Felix Schumm & André Aptroot

Brazilian Lichens
collected by Dr. André Aptroot

Vol VI - Sergipe, Amazonas



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Brazilian Lichens Vol VI

Sergipe, Amazonas &

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Herstellung und Verlag:BoD – Books on Demand,
Norderstedt
ISBN: 9 783 757 847 203

Introduction

Sergipe and Amazonas are the smallest and biggest states of Brazil.

The Amazone is famous because it is the richest biome for most terrestrial organism groups. Lichens are no exception, even though they are not very abundant in rainforest. Lichens are very species rich in the Amazon, and a single tree easily harbours 100 different species, and a small location up to 500 species. Also, many species grow on living leaves, easily up to 50 on a large, well-placed palm frond.

Sergipe is relatively rich in lichen species because its variation in ecosystems: from coastal Restinga dunes to Atlantic rainforest and semi-desert Caatinga inland.

In this book, some of these species are illustrated, in many cases for the first time, or for the first time in colour. All specimens were collected during joint excursions with Brazilian collegues, who organized the trips and the permits. All specimens are duplicates of specimens that are preserved in the Brazilian herbarium ISE, and in case of most of the Amazon specimens also in the Brazilian herbarium INPA.

For further details, see volume 1 of this book series.

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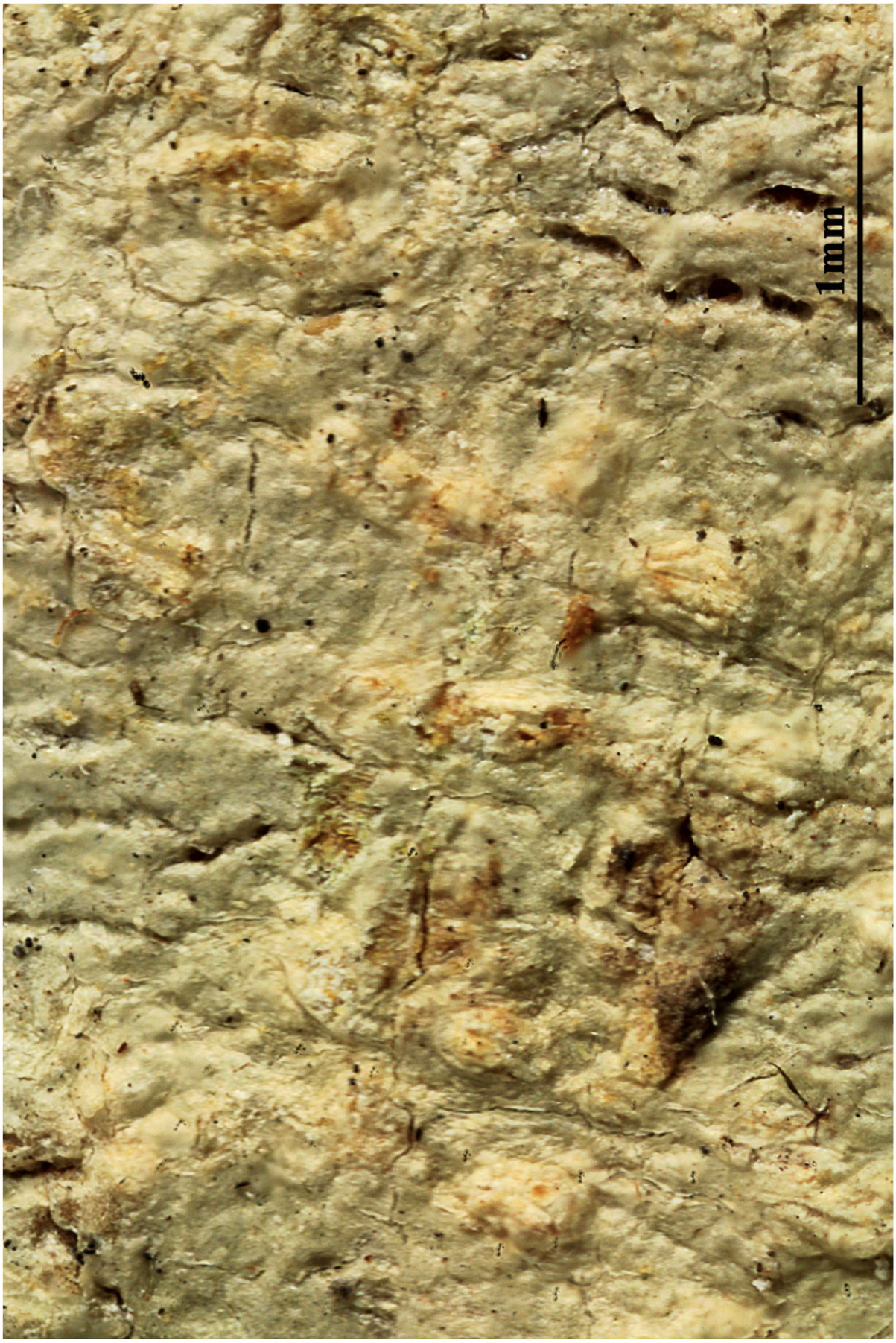
New species
Paraporpidia neotropica Aptroot & Schumm sp. nov
Myriotrema psormuriforme Aptroot & Schumm, sp. nov

New combination
Fissurina bothynocarpa (Redinger) Aptroot & Schumm new comb. =
Graphina bothynocarpa Redinger

Acanthothecis abaphoides (Nyl.) Staiger & Kalb, Mycotaxon 73: 93 (1999)
= *Graphis abaphoides* Nyl. 1889

[ABL11870], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11870), 15. March 2012, det. A. Aptroot 2012. - Thallus light-grey, uneven or with small warts, slightly fissured. Ascocarps short, ± branched lirellae (c. 2-4 x 0.4-0.7 mm). Thalline margin bulging and slightly crenate, paler than the thallus and slightly raised. Disc concealed in the slit formed by the margins. Excipulum uncarbonized, at the base poorly developed, laterally cery distinct, striate. Ne haymenia can develop below the old ones pushing them aside. The parathecium turns I+ blue. Hymenium c. 130 µm high. Paraphyses c. 1.5-2 µm thick, tips distinctly warty. Paraphysoids develop at the edge of the margin/lengthening of the parathecium. They re short (5-10 µm) and warty. Ascospores 1-4/ascus, hyline, muriform, cell wall thickened (hood-like) at the ends, 27-34/4-5-celled. 84-165 x 13-30 µm, I-. Chemistry: Protocetraric acid.

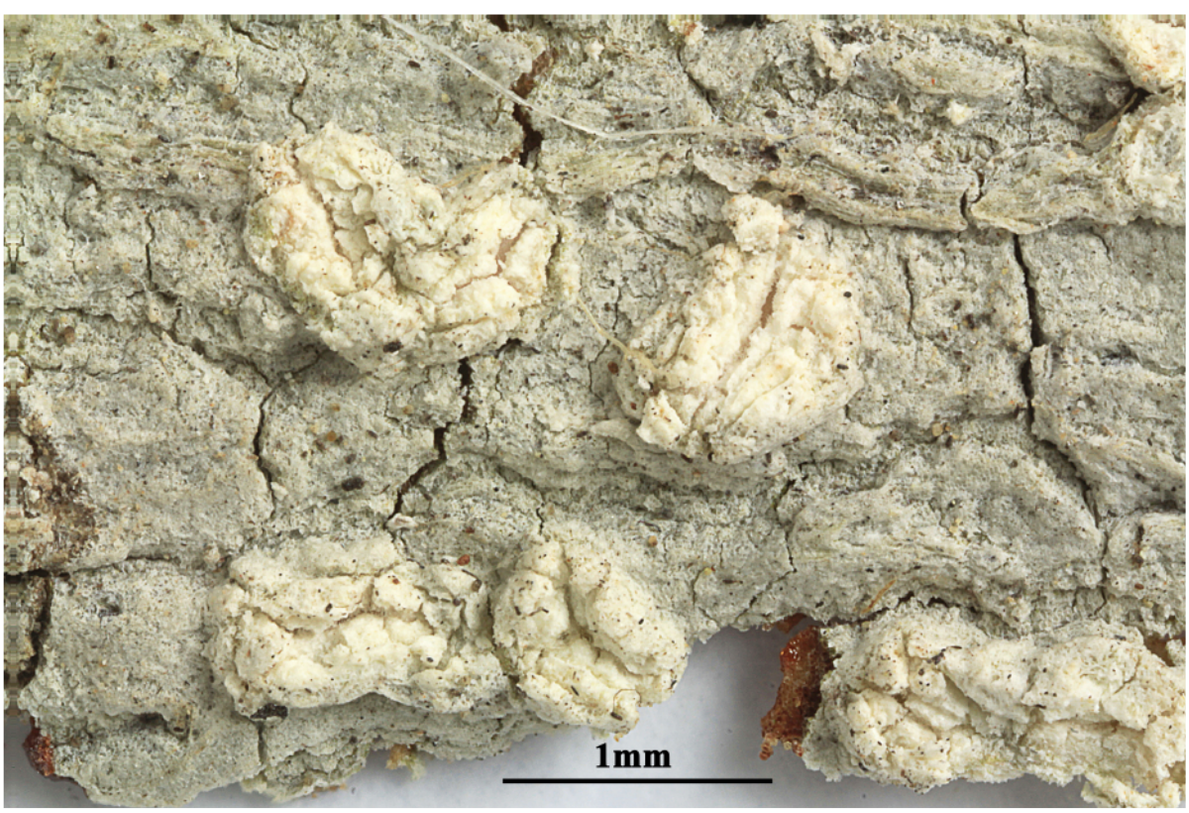




Acanthothecis abaphoides

Acanthothecis hololeucoides (Nyl.) Staiger & Kalb, Mycotaxon 73: 100 (1999)
= *Graphis hololeucoides* Nyl. 1863

Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A.Aptroot, (no. 42909), 27. October 2017, det. A. Aptroot 2017. - Thallus light-grey, yellowish grey, cracked or discontinous. Ascocarps rounded or oval to ± oblong, 1-3 x 0.6-1 mm, rarely branched lirellae. Margins slightly bulging, mostly crenate and sometimes cracked, concolorous with the thallus or slightly paler to yellowish. Discs more or less exposed, whitish pruinose. Excipulum not carbonized, poorly developed at the base, distinct thalline margins. Only the outer layer contains algae and is a real thalline margin. Paraphyses with warty tips, jutting out of the hymenia (10 µm). Periphysoids 10-20 µm long, with distinct warty surface as well. Spores 3-8/ascus, hyaline, muriorm, 20-35/2-4-celled, 67-96 x 12-19 µm, IKI-. Chemistry protocetraric acid





Acanthothecis hololeucoides

Allographa balbisina (Nyl.) Lücking & Kalb, Herzogia 31(1, Teil 2): 547 (2018)
= *Graphis balbisina* Nyl. 1891

[ABL18464], Brazil, Sergipe, Parque Nacional Serra de Itabaiana, entrance. 10°45'57" S, 37°20'20" W, 299 m. In Atlantic forest remnant on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18464), 18. Sept 2013, det. A. Aptroot 2013. - Thallus yellowish-grey, cortex 20-30 µm high. Lirellae long, flexuose, rarely branched, 1-4 x 0.2-0.4 mm diam., labia convergent so that disc can not be seen. Exciple totally carbonized. Hymenium c. 100 µm high, not inspersed, I-. Paraphyses 1-1.5 µm thick, not branched at the tips. Spores 4-8/ascus, hyaline, 11-17-septate, 60-100 x 10-12 µm, I+ blue-violet. Chemistry: no lichen substances detected





Allographa balbisina

Allographa chlorocarpa (Fée) Lücking & Kalb, Herzogia 31(1, Teil 2): 548 (2018)

= *Diplographis chlorocarpa* (Fée) A. Massal., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 3 5: 274 (1860) [1859-1860]

= *Graphina chlorocarpa* (Fée) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 44 (1887)

= *Graphis chlorocarpa* Fée, Essai Crypt. Exot. (Paris): 47, tab. XII, fig. 2 (1825) [1824]

= *Graphis frumentaria* subsp. *chlorocarpa* (Fée) Nyl., Annls Sci. Nat., Bot., sér. 4 19: 368 (1863)

= *Graphis frumentaria* var. *chlorocarpa* (Fée) Tuck., Proc. Amer. Acad. Arts & Sci. 7: 231 (1868) [1866]

= *Hemithecium chlorocarpum* (Fée) Trevis., Spighe Paglie: 12 (1853)

= *Ustalia chlorocarpa* (Fée) Stizenb., Ber. Tät. St Gall. naturw. Ges.: 155 (1862) [1861-62]

[ABL21637], Brazil, Sergipe, Ribeiropolis, Serra do Machado. 10°33' S, 37°22' W, 250 m. On tree bark in secondary rainforest. Leg. M. Cáceres & A. Aptroot, (no. 21637), 9 May 2014, det. A. Aptroot 2014. - Thallus tan to grey-green, continuous, glossy, smooth to slightly rugose. Ascocarps usually raised (nearly flush when young), straight to quite flexuose, usually unbranched, concolorous with the thallus except (usually) for the disc, which is pale orange-brown, 1-5 mm long, about 0.5 mm wide. Ascocarp transverse section: hymenium not inspersed, 120-180 µm high, I-; exciple yellow-brown to redbrown, open below, labia convergent, lightly striate, the tips of the striae sometimes slightly darkened. Spores l/ascus, hyline, densely muriform, 24-40 X 80-130 µm, I+ blue. Chamistry: no substances present.





Allographa chlorocarpa

Allographa pitmanii (Rivas Plata & Lücking) Lücking & Kalb, Herzogia 31(1, Teil 2): 554 (2018)
= *Graphis pitmanii* Rivas Plata & Lücking, Fungal Diversity 58: 24 (2012) [2013]

[ABL28482], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28482), 3.-8. June 2016, det. A. Aptroot 2016.

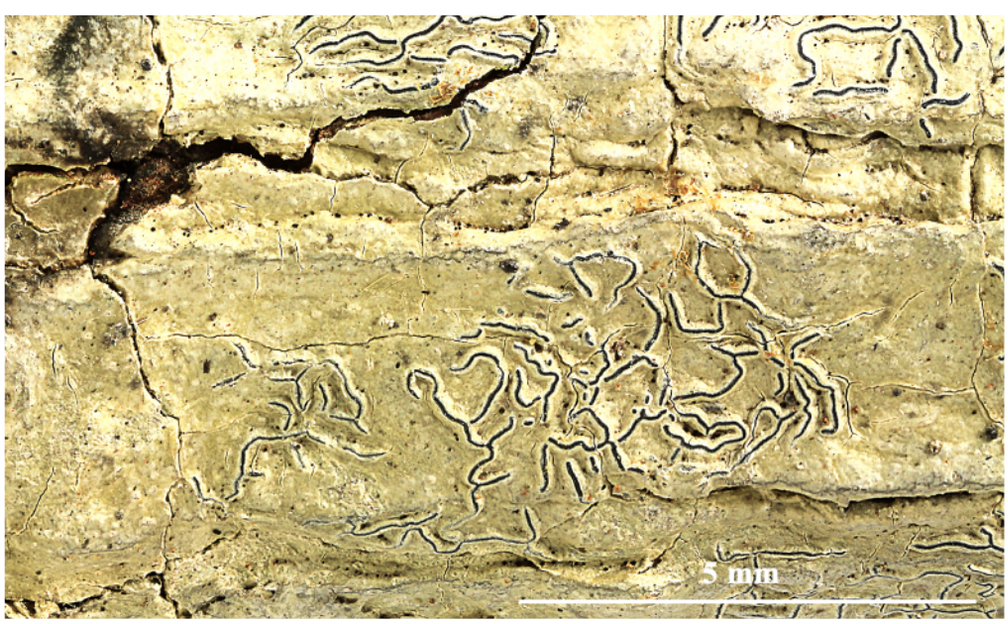




Allographa pitmanii

Allographa pitmanii (Rivas Plata & Lücking) Lücking & Kalb, Herzogia 31(1, Teil 2): 554 (2018)
= *Graphis pitmanii* Rivas Plata & Lücking, Fungal Diversity 58: 24 (2012) [2013]

[ABL50700], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50700), 21. June 2019, det. A. Aptroot 2019. - Lirellae irregularly branched, with apically thin complete margin; ascospores regularly 3-septate, 15–20 x 5–6 µm. - Thallus corticolous, white-grey, up to 5 cm diam. and 30–70 µm thick, continuous; surface uneven, with thin, prosoplectenchymatous cortex; photobiont *Trentepohlia*, with angular-rounded to elongate cells 7–12×5–7 µm large; photobiont layer incrusted with numerous clusters of calcium oxalate crystals; medulla white. Lirellae flexuose, irregularly branched, erumpent, with apically thin complete thalline margin, 0.5–2 mm long, 0.1–0.15 mm wide; disc concealed; proper margin distinct, labia entire, appearing dark grey due to corticate, non-algiferous thalline cover, non-pruinose; thalline margin laterally thick, pale grey. Excipulum entire, completely carbonized, 30–50 µm wide and thick at the base, black; laterally covered by corticate algiferous thallus including clusters of crystals; hypothecium prosoplectenchymatous, 5–10 µm high, colourless. Hymenium 70–100 µm high, colorless, clear; epithecium granulose, 5–10 µm high, brownish; paraphyses unbranched; asci fusiform, 70–100×15–20 µm. Ascospores 8/ascus, ellipsoid, transversely 3-septate, 15–20×5–6 µm, 3–3.5 times as long as wide, colorless, I+violet-blue. Chemistry: no substances detected by TLC (thallus surface or exposed medulla P–; thallus section K–).





Allographa pitmanii

Allographa rustica (Kremp.) Lücking & Kalb, in Lücking & Kalb, Phytotaxa 377(1): 23 (2018)

Graphis rustica Kremp., Nuovo G. bot. ital. 7(1): 61 (1875)

[ABL11927], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11927), 15. March 2012, det. A. Aptroot 2012. - Thallus corticate, smooth to uneven, yellowish gray. Lirellae prominent, partly branched, with thick lateral thalline margin, 1-6 mm long, 0.5-0.7 mm broad; labia entire, sharply delimited, jet-black. Excipulum completely carbonized. Hymenium clear. Ascospores 6-8/ascus, transversely 9-17-septate, 60-100 x 10-14 µm, hyaline. Chemistry: stictic acid.





Allographa rustica

Allographa brachylirellata (M. Cáceres & Lücking) Lücking & Kalb, Herzogia 31(1, Teil 2): 547 (2018)

= *Graphis brachylirellata* M. Cáceres & Lücking, in Cáceres, Vieira, Jesus & Lücking, Lichenologist 44(6): 808 (2012)

[ABL28244], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark (twigs). 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28244), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticolous, up to 5 cm diam., 50–100 mm thick, continuous; surface smooth to uneven, matt, pale yellowish grey; prothallus absent. Thallus in section with thin, cartilaginous upper cortex and irregular algal layer and medulla encrusted with large clusters of calcium oxalate crystals. Apothecia rounded to very shortly lirelliform, straight, unbranched, prominent, with thin to thick complete thalline margin, 0.7–1.0 mm long and broad, 0.3–0.4 mm high; disc concealed; proper margin thick, labia striate; thalline margin thin to thick, usually completely covering the labia, yellowish white, but sometimes abraded to expose black labia. Excipulum apically crenulate, completely carbonized, 100–200 µm wide, black; laterally covered by corticate algiferous thallus including large clusters of calcium oxalate crystals, laterally above the hymenium with short, thick periphysoids; hypothecium prosoplectenchymatous, 20–30 µm high, yellowish; hymenium 250–300 µm high, colourless, clear; epithecium indistinct. Paraphyses unbranched; asci fusiform, 150–200 x 30–40 µm. Ascospores 1/ascus, fusiform, 19–25-septate, 120–150 x 25–30 µm, 4–5 times as long as wide, colourless, I+ violet-blue. Chemistry: Stictic acid, constictic acid, traces of cryptostictic acid. This species is characterized by the unusual combination of short, almost rounded, massively carbonized ascomata with striate labia, large, transversely septate ascospores, and stictic acid.



Allographa brachylirellata



Allographa brachylirellata

Amazonomyces sprucei (R. Sant.) Lücking, Sérus. & G. Thor, in Lücking, Sérusiaux, Maia & Pereira, Lichenologist 30(2): 134 (1998)
= *Stirtonia sprucei* R. Sant. 1952

[ABL50700], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50700), 21. June 2019, det. A. Aptroot 2019. - Thallus rounded, up to 23 mm diam, in peripheral part dispersed, in central part continuous. Sterile part of the thallus smooth, white to pale greenish grey, matt, 12-20 µm thick; algae in the lower c. 10 µm thick tissue, not arranged in one simple algal plate, but irregularly distributed. Hypothallus indistinct. Fertile part of the thallus round, 0.5-1.0 mm diam., upto 110 µm thick, very slightly convex, very pale yellowish white to pale greenish white. A 5-15 µm thick algiferous tissue covering the whole or at least the peripheral parts of thw ascigerous tissue.The most basal tissue (10-15 µm)of the fertile patches ofte (light to) dark brown. Between the usually numerous asci a loose tissue, I + brownish red, formend by rather richely branched, 1-1.5 µm thick, uncoloured hyphae, the tissue very much encrusted with small, uncoloured crystals. Asci ± ovoid, 60-100 x 50-60 µm, the walls up to 10 µm thick, epiplasm I+ rownish red. Spores 4-8, 8-14-septate, fusiform with very small cells at the ends and with one large cell /10-13 µm long and somewhat broader than the other cells) in the middle part, no constrictions at the septa, colourless, 65-82 x 13-16 µm. Symbiontic algae: a sp. of *Trentepohlia*, cells rounded, oblong or irregular, 4-10 x 4-6 µm, forming short irregular threads



Amazonomyces sprucei



Amazonomyces sprucei

Ampliotrema auratum (Tuck.) Kalb, in Frisch, Biblthca Lichenol. 92: 82 (2006)
= *Ampliotrema auratum* (Tuck.) Kalb, Biblthca Lichenol. 88: 302 (2004)
= *Ocellularia aurata* (Tuck.) Hale, Mycotaxon 11(1): 136 (1980)
= *Thelotrema auratum* Tuck., Proc. Amer. Acad. Arts & Sci. 5: 408 (1862) [1860]

[ABL18919], Brazil, Sergipe, Capela, Refúgio de vida silvestre Mata do Junco. 10°32' S, 37°03' W, 150 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18919), 24. March 2014, det. A. Aptroot 2014. - Thallus corticolous, dark grey-olive, often somewhat browned, fissured, c. 0.15-0.2 mm thick, verrucose to warty, with a slightly glossy, compact surface; a thin white medullary layer present. Prothallus line thin, brownish. Phenocortex c. 20-25 µm thick, continuous, dense, strongly conglutinated, with predominantly periclinal hyphae. Photobiont layer 65-125 µm thick, with dense photobiont cells and with large clusters of oxalate crystals mainly concentrated in the thallus warts. Medulla endophloeodal. Pycnidia unknown. Apothecia frequent, dispersed, rounded, strongly emergent to adnate, c. 1-1.3 mm diam., with steep flanks and a moderately wide to wide pore. Margin concolorus with the thallus, incurved to rim-like, entire to rugged or deeply fissured, often with an incomplete black ring formed of the proper exciple at the top. Columella absent. Disc exposed, covered by a dense, coarse, lemon to deep yellow pruina. Phenocortex c. 25 µm thick. Photobiont layer 50-100 µm thick, with dense photobiont cells and numerous large oxalate crystals mostly concentrated towards the base. Periderm layer 25-40 µm thick, a moderately dense, brown conglutinated prosoplectenchyma. Proper exciple cupular, 25-45 µm deep and hyaline at the base, 25-70 µm wide laterally, carbonised to the base. Subhymenium c. 10 µm high. Hymenium c. 140 µm high, inspersed. Ascospores 8/ascus, 1-seriate, hyaline, muriform, 4-6 × 2-loculate, 14-21 × 8-10 µm, with rounded ends, I+ purplish-blue. Asci narrowly clavate, c. 125-140 × 11-15 µm. Paraphyses simple, straight, c. 2 µm wide; tips with 1-2 irregularly thickened cells at the apex or slightly branched. Epihymenium 10-12 µm high, inspersed by numerous yellow granules and with a diffuse yellow to yellow-green pigmentation in the hymenial gelatine. Chemistry: Protocetraric acid (major), virensic acid (trace) detected by TLC. Yellow pigment in the pruina of the apothecia: The pigment dissolves in K resulting in a bright yellow solution and in C without colour reaction. It shows no colour reaction nor does it solve in HNO_3



Ampliotrema auratum



Ampliotrema auratum

Ampliotrema lepadinoides (Leight.) Kalb, in Frisch, Biblthca Lichenol. 92: 81 (2006)
= *Ampliotrema lepadinoides* (Leight.) Kalb, Biblthca Lichenol. 88: 303 (2004)
= *Ocellularia lepadinoides* (Leight.) Zahlbr., Cat. Lich. Univers. 2: 594 (1923) [1924]
= *Thelotrema lepadinoides* Leight., Trans. Linn. Soc. London 25: 447 (1866)

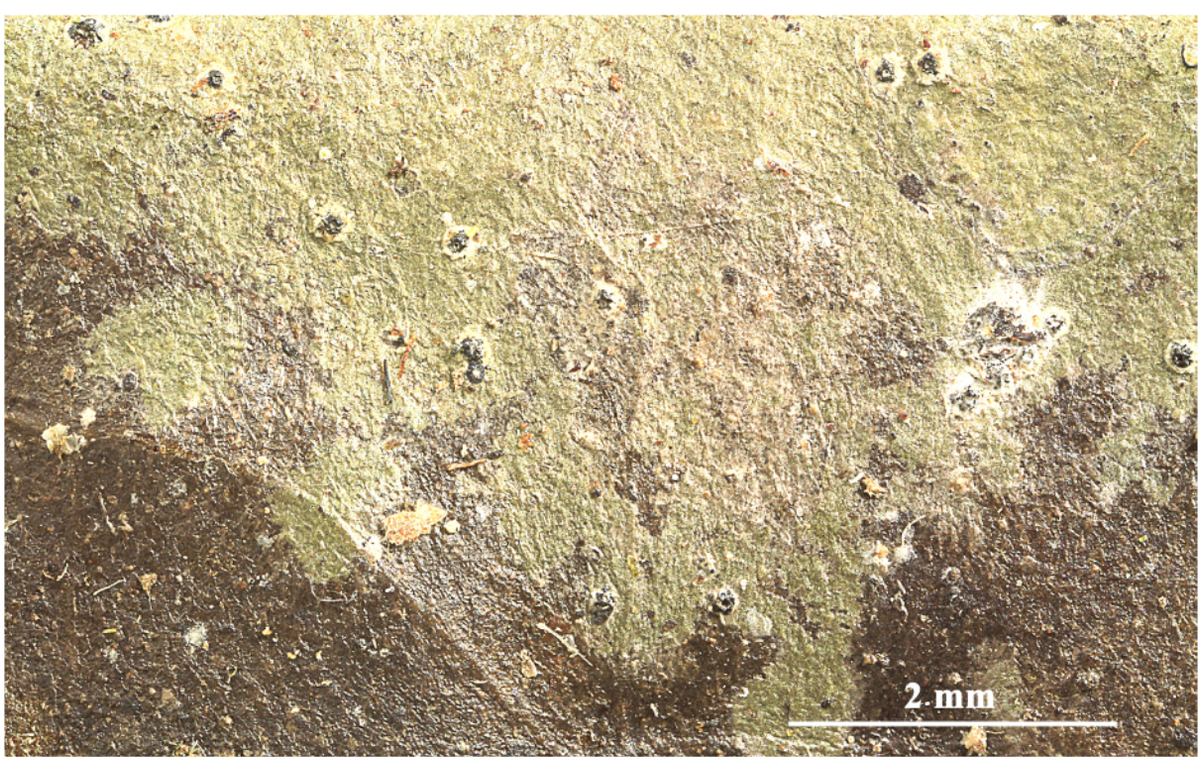
[ABL28271], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28271), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus grey-olive, smooth to uneven, with dense, proso- to paraplectenchymatous cortex; photobiont layer and/or medulla with clusters of calcium oxalate crystals. Apothecia sessile, rounded, 1–2 mm diam.; disc partially covered by 0.3–0.6 mm wide pore, brown-black, orange-pruinose; margin entire, fused, brownblack, covered by thalline layer. Columella absent. Excipulum paraplectenchymatous, carbonized; periphysoids absent. Hymenium 150–230 ìm high, inspersed; paraphyses apically branched. Ascospores 8/ascus, 60–150 x 10–12 µm, cylindrical, with thick septa and lens-shaped lumina, colorless, I+ violet-blue (amyloid), 15–35-septate. Secondary chemistry: protocetraric and virensic acids (exposed medulla P+ orangered; section K–), apothecial disc with orange (K+ red-purple) pigment. The large, multiseptate ascospores in combination with the orange apothecial pigment set this species apart from all others in the genus.





Ampliotrema lepadinoides

[ABL50710ac], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ac), 21. June 2019, det. A. Aptroot 2019. - Thallus crustose, continuous, with cartilaginous, corticiform layer, 5–15 mm across and 10–20 µm thick, smooth, dark green; a broad, dark brown prothallus usually present. Photobiont cells angular rounded, 7–15 x 5–8 µm, forming irregular plates. Perithecia adnate to sessile, hemispherical to subglobose, 0.2–0.3 mm diam. and 200–300 µm high, dark greyish black to black. Excipulum prosoplectenchymatous, 8–15 µm thick, dark brown, in upper parts fusing with involucrellum. Involucrellum carbonaceous, 50–80 µm thick, black, laterally covered by colorless, corticiform layer. Asci cylindrical, 70–100 x 7–9 µm. Ascospores 8 per ascus, uniseriate, broadly ellipsoid, 1-septate, with slight constriction at septum, 11–14 x 4–5 µm, 2.5–3 times as long as broad, distal cell somewhat enlarged. Pycnidia erumpent, wart-shaped to conical, 0.1–0.2 mm diam., lateral part covered by white thallus tissue, upper part exposed, black, forming star-like structure with rather wide, pale ostiole. Macroconidia broadly ellipsoid to ovoid, non-septate, 4–5 x 3–4 µm. Chemistry: no substances detected by TLC.





Anisomeridium foliicola

Anisomeridium musaesporoides Etayo & Lücking, Lichenologist 31(2): 145 (1999)

[ABL50710ab], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ab), 21. June 2019, det. A. Aptroot 2019. - Thallus crustose, continuous but marginally dispersed, with cartilaginous, corticiform layer, 5–15mm across and 10–20 µm thick, smooth, pale greenish to brownish or yellowish grey; narrow, dark brown prothallus often present. Photobiont cells angular rounded, 6–14 x 4–7 µm, forming irregular plates. Perithecia adnate, lens-shaped to applanately conical or wart-shaped, 0.4–0.7 mm diam. and 200–300 µm high, dark greyish black at top but lateral parts white. Excipulum prosoplectenchymatous, 5–15 µm thick, colorless to pale yellow, in upper parts fusing with involucrellum. Involucrellum 20–40 µm thick, dark brown in upper parts, laterally covered by colorless, cartilaginous, corticiform layer. Asci cylindrical to narrowly clavate, 80–120 x 12–15 µmm. Ascospores 8 per ascus, uniseriate to irregularly arranged, broadly ellipsoid-fusiform, 1-septate, without constriction at septum, 17–26 x 7–10 µm, 2–3 times as long as broad, septum markedly submedian and thus distal cell strongly enlarged. Pycnidia adnate, applanately conical, 0.3–0.5 mm diam., brownish black. Inner wall prosoplectenchymatous, 5–15 µm thick, colorless to pale yellow; outer wall carbonaceous, 30–50 µm thick, black. Macroconidia broadly ellipsoid to ovoid, non-septate, 4–5 x 3–4 µm. Chemistry: not tested.

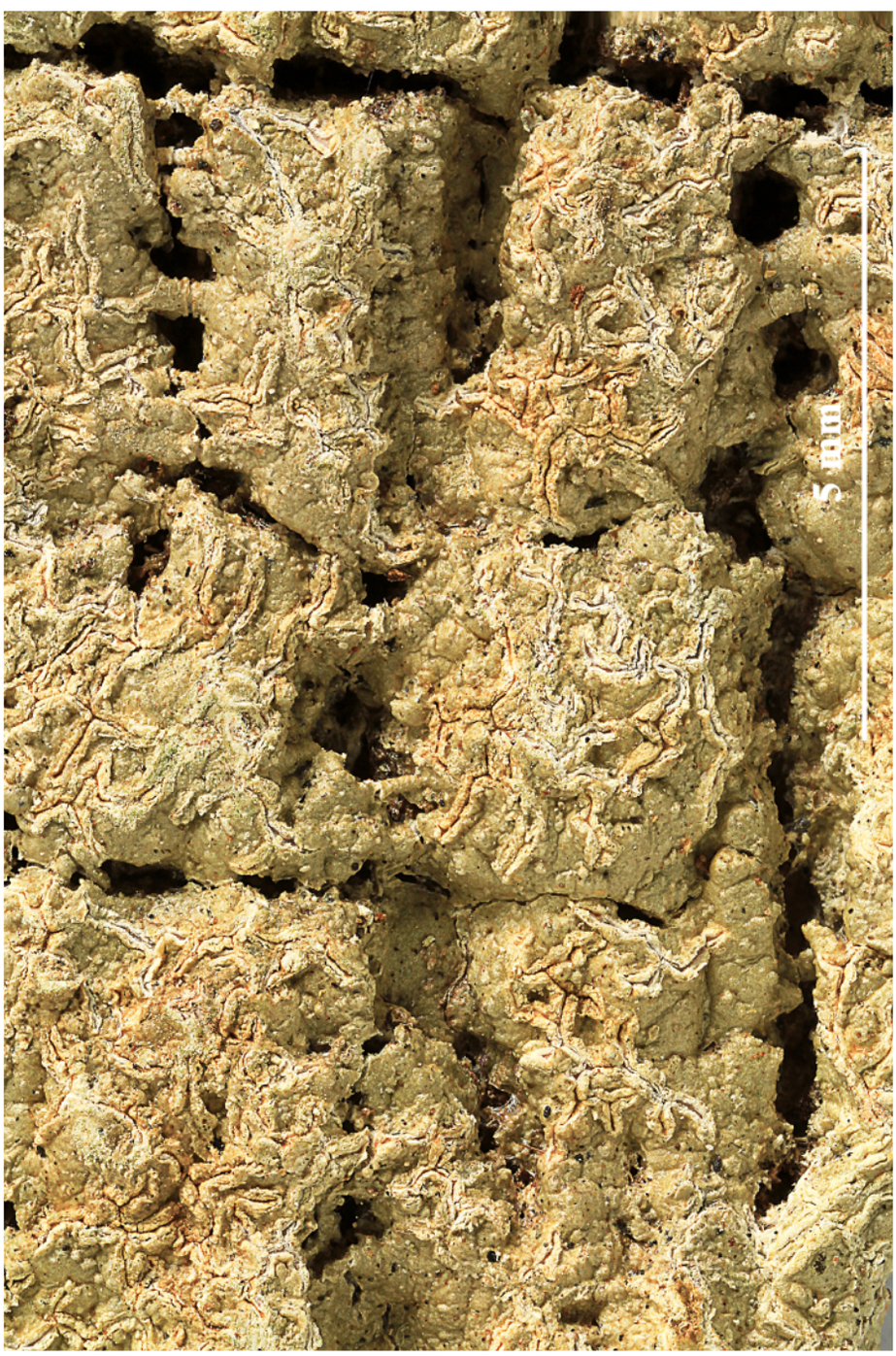




Anisomeridium musaesporoides

Anomomorpha subtorquens (Nyl.) Staiger, Biblthca Lichenol. 85: 94 (2002)
= *Graphina subtorquens* (Nyl.) D.D. Awasthi, Beih. Nova Hedwigia 17: 54 (1965)
= *Graphis subtorquens* Nyl., Bull. Soc. linn. Normandie, sér. 2 7: 177 (1873)

[ABL11830], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11830), 15. March 2012, det. A. Aptroot 2012. - Lirellae branched, 1-5 x 0.5 mm, sic a small slit. Excipulum not carbonied wit I+ redbrown-orange. Hymenium inspersed, 60-70 µm high. Spores 8/ascus, muriform, 2-3-locular, 4-6 x 4-5 µm. Chemistry: norstictic acid, neotricon.





Anomomorpha subtorquens

Arthonia accolens Stirt., Proc. Roy. phil. Soc. Glasgow 11: 105 (1879) [1878]

[ABL50710ax], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ax), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, partly confluent patches, smooth, 10–20 mm across, very thin (5–10 µm), ecorticate, pale green to brownish yellow, slightly shiny. Photobiont cells rectangular, 7–12 x 4–5 µm, in radiate plates. Ascomata sharply delimited, not raised above thallus level, rounded to slightly irregular in outline, 0.3–1.2 mm diam. and 20–30 µm high, light to dark brown, with velvet-like look. Hypothecium 3–5 µm high, colorless to brown, I+ yellowish brown, KI+ pale yellow. Epithecium formed by a layer of densely packed, parallel, periclinal hyphae, 4–6 µm high, brown, I+ yellowish brown, KI+ pale yellow. Hymenium 17–25 µm high, pale brown, darker in upper part, I+ orange-yellow, KI+ yellow. Asci obovate to globose, 15–20 x 16–13 µm, I–, KI–. Ascospores narrowly obovate, 2-septate, without constrictions at septa, 11–16 x 3–5 µm, distal cell enlarged, colorless. Conidiomata not observed. Chemistry: no substances detected by TLC.

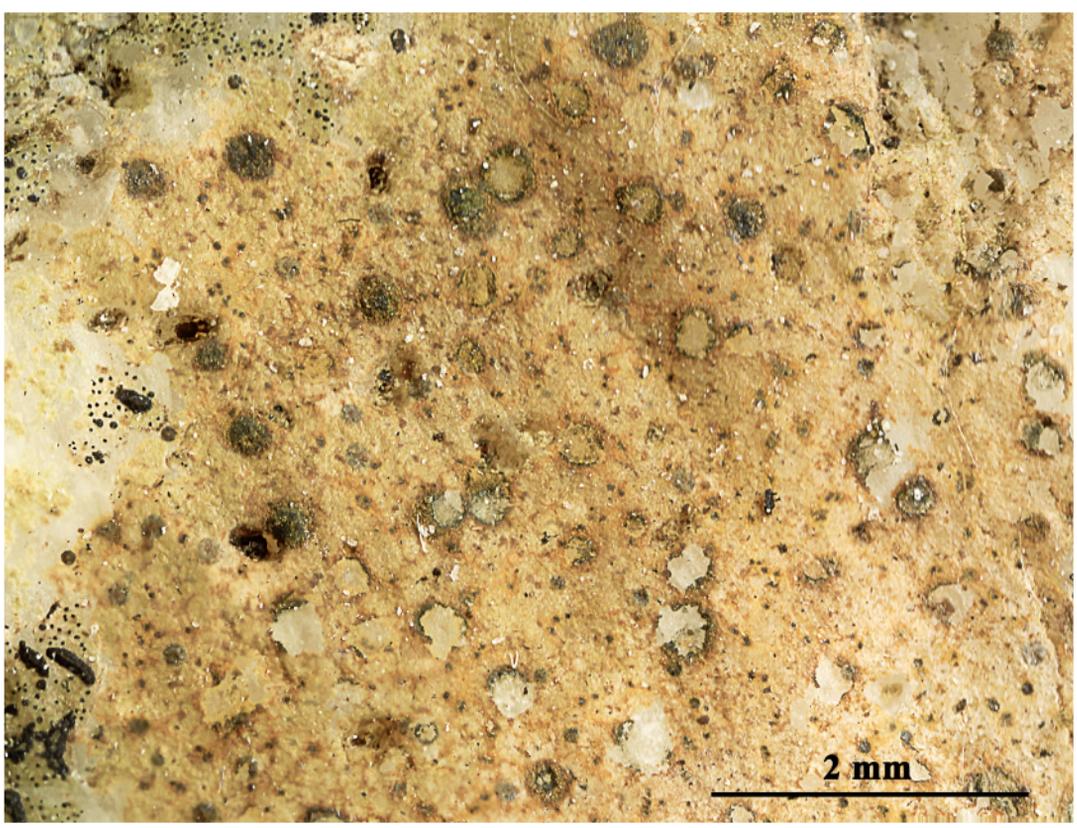


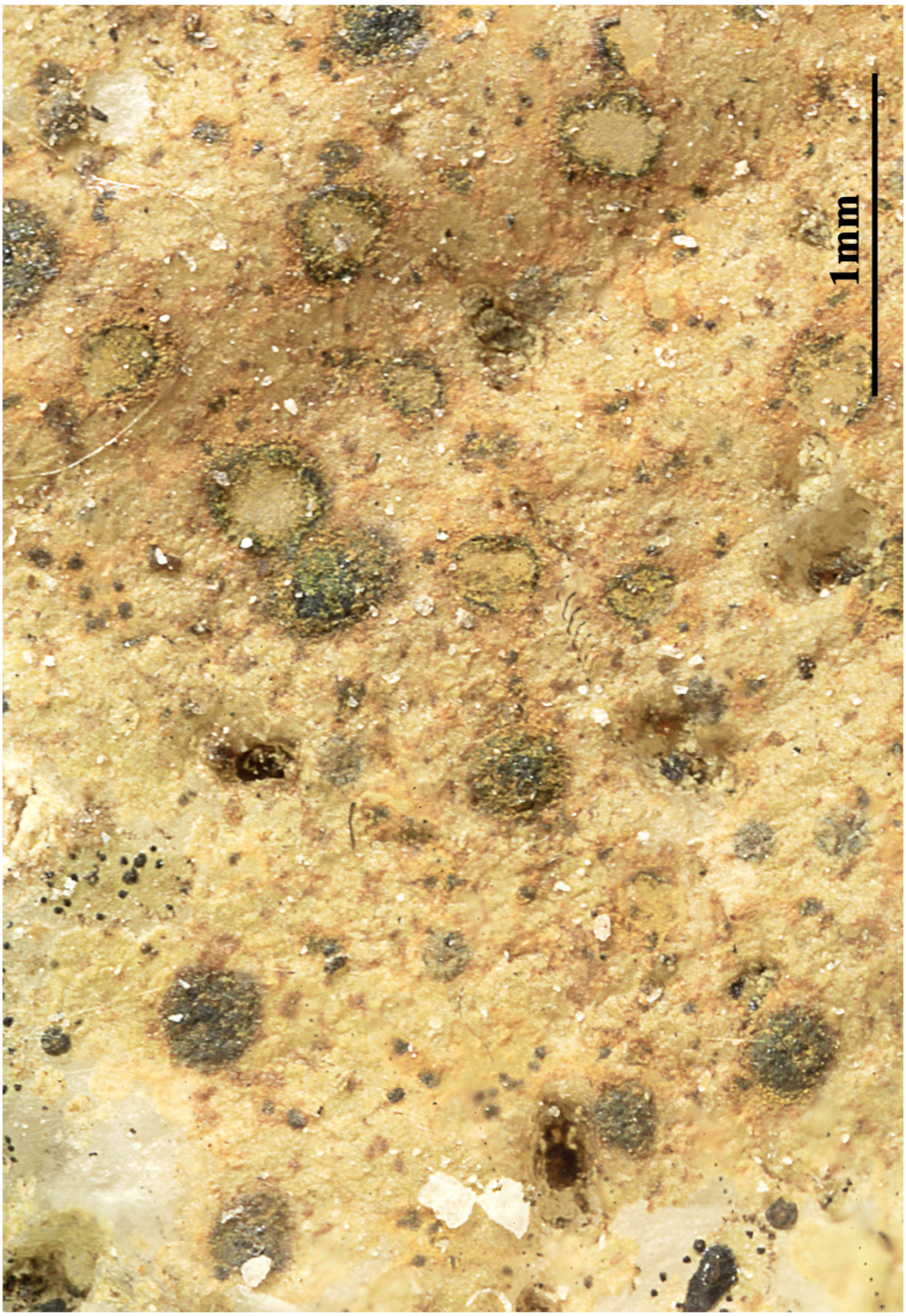


Arthonia accolens

Arthonia aciniformis Stirt., Proc. Roy. phil. Soc. Glasgow 11: 105 (1879) [1878]
= *Arthoniopsis aciniformis* (Stirt.) Müll. Arg., Lich. Epiph. Novi: 17 (1890)

[ABL18669], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44' S, 37°20' W, 400 m. On siliceous rock in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18669), 25. March 2014, det. A. Aptroot 2014. - Thallus continuous, smooth, 5–15 mm across, very thin (5–10 µm), ecorticate, olive-brown to brownish grey, matt to slightly shiny. Photobiont cells almost rectangular, often strongly curved, 7–13 x 3–5 µm, in irregular plates leaving small interspaces. Ascomata sharply delimited, not raised above thallus level, rounded to irregular in outline, 0.3–1.2 mm diam. and 20–30 µm high, dark greyish brown and usually with thin, black, marginal zone. Hypothecium 3–6 µm high, brown, I+ yellowish brown, KI+ yellowish brown. Epithecium formed by layer of densely packed, parallel, periclinal hyphae, 4–7 µm high, brown, I+ yellowish brown, KI+ pale yellow. Hymenium 18–26 µm high, pale brown, I+ orange-yellow, KI+ yellow. Asci broadly clavate to obovate, 15–20 x 8–16 µm, I–, KI+ in inner parts of tholus. Ascospores narrowly obovate to ellipsoid, 1-septate, without constriction at septum, thick-walled (0.5–0.8 µm), 9–12 x 3–5 µm, distal cell enlarged, colorless. Conidiomata campylidia, narrowly squamiform, 0.2–0.25 mm diam., blackish brown. Conidia filiform, often bent or curved, 3–5-septate, 30–40 x 0.8–1.2 µm, colorless. Chemistry: no substances detected by TLC.

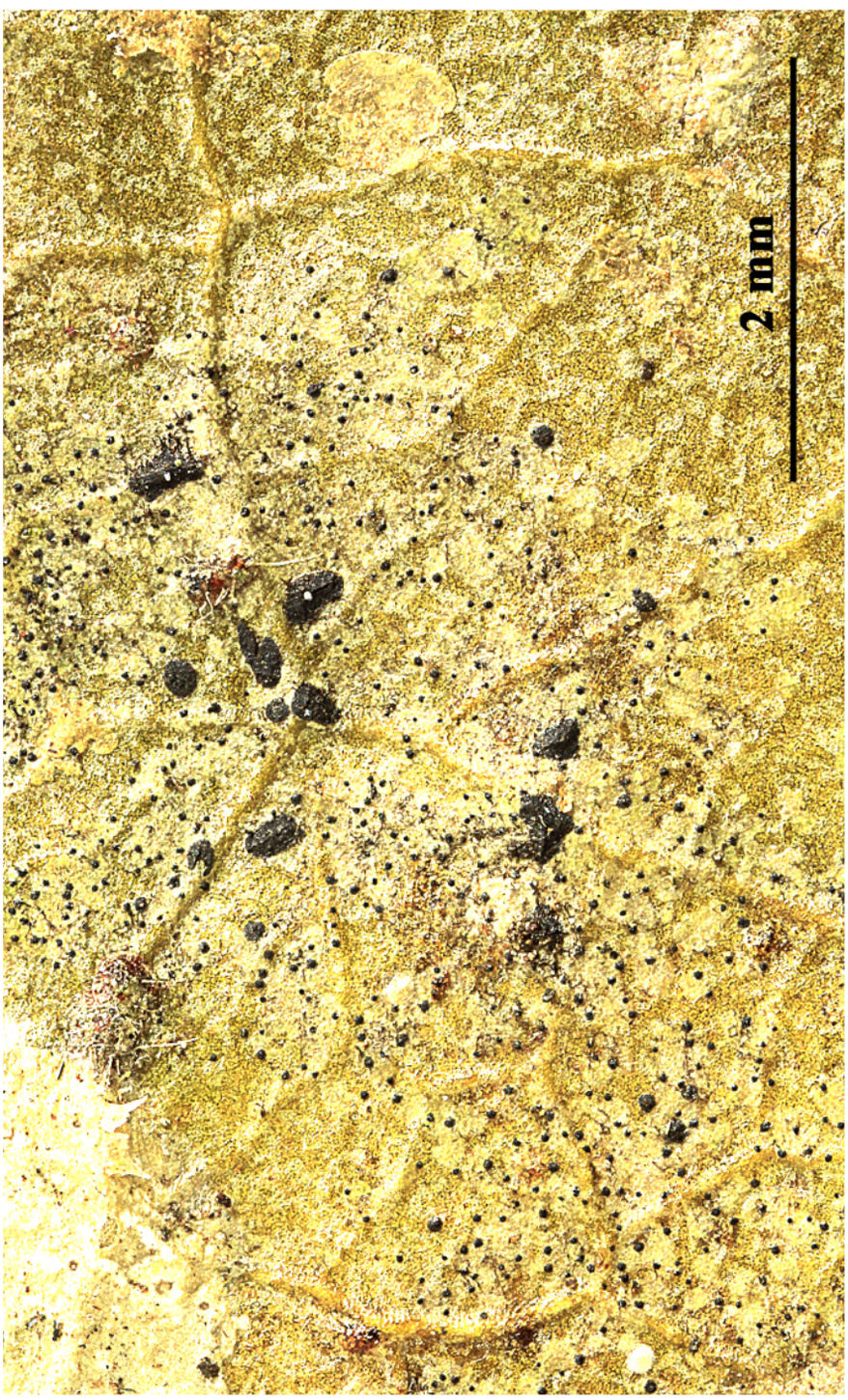


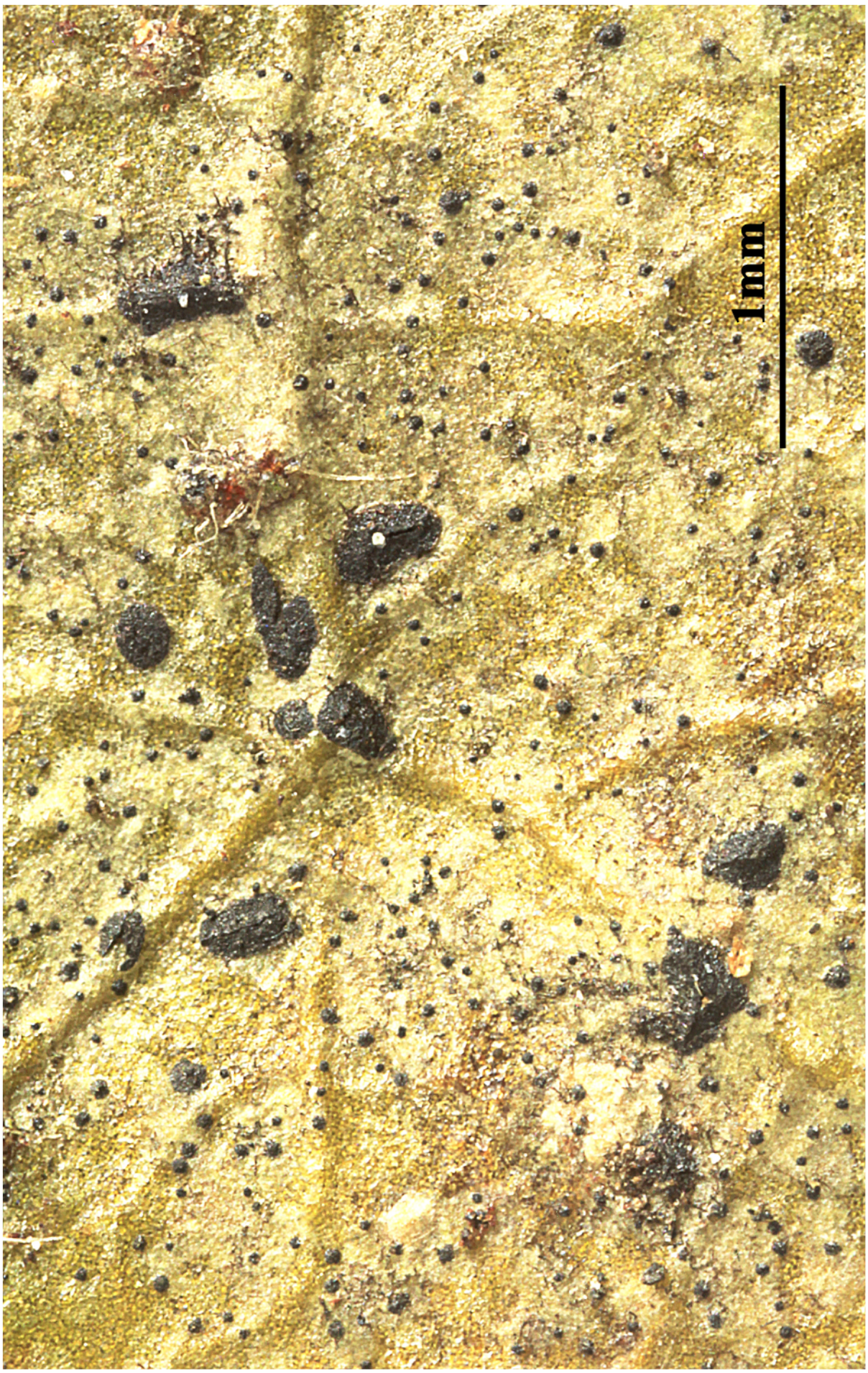


Arthonia aciniformis

Arthonia leptosperma (Müll. Arg.) R. Sant., Symb. bot. upsal. 12(no. 1): 79 (1952)
= *Arthoniopsis leptosperma* Müll. Arg. 1890

[ABL18210], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18210), 27. July 2013, det. A. Aptroot 2013. - Thallus yellowish to brownish green. Ascomata sharply delimited, rounded to oval, 0.3-1.1 mm diam., dark brown. Spores narrowly obovate, 1-septate, 6-10 x 2-3 µm, colourless, distal cell enlarged. Pycnidia 0.1-0.15 mm diam., black. Conidia non septate, 2-3.5 x 0.7-1 µm. No substances detected by TLC.





Arthonia leptosperma

Arthonia parantillarum Aptroot, in Aptroot & Sparrius, Fungal Diversity 14: 3 (2003)

[ABL18247], Brazil, Sergipe, Parque National Serra de Itabaiana, summit. 10°44'11" S, 37°21'47" W, 650 m. In transitional forest to caatinga, on wood. Leg. M. Cáceres & A. Aptroot, (no. 18247), 17. Sept 2013, det. A. Aptroot 2013. - Thallus smooth, yellowish-white. Apothecia irregular in outline, starting as a thin line or point, soon branching, finally branches usually mostly confluent, yellowish-brown, ca. 0.3-0.7 mm diam, flat. Excipulum absent, but visible as a stronger UV+ reddish zone surrounding the apothecia. Asci globoso-clavate, Arthonia-type. Ascospores 13.5-15.5 × 3.5-4.5 µm, clavate, consistently 3-septate, 8 per ascus. Pycnidia unknown. Chemistry: thallus without secondary substances (C-, K-, UV-); apothecia K-, UV+ reddish with a xanthone (probably arthothelin).





Arthonia parantillarum

Arthonia trilocularis Müll. Arg., Flora, Regensburg 64(15): 233 (1881)
= *Arthoniopsis trilocularis* (Müll. Arg.) Müll. Arg., Lich. Epiph. Novi: 17 (1890)
= *Santessonia trilocularis* (Müll. Arg.) Bat. & J.L. Bezerra, Atas Inst. Micol. Univ. Recife 5: 383 (1967)

[ABL50710aw], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710aw), 21. June 2019, det. A. Aptroot 2019. - Thallus irregular in outline and partly composed of finely lobate patches, smooth, 5–10(–20,)mm across, very thin (5–15 µm), ecorticate, pale brownish grey to yellowish brown, matt. Photobiont cells rectangular, 7–14 x 5–7 µm, in radiate plates. Ascomata sharply delimited, hardly raised above thallus level, angular-rounded to irregular in outline, 0.3–1.3 mm diam. and 30–40 µm high, blackish brown to black, sometimes marginal parts with thin, brown to grey pruina. Hypothecium 2–4 µm high, colorless to brown, I– to I+ pale yellow, KI– to KI+ pale yellow. Epithecium formed by thin layer of densely packed, parallel, periclinal hyphae, 3–6 µm high, brown, K+ sordid brown, I+ orange-brown, KI+ yellow. Hymenium 25–35 µm high, colorless to very pale brown, I+ orange-red, KI+ orange-yellow. Asci obovate, 17–30 x 10–18µm, I–, KI+ blue in inner parts of tholus. Ascospores narrowly obovate, 2-septate, without constrictions at septa, 11–19(–24) x 4–6(–9) µm, distal cell enlarged, greyish brown. Conidiomata pycnidia, applanately conical, rounded, 0.1–0.2 mm diam., dark grey to greyish black or pure black. Conidia of at least 4 types present in different individuals: [1] fusiform-ellipsoid to narrowly bean-shaped, 8–13(–16) x 2.5–3.5 µm, colorless (macroconidia); [2] bacillar, non-septate, 11–14 x 0.8–1 µm, colorless (macroconidia?); [3] bacillar, non-septate, 4–7 x 0.7–0.9 µm, colorless (microconidia?); [4] oblong-ellipsoid, non-septate, 2–3 x 0.5–0.7 µm, colorless (microconidia). Chemistry: no substances detected by TLC.



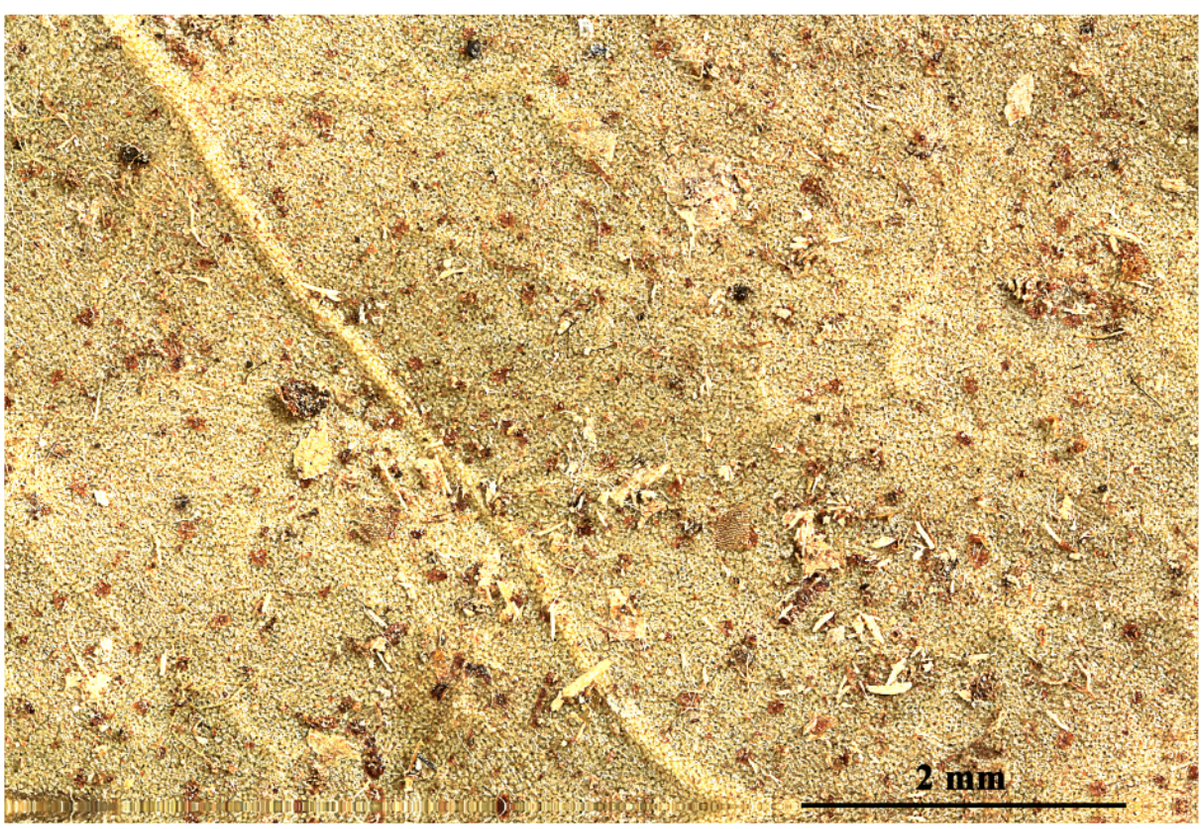
Arthonia trilocularis



Arthonia trilocularis

Aspidothelium geminiparum (Malme) R. Sant., Symb. bot. upsal. 12(no. 1): 285 (1952)
= *Thelenella geminipara* (Malme) R.C. Harris, More Florida Lichens, Incl. 10 Cent Tour Pyrenol. (New York): 165 (1995)
= *Porina geminipara* (Malme) Zahlbr., Cat. Lich. Univers. 8: 102 (1931) [1932]
= *Porinopsis geminipara* Malme, Ark. Bot. 22A(no. 6): 3 (1928)

[ABL50710ch], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ch), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, smooth, 5–20(–50) mm across, thin (15–50 µm), greenish grey. Perithecia sessile, hemispherical to subglobose, 0.25–0.5 mm diam. and 200–300 µm high, dark grey, smooth. Excipulum 10–30 µm thick, colorless. Involucrellum paraplectenchymatous, 60–120 µm thick, colorless to pale yellow but outermost part dark brownish grey, I+ orange-red, KI+ pale blue. Asci 110–160 x 20–30 µm. Ascospores 2–4(–8) per ascus, fusiform, 11–19-septate, without or with very slight constrictions at septa, 50–100 x 14–19 µm, 3.5–6 times as long as broad, individual cells very thin (2–5 µm long), colorless. Conidiomata not observed. Chemistry: not tested.



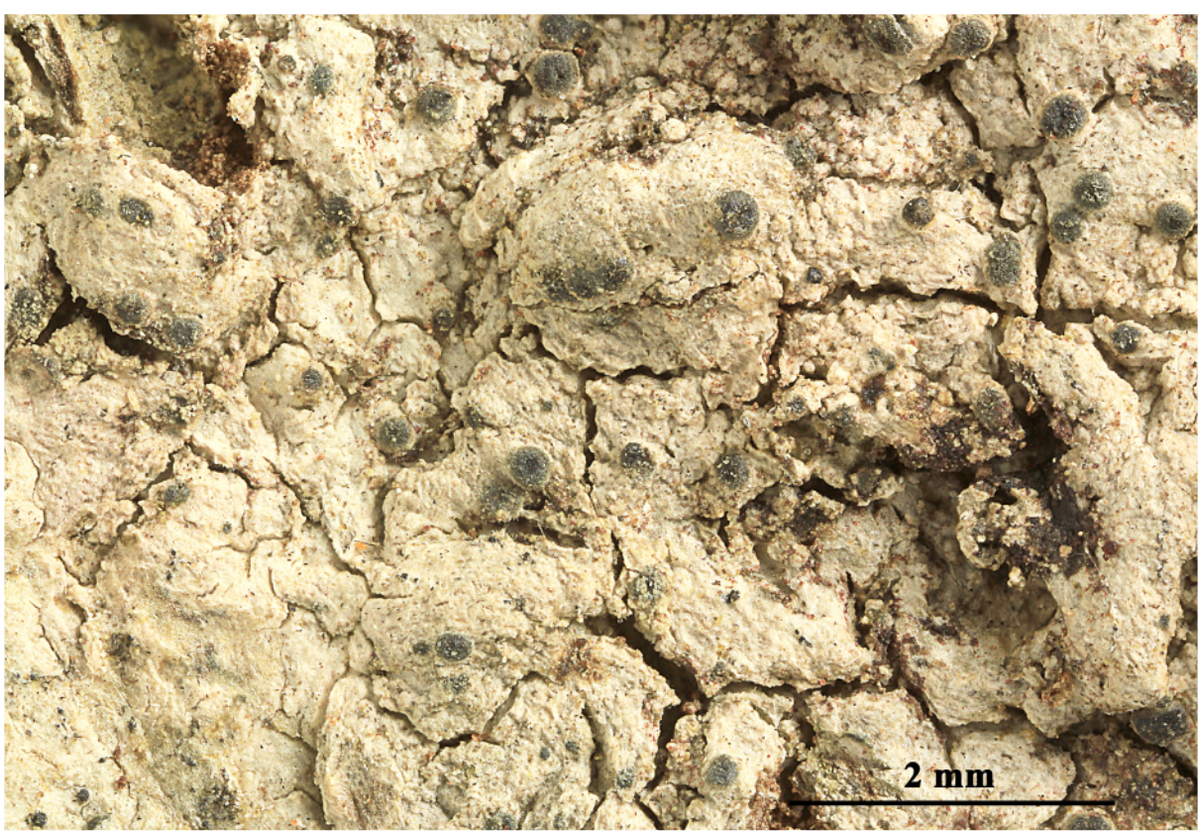


Aspidothelium geminiparum

Aspidothelium glabrum Lücking, Aptroot & Sipman, in Aptroot, Lücking, Sipman, Umaña & Chaves, Biblthca Lichenol. 97: 42 (2008)

[42975], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42975), 27. October 2017, det. A. Aptroot 2017. -

Thallus pale mineral grey to immersed, surrounded by an up to 0.2 mm wide black line of hypothallus. Perithecia sessile, hemispherical to barrelshaped, smooth, 0.2–0.4 mm diam., pale cream to grey, glossy, towards the top with brownish grey areas and with a depressed black ostiole, which is visible in cross section as a black cap somewhat below the top of the perithecia. Hamathecium not inspersed, filaments partly branched. Ascospores 4/ascus, fusiform, hyaline, densely muriform, 7–9 × 1–3-septate with partly oblique septa, 40–50 × 12–15 µm.





