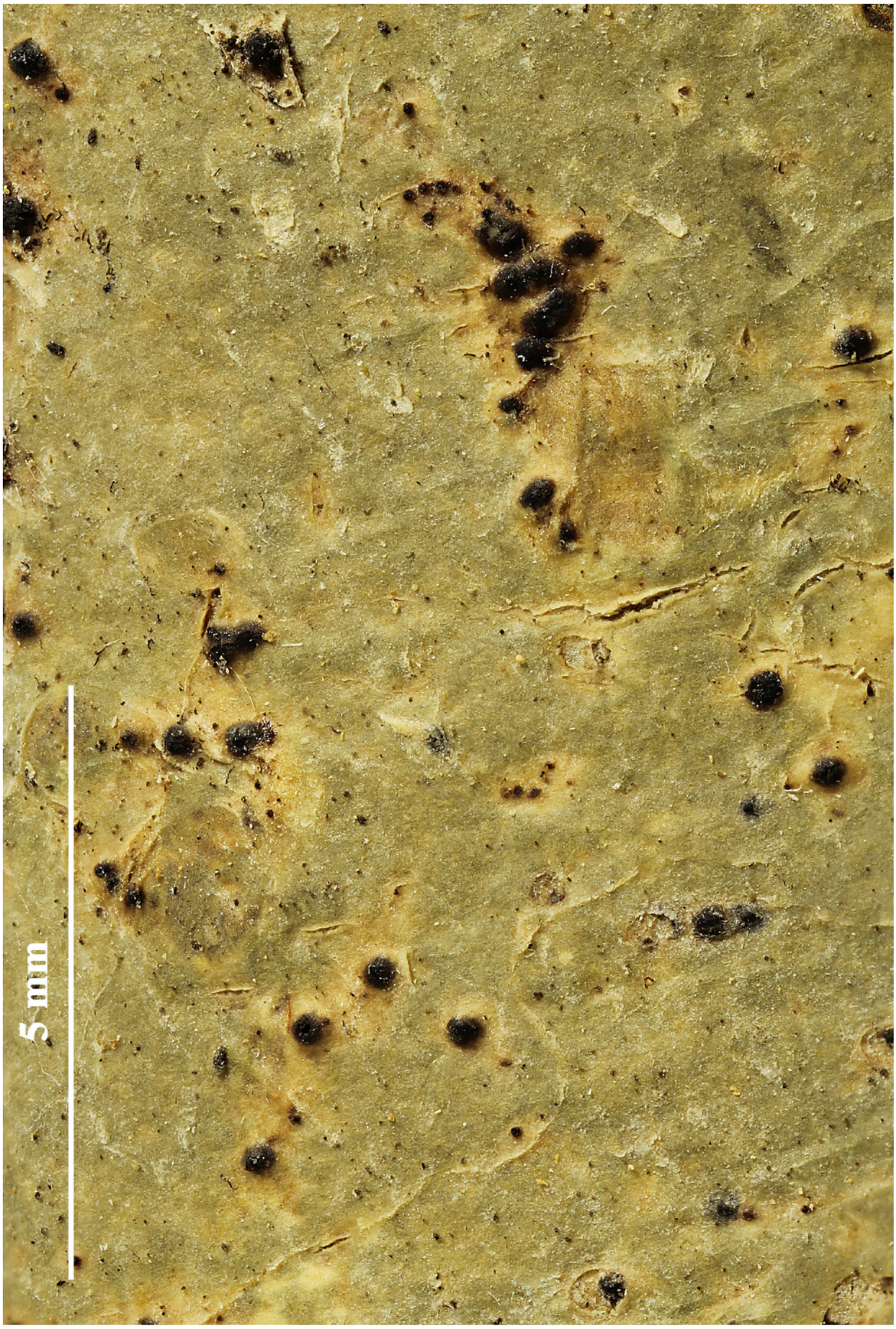
Viridothelium virens (Tuck. ex Michener) Lücking, M.P. Nelsen & Aptroot, in Lücking et al., Lichenologist 48(6): 759 (2016)

= *T*rypethelium eluteriae var. virens (Tuck.) Trevis., Flora, Regensburg 44: 20 (1861)

= *Trypethelium virens* Tuck. ex E. Michener, in Darlington, Fl. Cestrica, Edn 3 (Philadelphia): 453 (1853)

[ABL Harris 19352], USA, Hamilton County, Long Point, Raquette Lake, upland hardwoods, on Fagus. Leg. et det. R.C. Harris 6.9.1986

Thallus corticate, olive-green to yellowish, smooth to uneven. Ascomata trypethelioid, with apical ostioles, pseudostromatic; pseudostromata 0.6–1.5 mm diam., immersed-erumpent, with the upper parts of individual ascomata exposed and dark brown. Hamathecium clear. Ascospores 8/ascus, 7–11-septate, fusiform, 38–52 × rather thin septa, hyaline, IKI+ weakly violet. Chemistry: Thallus and pseudostromata UV-, K-, TLC no substances detected.



Viridothelium virens



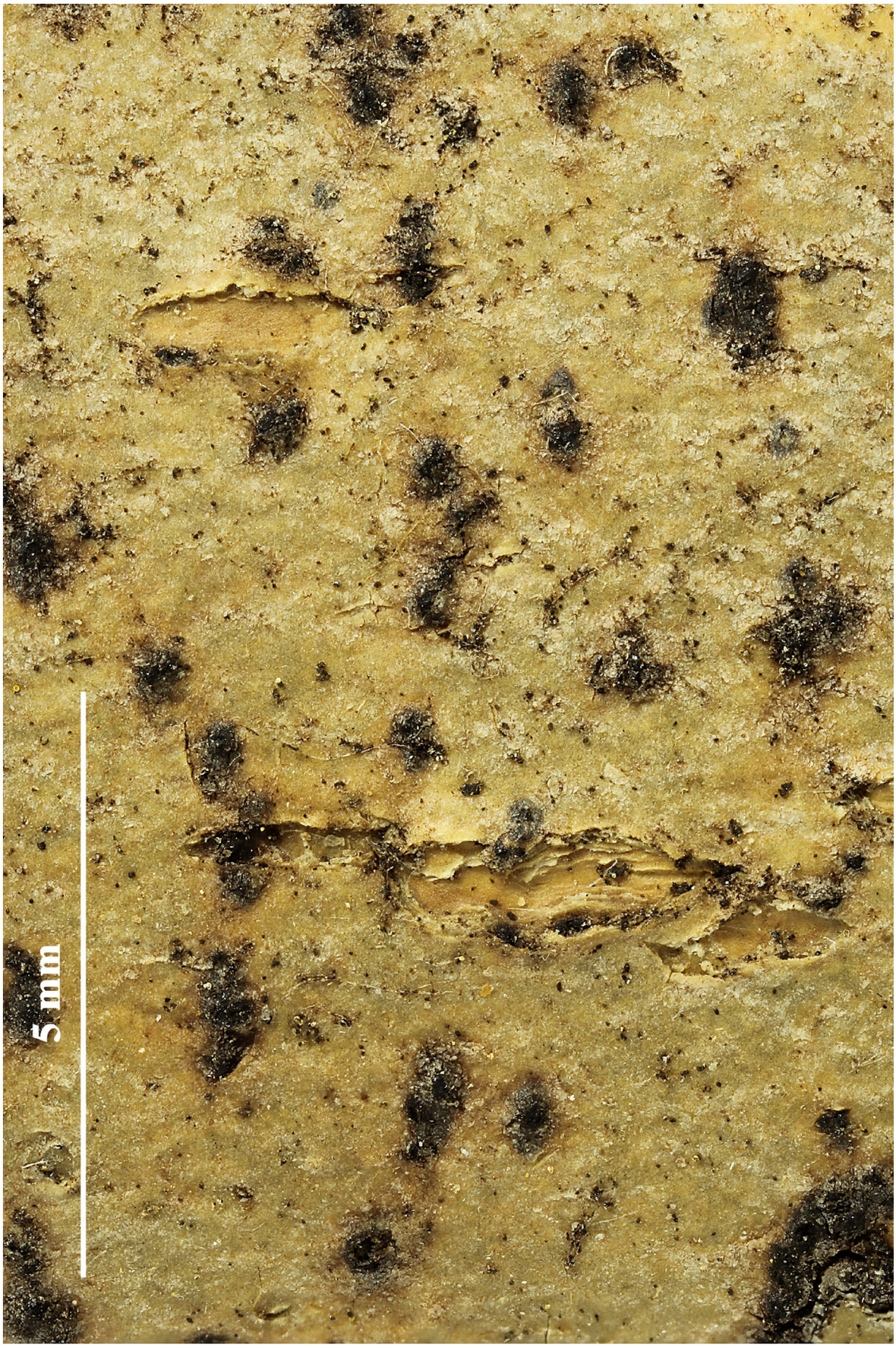
Viridothelium virens



Viridothelium virens



Viridothelium virens



Viridothelium virens