Aspidothelium glabrum

Asteristion platycarpum (Tuck.) I. Medeiros, Lücking & Lumbsch, in Medeiros, Kraichak, Lücking, Mangold & Lumbsch, Fieldiana, Life and Earth Sciences 9: 12 (2017)

= *Chapsa platycarpa* (Tuck.) Frisch, Biblthca Lichenol. 92: 113 (2006)

= *Phaeotrema platycarpum* (Tuck.) Zahlbr., Cat. Lich. Univers. 2: 609 (1923) [1924]

= *Thelotrema platycarpum* Tuck., Proc. Amer. Acad. Arts & Sci. 5: 406 (1862) [1860]

[42941], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42941), 27. October 2017, det. A. Aptroot 2017. - Thallus corticolous, brown-olive, continuous, c. 0.08-0.14 mm thick, slightly uneven, with a slightly glossy, cartilaginous surface; a white medullary layer absent. Prothallus line thin, brownish. Phenocortex 20-50 µm, dense and strongly conglutinated, with predominantly periclinal but often indistinct hyphae; oxalate crystals and decomposed bark cells are often embedded in the cortical layer. Photobiont layer 40-80 µm thick, with numerous oxalate crystals, partly endophloeodal. Medulla endophloeodal. Pycindia unknown. Apothecia dispersed, level with the thallus, rounded to angular or reniform, 1-2.3 mm diam. Margin raised, lobed, upright to strongly recurved, with a compact, brownish to yellowish-white inner surface; proper exciple free, white to pale brown, thin, frayed to fissured, surrounding the disc as a narrow rim bent over the hymenium. Disc pale brown to brown, covered by a thin (bluish-) white pruina. Proper exciple cupular, c. 7-15 µm deep and brownish at the base, laterally 10-15 µm wide, a hyaline and only slightly conglutinated prosoplectenchyma with short-celled (cells c. 3-6 × 1.5-2 µm) hyphae or almost paraplectenchymatic. Periphysoids up to 15 µm long, dense, free, c. 2 µm wide, perpendicular to the proper exciple, formed of up to three short rectangular cells; fused and often with a pale brown pigment in the cell walls above the level of the hymenium. Hymenium 50-60 µm high, clear. Ascospores 8/ascus, 1-2-seriate, brown, thick-walled, transversely septate, 11-15 × 4-5 µm, 4(-6)-loculate, with subacute ends, I+ pale purplish-blue. Asci narrowly clavate, c. 45-60 × 7-9 µm. Paraphyses simple, straight, 1.5-2 µm wide; tips slightly thickened, adspersed with fine greyish to brownish granules. Epihymenium unpigmented, 5-7 µm high. Chemitry: Stictic acid (major), α-acetylconstictic acid (minor to trace), constictic acid (minor) detected by TLC.



Asteristion platycarpum



Asteristion platycarpum

Asteristion platycarpum (Tuck.) I. Medeiros, Lücking & Lumbsch, in Medeiros, Kraichak, Lücking, Mangold & Lumbsch, Fieldiana, Life and Earth Sciences 9: 12 (2017)

= *Chapsa platycarpa* (Tuck.) Frisch, Biblthca Lichenol. 92: 113 (2006)

= *Phaeotrema platycarpum* (Tuck.) Zahlbr., Cat. Lich. Univers. 2: 609 (1923) [1924]

= *Thelotrema platycarpum* Tuck., Proc. Amer. Acad. Arts & Sci. 5: 406 (1862) [1860]

[ABL42984], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42984), 27. October 2017, det. A. Aptroot 2017.





Asteristion platycarpum

Astrothelium ceratinum (Fée) Aptroot & Lücking, Lichenologist 48(6): 852 (2016)

= *Pseudopyrenula ceratina* (Fée) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 30(no. 3): 29 (1888)

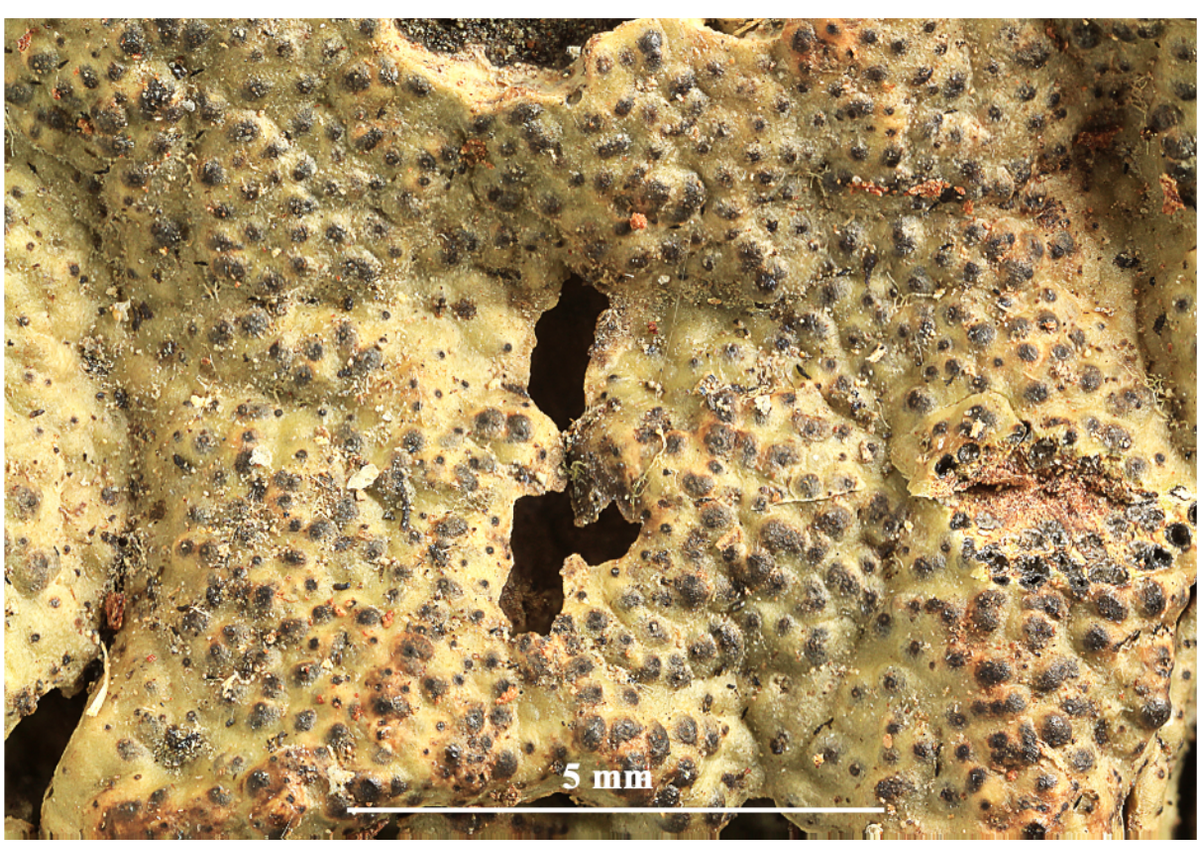
= *Pyrenula ceratina* Fée, Essai Crypt. Exot., Suppl. Révis. (Paris): 77 (1837)

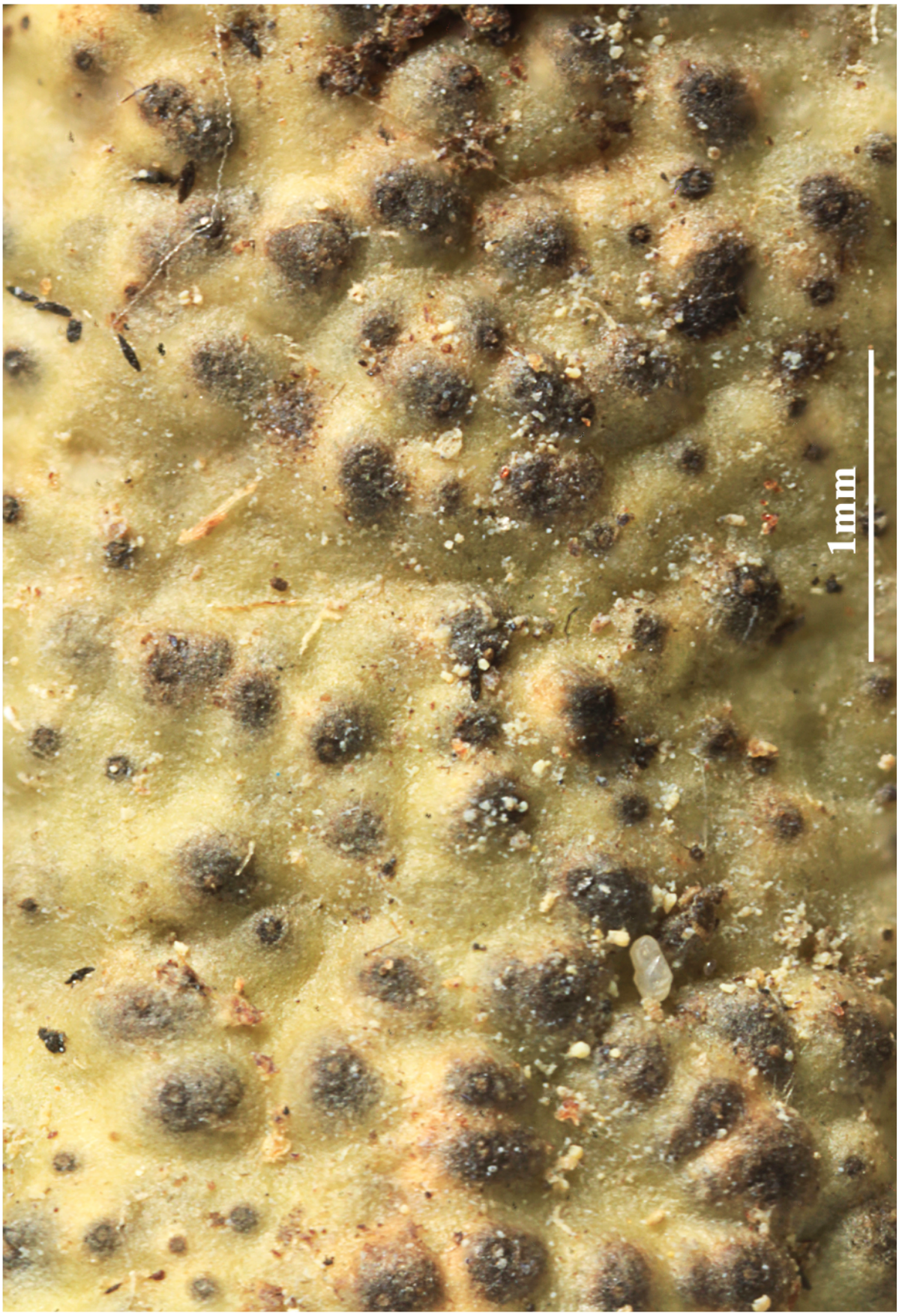
= *Segestria pupula var. ceratina* (Fée) Trevis., Conspect. Verruc.: 6 (1860)

= *Trypethelium ceratinum* (Fée) R.C. Harris, Lichenogr. Thomsoniana, North American Lichenology in Honor of John W. Thomson (Ithaca): 141 (1998)

= *Verrucaria ceratina* (Fée) Nyl., Acta Soc. Sci. fenn. 7(2): 491 (1863)

[ABL50666], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50666), 21. June 2019, det. A. Aptroot 2019. - Thallus corticate, olive-green, smooth to uneven. Ascomata trypethelioid, with apical ostioles, solitary, 0.3–0.4 mm diam., erumpent, covered by thallus but upper portion darker or greyish. Hamathecium not inspersed. Ascospores 8/ascus, 3-septate, fusiform, 21–28 × 9–12 µm, hyaline, IKI−. Chemistry: Thallus and pseudostromata UV−, K−; TLC no substances detected.





Astrothelium ceratinum

Astrothelium cryptolucens Lücking, M.P. Nelsen & N. Salazar, in Lücking, Nelsen, Aptroot, Benatti, Binh, Gueidan, Gutiérrez, Jungbluth, Lumbsch, Marcelli, Moncada, Naksuwankul, Orozco, Salazar-Allen & Upreti, Lichenologist 48(6): 644 (2016)

[ABL50665], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50665), 21. June 2019, det. A. Aptroot 2019. - Thallus crustose, corticolous, continuous, ≤10 cm diam., uneven to coarsely bumpy with bumps 1–3 mm diam. or often elongate (gall-forming), olive-yellow; in section with thin cortex and with irregular photobiont layer and thick medulla immersed in the modified periderm; photobiont layer and medulla encrusted with numerous, small crystals. Perithecia loosely aggregated and completely immersed in irregular to linear pseudostromata, with lateral, separate ostioles; pseudostromata 2–5 mm long and 1–3 mm wide, immersed, always developed between galls, often anastomosing, uneven and cracked into numeros small 'areoles', covered with a brownish white layer; ostioles papilliform, 0.05–0.10mm diam., brownish; perithecia pyriform, arranged laterally with ostiolar channels oriented irregularly, 0.3–0.5mm wide and ≤1 mm long ('high'). Excipulum in section 50–150 µm thick, carbonized; space between individual perithecia filled with amorphous, orange-brown tissue. Hamathecium composed of densely anastomosing, 0.5 µm thick, netlike paraphyses embedded in a gelatinous matrix, clear, IKI−; upper part of hamathecium and ostiolar channel strongly inspersed. Ascospores 1–2/ascus, oblong-ellipsoid, densely muriform with distinct median constriction and distinctly thickened median septum and thick outer wall, 150–200 × 50–60 µm, hyaline, IKI−. Chemistry. Pseudostromata with lichexanthone, UV+ yellow.





Astrothelium cryptolucens

Astrothelium megeustomurale M. Cáceres & Aptroot, Bryologist 120(2): 172 (2017)

[ABL50704], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50704), 21. June 2019, det. A. Aptroot 2019. TOPOTYPE. - Thallus dull, olivaceous green, not surrounded by a prothallus. Ascomata globose to pyriform, 0.5–0.8 mm diam., immersed in and below pseudostromata, in groups of 5–15. Pseudostroma slightly raised to flush with the thallus, c. 1–6 mm diam., irregularly ellipsoid to elongated or branched, occasionally forming a reticulum, ochraceous, internally not pigmented. Ostioles eccentric, fused, often crater-like depressed, black, up to 0.2 mm, surrounded by a c. 0.1 mm wide gray ring. Hamathecium not inspersed, IKI–. Ascospores 4/ascus, hyaline, regularly muriform, 15–17 / 5–9-septate, 95–120 x 30–33 µm, long-ellipsoid, with distinctly thickened median septum, not surrounded by a wide gelatinous sheath. Pycnidia not observed. Chemistry: Thallus UV–, C–, K–, KC–, P–; pseudostroma UV+ yellow, C–, P–, K–. TLC: Pseudostroma with lichexanthone.

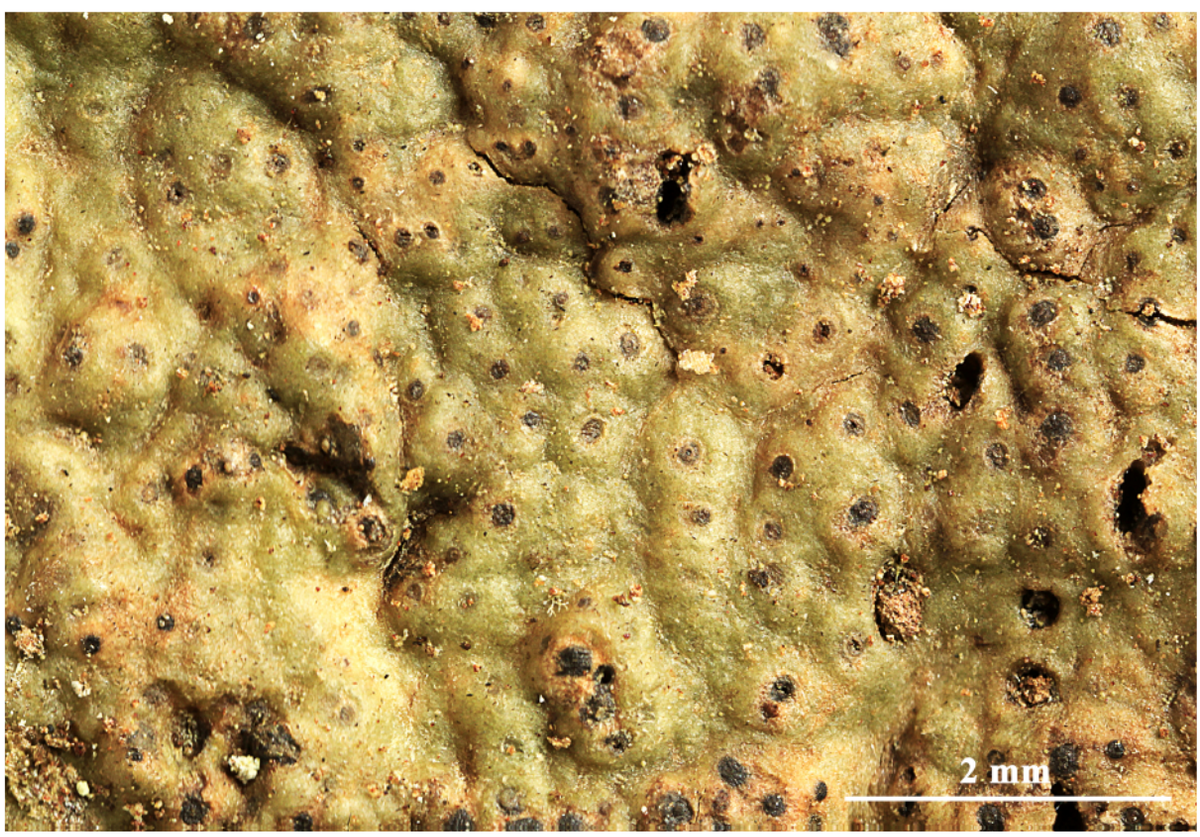




Astrothelium megeustomurale

Astrothelium papulosum (Nyl.) Aptroot & Lücking, Lichenologist 48(6): 876 (2016)
= *Pseudopyrenula papulosa* (Nyl.) Müll. Arg., Flora, Regensburg 66(16): 248 (1883)
= *Trypethelium papulosum* (Nyl.) Makhija & Patw., Int. J. Mycol. Lichenol. 5(3): 242 (1992)
= *Verrucaria papulosa* Nyl., Annls Sci. Nat., Bot., sér. 5 7: 345 (1867)

[ABL50774], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50774), 22. June 2019, det. A. Aptroot 2019. - Thallus corticate, yellowish brown, uneven to verrucose-papillose. Ascomata trypethelioid, with apical ostioles, aggregate in diffuse pseudostromata; pseudostromata 1–3(–5) mm diam. (individual ascomata 0.2–0.4mm diam.), immersed to erumpent, covered by thallus except for dark ostioles. Hamathecium clear. Ascospores 8/ascus, fusiform-ellipsoid, 3-septate, 26–38×7–9 µm, hyaline, IKI−. Chemistry: Thallus UV−, K−. TLC: no substances detected.





Astrothelium papulosum

Astrothelium pleiostomum Redinger, Hedwigia 73: 58 (1933)

[ABL50745], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50745), 22. June 2019, det. A. Aptroot 2019. - Thallus corticate, olive-green to yellowish, uneven somewhat bullate, often gall-like. Ascomata pleurothelioid with eccentric, separate ostioles, diffusely pseudostromatic; pseudostromata 0.8–1.3 mm diam., erumpent, covered by thallus but with upper portion whitish, internally with yellowish pigment. Hamathecium clear. Ascospores 8/ascus, fusiform-ellipsoid, 3-septate, 28–33 ×8–10 µm, rather thin-walled, hyaline, IKI−. Chemistry: Thallus and pseudostromata UV−, K−; pseudostroma internally K+ yellow, with anthraquinone.





Astrothelium pleiostomum

Astrothelium valsoides M. Cáceres & Aptroot, Bryologist 120(2): 174 (2017)

[ABL50762], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50762), 22. June 2019, det. A. Aptroot 2019. TOPOTYPE. - Thallus dull, olivaceous green, not surrounded by a prothallus. Ascomata globose to pyriform, 0.3–0.6 mm diam., deeply (up to 2 mm) immersed in the bark below pseudostromata, in groups of 3–15. Pseudostroma often not clearly differentiated from the thallus, flush or raised and somewhat bulbous, corticate, sometimes with extensive blackening, not pigmented. Ostioles eccentric, fused, surfacing in a black conical mount of c. 0.3 mm wide. Hamathecium not inspersed, IKI–. Ascospores 8/ascus, hyaline, (11–)13–15-septate, 69–80 x 15–17 µm, long-ellipsoid, surrounded by a 5–7 µm gelatinous sheath that extends to 13 µm at the tips. Pycnidia not observed. Chemistry: Thallus and pseudostroma UV–, C–, K–, KC–, P–. No lichen substances detected with TLC.





Astrothelium valsoides

Astrothelium zebrinum Aptroot, in Aptroot, Ertz, Etayo Salazar, Gueidan, Mercado Diaz, Schumm & Weerakoon, Lichenologist 48(6): 633 (2016)

[ABL50652], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50652), 21. June 2019, det. A. Aptroot 2019. - Thallus corticate, smooth, somewhat shiny, continuous, covering areas ≤ 9 cm diam., under 0.1 mm thick, pale yellowish grey, not surrounded by prothallus, not inducing gall formation of the host bark. Ascomata pyriform, c. 0.6–1.2mm diam., mostly aggregated 2–5, mostly immersed in the bark tissue below pseudostromata with a whitish surface different from the thallus, which are slightly raised above the thallus and mostly linear to irregular in outline, and ≤ 1 cm long and 4 mm wide, not forming a network. Wall carbonized, ≤ c. 80 µm thick. Ostioles eccentric, fused, strongly convex, pale brownish, surrounded by a thick whitish pruinose ring. Hamathecium not inspersed with oil globules. Asci with 8 ascospores. Ascospores hyaline, fusiform, 7-septate, 60–70 ×14–28 µm, ends pointed, not surrounded by a gelatinous layer. Chemistry: Thallus and pseudostromata UV−, K−. TLC: no secondary substances detected.



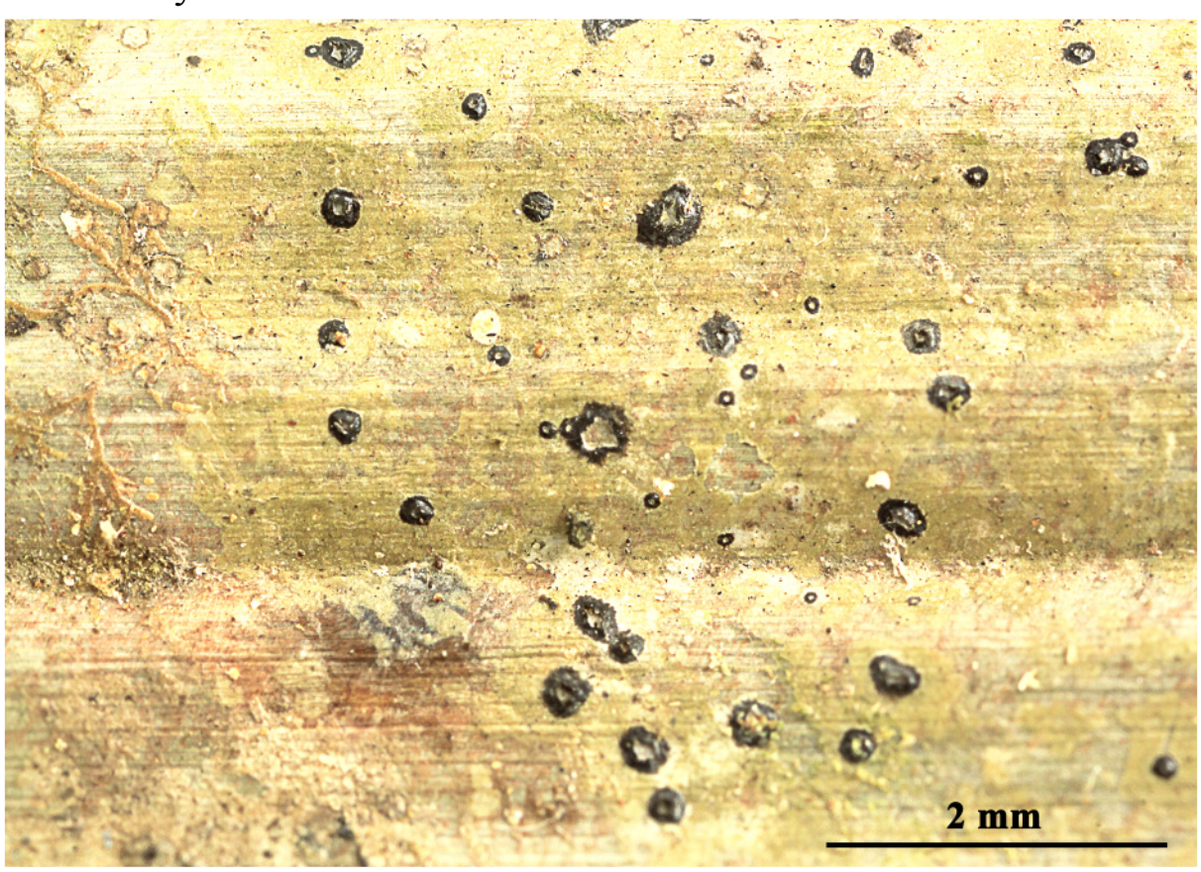




Astrothelium zebrinum

Aulaxina microphana (Vain.) R. Sant., Symb. bot. upsal. 12(no. 1): 299 (1952)
= *Bilimbia microphana* Vain. 1921

[ABL11799H], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799H), 15. March 2012, det. A. Aptroot 2012. - Thallus continuous or dispersed into rounded patches, 5–15 mm across and 10–15 µm thick, with cartilaginous, corticiform layer, smooth, green, connected by translucent prothallus. Apothecia adnate erumpent, zeorine but with carbonized, thalline margin, rounded, 0.15–0.35 mm diam. and 40–70 µm high; disc in young apothecia completely covered by margin, in mature apothecia plane, pale yellowish grey; margin very distinct, strongly prominent, gently sloping outwards and, therefore, appearing rather thick, pure black. Excipulum strongly reduced, prosoplectenchymatous, 3–7 µm broad, colorless, covered by 10–20 µm thick, entirely carbonized, thallus layer lacking algae. Hypothecium 5–10 µm high, colorless. Epithecium indistinct. Hymenium 20–30 µm high, colorless. Asci clavate, 20–30 x 8–12 µm. Ascospores 8 per ascus, fusiform ellipsoid, 3-septate, with slight constrictions at septa, (7–)10–20 x 2.5–4 µm, 3–5 times as long as broad. Hyphophores not observed. Chemistry: no substances
detected by TLC.

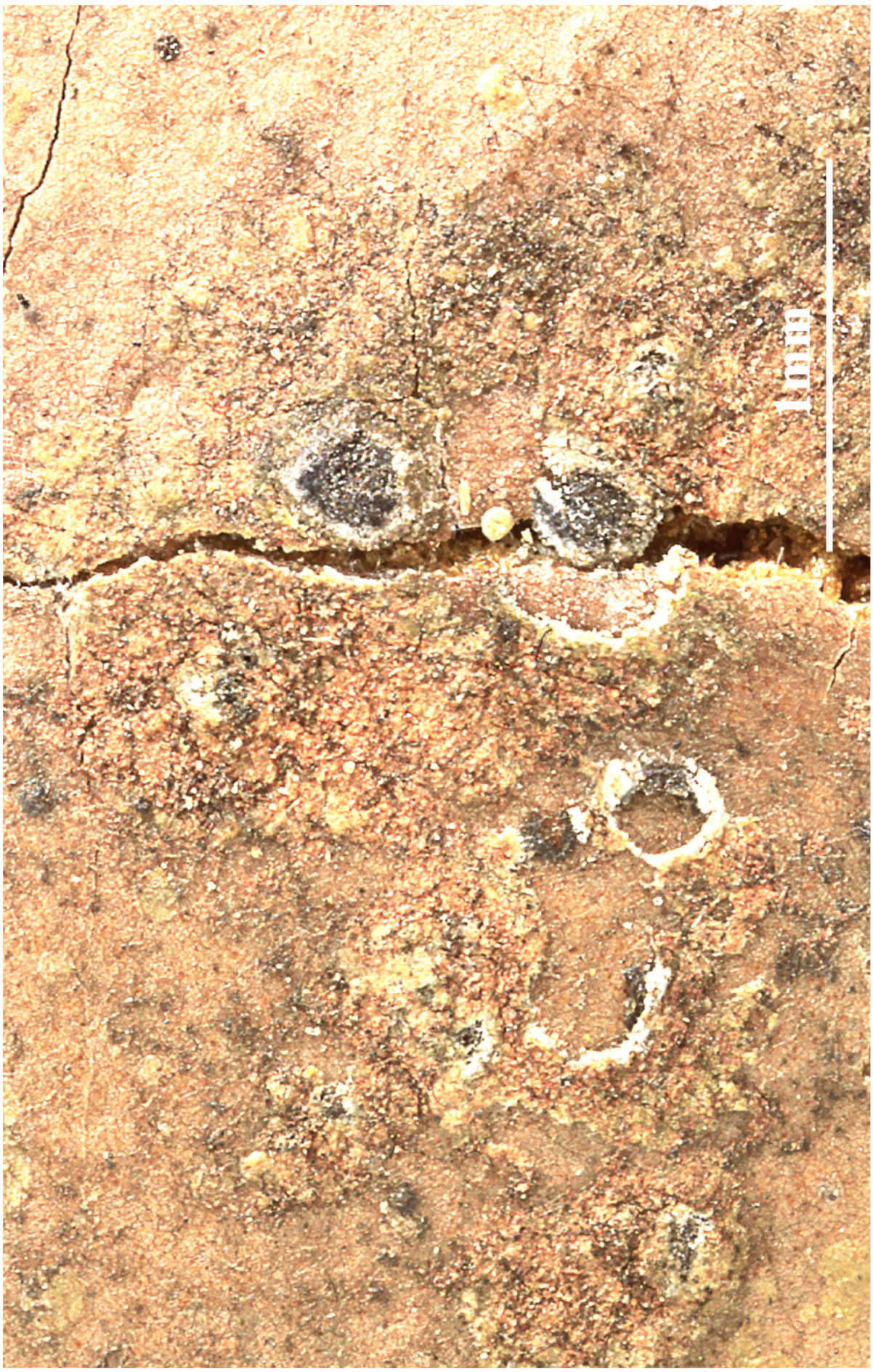




Aulaxina microphana

Bacidina adastra (Sparrius & Aptroot) M. Hauck & V. Wirth, Herzogia 23(1): 16 (2010)
= *Bacidia adastra* Sparrius & Aptroot, Lichenologist 35(4): 275 (2003)

[ABL18162], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18162), 27. July 2013, det. A. Aptroot 2013. - Thallus often forming large patches up to 0.5 m diam., thinly sorediate to thickly leprose, typically consisting of a cracked layer of soredia up to 1 mm thick, usually vivid yellowish green, resembling free living chlorococcoid algae, in the herbarium turning greenish grey or brownish grey; soredia 30-50 µm diam. Photobiont cells chlorococcoid, 7-14 µm diam. Apothecia rare, sessile, constricted at the base, (0.2-)0.4-0.7 mm diam.; disc flat to flexuose, pale pink to dark blue-black, often only partly coloured, the darkened parts with an aeruginose pigment in section; apothecial margin conspicuous, 0.1-0.2 mm wide, flush with the disc, pinkish with aeruginose or dark brown flecks; apothecial base hyaline. Excipulum well developed, paraplectenchymatous, 25-35 µm wide, hyphae with isodiametric to slightly ellipsoid lumina 5-7 x 5-10 µm, hyaline but in part, especially the upper part bordering the epithecium, aeruginose or orange-brown, without crystals. Epithecium hyaline to aeruginose or orange-brown, c. 5-10 µm thick, K- or the coloured parts intensifying; hypothedum hyaline or very pale straw, K- and C-, 40-60 µm thick, without crystals. Hymenium hyaline or orange-brown, K+ intensifying brown-purplish, 60-70 µm high. Paraphyses numerous, c. 1 µm thick, apices widened to 5 µm. Asci clavate, tips with Lecanora-type sensu Thell et al. (1995) and amyloid tholus. Ascospores 8 per ascus, acicular, 3-10 septate, hyaline, 40-50 x 0.9-1.2 µm, straight to slightly curved. Conidiomata rare, white, immersed, c. 0.1 mm diam.; conidia filiform, 35-50 x 1.0-1.2 µm, indistinctly 4-6-septate. Chemistry. No spot reactions and no lichen substances found by TLC.



Bacidina adastra

Bacidina pseudohyphophorifera (Lücking & Sérus.) Lücking, Fl. Neotrop., Monogr. 103: 607 (2008)

= *Woessia pseudohyphophorifera* Lücking & Sérus., in Sérusiaux, Biblthca Lichenol. 58: 422 (1995)

[ABL28327], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28327), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus epiphyllous or at leaf margin, continuous, 10–25 mm across and 10–15 µm thick, farinose, greenish grey to brownish green; isidia and goniocystangia absent. Photobiont chlorococcoid, cells 5–9 µm diam. Apothecia usually formed hypophyllous near leaf margin, sessile, rounded, 0.2–0.4 mm diam. and 100–160 µm high; disc plane to slightly convex, orange-yellow to ochraceous brown; margin thin but usually persistent, pale yellow to chamois-colored. Excipulum 30–60 µm broad. Hypothecium 25–35 µm high, colorless to pale yellow. Hymenium 30–40 µm high, colorless. Asci clavate, 25–30 x 5–7 µm. Ascospores spirally arranged, bacillar to narrowly fusiform and slightly tapering towards proximal end, (1–)3(–5)-septate, 16–23 x 1.2–1.5 µm, 13–16 times as long as broad. Pycnidia pedicellate, conidiogeneous chamber forming tubular, fusiform structure at top of pedicel, 1.3–1.8 mm high, pedicel 100–150 µm broad, upper fusiform segment 150–230 µm broad, pale yellow to ochraceous brown; wall composed of colorless, densely intricate hyphae at base (resembling paraplectenchyma) and parallel hyphae at fusiform tip; conidiogeneous cells 5–8 x 1–1.3 µm. Conidia filiform, strongly curved to sigmoid, seemingly non-septate but under strong magnification (3–)5–7 septa visible, 50–70 x 0.8–1.2 µm. Chemistry: no substances detected by TLC.





Bacidina pseudohyphophorifera

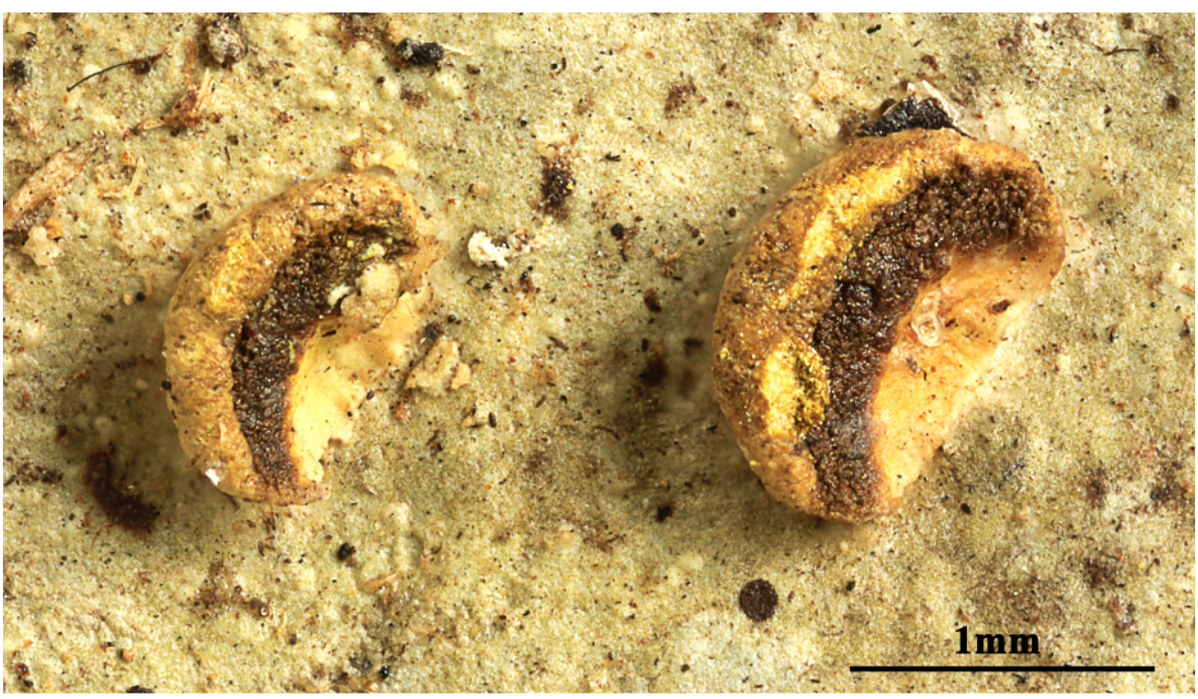
Badimia dimidiata (Bab. ex Leight.) Vězda, Folia geobot. phytotax. 21(2): 215 (1986)
= *Bacidia dimidiata* (Bab. ex Leight.) R. Sant., Symb. bot. upsal. 12(no. 1): 466 (1952)
= *Lecania dimidiata* (Bab. ex Leight.) Zahlbr., Cat. Lich. Univers. 5: 723 (1928)
= *Lecanora dimidiata* Bab. ex Leight., Trans. Linn. Soc. London 25: 446 (1866)

[ABL50710D], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50710D), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, 10–50 mm across and 15–25 µm thick, sparsely to irregularly verrucose, pale greenish grey, rarely with bluish tinge; verrucae hemispherical, 0.1–0.15 mm diam., white. Apothecia rounded, 0.4–0.8 mm diam. and 140–190 µm high; disc plane to slightly concave, pale yellow when young, brownish orange to ferrugineous brown when mature; margin thick, slightly prominent, chamoiscolored. Excipulum with indistinct structure due to strong incrustation with colorless crystals, 20–40 µm broad, grey, in K under pressure dissolving into free, moniliform hyphae with globose cells and contricted septa. Hypothecium 20–35 µm high, light brown, K–. Epithecium 5–10 µm high, pale yellow. Hymenium 50–70 µmm high, colorless. Asci 45–60 x 10–13 µm. Ascospores ellipsoid to fusiform, 3-septate, with slight constrictions at septa, 12–18 x 4–6 µm, 2.5–3.5 times as long as broad, colorless. Campylidia 0.8–1.5 mm broad, ferrugineous brown, wall incrusted with colorless crystals. Conidia filiform, 3–9-septate, 50–70 x 1–1.5 µm, with lateral appendages up to 10 µm long and 0.7 µm thick, colorless. Chemistry: usnic acid, zeorin.



Badimia dimidiata

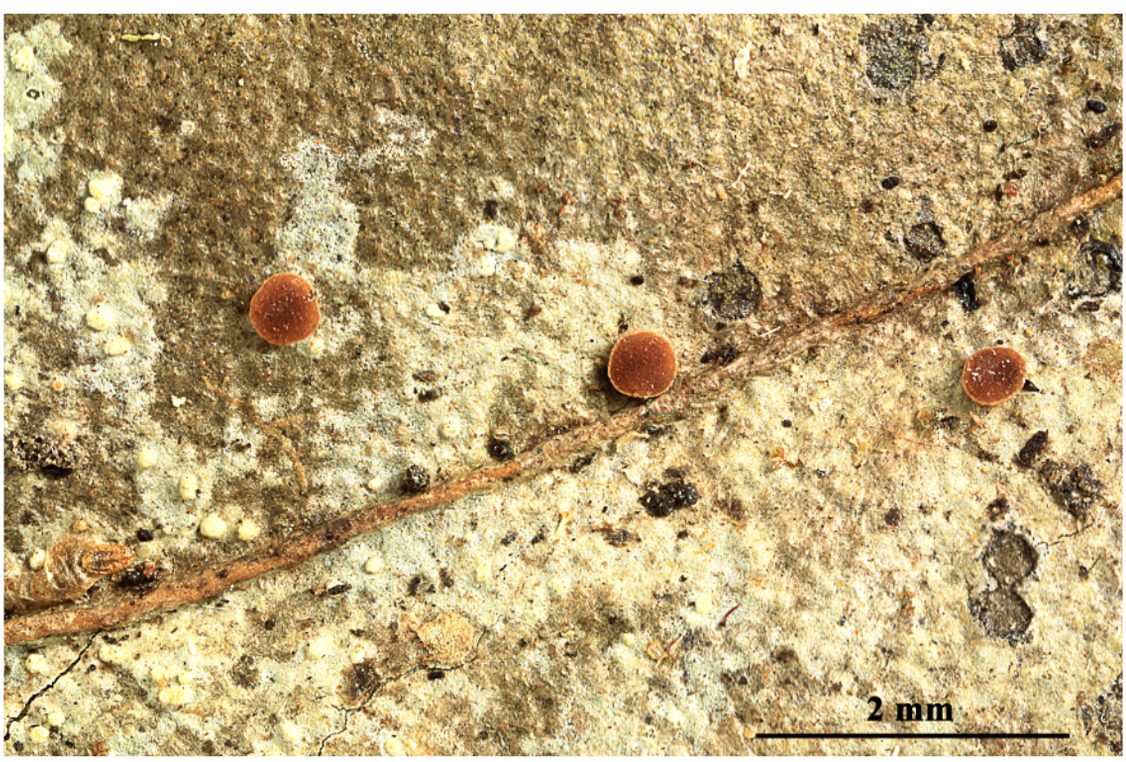




Badimia dimidiata

Badimia pallidula (Kremp.) Vězda, Folia geobot. phytotax. 21(2): 215 (1986)
= *Bacidia pallidula* (Kremp.) Zahlbr., Cat. Lich. Univers. 4: 135 (1926) [1927]
= *Lecidea pallidula* Kremp., Lich. Foliic. Leg. Beccari: 9 (1874)
= *Patellaria pallidula* (Kremp.) Müll. Arg., Flora, Regensburg 73: 188 (1890)

[ABL50710C], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50710C), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous or irregularly dispersed, 10–30 mm across and 15–30 µm thick, sparsely to densely verrucose, pale bluish to greenish grey; verrucae hemispherical, 0.1–0.15(–0.2) mm diam., white. Apothecia rounded, 0.3–0.7 mm diam. and 150–200 µm high; disc plane, flesh-colored to orange or pinkish and usually slightly translucent; margin thin, slightly prominent, of same color as disc. Excipulum paraplectenchymatous, lacking crystals, 30–50 µm broad, colorless. Hypothecium 20–30 µm high, pale yellow, K–. Epithecium indistinct. Hymenium 40–60 µm high, colorless. Asci 35–50 x 8–12 µm. Ascospores ellipsoid to fusiform, 3-septate, with slight constrictions at septa, 11–15 x 3–4 µm, 3–4 times as long as broad, colorless. Campylidia 0.6–1.2 mm broad, chamois-colored to white. Conidia filiform, 5–7-septate, 40–65 x 1.2–1.5 µm, with lateral appendages up to 7 µm long and 0.7 µm thick, colorless. Chemistry:usnic acid, zeorin.





Badimia pallidula

Brasilicia brasiliensis (Müll. Arg.) Lücking, Kalb & Sérus., in Lücking, Fl. Neotrop., Monogr. 103: 667 (2008)

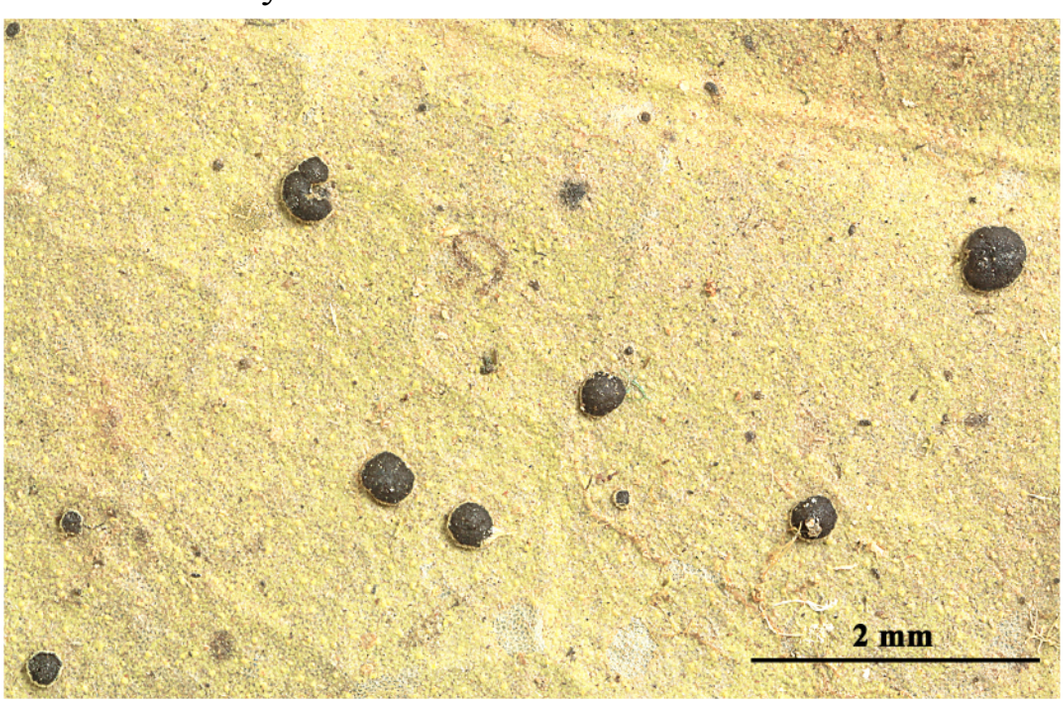
= *Bacidia brasiliensis* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 4: 183 (1926) [1927]

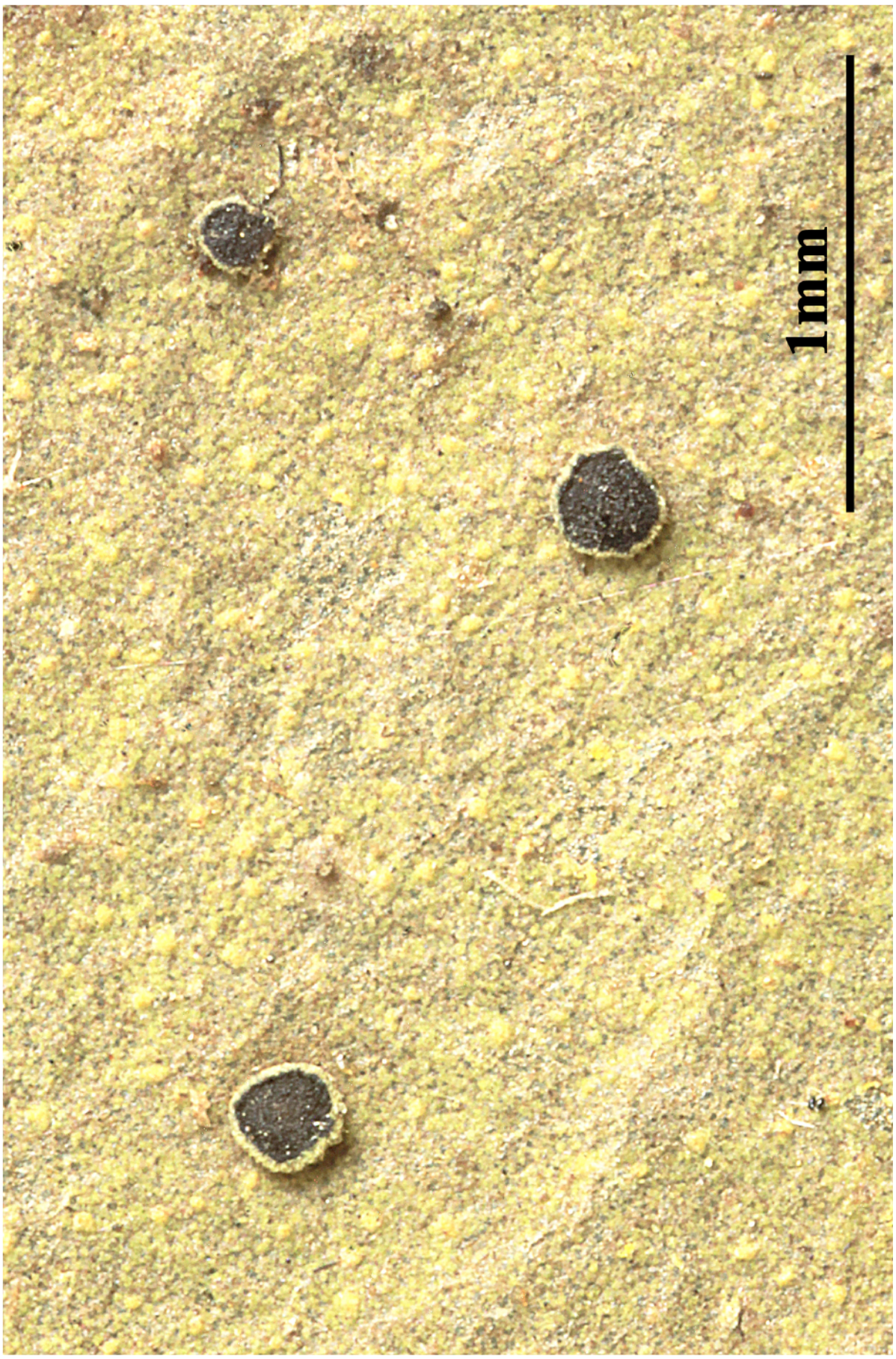
= *Bacidia brasiliensis var. laevis* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 4: 183 (1926) [1927]

= *Patellaria brasiliensis* Müll. Arg., Lichenes Epiphylli Novi: 10 (1890)

= *Patellaria brasiliensis var. laevis* Müll. Arg., Lichenes Epiphylli Novi: 10 (1890)

[ABL50710C], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50710C), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, 10–40 mm across and 15–30 µm thick, finely verrucose, pale greenish to yellowish grey; verrucae wart-shaped, 0.03–0.07 mm diam., chamois-colored to white. Apothecia rounded, 0.3–0.6 mm diam. and 250–300 µm high; disc plane, reddish brown to dark brown; margin distinct and in young apothecia slightly prominent, persistent, chamois-colored. Excipulum 50–70 µm broad. Hypothecium 30–60 µm high, yellowish brown, K–. Epithecium 5–10 µm high, composed of colorless granules. Hymenium 70–90 µm high, colorless. Asci 60–80 x 8–10 µm. Ascospores narrowly cylindrical to filiform and slightly tapering towards proximal end, (7–)15-septate, without constrictions at septa, (35–)50–70 x 2–3 µm, 20–25 times as long as broad, colorless. Pycnidia rare, sessile, cupuliform to subglobose, 0.05–0.1 mm diam. and 30–70 µm high, chamois-colored to grey. Conidia fusiform, nonseptate, 4–6 x 1.2–1.6 µm, colorless. Chemistry: zeorin.

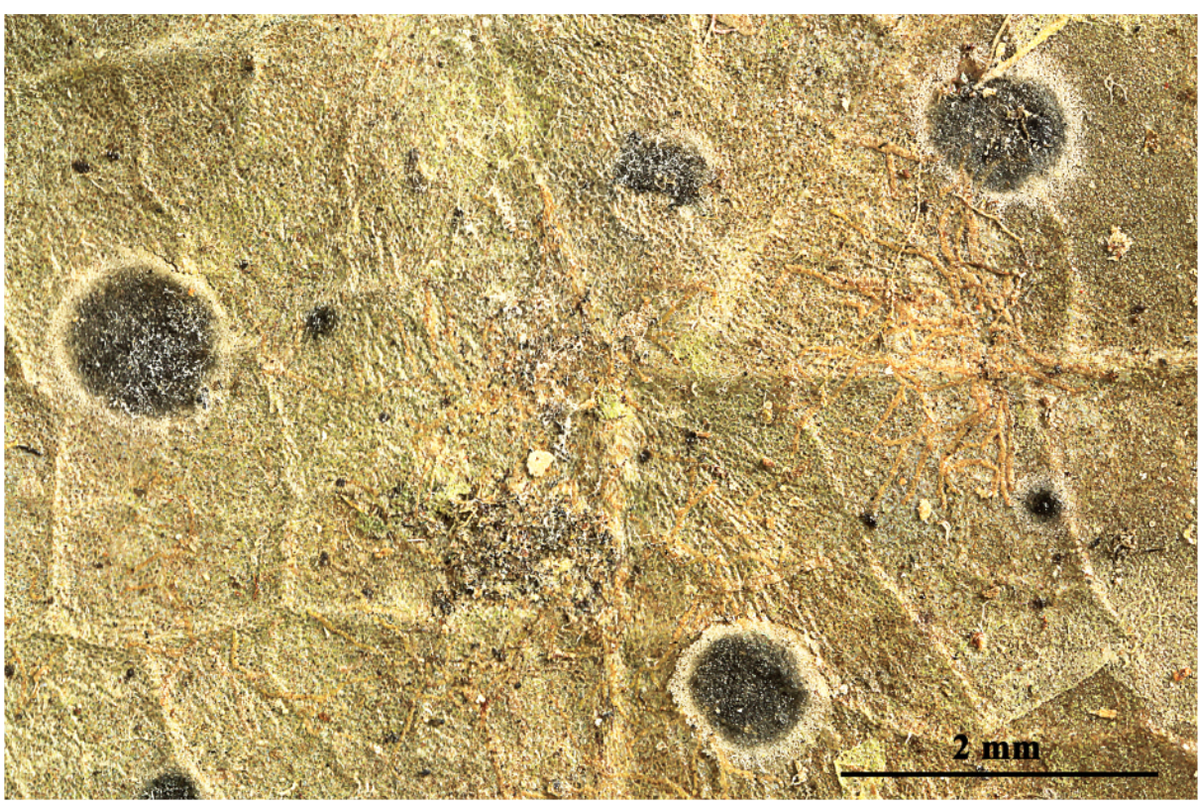


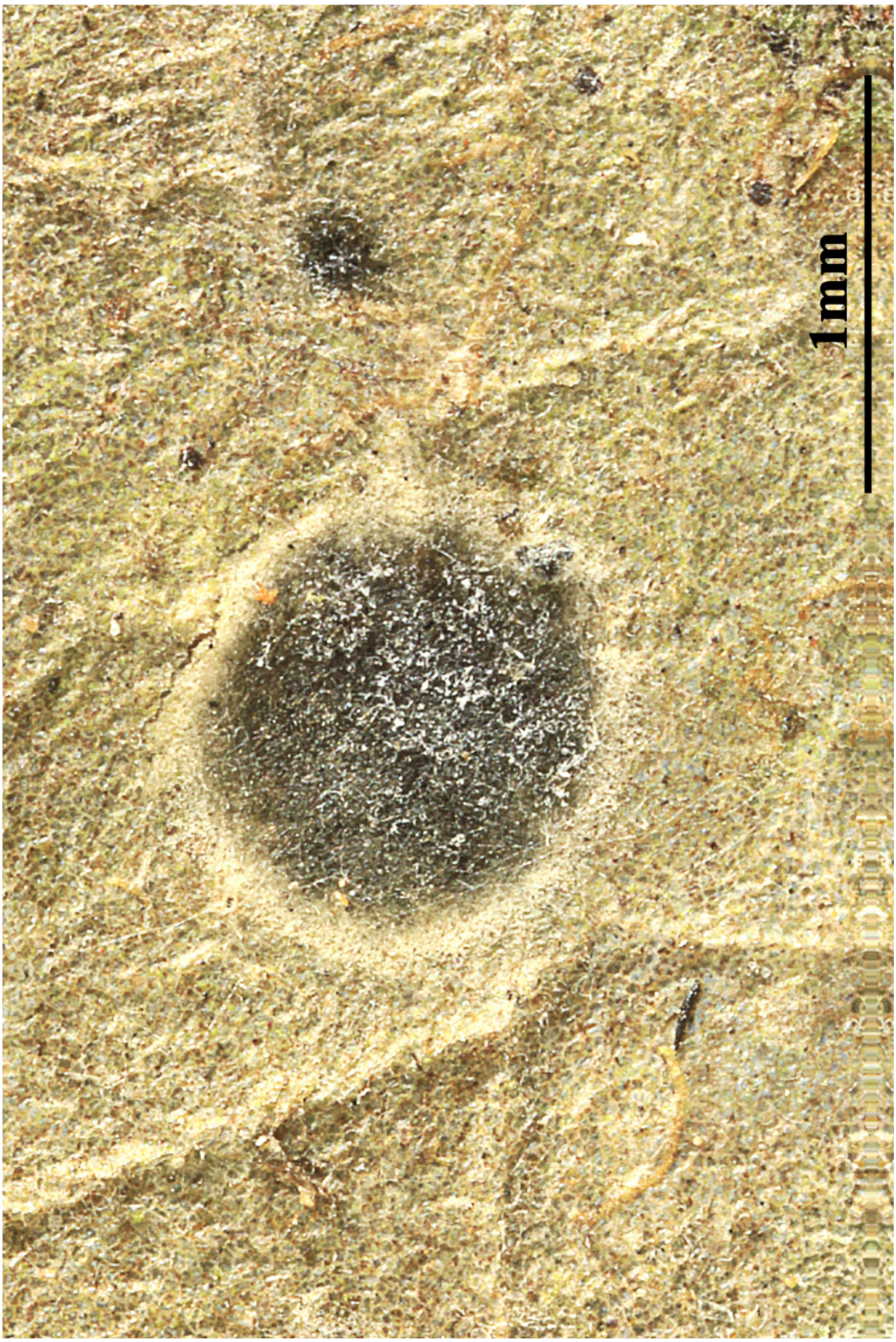


Brasilicia brasiliensis

Byssolecania fumosonigricans (Müll. Arg.) R. Sant., Symb. bot. upsal. 12(no. 1): 553 (1952)
= *Patellaria fumosonigricans* Müll. Arg. 1890

[ABL50710y], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710y), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, 10–30 mm across and 10–20 µm thick, smooth to minutely farinose, brownish to greenish grey. Apothecia very weakly raised above thallus level, rounded, 0.5–0.8 mm diam. and 50–90 µm high; disc plane to slightly convex, dark greyish brown to greyish black with indistinct, paler, marginal zone; margin absent. Excipulum present only below hypothecium, 5–15 µm broad, colorless, laterally with short, free hyphae. Hypothecium 5–15 µm high, dark sordid brown, K–. Hymenium 40–60 µm high, colorless. Asci 35–55 x 9–12 µm. Ascospores (6–)8 per ascus, oblong, 3-septate, without or with very slight constrictions at septa, 14–22 x 2–3 µm, 6–8 times as long as broad, colorless. Pycnidia subglobose to cup-shaped, 0.07–0.15 mm diam., brownish grey to bluish brown. Conidia fusiform, non-septate, 4–5 x 1.3–1.6 µm, colorless. Chemistry: two unidentified substances detected by TLC; no TLC spot color but pale blue fluorescence in long-wave UV after charring (RF 46 and 66 in solvent C).





Byssolecania fumosonigricans

Byssoloma fuscothallinum Lücking, Cryptog. Mycol. 27(2): 128 (2006)

[ABL50710x], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710x), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, 5–20 mm across and 10–15 µm thick, smooth, dark brown. Apothecia sessile to adnate, rounded to slightly irregular in outline, 0.2–0.3 mm diam. and 80–120 µm high; disc plane to slightly convex, at first pale brown but in mature apothecia rather dark brown; margin thinly byssoid, persistent but not spreading over thallus surface, chamois-colored to white. Excipulum reduced, made of loosely woven hyphae, 20–30 µm broad, pale greyish brown due to inspersion with crystals, K+ bright yellow. Hypothecium 10–15 µm high, brown, K– or K+ slightly yellow. Apothecial base brown, K– or K+ slightly yellow. Epithecium indistinct. Hymenium 50–60 µm high, colorless. Asci 35–45 x 10–12 µm. Ascospores oblong-ellipsoid, 1-septate, with slight constriction at septum, 8–11 x 2–2.5 µm, 3.5–4 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC.





Byssoloma fuscothallinum

Calopadia fusca (Müll. Arg.) Vězda, Folia geobot. phytotax. 21(2): 215 (1986)
= *Lopadium fuscum* Müll. Arg., Flora, Regensburg 64(7): 108 (1881)

[ABL11799L], Brazil, Amazonia, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799L), 15. March 2012, det. A. Aptroot 2012. - Thallus dispersed into rounded patches, 10–20 mm across and 10–20 µm thick, ecorticate, smooth, pale grey. Apothecia rounded, 0.3–0.5 mm diam. and 170–250 µm high; disc plane to slightly convex, light orange to reddish brown; margin thin, pale grey. Excipulum 30–50 µm broad. Hypothecium 20–30 µm high, light yellowish brown. Apothecial base aeruginous. Epithecium indistinct. Hymenium 80–100 µm high, colorless. Asci 70–80 x 22–32 µm. Ascospores single, ellipsoid, muriform, 60–85 x 18–30 µm, 3–4 times as long as broad, colourless. Campylidia sessile, 0.4–0.6 mm broad; lobe well-developed, hood-shaped, grey; socle not apparent. Conidia filiform with clavate apex, 3–7-septate, 30–45 x 1–1.5 µm. Chemistry: no substances detected by TLC and HPLC.

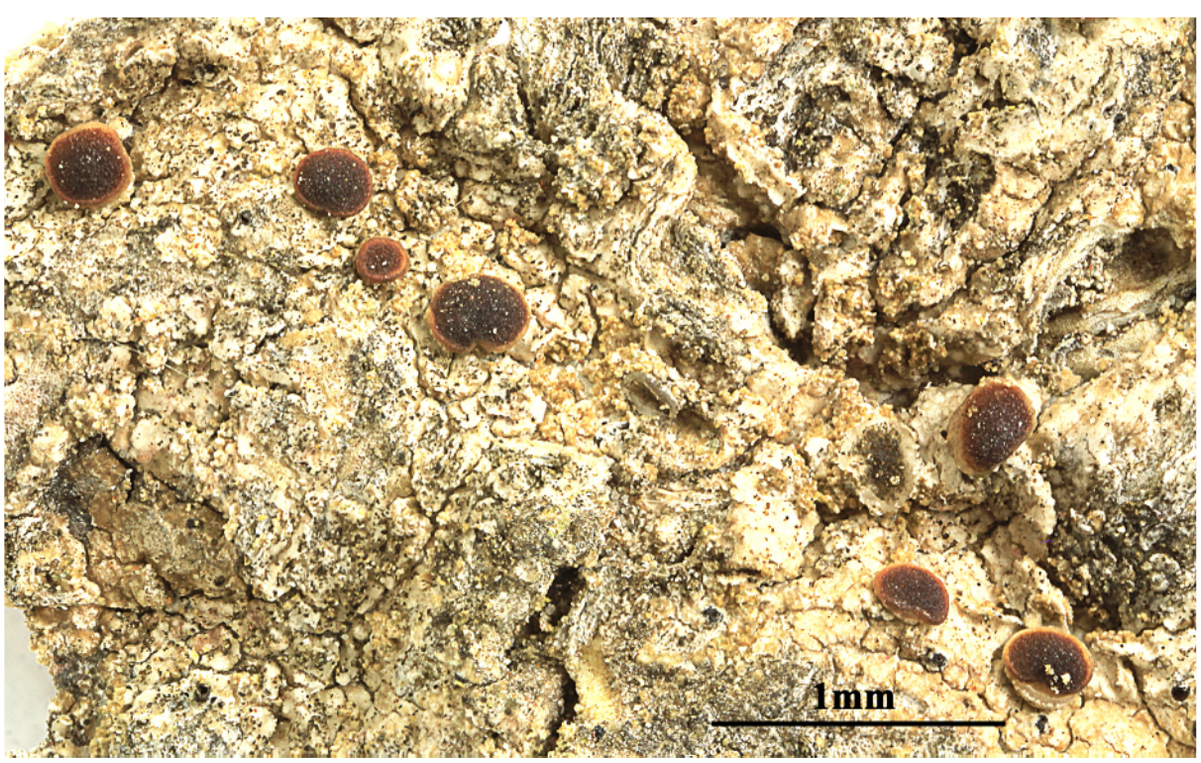




Calopadia fusca

Caloplaca wrightii (Tuck.) Fink, Lich. Fl. U.S.: 355 (1935)
= *Huneckia wrightii* (Tuck.) Arup, Søchting & Bungartz, in Bungartz, Søchting & Arup, Plant and Fungal Systematics 65(2): 530 (2020)
= *Blastenia ferruginea subsp. wrightii* (Tuck.) Hasse, Contr. U.S. natnl. Herb. 17(1): 111 (1913)
= *Blastenia ferruginea var. wrightii* (Tuck.) Zahlbr., Cat. Lich. Univers. 7: 125 (1930) [1931]
= *Caloplaca ferruginea var. wrightii* (Tuck.) Zahlbr., Cat. Lich. Univers. 7: 125 (1930) [1931]
= *Placodium ferrugineum f. wrightii* Tuck., Syn. N. Amer. Lich. (Boston) 1: 178 (1882)
= *Placodium ferrugineum var. wrightii* (Tuck.) Zahlbr., Cat. Lich. Univers. 7: 125 (1930) [1931]

[79509], Brazil, Rio Grande do Sul, Pelotas, Praia do Laranjal. 31°45'15" S, 52°13'37" W, 5 m. On coastal tree bark. Leg. A. Aptroot, (no. 79509), 17. July 2019, det. A. Aptroot 2019. - Thallus moderately thick, light greenish gray to whitish, densely sprinkled over with white granules or coralloid branchlets; apothecia small to middle-sized, 0.3-1 mm. across, adnate, the disk flat to convex, dark red to reddish brown, the exciple moderately thick, lighter or colored like the disk, becoming flexuous, sometimes bordered more or less by a thin thalloid one; spores ellipsoid, 12-19 x 6-9 µm.





Caloplaca wrightii

Carbacanthographis chionophora (Redinger) Staiger & Kalb, in Staiger, Biblthca Lichenol. 85: 105 (2002)
= *Graphis chionophora* Redinger, Ark. Bot. 27A(no. 3): 4 (1935)

[ABL18606], Brazil, Sergipe, Parque Nacional Serra de Itabaiana. 10°45'37" S, 37°22'15" W, 250 m. In transitional forest to caatinga, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18606), 18. Sept 2013, det. A. Aptroot 2013. - Lirellae 0.5-3 x 0.5-0.8 mm, labiae covered from the thallus, convergent. Excipiulum completely carbonized. Hymenium 80-100 µm, not inspersed. Spores 8/ascus, hyaline, transversally septated, 6-9-locular, 20 -25 x 6-8 µm, I-. Chemistry: protocetraric acid, lichexanthone.





Carbacanthographis chionophora

Carbacanthographis inspersa Staiger, Biblthca Lichenol. 85: 107 (2002)

[ABL28329], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28329), 3.-8. June 2016, det. A. Aptroot 2016. - Lirellae erumpent, long, branched, 1-5 x 0.3-0.5 mm. Labia carbonized but with white pruina. Disc nearly completely enclosed. Excipulum carbonized especially in the upper parts. Hymenium, 90 µm, inspersed. Spores 8/ascus, hyaline, muriform, 4-7/2-3-locular, 14-18 x 6-7 µm, I+ weakly violet. Chemistry: protocetraric acid.





Carbacanthographis inspersa

Carbacanthographis marcescens (Fée) Staiger & Kalb, in Staiger, Biblthca Lichenol. 85: 109 (2002)
= *Graphis marcescens* Fée 1825
= *Graphina marcescens* (Fée) Müll. Arg. 1887

[ABL28279], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28279), 3.-8. June 2016, det. A. Aptroot 2016. - Lirellae erased, long, branched, 1-5 x 0.2 mm, lips carbonized but white pruinose, disc copletely enclosed. Excipulum up to 200 µm high. Hymenium 50-70 µm, not inspersed. Spores 8/ascus, hyaline, submuriform, 4-5/2-locular, 12-17 x 5-7 µm, with 1-2 µm gel, I- or weakly violet. Chemistry: Salazinic acid, protocetraric acid (trace), norstictic acid (trace).





Carbacanthographis marcescens

Chapsa dissuta (Hale) Mangold, in Mangold, Elix & Lumbsch, in McCarthy (Ed.), Flora of Australia, Vol. 57. Lichens 5 (Melbourne): 653 (2009)
= *Ocellularia dissuta* Hale, Smithson. Contr. bot. 38: 20 (1978)
= *Thelotrema dissutum* (Hale) Hale, Mycotaxon 11(1): 131 (1980)

[ABL28363], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28363), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticola, epiphloeodes, nitidus, continuus, pallide brunneo-olivaceus, 6-10 cm latus; apothecia chroodiscoida, solitaria vel pauce aggregata, 0.6-0.8 mm diametro, margine thallino crasso, irregulariter fisso, non reflexo; ostiolum irregulare, 0.4-0.6 mm latum; excipulum pro parte separatum fissum; disco pallide livido, leviter albo-pruinoso; hymenium 60-70 µm altum; sporae 8/ascus, 4-6 x 10-12 µm, 3-4 loculatae, I-. Chemistry: no substances present. - The thalline margin of this species is coarse and split but not recurved, unlike any other species in the genus. It is confined to the lower trunks of small to medium-sized trees in mature rain forests at lower elevations.





Chapsa dissuta

Chapsa leprocarpoides (Hale) M. Cáceres & Lücking, in Cáceres, Libri Botanici 22: 52 (2007)
= *Thelotrema leprocarpoides* Hale 1981

[42936], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42936), 27. October 2017, det. A. Aptroot 2017. - Thallus whitish mineral grey, 8-12 cm broad, thin, dull, continuous, cortex not developed; algal layer distinct, 10-15 µm , interrupted by crystalls; apothecia round to somewhat elongate, 0.4-0.6 mm diam., solitary or aggregated in twos or threes, the thallin rim barely developed, low to suberect and splitting, barely recurved, the exicple free, coarse, partially filling the disc; hymenium 90 µm; spores colourless, muriform, 10-12 x 36-40 µm, 1-3 x 8-10 loculate, 4-8/ascus, I-. Chemistry: No substances presenr-





Chapsa leprocarpoides

Chiodecton lichexanthonicum M. Cáceres & Aptroot, Bryologist 120(2): 177 (2017)

[ABL50770], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50770), 22. June 2019, det. A. Aptroot 2019. TOPOTYPE. - Thallus crustose, continuous, uneven, not corticate, dull, pale greenish white, up to 0.2 mm thick, surrounded by a thin black prothallus. Photobiont trentepohlioid. Ascomata fully immersed in pseudostromata and only visible as tiny black ostioles, globose to pyriform, 0.1–0.17 mm diam., in round or irregular gray pseudostromata of 0.4–0.7 mm diam. and c. 0.3 mm high which are superficial on the thallus. Excipulum black, dark brown in section, c. 10–20 µm thick. Hamathecium not inspersed, IKI+ blue (amyloid), paraphysoids 1–1.5 µm wide, anastomosing. Asci cylindrical, 65–80 x 10–12 µm, tholus amyloid. Ascospores 8/ascus, hyaline, 7-septate, narrowly clavate, 30–34 x 2.5–3.5 µm, not surrounded by a gelatinous sheath, lumina somewhat rounded. Pycnidia not observed. Chemistry: Thallus (and partially also the pseudostromata) UV+ yellow, C–, P–, K–. TLC: lichexanthone.

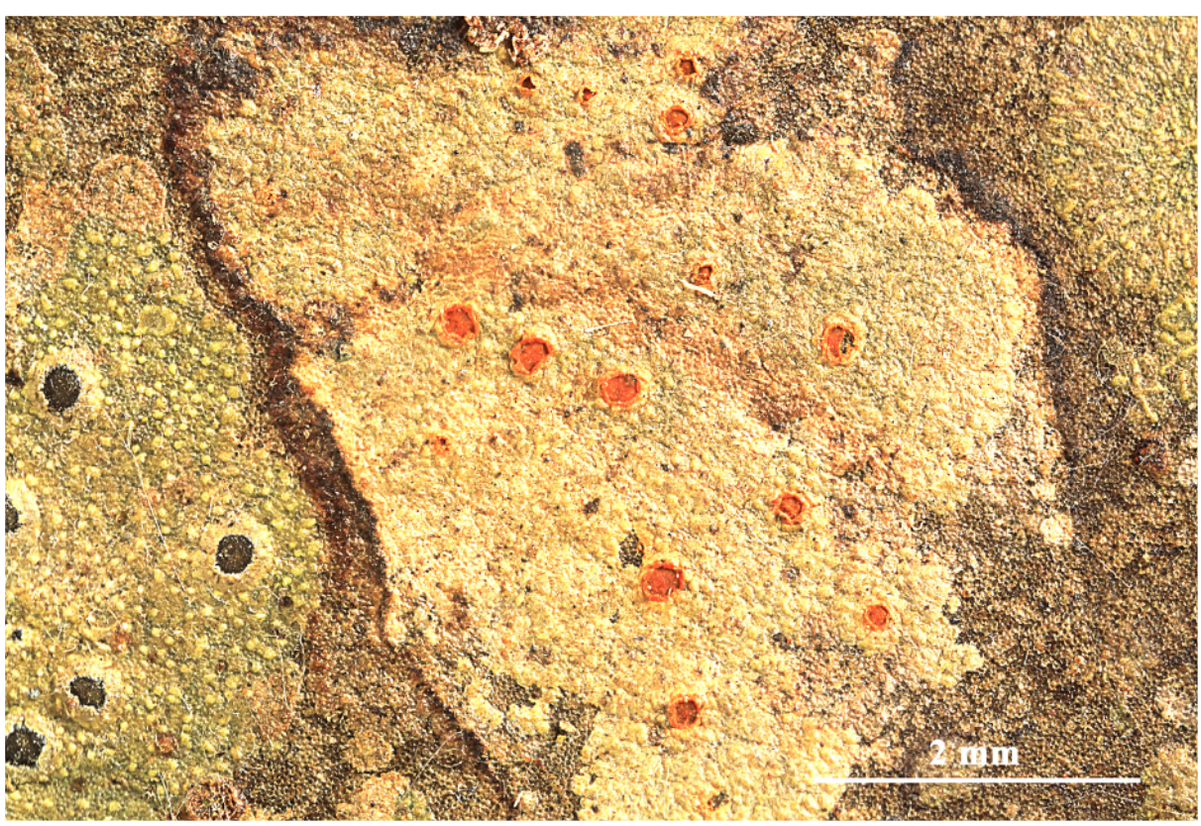




Chiodecton lichexanthonicum

Chroodiscus coccineus (Leight.) Müll. Arg., Lichenes Epiphylli Novi: 18 (1890)
= *Ocellularia coccinea* (Leight.) Müll. Arg., Flora, Regensburg 66(22): 353 (1883)
= *Phyllophthalmaria coccinea* (Leight.) Zahlbr., in Engler & Prantl, Nat. Pflanzenfam., Edn 2 (Leipzig) 8: 139 (1926)
= *Platygrapha coccinea* Leight., Trans. Linn. Soc. London 25: 456 (1866)
= *Thelotrema coccineum* (Leight.) Hale, Mycotaxon 11(1): 131 (1980)

[ABL50710bb], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bb), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, coarsely verrucose, pale greenish grey to greenish white. Photobiont cells rectangular, 12–20 x 4–5 µm, in radiate rows. Apothecia immersed-erumpent, more or less regularly rounded, 0.2–0.4 mm diam. and 60–80 µm high; disc plane, orange-red, K+ dark purple; margin orange-red, K+ purple. Excipulum 5–8 µm broad, colorless. Hypothecium 5–15 µm high, pale yellow. Epithecium 3–8 µm high, yellow to orange-red, K+ purple. Hymenium 40–55 µm high, colorless. Ascospores fusiform ellipsoid, 3-septate, without constrictions at septa, 8–12 x 2.5–4 µm, colorless. Pycnidia not observed. Chemistry: unidentified anthraquinones in apothecial disc.



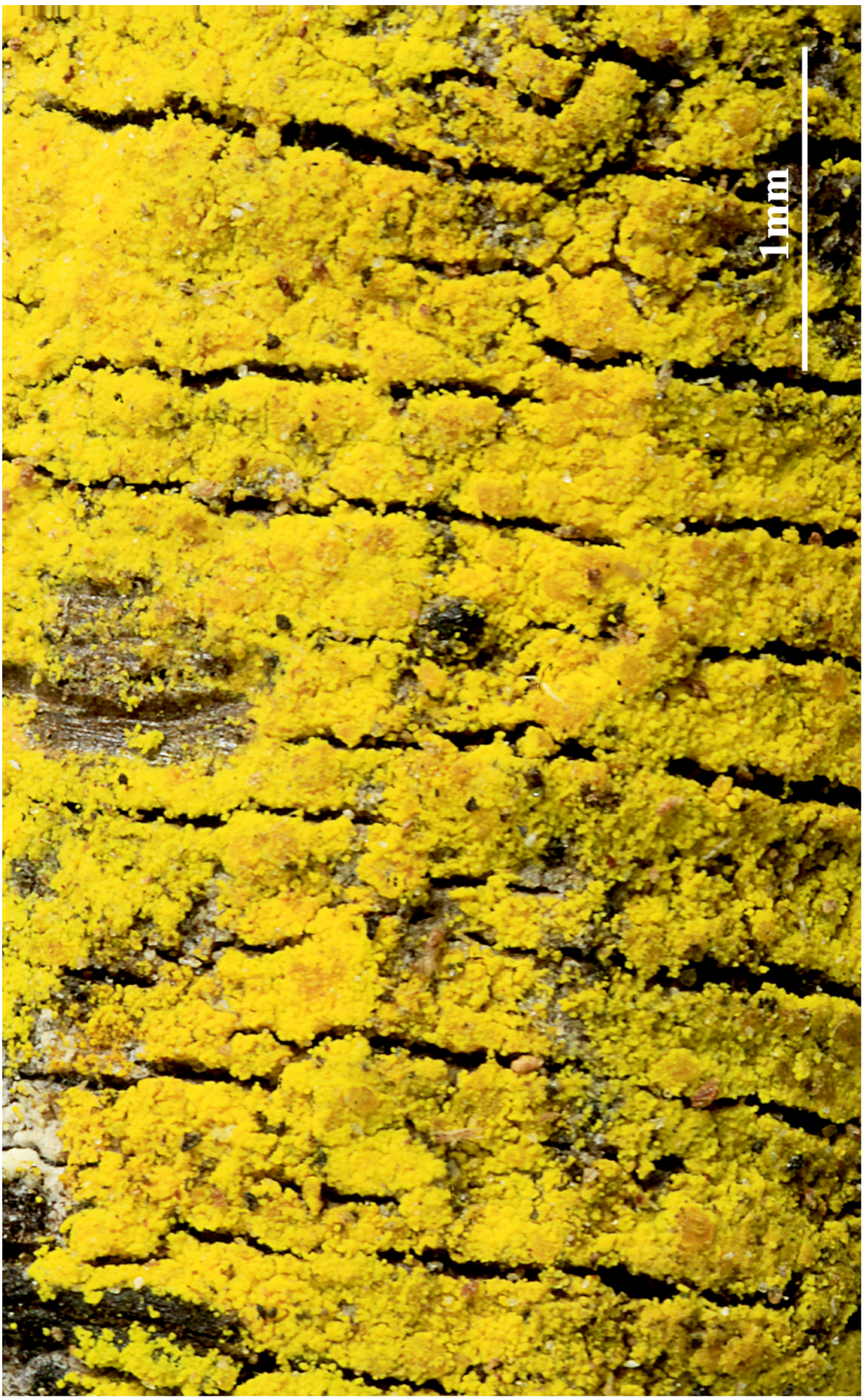


Chroodiscus coccineus

Chrysothrix xanthina (Vain.) Kalb, Biblthca Lichenol. 78: 144 (2001)
= *Lepraria xanthina* Vain., in Hiern, Cat. Afr. Pl. 2(2): 463 (1901)

[ABL48004], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Eco-parque. 09°39'43" S, 45°40'18" W, 30 m. On twigs in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48004), 15. November 2018, det. A. Aptroot 2018. - Thallus granules 20-50 µm. Spores 2-4-septate. Chemistry: pinastric acid (major), calycin (trace)





Chrysothrix xanthina

Clandestinotrema pauperius (Nyl.) Rivas Plata, Lücking & Lumbsch, Index Fungorum 522: 1 (2022)

= *Clandestinotrema pauperius* (Nyl.) Rivas Plata, Lücking & Lumbsch , Fungal Diversity 52(1): 118 (2012)

= *Thelotrema laevigans subsp. pauperius* Nyl., Annls Sci. Nat., Bot., sér. 5 7: 318 (1867)

= *Thelotrema pauperius* (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 626 (1923) [1924]

[ABL13513], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On tree bark in transitional forst. Leg. M. Cáceres & A. Aptroot, (no. 13513), 6 Sept. 2012, det. A. Aptroot 2012. - Cortex absent. Columella present, stump shaped, with fissured margins. Apothecia laterally and columella fully carbonized. Hymenium not inspersed. Spores hyaline, murifoem, 15-25 x 6-10 µm. Chemistry: no substances detected.





Clandestinotrema pauperius

Coenogonium barbatum Lücking, Aptroot & L. Umaña, in Rivas Plata, Lücking, Aptroot, Sipman, Chaves, Umaña & Lizano, Fungal Diversity 23: 273 (2006)

[ABL50710ah], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ah), 21. June 2019, det. A. Aptroot 2019. - Thallus filamentous, projecting horizontally from the margin of leaves, caespitose, beard-shaped, composed of several tufts of filaments connected at the base, with a single point of attachment, yellowish green, up to 10 mm long and broad, ecorticate; prothallus absent. Photobiont *Trentepohlia*, cells cylindrical, in distinct filaments, 50–60 × 25–30 µm diam. Apothecia produced on the underside of the thallus, substipitate, rounded, 0.3–0.5 mm diam. and 100–130 µm high; disc soon convex, pale yellow to yellow-orange; margin thin, not prominent, smooth, cream-colored. Excipulum paraplectenchymatous with radiating cell rows, 25–55 µm broad, colorless, I+ sordid yellow-green; cells isodiametric and thin-walled, 4–7 µm diam. Hypothecium 10–20 µm high, colorless. Hymenium 60–80 µm high, colorless, I+ permanently blue. Ascospores uniseriate, 1-septate, ellipsoid, 7–9 × 2–2.5 µm, 3–3.5 times as long as broad. Pycnidia not observed. Chemistry: no substances detected by TLC.





Coenogonium barbatum

Coenogonium ciliatum Kalb & Lücking, in Lücking & Kalb, Bot. Jb. 122(1): 29 (2000)

[ABL50710ad], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ad), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but often laciniate, thin, smooth, pale greenish grey, densely furnished with pale hairs, up to 0.4 mm long and 5–7 µm broad, formed by photobiont and wrapped with thin layer of fungal hyphae. Photobiont cells of basal thallus angular-rounded, in irregular plates or short threads, cells of hairs rectangular. Apothecia epiphyllous or marginally hypophyllous on mycelium free of algae, sessile, rounded, 0.6–1 mm diam. and 150–220 µm high; disc plane to slightly concave, pale to bright yellow; margin distinct, slightly prominent, irregularly pilose, pale chamois-colored. Excipulum 70–140 µm broad, colorless, marginally with short, projecting bunches of fungal hyphae. Hypothecium 20–35 µm high, colorless to pale yellow. Hymenium 70–80 µm high, colorless. Asci 65–75 x 5–7 µm. Ascospores irregularly biseriate, fusiform, 1-septate, 10–15 x 3–3.5 µm, 3.5–4.5 times as long as broad. Pycnidia rather common but not dense, applanately wart-shaped, 0.2–0.4(–0.8) mm diam., chamois colored. Conidia oblong-ellipsoid, sometimes slightly curved, non-septate, 7–8 x 2–2.5 µm. Chemistry: no substances detected by TLC.





Coenogonium ciliatum

Coenogonium hypophyllum (Vězda) Kalb & Lücking, in Lücking & Kalb, Bot. Jb. 122(1): 32 (2000)
= *Dimerella hypophylla* Vězda, Folia geobot. phytotax. 10(4): 406 (1975)

[ABL50710ai], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ai), 21. June 2019, det. A. Aptroot 2019. - Thallus hypophyllous, continuous, very thin, smooth, pale greenish grey with slight blue tinge. Photobiont cells angular-rounded, in irregular plates or short threads. Apothecia hypophyllous, sessile, rounded, 0.3–0.8 mm diam. and 100–150 µm high; disc plane, pale yellow; margin thin, not prominent, smooth to minutely dentate, wax-colored. Excipulum 30–40 µm broad, colorless. Hypothecium 10–15 µm high, colorless to pale yellow. Hymenium 50–65 µm high, colorless. Asci 45–60 x 6–8 µm. Ascospores irregularly biseriate, fusiform, 1-septate, 13–20 x 2–3 µm, 6–7 times as long as broad. Pycnidia wartshaped, 0.2–0.3 mm diam., pale yellow. Conidia ellipsoid, non-septate, 4–6 x 2–2.5 µm. Chemistry: no substances detected by TLC.





Coenogonium hypophyllum

Coenogonium interplexum Nyl., Annls Sci. Nat., Bot., sér. 4 16: 92 (1862)

[ABL50710af], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710af), 21. June 2019, det. A. Aptroot 2019. - Thallus filamentous, forming loose mats on substrate, yellowish green. Photobiont filaments richly branched, cells cylindrical, 12–18 x 4–8 µm. Apothecia sessile to shortly stipitate, rounded, 0.3–0.7 mm diam. and 100–150 µm high; disc plane, yellow to pale orange; margin thin, not prominent, smooth, chamois-colored. Excipulum 30–50 µm broad, colorless. Hypothecium 10–15 µm high, colorless. Hymenium 40–60 µm high, colorless. Asci 35–55 x 5–7 µm. Ascospores irregularly biseriate, ellipsoid, 1-septate, 6–8 x 2–3 µm, 3–4 times as long as broad. Pycnidia sessile, globose, 0.1–0.2 mm diam., chamois-colored. Conidia fusiform, non-septate, 5–8 x 1.5–2 µm. Chemistry: no substances detected by TLC.



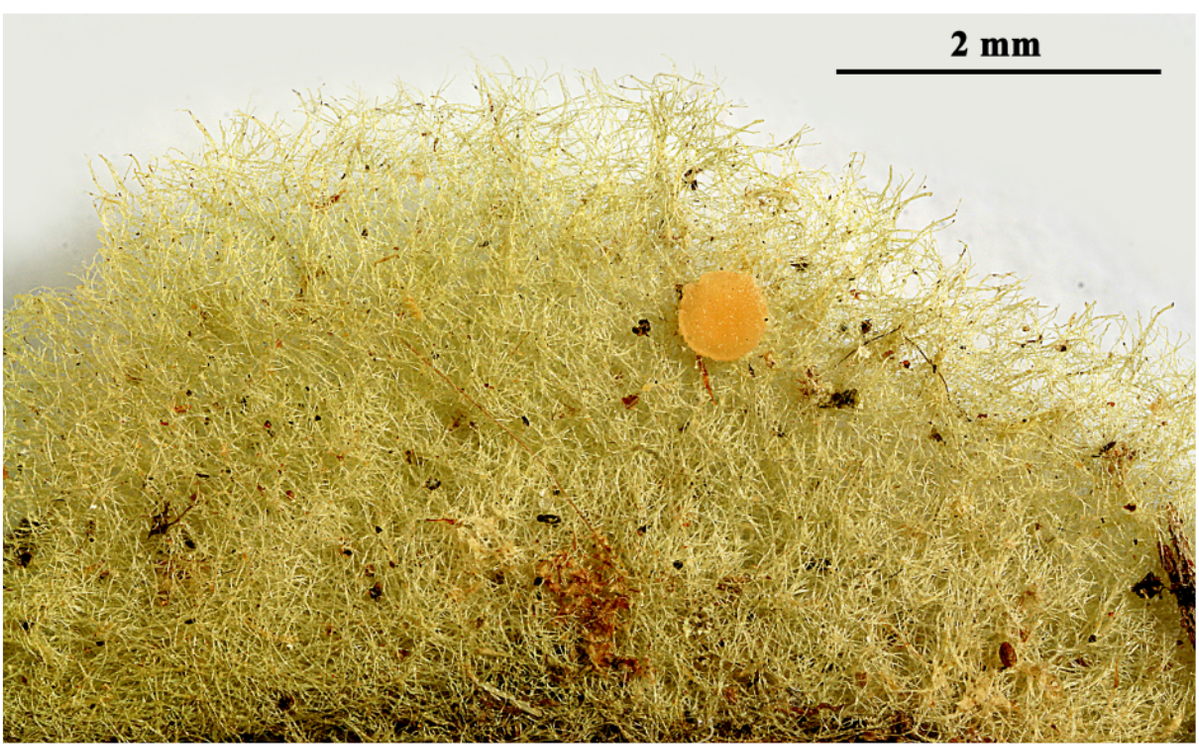


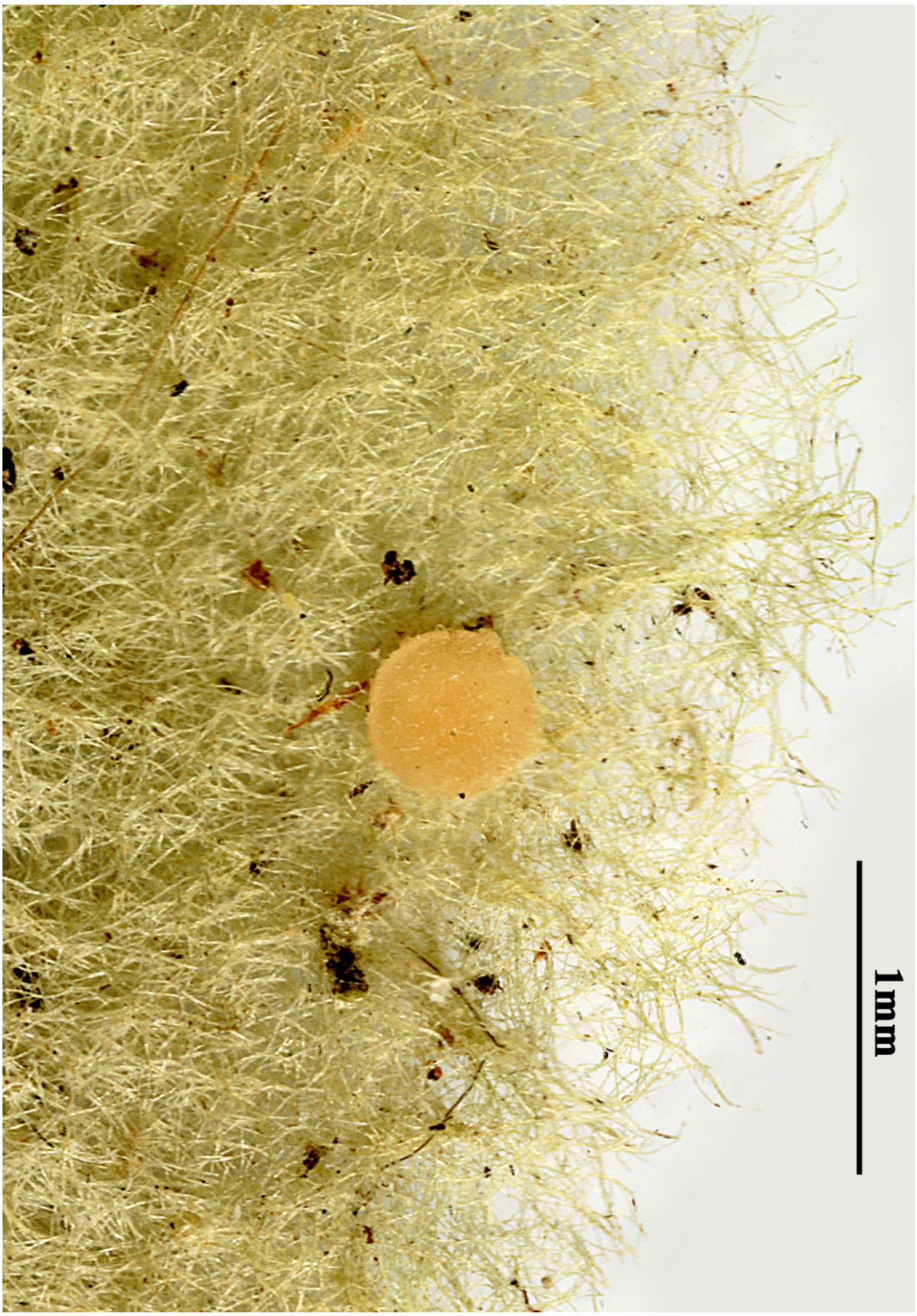
Coenogonium interplexum

Coenogonium linkii Ehrenb., in Nees von Esenbeck (Ed.), Horae Phys. Berol.: 120, tab. 27 (1820)

= *Coenogonium controversum* Pers., in Gaudichaud-Beaupré, in Freycinet, Voy. Uranie., Bot. (Paris) 4: 214 (1827) [1826-1830]

[ABL50710ag], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ag), 21. June 2019, det. A. Aptroot 2019. - Thallus filamentous, usually forming hemispherical, shelf-like structures projecting horizontally from substrate, yellowish green to bright green. Photobiont filaments branched, cells cylindrical, 13–18 x 5–8 µm. Apothecia usually formed on thallus underside, sessile to shortly stipitate, rounded, 0.3–0.6 mm diam. and 100–150 µm high; disc plane, yellow to pale orange; margin thin, not prominent, smooth, chamois-colored. Excipulum 30–50 µm broad, colorless. Hypothecium 10–20 µm high, colorless. Hymenium 50–60 µm high, colorless. Asci 45–55 x 5–8 µm. Ascospores irregularly biseriate, ellipsoid, 1-septate, 6–9 x 2–3 µm, 2.5–3.5 times as long as broad. Pycnidia sessile, globose, 0.1–0.15 mm diam., chamois-colored. Conidia fusiform, nonseptate, 5–7 x 1.5–2 µm. Chemistry: no substances detected by TLC.

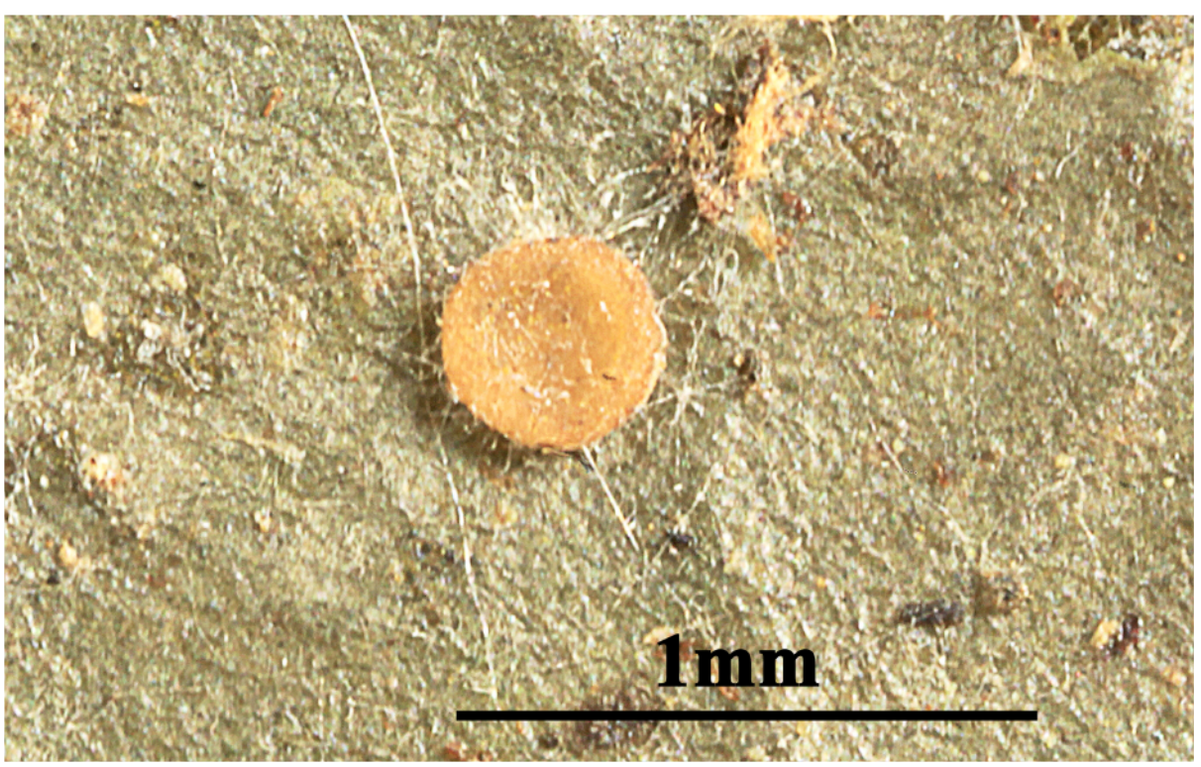




Coenogonium linkii

Coenogonium subluteum (Rehm) Kalb & Lücking, in Lücking & Kalb, Bot. Jb. 122(1): 34 (2000)
= *Biatorina sublutea* Rehm, Philipp. J. Sci., C, Bot. 8(5): 404 (1913)
= *Biatorinopsis epiphylla* Müll. Arg., Flora, Regensburg 64(7): 103 (1881)
= *Dimerella epiphylla* (Müll. Arg.) Malme, Ark. Bot. 26A(no. 13): 9 (1935) [1934]
= *Gyalecta epiphylla* (Müll. Arg.) Vain., in Hiern, Cat. Afr. Pl. 2(2): 427 (1901)
= *Microphiale epiphylla* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 2: 696 (1924)

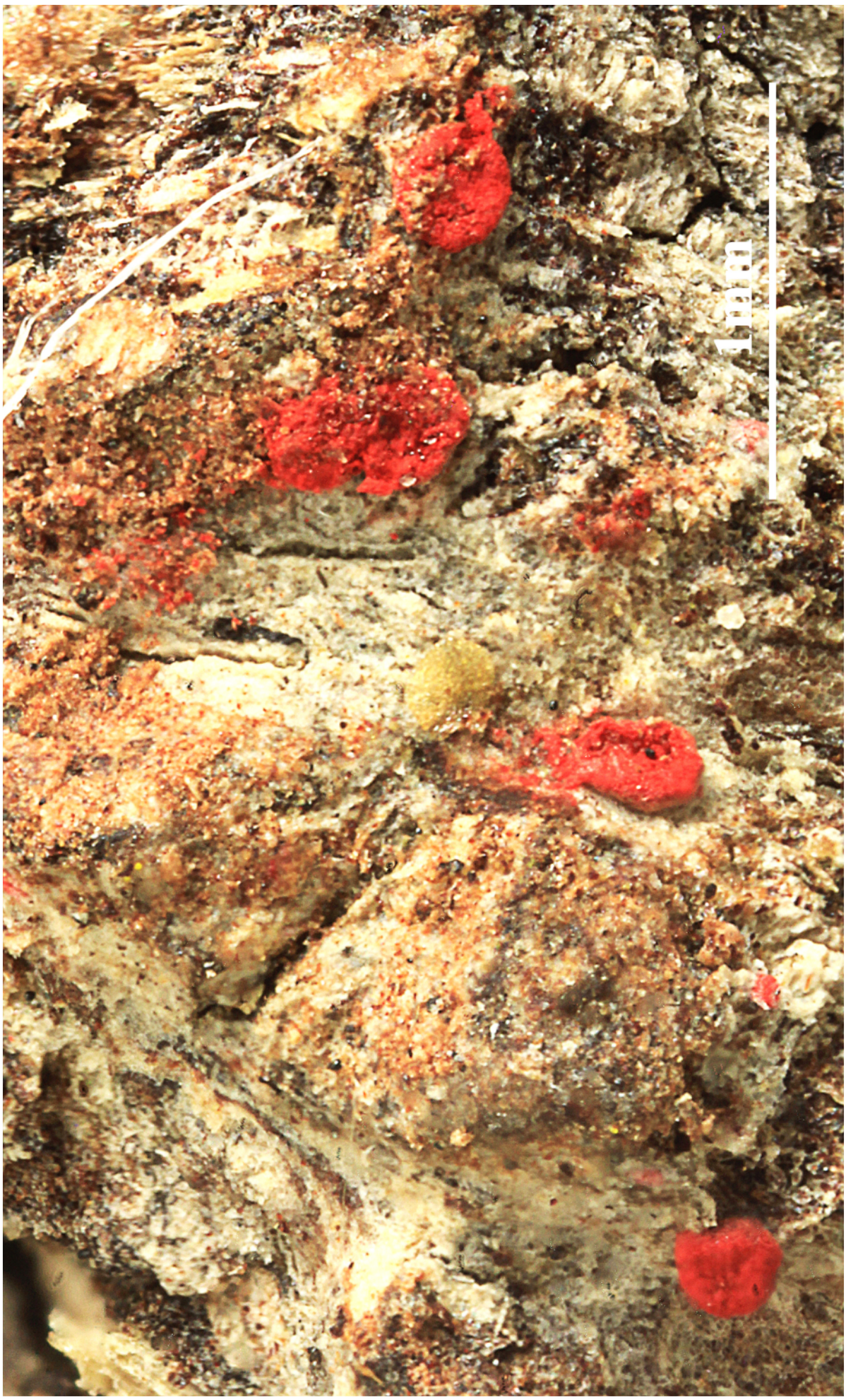
[ABL50710ae], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ae), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but often laciniate when young, thin, smooth (but appearing coarsely verrucose due to abundant pycnidia), green. Photobiont cells angular-rounded, in irregular plates or short threads. Apothecia sessile, rounded, 0.2–0.5 mm diam. and 80–130 µm high; disc plane, wax-colored to pale orange; margin slightly prominent, smooth, pale wax-colored to yellow. Excipulum 20–40 µm broad, colorless. Hypothecium 5–10 µm high, colorless. Hymenium 45–65 µm high, colorless. Asci 40–50 x 5–7 µm. Ascospores irregularly uniseriate, ellipsoid, 1-septate, 6–12 x 3–4 µm, 2–3 times as long as broad. Pycnidia wart-shaped, 0.1–0.15 mm diam., pale green. Conidia bacillar, 1-septate, 12–17 x 2–3 µm. Chemistry: no substances detected by TLC.



Coniarthonia megaspora Aptroot, C. Mendonça & M. Cáceres, in Aptroot, Ertz, Silva, Grube & Cáceres, Phytotaxa 218(2): 130 (2015)

[ABL50758], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50758), 22. June 2019, det. A. Aptroot 2019. - Thallus spreading, covering an area of up to 5 cm diam., brown to dark brown, very thin and mostly visible near the ascomata, dull, without prothallus. Algae trentepohlioid. Apothecia irregular in outline with linear or branched shapes, only slightly raised above the thallus, 0.2–0.6 mm diam., occasionally confluent, dark pink throughout, without differently coloured pruina, margins not differentiated. excipulum not developed. epihymenium blood red. Hymenium without gel, IKI+ blue, hyaline with red streaking; paraphysoids anastomosing. Asci ellipsoid, IKI-negative, dispersed in the hymenium, 63–76 × 20–26 µm diam, wall *c.* 5 µm. Ascospores 8/ascus, hyaline but becoming violet in tap water when squashing a section, probably by taking up one of the pigments of the hamathecium, clavate, 1-septate, 23–26 × 9–10 µm, slightly constricted at the septum, ends broadly rounded, wall and septum c. 1 µm thick. Pycnidia not observed. Chemistry: Apothecia UV-, C-, P-, K+ purple red, pigment dissolving and colour becoming orange before vanishing. TLC: chiodectonic acid.

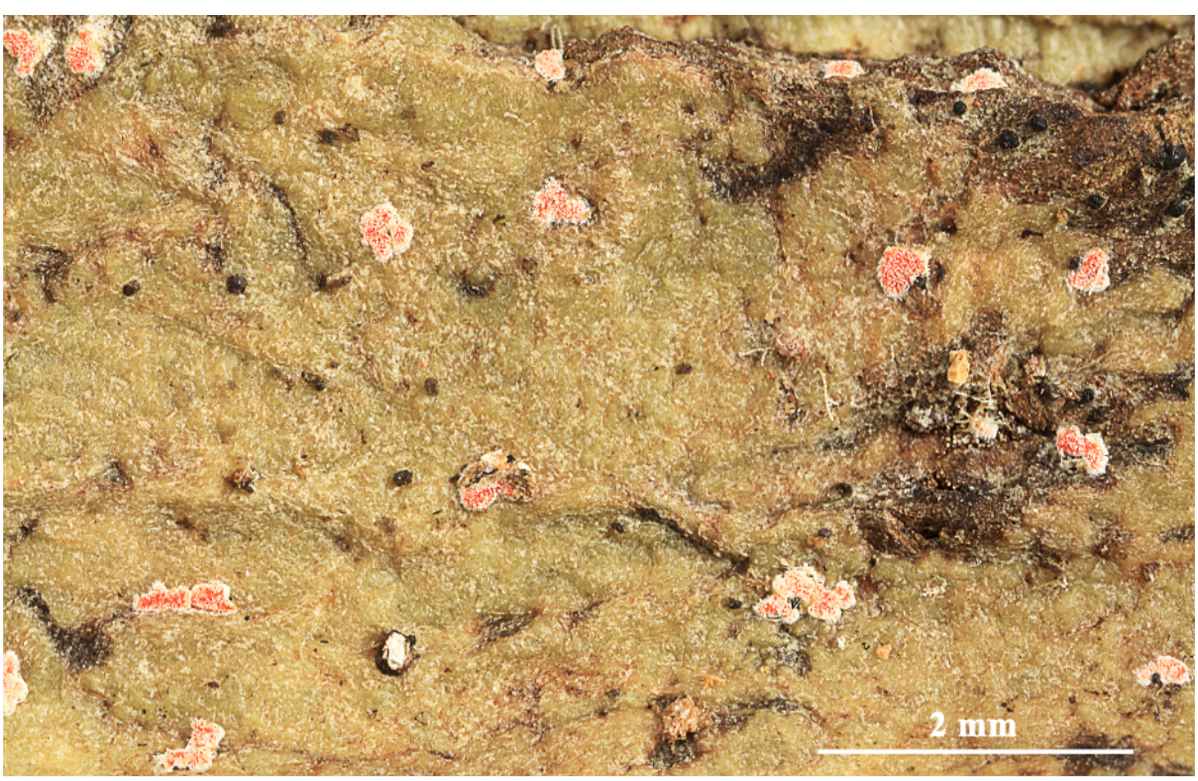


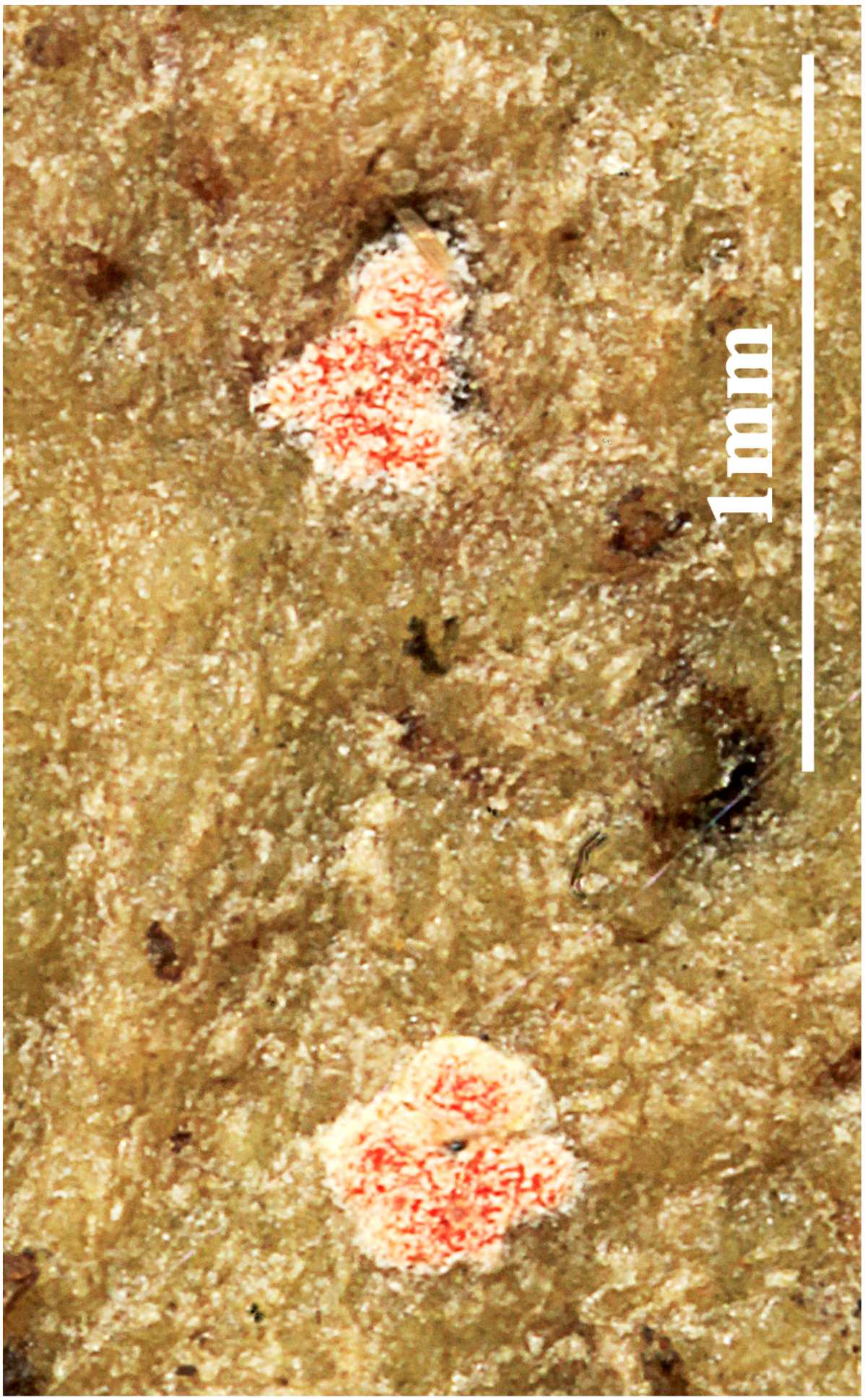


Coniarthonia megaspora

Coniarthonia rosea Aptroot & M. Cáceres, Lichenologist 46(4): 578 (2014)

[ABL28170], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28170), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus spreading, covering an area of up to 5 cm diam., brown to dark brown, very thin and mostly visible near the ascomata, dull, without prothallus. Algae trentepohlioid. Apothecia irregular in outline with linear or branched shapes, only slightly raised above the thallus, 0.5–1.4 mm diam., occasionally confluent, pale pink throughout, without differently coloured pruina, margins not differentiated. Excipulum not developed. Hymenium without gel, IKI+ blue; paraphysoids anastomosing. Asci short ellipsoid to nearly globose, IKI-, dispersed in the hymenium, 25–30 µm diam. Ascospores 8 per ascus, hyaline, clavate, 1-septate, 13–16 x 5.5–6.5 µm, slightly constricted at the septum, ends broadly rounded, wall and septum c. 1 µm thick. Pycnidia not observed. Chemistry: Apothecia UV-, C-, P-, K+ purple-red, pigment dissolving and colour becoming orange before vanishing. TLC: an anthraquinone.





Coniarthonia rosea

Constrictolumina esenbeckiana (Fée) Lücking, M.P. Nelsen & Aptroot , in Aptroot & Lücking, Lichenologist 48(6): 920 (2016)

= *Arthopyrenia esenbeckiana* (Fée) R.C. Harris, More Florida Lichens, Incl. 10 Cent Tour Pyrenol. (New York): 81 (1995)

= *Melanotheca esenbeckiana* Fée, Essai Crypt. Exot., Suppl. Révis. (Paris): 71 (1837)

= *Melaspilea esenbeckiana* (Fée) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 134 (1858)

= *Mycoporum esenbeckianum* (Fée) Trevis., Flora, Regensburg 44: 24 (1861)

= *Tomasellia esenbeckiana* (Fée) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 30(no. 3): 20 (1888)

[42905], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42905), 27. October 2017, det. A. Aptroot 2017. - Thallus thin, whitish. Ascomata with apical ostioles, solitary, 0·4–0.6 mm diam., erumpent to prominent, hemispherical to flattened, sideways confluent in dense groups of 5–20. Wall lacking below. Asci mostly narrowly obovate, rarely almost cylindrical, c. 100–125 × 17–22 µm. Ascospores 4–8/ascus, biseriate, subbiseriate or almost uniseriate, narrowly ovate, 1-septate, lower cell occasionally slightly constricted in the middle, perispore well developed, 22–27 × 7–10 µm. Pycnidia often present. Conidia rod-like, 4–5 × 1 µm. Chemistry: Thallus and ascomata UV−, K−. TLC: no substances detected.

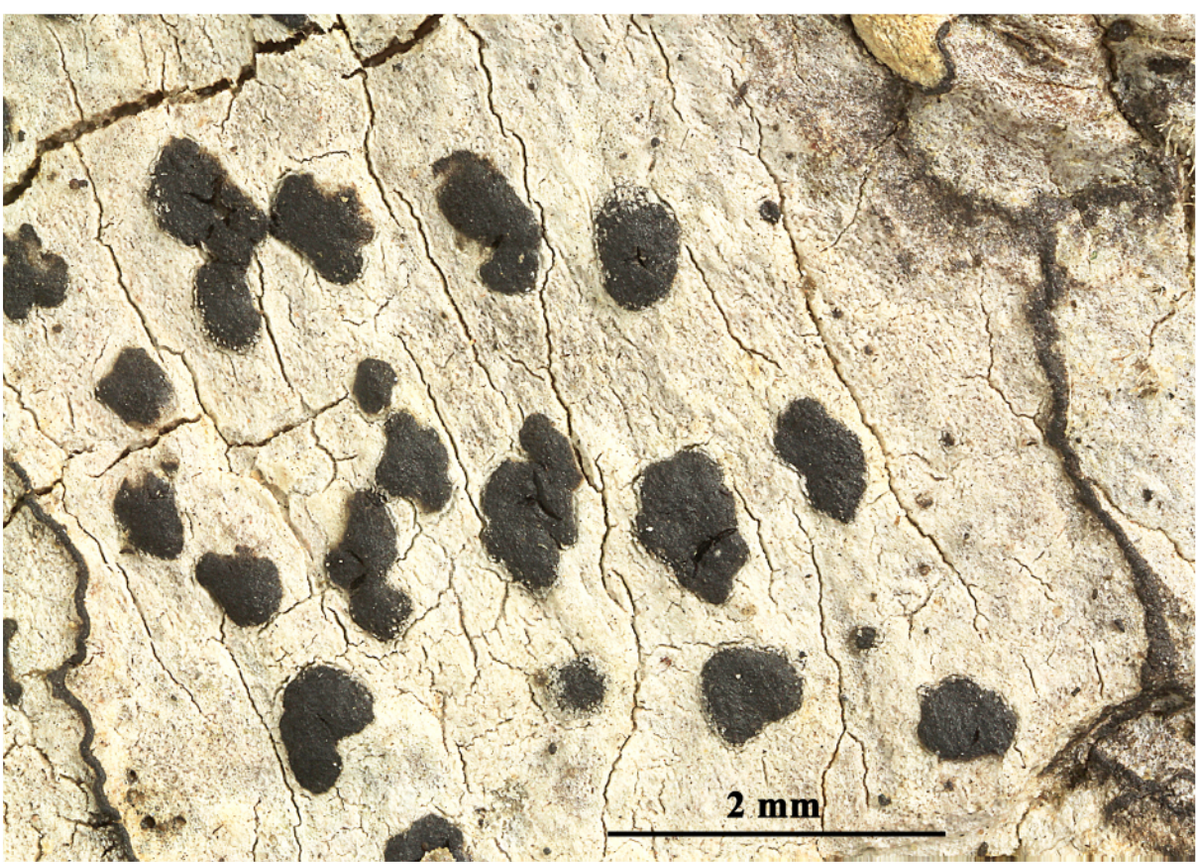


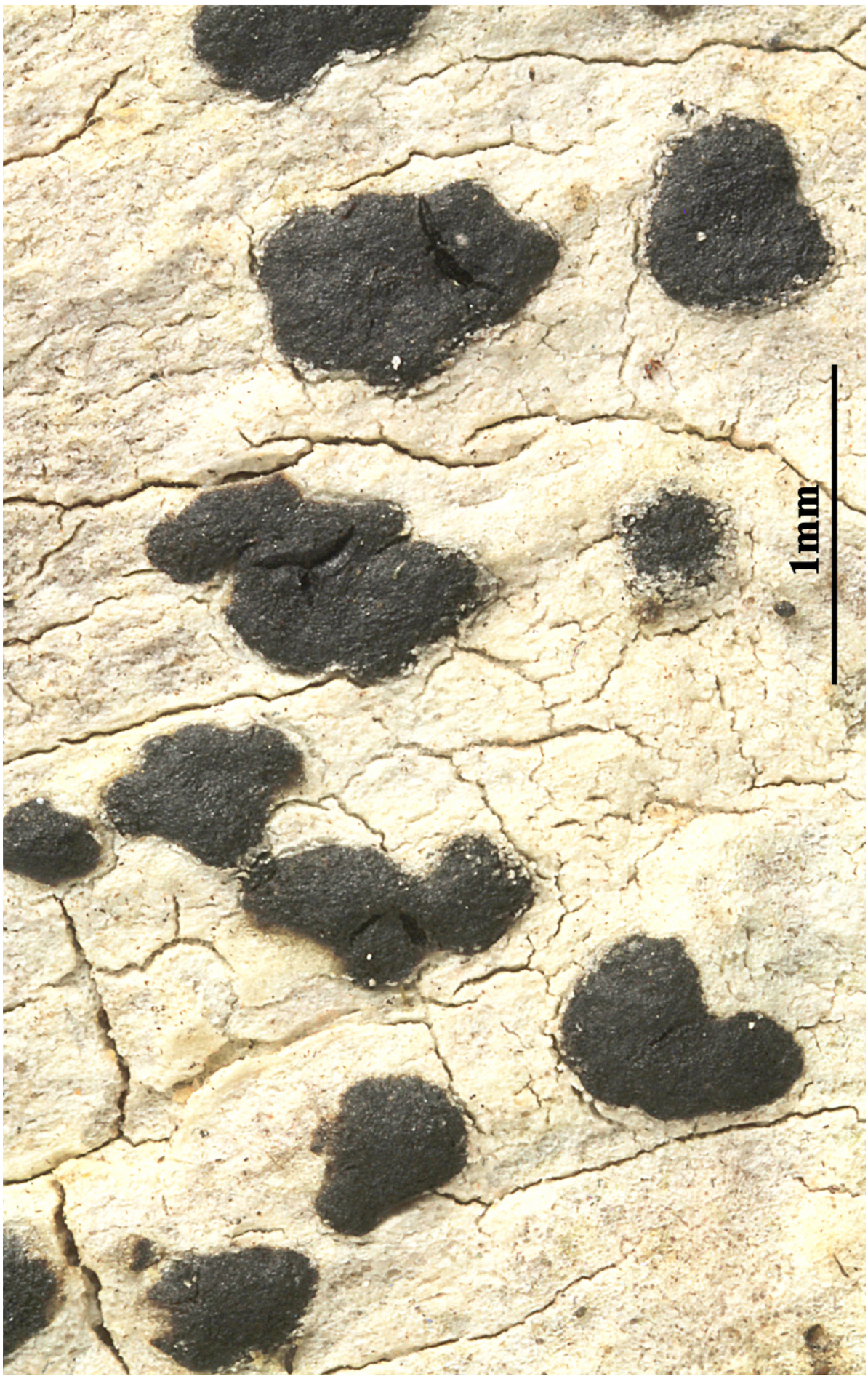


Constrictolumina esenbeckiana

Constrictolumina porospora (Vain.) Lücking, M.P. Nelsen & Aptroot, in Aptroot & Lücking, Lichenologist 48(6): 922 (2016)
= *Arthopyrenia porospora* Vain., J. Bot., Lond. 34: 296 (1896)

[42920], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42920), 27. October 2017, det. A. Aptroot 2017. - Thallus thin, whitish. Ascomata with apical ostioles, solitary, 0.8–1.2 mm diam., erumpent to prominent, hemispherical. Wall thin, lacking below. Asci narrowly obovate. Ascospores 8/ascus, biseriate, narrowly elliptical to narrowly ovate, 1-septate, each cell partially subdivided by a flat-topped ring-like thickening of the wall, becoming 3-septate; wall strongly granular ornamented, perispore thick, up to 2 µm, 42–46 × 16–24 µm(excluding perispore). Chemistry: Thallus and ascomata UV−, K−. TLC: no substances detected.





Constrictolumina porospora

Cryptothecia inexspectata G. Thor, Symb. bot. upsal. 32(no. 1): 283 (1997)

[ABL50710u], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710u), 21. June 2019, det. A. Aptroot 2019.-

Thallus up to 1.5 cm diam., firmly attached to the substrate, smooth, dull, grey to whitish grey, with scattered paler and slightly raised areas, ± heteromerous in the raised areas, raised areas up to 0.1 mm thick; prothallus indistinct, byssoid, mainly of radiating hyphae, whitish; medulla whitish, with few calcium oxalate crystals (5-10 µm in diam.); hyphae 1-2 µm wide; photobiont cells single or a few cells aggregated, 8-12 x 6-9 µm; isidia not seen. Paraphysoids enclosing the asci loosely attached. Asci frequent, weakly aggregated, often without spores, 1-spored, with or without a distinct occular chambre, 60-80 x 32-36 µm when with spores. Spores muriforme, frequent, ovoid and often slightly constricted just below the middle, surrounded by abundant cytoplasm also when mature, (40-)42-52(-60) x (17-)18-22(-25) µm. Pycnidia not seen. Chemistry: Gyrophoric acid; C+ red, K-, P-, UV+ pale grey white; medulla and paraphysoids I+ and KI+ sky blue in patches.

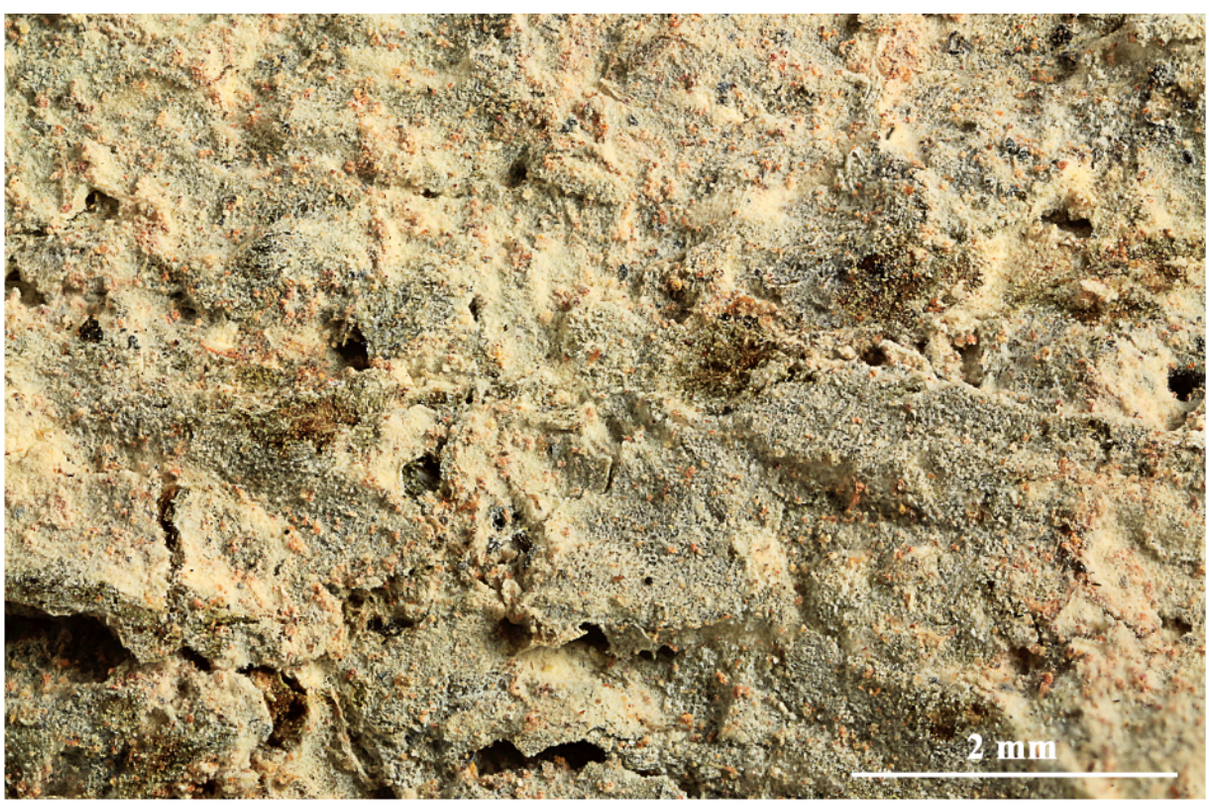




Cryptothecia inexspectata

Cryptothecia demethylconfluentica Aptroot, in Aptroot, Souza, Santos, Oliveira Junior Cardosa & Cáceres, Bryologist 125(3): 448 (2022)

[ABL18063], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18063), 27. July 2013, det. A. Aptroot 2013. - Thallus crustose, continuous, not corticate, dull, pale ochraceous, covering areas of up to 15 cm diam., under 0.1 mm thick, not surrounded by a prothallus, with soredia. Soredia granular, superficial on the thallus, not in soralia. Photobiont trentepohlioid. Ascigerous areas not distinguishable from the thallus. Asci macroscopically invisible, single, immersed in the thallus, globose, c. 100–125 µm diam. Ascospores 8/ascus, hyaline, muriform, ellipsoid, 50–56 x 20–22.5 µm, without gelatinous sheath. Pycnidia not observed. Chemistry: Thallus UV–, C–, K–, KC–, P–. TLC: demethylconfluentic and confluentic acid. This species would key out in the world key by Jagadeesh Ram & Singh (2016) at couplet 60: Thallus with demethylconfluentic and confluentic acid; ascospores 50–56 x 20–22.5 µm.