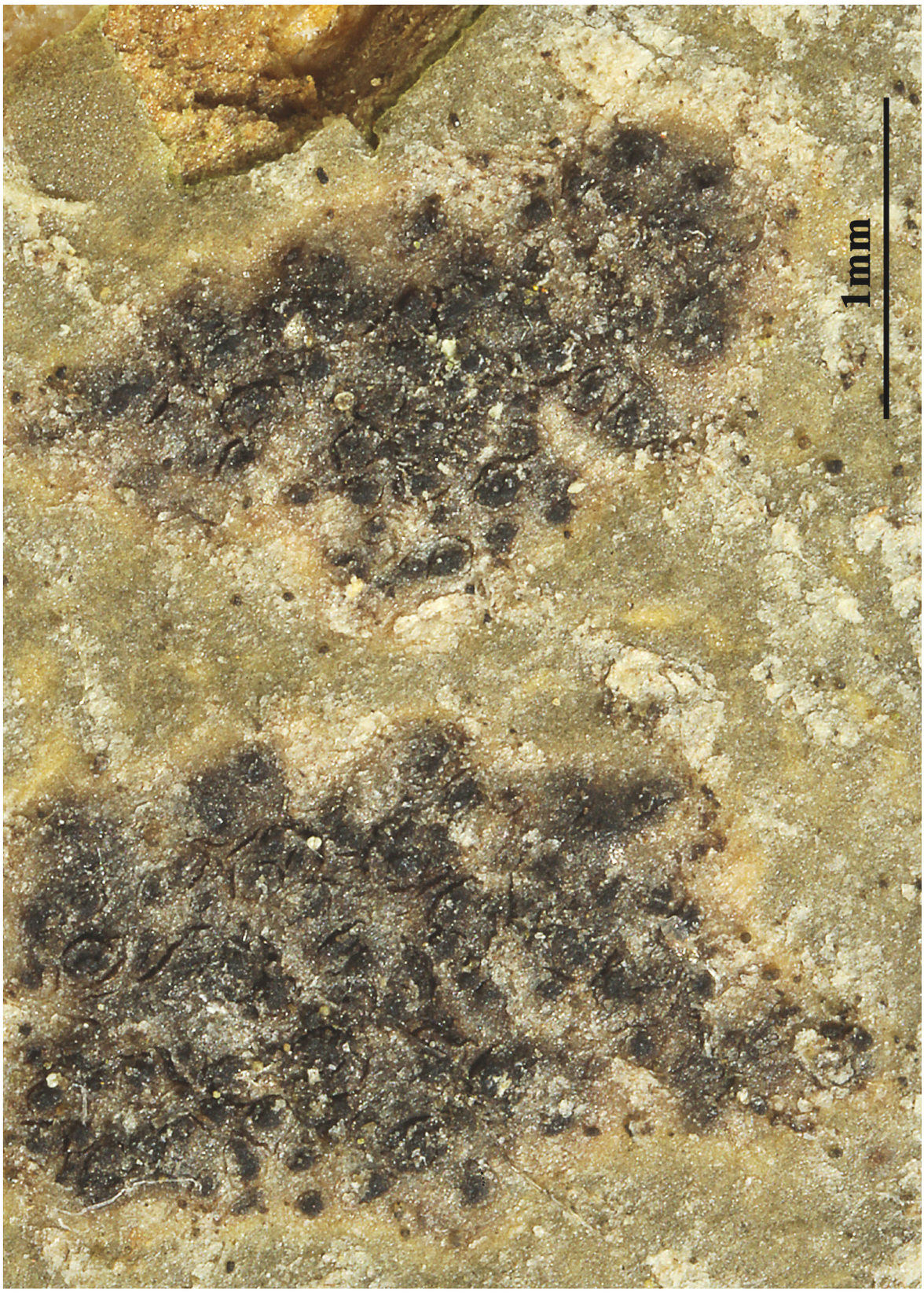
Viridothelium virens



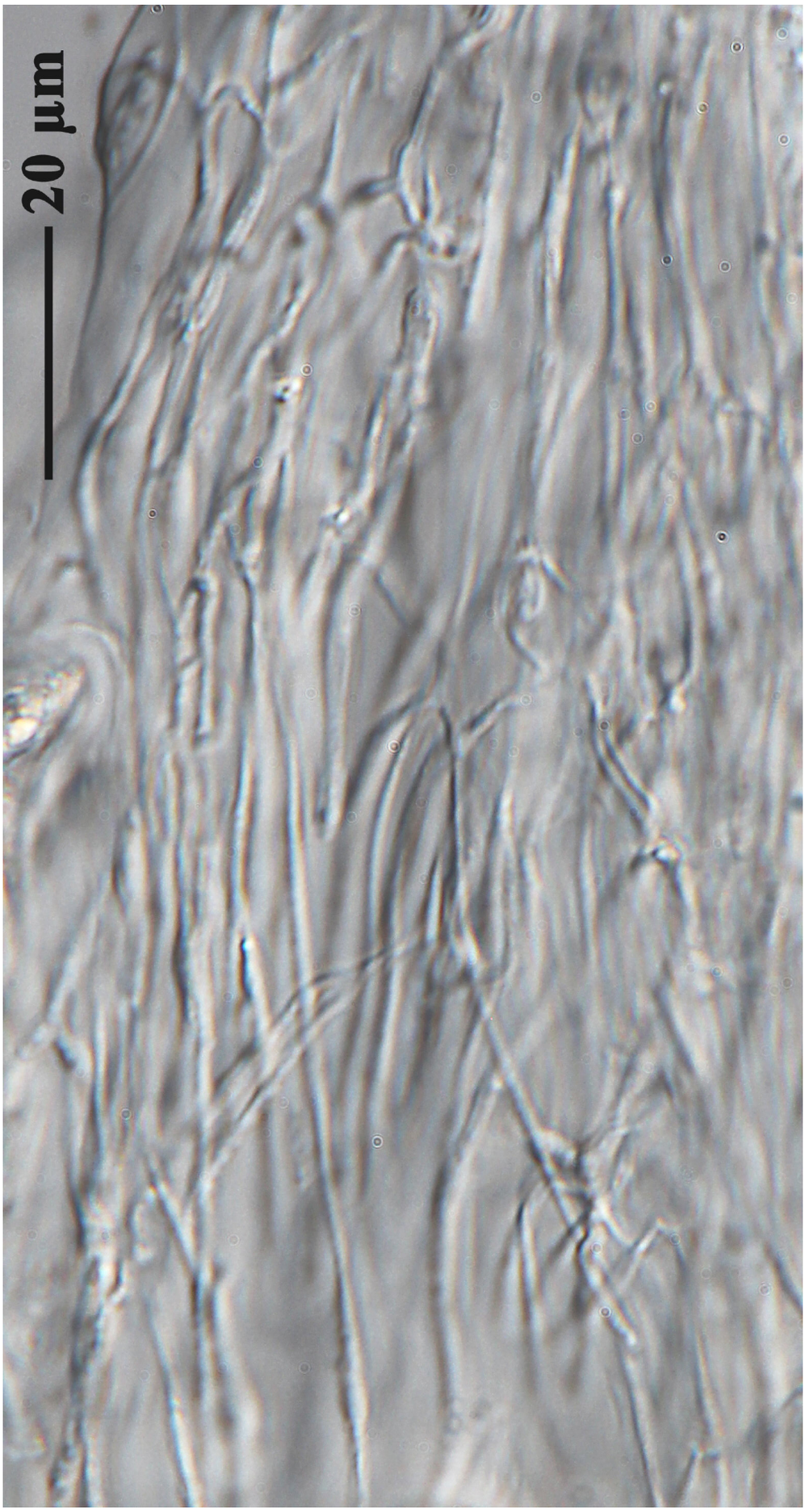
Viridothelium virens



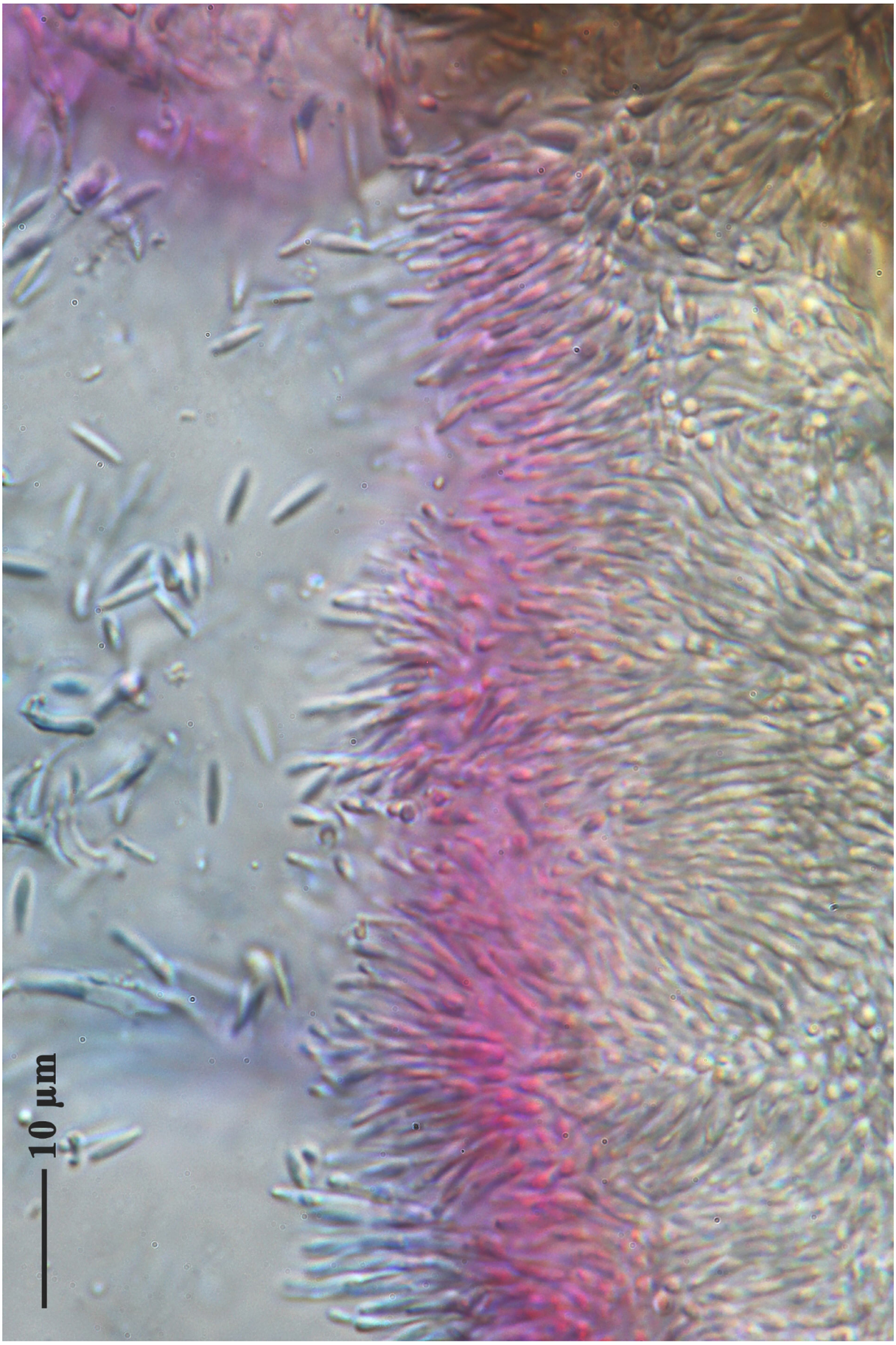
Viridothelium virens



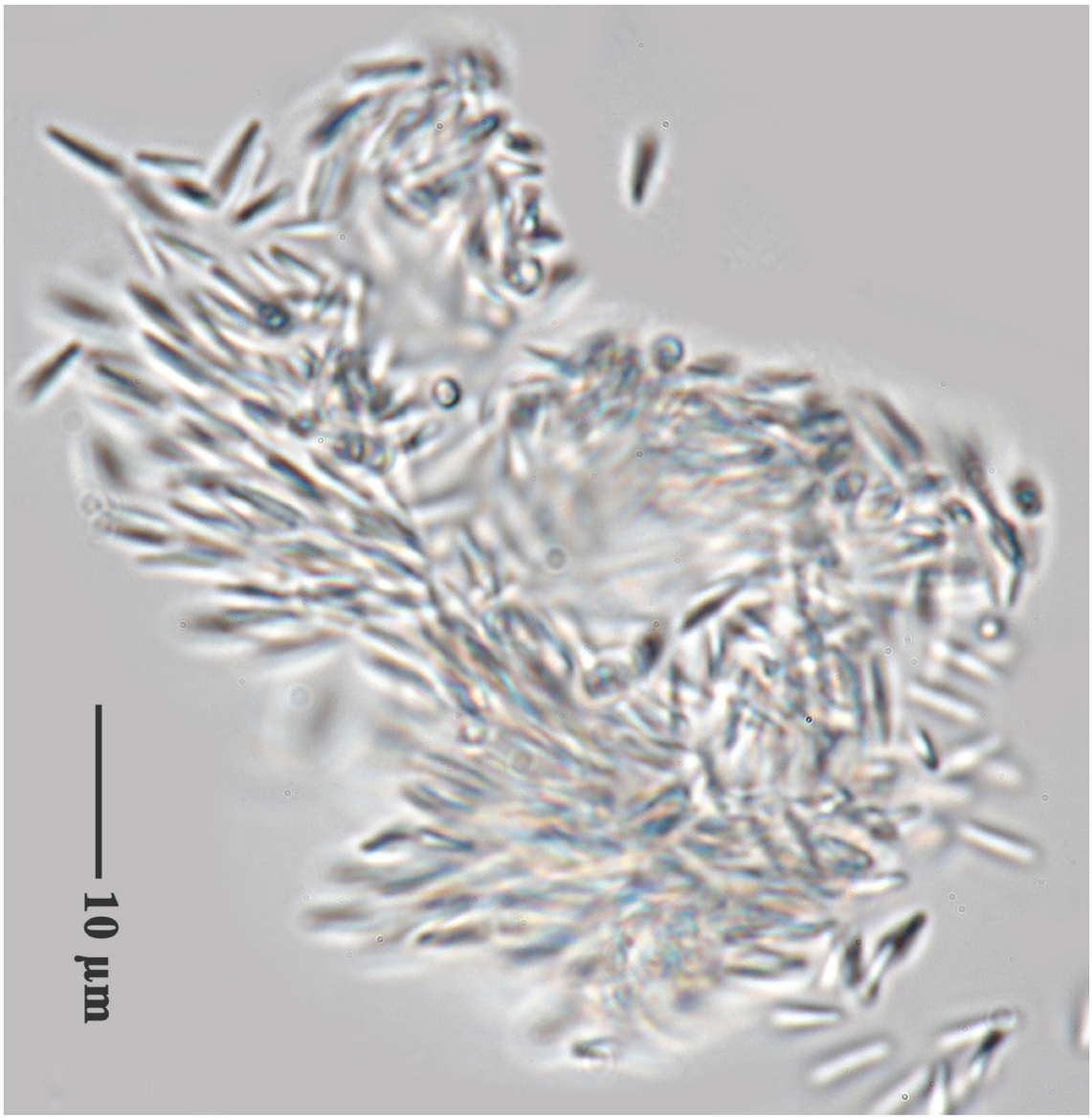
Viridothelium virens



Viridothelium virens



Viridothelium virens



Viridothelium virens