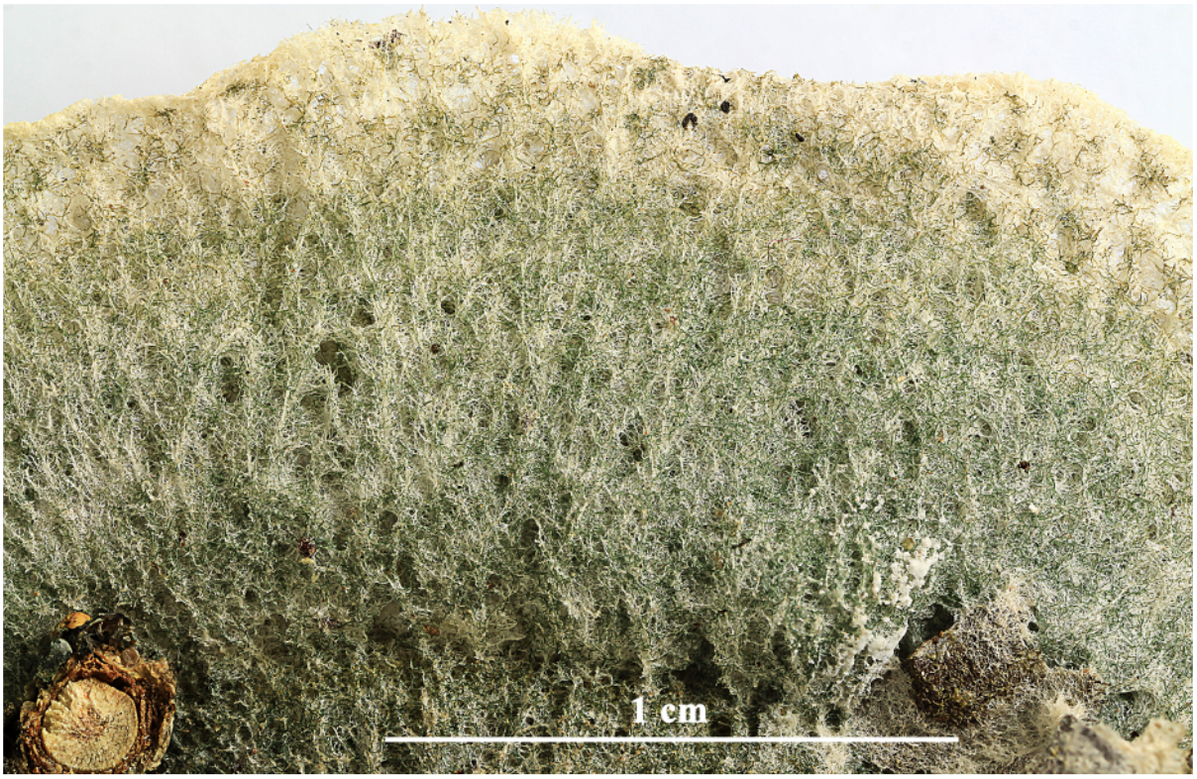
Cryptothecia demethylconfluentica

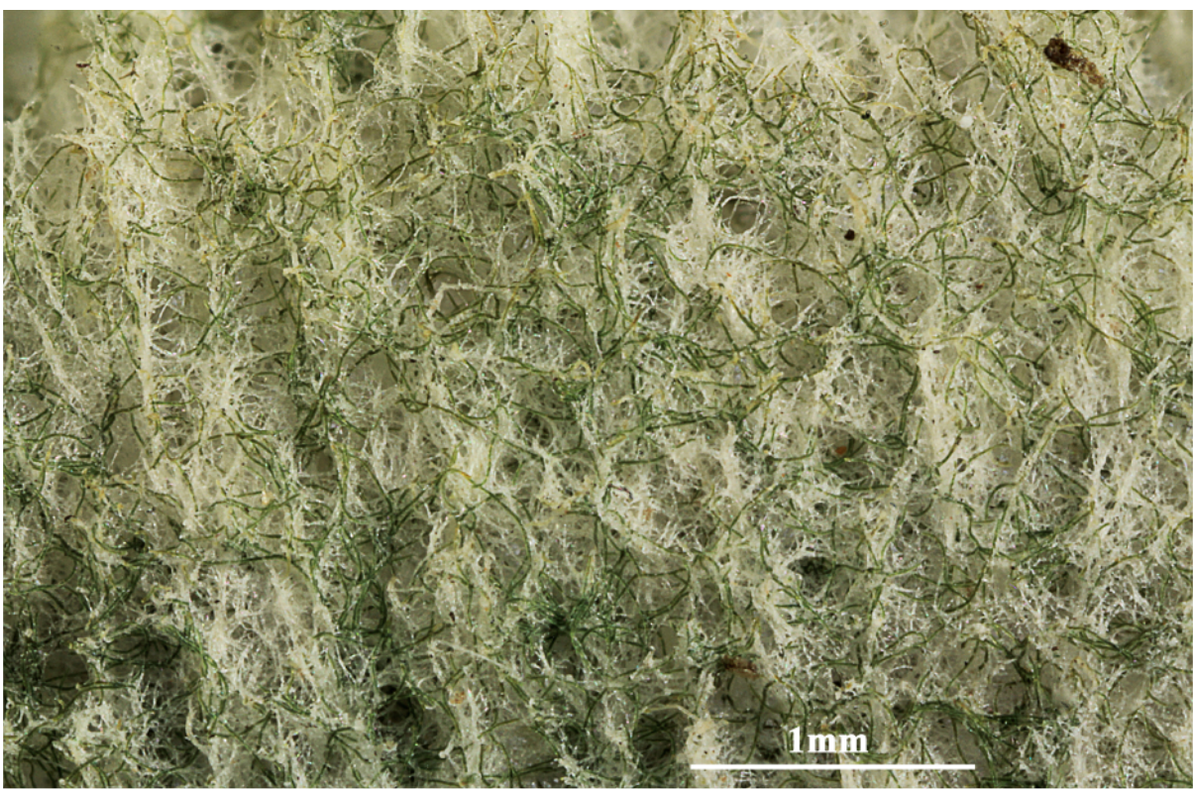
Dictyonema sericeum (Sw.) Berk., London J. Bot. 2: 639 (1843)
= *Dictyonema thelephora* (Spreng.) Zahlbr., Cat. Lich. Univers. 7: 748 (1931)
= *Cora aeruginosa* (Blume & T. Nees) Sacc., Syll. fung. (Abellini) 6: 686 (1888)
= *Cora neesiana* Lév., Annls Sci. Nat., Bot., sér. 3 5: 154 (1846)
= *Cora sericea* (Sw.) Fr., K. svenska Vetensk-Akad. Handl., ser. 3: 144 (1849) [1848]
= *Dematium thelephora* Spreng., K. svenska Vetensk-Akad. Handl., ser. 3 41: 53 (1820)
= *Dichaena sericeum* (Sw.) Overeem, Bull. Jard. bot. Buitenz, 3 Sér. 4: 129 (1922)
= *Dichonema aeruginosum* Blume & T. Nees [as 'Dichonemia'], Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13: 12 (1826)
= *Dichonema diducens* Nyl., Flora, Regensburg 68(24): 449 (1885)
= *Dichonema sericeum* (Sw.) Mont., Voy. Indes Or., Bot. 2(Cryptog.): 155 (1834)
= *Dictyonema aeruginosum* (Blume & T. Nees) Berk., J. Linn. Soc., Bot. 13: 169 (1872) [1873]
= *Dictyonema excentricum* C. Agardh, in Kunth, Syn. pl. (Paris) 1: 1 (1822)
= *Dictyonema schenckianum* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 7: 748 (1931)
= *Dictyonema sericeum* f. *laminosum* Har., Bull. Soc. mycol. Fr. 7: 41 (1891)
= *Dictyonema sericeum* f. *membranaceum* P. Metzner, Ber. dt. bot. Ges. 52: 238 (1934)
= *Dictyonema sericeum* f. *schenckianum* (Müll. Arg.) Parmasto, Nova Hedwigia 29(1-2): 112 (1977)
= *Dictyonema sericeum* f. *thelephora* (Spreng.) Parmasto, Nova Hedwigia 29: 111 (1977) [1978]
= *Dictyonema sericeum* f. *typica* P. Metzner, Ber. dt. bot. Ges. 52: 238 (1934)
= *Dictyonema sericeum* var. *aeruginosum* (Blume & T. Nees) Vain., J. Bot., Lond. 34: 297 (1896)
= *Hydnum sericeum* Sw., Prodr.: 149 (1788)
= *Laudatea schenckiana* Müll. Arg., Hedwigia 30(4): 234 (1891)
= *Rhipidonema excentricum* (C. Agardh) Sacc., Syll. fung. (Abellini) 6: 689 (1888)
= *Rhipidonema schenckianum* (Müll. Arg.) Tomas., Arch. Bot. (Forli) 25(3-4): 261 (1949)
= *Rhipidonema sericeum* (Sw.) Mattir., Nuovo G. bot. ital. 13(4): 265 (1881)
= *Rhipidonema thelephora* (Spreng.) Tomas., Arch. Bot. (Forli), II 25: 262 (1949)
= *Thelephora sericea* (Sw.) Sw., Fl. Ind. Occid. 3: 1928 (1806)

[42939], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42939), 27. October 2017, det. A. Aptroot 2017. -

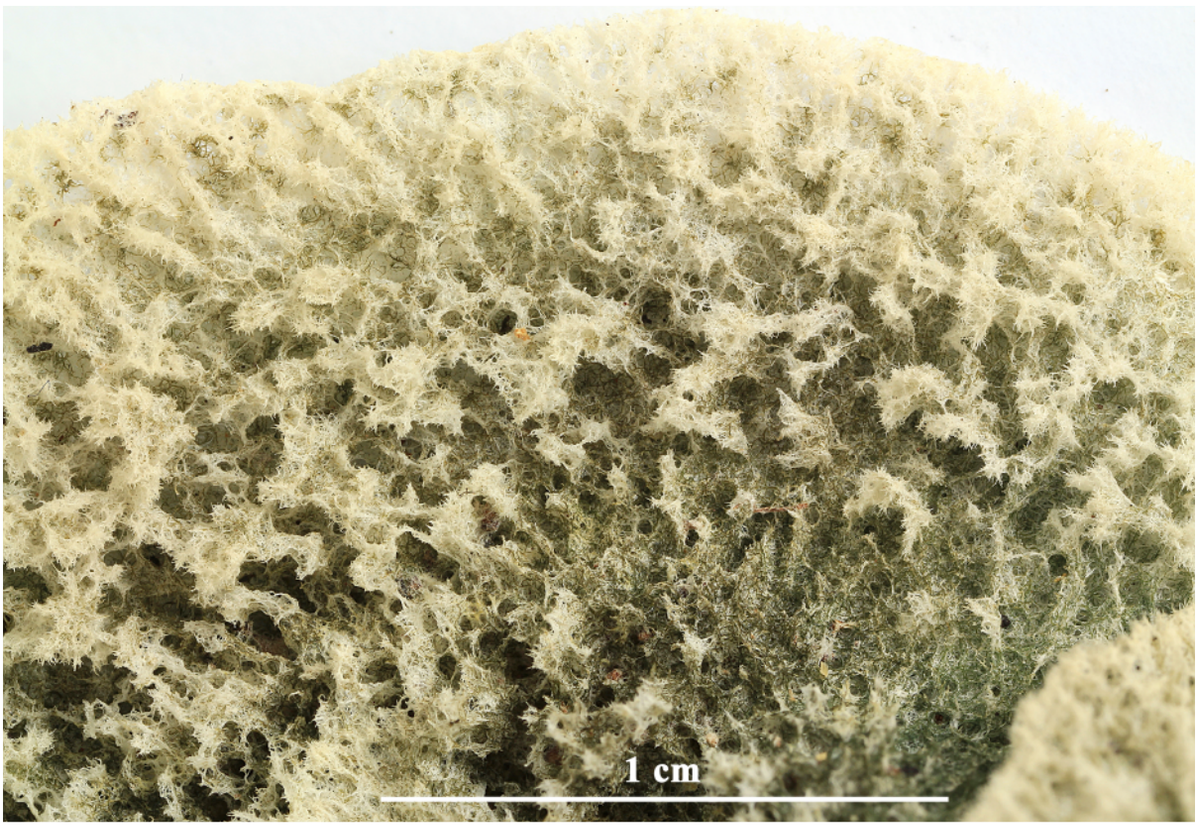
Basidiocarps sessile, usually imbricate and united in rosettes up to 25 cm and over in diam.. Pilei semicircular or reniform, 0.5-6(-9) x 1-8(-11) cm, rather thick 0.5-3(-4) mm, soft, membraneous-spongy, when dry somewhat brittle and very light. Upper surface indistinctly zonate or azonate, radially fibrillose or spongiose, uneven, ochraceous buff, dull green, dark green, grayish green, pale malachite green, malachite green or up to dark bluish green, sometimes ochraceous green. Fibrills of the surface appressed or ascendent, 0.5-3(-5) mm long and 0.15-0.3 mm in diam., penicillate, tips of fibrills often without greenish tint (concolorous with the margin of the surface). Margin rounded, loosely radially fibrillose, (1-)-2-7(-10) mm wide, dark cream, ochraceous cream or up to pale ochraceous. Context loose, fibrillose, sometimes sparse reticulate. Lower surface sparsely radially reticulate; hymenophore develops at the tips of fibrils in the form of scattered cupules 0.3-1 mm in diam., which soon unite to form scattered spots up to 1 cm in diam., or more frequently to form a more or less continuous slightly waxy hymenium. Hymenium at first whitish, then dark cream colour, in old specimenss up to buff, irregularly or polygonally split into small patches falling afterwards away. Context of the basiocarp stratose. The maintissue consists of algal trichomata enveloped in hyphal shells, and of sparsela interwoven hyphae; subhmenium and hymenium without any algal component (*Scytonema*). Basidia clavate cylindrical, not constricted, 15-23 x (6-)7-8 µm with 4 slightly curved sterigmata 5-6 µm long. Spores naviculate-obovoid or elliptic-ovoid, with lateral apiculus, with a homogenous content without guttulae, 6.5-7.5(-8) x 3.5-4.5 µm.

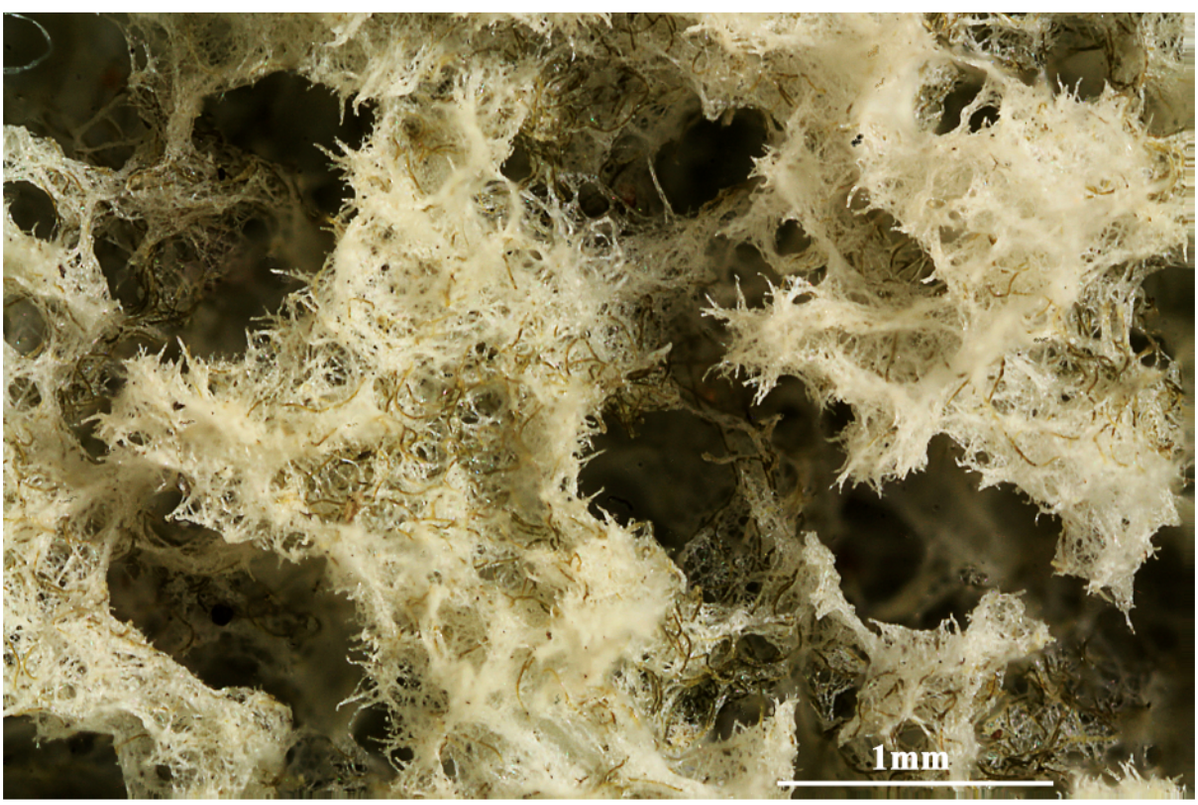
Dictyonema sericeum





Dictyonema sericeum





Dictyonema sericeum

Diorygma alagoense M. Cáceres & Lücking, in Cáceres, Libri Botanici 22: 67 (2007)

[ABL50711], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50711), 23. June 2019, det. A. Aptroot 2019. - Thallus smooth to minutely fariunose, UV+ bright yellow. Excipulum not carbonized. Hypothecium 30-60 µm high, orange brown. Spores 6-8/ascus, muriform, 40-60 x 10-14 µm, colourless, I+ violet-blue. Chemistry: lichexanthome (thallus only), stictic acid.





Diorygma alagoense

Diorygma hieroglyphicum (Pers.) Staiger & Kalb, in Kalb et al., Symb. bot. upsal. 34(no. 1): 151 (2004)
= *Graphina hieroglyphica* (Pers.) M. Nakan., in Nakanishi, Kashiwadani & Moon, Annals of the Tsukuba Botanical Garden 21: 110 (2002)
= *Graphina pallidoochracea* (Kremp.) Zahlbr. [as 'Graphina pallidoochracea'], Cat. Lich. Univers. 2: 417 (1923) [1924]
= *Graphis hieroglyphica* (Pers.) Ach., Syn. meth. lich. (Lund): 335 (1814)
= *Graphis pallidoochracea* Kremp., Nuovo G. bot. ital. 7(1): 32 (1875)
= *Opegrapha hieroglyphica* Pers., Ann. Wetter. Gesellsch. Ges. Naturk. 2(1): 16 (1810)

[ABL18021], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18021), 27. July 2013, det. A. Aptroot 2013. - Thallus whitish, pale grey or greenish grey, c. 130–150 µm thick; surface matt, partly granular, rough and with small warts, continuous or cracked, especially along the lirellae; pseudocortex not visible or very thin; algal layer sometimes up to the surface; medulla not distinctly separated, with many crystals. Ascocarps often numerous, short or oblong, ± flexuous and branched, 0.4–3 x 0.2–0.5 mm; lirellae immersed in the thallus, whitish, powdery; thalline margins indistinct or not visible, separated by a deep slit from the thallus or from the adjacent disc of the apothecium; disc narrow to slightly open, often slightly concave with a thick white or seldom creamy yellowish pruina; exciple divergent, poorly developed, with a very variable carbonisation, i.e. rudimentary and totally uncarbonised or a narrow tissue composed of yellowish hyphae or laterally brownish or distinctly carbonised, carbonisation sometimes confined to the basal “corners” (in section) of the exciple; in a few collections the carbonisation invades the lateral parts of the hymenium; hymenium 110–140 µm high, not inspersed, I+ weakly to distinctly violet (lateral part); epithecium mostly distinctly developed, 10–15(–20) µm high, consisting of intermingled anastomosing, hyaline or yellowish, partly brownish paraphysis tips, and hyaline or brownish granula and dead hyphae; paraphyses with thin lumina, c. 1–1.5 µm thick, more adjacent than in other species of the genus. Spores 1/ascus, hyaline, muriform, all cells of ± equal size, 23–32/6–9 locular, 95–150(–170) x 30–45 µm (including the 2–5 µm thick spore wall, even thicker in young spores), I+ violet, wall thickening I–. Pycnidia not seen. Chemistry: Stictic and norstictic acids (major), cryptostictic acid, substictic acid, 3-*O*-methylconsalazinic acid, constictic acid, hypostictic acid, connorstictic acids (trace or absent).



Diorygma hieroglyphicum



Diorygma hieroglyphicum

Diorygma junghuhnii (Mont. & Bosch) Kalb, Staiger & Elix, Symb. bot. upsal. 34(no. 1): 157 (2004)
= *Glaucinaria junghuhnii* (Mont. & Bosch) A. Massal., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 3 5: 319 (1860) [1859-1860]
= *Graphina junghuhnii* (Mont. & Bosch) Müll. Arg., Flora, Regensburg 65(24): 385 (1882)
= *Graphina mendax* (Nyl.) Müll. Arg., Revue mycol., Toulouse 10(no. 40): [177] (1888)
= *Graphis junghuhnii* Mont. & Bosch, Pl. Jungh. 4: 471 (1856)
= *Graphis mendax* Nyl., Annls Sci. Nat., Bot., sér. 4 11: 244 (1859)
= *Phaeographina junghuhnii* (Mont. & Bosch) Zahlbr., Annals Cryptog. Exot. 1(2): 148 (1928)
= *Phaeographis junghuhnii* (Mont. & Bosch) Zahlbr. ex E.A. Tripp, Lendemer & R.C. Harris, Lichenologist 42(1): 67 (2010)
= *Thalloloma junghuhnii* (Mont. & Bosch) A. Massal., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 3 5: 318 (1860) [1859-1860]

[ABL18434], Brazil, Sergipe, Povoado Pedrinhas, Mata da Fazenda Cafuz. 10°47'22" S, 37°26'46" W, 75 m. In Atlantic forest remnant, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18434), 20. Sept 2013, det. A. Aptroot 2013. - Thallus whitish, pale grey or greenish grey, c. 70–100 µm thick; surface matt, rough, slightly farinose, partly with small warts and with fine cracks, especially along the lirellae; pseudocortex not visible or very thin, the algal layer sometimes up to the surface; medulla not distinctly separated, filled with many crystals. Ascocarps often numerous, roundish, oval to distinctly elongated, ± flexuous and irregularly branched, 1–5 x 0.2–0.5 mm; lirellae immersed in the thallus, whitish, powdery; disc surrounded by entire, sometimes slightly raised thalline margins; disc wide, covered by a thick white or bright brownish pruina; exciple slightly divergent, completely uncarbonised, poorly developed, often only consisting of a narrow tissue of yellowish hyphae intermingled with parts of the substrate; hymenium 100–130 µm high, not inspersed, I+ distinctly bluish violet; epithecium mostly distinctly developed, consisting of intermingled anastomosing, hyaline or slightly brownish paraphysis tips, colourless granula and dead hyphae; paraphyses with thin lumina (c. 1 µm thick), surrounded by a thick gelatinous layer, with many anastomoses, reticulately branched, especially towards the hyaline or yellowish tips and in the lateral parts of the hymenium. Spores 1 (rarely 2)/ascus, hyaline, muriform, all spore locules of ± equal size, 25–31/6–10 locular, (60–)80–125 x 21–42 µm, I+ violet. Pycnidia not seen. Chemistry: Norstictic acid (major), connorstictic acid (minor).



Diorygma junghuhnii



Diorygma junghuhnii

Echinoplaca leucotrichoides (Vain.) R. Sant., in Thorold, J. Ecol. 40: 129 (1952)

= *Calenia leucotrichoides* Vain., Ann. Acad. Sci. fenn., Ser. A 15(no. 6): 166 (1921)

[ABL18196], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On leaving leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18196), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous, 5–25 mm across and 15–25 µm thick, with cartilaginous, corticiform layer, finely verrucose to marginally rugose due to incrustation with calcium oxalate crystals, with scattered, sterile setae, pale greenish grey to white; verrucae 0.05–0.1 mm diam., white; setae 0.4–0.8 mm long, white. Apothecia applanate to adnate and spot-like, as a rule slightly raised above thallus level, emarginate, rounded, 0.2–0.8 mm diam. and 80–110 µm high; disc plane, orange-brown to dark brown; margin absent but excipulum usually visible as distinct, translucent zone. Excipulum composed of branched, radiating hyphae embedded in gelatinous matrix, spreading over thallus surface, 100–300 µm broad, colorless to pale yellow. Hypothecium 5–10 µm high, colorless to pale yellow. Epithecium 2–6 µm high, pale yellow. Hymenium 70–90 µm high, colorless. Asci clavate, 60–80 x 15–25 µm. Ascospores (1–)4(–6) per ascus, vermiform-cylindrical and often spirally curved, 15–27-septate, with distinct constrictions at septa, 60–100 x 10–18 µm, 5–7 times as long as broad. Hyphophores frequent, setiform with slightly thickened apex, 0.1–0.2 mm high, white but apically black. Diahyphae inserted apically, branched throughout, filiform, terminal segments distinctly elongate-clavate and 3–5-septate, 20–30 x 3–4 µm. Chemistry: no substances detected by TLC.

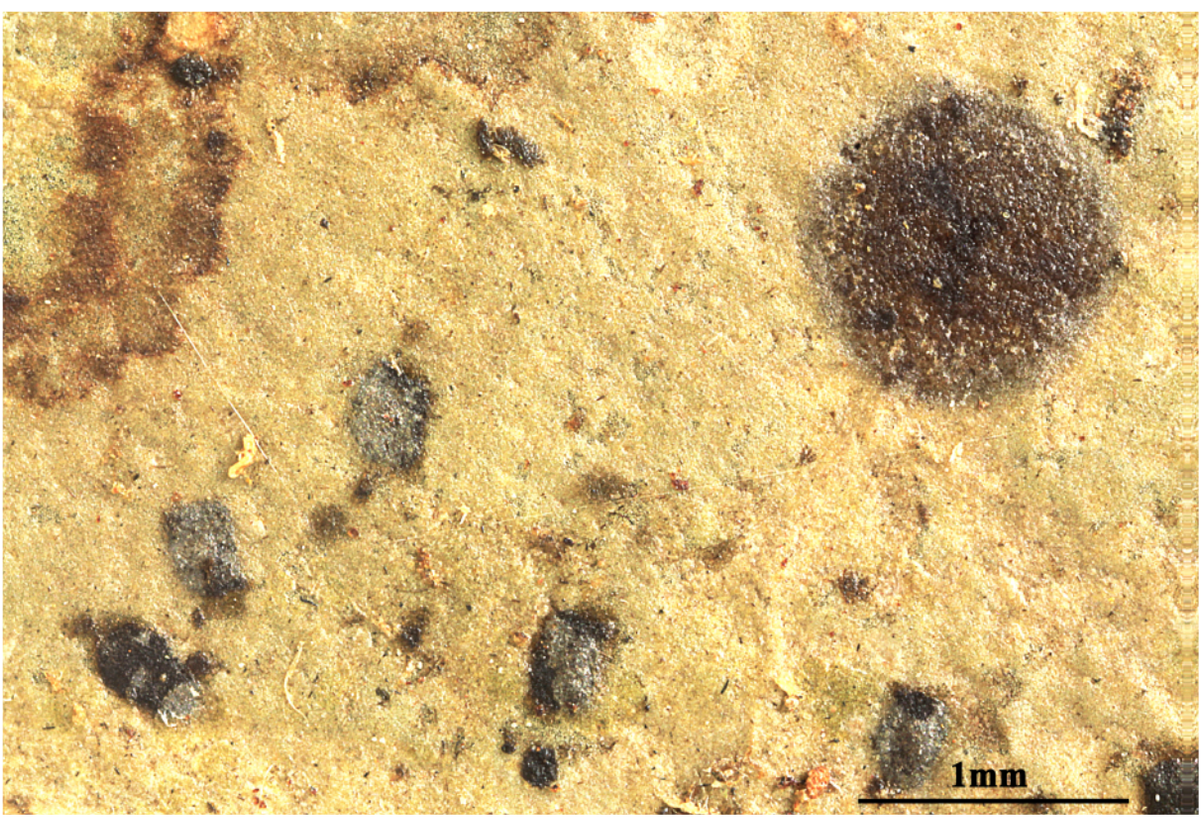


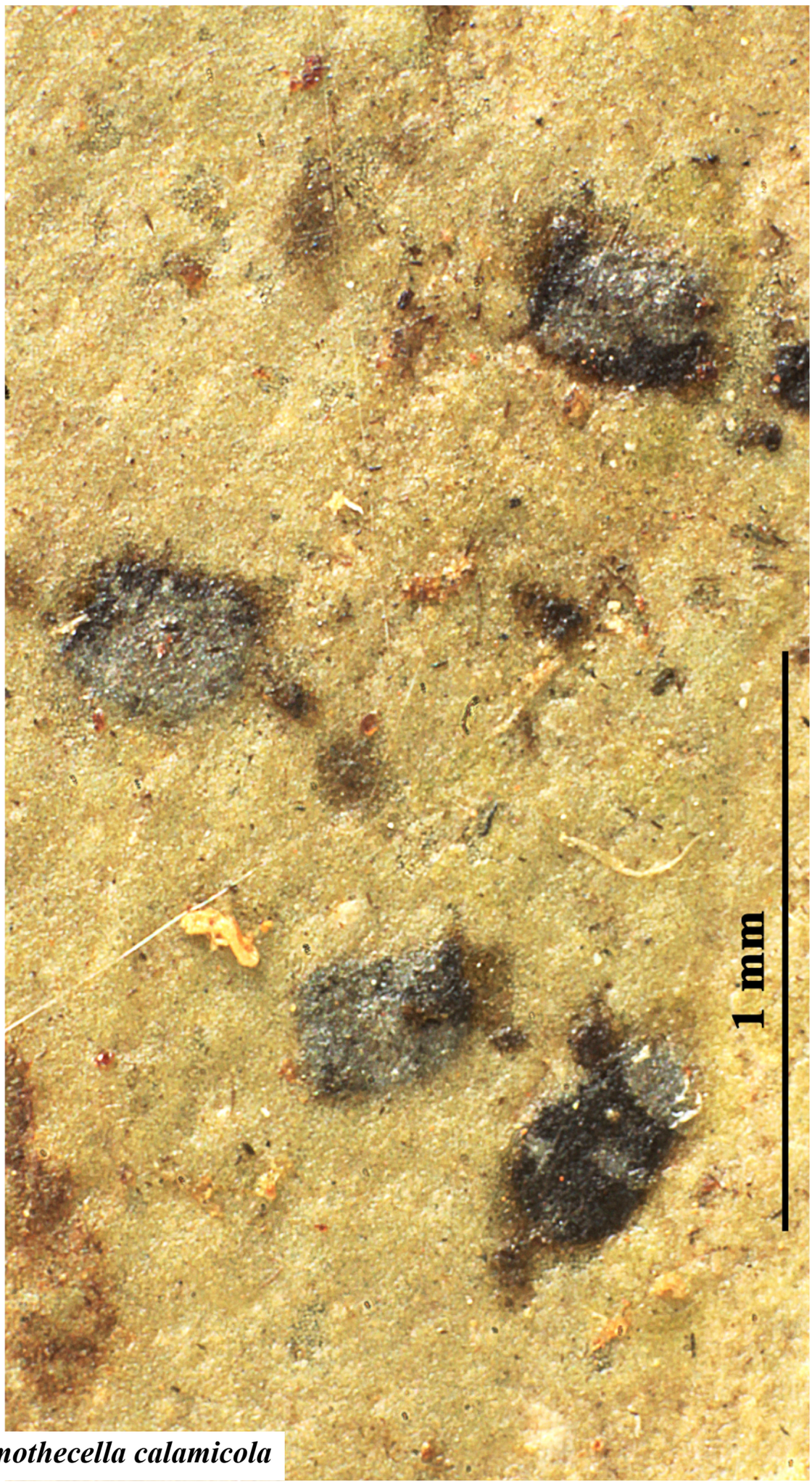


Echinoplaca leucotrichoides

Eremothecella calamicola Syd. & P. Syd., Annls mycol. 15(3/4): 236 (1917)
= *Arthonia calamicola* (Syd. & P. Syd.) R. Sant., Symb. bot. upsal. 12(no. 1): 88 (1952)
= *Arthoniopsis calamicola* (Syd. & P. Syd.) Szatala, Annls Mus. natn. Hung., n.s. 7: 26 (1956)

[ABL50710au], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710au), 21. June 2019, det. A. Aptroot 2019. - Thallus foliicolous, crustose, continuous or dispersed, ecorticate, smooth. Photobiont trentepohlioid. Ascomata apothecioid, adnate and spot-like, appearing verrucose due to asci protruding through surface. Hamathecium composed of branched and anastomosing paraphyses, Ip intensely orange-red, KI+ yellow or blue, then yellow. Asci obovate to globose. Ascospores 2–8 per ascus, transversely septate to muriform (then with large cell near median septum), colorless or rarely greyish brown. Conidiomata pycnidia, applanate, rounded to oval or oblong-ovate in outline. Conidia filiform, transversely multiseptate, colorless. Chemistry: no substances detected by TLC, except anthraquinones in the Paleotropical E. variratae.





Eremothecella calamicola

Dichosporidium nigrocinctum (Ehrenb.) G. Thor, Op. bot. 103: 71 (1990)
= *Chiodecton nigrocinctum* (Ehrenb.) Mont., Annls Sci. Nat., Bot., sér. 3 16: 76 (1851)
= *Hypochnus nigrocinctus* Ehrenb., Enum. fung. Chamisso coll.: 85 (1820)

[ABL50710bc], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bc), 21. June 2019, det. A. Aptroot 2019. -

Thallus byssoid, at least sometimes sparsely squamulose, grey with a greenish tinge; prothallus in the inner part whitish and in the outer part brown; medulla with a sometimes almost lacking whitish layer and lower part brown to black, with many calicium oxalate granules; hyphae 2-3 µm in diam.; photobiont cells filiform and branched ; isidia usually numerous, present or rarely lacking, unbranched or rarely sparsely branched. of the same colour as the thallus ot slightly paler, up to 1 mm high; soralia not seen. Ascocarps perithecioid, usually numerous, rarely lacking, aggregated into slightly to distinctly elevated stroma-like structures with or without a slightly constricted base; stroma-like structures 0.5-1.3 mm in diam.; hypothecium fusing with the whitish medulla, in the upper part hard and black and in the lower part soft and pale brown; excipulum 10-20 µm thick; hymenium c. 90-110 µm high; paraphysoids 1 µm in diam., richly branched; paraphysoid tips 1-3 µm in diam.; asci c. 70-90 x 11-15 µm. Spors biclavate, usually straight but sometimes curved up to 90°, 4-5-septate, 38-52 x 3-4 µm (thinner biclavate part 2 µm). Pycnidia few to many, conidia bacilliform, 4-6 x 1 µm. Chemistry: protocetraric acid (major), ± salazinic acid (minor), ± norstictic acid (minor); C-, K+ red to almost K-, P+ orange to red, UV-. Medulla around the ascocarps I+ blue; hymenium I+ pale blue rapidly turning pale red, KI+ pale blue.



Dichosporidium nigrocinctum



Dichosporidium nigrocinctum

Diploschistes diacapsis (Ach.) Lumbsch, Lichenologist 20(1): 20 (1988)
= *Diploschistes diacapsis* subsp. *interpediens* (Nyl.) Clauzade & Cl. Roux, Bull. Soc. linn. Provence 40: 86 (1989)
= *Diploschistes diacapsis* subsp. *interpediens* (Nyl.) Cl. Roux, in Roux, Coste, Masson & Bauvet, Bull. Soc. linn. Provence 57: 83 (2006)
= *Diploschistes gypsaceus* subsp. *interpediens* (Nyl.) Clauzade & Cl. Roux, Bull. Soc. bot. Centre-Ouest, Nouv. sér., num. spec. 7: 355 (1985)
= *Lecanora diacapsis* (Ach.) Lumbsch, Lichenologist 20(1): 20 (1988)
= *Lecanora scruposa* var. *diacapsis* (Ach.) Nyl., Mém. Soc. Sci. nat. Cherbourg 2: 313 (1854)
= *Parmelia scruposa* var. *diacapsis* (Ach.) Fr., Lich. eur. reform. (Lund): 192 (1831)
= *Urceolaria diacapsis* Ach., Lich. Univ.: 339 (1810)
= *Urceolaria scruposa* var. *diacapsis* (Ach.) Nyl., Enum. critic. lich. europ. (Bern): 90 (1850)
= *Urceolaria scruposa* var. *interpediens* (Nyl.) Boistel, Nouv. Fl. Lich. (Paris) 2: 165 (1903)

[ABL18114], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On soil in caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18114), 27. July 2013, det. A. Aptroot 2013. - Thallus terricolous, thick whitish pruinose, discs urceolate. Spores 2-4/ascus, brownish, muriforme, 3-6 transverally and 1-2 longitudinally septate, 20-38 x 9-20 µm. Chemistry: K+ yellow, C+ red, P-, UV-; diploschistesic acid (major), lecanoric acid, orsellinic acid (minor).





Diploschistes diacapsis

Echinoplaca subsimilis Kalb & Vězda, Biblthca Lichenol. 29: 28 (1988)

[ABL18016], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18016), 27. July 2013, det. A. Aptroot 2013. - Thallus corticolous, white, glossy. Apothecia brown, up to 0.5 mm diam. Spores 1/ascus, 66ö70 x 30-40 µm. Hypophores stalked, at the tips with 50-75 µm wide, globose bunches. Bristles white, 0.6-0.7 mm long.

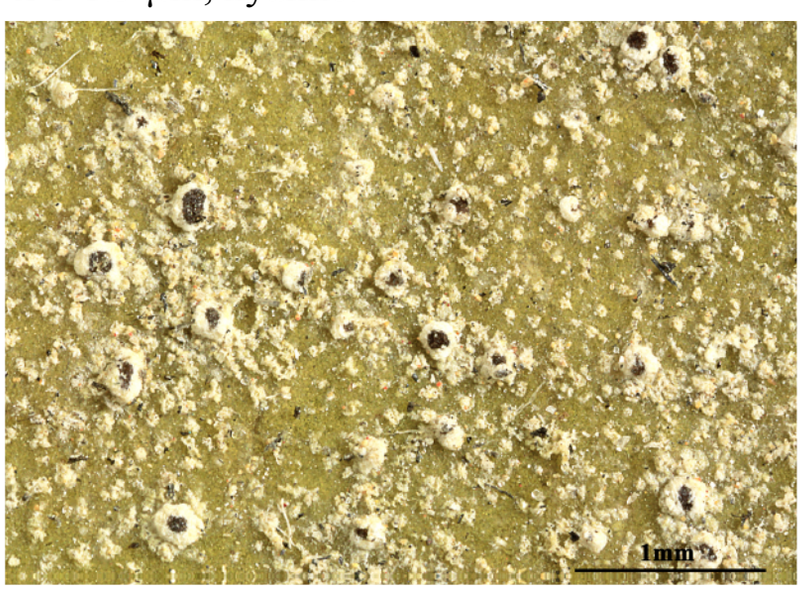


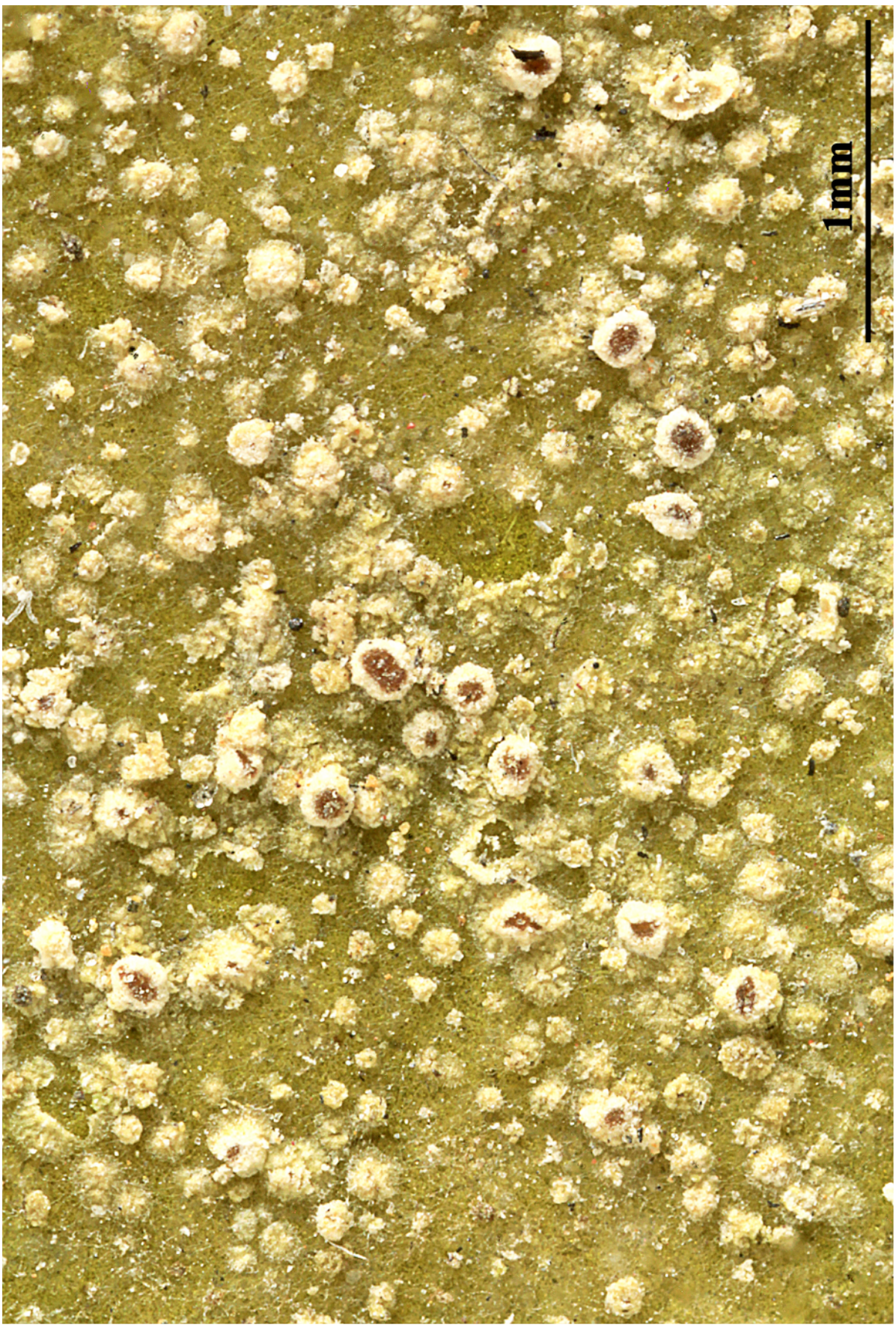


Echinoplaca subsimilis

Enterographa perez-higaredae Herrera-Camp. & Lücking, Lichenologist 34(3): 213 (2002)

[ABL15004], Brazil, Sergipe, Parque dos Falcoes, just E of Itabaiana. 10°44'50" S, 37°22'39" W, 400m. On tree leaves in transitional forest. Leg. M. Cáceres & A. Aptroot, (no. 15004), 11. November 2012, det. A. Aptroot 2012. - Thallus foliicolous, epiphyllous, continuous, but patches irregular in outline and with an uneven surface, pale greyish to whitish green, 5-10 mm wide. Phycobiont a species of *Trentepohlia* or *Phycopeltis*; cells angular-rounded to rectangular, 5-10 x 3-6 µm, with yellowish green contents, in clusters of irregular plates 40-80 µm diam. Ascomata appearing first as prominent warts, when mature rounded to slightly elongate or irregular in outline, 0.15-0.3 mm diam., rarely up to 0.5 mm long, 0.12-0.16 mm high; disc fully exposed, brown; margin thin but distinct, not prominent, whitish to chamois-coloured. Excipuloid tissue 10-15 µm thick, its inner part formed by densely interwoven hyphae filled with grey crystals, its outer part composed of a single algal layer covered by a thin layer of hyaline hyphae; hypothecioid layer 5-15 µm high, hyaline; below the hypothecioid layer a welldeveloped, 60-90 µm high base formed by densely intricate, hyaline hyphae and filled with greyish crystals (hardly dissolving in KOH); epithecioid tissue 3-5 µm high, hyaline; hymenium 40-50 µm high, its lower part hyaline but its upper part (10-20 µm) distinctly brownish. Paraphysoids branched and anastomosing, 1 µm thick. Asci broadly clavate to ellipsoid, 40-50 x 13-16 µm. Ascospores 8 per ascus, narrowly fusiform, 7-9-septate, slightly thick-walled, 26-30 x 3 -3.5 µm, hyaline; halo not observed. Pycnidia not observed but parts of the hymenium often transformed into urceolate, hyaline cavities with their internal surface covered by a conidiogeneous layer. Conidia oblong-bacillar, non-septate, 4-5 x 1-1.3 µm, hyaline.





Enterographa perez-higaredae

Enterographa quassiicola Fée [as 'quassiaecola'], Essai Crypt. Exot. (Paris): 57 (1825) [1824]

[42923], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42923), 27. October 2017, det. A. Aptroot 2017. - Photobiont Trentepohlia. Ascomata 1-3 together in pseudostromata of 0.7-1.2 mm diam., disc brown, not pruinose. Hypothecium pale orange, K+ greenish and diffusing yellow, forming red needle-shaped crystals. Spore acicular fusiform, 27-45 x 2.5-4 µm, 5-11-septate. Chemistry: C-, K+ yellow , P-, UV-; norstictic acid.





Enterographa quassiicola

Eschatogonia prolifera (Mont.) R. Sant., in Swinscow & Krog, Macrolichens of East Africa (London): 86 (1988)
= *Biatora prolifera* Mont., Annls Sci. Nat., Bot., sér. 3 16: 52 (1851)
= *Eschatogonia montagnei* Trevis., Spighe Paglie: 6 (1853)

[ABL50710aj], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710aj), 21. June 2019, det. A. Aptroot 2019. - Thallus loosely adnate to substrate. Squamules papery thin., imbricate. Upper side greyish green. Under side cream to pale fawn, rhizines lacking, but sparse hairs present here and there on under side and margins. Isidia and soredia absent. Apothecia not seen. Chemistry: Sekikaic acid, 4'-*O*-methylnorhomosekikaic acid, zeorin.





Eschatogonia prolifera

Eugeniella leucocheila (Tuck.) Lücking, Sérus. & Kalb, in Lücking, Fl. Neotrop., Monogr. 103: 714 (2008)

= *Biatora leucocheila* (Tuck.) Tuck., Gen. lich. (Amherst): 162 (1872)

= *Byssoloma leucocheilum* (Tuck.) Zahlbr., Cat. Lich. Univers. 2: 568 (1923) [1924]

= *Byssoloma wettsteinii* (Zahlbr.) Zahlbr., Cat. Lich. Univers. 2: 571 (1923) [1924]

= *Eugeniella wettsteinii* (Zahlbr.) Lücking, Sérus. & Kalb, in van dem Boom & Sipman, Öst. Z. Pilzk. 23: 160 (2014)

= *Lecidea leucocheila* Tuck., Proc. Amer. Acad. Arts & Sci. 6: 278 (1866) [1864]

= *Pilocarpon wettsteinii* Zahlbr., Denkschr. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 83: 115 (1909)

[42900], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42900), 27. October 2017, det. A. Aptroot 2017. - Thallus continuous, 5–25 mm across and 10–20 µm thick, smooth to minutely farinose, pale greenish grey. Apothecia rounded, 0.3–0.6 mm diam. and 160–220 µm high; disc plane, very dark brown to brownish black; margin very distinct, slightly prominent, chamois-coloured to white. Excipulum 30–60 µm broad, colorless to grey. Hypothecium 30–50 µm high, dark brown to brownish black and sometimes with slight reddish tinge, K–. Apothecial base brownish black, K–. Epithecium indistinct. Hymenium 50–70 µm high, colorless. Paraphyses unbranched. Asci 45–65 x 10–14 µm. Ascospores oblong-ellipsoid, 3-septate, with constrictions at septa, 10–17 x 3.5–5 µm, 3–3.5 times as long as broad, colorless. Pycnidia not observed. Chemistry: unidentified substances detected by HPLC.

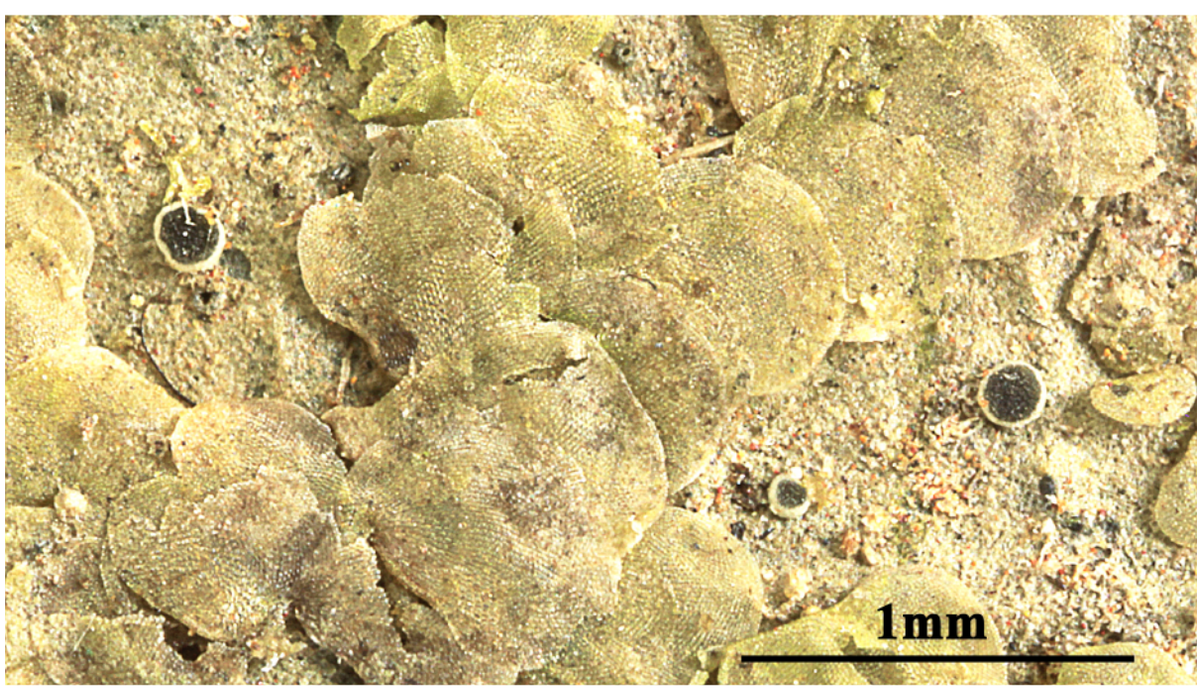




Eugeniella leucocheila

Fellhanera fuscatula (Müll. Arg.) Vězda, Folia geobot. phytotax. 21(2): 214 (1986)
= *Bacidia fuscatula* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 4: 112 (1926) [1927]
= *Bilimbia fuscatula* (Müll. Arg.) Szatala, Annls Mus. natn. Hung., n.s. 7: 43 (1956)
= *Patellaria fuscatula* Müll. Arg., Flora, Regensburg 64(15): 231 (1881)

[ABL18211], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On leaving leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18211), 27. July 2013, det. A. Aptroot 2013. - Thallus usually foliicolous, epiphyllous, crustose, continuous, 5–20 mm across and 10–15 µm thick, smooth to farinose or granulose, greenish to brownish grey. Photobiont cells 4–8 µm diam. Apothecia sessile, rounded, 0.2–0.5 mm diam. and 150–200 µm high; disc plane to slightly convex, ochraceous yellow to (reddish) brown; margin thin but usually persistent, chamois-colored. Excipulum paraplectenchymatous, 30–50 µm broad. Hypothecium 15–35 µm high, orange to reddish brown, K+ orange. Apothecial base aeruginous, K–. Epithecium indistinct. Hymenium 70–80 µm high, colourless. Asci clavate, 60–70 x 12–16 µm. Ascospores 8 per ascus, oblong, 7-septate, with constrictions at septa, 18–24 x 3–4.5 µm, 5–6 times as long as broad. Pycnidia very rare, sessile, cupuliform to subglobose, 0.07–0.15 mm diam. and 50–100 µm high, dark grey; wall paraplectenchymatous. Conidia bacillar, non-septate, 3–5 x 0.7–1 µm. Chemistry: no substances detected by TLC and HPLC.



Fellhanera rubida (Müll. Arg.) Lücking, Trop. Bryol. 13: 160 (1997)
= *Patellaria rubida* Müll. Arg. 1890

[ABL11799q], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799q), 15. March 2012, det. A. Aptroot 2012. - Thallus continuous, 5–15mm across and 10–20 µm thick, farinose to granulose, pale greenish grey (no blue tinge). Apothecia rounded to slightly irregular in outline, 0.2–0.4 mm diam. and 150–200 µm high; disc plane to convex, orange-brown to light reddish brown; margin thin but persistent, chamois colored. Excipulum paraplectenchymatous, 20–40 µm broad, its cells rather large (8–15 x 4–6 µm). Hypothecium 20–30 µm high, light yellowish brown, K–. Apothecial base yellowish brown, K–. Epithecium indistinct. Hymenium 60–70 µm high, colourless. Asci 50–60 x 10–15 µm. Ascospores 8 per ascus, ellipsoid, 3(–4)-septate, 12–18 x 3.5–5 µm, 3–4 times as long as broad. Pycnidia sessile, cupuliform to subglobose, 0.1–0.15 mm diam. and 50–100 µm high, chamois-colored to grey; wall paraplectenchymatous. Conidia pyriform, non-septate, 3–4 x 1.5–2 µm. Chemistry: not tested.



Fissurina aggregatula Common & Lücking, Bull. Florida Mus. Nat. Hist. 49(4): 141 (2011)

[ABL18392], Brazil, Sergipe, Povoado Pedrinhas, Mata da Fazenda Cafuz. 10°47'22" S, 37°26'46" W, 75 m. In Atlantic forest remnant, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18392), 20. Sept 2013, det. A. Aptroot 2013. - Thallus corticolous, 1–3 cm diam., 40–80 μm thick, continuous; surface uneven to verrucose-bullate, yellowish green to olive-brown. Photobiont trentepohlioid. Thallus in section with prosoplectenchymatous upper cortex, irregular algal layer and scattered clusters of crystals. Lirellae densely aggregate in small clusters, straight to curved, unbranched to sparsely branched, erumpent, with lateral thalline margin, 0.3–0.7 mm long, 0.15–0.2 mm wide, 0.12–0.15 mm high; disc concealed; labia conspicuous, thick, yellowish-white; thalline margin olive-brown. Excipulum entire, apically dark brown, 25–50 μm wide; laterally covered by corticate algiferous thallus including clusters of crystals; hypothecium prosoplectenchymatous, 5–10 μm high, colorless to pale yellowish; hymenium 60–80 μm high, colorless, clear; epithecium granulose, 5–10 μm high, brown. Paraphyses unbranched, glabrous; periphysoids not observed; asci fusiform, 60–70 × 10–13 μm. Ascospores 8 per ascus, ellipsoid, transversely 3-septate, 14–20 × 7–9 μm (including 1–1.5 μm thick wall), 2 times as long as wide, with comparatively thin septa and angular-rounded lumina, colorless to pale gray-brown, I–. Chemistry: no substances detected by TLC.





Fissurina aggregatula

Fissurina bothnynocarpa (Redinger) Aptroot & Schumm new.comb.
= *Graphina bothynocarpa* Redinger, Ark. Bot. 27A(no. 3): 96, fig. 3 (1935)

[ABL21615], Brazil, Sergipe, Ribeiropolis, Serra do Machado. 10°33' S, 37°22' W, 250 m. On tree bark in secondary rainforest. Leg. M. Cáceres & A. Aptroot, (no. 21615), 9 May 2014, det. A. Aptroot 2014. - Thallus corticolous, epiphloeodes, crustaceous, uniform, 50-80 µm highl, continuous, widely expanded. K+ yellow-orange, then red; lacking soredia and isidia. Apothecia sessile, generally rounded or oblong, 0.3 mm wide, up to 1 mm long, margin 0.3 mm wide. Excipulum pale. Hymenium 45-60 µm high. Spores ellipsoid, hyaline, submuriform, 3-4 transversally and 0-1 longitudinally septate,12-15 x 5-6 µm.

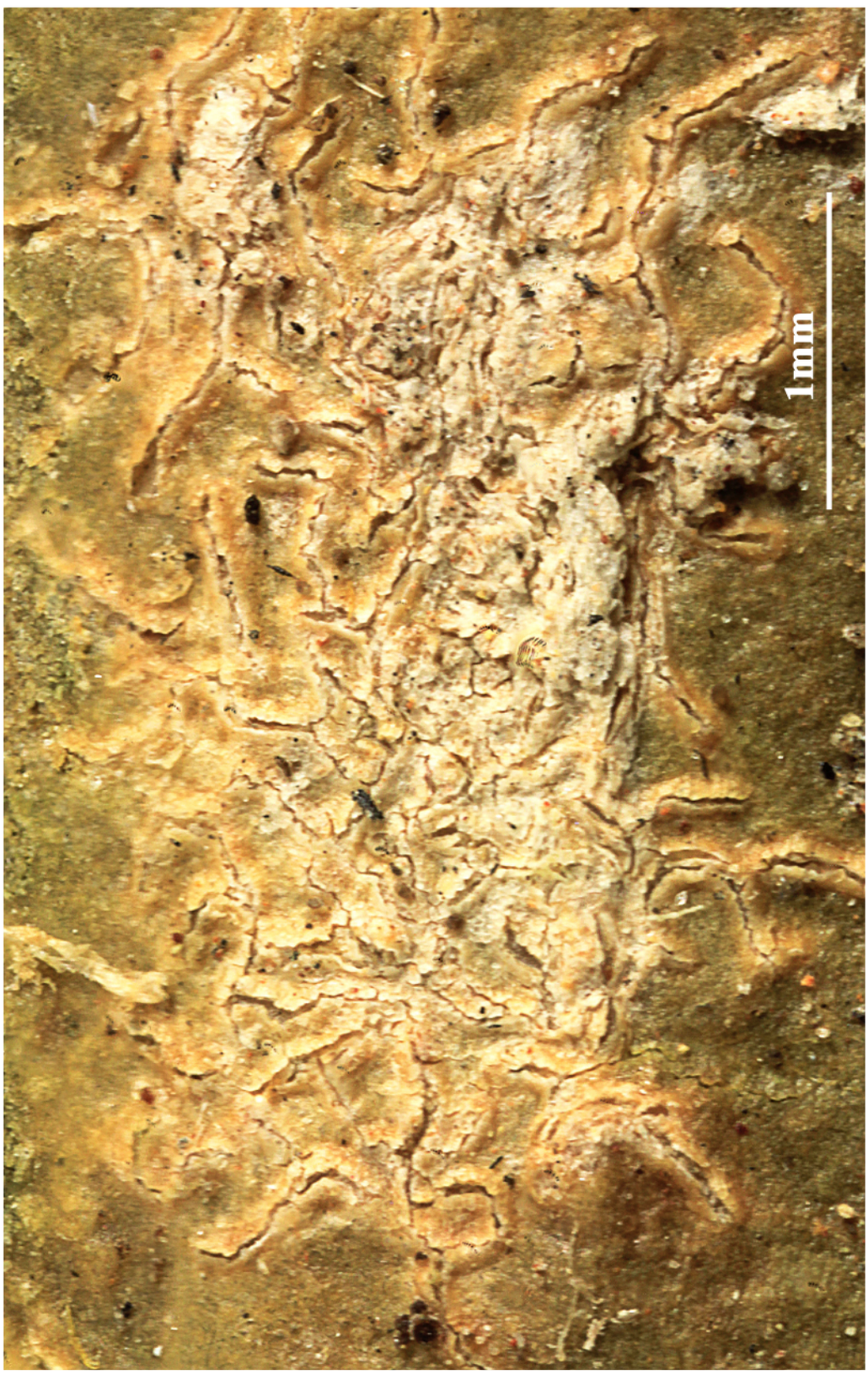




Fissurina bothnynocarpa

Fissurina egena (Nyl.) Nyl., Sert. Lich. Trop. Labuan Singapore: 13 (1891)
= *Graphis egena* Nyl. 1859

[ABL18032], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18032), 27. July 2013, det. A. Aptroot 2013. - Spores 8/ascus, hyaline, muriforme, 4-6/2-3-locular, 15-23 x 7-10 µm, with 3-4 µm thick halo, I- or + weakly violet.





Fissurina egena

Graphis anfractuosa (Eschw.) Eschw., in Martius, Fl. bras. enum. pl. 1(1): 86 (1833)
= *Opegrapha anfractuosa* (Eschw.) Mont., Annls Sci. Nat., Bot., sér. 2 18: 273 (1842)
= *Scaphis anfractuosa* Eschw., Syst. Lich.: 25 (1824)

[ABL11915], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11915), 15. March 2012, det. A. Aptroot 2012. - Thallus corticate, smooth to uneven, white-gray. Lirellae prominent, partly branched, lacking thalline margin, jet-black, Melaspilea-like, 1-3 mm long, 0.1-0.2 mm broad; labia entire. Excipulum completely carbonized. Hymenium inspersed. Ascospores 8 per ascus, transversely 7-11-septate, 25- 45 x 6—9 µm, hyaline. Secondary chemistry: no substances detected by TLC.





Graphis anfractuosa

Graphis borealis (A.W. Archer) A.W. Archer, Telopea 11(1): 72 (2005)
= *Graphina borealis* A.W. Archer, Mycotaxon 77: 163 (2001)

[ABL18405], Brazil, Sergipe, Povoado Pedrinhas, Mata da Fazenda Cafuz. 10°47'22" S, 37°26'46" W, 75 m. In Atlantic forest remnant, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18405), 20. Sept 2013, det. A. Aptroot 2013. - Thallus pale fawn, thin, corticolous, surface smuth and dull; apothecia lirelliform, black, immersed, conspicuous, scattered, with a slightly raised thalline margin, straight, curved or sinuous, often branched, lips closed, 0.5-2(-3) mm long, 0.1-0.15 mm wide; proper exciple laterally carbonized; hymenium 80-150 µm tall. I-; spores ellipsoid, hyaline, muriform, 6-8 x 2-4 locular, 37-51 x 17-25 µm, I+ blue. Chemistry: norstictic acid.





Graphis borealis

Graphis cremicolor (H. Magn.) Lücking & A.W. Archer, in Lücking, Archer & Aptroot, Lichenologist 41(4): 436 (2009)
= *Graphina cremicolor* H. Magn., Ark. Bot., Ser. 2 3(no. 10): 267 (1955)

[ABL28140], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree twigs bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28140), 3.-8. June 2016, det. A. Aptroot 2016. - Lirellae immersed, with lateral thalline margin. Labia entire. Excipulum completely carbonized. Hymenium not inspersed. Spores muriform, hyaline, I+ blue, 27-31 x 9-10 µm long. Chemistry: C-, K+ yellow>red; norstictic acid.





Graphis cremicolor

Graphis cupei Vain. ex Lücking, in Lücking, Archer & Aptroot, Lichenologist 41(4): 436 (2009)

[ABL28236], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28236), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticate, smooth to uneven, white to pale grey. Lirellae prominent, with basal thalline margin, elongate and irregularly branched, 1–5 × 0.3–0.4 mm; labia eventually striate. Excipulum completely carbonized; hymenium inspersed. Ascospores 4–8 per ascus, transversely 13–17-septate, 60–70 × 7–9 µm, hyaline. Secondary chemistry. No substances detected.





Graphis cupei

Graphis fumosa Müll. Arg., Hedwigia 30: 184 (1891)

[ABL28480], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28480), 3.-8. June 2016, det. A. Aptroot 2016. - Lirellae erumpent, with apically thin complete thalline margin, elongate to irregularly branched.Labia striate. Excipulum completely carbonized, hymenium not inspersed.Spores transversely 5-7-septate 25.35 µm long. Chemistry: K+ yellow, stictic acid.





Graphis fumosa

Graphis immersicans A.W. Archer, Aust. Syst. Bot. 14(2): 262 (2001)

[ABL28276], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree twig. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28276), 3.-8. June 2016, det. A. Aptroot 2016. - Lirellae erumpent, with lateral margin, short to elongate and sparsely to irregularly branched. Disc conceiled. Excipulum completely carbonized. Hymenium not inspersed. Spores transversely 5-7-septate, 20-30 x 6-8 µm. Chemistry: K-, no substances detected.





Graphis immersicans

Graphis implicata Fée, Bull. Soc. bot. Fr. 21(1): 27 (1874)
= *Hemithecium implicatum* (Fée) Staiger, Biblthca Lichenol. 85: 287 (2002)

[ABL18017], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18017), 27. July 2013, det. A. Aptroot 2013. - Thallus yelowish grey, cracked. Apothecia 1-2.5 x 0.1-0.2 µm, yellowish orange, disc a small slit. Excipulum not carbonized. Parathecium I+ blue-violet. Hymenium 120 µm, not inspersed. Spores 6-8/ascus, hyaline, transversely 11-14-septate, 40-50 x 8-10 µm, I+ blue-violet. Chemistry: no substances detected.





Graphis implicata

Graphis intricata Eschw., in Martius, Fl. bras. enum. pl. 1(1): 79 (1833)

[ABL21650a], Brazil, Sergipe, Ribeiropolis, Serra do Machado. 10°33' S, 37°22' W, 250 m. On treebark in secondary rainforest. Leg. M. Cáceres & A. Aptroot, (no. 21650a), 9 May 2014, det. A. Aptroot 2014. - Lirellae elongate to very long. Disc conceiled. Labia not pruinose.Excipulum completely carbonied. Hymenium not inspersed. Spores transversely septate, 15-30 µm long. TLC: norstictic acid.





Graphis intricata

Graphis stipitata A.W. Archer, Mycotaxon 80: 368 (2001)

[ABL28593], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28593), 3.-8. June 2016, det. A. Aptroot 2016. - Tallus off-white, thin, corticolous, surface smooth and dull; apothecia lirelliform, numerous, crowded, narrow, subimmersed, straight, curved or sinuous, sometimes branched, lips closed, 0.5-2 mm long, 0.1-0.15 mm wide; proper exciple laterally carbonized; hymenium 80-90 mm, I-; spores 8/ascus, irregularly 2-seriate, hyaline, narrow ellipsoid, 15-20 x 5-6 µm, 5-6 locular, I+ blue. Chemistry: lichexanthone (major), norstictic acid (minor), connorstictic acid (trace); thallus UV+ yellow.





Graphis stipitata

Graphis tenella Ach., Syn. meth. lich. (Lund): 81 (1814)
= *Graphis scripta subsp. tenella* (Ach.) Nyl., Flora, Regensburg 50(13): 195 (1867)
= *Graphis scripta var. tenella* (Ach.) Tuck., Gen. lich. (Amherst): 207 (1872)
= *Opegrapha comma var. tenella* (Ach.) Mont., London J. Bot. 4: 3 (1845)
= *Opegrapha tenella* (Ach.) Mont., Annls Sci. Nat., Bot., sér. 3 16: 58 (1851)

[ABL18919], Brazil, Sergipe, Capela, Refúgio de vida silvestre Mata do Junco. 10°32' S, 37°03' W, 150 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18919), 24. March 2014, det. A. Aptroot 2014. - Thallus corticate, smooth to uneven, white-gray. Lirellae erumpent, unbranched, with basal to lateral thalline margin, 1-3 mm long, 0.1-0.2 mm broad; labia entire. Excipulum laterally carbonized. Hymenium in- spersed. Ascospores 8 per ascus, transversely 7-9-setate, 35-45 x 6-8 µm, hyaline. Secondary chemistry: norstictic acid.