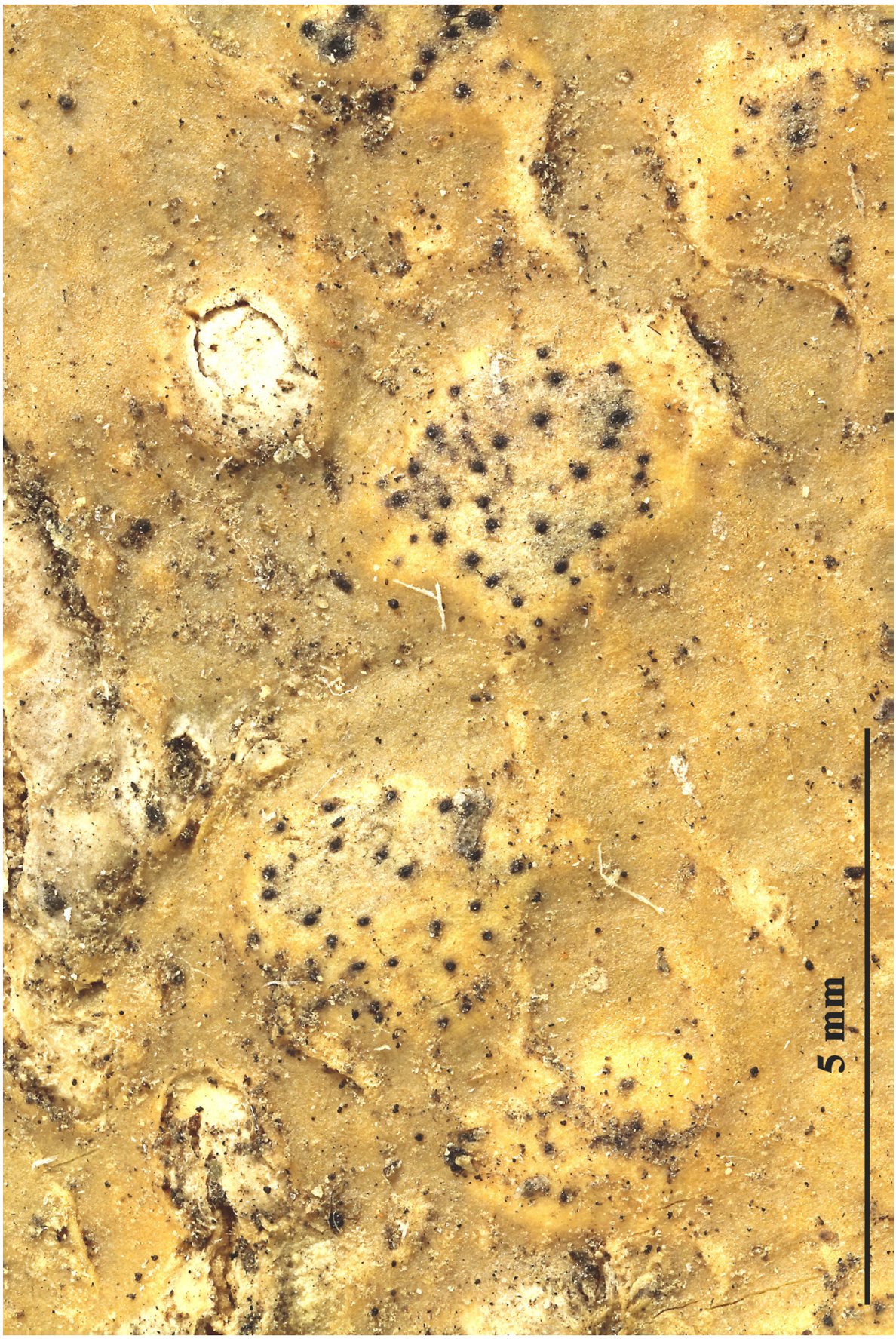
Viridothelium virens (Tuck. ex Michener) Lücking, M.P. Nelsen & Aptroot, in Lücking et al., Lichenologist 48(6): 759 (2016)

= *T*rypethelium eluteriae var. virens (Tuck.) Trevis., Flora, Regensburg 44: 20 (1861)

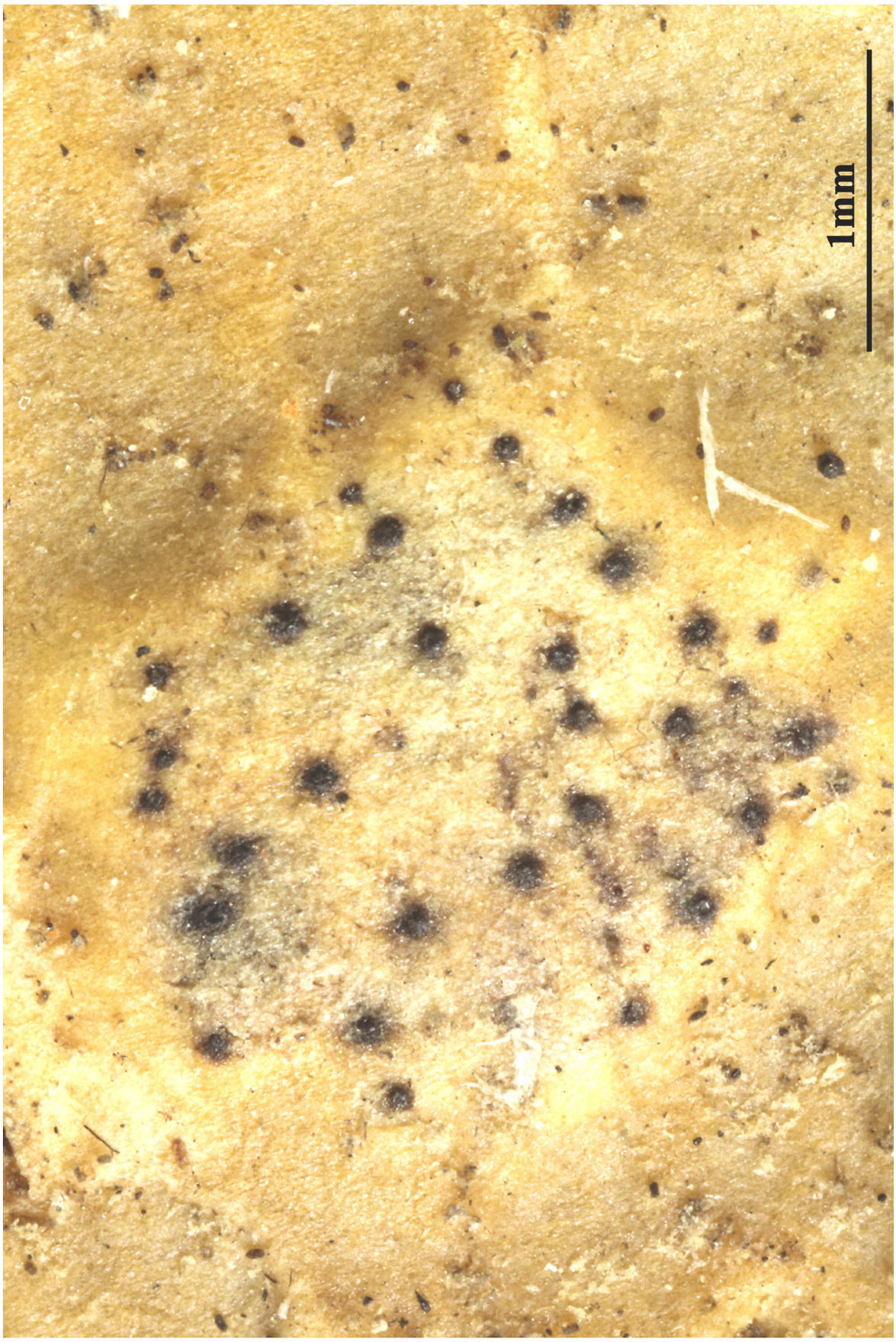
= *Trypethelium virens* Tuck. ex E. Michener, in Darlington, Fl. Cestrica, Edn 3 (Philadelphia): 453 (1853)

[Johnson7514], USA, South Carolina, Sumpter County, near Stateburg. Leg. G.T. Johnson (no 7514), 28.01.1967, det. G.T. Johnson.