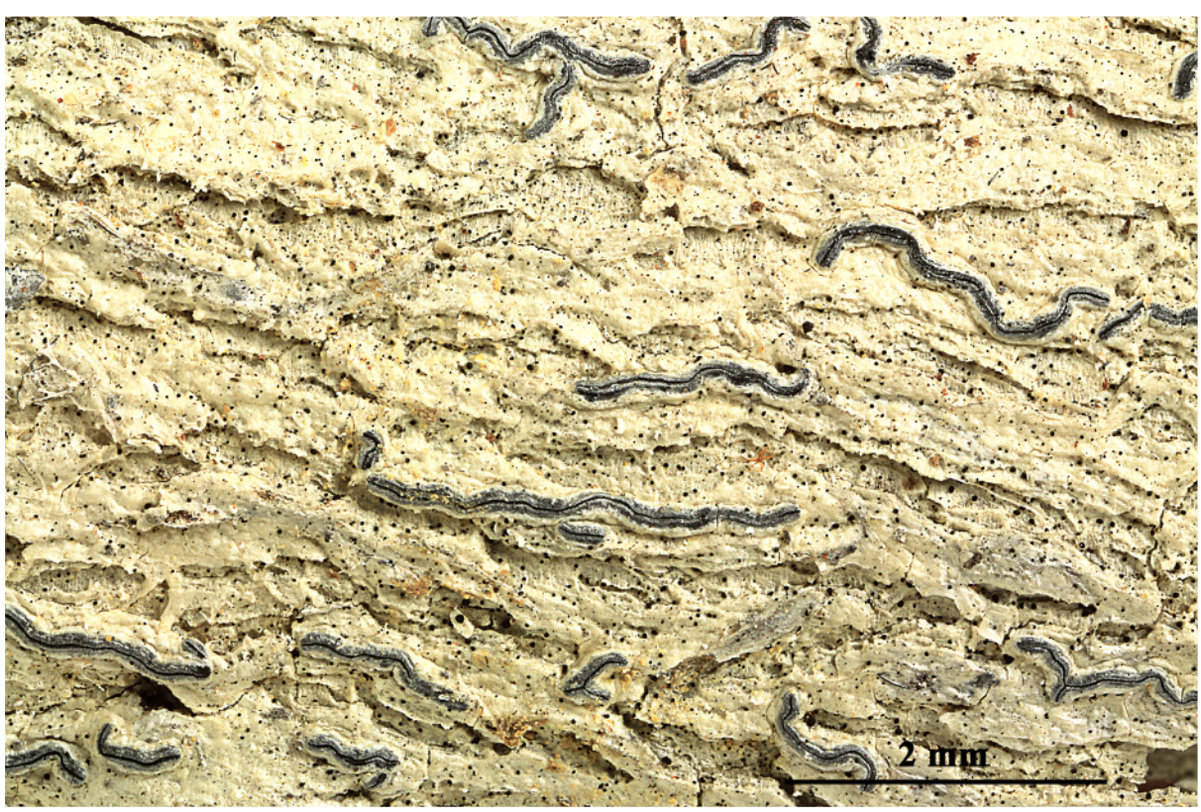




Graphis tenella

Graphis tetralocularis C. Bock & M. Hauck, Lichenologist 37(2): 105 (2005)

[ABL11936], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11936), 15. March 2012, det. A. Aptroot 2012. - Thallus crustose, thin, smooth, cracked, whitish grey to grey-green. Soredia and isidia absent. Photobiont green, *Trentepohlia*. Apothecia frequent, black, simple or rarely branched, curved, 0.5–1.5 mm long, semiimmersed. Exciple connivent, nearly closed, laterally carbonized, 20–30 µm thick, basally uncarbonized, I-. Hypothecium 13–20 µm thick, pale yellowish brown to hyaline, I-. Parathecium *hyaline*, I-. Hymenium 60–75 µm tall, hyaline, not inspersed, I-. Epihymenium pale yellowish brown, I-. *Asci* 45–50 x 7–15 µm, with eight spores. Ascospores colourless, transversely trisep-tate, 12–15(–17) x 5–7·5 µm, ellipsoid, occasionally with pointed ends, I+ blue. Paraphyses simple, 0.5–1 µm wide, apices ±thickened. Pycnidia not observed. Chemistry. Atranorin (traces) detected by TLC.





Graphis tetralocularis

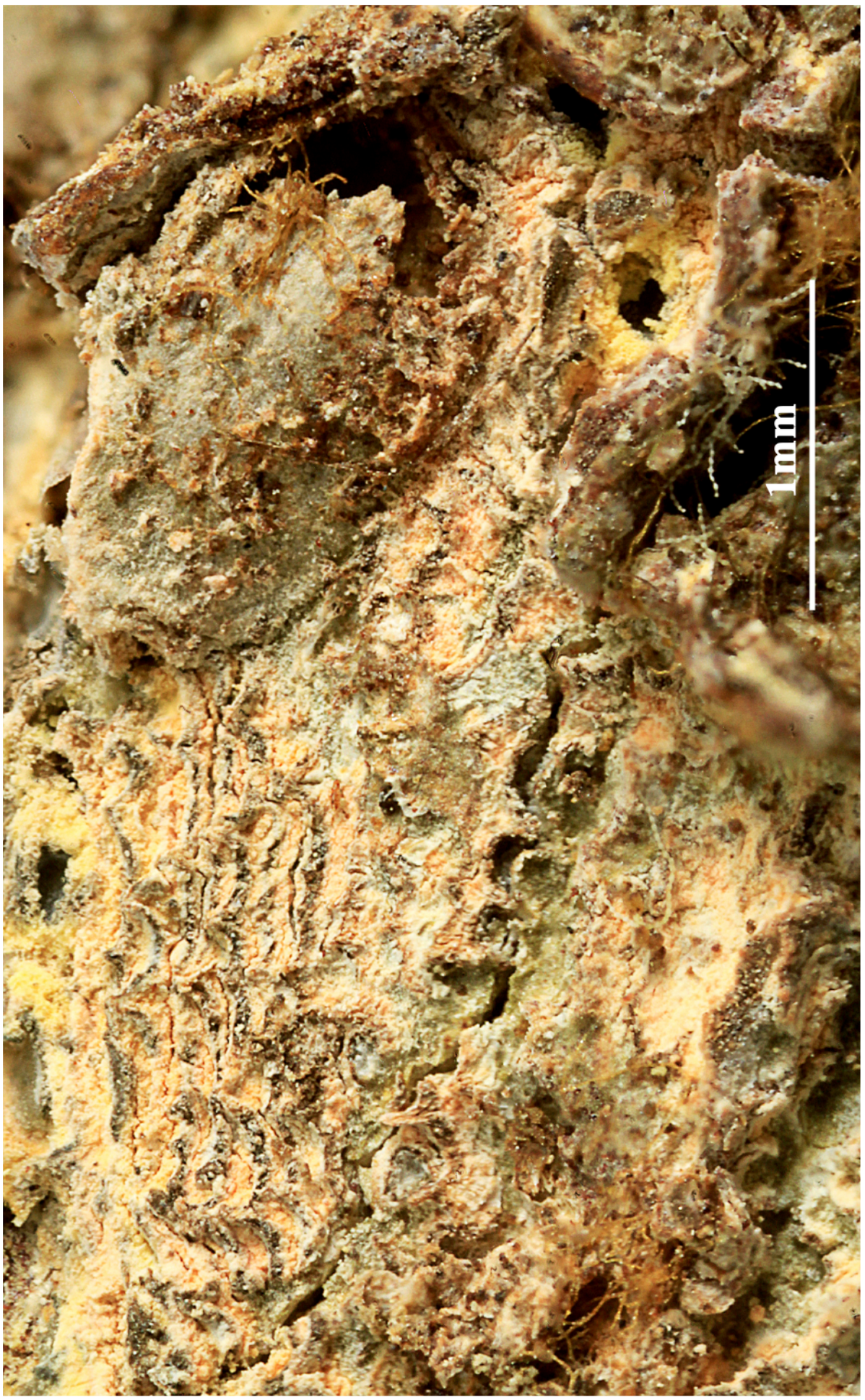
Gyrotrema flavum M. Cáceres, Aptroot & Lücking, in Cáceres, Aptroot, Parnmen & Lücking, Phytotaxa 189: 102 (2014)

[ABL50783], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50783), 23. June 2019, det. A. Aptroot 2019.

Thallus corticolous on tree bark, epiperiderma, up to c. 10 cm diam., continuous; surface smooth, olive-green; prothallus absent. Thallus in section 50–70 µm thick, with paraplectenchymatous cortex, 5–10 µm thick, photobiont layer 30–40 µm thick, and indistinct medulla, 20–30 µm thick, with numerous small, grey crystals interspersed. Photobiont *Trentepohlia*; cells rounded to irregular in outline, in irregular groups, yellowish green, 6–11 × 6–9 µm. Ascomata rounded to irregular in outline, often growing assymetrically, erumpent, with lateral thalline margin, 2–4 mm diam., 0.2–0.3 mm high; disc exposed, formed by concentric rings of hymenium (youngest at the periphery) separated by thin strands of excipulum, pale yellow; proper margin distinct, fissured to lobulate, forming 4–8 erect to recurved, coarse lobules that often break off, fused with thalline margin; thalline margin fissured to lobulate, smooth, olive-green. Excipulum formed in concentric rings, carbonized, 20–40 µm wide; outermost excipulum laterally covered by algiferous, corticate thallus; true columella absent; hypothecium prosoplectenchymatous, 10–15 µm high, hyaline; hymenium 100–120 µm high, hyaline, clear; epithecium indistinct, 5–10 µm high, hyaline. Paraphyses unbranched, apically smooth; periphysoids absent; asci (few seen) narrowly clavate, 100–100 × 12–15 µm. Ascospores (very few seen) 8 per ascus, ellipsoid, 5–9-septate, 20–30 ×6–8 µm, 3–4 times as long as wide, hyaline, distoseptate with lens-shaped lumina, I+ violet-blue. Secondary chemistry: Hypoprotocetraric and 4-*O*-demethylnotatic acids and pale to bright yellow apothecial disc pigment; medulla P–, microscopic section K–, apothecial disc K+ blood-red.



Gyrotrema flavum



Gyrotrema flavum

Gyrotrema sinuosum (Sipman) Frisch, in Frisch & Kalb, Biblthca Lichenol. 92: 380 (2006)
= *Ocellularia sinuosa* Sipman, Trop. Bryol. 6: 30 (1992)

[ABL28136], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28136), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticolous, epiploedal, often over 10 cm. diam., grey or pale greenish grey, smooth, slightly glossy, without vegetative propagules, 20-40 µm thick; cortex composed of agglutinated hyphae, c. 6 µm thick; TLC: hypoprotocetraric axid with unknown accesory spot; algalcells subglobose, c. 8 µm diam.; medulla without rystals, in part entering the bark cells. Apothecia frequent, rounded with recuved, chroodiscoid margin, measuring 10 x 5 mm, flat and appressed on the thallus; disc pink, with numerous orallel, sinuous, partly carbonized columellae; hymenium 75 µm high, clear; spores hyaline, transversely 9-septate, 8/ascus, I+, c. 24 x 6 µm.



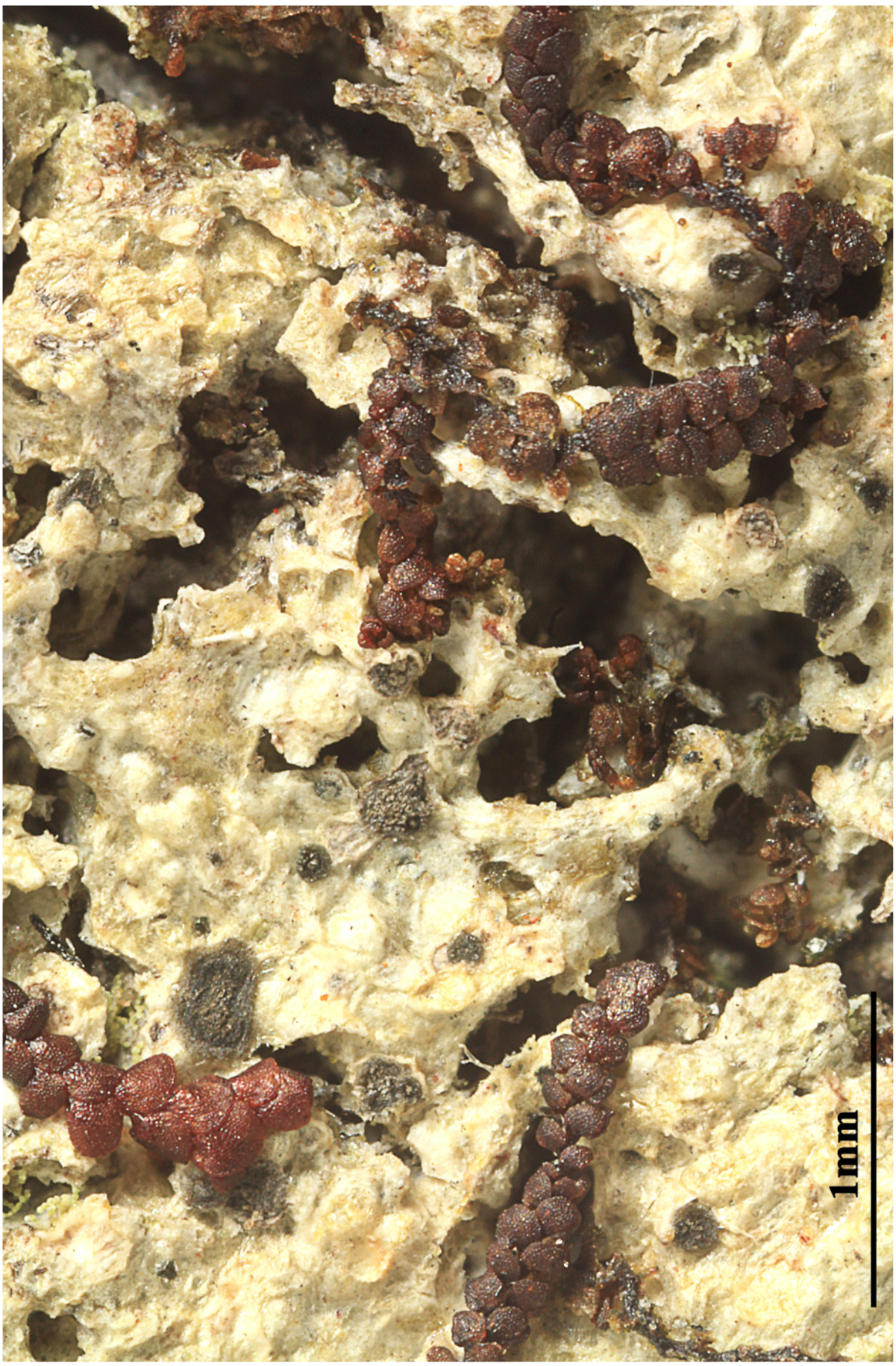


Gyrotrema sinuosum

Gyalideopsis aequatoriana Kalb & Vězda, in Kalb & Vězda, Nova Hedwigia 58(3-4): 512 (1994)

[ABL18953], Brazil, Sergipe, Capela, Refúgio de vida silvestre Mata do Junco. 10°32' S, 37°03' W, 150 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18953), 24. March 2014, det. A. Aptroot 2014. - Apothecia roundedor irregularly crenate, 0.5-0.83 mm diam., pale brown, margins somewhat elevated, paler than disc. Exciple lateral c. 80 µm thick,pale brown or without colour. Hypothecium and subhymenium 30 µm, not coloured. Paraphyses 0.8 µm thick. Spores 2/ascus, muriform, 22-27 x 13-20 µm.





Gyalideopsis aequatoriana

Gyalideopsis rubrofusca Kalb & Vězda, Biblthca Lichenol. 29: 48 (1988)

[ABL21743], Brazil, Sergipe, Parque National Serra de Itabaiana, S slope. 10°44'35" S, 37°20'25" W, 400 m. On tree bark in Atlantic rain forst. Leg. M. Cáceres & A. Aptroot, (no. 21743), 10 May 2014, det. A. Aptroot 2014. - Tallus corticolous, thin, grey-white, with hyphophores. Hyphophores 0.1-0.2 mm long, at the tips dark brown. Apothecia red-brown, 0.3-0.7 mm. Spores (1-)2-4/ascus, muriform, 6-8 transveral with 1-3 longitudinal septa, 20-27 x 10-13 µm.





Gyalideopsis rubrofusca

Haematomma africanum (J. Steiner) C.W. Dodge, Beih. Nova Hedwigia 38: 39 (1971)
= *Haematomma bubalinum* R.W. Rogers, Lichenologist 17(3): 308 (1985)
= *Haematomma puniceum* var. *africanum* J. Steiner, Bull. Herb. Boissier, 2 sér. 7: 641 (1907)

[ABL48005F], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Eco-parque. 09°39'43" S, 45°40'18" W, 30 m. On twig bark in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48005F), 15. November 2018, det. A. Aptroot 2018. - Thallus whitish, warty, without soredia. Apothecia sessile, 0.5-2 mm diam. Disc ± yellowish pruinose. Spores 8/ascus, 9-19-septate, 45-80 x 4-7 µm. Chemistry: atranorin, placodiolic acid, haematommon.





Haematomma africanum

Herpothallon roseocinctum (Fr.) Aptroot, Lücking & G. Thor, in Aptroot, Thor, Lücking, Elix & Chaves, Biblthca Lichenol. 99: 59 (2009)
= *Chiodecton sanguineum f. roseocincta* (Fr.) Vain., Acta Soc. Fauna Flora fenn. 7(no. 2): 143 (1890)
= *Chiodecton sanguineum f. roseocinctum* (Fr.) Vain. [as 'roseo-cincta'], Acta Soc. Fauna Flora fenn. 7(no. 2): 143 (1890)
= *Herpothallon sanguineum f. roseocinctum* (Fr.) Tomas., Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10: 321 (1954)
= *Hypochnus roseocinctus* (Fr.) Sacc., in Fries, Epicr. syst. mycol. (Upsaliae): 569 (1838) [1836-1838]
= *Thelephora roseocincta* Fr. [as 'roseo-cincta'], Linnaea 5: 530 (1830)

[ABL50710bg], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bg), 21. June 2019, det. A. Aptroot 2019. - Thallus corticolous or rarely saxicolous, up to 8 cm diam., loosely to partly firmly appressed to the substrate, firm, not flaking off, minutely felty, dull, pale greenish-green,; in section up to 100 µm thick, with many calcium oxalate crystals in the photobiont layer and with 1-2 µm wide hyphae. Hypothallus distinct where the thallus is loosely appressed to the substrate, byssoid, dirty whitish to pale red to at least with some dark brown hyphae, composed of 1-2 µm wide hyphae. Prothallus up to 1.5 mm wide, byssoid, composed of interwoven and radiating hyphae, dirty whitish to more rarely pale red in the inner part and pale red or more rarely whitish in the outer part. Pseudisidia many to few , cylindrical to rarely globose, unbranched or rarely sparsely branched, byssoid-felty with many projecting hyphae, of the same colour as the thallus or more strongly pigmented, up to 0.5 x 0.4 mm. Photobiont cells single or in part aggregated, 6-11 x 5-9 µm. Asci and pycnidia not seen. Chemistry: confluentic acid (major), 2'-*O*-methylperlatolic acid (trace), 2'-*O*-methylmicrophylinic acid (trace), chiodectonic acid (trace). Thallus and prothallus C-, K+ purple in pigmented parts (chiodectonic acid), P-, UV-, I-, KI-.



Herpothallon roseocinctum

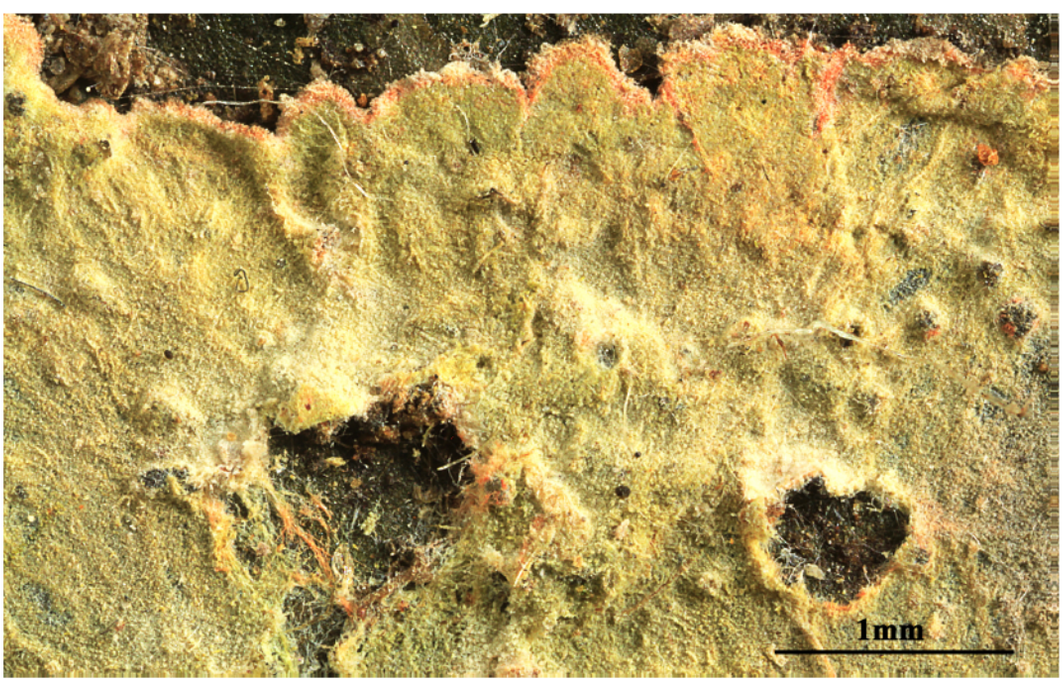


Herpothallon roseocinctum

Herpothallon aurantiacoflavum (B. de Lesd.) Aptroot, Lücking & G. Thor, in Aptroot, Thor, Lücking, Elix & Chaves, Biblthca Lichenol. 99: 31 (2009)

= *Chiodecton aurantiacoflavum* B. de Lesd., Rev. Bryol. Lichénol. 7: 61 (1934)

[ABL50710bd], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bd), 21. June 2019, det. A. Aptroot 2019. - Thallus corticolous, up to c. 7 cm diam., loosely to more firmly appressed to the substrate, more or less compact-felty to byssoid, not flaking off, dull, sulphur yellow to yellowish-orange to orange-red; in section up to 100 µm thick, without calcium oxalate crystals, with 1-2 µm wide hyphae. Hypothallus below the entire thallus, sometimes visible from above, more or less byssoid to rather compact, yellow to brownish-black in parts, composed of 1-3 µm wide hyphae. Prothallus up to 0.5 mm wide , byssoid, composed of interwoven and radiating hyphae, yellowish-orange to orange-red. Pseudisidia scattered to numerous to few, irregularly globose to cylindrical, unbranched or rarely sparsely branched, felty-byssoid with few to many projecting hyphae, of the same colour as the thallus or more orange-red, up to 0.5 x 0.1 mm. Photocells single or a few cells aggregated, 4-12 x 4-7 µm. Asci and pycnidia not seen. Chemistry: confluentic acid (major), rugulosin (submajor), 2'-*O*-microphylinic acid (trace), chiodectonic acid (trace). Thallus and prothallus C-, K+ red (rugulosin) to purple (chiodectonic acid), P-, UV-, I-, KI-. The substance giving the yellow colour is rugulosin and the substance giving the red colour is chiodectonic acid.

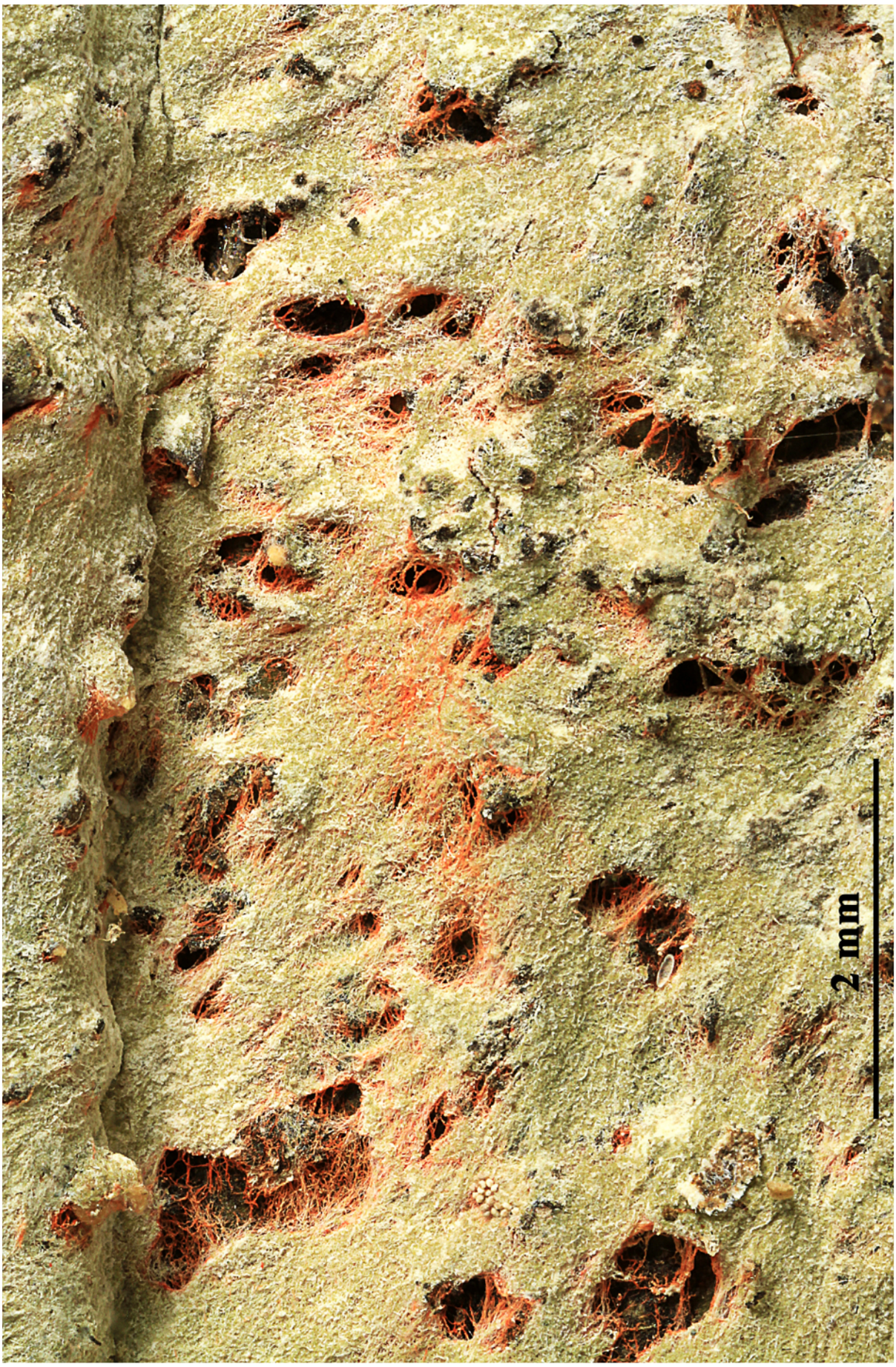




Herpothallon aurantiacoflavum

Herpothallon rubrocinctum (Ehrenb.) Aptroot, Lücking & G. Thor, in Aptroot, Thor, Lücking, Elix & Chaves, Biblthca Lichenol. 99: 61 (2009)
= *Byssus sanguinea* Sw., Prodr.: 148 (1788)
= *Chiodecton rubrocinctum* (Ehrenb.) Nyl., Bot. Ztg. 20: 278 (1862)
= *Chiodecton sanguineum* (Sw.) Vain., Acta Soc. Fauna Flora fenn. 7(no. 2): 143 (1890)
= *Corticium rubrocinctum* (Ehrenb.) Bres., Annls mycol. 9(3): 272 (1911)
= *Cryptothecia rubrocincta* (Ehrenb.) G. Thor, Bryologist 94: 280 (1991)
= *Herpothallon sanguineum* (Sw.) Tobler, Flora, Regensburg 131: 447 (1937)
= *Hypochnus rubrocinctus* Ehrenb., in Nees von Esenbeck (Ed.), Horae Phys. Berol.: 84, tab. 17, fig. 3 (1820)
= *Hypochnus sanguineus* (Sw.) Kuntze, Revis. gen. pl. (Leipzig) 3(3): 486 (1898)
= *Thelephora sanguinea* (Sw.) Sw., Fl. Ind. Occid. 3: 1937 (1806)

[ABL50710be], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710be), 21. June 2019, det. A. Aptroot 2019. - Thallus corticolous or foliicolous, usually up to 10 cm diam. but rarely to 1 m diam., loosely to rarely closely appressed to the substrate,firm, not flaking off, minutely felty, dull, pale mineral to dark green and partly ± red; in section up to 300 µm thick, with few to many calcium oxalate crystals in the photobiont layer and with 1-2 µm wide hyphae. Hypothallus distinct where the thallus is loosely attached to the substrate, byssoid, whitish to red to rarely violet or yellow, composed of 1-3 µm wide hyphae. Prothallus up to 2 mm wide, byssoid, composed of interwoven and radiating hyphae, red to rarely violet. Pseudisidia many to few, cylindrical or sometimes more or less globose, unbranched or sparsely branched, byssoid to rarely firm with many projecting hyphae, of the same colour as the thallus but often more strongly red-pigmented than the upper part of the thallus, up to 0.5 x 0.4 mm. Photobiont cells single or a few cells aggregated, 8-15 x 5-11 µm. Asci and pycnidia not seen. Chemistry: Confluentic acid (major), chiodectonic acid (minor), 2'-*O*-microphyllinic acid (trace), ± atranorin (trace). Thallus and prothallus C-, K+ purple in pigmented parts(chiodectonic acid), P-, UV-, I-.



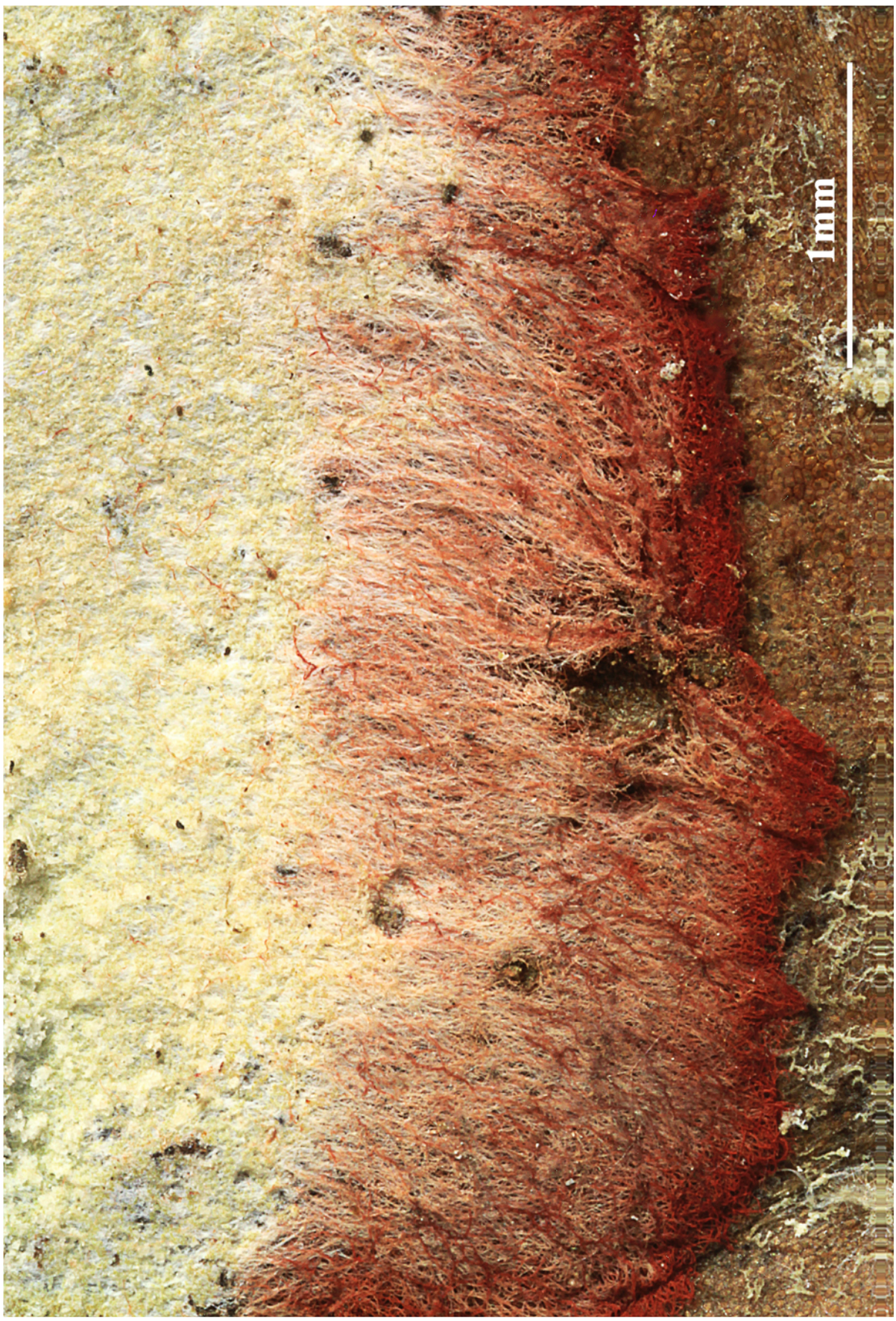
Herpothallon rubrocinctum



Herpothallon rubrocinctum

Herpothallon rubromaculatum G. Thor, in Aptroot, Thor, Lücking, Elix & Chaves, Biblthca Lichenol. 99: 63 (2009)

[ABL50710bf], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bf), 21. June 2019, det. A. Aptroot 2019. - Thallus corticolous, up to 7 cm diam., loosely to sometimes firmly appressed to the substrate, firm, not flaking off, rarely minutely felty, dull, grey to greenish-grey with spots of red pigment on the upper surface, often cracked or with holes in which the red pigment is visible; in section up to 100 µm thick, with few calcium oxalate crystals in the photobiont layer and with 1-2 µm wide hyphae. Hypothallus below the entire thallus, with a byssoid red layer but beneath where the thallus is loosely appressed usually with a smooth and black layer, composed of 1-2 µm wide hyphae. Prothallus up to 1 mm wide, byssoid, composed of interwoven and radiating hyphae, pale red to whitish in the inner part and pale red in the outer part. Pseudisidia not seen but thallus surface sometimes with few and globose granules on the thallus surface, up to 0.05 x 0.05 mm. Photobiont cells single or rarely aggregated, 6-12 x 5-9 µm. Asci and pycnidia not seen. Chemistry: Neodiffractaic acid (major), confluentic acid (minor), chiodectonic acid (trace), 4-*O*-demethyldiffractaic acid (trace). Thallus and prothallus C-, K+ purple in pigmented parts (chiodectonic acid), P-, UV-, I-, KI-.



Herpothallon rubromaculatum

Lasioloma arachnoideum (Kremp.) R. Sant., Symb. bot. upsal. 12(no. 1): 547 (1952)

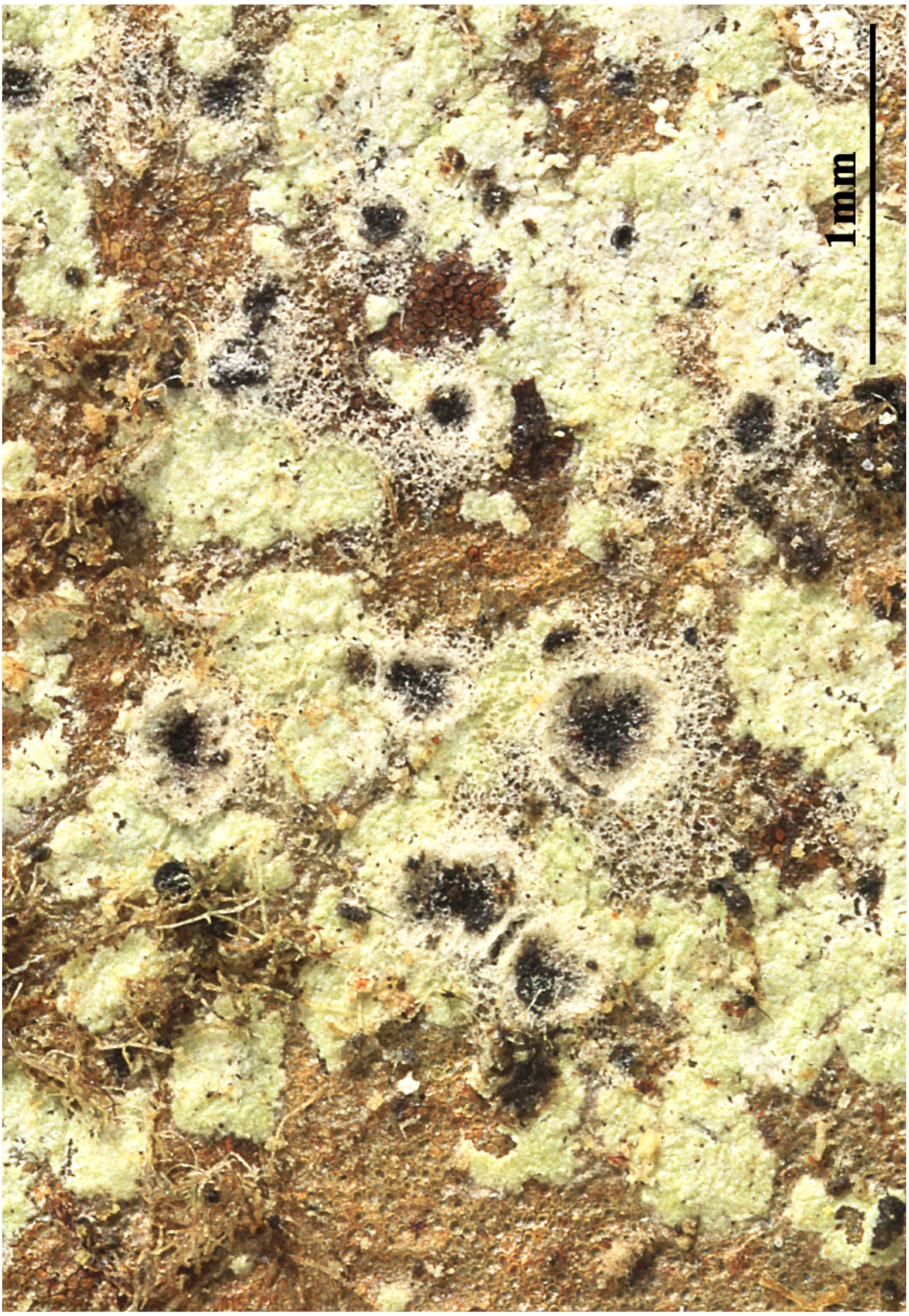
= *Lopadium arachnoideum* (Kremp.) Müll. Arg., Flora, Regensburg 73: 190 (1890)

= *Phlyctis arachnoidea* Kremp., Nuovo G. bot. ital. 7(1): 16 (1875)

= *Sporopodium leprieurii* var. *arachnoideum* (Kremp.) Vain., Ann. Acad. Sci. fenn., Ser. A 15(no. 6): 100 (1921)

[ABL50710B], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50710B), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, partly confluent patches, 10–40 mm across and 20–35 µm thick, ecorticate, smooth, pale grey; prothallus well-developed between algiferous, thallus patches. Apothecia rounded, 0.4–0.8 mm diam. and 200–300 µm high; disc plane, dark greyish brown; margin thick, pale grey, laterally densely pilose. Excipulum 30–60 µm broad, laterally with numerous hairs, up to 100 µm long. Hypothecium 20–60 µm high, dark aeruginous brown. Apothecial base aeruginous. Epithecium thin, 5–10 µm high, pale brown. Hymenium 100–130 µm high, colourless. Asci 90–110 x 20–30 µm. Ascospores single, oblong, muriform, 70–105 x 18–28 µm, 3.5–4.5 times as long as broad, colourless. Campylidia sessile, 0.5–0.9 mm broad; lobe dark grey to slightly bluish grey. Conidia filiform with 3–5 branches originating from single point, each branch 3–5-septate, 20–30 x 1.3–1.7 µm. Chemistry: no substances detected by TLC and HPLC.

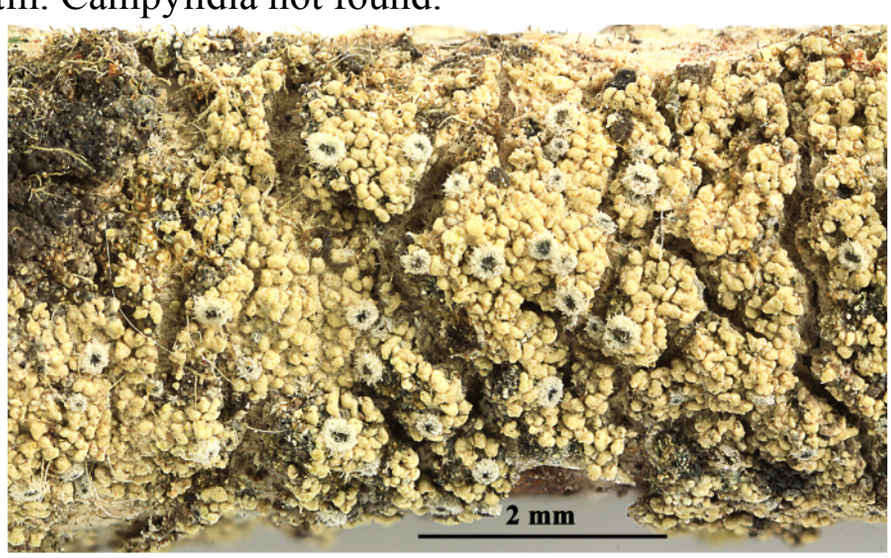




Lasioloma arachnoideum

Lasioloma stephanellum (Nyl.) Lücking & Sérus., Mycotaxon 77: 302 (2001)
= *Lecidea stephanella* Nyl., Flora, Regensburg 49: 291 (1866)
= *Lopadium stephanellum* (Nyl.) Zahlbr., Cat. Lich. Univers. 4: 314 (1926) [1927]

[42940], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42940), 27. October 2017, det. A. Aptroot 2017. -
Thallus warted, entirely made of rather loosely compact verrucae which are whitish but with a faint yellowish green hue, 0.1-0.2 mm in diam. and c. 0.1 mm in heigh, and sometimes coalescing; medulla pale yellow to reddish when old. Prothallus abundant between the verrucae, and sometimes on the outer edge of the thallus, white or very pale grey, made of densely intewoven, 4-7 µm thick hyphae. Photobiont a species of the Chlorococcacee, most probably *Trebouxia*. Cyanobacteria always present on the prothallus, not clearly associated with hyphae, belonging to Scytonemataceae (probably a species of *Scytonema*), forming dark blue or almost black patches. Apothecia lecideoid, rounded or slightly irregular, 0.3-0.5(-0.6) mm in diam., constricted at their base, disc plane or slightly convex, pale greyish to dark grey, or almost black, with a faint violet or bluish hue, not pruinose, margin paler than the disc, with densely or irregularly arranged (but sometimes almost absent) whitish or pale grey hairs which do not exceed 50-80 µm long. Excipulum hyaline or almost so, typically paraplectenchymatous, 40-70 µm thick; hypothecium dark brown, ± aeruginose in cetral parts, up to 50 µm thick; hymenium hyaline, c. 100 µm thick; paraphyses abundant, branched and anastomosed; asci clavate, of the *Sporopodium*-type; ascospores singel in the asci, strongly muriform, ellipsoid, 70-85 x 22-24 µm. Campylidia not found.





Lasioloma stephanellum

Leucodecton sordidescens (Fée) Lücking & Sipman, in Sipman, Lücking, Aptroot, Chaves, Kalb & Umaña Tenorio, Phytotaxa 55: 83 (2012)
= *Myriotrema sordidescens* (Fée) Kalb, Herzogia 9(1-2): 75 (1992)
= *Thelotrema sordidescens* (Fée) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 118 (1858)
= *Trypethelium sordidescens* Fée, Essai Crypt. Exot., Suppl. Révis. (Paris): 64 (1837)

[ABL18004], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18004), 27. July 2013, det. A. Aptroot 2013. - Thallus grey-olive-yellow, with minutely grainy surface, with loose cortex; photobiont layer and/or medulla with columnar clusters of calcium oxalate crystals. Apothecia erumpent, rounded, 0.3–0.5 mm diam.; disc concealed by minute, ostiolate, 0.03–0.05 mm wide pore, invisible; margin entire, brown. Columella absent. Excipulum paraplectenchymatous, brown; periphysoids absent. Hymenium 120–150 µm high, clear; paraphyses unbranched. Ascospores 4–8/ascus, muriform, 25–35 x 15–18 µm, ellipsoid, with thickened septa and rounded lumina, colorless to pale brown, young I+ violet-blue (amyloid). Chemistry: stictic, hypostictic, cryptostictic, and constictic acids.

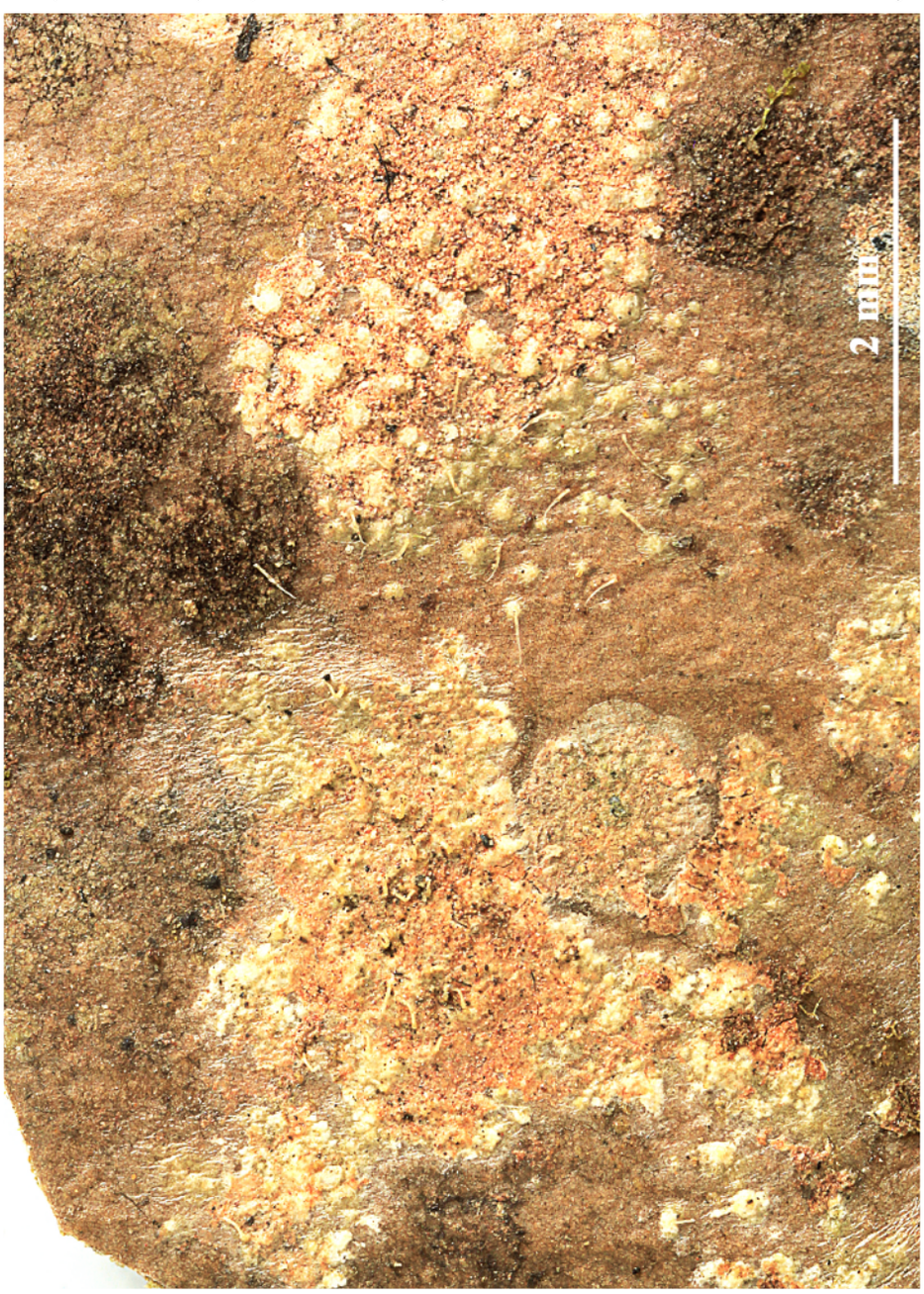




Leucodecton sordidescens

Lyromma nectandrae Bat. & H. Maia, Atas Inst. Micol. Univ. Recife 2: 360 (1965)

[ABL18176], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18176), 27. July 2013, det. A. Aptroot 2013. - Thallus crustose, continuous, smooth, 1–3 mm across, very thin (7–10 µm), green. Photobiont cells rectangular, 10–15 x 4–5 µm, in radiate plates. Perithecia not observed. Pycnidia elongate barrel-shaped with tapering top, often vertically flattened, 0.04–0.07 mm diam. and 100–130 µm high, dark brown, upper part around ostiole furnished with (2–)3–5 recurved, tubular setae formed by agglutinate hyphae, 40–60 µm long and 10–15 µm broad, brownish black. Conidia filiform, indistinctly multiseptate, 45–65 x 0.8–1.2 µm, ends usually thinner (0.3–0.6 µm). Chemistry: no substances detected by TLC.





Lyromma nectandrae

Malmidea badimioides (M. Cáceres & Lücking) M. Cáceres & Kalb, in Kalb, Rivas Plata, Lücking & Lumbsch, Biblthca Lichenol. 106: 164 (2011)

= *Malcolmiella badimioides* M. Cáceres & Lücking, in Cáceres, Libri Botanici 22: 102 (2007)

[42965], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42965), 27. October 2017, det. A. Aptroot 2017. Thallus crustose, corticolous, continuous, 20-50 mm across and 30-70 µm thick, densely verrucose, green-grey; medulla white, K-. Photobiont chlorococcoid; cells 4-7 µm diam. Apothecia sessile, rounded, 0.4-0.8 mm diam. and 250-350 µm high; disc plane, orange-brown to brown-red; margin thick, slightly prominent, cream-cloured to white. Excipulum externally paraplectenchymatous with small cells and loose hyphal ends. 20-50 µm broas, hyaline, internally with medullary layer composed of loosely arranged, periclinal hyphae with constricted septa, 40-60 µm broad, incrusted with hydrophobic granules, nubilous but dissolving in KOH with K+ grass-green reaction. Hypothecium 20-30 µm high, orange-brown, K-. Epithecium indistinct. Hymnium 80-100 µm high, colorless. Asci 70-90 x 15-20 µm. Ascospores 8/ascus, non-septate. ellipsoid, 15-20 x 6-10 µm. Pycnidia not observed. Chemistry: no substances detected by TLC.

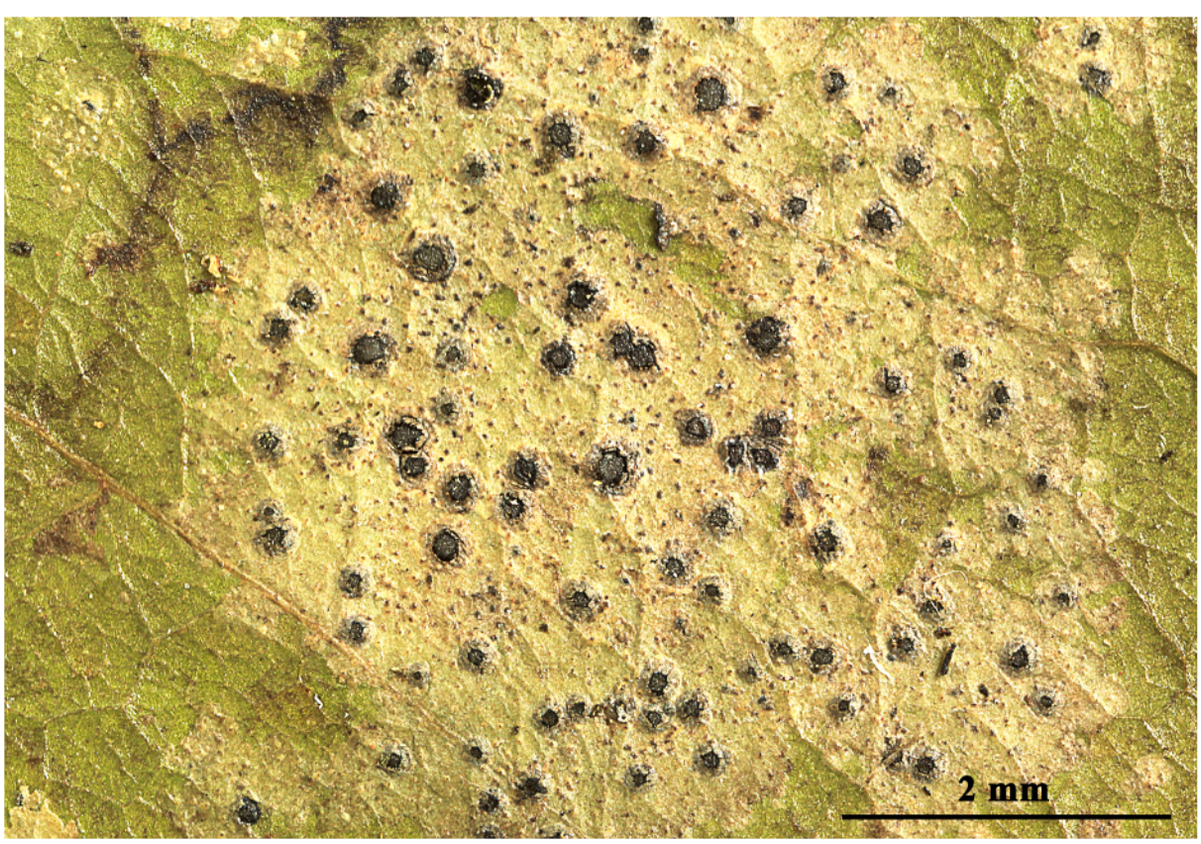


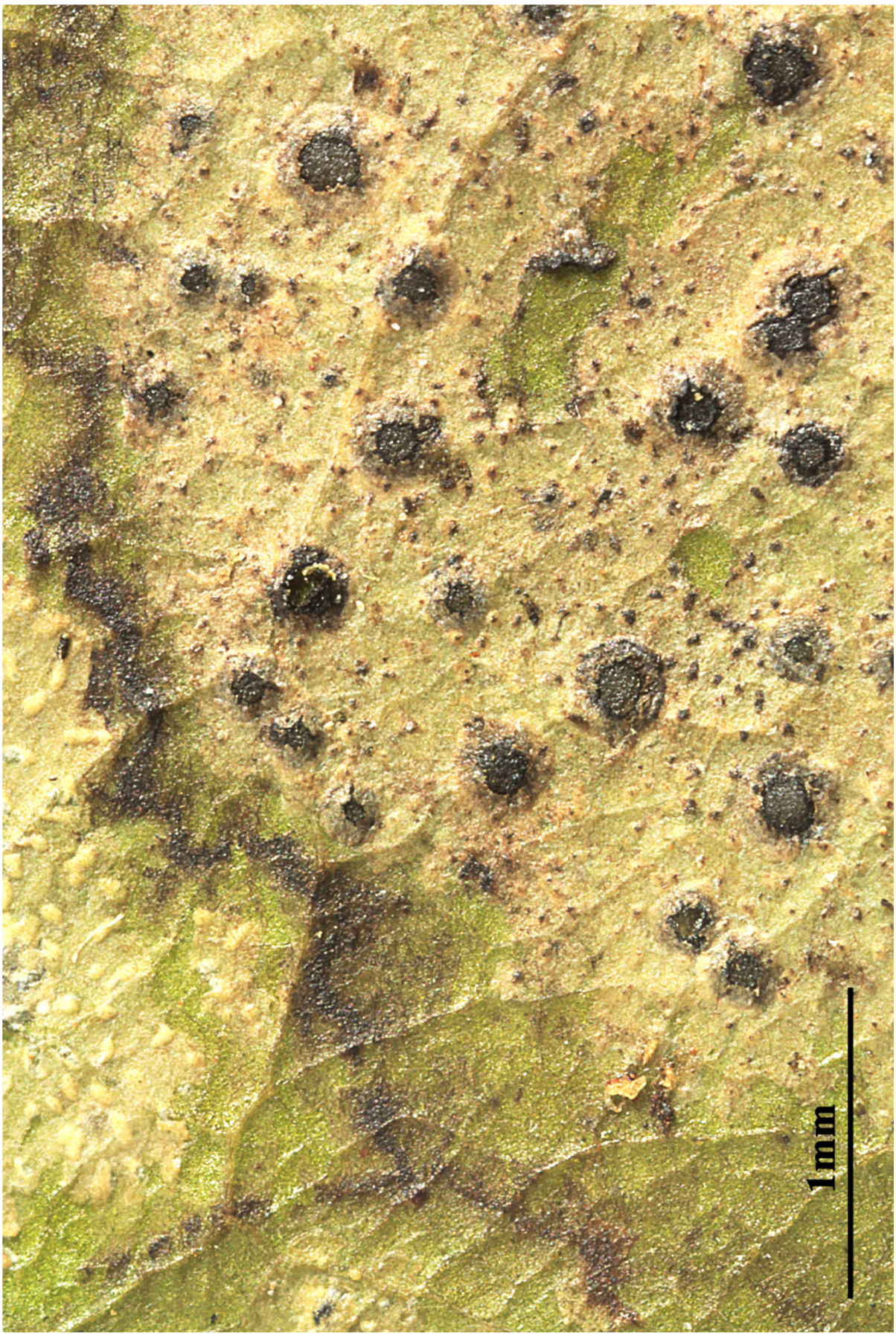


Malmidea badimioides

Mazosia bambusae (Vain.) R. Sant., Symb. bot. upsal. 12(no. 1): 121 (1952)
= *Chiodecton bambusae* Vain., Ann. Acad. Sci. fenn., Ser. A 15(no. 6): 290 (1921)
= *Rotularia bambusae* (Vain.) Zahlbr., Cat. Lich. Univers. 2: 470 (1924)

[ABL50710bo], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bo), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but often irregular in outline, finely verrucose, 5–20 mm across, thin (7–15 µm), brownish grey to olive-green, matt to slightly shiny, usually with dark brown prothallus; verrucae 0.02–0.05 mm diam., dark brown to blackish brown. Photobiont cells rectangular, 10–16 x 3–5 µm, in radiate plates. Ascomata rounded, 0.3–0.6 mm diam. and 70–90 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 7–15 µm thick. Hypothecium 7–10 µm high, pale brown but lowermost zone dark brown. Hymenium 60–80 µm high. Asci 45–60 x 10–14 µm. Ascospores fusiform, 3-septate, 15–25 x 4–5 µm, upper median cell slightly enlarged, colorless. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia not observed. Microconidia ellipsoid, non-septate, 2.5–3.5 x 1–1.3 µm. Chemistry: no substances detected by TLC.

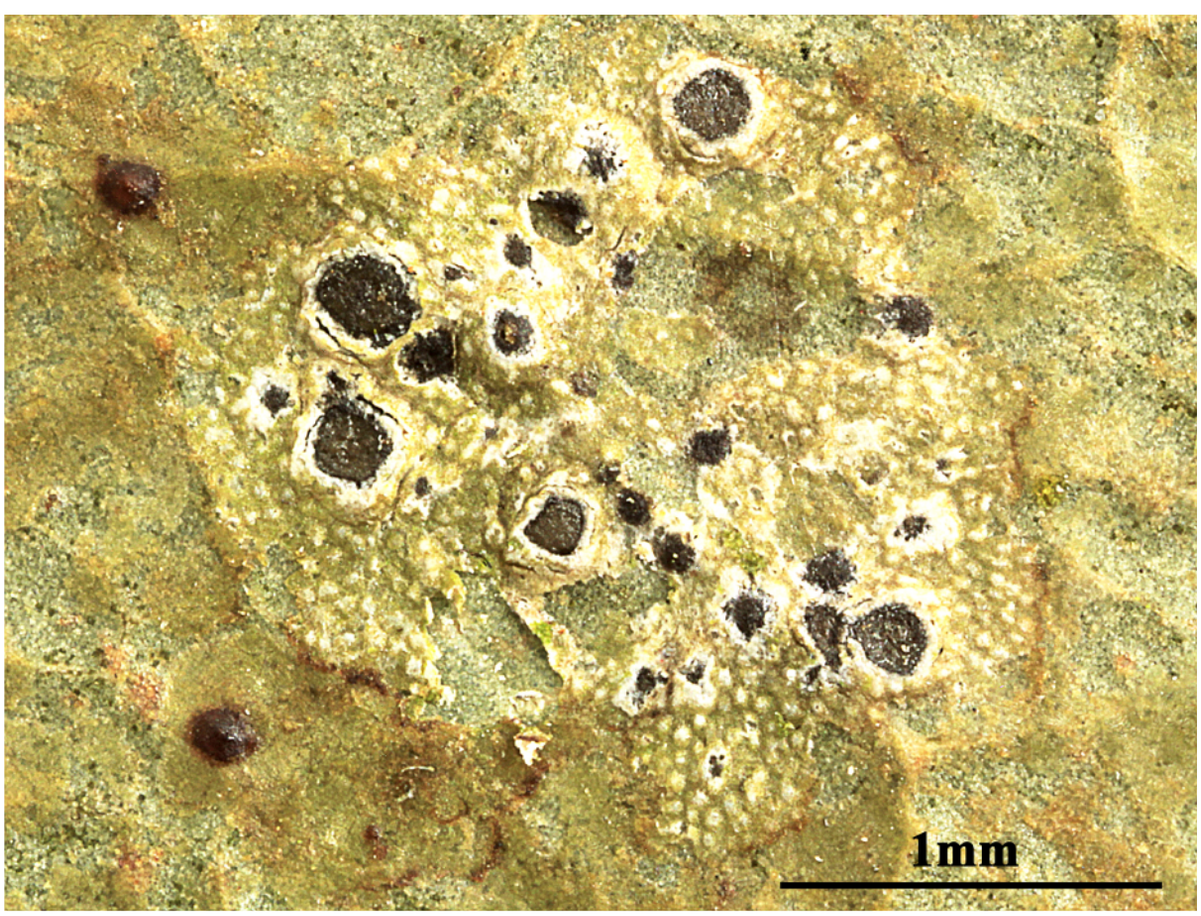




Mazosia bambusae

Mazosia dispersa (J. Hedrick) R. Sant., Symb. bot. upsal. 12(no. 1): 120 (1952)
= *Calenia dispersa* J. Hedrick 1935

[ABL18178], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18178), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous or dispersed into rounded, confluent patches, verrucose, 5–15 mm across, thin (10–15 µm), pale greenish grey to pale green but often with white pruina, matt; verrucae 0.07–0.13 mm diam., paler than thallus. Photobiont cells rectangular, 10–20 x 4–6 µm, in radiate plates. Ascomata rounded, 0.3–0.6 mm diam. and 70–100 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 15–25 µm thick. Hypothecium 10–15 µm high, brown. Hymenium 60–90 µm high. Asci 55–75 x 10–16 µm. Ascospores fusiform, (4–)5(–7)-septate, 26–39 x 4–7 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia bacillar, non-septate, 4–7 x 2–2.5 µm. Microconidia not observed. Chemistry: unidentified fatty acids in a few specimens (RF in A between 33 and 37).

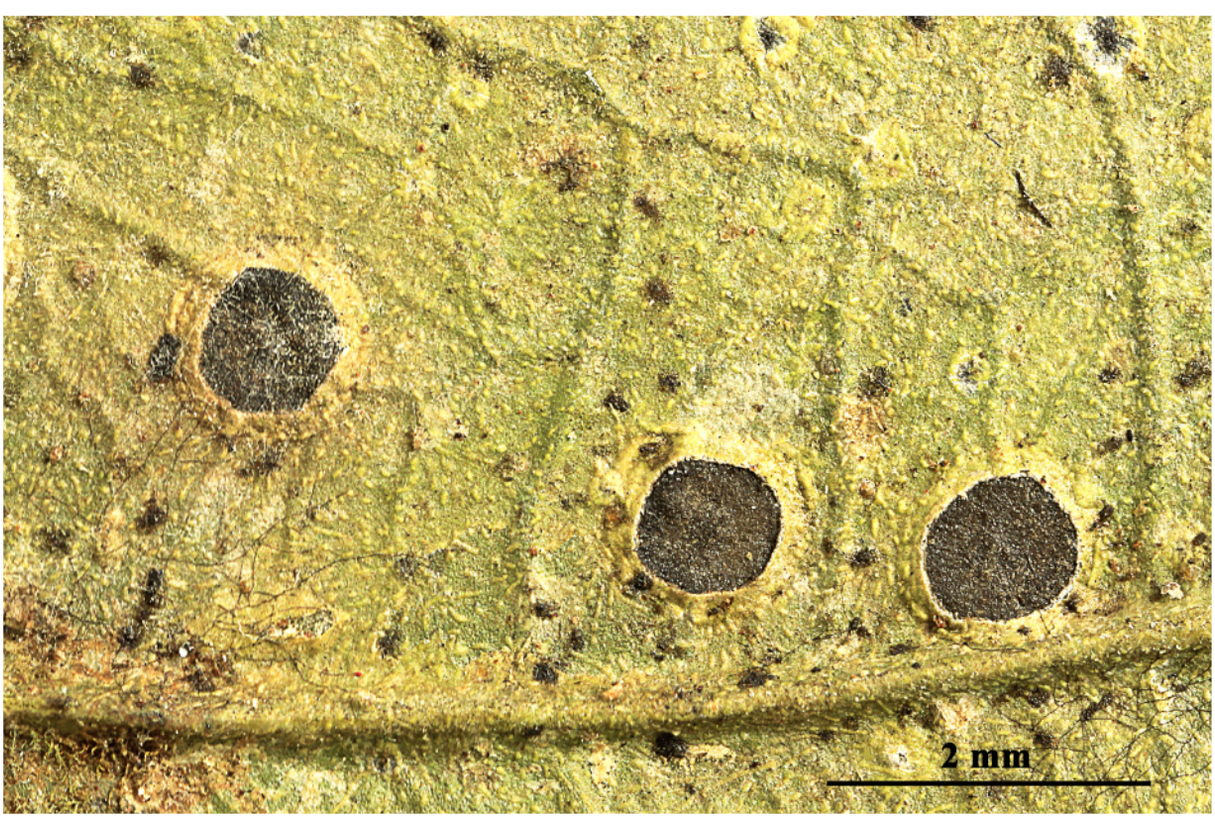


Mazosia melanophthalma (Müll. Arg.) R. Sant., Symb. bot. upsal. 12(no. 1): 117 (1952)

= *Opegrapha melanophthalma* Müll. Arg., Flora, Regensburg 66(21): 348 (1883)

= *Platygrapha melanophthalma* (Müll. Arg.) Müll. Arg., Revue mycol., Toulouse 10(no. 39): 117 (1888)

[ABL50710bn], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bn), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but often marginally dispersed into rounded patches, finely verrucose, 5–15 mm across, thin (10–15 µm), pale greenish grey to pale green, slightly shiny; verrucae 0.05–0.1mm diam., slightly paler than thallus. Photobiont cells rectangular, 8–15 x 4–5 µm, in radiate plates. Ascomata rounded, 0.3–0.7 mm diam. and 60–90 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 10–15 µm thick. Hypothecium 10–15 µm high, brown. Hymenium 50–75 µm high. Asci 45–55 x 8–12 µm. Ascospores fusiform, 3-septate, 15–22 x 3–5 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia bacillar, nonseptate, 5–8 x 2–3 µm. Microconidia fusiform ellipsoid, non-septate, 2–3 x 0.8–1.2 µm. Chemistry: no substances detected by TLC (unknown fatty acid in one specimen).