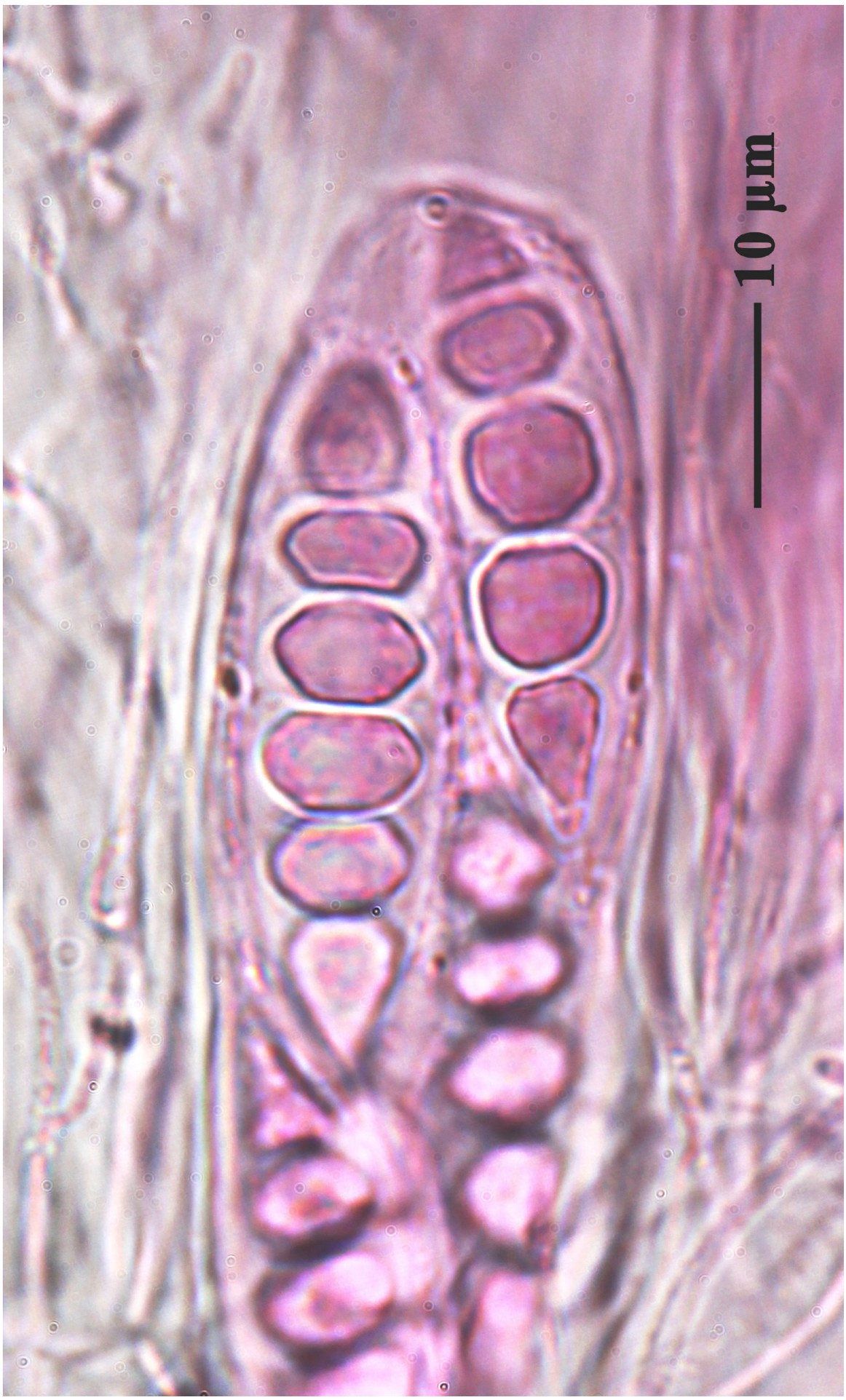
Thallus corticate, olive-green to yellowish, smooth to uneven. Ascomata trypethelioid, with apical ostioles, pseudostromatic; pseudostromata 0.6–1.5 mm diam., immersed-erumpent, with the upper parts of individual ascomata exposed and dark brown. Hamathecium clear. Ascospores 8/ascus, 7–11-septate, fusiform, 38–52 × rather thin septa, hyaline, IKI+ weakly violet. Chemistry: Thallus and pseudostromata UV-, K-, TLC no substances detected.



Viridothelium virens



Viridothelium virens



Viridothelium virens



Viridothelium virens



Viridothelium virens

Xanthomaculina convoluta (Hue) Hale, Lichenologist 17(3): 263 (1985)
= *Omphalodium convolutum* Hue 1900
= *Xanthoparmelia hueana* (Gyeln.) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch, Taxon 53(4): 968 (2004)

[OH500], Namibia. South West Africa. Swakopmund, Namib Desert Perk. Leg. Togashi, 21.10.1974, det. S. Kurokawa. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR.500.

Thallus free-growing on soil. foliose, forming tubular, convolute sticks with black outer surface (= morphological the under side) and pale green inner surface (the latter is often not visible when dry), 3-5 cm long, 2-5 mm thick, simple or sparsely branched expanding when wet to 15(-20) mm wide, upper surface greenish, with prominent, effigurate white maculae, margins sparsely ciliate, cilia to 1.5 mm kong, lower surface black, erhizinate or with very sparse rhizines. Apothcia extremly rare. Chenistry: medulla K+ yellow-orange to red, P+ yellow to orange; usnic, stictic, norstictic,cryptostictic, constictic acids.- Namib desert endemic.



Xanthomaculina convoluta

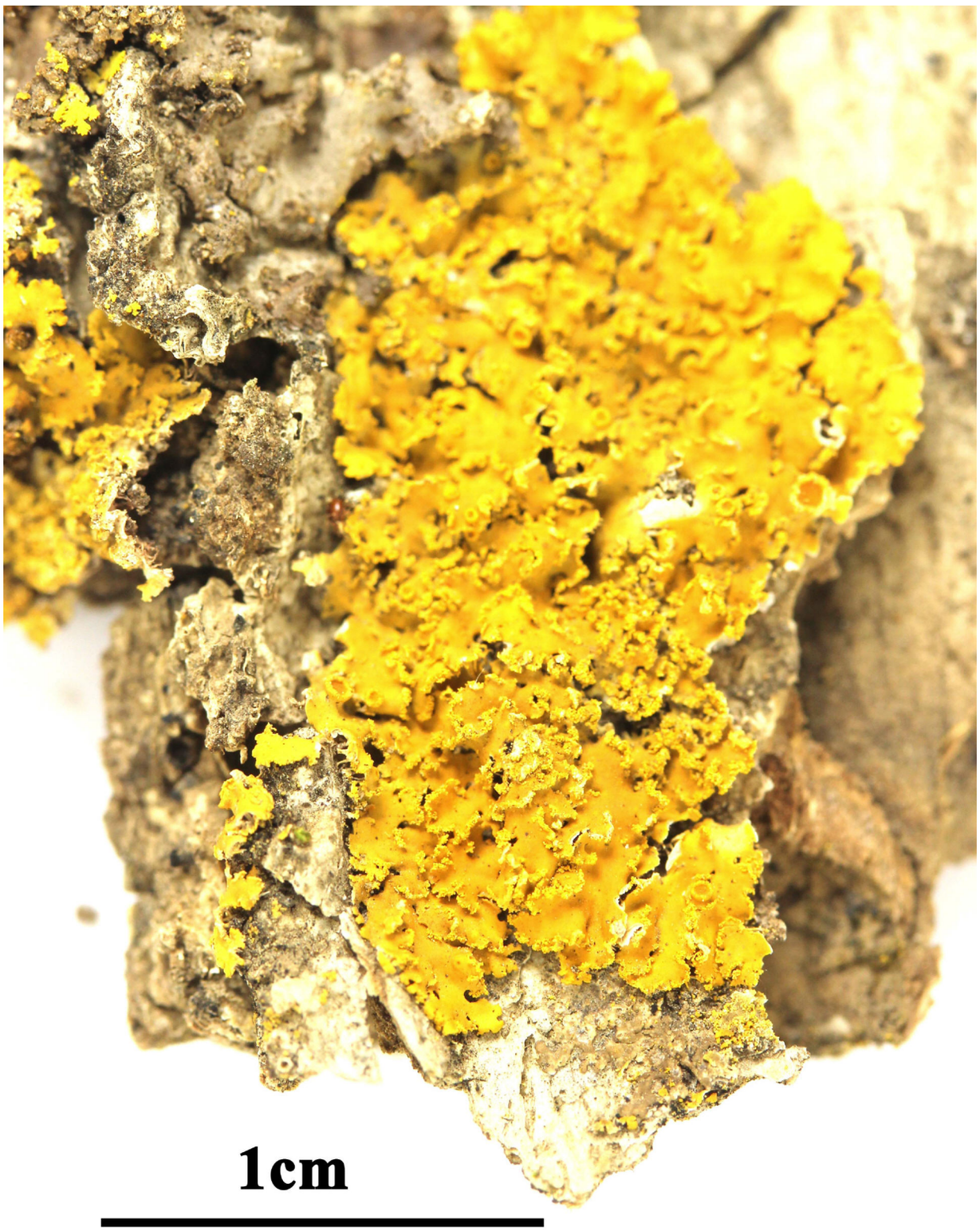


Xanthomaculina convoluta

Xanthomendoza fallax Søchting, Kärnefelt & S.Y. Kondr., Mitt. Inst. Allg. Bot. Hamburg 30-32: 237 (2002)

[OH649], Japan. Honshu. Prov. Shinano (Nagano Pref.): Azusayama, Kawakami-mura, Minami-Suku-gun (35°57'52" N, 138°40'29" E). On trunc of Quercus crispula, 1330 m. Leg. H. Kashiwadani (no. 517999), K. Yoshida & M. Sugimoto, 2.4.2917, det. Y. Ohmura. EX Y. OHMURA LICHENES MINUS COGNITI EXSICCATI NR. 649.

Thallus foliose, heteromerous, dorsiventral, yellowish red to orange-brown, adnate to loosely adnate, lobed, forming regular to irregular, 1-2 cm wide rosettes which often coalesce to cover much larger surfaces. Lobes flattened, 2.5-5 mm long, the marginal ones 0.3-0.6 mm wide, smooth, with marginal soredia. Lower surface white to yellow, somewhat wrinkled, with white rhizines. Upper and lower cortex paraplectenchymatous; medulla white. Apothecia lecanorine, very rare, 0.5-0.7 mm across, laminal, stipitate, the margin initially smooth but often becoming sorediate. Thalline exciple paraplectenchymatous; proper exciple a strongly gelatinized plectenchyma with unoriented, short-celled hyphae; epithecium orange-brown, K+ purple-red; hymenium colourless; paraphyses simple or sparingly branched; hypothecium colourless. Asci 4-6-spored, clavate, functionally unitunicate, apically thickened with a broad internal beak, the inner part of apex and external cap I+ blue, Teloschistes-type. Ascospores 2-celled, polarilocular, hyaline, ellipsoid, (10.5-)12-16 x 6.5-8 µm, the equatorial thickening ("septum") 3.5-5(-6) µm. Pycnidia common, immersed to projecting, darker orange than thallus. Conidia short-bacilliform. Spot tests: thallus and soredia K+ purple-red, C-, KC-, P-, UV+ orange. Chemistry: parietin (major), fallacinal (major), emodin, teloschistin (major) and parietinic acid (chemosyndrome A3 of Søchting 1997). - Note: this mainly northern to montane species mainly grows on siliceous or calcareous rocks.



Xanthomendoza fallax



Xanthomendoza fallax

A
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Gyrophora caroliniana (Tuck.) Schol..... 79, 83, 86, 89
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Gyrophora proboscidea var. arctica (Ach.) Ach..... 68, 73
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