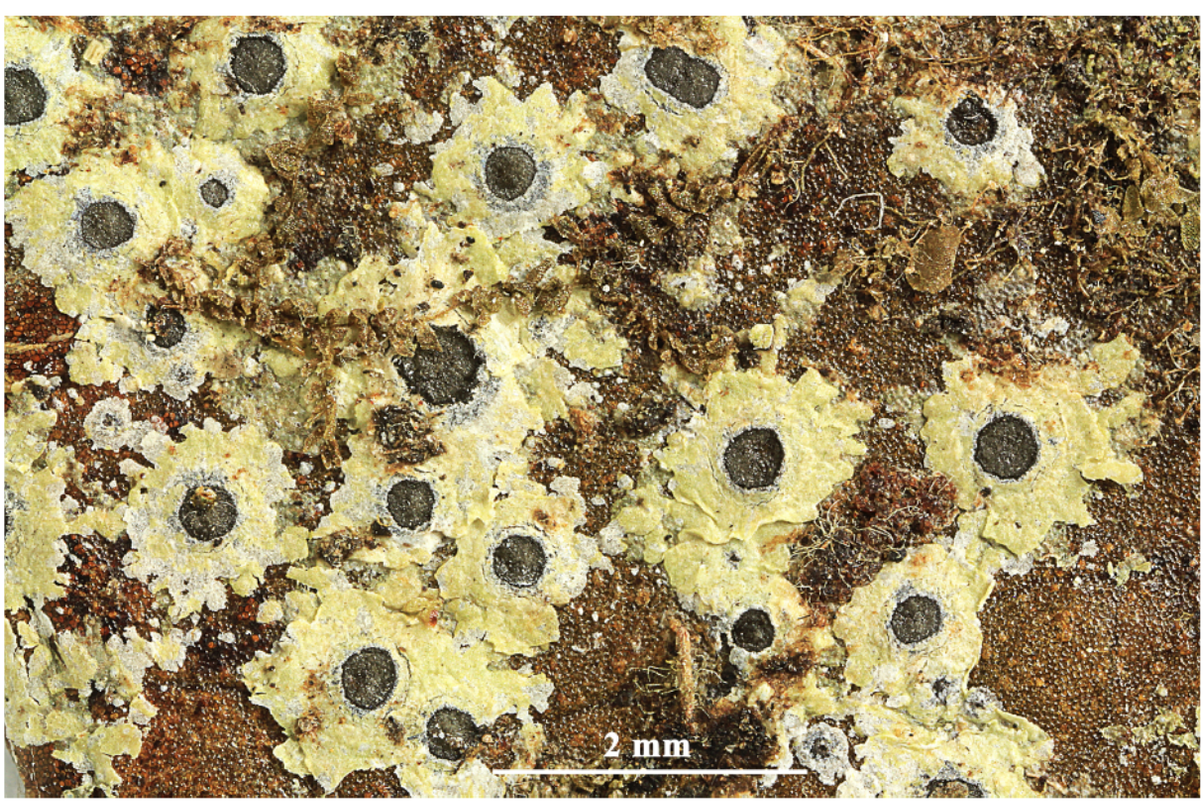


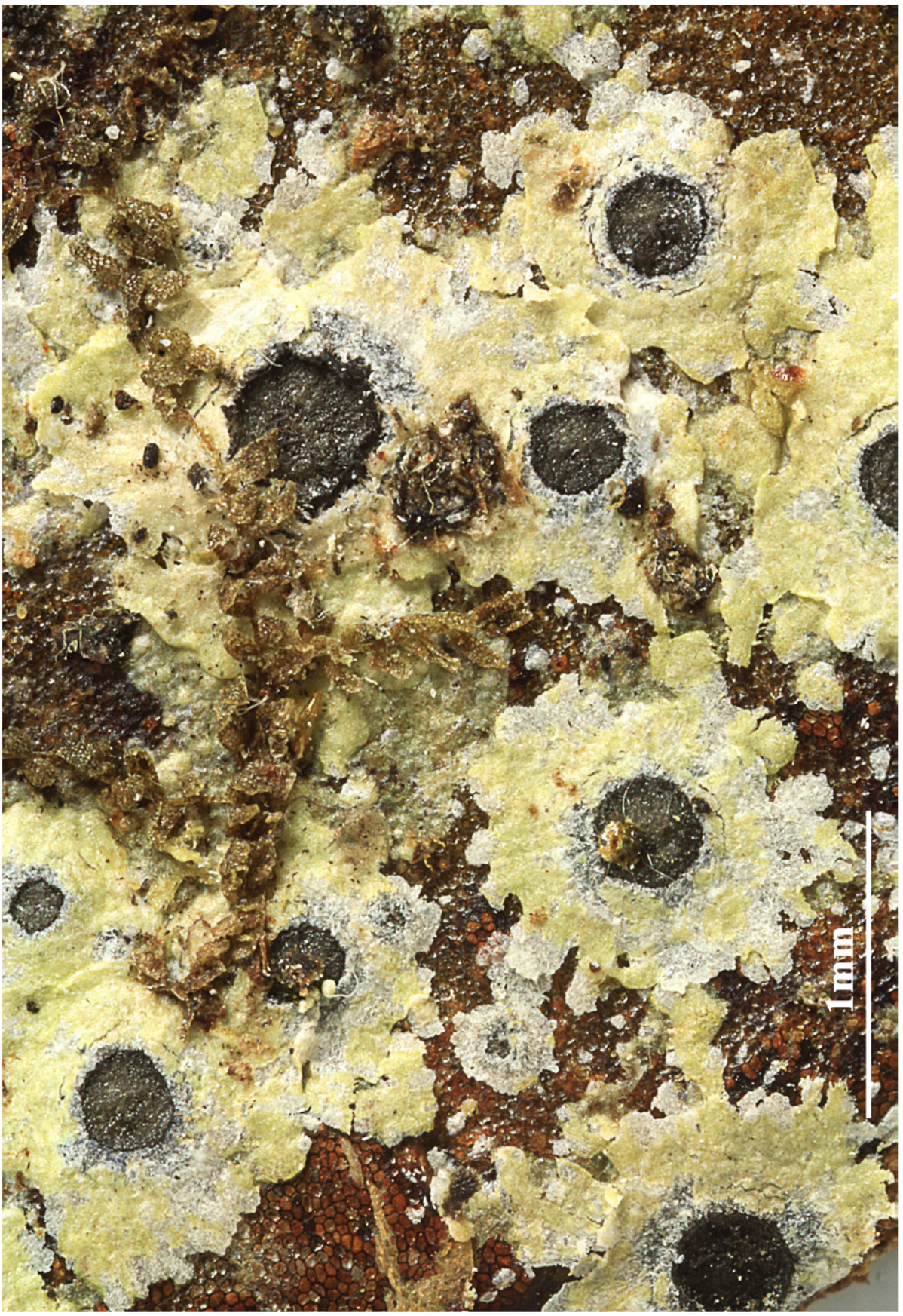


Mazosia melanophthalma

Mazosia phyllosema (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 503 (1923) [1924]
= *Platygrapha phyllosema* Nyl., Bull. Soc. linn. Normandie, sér. 2 7: 171 (1873)

[ABL50710bp], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bp), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but marginally dispersed into rounded patches, smooth, 5–15(–40) mm across, thin (10–15 µm), pale greenish grey to pale green, matt. Photobiont cells angular-rounded, 7–12 x 4–6 µm, in irregular plates. Ascomata rounded, 0.3–0.6 mm diam. and 60–80 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 10–15 µm thick. Hypothecium 10–15 µm high, colourless to pale yellowish brown. Hymenium 50–70 µm high. Asci 50–65 x 10–14 µm. Ascospores fusiform, 3-septate, 15–25 x 4–5 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia bacillar, non-septate, 4–7 x 2–3 µm. Microconidia fusiform ellipsoid, non-septate, 2–3 x 0.8–1 µm. Chemistry: no substances detected by TLC.

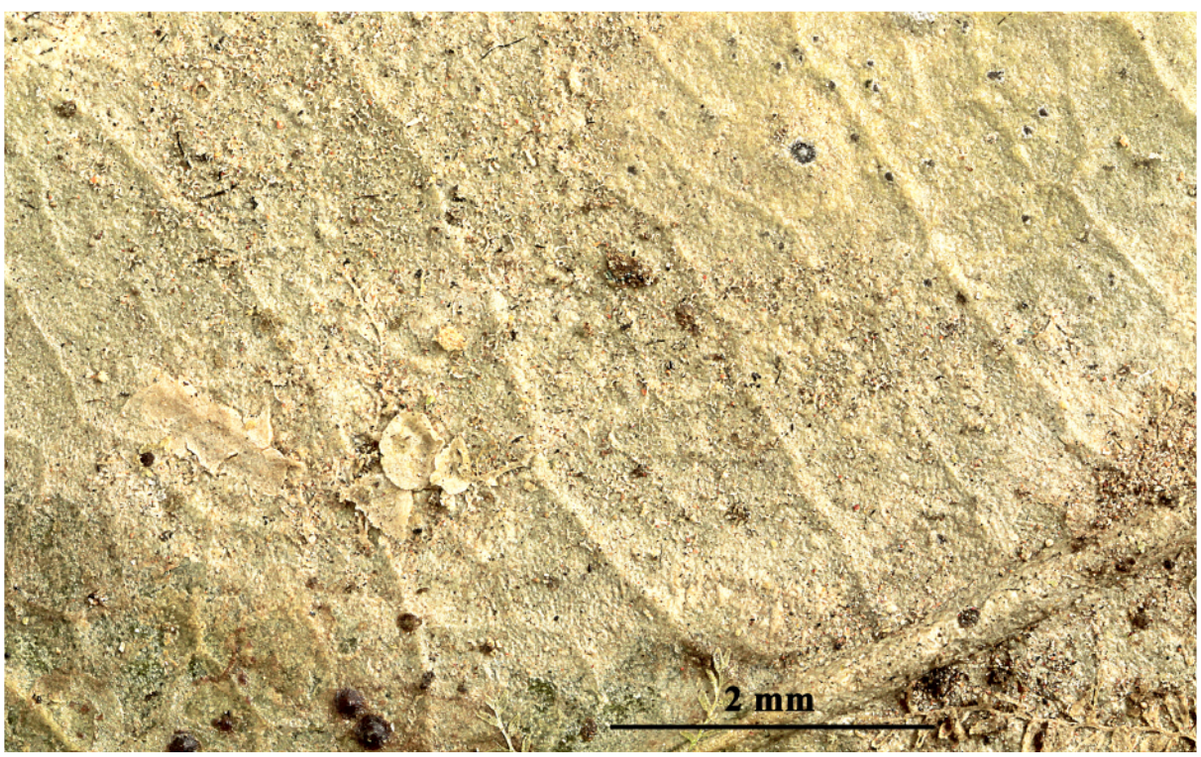


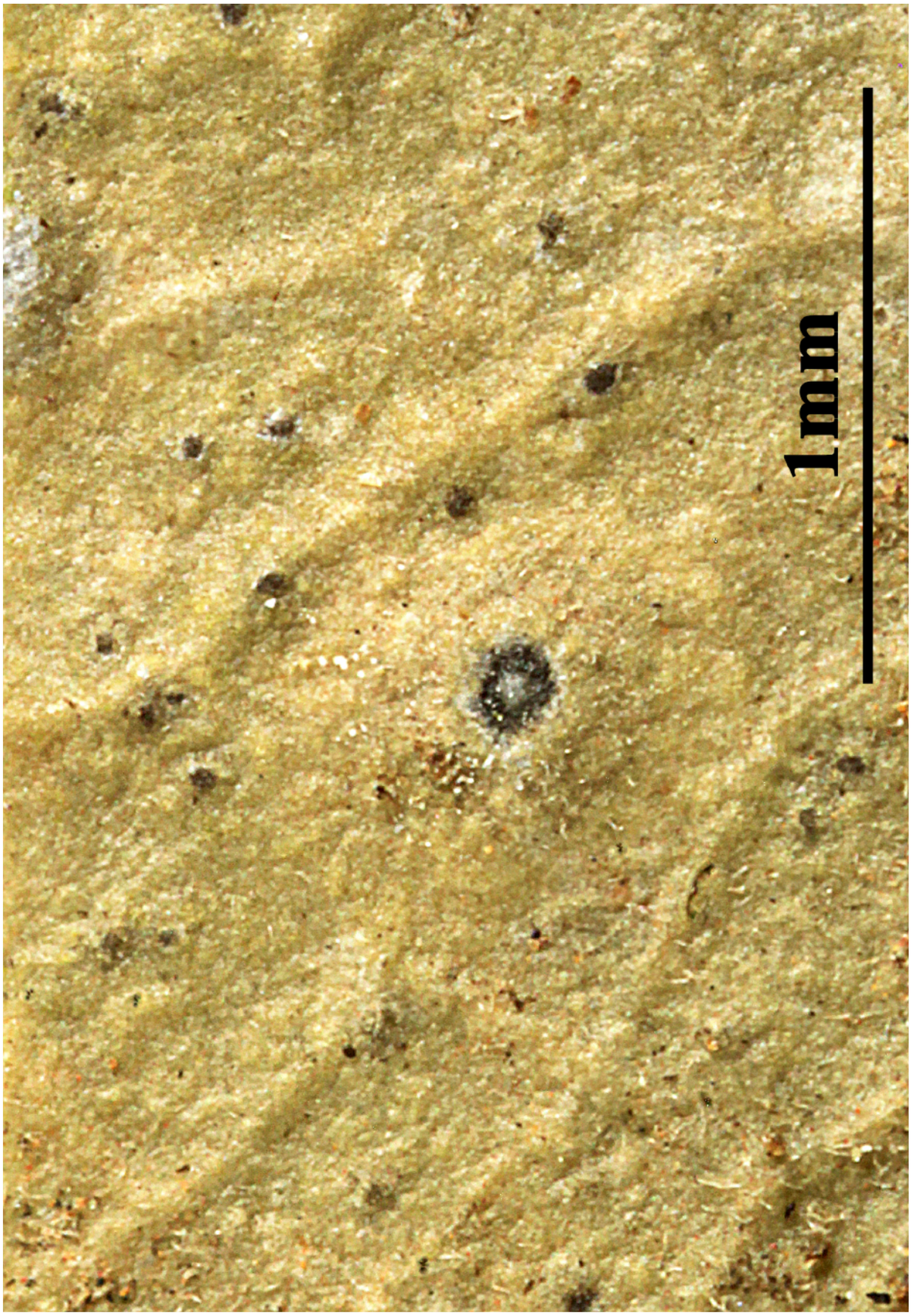


Mazosia phyllosema

Mazosia pilosa Kalb & Vězda, Folia geobot. phytotax. 23: 203 (1988)

[ABL18203], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18203), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous, finely pilose, 5–15mm across, thin (10–15 µm), greenish to brownish grey, matt; hairs formed by single, unbranched hyphae, 0.05–0.1 mm long and 3–5 µm broad at base, colorless. Photobiont cells angular-rounded, 5–10 x 3–6 µm, in irregular plates. Ascomata rounded, 0.3–0.6 (–1) mm diam. and 70–90 µm high; disc dark grey, translucent when moistened; margin gently sloping outwards. Excipulum 15–30 µm thick. Hypothecium 10–15 µm high, brown. Hymenium 60–80 µm high. Asci 50–70 x 9–13 µm. Ascospores narrowly fusiform, 3-septate, 17–27 x 3.5–5 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia not observed. Microconidia ellipsoid, non-septate, 2–3 x 1–1.3 µm. Chemistry: no substances detected by TLC.

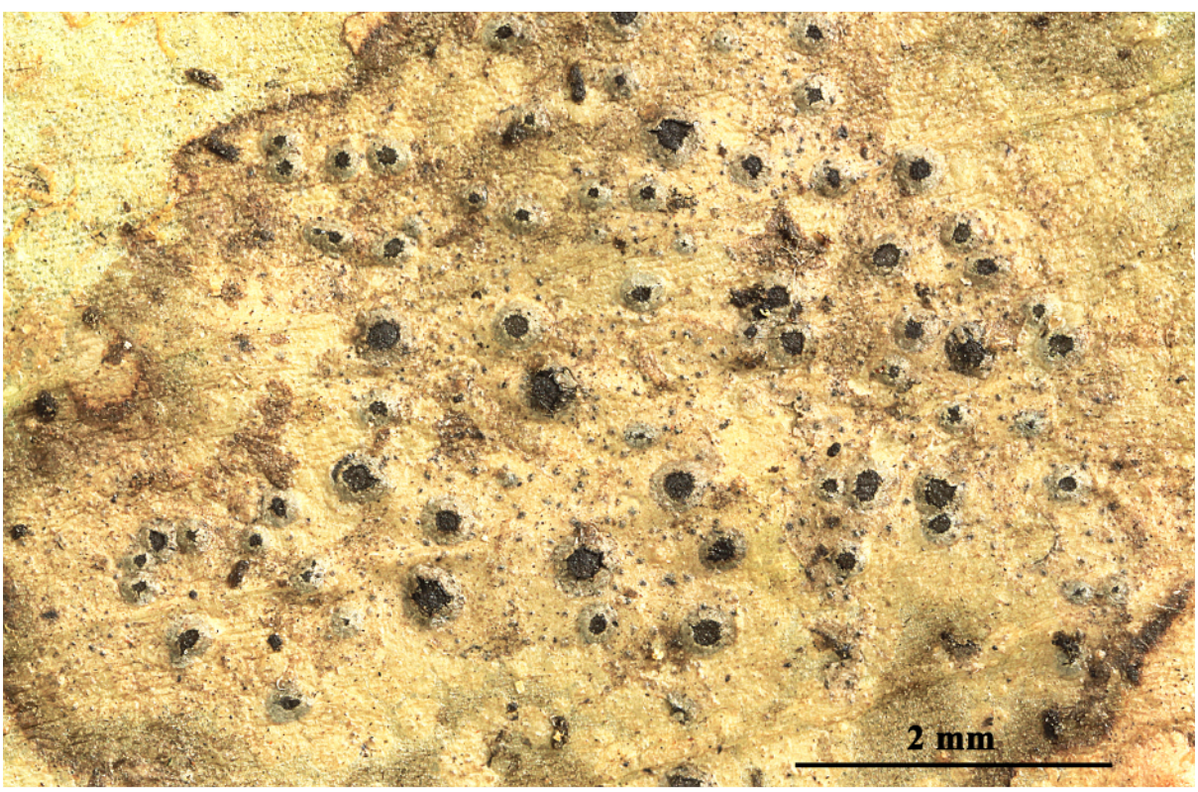




Mazosia pilosa

Mazosia pseudobambusae Kalb & Vězda, Folia geobot. phytotax. 23: 207 (1988)

[ABL11799s], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799s), 15. March 2012, det. A. Aptroot 2012. - Thallus continuous but often irregular in outline, finely verrucose, 5–20 mm across, very thin (7–12 µm), very pale brownish grey, matt, usually with a dark brown prothallus; verrucae 0.02–0.05 mm diam., of same color as thallus. Photobiont cells rectangular, 12–18 x 4–5 µm, in radiate or slightly irregular plates. Ascomata rounded, 0.3–0.7 mm diam. and 70–90 µm high; disc black, translucent when moistened; margin gently sloping outwards. Excipulum 10–15 µm thick. Hypothecium 10–15 µm high, pale brown but lowermost zone dark brown. Hymenium 50–70 µm high. Asci 45–55 x 9–14 µm. Ascospores fusiform, 3-septate, 20–28 x 4–5 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.1–0.2 mm diam. Macroconidia bacillar, non-septate, 4–6 x 2– 2.5 µm. Microconidia not observed. Chemistry: no substances detected by TLC.





Mazosia pseudobambusae

Mazosia rotula (Mont.) A. Massal., Geneac. lich. (Verona): 9 (1854)
= *Chiodecton rotula* (Mont.) Vain., Acta Soc. Fauna Flora fenn. 7(no. 2): 146 (1890)
= *Opegrapha rotula* (Mont.) Müll. Arg., Flora, Regensburg 66(22): 349 (1883)
= *Phyllocharis rotula* (Mont.) Trevis., Conspect. Verruc.: 17 (1860)
= *Platygrapha rotula* (Mont.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 131 (1858)
= *Strigula rotula* Mont., in Sagra, Hist. phys. Cuba, Bot. Pl. Cell. 9: 95 (1845)

[ABL50710br], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710br), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous or dispersed into rounded, confluent patches, distinctly rugose with radiate ridges, 10–20 mm across, thin (10–15 µm), pale greenish grey to pale green, matt to slightly shiny; ridges 0.05–0.1 mm broad, slightly paler than thallus. Photobiont cells rectangular, 10–16 x 3–6 µm, in radiate plates. Ascomata rounded, 0.3–0.8 mm diam. and 60–90 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 5–10 µm thick. Hypothecium 10–15 µm high, colorless to pale brown. Hymenium 50–80 µm high. Asci 40–55 x 8–13 µm. Ascospores fusiform, 3-septate, 14–23 x 4–6 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia bacillar, non-septate, 4–6 x 2–3 µm. Microconidia not observed. Chemistry: psoromic acid.



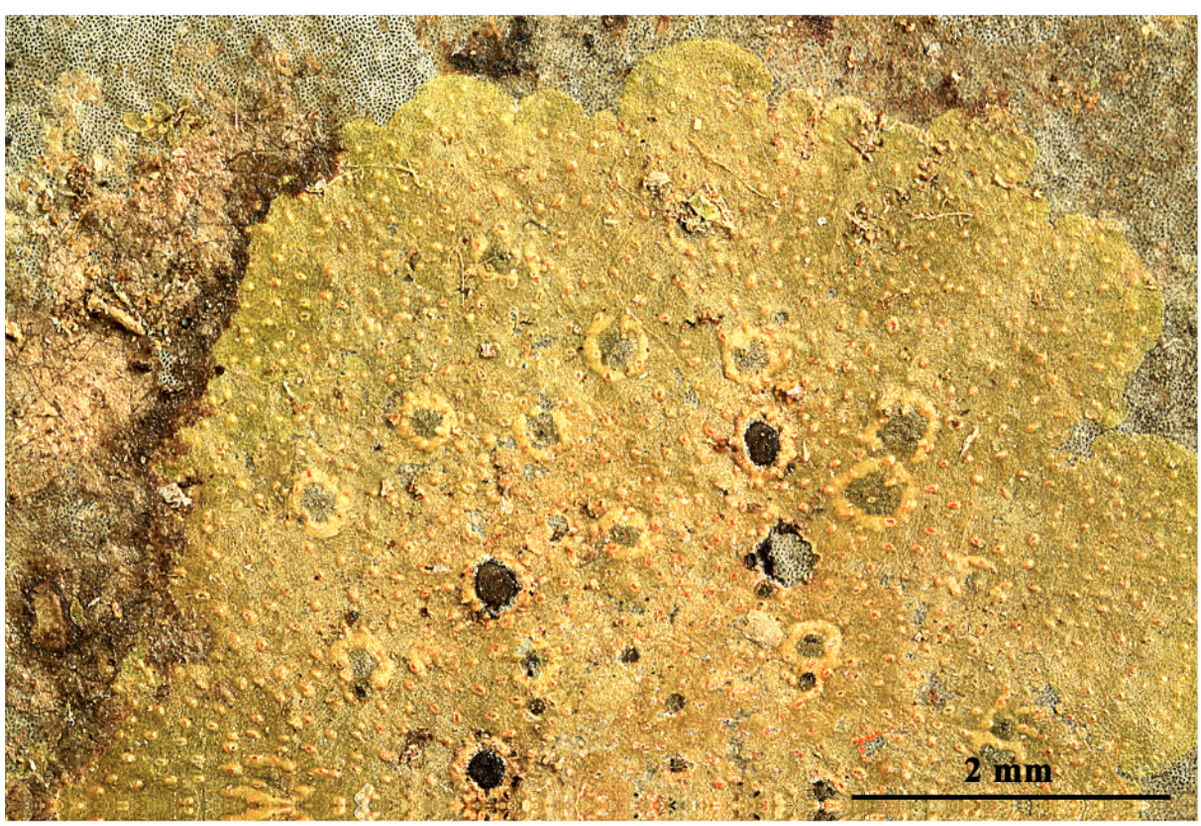


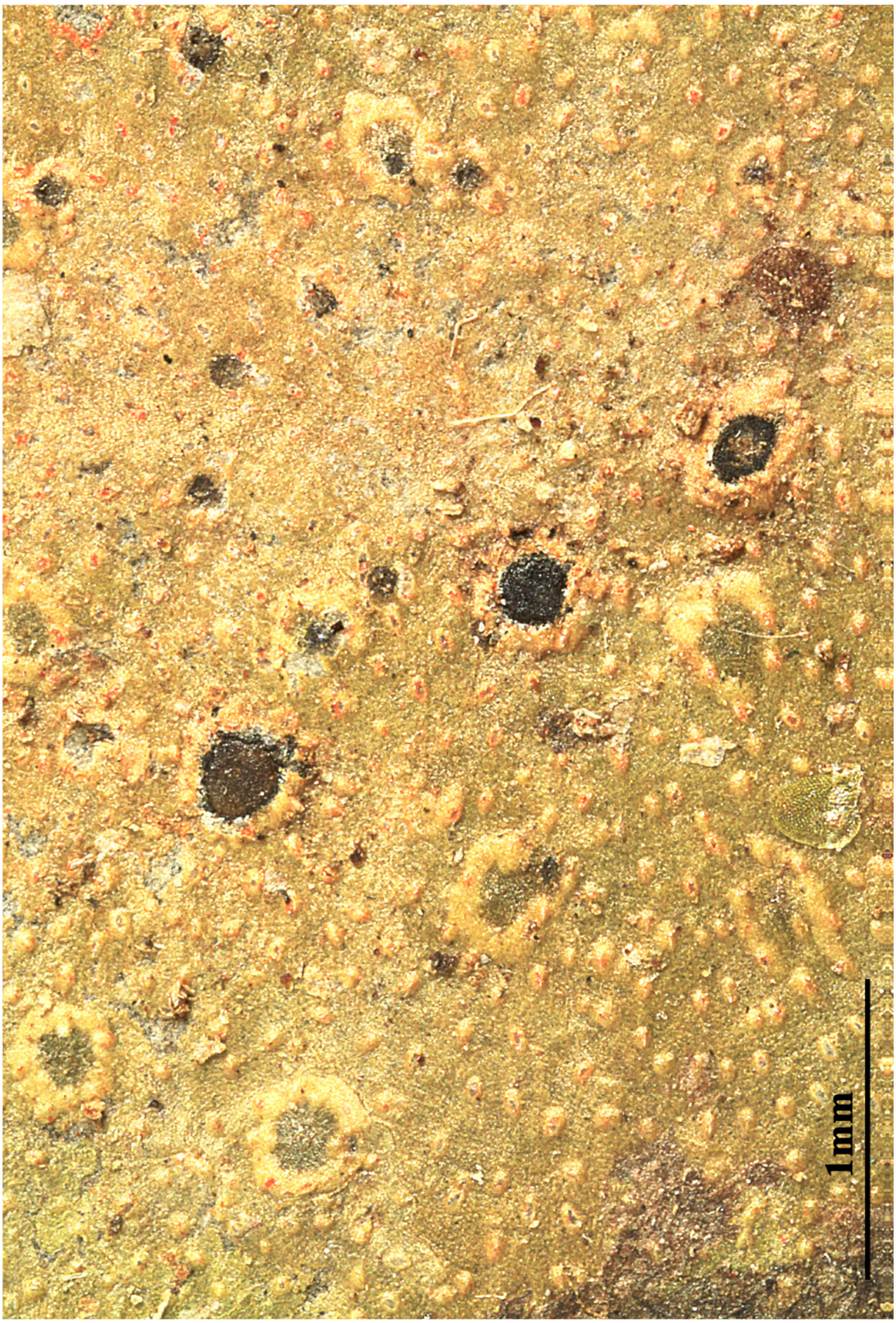
Mazosia rotula

Mazosia rubropunctata R. Sant., Symb. bot. upsal. 12(no. 1): 122 (1952)

[ABL50710bq], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bq), 21. June 2019, det. A. Aptroot 2019. -

Thallus continuous, finely verrucose, 5–15(–50) mm across, very thin (6–12 µm), yellowish green to green, shiny; verrucae 0.03–0.07 mm diam., red to brown and partly containing red, K– crystals. Photobiont cells rectangular, 12–22 x 4–6 µm, in radiate
plates. Ascomata rounded, 0.3–0.5 mm diam. and 70–100 µm high; disc dark grey to black, translucent when moistened; margin gently sloping outwards. Excipulum 5–15 µmm thick. Hypothecium 10–15 µm high, pale brown. Hymenium 60–90 µm high. Asci 50–70 x 8–14 µmm. Ascospores fusiform, 4-septate, 20–27 x 4–6 µm, median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia and microconidia not observed. Chemistry: unidentified pigment in thallus verrucae.





Mazosia rubropunctata

Mazosia tumidula (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 2: 504 (1923) [1924]
= *Rotula tumidula* Müll. Arg. 1890

[ABL50710bs], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bs), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, coarsely verrucose, 5–25 mmacross, thin (10–15 µm), yellowish green, slightly shiny; verrucae 0.1–0.15 mm diam. or sometimes elongate and then up to 0.5 mm long, of same color as thallus. Photobiont cells rectangular, 10–15 x 4–6 µm, in indistinctly radiate to almost netlike plates leaving irregular interspaces. Ascomata rounded, 0.3–0.6 mm diam. and 70–90 µm high; disc black, translucent when moistened; margin rather thick and often uneven, steeply sloping downwards. Excipulum 5–10 µm thick. Hypothecium 7–15 µm high, pale brown but lowermost part darker. Hymenium 50–70 µm high. Asci 45–55 x 10–15 µm. Ascospores fusiform, 3-septate, 15–24 x 3–5 µm, upper median cell slightly enlarged. Pycnidia low conical, 0.15–0.25 mm diam. Macroconidia and microconidia not observed. Chemistry: psoromic acid.





Mazosia tumidula

Melanotrema meiospermum (Nyl.) Frisch, in Frisch & Kalb, Biblthca Lichenol. 92: 394 (2006)
= *Ocellularia meiosperma* (Nyl.) Hale, Mycotaxon 11(1): 137 (1980)
= *Phaeotrema meiospermum* (Nyl.) Müll. Arg., Flora, Regensburg 69(20): 311 (1886)
= *Thelotrema meiospermum* Nyl., in Triana & Planchon, Annls Sci. Nat., Bot., sér. 4 19: 333 (1863)

[ABL18605], Brazil, Sergipe, Parque Nacional Serra de Itabaiana. 10°45'37" S, 37°22'15" W, 250 m. In transitional forest to caating, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18605), 18. Sept 2013, det. A. Aptroot 2013. - Thallus corticolous, white to pale greenish-grey or olive-fawn, c. 0.05-0.2 mm thick, rimose to slightly fissured, with an uneven to rugose or minutely warty, matt to slightly glossy or crystalline, mealy to compact surface; the bark substrate in some specimens showing through the thallus surface; a white medullary layer is not developed. Prothallus line thin, brownish. Phenocortex up to 10 µm thick, loosely organised and not well separated from the photobiont layer; or absent. Photobiont layer c. 70-100 µm thick, with scattered photobiont cells and few to numerous inclusions of calcium oxalate crystals, partly endophloeodal. Medulla endophloeodal, often filled with numerous calcium oxalate crystals. Pycnidia immersed in the thallus or in small thallus warts, c. 0.1-0.2 mm in diam., with a dark brown to black pore area and a tiny rounded to elongated pore. Nucleus globular to broad elliptical in section, c. 0.07-0.11 mm high and 0.1-0.15 µm wide, with an undulating inner surface and often incompletely divided by a thin septum. Pycnidial wall 5-12 µm wide, comprising a brown to black conglutinated prosoplectenchyma, widening to 50 µm and darker brown in the pore area. Conidiophores of Vobis type II(-IV). Conidiogenous cells bottle-shaped, 7-10 × 1.5-2 µm. Conidia formed acrogenously, bacilliform, 5-6 × 1-1.2 µm. Apothecia dispersed, immersed in the thallus to moderately emergent, rounded to angular or sometimes shortly elongated, 0.4-1.1 mm in diam. Margin entire to fissured or lobed, incurved to recurved, with a black inner surface covered by a white hyphal felt. Columella filling the disc, entire to lobate, flat, black, tipped with white, the surface often cracked by deep fissures. Disc blackish, covered by thin white pruina. Phenocortex up to 10 µm thick or absent. Photobiont layer c. 50-90 µm thick. Periderm layer 50-60 µm thick, comprising a loosely organised to moderately dense, ± brown conglutinated prosoplectenchyma with periderm inclusions. Proper exciple cupular, 10-20 µm deep and pale brown at base, laterally 35-60 µm wide, strongly carbonised unto the base, with a thin

apical layer of hyaline hyphae. Columella entire, broad stump-shaped, flat, strongly carbonised but with a thin apical layer of hyaline hyphae. Subhymenium 10-15 µm high. Hymenium 90-120 µm high, clear. Ascospores 8/ascus, 1-2 seriate, brown, transversely septate, 4-7 loculate, 15-24 × 6-7.5 µm, with subacute to rounded ends, I+ purplish-blue when young. Asci narrowly clavate, c. 105-110 × 8-13 µm. Paraphyses simple, straight, 1.5-2 µm wide; tips with a single thickened cell, adspersed with fine greyish to brownish granules. Epihymenium unpigmented, 8-10 µm high. Chemistry: No lichen compounds detected by TLC.



Melanotrema meiospermum



Melanotrema meiospermum

Micarea denigrata (Fr.) Hedl., Bih. K. svenska VetenskAkad. Handl., Afd. 3 18(no. 3): 78 (1892)
= *Biatora aniptiza* (Stirt.) Walt. Watson, Census Catalogue of British Lichens: viii (1953)
= *Biatora denigrata* Fr., K. svenska Vetensk-Akad. Handl., ser. 3: 265 (1822)
= *Biatora globulosa* var. *denigrata* (Fr.) Boistel, Nouv. Fl. Lich. (Paris): 71 (1896)
= *Biatorina denigrata* (Fr.) Poetsch, in Poetsch & Schidermann, System. Aufzähl. samenlos. Pflanzen (Krypt.): 216 (1872)
= *Biatorina globulosa* var. *spodiza* (Nyl.) Boistel, Nouv. Fl. Lich. (Paris) 2: 195 (1903)
= *Biatorina spodiza* (Nyl.) A.L. Sm., Monogr. Brit. Lich. 2: 121 (1911)
= *Biatorina synothea* var. *denigrata* (Fr.) Körb., Parerga lichenol. (Breslau) 2: 144 (1860) [1865]
= *Biatorina synothea* var. *semialbula* (Stirt.) A.L. Sm., Monogr. Brit. Lich. 2: 122 (1911)
= *Catillaria denigrata* (Fr.) Vain., Acta Soc. Fauna Flora fenn. 57(no. 2): 422 (1934)
= *Catillaria hemipoliella* (Nyl.) Blomb. & Forssell, Enum. Pl. Scand.: 92 (1880)
= *Catillaria spodiza* (Nyl.) Zahlbr., Cat. Lich. Univers. 4: 72 (1926) [1927]
= *Catillaria synothea* f. *hemipoliella* (Nyl.) Zahlbr., Cat. Lich. Univers. 4: 78 (1926) [1927]
= *Catillaria synothea* var. *semialbula* (Stirt.) Zahlbr., Cat. Lich. Univers. 4: 79 (1926) [1927]
= *Lecanora varia* * *denigrata* (Fr.) Flot., Jber. schles. Ges. vaterl. Kultur [27]: 134 (1849)
= *Lecidea aniptiza* Stirt., Trans. Glasgow Soc. Fld Nat. 4: 85 (1876)
= *Lecidea anomala* f. *denigrata* (Fr.) Nyl., Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 5: 202 (1861)
= *Lecidea anomala* var. *denigrata* (Fr.) Nyl., Lich. Scand. (Helsinki): 202 (1861)
= *Lecidea denigrata* (Fr.) Nyl., Bot. Notiser(6-7): 93 (1853)
= *Lecidea denigrata* subsp. *hemipoliella* (Nyl.) Vain., Meddn Soc. Fauna Flora fenn. 2: 62 (1878)
= *Lecidea hemipoliella* Nyl., Flora, Regensburg 58(1): 11 (1875)
= *Lecidea hemipoliella* var. *semialbula* Stirt., Trans. Glasgow Soc. Fld Nat. 4: 89 (1876)
= *Lecidea parissima* Nyl., J. Bot., Lond. 9: 178 (1871)
= *Lecidea spodiza* Nyl., Flora, Regensburg 57: 9 (1874)
= *Lecidea vernalis* var. *denigrata* (Fr.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 157 (1858)
= *Micarea denigrata* f. *hemipoliella* (Nyl.) Hedl., Bih. K. svenska VetenskAkad. Handl., Afd. 3 18(no. 3): 79 (1892)

= *Micarea hemipoliella* (Nyl.) Vězda, Folia geobot. phytotax. 11(1): 100 (1976)
= *Parmelia varia* var. *denigrata* (Fr.) Schaer., Lich. helv. spicil. 8: 411 (1840) [1839]
= *Patellaria denigrata* (Fr.) Spreng., Syst. veg., Edn 16 4(1): 264 (1827)

[ABL50804], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on wood. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50804), 23. June 2019, det. A. Aptroot 2019. - Thallus crustose, episubstratic, rarely endosubstratic and poorly evident, usually composed of convex, white to pale grey-green, smooth, ecorticate areoles, sometimes reacting K+ violet. Apothecia micareoid, sessile, 0.1-0.6 mm across, with a dark grey to black (pale grey to whitish in shade-forms), strongly convex, sometimes tuberculate, epruinose disc, without a proper margin. Proper exciple indistinct: epithecium grey-green, K+ violet; hymenium colourless, 25-40 µm high, C+ pink; paraphyses numerous, branched and anastomosing, 1-1.5 µm thick, not capitate; hypothecium colourless, 60-110 µm high. Asci 8-spored, cylindrical-clavate, the I+ blue tholus with a wide, I+ dark blue tube structure that expands towards the top, without a pale axial body. Ascospores 1-septate, often with slightly unequal cells, hyaline, narrowly ellipsoid, straight or slightly curved, (7-)9-16(-18) x 2-3.5 µm. Pycnidia immersed to emergent-stalked, grey to black, the wall greenish, K+ violet. Conidia of three types: i) macroconidia, curved, (1-)3 septate, 12-24 x 1 µm; ii) mesoconidia, simple, 2.5-4.5 x 1-2 µm, extruded as a white mass from the ostiole; iii) microconidia, simple, 5-7.5 x 0.5-1 µm. Photobiont micareoid, thin-walled, the cells 4-7 µm wide. Spot tests: Thallus, apothecial and pycnidial sections K- or K+ violet, C+ red, KC+ red, P- (reactions best visible under the microscope). Chemistry: gyrophoric acid.



Micarea denigrata



Micarea denigrata

Micarea peliocarpa (Anzi) Coppins & R. Sant., in Coppins & James, Lichenologist 11(2): 155 (1979)
= *Bacidia friesiana* var. *violacea* Arnold, Flora, Regensburg 47: 598 (1864)
= *Bacidia hemipolioides* (Nyl.) Zahlbr., Cat. Lich. Univers. 4: 114 (1926) [1927]
= *Bacidia peliocarpa* (Anzi) Lettau, Hedwigia 52(3-4): 133 (1912)
= *Bacidia trisepta* (Nägeli) Zahlbr., in Engler & Prantl, Nat. Pflanzenfam., Teil. I (Leipzig) 1(1*): 135 (1905)
= *Bacidia violacea* (Arnold) Arnold, Flora, Regensburg 67: 581 (1884)
= *Biatora trisepta* Nägeli, in Müller Argoviensis, Mém. Soc. Phys. Hist. nat. Genève 16(2): 400 (1862)
=*Bilimbia hemipolioides* (Nyl.) A.L. Sm., Monogr. Brit. Lich. 2: 141 (1911)
= *Bilimbia hypnophila* var. *trisepta* (Nägeli) Bausch, Verh. naturw. Verein. Karlsruhe 4: 127 (1869)
= *Bilimbia lignaria* f. *trisepta* (Nägeli) Arnold, Flora, Regensburg 57(24): 383 (1874)
= *Bilimbia lignaria* var. *trisepta* (Nägeli) Zahlb., Cat. Lich. Univers. 4: 158 (1926) [1927]
= *Bilimbia milliaria* var. *trisepta* (Nägeli) Th. Fr., Lich. Scand. (Upsaliae)(2): 382 (1874)
= *Bilimbia peliocarpa* Anzi, Atti Soc. ital. Sci. nat. 9: 250 (1866)
= *Bilimbia sabuletorum* var. *trisepta* (Nägeli) Rabenh., Krypt.-Fl. Sachsen, Abth. 2 (Breslau): 187 (1870)
= *Bilimbia sphaeroides* var. *trisepta* (Nägeli) Boistel, Nouv. Fl. Lich. (Paris) 2: 190 (1903)
= *Bilimbia subviridescens* var. *trisepta* (Nägeli) A.L. Sm., Monogr. Brit. Lich., Edn 2 2: 157 (1926)
= *Bilimbia trisepta* Hellb., Nerik. Laffl.: 77 (1871)
= *Bilimbia violacea* (Arnold) Arnold, Flora, Regensburg 53(30–31): 473 (1871) [1870]
= *Lecidea hemipolioides* Nyl., Flora, Regensburg 56(19): 294 (1873)
= *Lecidea peliocarpa* (Anzi) Nyl., Flora, Regensburg 64: 114 (1881)
= *Lecidea sabuletorum* f. *trisepta* (Nägeli) Stizenb., Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 34(no. 2): 47, tab. III. fig. A, 35?62 (1867)
= *Lecidea trisepta* (Nägeli) Nyl., in Vainio, Meddn Soc. Fauna Flora fenn. 3: 113 (1878)
= *Lecidea violacea* P. Crouan & H. Crouan ex Nyl., Bull. Soc. bot. Fr. 8(10): 759 (1863) [1861]
= *Micarea trisepta* (Nägeli) Wetmore, Publs. Mich. St. Univ. Mus., ser. biol. 3: 284 (1968)
= *Micarea violacea* (Arnold) Hedl., Bih. K. svenska VetenskAkad. Handl., Afd. 3 18(no. 3): 80 (1892)

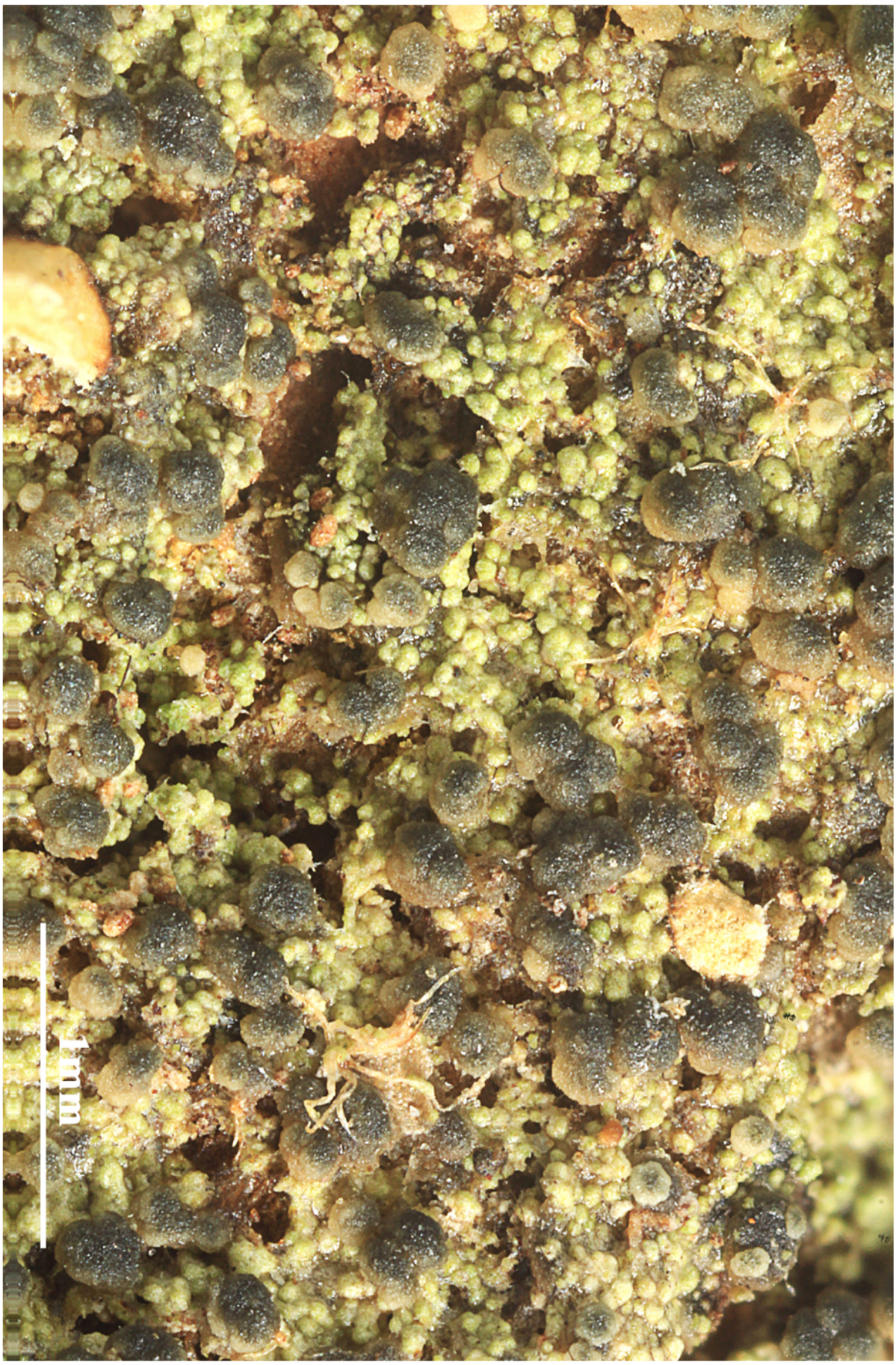
= *Micarea violacea* f. *hemipolioides* (Nyl.) Hedl., Bih. K. svenska Vetens-kAkad. Handl., Afd. 3 18(no. 3): 80 (1892)
= *Micarea violacea* f. *peliocarpa* (Anzi) Hedl., Bih. K. svenska VetenskA-kad. Handl., Afd. 3 18(no. 3): 81 (1892)
= *Patellaria trisepta* (Nägeli) Müll. Arg., Nuovo G. bot. ital. 21(3): 364 (1889)
= *Weitenwebera trisepta* (Nägeli) Poetsch, System. Aufzähl. samenlos. Pflanzen (Krypt.): 214 (1872)

[ABL50717], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50717), 22. June 2019, det. A. Aptroot 2019. - Thallus crustose, usually episubstratic, greenish white to blue-grey, of convex, to 0.2 mm wide areoles, rarely endosubstratic and poorly evident. Apothecia micareoid, rounded, sessile, not constricted at base, sometimes confluent and tuberculate, 0.15-0.7(-1) mm across, with a whitish to grey-black, flat to usually convex disc, and a thin, finally often excluded proper margin. Proper exciple thin but usually evident, colourless; epithecium scarcely differentiated from the hymenium; hymenium colourless in lower part, greenish to blue-green in upper part, the pigmented parts K-, N+ red, 40-55 µm high; paraphyses conglutinated, branched and anastomosing, 1-1.5 µm thick at mid-level, the apical cells to 2.5 µm wide; hypothecium more or less colourless. Asci 8-spored, clavate, the I+ blue tholus with a wide, I+ dark blue tube structure, without ring-structure. Ascospores (1-)3(-5)-septate, hyaline, fusiform-elongate, often slightly curved, (11-)15-23(-24) x 3-5(-6) µm. Pycnidia frequent, producing either macro- or mesoconidia, the wall colourless or greenish around the ostiole, K-, C+ red. Macroconidia strongly curved, 20-50 x 1-1.5 µm; microconidia generated by smaller, pale pycnidia, fusiform, 6-7 x 0.5-1 µm. Photobiont micareoid, the cells 4-7 µm wide. Spot tests: thallus and apothecial sections K-, C+ red, KC+ red, P-. Chemistry: gyrophoric acid.

Micarea peliocarpa



Micarea peliocarpa



Micarea peliocarpa

Micarea prasina Fr., Syst. orb. veg. (Lundae): 257 (1825)
= *Biatora byssacea* Hampe, Linnaea 25: 709 (1852)
= *Biatora prasina* (Fr.) Fr., Nov. Sched. Critic. Lich. (Lundae): 38 (1826)
= *Biatora prasina [*unranked*] sordidescens* (Nyl.) Willey, Enum. Lich. New Bedford: 23 (1892)
= *Biatora vernalis* f. *prasina* (Fr.) Kieff., Bull. Soc. Hist. Nat. Metz 19: 81 (1895)
= *Biatora vernalis* var. *prasina* (Fr.) Arnold, Flora, Regensburg 44(32): 503 (1861)
= *Biatorina erysiboides* b *sordidescens* (Nyl.) H.G. Falk, Oestra Blek. Lafflora: 14 (1874)
= *Biatorina erysiboides* var. *prasiniza* (Nyl.) Boistel, Nouv. Fl. Lich. (Paris) 2: 194 (1903)
= *Biatorina globulosa* var. *prasina* (Fr.) Boistel, Nouv. Fl. Lich. (Paris) 2: 195 (1903)
= *Biatorina prasina* (Fr.) Stein, in Cohn, Krypt.-Fl. Schlesien (Breslau) 2(2): 193 (1879)
= *Biatorina prasina* a *laeta* Arnold, Flora, Regensburg 57(36): 570 (1874)
= *Biatorina prasina* f. *laeta* Arnold, Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 25: 493 (1875)
= *Biatorina prasina* f. *sordidescens* (Nyl.) Eitner, Jber. schles. Ges. vaterl. Kultur 88(2b Abth.): 37 (1911) [1910]
= *Biatorina prasina* var. *laeta* Kreyer, Acta Horti Petropolit. 31(2): 334 (1913)
= *Biatorina prasiniza* (Nyl.) Arnold, Flora, Regensburg 67: 565 (1884)
= *Biatorina sordidescens* (Nyl.) Arnold, Flora, Regensburg 67: 565 (1884)
= *Catillaria prasina* (Fr.) Th. Fr., Lich. Scand. (Upsaliae)(2): 573 (1874)
= *Catillaria prasina* f. *laeta* Lettau, Hedwigia 52(3-4): 136 (1912)
= *Catillaria prasina* f. *prasiniza* (Nyl.) Zahlbr., Cat. Lich. Univers. 4: 66 (1926) [1927]
= *Catillaria prasina* f. *sordidescens* (Nyl.) Blomb. & Forssell, Enum. Pl. Scand.: 91 (1880)
= *Catillaria prasina* var. *laeta* Th. Fr., Lich. Scand. (Upsaliae)(2): 573 (1874)
= *Catillaria prasina* var. *sordidescens* (Nyl.) Lettau, Hedwigia 52(3-4): 136 (1912)
= *Catillaria prasiniza* (Nyl.) B. de Lesd., Bull. Soc. R. Bot. Belg. 43: 254 (1906)
= *Catillaria sordidescens* (Nyl.) Zahlbr., in Beck, Annln K. K. naturh. Hofmus. Wien 4: 357 (1889)
= *Lecidea byssacea var. sordidescens* (Nyl.) Vain., Term. Füz. 22: 320 (1899)
= *Lecidea erysiboides* f. *sordidescens* Nyl., in Norrlin, Not. Sällsk. Fauna et Fl. Fenn. Förh., Ny Ser. 11: 188 (1870)
= *Lecidea prasina* (Fr.) Schaer., Lich. helv. spicil. 4-5: 164 (1833)

= *Lecidea prasiniza* Nyl., Flora, Regensburg 57(20): 312 (1874)
= *Lecidea sordidescens* Nyl., Flora, Regensburg 57(20): 312 (1874)
= *Lecidea vernalis* f. *prasina* (Fr.) Harm., Cat. Descript. Lich. Lorraine IV: 365 (1899)
= *Lecidea vernalis* var. *prasina* (Fr.) Nyl., Syst. lich. germ. (Breslau): 399 (1855)
= *Micarea prasina* subf. *prasiniza* (Nyl.) Hedl., Bih. K. svenska VetenskA-kad. Handl., Afd. 3 18(no. 3): 77 (1892)
= *Micarea prasina* var. *sordidescens* (Nyl.) Brodo, Bull. N.Y. St. Mus. Sci. Serv. 410: 152 (1968)

[ABL50715], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on wood. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50714), 22. June 2019, det. A. Aptroot 2019. - Thallus light to dark grey-green, of thinly scattered to densely aggregated, goniocysts. Apothecia 0.1-0.4 mm diam., subglobose, whitish, paqle to dark grey, brownish grey, or blackish. Spores 0-1(-3)-septate, 8-14(-17) x 2.3-4(-5) µm. Chemistry: P-, K- C-, rarely thallus C+ persistent orange; methyloxymicareic acid, micareic acid, prasinic acid, unidentified xanthones (thallius C+ orange).



Micarea prasina

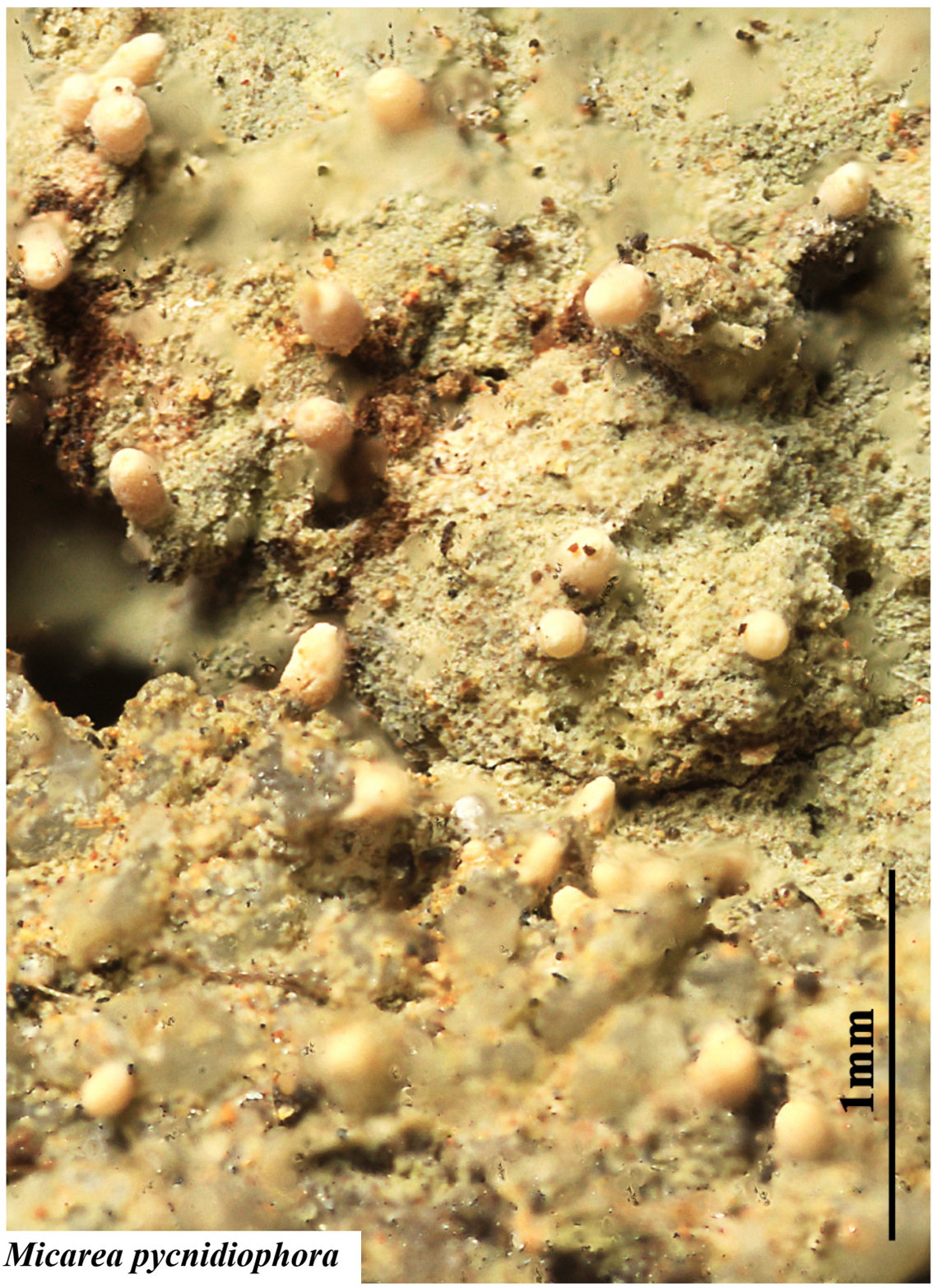


Micarea prasina

Micarea pycnidiophora Coppins & P. James, Lichenologist 11(2): 153 (1979)

[ABL18095], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18095), 27. July 2013, det. A. Aptroot 2013. - Thallus epiphloeodal, effuse, often wide-spreading, continuous, thin, uneven, of more or less coalescing, verrucose granules dispersed on a varnish-like prothallus, in part rather smooth or mostly uneven, granular or granular-verrucose; dull grey-green to green, verrucose areas often paler than the main thallus. Often overgrowing the moribund thalli of other crustose lichens and bryophytes. Apothecia not common but usually abundant when present, small, 0.1-0.3 mm diam. globose to hemispherical, sessile, immarginate, rounded or oval or sometimes tuberculate in outline, discrete but often becoming contiguous and occasionally laterally fused. Entirely pallid ivory to pale flesh-coloured when dry, translucent and grey-green when moist; surface minutely roughened. Pycnidia always numerous, scattered or contiguous, erumpent from thalline granules and the surface of the thallus, sessile or shortly stalked, 0.1-0.3 mm high, *c.* 0.1 mm broad, globose to shortly elongate, apex rounded or slightly tapered, concolorous with the apothecia. Stipitate pycnidia usually with a simple stalk (pycnidiophore) but occasionally clustered and appearing as if branched at the base. Thallus poorly organized, consisting of more or less contiguous glomerulae containing algal cells encapsulated by the mycobiont. Algal cells 4-8 µm diam. Hyphae closely contiguous with the algal cells. Hymenium 35-50 µm tall, colourless, I+ persistent blue; epithecium colourless, non-granular, outer edge irregular, delimited by a hyaline gelatinous extension of the thecium. Paraphyses and asci coherent in a gelatinous matrix, indistinct in water mounts but readily discernible in K mounts, richly branched and anastomosing, septate, apices not swollen, 1-1.5 µm wide, not extending to the outer edge of the gelatinous matrix (epithecium). Asci clavate, 30-35 x 10-12 µm, wall 1.5-2 µm below, gradually thickening to 3(-4) µm at the apex (in lactophenol cotton-blue), 8-spored; in iodine immature asci have an I + deep blue tholus, an I - inner wall and an I+ blue, rather ill-defined, outer wall. Ascospores straight and vertically aligned in the ascus, not spiralled, shortly acicular, one end broadened and more obtuse than the other, 3-5(-7)-septate, septa thin but usually distinct in lactophenol cotton-blue, (14-)21-28(-31) x 2-2.5 µm. Hypothecium hyaline, of very thin, more or less vertically aligned, hyphae, c. 20-30 µm tall, often

infiltrated by clusters of algae from below. Excipulum poorly developed, c. 10 µm wide; of branched and anastomosing, outwardly radiating hyphae in a gelatinous matrix, c. 1 µm wide, readily separating in K. Pycnidial wall c. 20-25 µm thick, hyaline, semi-translucent, composed of very closely compacted and densely interwoven hyphae, c. 1-1.5 µm wide. Conidiogenous cells simple or sometimes branched, more or less cylindrical, phialidic, 6-10 x 1-1.8 µm. Conidia hyaline, straight, cylindrical, eguttulate, 4-6 x 1(-1.5) µm. Chemistry: K-, C+ red (apothecia and pycnidia), P-; gyrophoric acid (TLC).



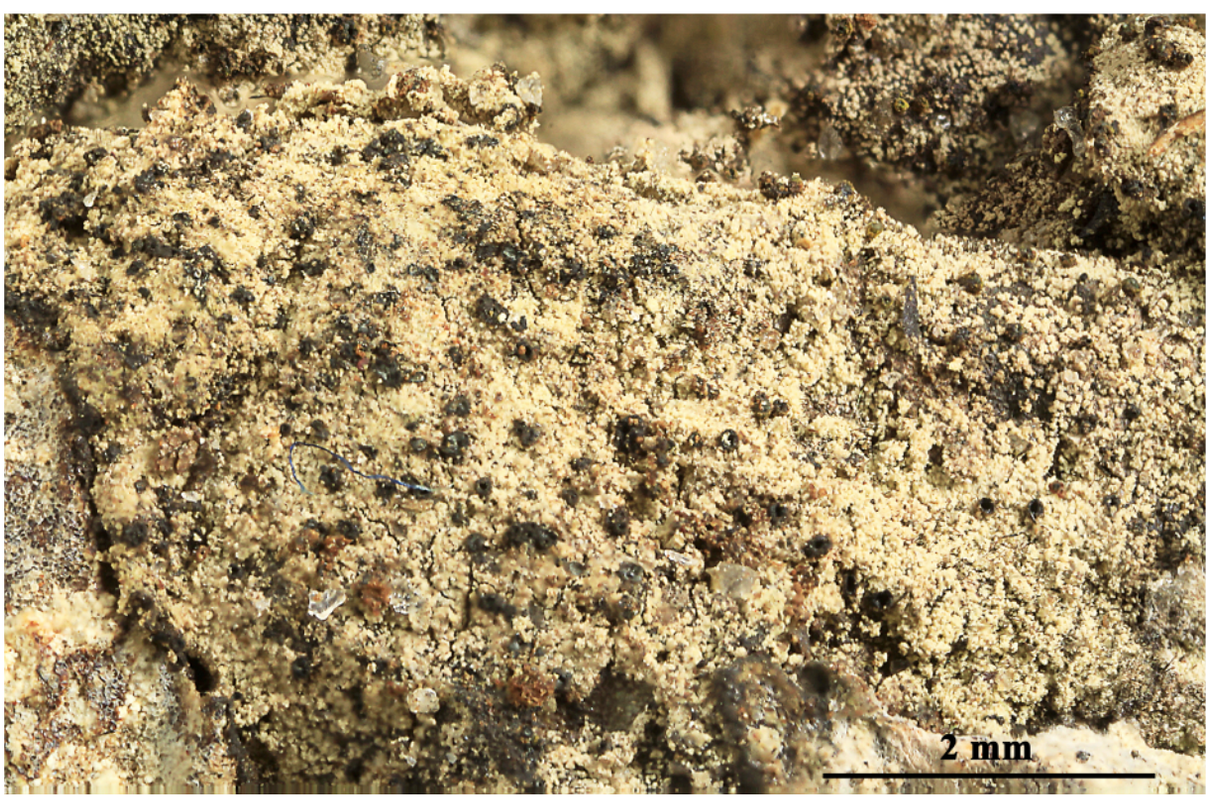
Micarea pycnidiophora



Micarea pycnidiophora

Micarea stipitata Coppins & P. James, Lichenologist 11(2): 156 (1979)

[ABL28551], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28551), 3.-8. June 2016, det. A. Aptroot 2016. - External appearance and internal anatomy of the thallus and apothecia as in *Micarea pycnidiophora.* Ascospores very similar but often slightly larger, (17-)20-30(-35) x 2-2-5(-3) µm. Apothecia often absent. Pycnidia always abundant, borne on distinct whitish stalks (pycnidiophores) which are simple, bifurcate or to 5-branched, mainly 0.4-0.8 mm tall and 0.07-0.l(-0.15) mm broad, often with small irregular clusters of more or less superficially encapsulated algae. Pycnidiophores composed of more or less randomly orientated closely compacted hyphae, 1-1.5 µm wide. Pycnidia embedded near the apex or apices of pycnidiophores, ± globose, 70-90 µm diam; wall hyaline, *c.* 15 µm thick. Conidiogenous cells simple or more rarely branched, more or less cylindrical, phialidic, 7-10 x 1.4-2 µm. Conidia straight, cylindrical to narrowly elliptical, eguttulate, 6-8 x 1-1.8 µm. Chemistry: K- , C-, KC-, P-. No lichen substances detected by TLC.

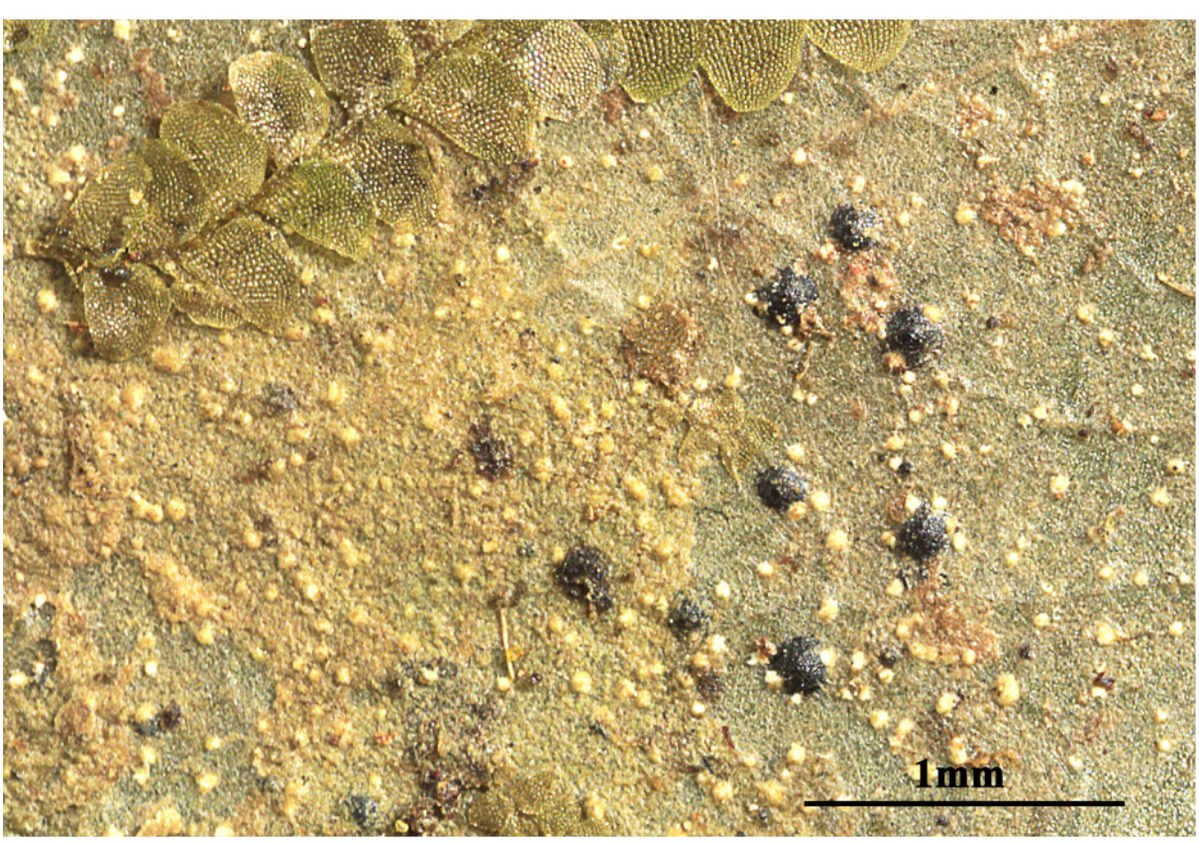




Micarea stipitata

Microtheliopsis uleana Müll. Arg., Flora, Regensburg 73: 195 (1890)
= *Microthelia uleana* (Müll. Arg.) F. Schill., Hedwigia 67: 290 (1927)
= *Microtheliopsidomyces uleanae* Cif. & Tomas., Atti Ist. bot. Univ. Lab. crittog. Pavia, sér. 5 10(1): 61 (1953)

[ABL50710bk], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710bk), 21. June 2019, det. A. Aptroot 2019. - Thallus crustose, continuous or dispersed into rounded to irregular patches, smooth or rarely thinly setose, 3–8 mm across, very thin (7–13 µm), ochraceous yellow to yellowish brown or green; setae formed by single, unbranched, septate hyphae (cells 4–6 µm long), 0.05–0.1 mm long and 2–3 µm broad, dark brown. Photobiont cells rectangular, 12–20 x 6–10 µm, in radiate plates, often forming setose, pale zoosporangia and gametangia (not to be confused with setae of the mycobiont!). Perithecia adnate, lens-shaped to conical, rounded or radiately elongate, 0.15–0.25 mm diam. and 60–80 µm high, brownish black. Excipulum 7–15 µm thick, inner part pale, outer part dark brown. Involucrellum 6–12 µm thick, dark brown. Asci 24–30 x 6–8 µm. Ascospores fusiform ellipsoid, 3-septate, without constrictions at septa, 9–13 x 2.5–4 µm, greyish brown. Conidiomata not observed. Chemistry: no substances detected by TLC.





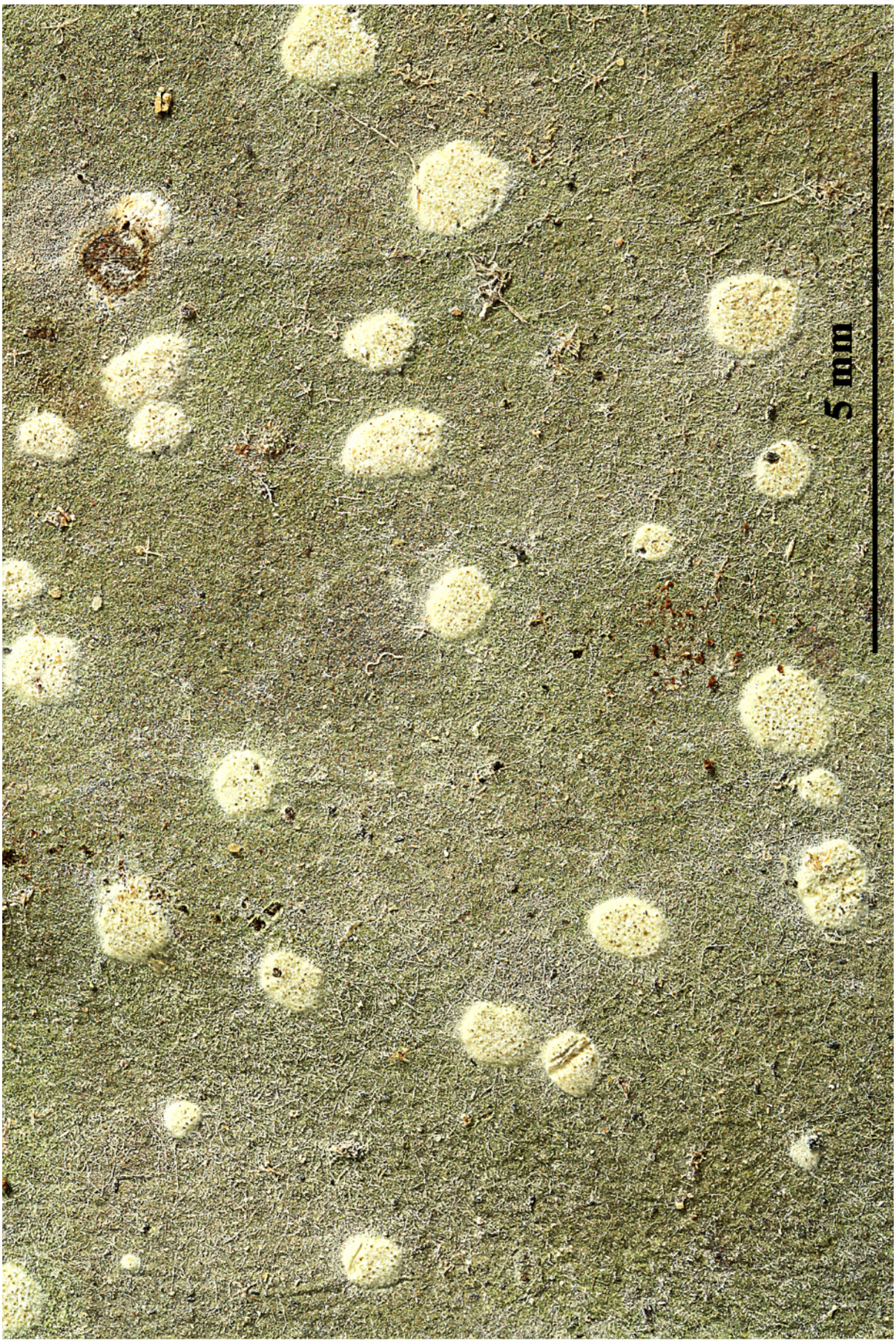
Microtheliopsis uleana

Myriostigma filicinum (Ellis & Everh.) Frisch & G. Thor, in Frisch, Thor, Ertz & Grube, Taxon 63(4): 739 (2014)

= *Ascomycetella filicina* Ellis & Everh., Journal of the Inst. Jamaica 1: 247 (1893)

= *Cryptothecia filicina* (Ellis & Everh.) Lücking & G. Thor, in Lücking, Thor, Aptroot, Kalb & Elix, Lichenologist 38(3): 238 (2006)

[ABL50710o], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710o), 21. June 2019, det. A. Aptroot 2019. - Thallus foliicolous or corticolous on smooth bark or bamboo, epiphyllous or often hypophyllous, continuous but marginally often effuse, smooth to indistinctly farinose-byssoid, 10–50 mm across and 15–35 µm thick, ecorticate, pale greyish green, matt, with colourless, hydrophobic crystals dissolving in K. Photobiont a species of *Trentepohlia*, cells rounded to oblong, 8–15 x 4–6 µm, in irregular plates or short threads leaving large interspaces. Ascomata (ascigerous areas) erumpent, slightly raised above thallus level, rounded to somewhat irregular in outline, 0.8–3(–5) mm diam. and 100–140 µm high, white to pale greenish white and usually with darker dots indicating individual asci. Ascigerous layer covered by 15–25 µm high, algiferous thallus layer. Ascigerous layer 70–110 µm high, dark grey due to inspersion of paraphyses with numerous small crystals (dissolving in K), I+ bluish, KI+ blue then greenish. Asci obovate to globose, shortly stalked, 60–90 x 50–70 µm, I-, KI-. Ascospores (6–)8 per ascus, oblong-ellipsoid, muriform, with very slight constrictions at septa, 40–80 x 15–25 µm, 2.5–3.5 times as long as broad, colourless. Pycnidia not observed. Chemistry. Perlatolic acid (thallus and ascomata C-).



Myriostigma filicinum

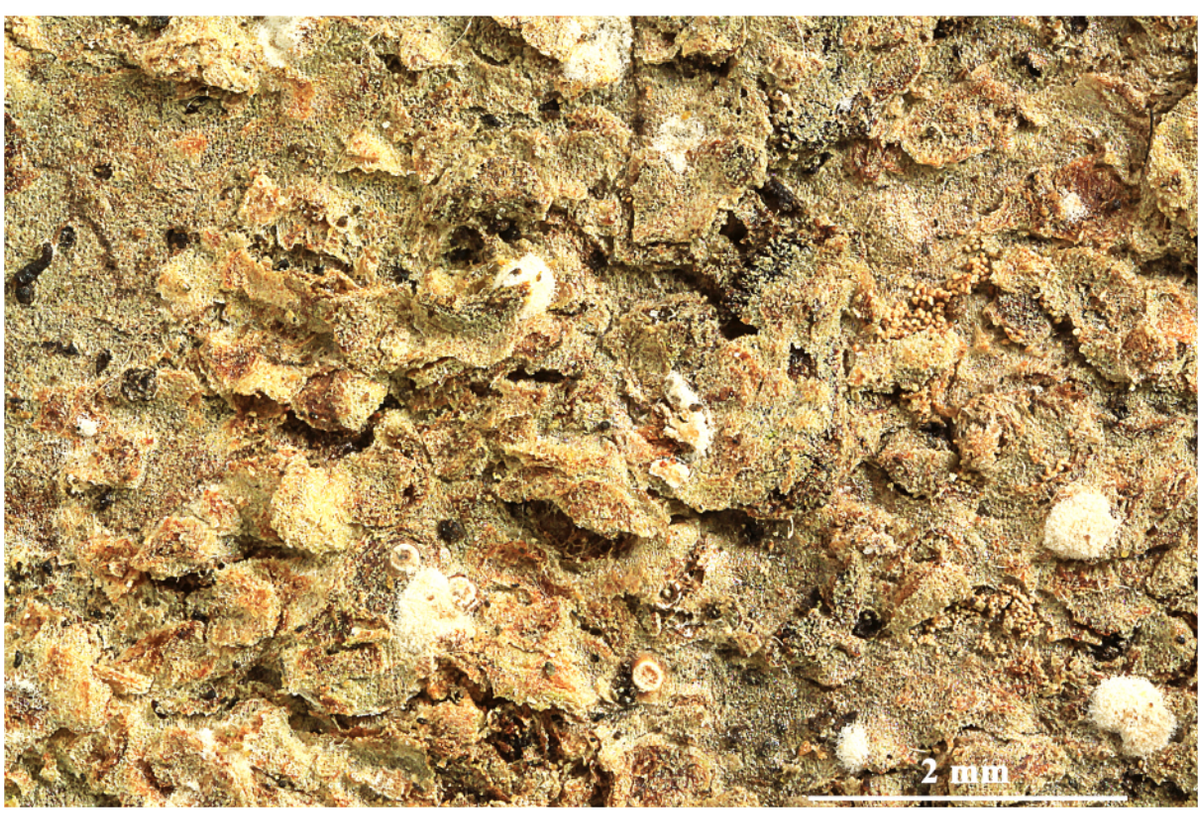


Myriostigma filicinum

Myriostigma subcandidum (M. Cáceres & Lücking) Frisch & G. Thor , in Frisch, Thor, Ertz & Grube, Taxon 63(4): 739 (2014)

= *Cryptothecia subcandida* M. Cáceres & Lücking, in Cáceres, Libri Botanici 22: 65 (2007)

[42948], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42948), 27. October 2017, det. A. Aptroot 2017. - Thallus corticolous, crustose, continuous, smooth to minutely farinose-byssoid, 10–20 mm across and 15–25 µm thick, ecorticate, green, matt, in section with scattered, colorless, hydrophobic crystals dissolving in K. Photobiont *Trentepohlia*; cells rounded to oblong, 8–12 x 4–6 µm, in irregular plates or short threads leaving interspaces. Ascomata erumpent to sessile, distinctly raised over thallus level, rounded to slightly irregular, 0.4–0.7 mm diam. and 80–100 µm high, white. Hypothecium indistinct. Ascigerous layer 60–80 µm high, colorless to yellow-grey due to sparse inspersion of interascal hyphae with small crystals (dissolving in K), I+ blue, KI+ blue then green, with scattered algal cells above. Asci obovate to globose, 50–70 x 40–60 µm, I–, KI–. Ascospores 8/ascus, ellipsoid to oval, muriform, with very slight constrictions at septa, 30–50 x 12–22 µm, 2.5–3.5 times as long as broad. Pycnidia not observed. Chemistry: no substances detected by TLC.

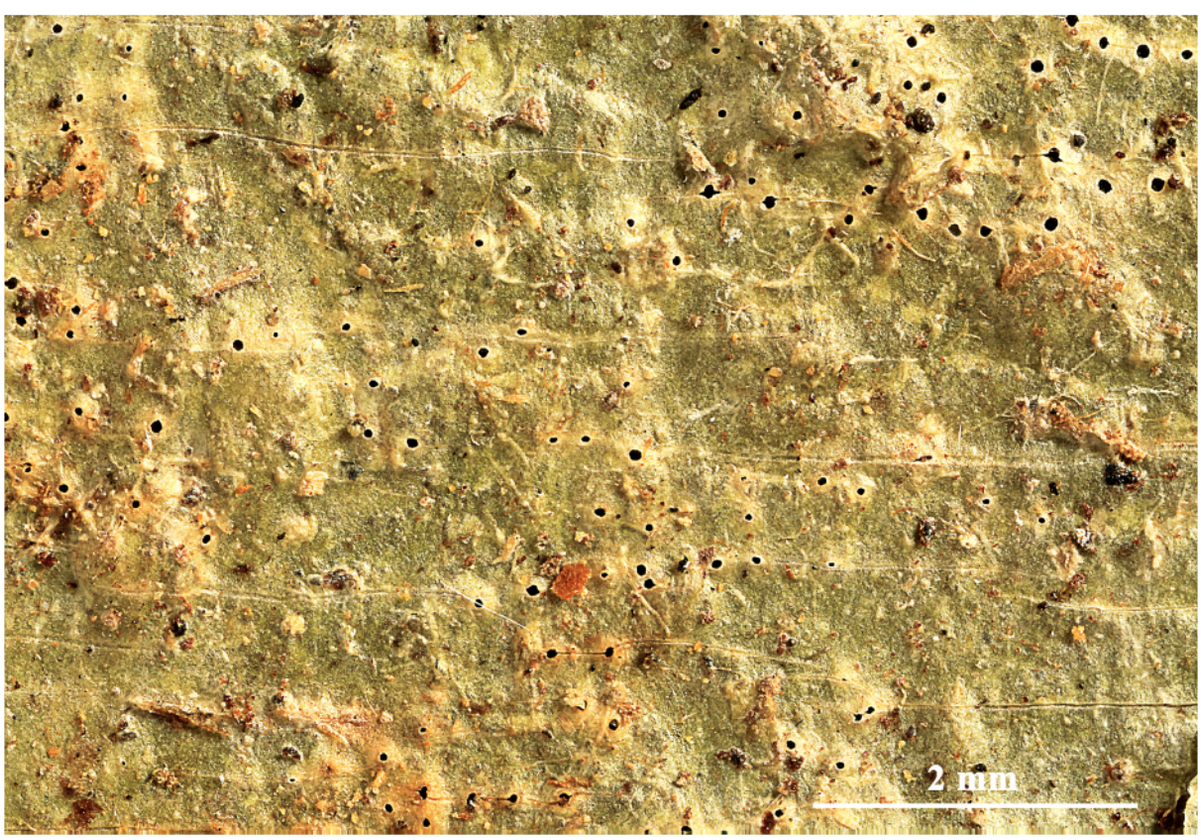




Myriostigma subcandidum

Myriotrema album Fée, Essai Crypt. Exot. (Paris): 104 (1825) [1824]
= *Ocellularia alba* (Fée) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 6 (1887)
= *Ocellularia alba var. caesiascens* Räsänen, Arch. Soc. Zool. Bot. fenn. Vanamo 3: 185 (1949)
= *Thelotrema album* (Fée) Nyl., Bull. Soc. linn. Normandie, sér. 2 2: 35 (1868)
= *Thelotrema myriotrema* Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 117 (1858)

[ABL28143], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28143), 3.-8. June 2016, det. A. Aptroot 2016. - hallus thin, shiny, grenish mineral gray, 3-5 cm broad; apothecia numerous, immersed, dispersed, 0.2-0.4 mm in diameter, not carbonized, a columella lacking, the pore round, 0.05-0.1 mm in diameter; spores 8/ascus, uniseriate, 5-6 x 16-18 µm, 4-5 loculate, I+ blue. Chemistry: No substances present.

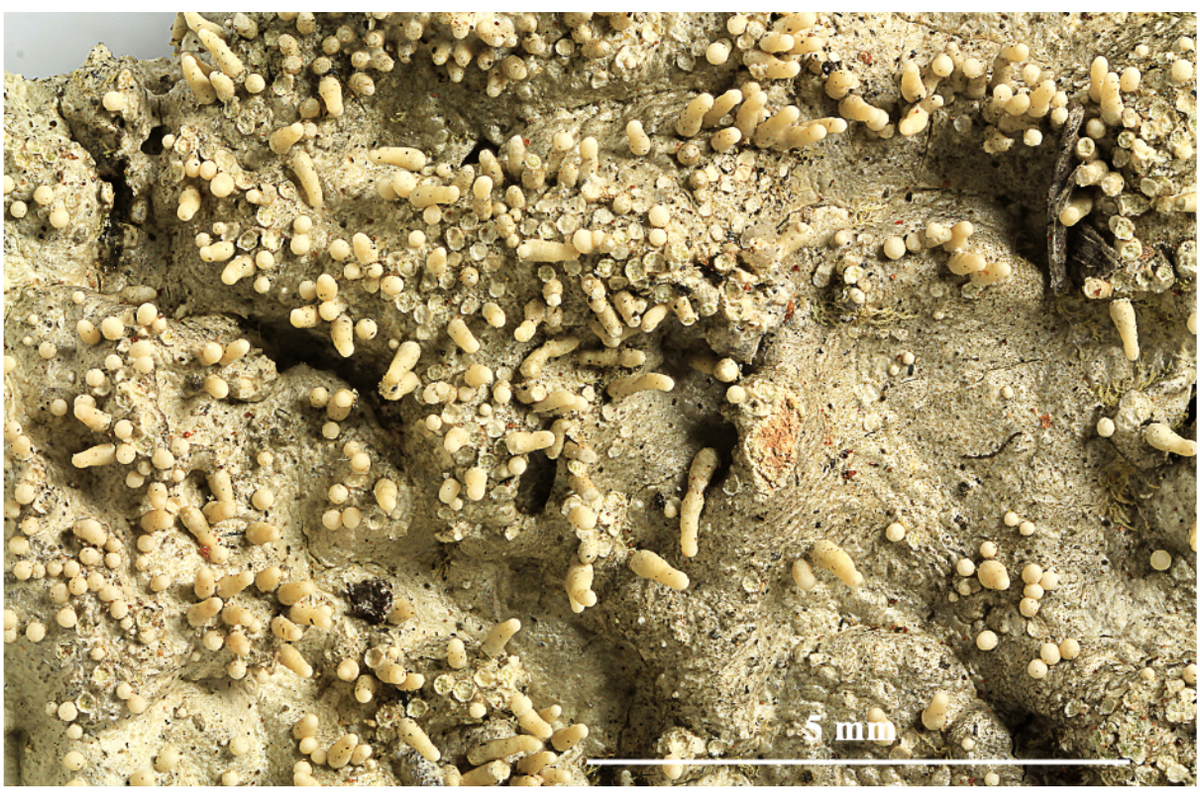




Myriotrema album

Myriotrema hartii (Müll. Arg.) Hale, Mycotaxon 11(1): 133 (1980)
= *Thelotrema hartii* Müll. Arg., Flora, Regensburg 69(20): 311 (1886)

[ABL21778], Brazil, Sergipe, Parque National Serra de Itabaiana, S slope. 10°44'35" S, 37°20'25" W, 400 m. On tree bark in Atlantic rain forst. Leg. M. Cáceres & A. Aptroot, (no. 21778), 10 May 2014, det. A. Aptroot 2014. - Thallus light grey-green, smooth to uneven, producing isidia, with dense, prosoplectenchymatous cortex; isidia up to 1 mm long and 0.15 mm thick, usually decumbent; photobiont layer and medulla with clusters of calcium oxalate crystals. Apothecia prominent to sessile, rounded, 0.2–0.4 mm diam.; disc partially covered by 0.1–0.2 mm wide pore, pale brown, white-pruinose; margin entire, with (indistinct) split between thallus and proper margin, white. Columella absent. Excipulum prosoplectenchymatous, colorless; periphysoids absent. Hymenium 60–70 µm high, clear; paraphyses unbranched. Ascospores 8/ascus, submuriform with 3 transverse septa and 0–1 longitudinal septa per segment, 10–15 x 6–10 µm, ellipsoid, with thick septa and rounded lumina, colorless, I+ violet-blue (amyloid). Chemistry: psoromic, subpsoromic and 2'-*O*-demethylpsoromic acids.





Myriotrema hartii

Myriotrema microporum (Mont.) Hale, Mycotaxon 11(1): 134 (1980)
= *Coscinedia micropora* (Mont.) A. Massal., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 3 5: 257 (1860) [1859-1860]
= *Ocellularia micropora* (Mont.) Müll. Arg., Flora, Regensburg 74(1): 112 (1891)
= *Thelotrema microporum* Mont., Annls Sci. Nat., Bot., sér. 3 10: 130 (1848)

[ABL18026], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18026), 27. July 2013, det. A. Aptroot 2013. - Thallus corticolous, dark olive-grey to fawn or off-white, 0.15-0.3 mm thick, deeply fissured to fissured-areolate, with a smooth or slightly uneven, compact and glossy surface; a thick white medullary layer present. Prothallus line not seen. Phenocortex 5-7 µm thick, continuous, dense and strongly conglutinated to rather indistinct, formed from periclinal hyphae. Photobiont layer c. 120-190 µm thick, with some basal inclusions of calcium oxalate crystals. Medulla up to 200 µm thick, dense, not clearly separated from the photobiont layer, with some inclusions of calcium oxalate crystals and filled by a dense, finely granular gelatinous matrix; partly endophloeodal. Pycnidia unknown. Apothecia dispersed, immersed in the thallus to slightly emergent, with a c. 0.05-0.2 mm wide, rounded to angular and often paler rimmed pore. Proper exciple free, white to slightly brownish, fissured, ± bent over the hymenium. Disc flesh-coloured, covered by thin white pruina. Phenocortex 5-7 µm thick. Photobiont layer 45-85 µm thick. Periderm layer absent. Proper exciple cupular, up to 230 µm deep and often distinctly layered at the base, c. 7-15 µm wide laterally, hyaline, often pale brown to slightly blackish at the top; tips of the excipular hyphae radiating towards the pore in some specimens. Subhymenium c. 10 µm high. Hymenium 70-100 µm high, clear. Ascospores 8/ascus, 1 seriate, hyaline, transversely septate, (2-)4- loculate, 10-14 × 5-6 µm, with subacute ends, I+ purplish-blue. Asci narrowly clavate, c. 70-95 × 7-10 µm. Paraphyses simple, straight, c. 2 µm wide; tips with a single thickened cell, adspersed with fine greyish to brownish granules. Epihymenium unpigmented, 5-8 µm high. Chemistry: Psoromic acid (major), ± subpsoromic acid (minor), 2'-*O*-demethylpsormic acid (minor) detected by TLC.



Myriotrema microporum



Myriotrema microporum

Myriotrema olivaceum Fée, Essai Crypt. Exot. (Paris): 103 (1825) [1824]
= *Ocellularia olivacea* (Fée) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 7 (1887)
= *Patellaria angusturae* Spreng., Syst. veg., Edn 16 4(1): 267 (1827)

[ABL18864], Brazil, Sergipe, Capela, Refúgio de vida silvestre Mata do Junco. 10°32' S, 37°03' W, 150 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18864), 24. March 2014, det. A. Aptroot 2014. - Thallus light greenish to ashy white, shiny, thick, up to 0.5 mm, forming extensive colonies up to 50 cm broad, sometimes finely cracked and fissured; apothecia very numerous, immersed, 0.15-0.3 mm in diameter, not carbonized and without a columella; pore small, flush, about 0.1 mm in diameter; hymenium 65-75 µm high; spores 8/ascus, more or less uniseriate, 4 loculate, 4 - 6 x 8-12 µm, I+ blue. Chemistry: “Olivacea” unknown and a second lower spot.





Myriotrema olivaceum

Myriotrema psormuriforme Aptroot & Schumm, sp. nov.
Mycobank MB850565.

Corticolous Myriotrema differing from all known species in the genus by the combination of the following characters: thallus with psoromic acid, hamathecium inspersed, ascospores hyaline, muriform.

[ABL87338], TYPE: BRAZIL. Amazonas, Novo Aripuanã, Pousada Rio Roosevelt, 8°29'S, 60°58'W, 100 m alt., 16-20 May 2022, leg. A. Aptroot 87338 (CGMS, holotype; ABL, isotype).

Thallus crustose, continuous, somewhat bullate, corticate, somewhat shiny, metallic grey, up to 5 cm diam., c. 0.2 mm thick, without pseudocyphellae, not surrounded by a prothallus. Soredia and isidia absent. Photobiont trentepohlioid. Ascomata immersed, globose, single, 0.15–0.25 mm diam. Excipulum brown. Ostiole c. 0.1 mm diam. Hamathecium densely inspersed with hyaline oil droplets. Ascospores 8/ascus, hyaline, muriform, 70–90 × 32–39 µm, without gelatinous sheath. Pycnidia not observed. Chemistry. Thallus UV–, P+ yellow, K–. TLC: psoromic acid.

Etymology. Named for the psoromic acid and the muriform ascospores. Ecology and distribution. On tree bark in primary rain forest; only known from Brazil.

Discussion. This species is well characterized by the inspersed hamathecium, the muriform ascospores and the presence of psoromicic acid. It would key out in the world key of Myriotrema by Lücking et al. (2016) at couplet 41 as: thallus with psoromic acid, hamathecium inspersed.

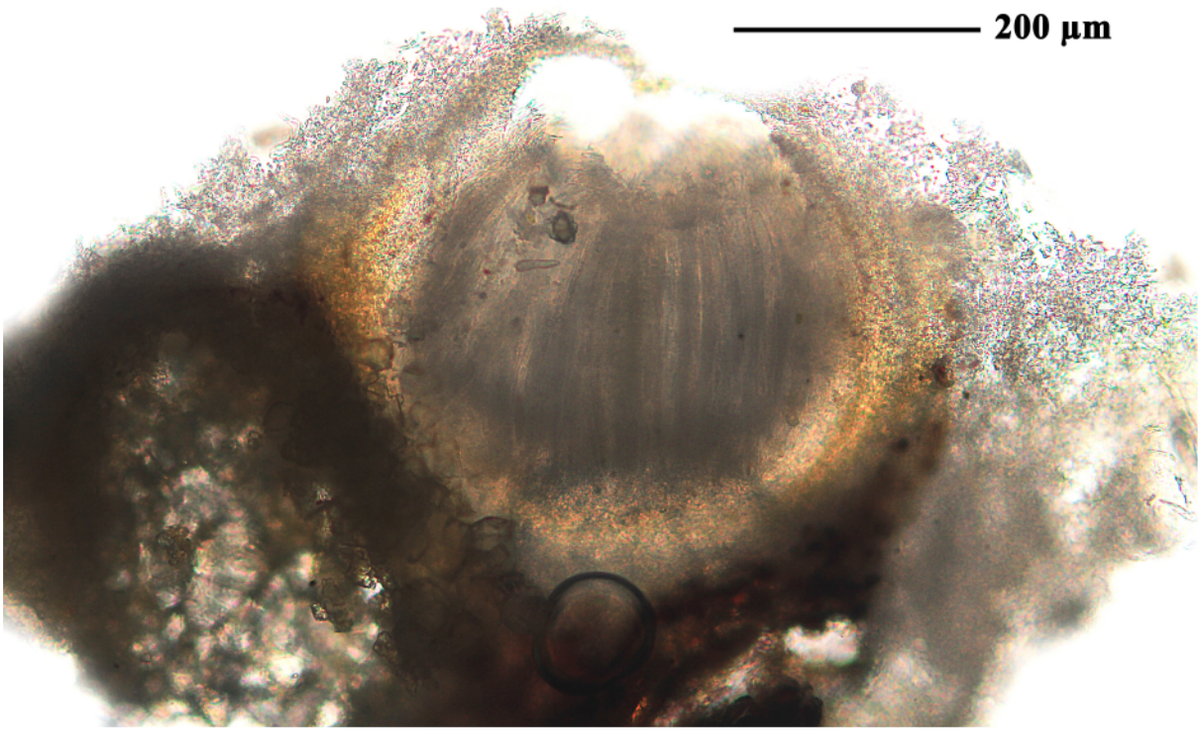


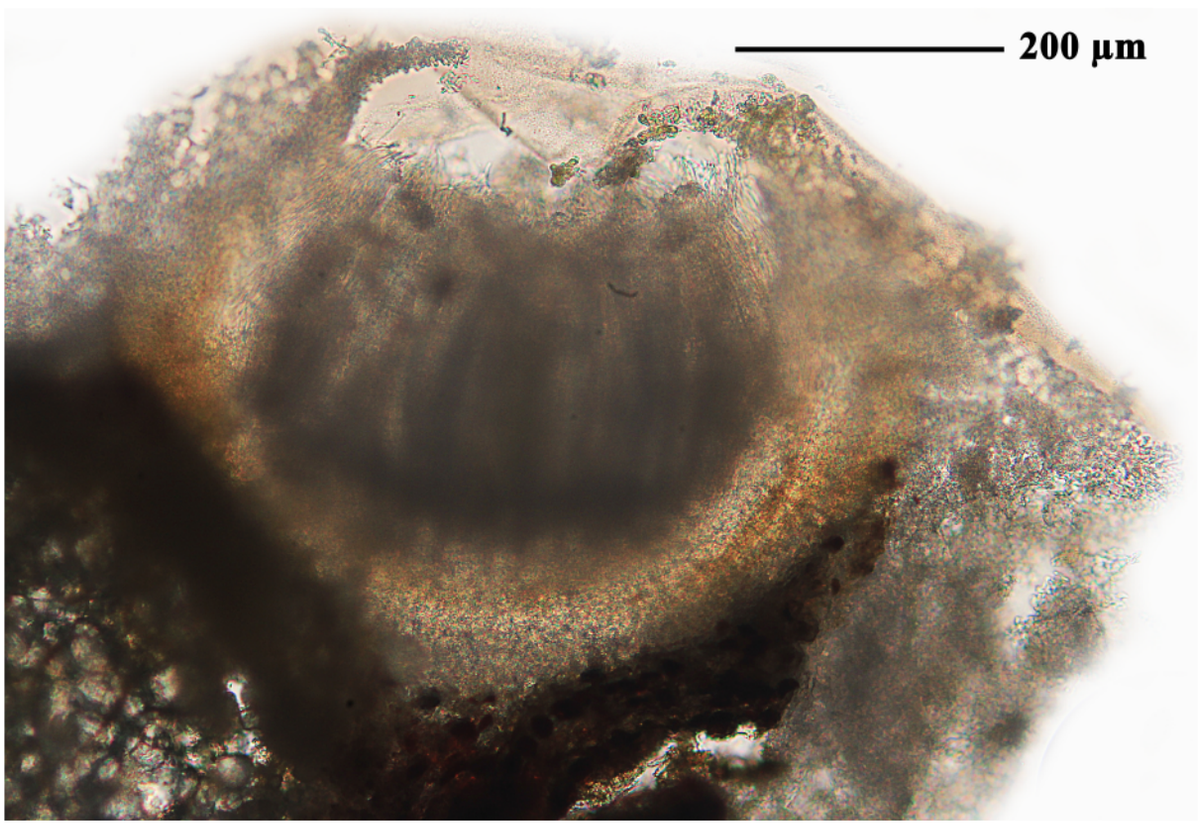


Myriotrema psormuriforme

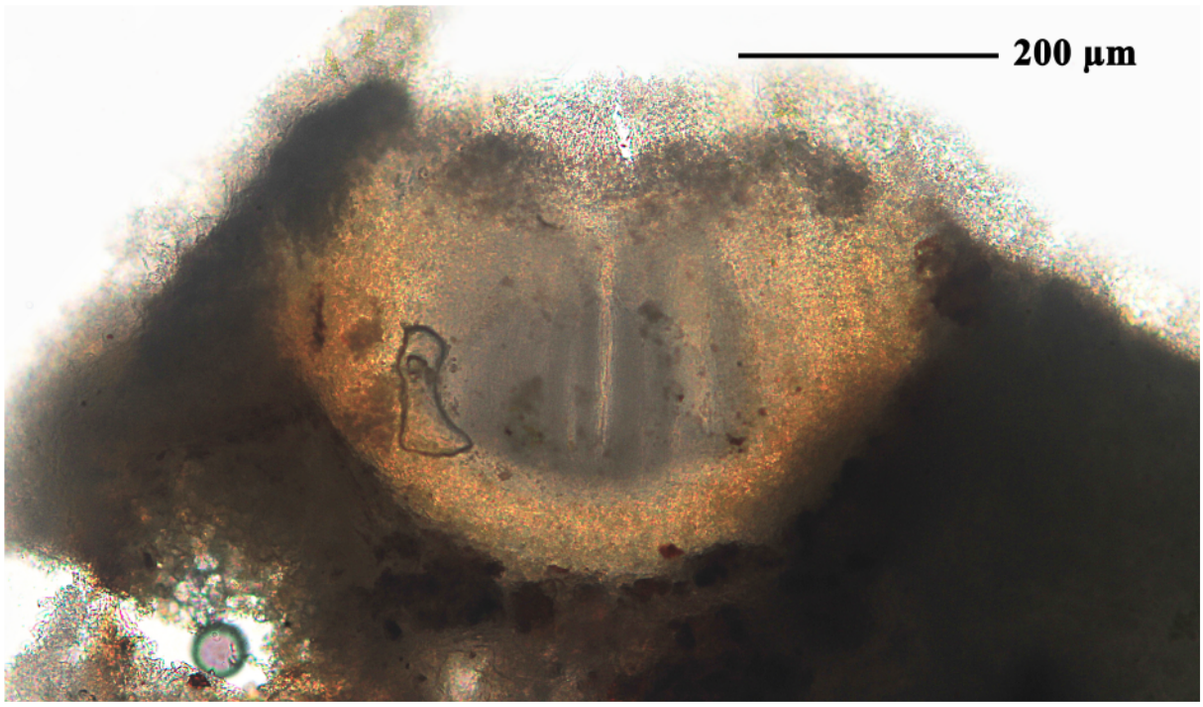


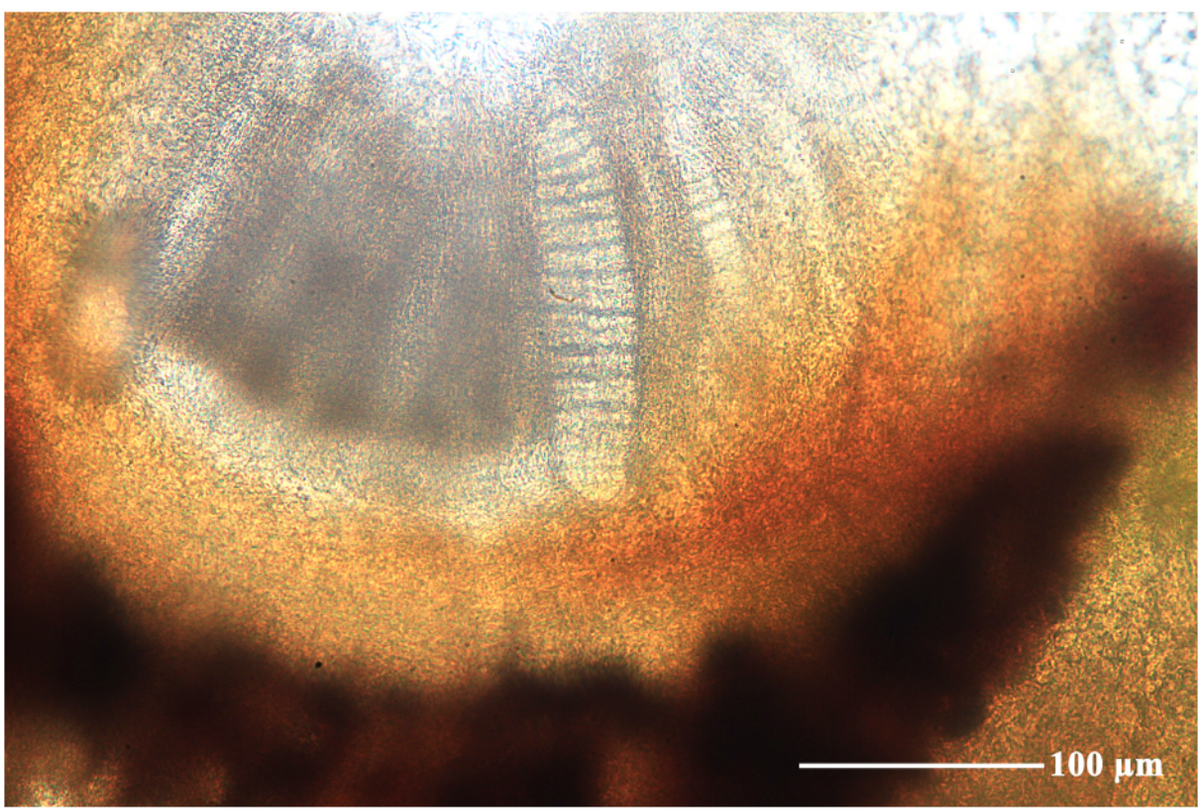
Myriotrema psormuriforme



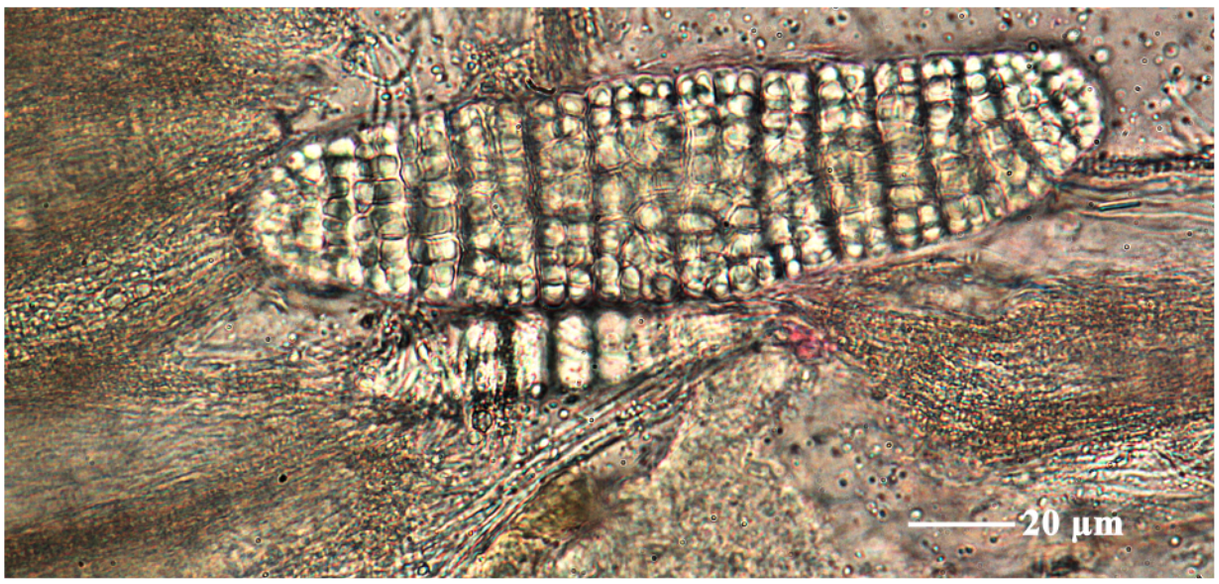


Myriotrema psormuriforme

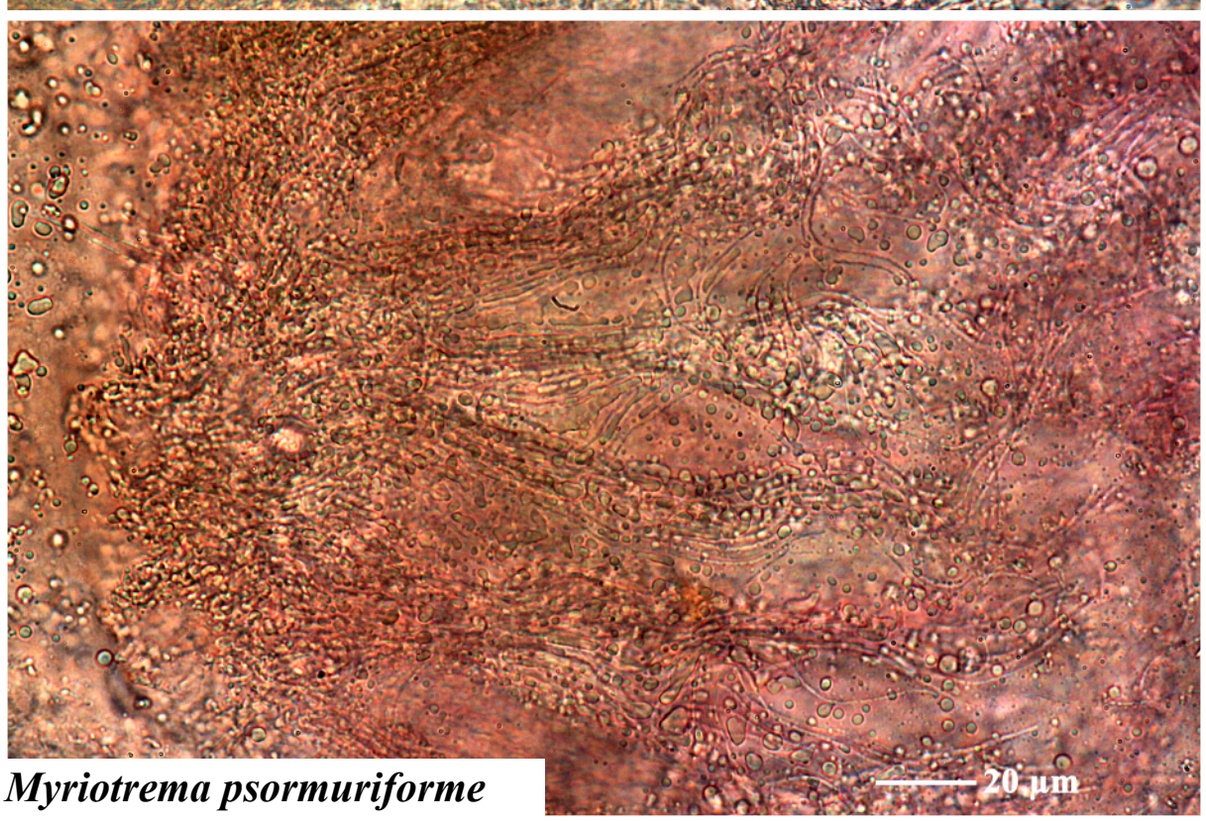




Myriotrema psormuriforme





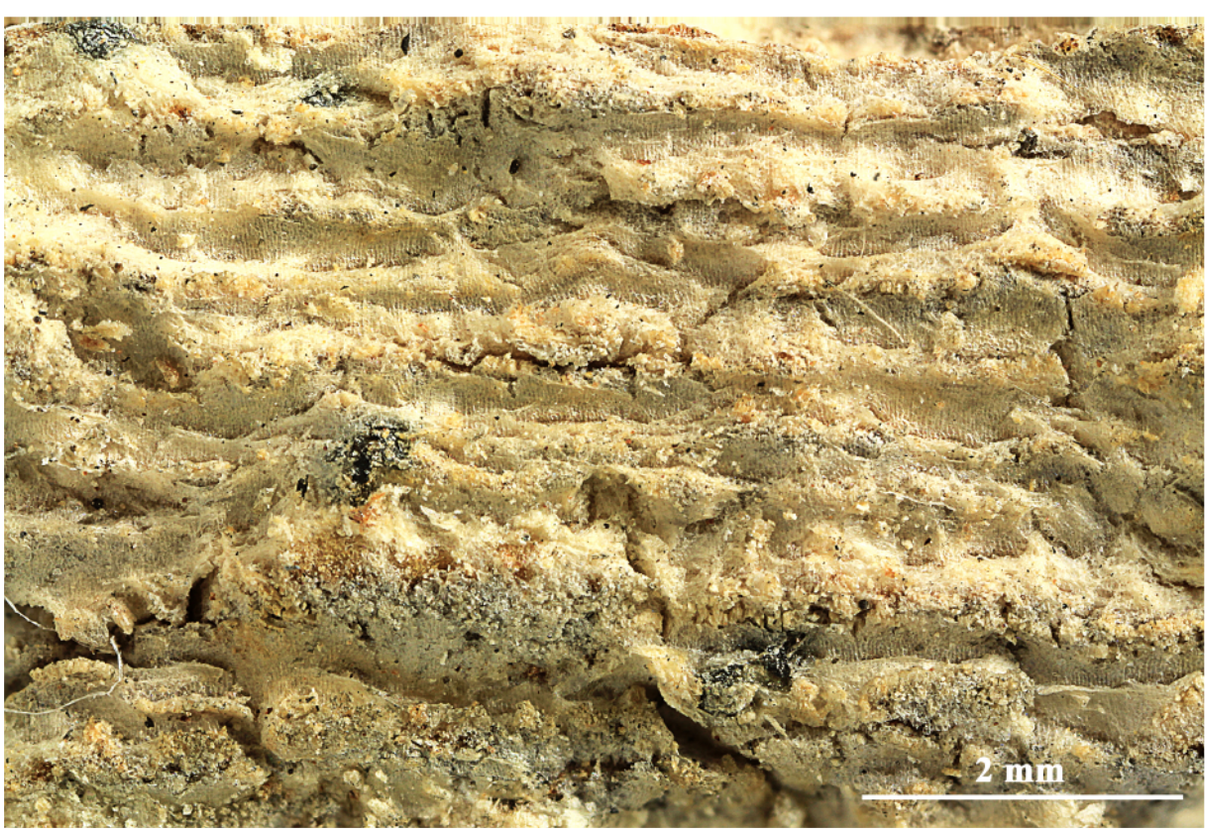


Myriotrema psormuriforme

Naevia pinastri (Anzi) Thiyagaraja, Lücking & K.D. Hyde, in Thiyagaraja, Lücking, Ertz, Wanasinghe, Karunarathna, Camporesi & Hyde, Fungal Diversity: 10.1007/s13225-020-00451-9, [12] (2020)

= *Arthonia pinastri* Anzi, Comm. Soc. crittog. Ital. 1(fasc. 3): 159 (1862)

[ABL15058], Brazil, Sergipe, Parque dos Falcoes, just E of Itabaiana. 10°44'50" S, 37°22'39" W, 400m. On tree bark in transitional forest. Leg. M. Cáceres & A. Aptroot, (no. 15058), 11. November 2012, det. A. Aptroot 2012. - Thallus crustose, endosubstratic or thinly episubstratic, greyish white-pruinose, sometimes delimited by a poorly developed, dark prothallus. Apothecia arthonioid, rounded to ellipsoid, c. 0.2-0.5 mm wide, black, adnate, slightly erumpent from thallus. Proper exciple poorly developed; epithecium olivaceous brown, 20-25 µm high, K/I+ blue; hymenium colourless, (20-)30-50 µm high, I and K/I+ blue; paraphysoids branched and anastomosing, 1-1.5 µm thick, pale yellowish, densely arranged, the apical cells swollen and brown, 1.5-2 µm wide; hypothecium colourless to pale yellowish, poorly developed, 5-15 µm high. Asci 8-spored, broadly clavate to ovoid, semi-fissitunicate, with a large apical dome, a distinct ocular chamber, the apex with a K/I+ blue ring-structure. Ascospores (0-)3-septate, not constricted at septa, with almost equal loculi, hyaline, spindle-shaped to ovoid, 11-17 x 4-6 µm. Pycnidia black, semi immersed. Conidia straight, 3-5 x 1-2 µm. Photobiont probably absent. Spot tests: thallus K-, C-, KC-, P-, UV-. Chemistry: not known, but probably thallus without lichen substances.





Naevia pinastri

Nitidochapsa aggregata (Hale) Poengs., Lücking & Lumbsch, in Poengsungnoen, Manoch, Mongkolsuk, Boonpragob, Parnmen, Lücking, Tehler & Lumbsch, Phytotaxa 189(1): 276 (2014)

= *Chapsa aggregata* (Hale) Sipman & Lücking, in Rivas Plata, Lücking, Sipman, Mangold, Kalb & Lumbsch, Lichenologist 42(2): 182 (2010)

= *Phaeotrema aggregatum* Hale, Smithson. Contr. bot. 16: 29 (1974)

= *Pseudotopeliopsis aggregata* (Hale) Parnmen, Lücking & Lumbsch [as 'aggregate'], PLoS ONE 7(12): e51392, 11 (2012)

= *Thelotrema aggregatum* (Hale) Hale, Mycotaxon 11(1): 131 (1980)

[ABL18685], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44' S, 37°20' W, 400 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18685), 25. March 2014, det. A. Aptroot 2014. - Thallus corticolous, pale greenish-grey, epiphloeodes, planus, cracked when old; apothecia aggregate, 0.4-0.6 mm diam., immersed, medulla not coloured, without a columella, disc ± hidden; margin not felty; excipulum free; inner exciple well developed, ostioles 0.1-0.2 mm. Hymenium 119-129 µm. Spores 8/ascus, brown, transversally septate, 4-5-loculate, 16 x 8 µm. Chemistry. No substances present.





Nitidochapsa aggregata

Ocellularia crocea (Kremp.) Overeem & D. Overeem, Bull. Jard. bot. Buitenz, 3 Sér. 4(1): 118 (1922)
= *Ascidium croceum* Kremp., Nuovo G. bot. ital. 7(1): 25 (1875)
= *Phaeotrema croceum* (Kremp.) Zahlbr., Cat. Lich. Univers. 2: 606 (1923) [1924]

[ABL28609], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark (twigs). 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28609), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticolous, epiphloeodal, rather thick, shiny, smooth to minutely verruculose, tannish gray, the exposed medulla pale reddish orange, 4-8 cm broad; apothecia numerous, solitary or crowded in 2s and 3s, more or less emergent, 0.4-0.7 mm in diameter, the thalline rim with a dull orange cast, a columella lacking, the inner exciple persisting and more or less filling the pore, the pore 0.1-0.2 mm in diameter; spores 8/ascus, 5-8 x 18-20 µm, 5-7 loculate, I+ blue. Chemistry: "Cinchonarum" unknown and unidentified pigments.





Ocellularia crocea

Ocellularia croceoisidiata Sipman, Trop. Bryol. 6: 8 (1992)

[ABL11925], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11925), 15. March 2012, det. A. Aptroot 2012. - Thallus corticolous, epiphloedal, up to at least 8 cm diam., brownish grey, smooth, dull, continuous isidiate, c. 40 µm thicj; cortical layer composed of weakly agglutinated hyphae, c. 8 µm thick; TLC: cinxhonarum unknown and pigment; algal cells subglobose, c. 6 µm diam., medulla in part endophloedal; isidia cylindrical with irregular shallow constrictions, c. 0.15 mm wide to c. 0.5 mm long, glossy, with yellow medulla. Apothecia ascidioid, emergent, basally constricted, with yellow medulla, rather frequent, singla, with carbonized excipular margin and columella, round, c. 1 mm diam; pore c. 0.15 mm wide, often showing a blackish columella top, with whitish rim; excipulum carbonized, c. 0.2 mm wide, with rounded black scarcely pruinose top; hymenium c. 80 µm high, clear, paraphxses not thickened at apex; spores hyaline, transversally 11-15-septate, 8/ascus, I+ purplish, c. 35-50 x 8 µm.





Ocellularia croceoisidiata

Ocellularia albula (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 582 (1923) [1924]
= *Thelotrema albulum* Nyl., Flora, Regensburg 52: 120 (1869)

[ABL18645], Brazil, Sergipe, Parque Nacional Serra de Itabaiana, summit. 10°44'11" S, 37°21'47" W, 650 m. In transitional forest to caatinga, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18645), 17. Sept 2013, det. A. Aptroot 2013. - Thallus light whitish grey. Apothecia immersed to erumpent, rounded, 0.2–0.4 mm diam.; disc covered by narrow, 0.1–0.2 mm wide pore, white pruinose; margin entire, fused, yellow-white to brown. True columella absent. Excipulum prosoplectenchymatous, colorless; periphysoids absent. Hymenium clear; paraphyses unbranched. Ascospores 8/ascus, 3–septate, 13–18 × 6–7 µm, ellipsoid, with thick septa and rounded lumina, hyaline. Secondary chemistry: psoromic acid aggr.





Ocellularia albula

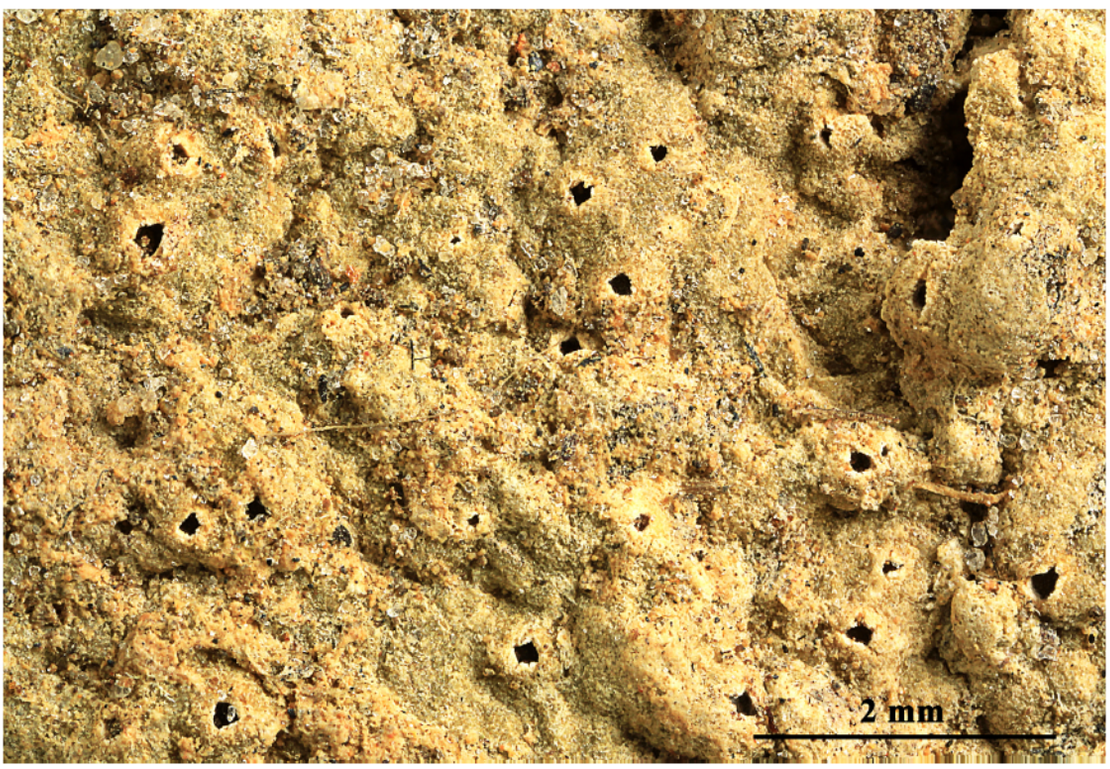
Ocellularia laeviuscula (Nyl.) Kraichak, Lücking & Lumbsch, in Kraichak, Parnmen, Lücking, Rivas Plata, Aptroot, Cáceres, Ertz, Mangold, Mercado-Díaz, Papong, Van Den Broeck & Lumbsch, Phytotaxa 189(1): 74 (2014)

= *Leptotrema laeviusculum* (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 635 (1923) [1924]

= *Myriotrema laeviusculum* (Nyl.) Hale, Mycotaxon 11(1): 134 (1980)

= *Thelotrema laeviusculum* Nyl., in Triana & Planchon, Annls Sci. Nat., Bot., sér. 4 19: 335 (1863)

[ABL18869], Brazil, Sergipe, Capela, Refúgio de vida silvestre Mata do Junco. 10°32' S, 37°03' W, 150 m. On tree bark in Atlantic rainforest. Leg. M. Cáceres & A. Aptroot, (no. 18869), 24. March 2014, det. A. Aptroot 2014. - Spores muriform, brown, 20 x 12 µm. - Thallus light grey-olive, with minutely grainy surface, with loose cortex; photobiont layer and medulla with columnar clusters of calcium oxalate crystals. Apothecia immersed, rounded, 0.2–0.3 mm diam.; disc covered by narrow, 0.05–0.1 mm wide pore, invisible; margin entire, fused, yellow-white to brown. True columella absent but irregular pseudocolumella extending laterally from the excipulum often present. Excipulum prosoplectenchymatous, colorless; periphysoids absent. Hymenium 100–140 µm high, clear; paraphyses unbranched. Ascospores 8/ascus, submuriform with 3–5 transverse septa and 0–1 longitudinal septa per segment, 18–24 × 6–12 µm, ellipsoid, with thick septa and rounded lumina, brown, young I+ violet-blue (amyloid). Secondary chemistry: protocetraric and virensic acids.





Ocellularia laeviuscula

Ocellularia obturascens (Nyl.) Hale, in Egan, Bryologist 90(2): 164 (1987)
= *Leptotrema bahianum var. obturascens* (Nyl.) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 12 (1887)
= *Leptotrema obturascens* (Nyl.) Hale, Lichenes Americani Exsiccati Fasc. 5: no. 110 (1970)
= *Thelotrema bahianum var. obturascens* Nyl., Acta Soc. Sci. fenn. 7(2): 453 (1863)

[ABL18498], Brazil, Sergipe, Parque Nacional Serra de Itabaiana, entrance. 10°45'57" S, 37°20'20" W, 200 m. In Atlantic forest remnant on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18498), 18. Sept 2013, det. A. Aptroot 2013. - Thallus grey-olive-yellow, minutely grainy, with loose cortex; photobiont layer and medulla with columnar clusters of calcium oxalate crystals. Apothecia prominent, rounded, 0.4–1 mm diam.; disc partially covered by 0.2–0.6 mm wide pore, partly filled by brown-black, white-pruinose (pseudo-)columella; margin entire, brown, laterally covered by thick thalline layer. (Pseudo-)columella partly present, irregular-reticulate, brown. Excipulum prosoplectenchymatous, apically brown; periphysoids absent. Hymenium 100–120 µm high, clear; paraphyses unbranched, thick. Ascospores 8/ascus, muriform, 15–25 x 10–15 µm, ellipsoid, with thick septa and rounded lumina, brown, young I+ violet-blue (amyloid). Chemistry: protocetraric and virensic acids.

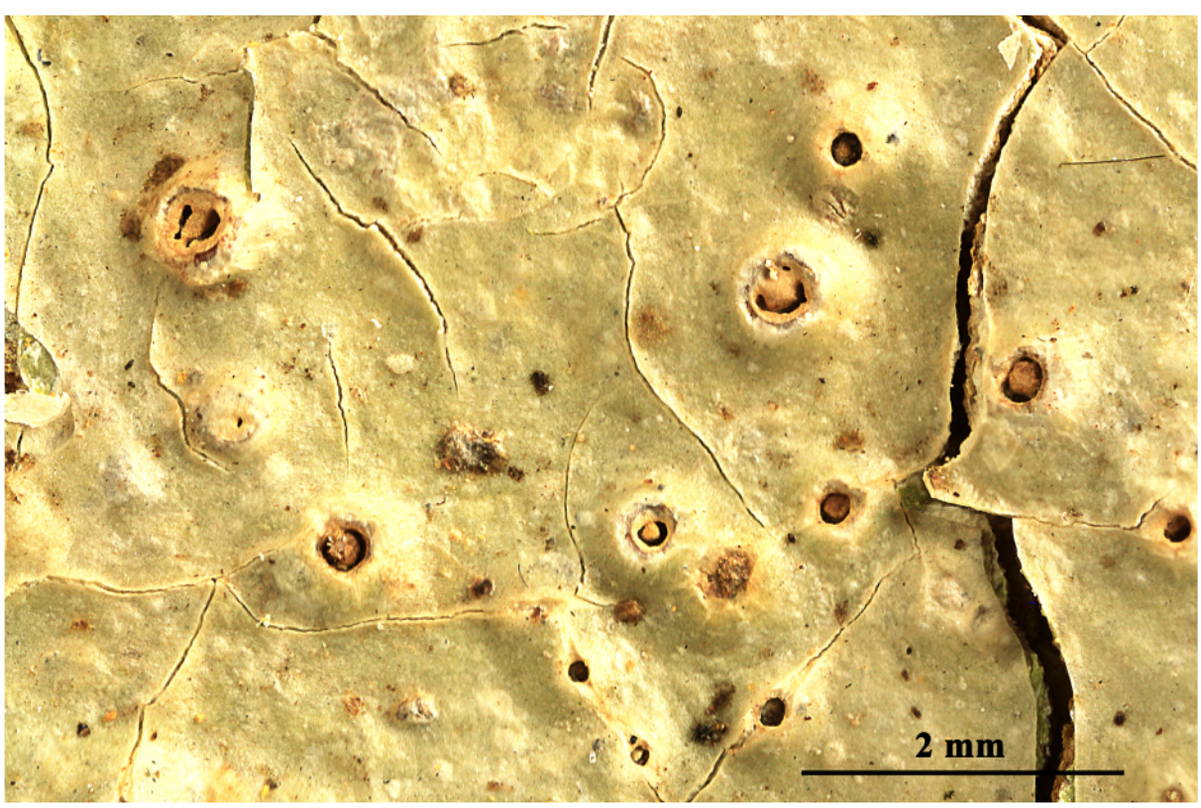




Ocellularia obturascens

Ocellularia pluriporoides Homchant. & Coppins, Lichenologist 34(2): 127 (2002)

[ABL50664], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50664), 21. June 2019, det. A. Aptroot 2019. - Thallus greenish grey, shiny, smooth, continuous; cortex dense, 11-14 µm; algal layer continuous, 40-60 m, medulla 45-100 µm, white with large crystals. Apothecia solitary or fused in pairs, flush to raised, immersed in the periderm, 0.6-0.9 mm diam.; pores round, 0.07-0.2 mm diam., sometimes depressed; exciple pale brown and carbonized at the base; columella simple to reticulate at maturity, carbonized above; hymenium 165-180 µm. Ascospores colourless, thin-walled, narrowly ellipsoid, 8/ascus, transversely septate, (4-)7-14-loculate, (28.5-)34.5-39.5-45.5(-46.0) x (7.0-)7.5-8.0-9.0(-10.0) µn, I+blue. Chemistry: Psoromic acid (PD+ deep yellow, K - , KC-.





Ocellularia pluriporoides

Ocellularia referta Hale, Smithson. Contr. bot. 38: 28 (1978)
= *Chapsa referta* (Hale) Lücking, in Sipman, Lücking, Aptroot, Chaves, Kalb & Umaña Tenorio, Phytotaxa 55: 47 (2012)
= *Thelotrema refertum* (Hale) Hale, Mycotaxon 11(1): 132 (1980)

[ABL28380], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28380), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticola, epiphloeodes, nitidus, rimosus, pallide olivaceo-viridis, 5-7 cm latus; apothecia semi-emergentia, subchroodiscoida, solitaria atque 2-3 confluentia, 0.5-0.7 mm diametro, margine thallino crasso, fisso, vix emergenti, non reflexo; ostiolum vix visibile, ca 0.1 mm diametro; excipulum pro parte separatum, fissum, apice fuligineum; hymenium ca 60 pm altum; sporae 8/ascus, 8 x 24 µm, 5-7 loculatae, I+ caerulescentes. Chemistry: Hypoprotocetraric and 4-*0*-demethylnotatic acids.





Ocellularia referta

Ocellularia rhodostroma (Mont.) Zahlbr., Cat. Lich. Univers. 2: 600 (1923) [1924]
= *Ascidium rhodostroma* Mont., Annls Sci. Nat., Bot., sér. 3 16: 75 (1851)
= *Ectolechia rhodostroma* (Mont.) A. Massal., Alcuni Gen. Lich.: 10 (1853)
= *Thelotrema domingense* f. *rhodostroma* (Mont.) Tuck., Syn. N. Amer. Lich. (Boston) 1: 225 (1882)
= *Thelotrema domingense* var. *rhodostromum* (Mont.) Tuck. [as 'rhodostroma'], Syn. N. Amer. Lich. (Boston) 1: 225 (1882)
= *Thelotrema rhodostroma* (Mont.) Vain., J. Bot., Lond. 34: 208 (1896)

[ABL28306], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark (twigs). 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28306), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus light greenish tan to gray, smooth to finely warty, continuous and epiphloeodal, the medulla white or pink, forming colonies 5-10 cm broad; apothecia large and easily visible with the naked eye, ascidioid, 1.0-1.8 mm in diameter, the walls heavily carbonized and the medulla deep pink, readily exposed as the fragile cortex breaks away, columella lacking; pore round and small, 0.05-0.1 mm in diameter, surrounded by a raised ring; hymenium 2OO-275 µm high; spores l-2/ascus, 25-30 loculate, 25p-4O x lOO-25O µm, I+ blue . Chemistry: Hypoprotocetraric acid and in greater concentration 4-*0*-demethylnotatic acid along with unidentified pigments.





Ocellularia rhodostroma

Ocellularia rotundifumosa Naksuwankul, Lücking & Lumbsch, in Naksuwankul, Kraichak, Parnmen, Lücking & Lumbsch, MycoKeys 17: 57 (2016)

[ABL18007], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On bark in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18007), 27. July 2013, det. A. Aptroot 2013. - Thallus corticolous, endophloeodal to epiphloeodal, up to c. 200 µm thick, greenish gray to olive, slightly glossy, smooth, rarely continuous to usually ±verrucose. True cortex discontinuous, to c. 15 µm thick, formed by irregular hyphae. Algal layer well developed, continuous; calcium oxalate crystals moderately large, scattered. Photobiont *Trentepohlia*; cells rounded to irregular in outline, in irregular groups, green, 7–9 × 6–9 µm. Vegetative propagules not seen. Ascomata rounded with complete thalline margin, 0.4–0.9 mm diam., solitary to marginally fused, immersed to rather emergent, then verrucose-hemispherical to urceolate. Disc with the columella visible from above, entire, free, slightly pruinose, dark gray. Pores formed by the thalline rim margin, c. 0.5 mm diam., the apex of the proper exciple becoming visible from above as a brownish to dark gray line, moderately thick, concolorous with the thallus or brighter; thalline rim incurved. Proper exciple fused, dark brown to carbonized marginally and towards the tips, usually distinctly amyloid at the base. Hymenium to c. 150 µm thick, densely inspersed, distinctly conglutinated; paraphyses slightly bent, ±interwoven, unbranched, with moderately thickened tips; columellar structures moderately well developed, to 150 µm wide, entire, the upper parts brownish to carbonized. Epihymenium brownish, with grayish or brownish granules. Asci 8-spored; tholus initially thick, thin when mature. Ascospores 7–9-septate, fusiform to oblong-fusiform, rarely clavate, with rounded ends, 24–35 × 7–10 µm, hyaline, distoseptate with lens-shaped lumina, I+ violet-blue. Pycnidia not seen. Chemistry: No compounds detectable by TLC.



Ocellularia rotundifumosa



Ocellularia rotundifumosa

Ocellularia pseudochapsa M. Cáceres, Aptroot & Lücking, in Cáceres, Aptroot, Parnmen & Lücking, Phytotaxa 189(1): 114 (2014)

[ABL28337], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28337), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticolous, epiperidermal, up to c. 10 cm diam., continuous; surface uneven to farinose, grey (greenish when thin and mostly endoperidermal); prothallus absent. Thallus in section 50–100 µm thick, ecorticate, with photobiont layer 20–30 µm thick, and medulla, 50–70 µm thick, strongly encrusted with numerous small, grey crystals. Photobiont *Trentepohlia*; cells rounded to irregular in outline, in irregular groups, yellowish green, 8–12 ×6–10 µm. Ascomata irregular in outline, erumpent to prominent, sometimes aggregate or pseudostromatic with several discs, with lateral thalline margin, 0.7–1.2 mm diam., 0.3–0.4 mm high; disc covered by 0.2–0.3 mm wide pore, otherwise filled with layered remnants of excipular tissue; proper margin distinct, entire to mostly fissured, white, often crumbling and appearing pruinose-farinose; thalline margin thin, fissured lobulate and sometimes even recurved in large ascomata, with uneven surface, grey. Excipulum entire, pale yellow, 30–50 µm wide; laterally covered by algiferous thallus containing periderm layers and masses of small, grey crystals; columella absent; hypothecium prosoplectenchymatous, 10–20 µm high, hyaline; hymenium 140–160 µm high, hyaline, clear; epithecium amorphously pigmented, 10–15 µm high, olive-grey. Paraphyses unbranched, apically smooth; periphysoids present, distinct, slender, up to 30 µm long; asci cylindrical, 130–150 × 12–15 µm. Ascospores 8 per ascus, oblong, 9–11-septate, 35–45 × 8–10 µm, 4–5 times as long as wide, hyaline, distoseptate with lens-shaped lumina, I+ violet-blue. Secondary chemistry: Hypoprotocetraric acid and (possibly) the cinchonarum unknown accessory spot 1 (Frisch et al. 2006); medulla P–, microscopic section K–.



Ocellularia pseudochapsa



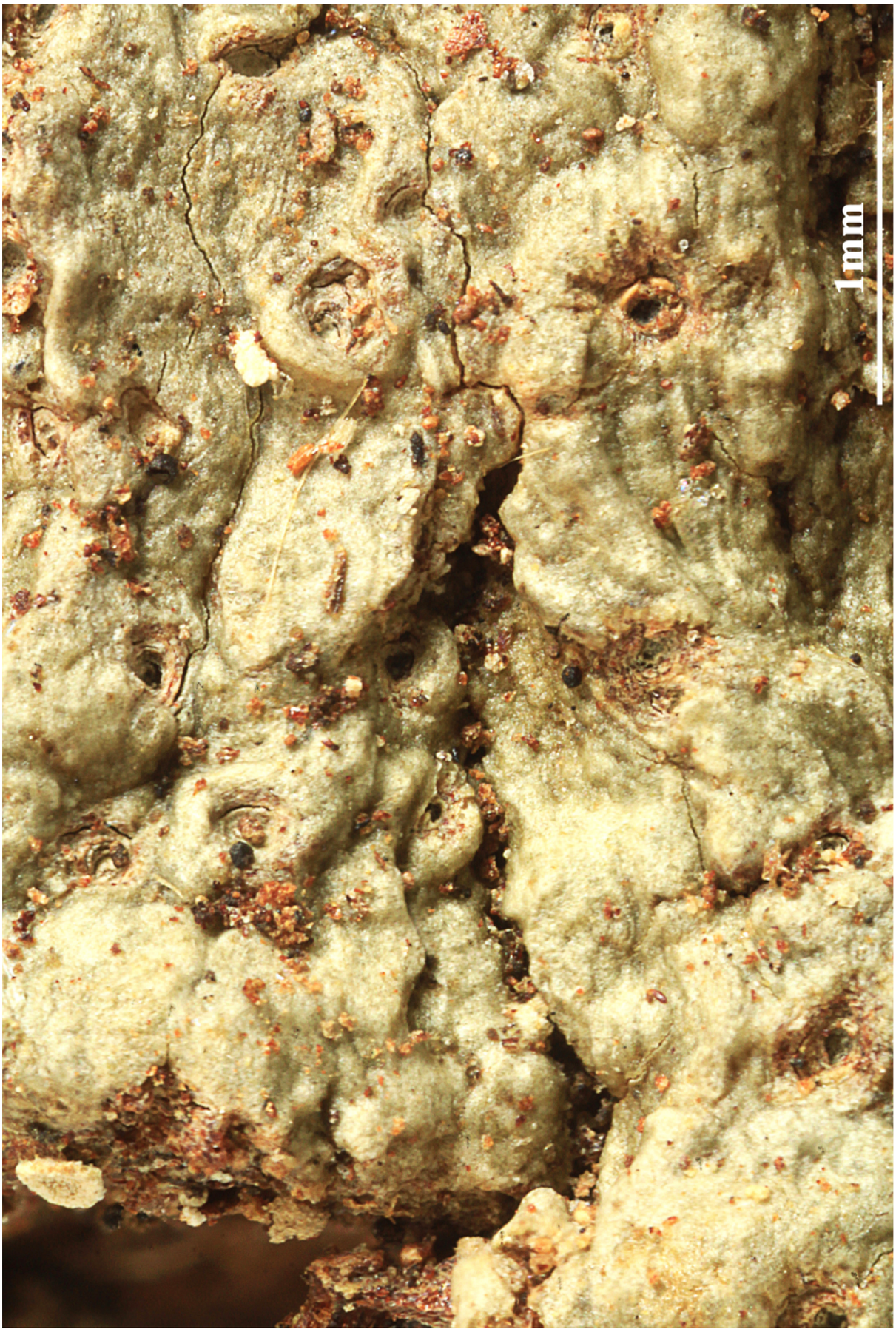
Ocellularia pseudochapsa

Ocellularia pseudochapsa M. Cáceres, Aptroot & Lücking, in Cáceres, Aptroot, Parnmen & Lücking, Phytotaxa 189(1): 114 (2014)

[ABL28345], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28345), 3.-8. June 2016, det. A. Aptroot 2016. - Thallus corticolous, epiperidermal, up to c. 10 cm diam., continuous; surface uneven to farinose, grey (greenish when thin and mostly endoperidermal); prothallus absent. Thallus in section 50–100 µm thick, ecorticate, with photobiont layer 20–30 µm thick, and medulla, 50–70 µm thick, strongly encrusted with numerous small, grey crystals. Photobiont *Trentepohlia*; cells rounded to irregular in outline, in irregular groups, yellowish green, 8–12 ×6–10 µm. Ascomata irregular in outline, erumpent to prominent, sometimes aggregate or pseudostromatic with several discs, with lateral thalline margin, 0.7–1.2 mm diam., 0.3–0.4 mm high; disc covered by 0.2–0.3 mm wide pore, otherwise filled with layered remnants of excipular tissue; proper margin distinct, entire to mostly fissured, white, often crumbling and appearing pruinose-farinose; thalline margin thin, fissured lobulate and sometimes even recurved in large ascomata, with uneven surface, grey. Excipulum entire, pale yellow, 30–50 µm wide; laterally covered by algiferous thallus containing periderm layers and masses of small, grey crystals; columella absent; hypothecium prosoplectenchymatous, 10–20 µm high, hyaline; hymenium 140–160 µm high, hyaline, clear; epithecium amorphously pigmented, 10–15 µm high, olive-grey. Paraphyses unbranched, apically smooth; periphysoids present, distinct, slender, up to 30 µm long; asci cylindrical, 130–150 × 12–15 µm. Ascospores 8 per ascus, oblong, 9–11-septate, 35–45 × 8–10 µm, 4–5 times as long as wide, hyaline, distoseptate with lens-shaped lumina, I+ violet-blue. Secondary chemistry: Hypoprotocetraric acid and (possibly) the cinchonarum unknown accessory spot 1 (Frisch et al. 2006); medulla P–, microscopic section K–.



Ocellularia pseudochapsa



Ocellularia pseudochapsa

[ABL50800], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50800), 23. June 2019, det. A. Aptroot 2019.

Thallus corticolous, olive-grey, continuous to slightly fissured, c. 50 –100 µm thick, smooth, with a compact and ± glossy surface. Soralia erumpent to hemisphaerical, flat or raised, rounded to undulate or slightly lobate in outline, surrounded by erect and recurved thalline lobules, 0.3 – 0.5 mm in diam., with a white medulla; the leprose to mostly granular soredia are white. Cortical layer c. 5 –10 µm thick, continuous, moderately dense, conglutinated, formed predominantly from irregular hyphae and short lumina in section. Photobiont layer 40 – 80 µm thick, with few inclusions of large calcium oxalate crystals. Medulla thin or endophloeodal. Apothecia dispersed, rounded, nearly immersed in the thallus to moderately emergent, rarely slightly constricted at the base, with ± steep flanks and a rounded apex, c. 0.4 –1 mm in diam. Margin entire at first, concolorous with the thallus, incurved, thalline exciple bursting open with age and exposing the white medulla giving the impression of soralia. Columella 0.3 mm broad, 0.25 mm high, black with an off white tip, carbonised to the base, with a thin apical layer of hyaline hyphae, strongly raised above the hymenium. Proper exciple laterally carbonised. Disc depressed, not visible through the open pore. Subhymenium 15 –20 µm high. Hymenium 110 –125 µm high, inspersed by small granules. Ascospores 4 – 8/ascus, 1–2 seriate, hyaline, transversely septate, (6 –)10 –12 loculate, 25 –35 × 8 –9 µm, with one round and one subacute end, I+ purplish-blue. Asci clavate, c. 100 –125 × 16 –20 µm. Paraphyses simple, straight, 2–2.5 µm wide; tips with a single slightly thickened cell, adspersed with fine greyish to brownish granules. Epihymenium unpigmented, 7–8 µm high. Pycnidia not seen. Chemistry: Hypoprotocetraric acid (major), 4-*O*-demethylnotatic acid (minor to trace).



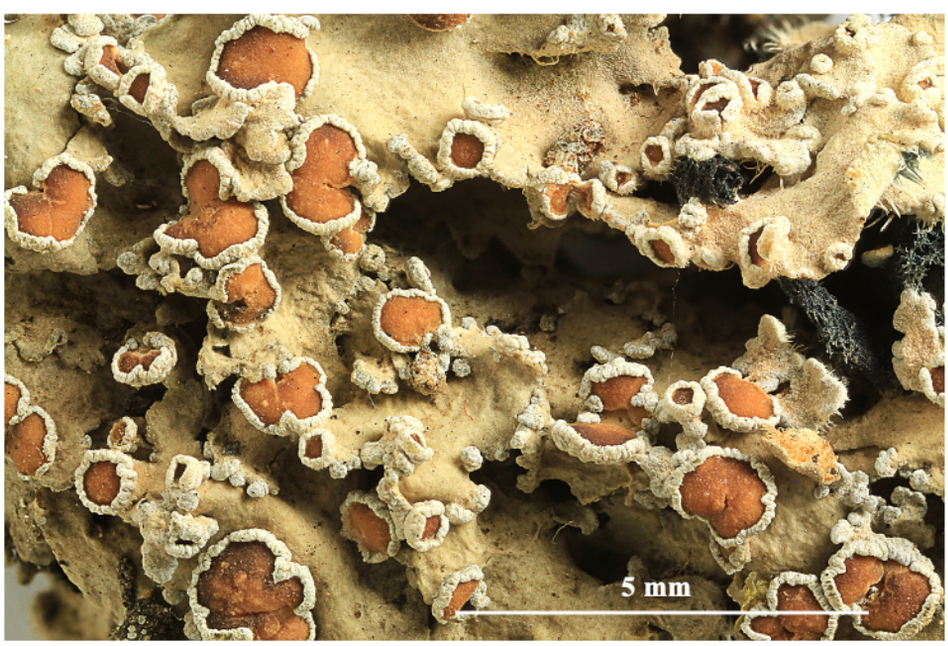
Ocellularia soralifera



Ocellularia soralifera

Pannaria lurida (Mont.) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 109 (1858)
= *Collema luridum* Mont., Annls Sci. Nat., Bot., sér. 2 18: 266 (1842)
= *Dichodium subluridum* (Nyl.) Nyl., in Hue, Nouv. Arch. Mus. Hist. Nat., Paris, 3 sér. 2: 232 (1890)
= *Pannaria lurida* subsp. *quercicola* P.M. Jørg., Bryologist 103(4): 694 (2000)
= *Pannaria lurida* subsp. *russellii* (Tuck.) P.M. Jørg., Bryologist 103(4): 694 (2000)
= *Pannaria sublurida* Nyl., Annls Sci. Nat., Bot., sér. 4 11: 256 (1859)
= *Physma globiferum* Hue, Bull. Soc. bot. Fr. 62: 333 (1914)
= *Physma luridum* (Mont.) Tuck., Syn. N. Amer. Lich. (Boston) 1: 116 (1882)

[42937], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42937), 27. October 2017, det. A. Aptroot 2017. - Thallus foliolose, loosely attached, 2-10 vm wide, often with a dense mat of entangled blue-black rhizohypae proje cting from margins. Lobes thick, somewhat coriaceous, irregularly laciniate, 1-5 mm wide, disrete to adjacent with ±crenate margins, noticeably thickened and often white-cobwebby. Upper surface irregularly and often sharply wrinkled, minutely scabrid in parts, slate blue when wet, greyish fawn when dry. Lower surface ecorticate, white to pale buff with entangled blue-black rhizohyphae. Apthecia frequent, laminal or often marginal, sessile, 0.5-2 mm wide; disc flat to convex, yellow to red-brown; thalline exciple crenulate, prominent. Spores 15-19 x 9-10 µm, often apiculate at one end and then to 25 µm long; exosporium nodulose. Chemistry: P+ orange, pannarin, ± ursolic acid.





Pannaria lurida

Paraporpidia neotropica Aptroot & Schumm sp. nov.

Type: Brazil, Sergipe, Parque dos Falcões, just E of Itabaiana, 10°44'50" S, 37°22'39" W, 400m, 11. November 2012, on siliceous rock in semidesert Caatinga, leg. M.E.S. Cáceres & A. Aptroot, ISE no. 15063 (ISE, holotype; ABL, isotype).

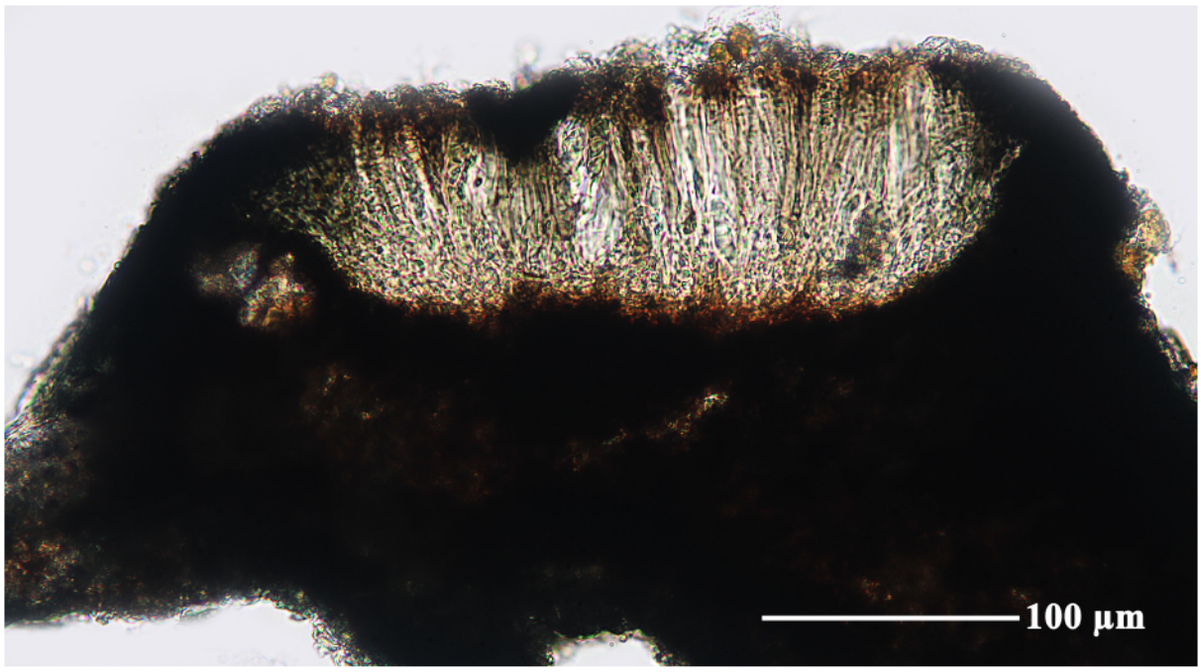
Diagnosis: saxicolous Paraporpidia with thallus whitish grey, without secondary substances, dendritically meandering black prothallus, apothecia with a thin whitish pruinose rim inside, ascospores 13-15 x 8-10 microns, without halo. Mycobank nr: 850544

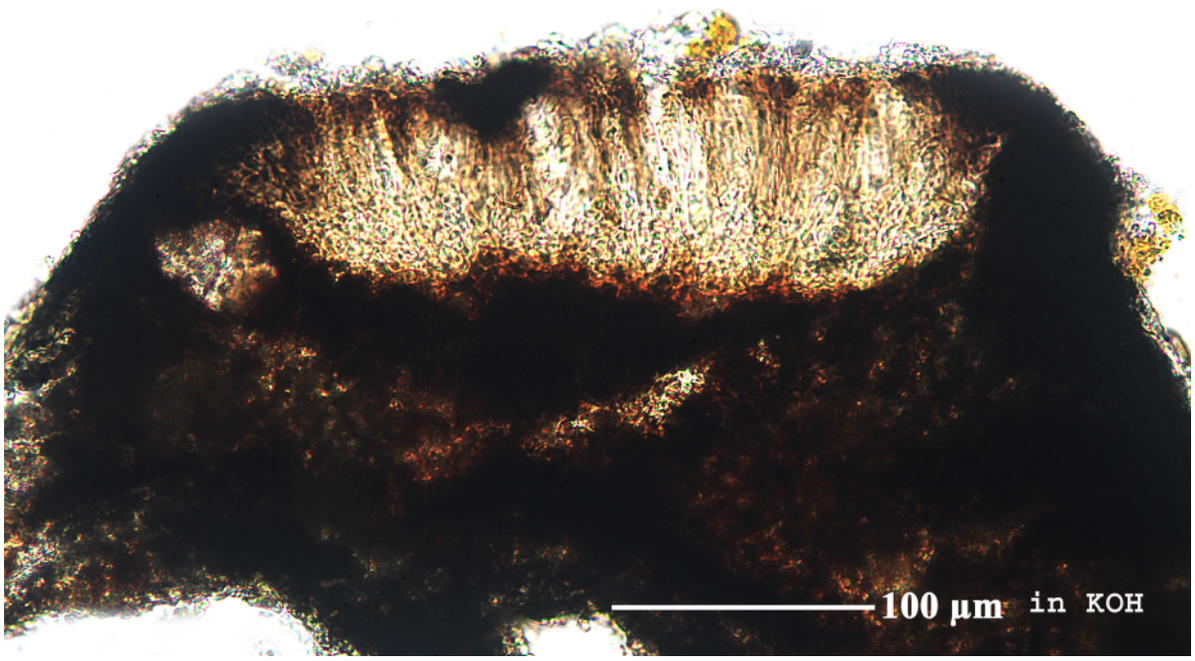
[ABL15063], Thallus whitish grey, non-corticate, continuous, irregularly delimited, surrounded by a thin, almost hyphal, black prothallus that is dendritically meandering in crevices around the thallus. Isidia and soredia absent. Apothecia appressed, round, c. 0.25-0.45 mm diam., margin black, somewhat higher than the disc, c. 0.1 mm diam., with a thin whitish pruinose rim inside, disc black. Excipulum only apically carbonized, greenish bluish black. Hypothecium dark brown. Epihymenium brown, with old asci. Hymenium grey, not inspersed. All KOH-negative. Paraphyses anastomosing, glued. Asci Porpidiaceae-type. Ascospores 8/ascus, hyaline, ellipsoid, thin-walled, 13-15 x 8-10 µm, without halo. Chemistry: K-, C-, KC-, P-, UV-; TLC: nil.
This is a species in the small genus Paraporpidia; dna sequencing failed to some extent, so the phylogenetic classification has not been confirmed. It is locally common in areas with pebbles in semi-desert environment in Brazil.



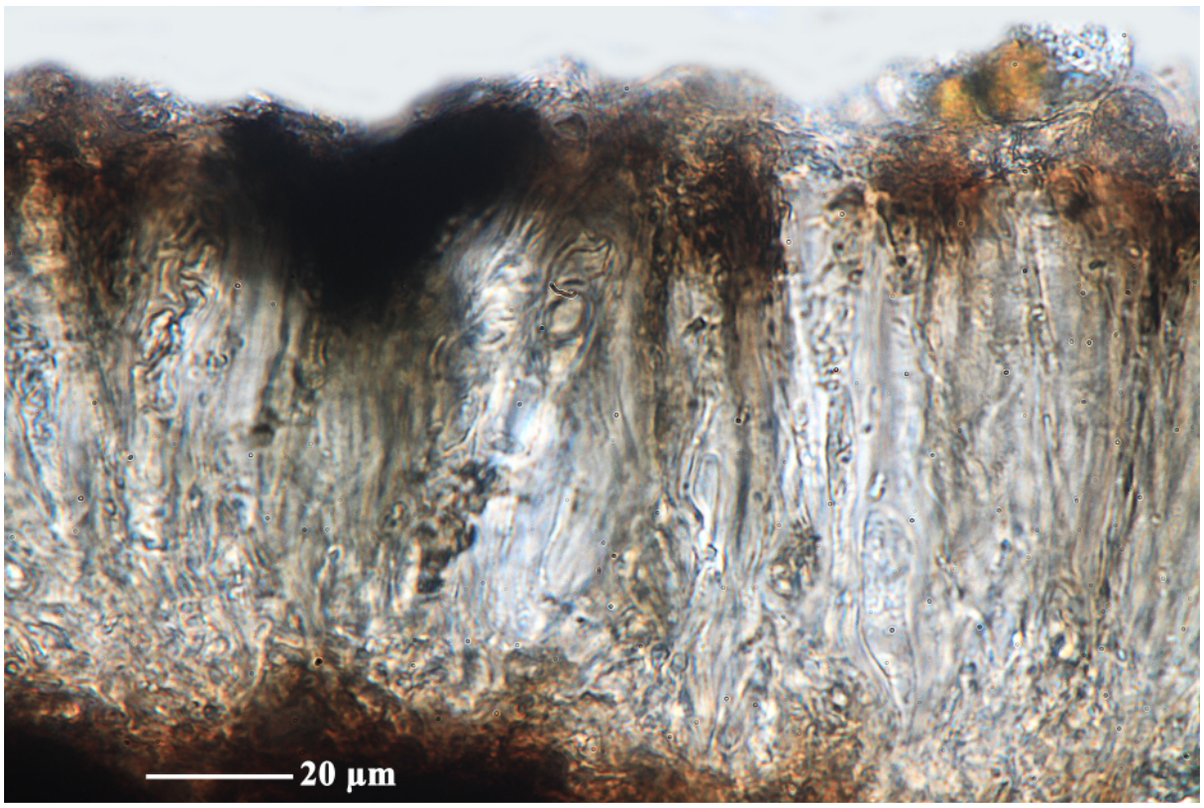


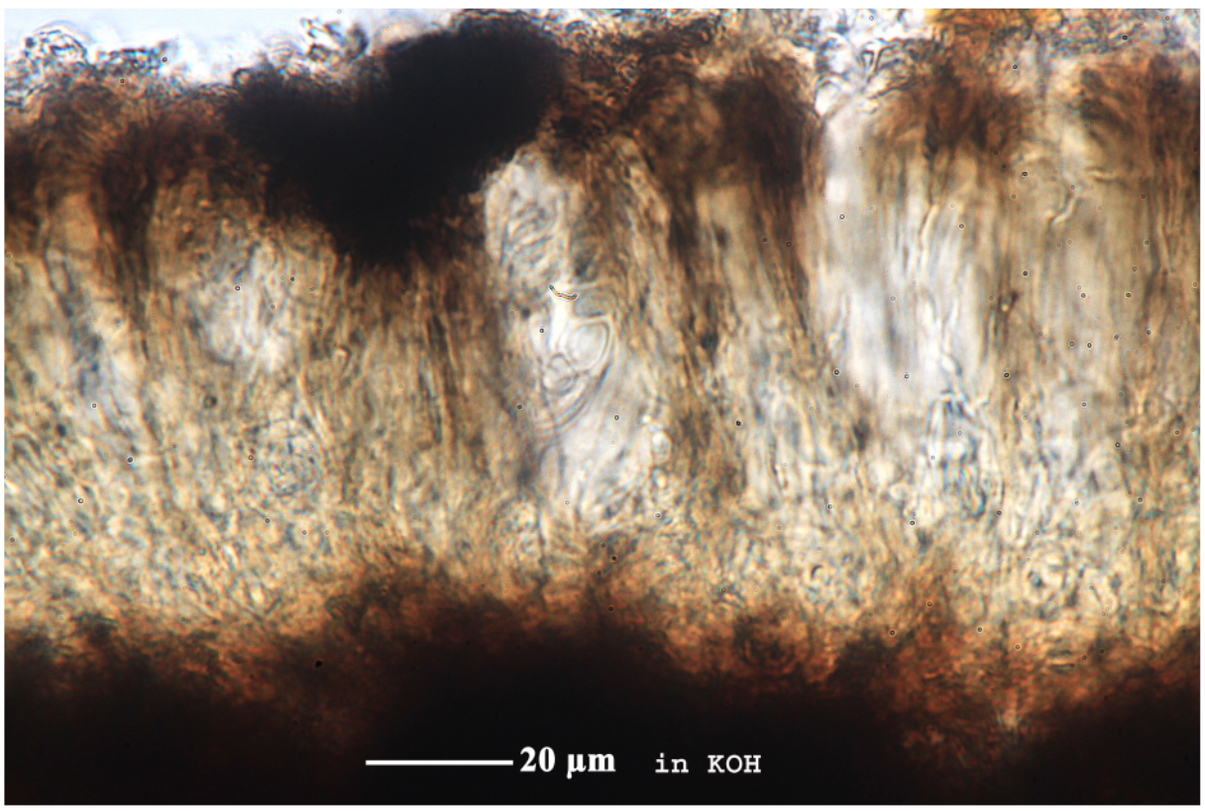
Paraporpidia neotropica



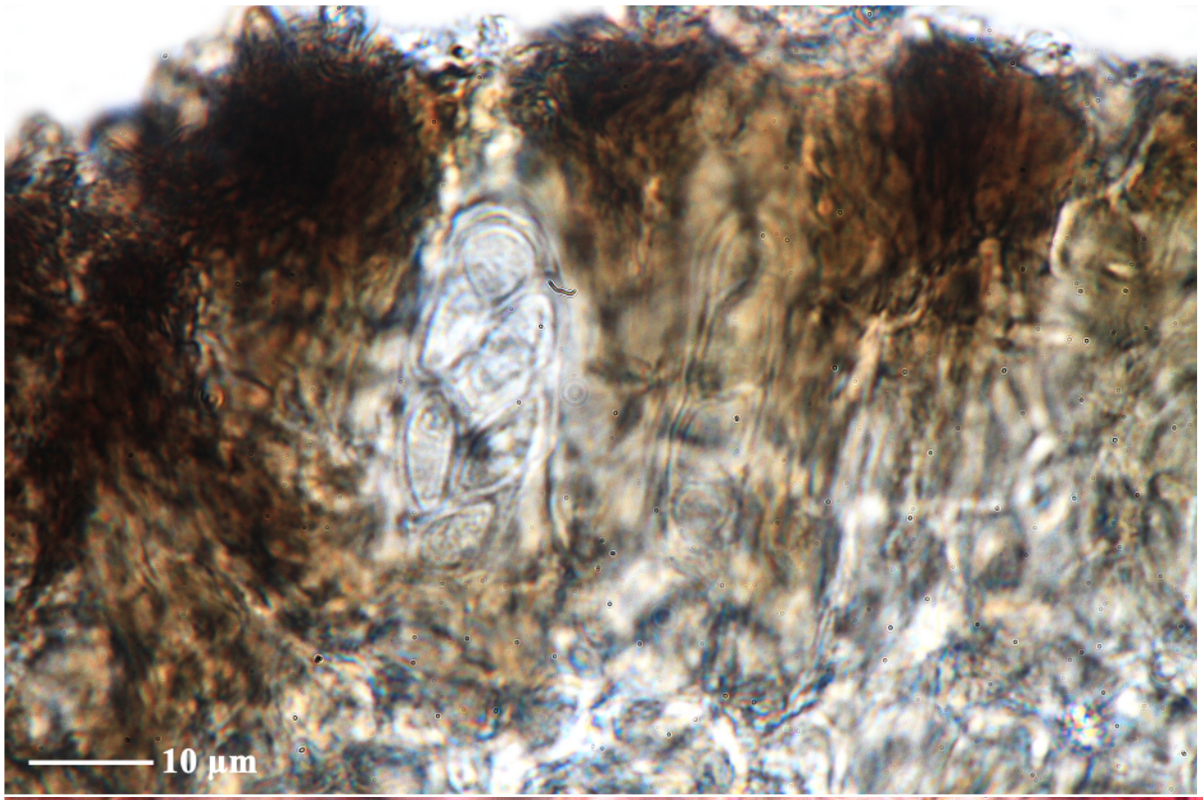


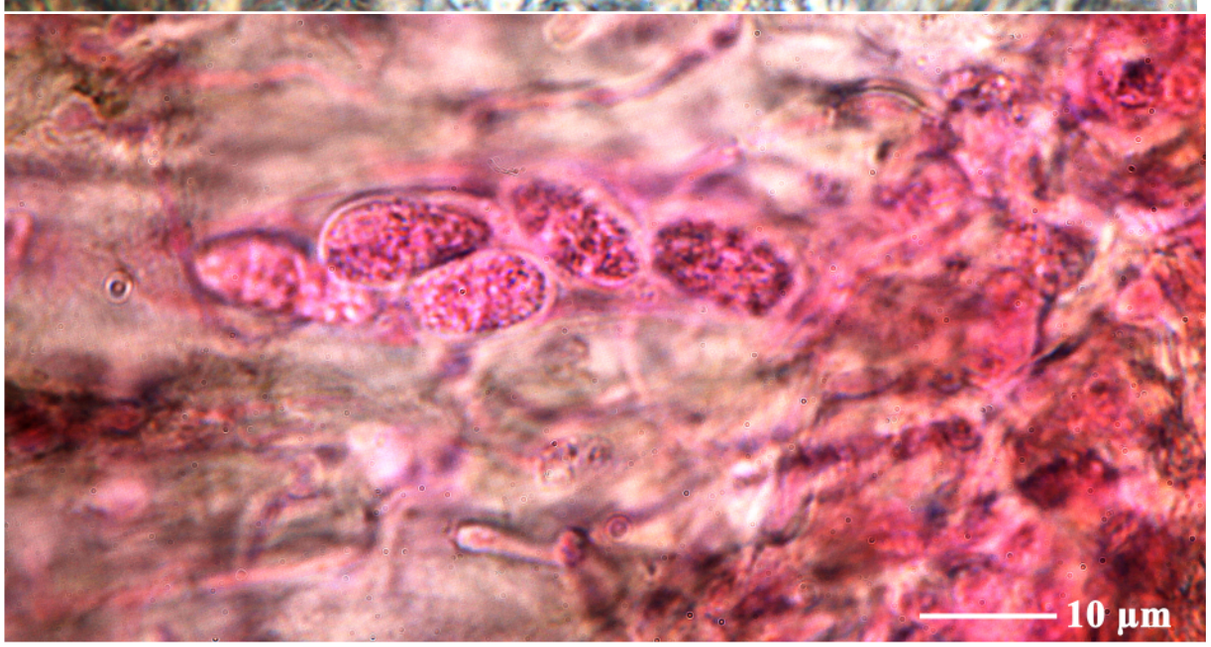
Paraporpidia neotropica

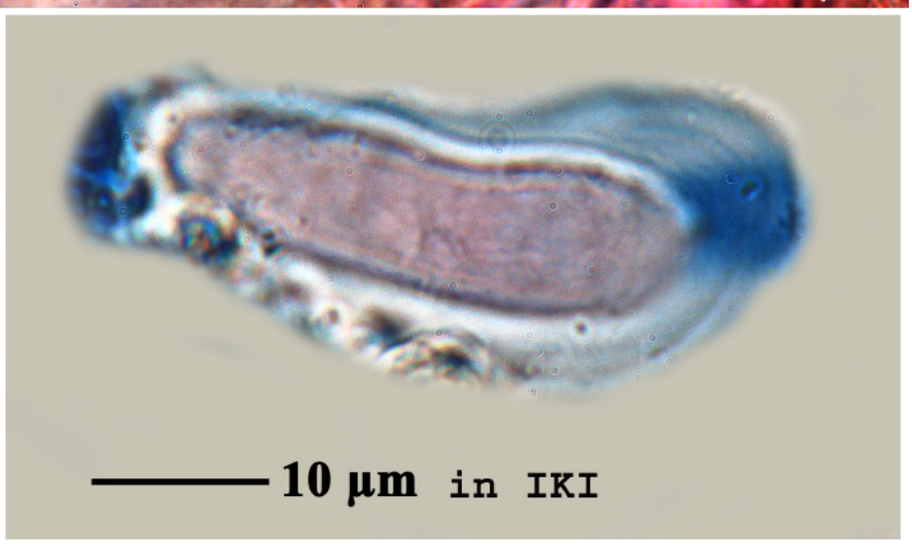




Paraporpidia neotropica



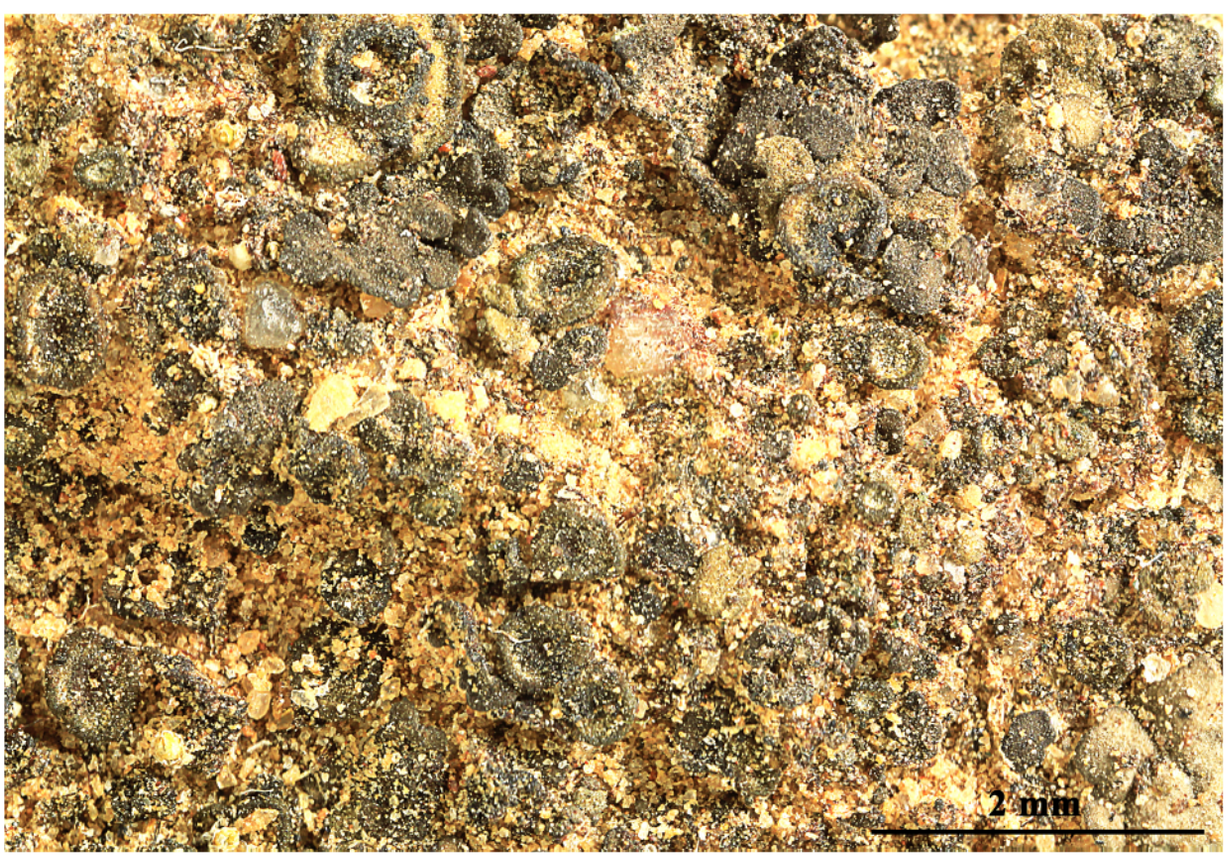


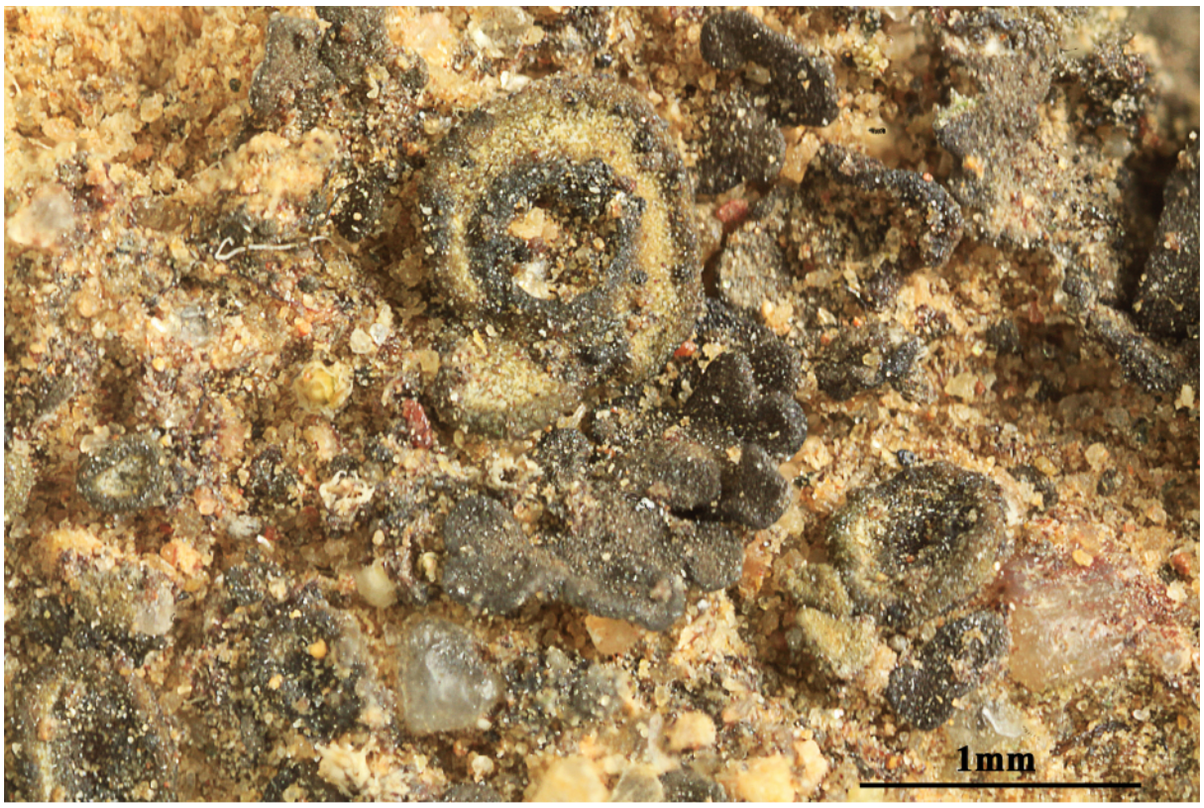


Paraporpidia neotropica

Peltula patellata (Bagl.) Swinscow & Krog, Norw. Jl Bot. 26: 221 (1979)
= *Acarospora patellata* Bagl., Nuovo G. bot. ital. 7(3): 245 (1875)
= *Heppia australiensis* Müll. Arg., Hedwigia 31: 193 (1892)
= *Heppia patellata* (Bagl.) Stizenb., Ber. Tät. St Gall. naturw. Ges.: 190 (1890) [1888-89]
= *Peltula australiensis* (Müll. Arg.) Filson, in Filson & Rogers, Lich. S. Australia: 142 (1979)

[ABL48001], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Eco-parque. 09°39'43" S, 45°40'18" W, 30 m. On soil in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48001), 15. November 2018, det. A. Aptroot 2018. - Squamules orbicular to somewhat angulate or lobulate, up to 4 mm diam., plane or ascending towards periphery, with margins generally upcurved, attached to substrate by tuft of hyphae. Upper side pale to olivaceous brown or greyish green, matt to slightly pubescent, with thin necrallayer. Medulla mainly of loose hyphae but with some paraplectenchymatous cells. Under side dark brown to black, cortex of 2-8 rows of large isodiametric cells. Isidia and soredia absent. Apothecia one to several per squamule, partly immersed, with conspicuous red discs up to 1.5 mm diam., some with thalline rim. Spores subglobose to ellipsoid, 6-9 x 3-6 µm.







wet

Peltula patellata

Peltula placodizans (Zahlbr.) Wetmore, Ann. Mo. bot. Gdn 57(2): 179 (1971) [1970]

= *Endocarpiscum placodizans* (Zahlbr.) Fink, Mycologia 1(2): 87 (1909)

= *Heppia placodizans* Zahlbr., Bull. Torrey bot. Club 35: 299 (1908)

= *Peltula decorticans* (Müll. Arg.) Filson, Muelleria 6(6): 502 (1988)

= *Placoheppia placodizans* (Zahlbr.) Oxner, Flora Lischaĭnikiv Ukraïni (Kiev) 1: 407 (1956)

= *Pyrenopsidium decorticans* Müll. Arg., Hedwigia 31: 191 (1892)

= *Solorinaria placodizans* (Zahlbr.) Gyeln., Feddes Repert. Spec. Nov. Regni veg. 38: 307 (1935)

[ABL48040], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Eco-parque. 09°39'43" S, 45°40'18" W, 30 m. On siliceous rock in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48040), 15. November 2018, det. A. Aptroot 2018. - Thallus compound, areolate in the centre, effigurate-lobate at the margin; central squamules erect, cylindrical, plane or convex and often sorediate at the top, brownish to olive-green, to 1.3 mm tall, 0.1–0.5 mm thick. Upper cortex absent; epinecral layer 8–15 µm thick, yellowish. Medulla composed of loosely interwoven hyphae with globose to elongate cells, with numerous air spaces; photobiont layer 50–90 µm thick. Lower cortex poorly developed, paraplectenchymatous, 20–40 µm thick, with globose hyphal cells 3–8 µm diam. Apothecia rare, immersed, usually 1 per squamule, restricted to central squamules; disc punctiform, to 0.3 mm diam., yellowish brown to blackish brown; hymenium wine-red in iodine. Asci clavate to obclavate; walls orange in iodine, blue after pretreatment with KOH. Ascospores more than 64 per ascus, globose to ellipsoidal, 4.5–8 × 3–4.5 µm. Pycnidia immersed, simple, globose; conidia fusiform, 3.5 × 1.5 µm.







wet

Peltula placodizans

Phaeographis lindigiana Müll. Arg., Flora, Regensburg 65(24): 383 (1882)
= *Graphis lindigiana* (Müll. Arg.) Harm. [as 'liredigiana'], Annals Cryptog. Exot. 1: 335 (1928)

[42913], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42913), 27. October 2017, det. A. Aptroot 2017. - Thallus pale fawn, thin, smooth, glossy. Ascomata conspicuous, scattered, sessile, open, straight, curved or sinuous, often branched, terminally acute, with a thin thalline margin, 2–4 (–6) mm long, 0.15–0.25 mm wide. Disc black, white-pruinose. Proper exciple apically carbonised. Hymenium 100–125 µm thick, inspersed. Ascospores 8 per ascus, overlapping-uniseriate, pale brown, 4-locular, 17–20 × 6–8 µm. CHEMISTRY: No lichen compounds detected.





Phaeographis lindigiana

Phaeographis subbifida (Zenker) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 23 (1887)
= *Graphis subbifida* Zenker, in Göbel & Kunze 1829

[ABL28583], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 59°57' W, 2°56' S. Leg. M. Cáceres & A. Aptroot, (no. 28583), 3.-8. June 2016, det. A. Aptroot 2016. -
Thallus K+ yellow then red. Hymenium inspersed. Spores 5-septate, brown, 22x7 µm.

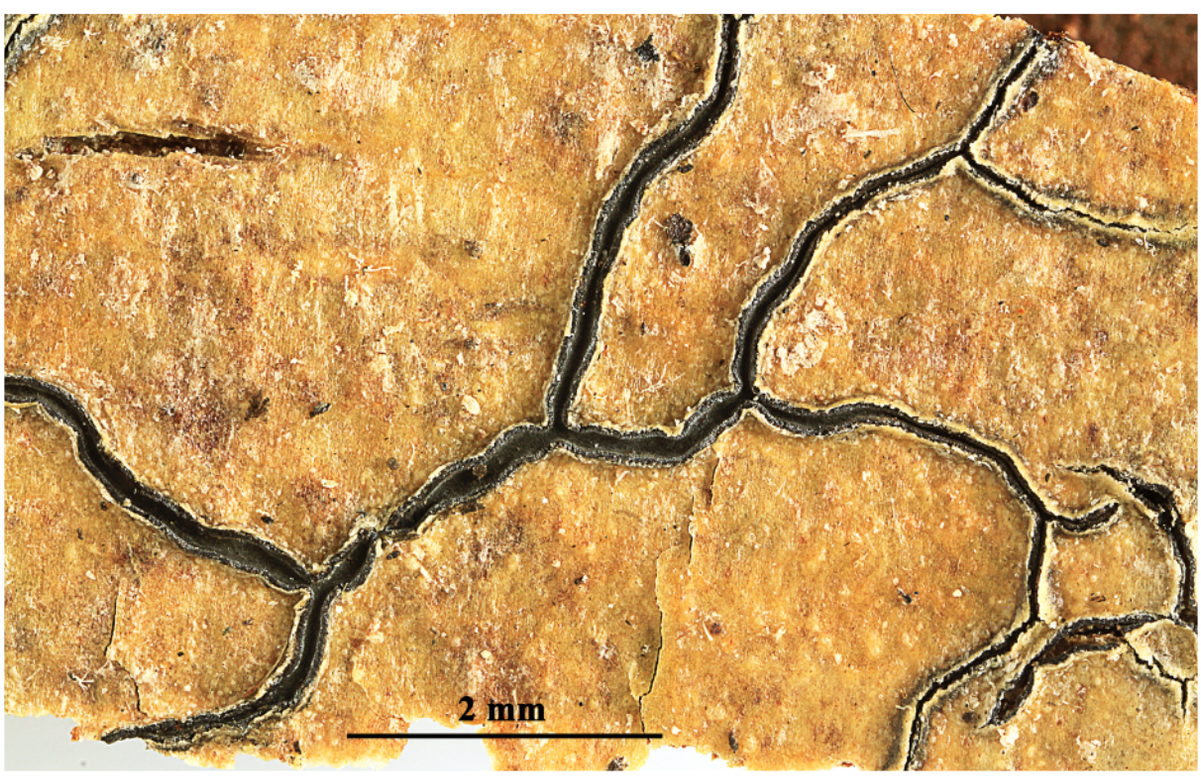




Phaeographis subbifida

Phaeographis tortuosa (Ach.) Müll. Arg., Mém. Soc. Phys. Hist. nat. Genève 29(no. 8): 26 (1887)
= *Graphis tortuosa* Ach. 1814

[ABL11834], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On tree bark in primary rain forest. 8°24'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11834), 15. March 2012, det. A. Aptroot 2012. - Thallus whitish-grey, yellowish, dull, c. 0.1 mm thick. Lirellae long, sparsely branched. Disc blck, open, immersed, white pruinose, 2-3 x 0.1-0.2 mm diam. Exciple in upper parts carbonized in lower parts light yellow brown. Paraphyses 1.5-2 µm wide, somewhat branched at the tips. Hymenium 120-130 µm, inspersed, I-. Spores, brown, 4/ascus, muriform, 6/2-3 - 9/2-3 celled, 25-40 x 8-14 µm, I+ brown-red. Chemistry: No lichen substances detected with TLC.



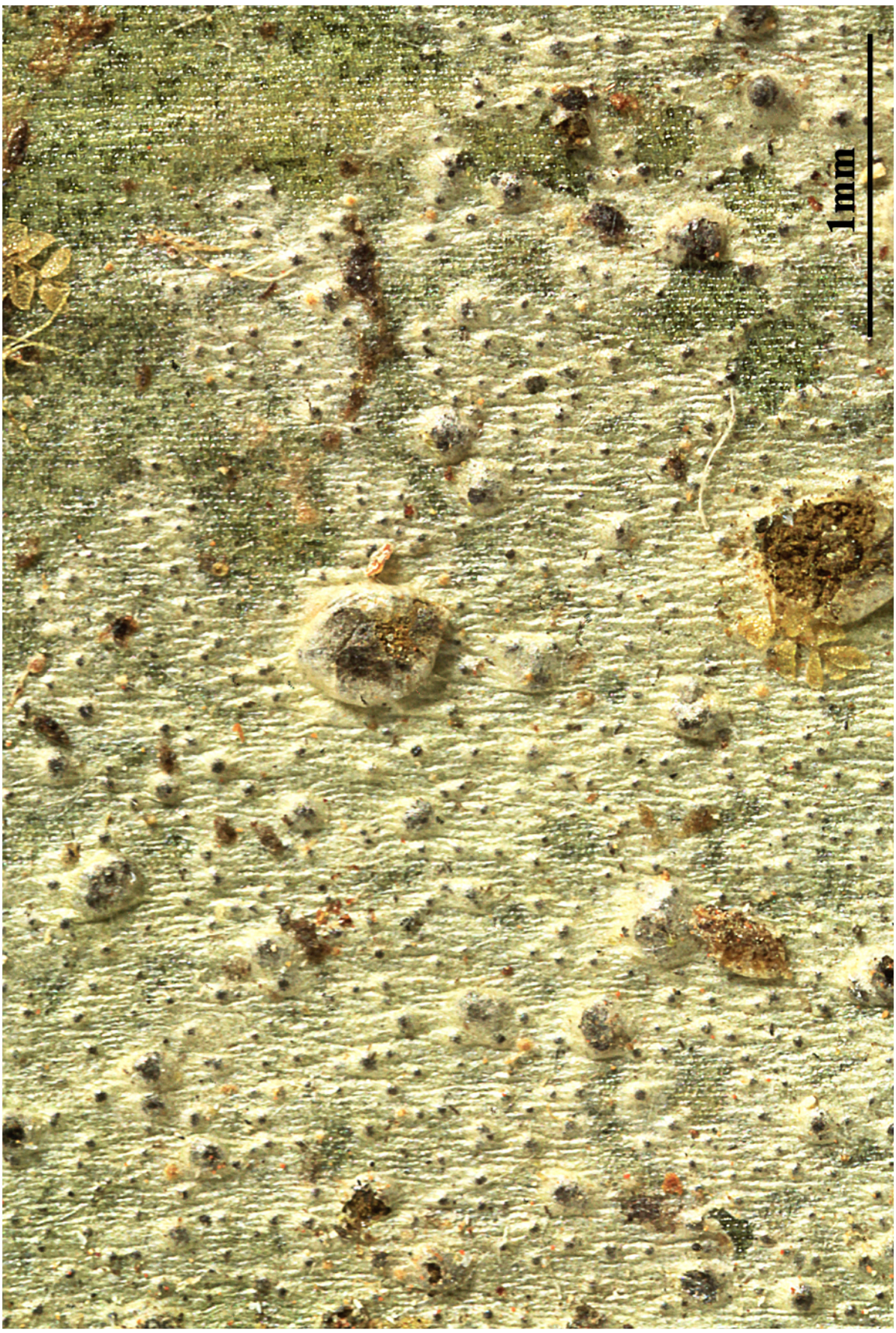


Phaeographis tortuosa

Phyllobathelium chlorogastricum (Müll. Arg.) Aptroot & Lücking, Lichenologist 48(6): 976 (2016)
= *Campylothelium chlorogastricum* (Müll. Arg.) Aptroot, in Aptroot, Lücking, Sipman, Umaña & Chaves, Biblthca Lichenol. 97: 53 (2008)
= *Cryptothelium chlorogastricum* (Müll. Arg.) Zahlbr., Cat. Lich. Univers. 1: 521 (1922)
= *Heufleria chlorogastrica* Müll. Arg., Flora, Regensburg 66(16): 243 (1883)
= *Phyllobathelium thaxteri* (Vain.) Zahlbr., Cat. Lich. Univers. 8: 142 (1931) [1932]
= *Thelenella thaxteri* Vain., Proc. Amer. Acad. Arts & Sci. 58(3): 144 (1923)

[ABL50710aa], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710aa), 21. June 2019, det. A. Aptroot 2019. -

Thallus continuous, 15–65 mm across and 20–50(–150) µm thick, minutely verrucose, greenish grey and with distinct metallic look; verrucae wartshaped to conical, 0.03–0.1 mm diam., dark greenish grey to black. Photobiont cells angular-rounded, 8–15 x 3–6(–10) µm, in irregular plates. Perithecia broadly wart-shaped with strongly irregular surface, top depressed, 0.5–1 mm diam. and 200–300 µm high, dark greenish grey to greyish black. Excipulum prosoplectenchymatous, 10–20 µm thick, colorless. Involucrellum formed by 3–7 large clusters of dark brown to black granules, 100–150(–250) µm thick, externally covered by algiferous, thallus layer. Asci clavate, 140–190 x 35–60 µm. Ascospores (4–)8 per ascus, fusiform-ellipsoid, muriform, with distinct constriction at median septum, 50–80 x 17–35 µm, 2.5–3.5 times as long as broad. Pycnidia in groups of 3–7(–15) immersed in irregular, prominent pseudostromata; individual pycnidia globose, 0.1–0.2 mm diam., visible as black dots. Macroconidia oblongellipsoid, muriform, 150–220 x 28–35 µm, each end with several gelatinous appendages, 20–30 µm long and 2–3 µm thick. Microconidia not observed. Chemistry: not tested.



Phyllobathelium chlorogastricum



Phyllobathelium chlorogastricum

Phylloporis phyllogena (Müll. Arg.) Clem., Gen. fung. (Minneapolis): [173] (1909)
= *Phylloporina phyllogena* (Müll. Arg.) Müll. Arg., Lichenes Epiphylli Novi: 22 (1890)
= *Porina phyllogena* Müll. Arg., Flora, Regensburg 66: 335 (1883)
= *Porinomyces phyllogenus* (Müll. Arg.) Bat. [as 'phyllogena'], Atas Inst. Micol. Univ. Recife 5: 410 (1967)
= *Strigula phyllogena* (Müll. Arg.) R.C. Harris, More Florida Lichens, Incl. 10 Cent Tour Pyrenol. (New York): 159 (1995)

[ABL50710ak], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ak), 21. June 2019, det. A. Aptroot 2019. - Thallus supracuticular, continuous, 5–25 mm across and 7–10 µm thick, smooth, pale grey. Photobiont a species of *Phycopeltis*, cells rectangular, 5–14 x 3–5 µm, forming nets with distinct interspaces. Perithecia completely exposed, rarely covered by thin, thallus layer, applanately conical, 0.3–0.5 mm diam. and 90–120 µm high, black or rarely greyish black. Excipulum prosoplectenchymatous, 8–12 µm thick, colorless to brown. Involucrellum carbonaceous, 15–25 µm thick, black. Paraphyses unbranched. Asci cylindrical, 25–35 x 4–6 µm. Ascospores uniseriate to irregularly arranged, fusiform-ellipsoid, 1-septate, with slight constriction at septum, 9–12 x 2–3 µm, 3.5–4.5 times as long as broad. Pycnidia exposed, conical, those producing macroconidia 0.1–0.2 mm, those producing microconidia 0.07–0.15 mm diam., black. Macroconidia bacillar, for a long time non-septate but finally 1-septate, 9–11 x 2–2.5 µm. Microconidia fusiformellipsoid, non-septate, 3–5 x 1.5–1.8 µm. Chemistry: no substances detected by TLC.



Phylloporis phyllogena

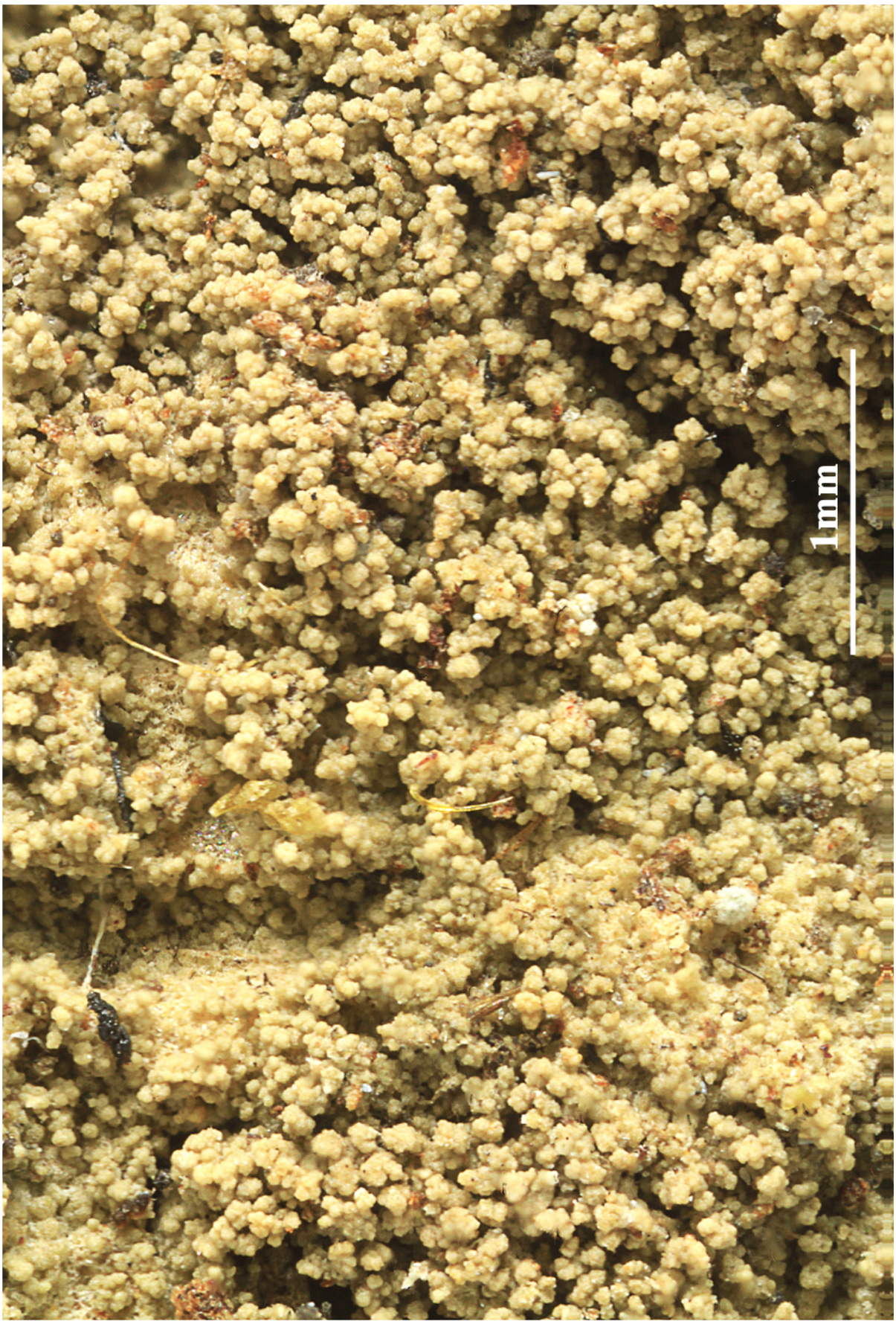


Phylloporis phyllogena

Phyllopsora confusa Swinscow & Krog, Lichenologist 13(3): 229 (1981)

[ABL18263], Brazil, Sergipe, Parque Nacional Serra de Itabaiana, BW foot, 10°45'37" S, 37°22'15" W, 250 m. In transitional forest to caatinga, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18263), 17. Sept 2013, det. A. Aptroot 2013. - Thallus of adjoined or overlapping mainly ascending squamules. Squamules 0.1-0.3 mm wide, elongate to flabellate, much branched, plane to convex. Upper side glabrous, glabrous or with sparse tufts of hyphae at margins. Under side mainly glabrous, pseudocortex of loosely organized hyphae. Hypothallus red, thin. Isidia absent. Apothecia with excipulum usually tinged red in patches, subhymeniallayers colourless. Spores 8-12 x 2.5-3 µm, with indistinct pseudosepta. CHEMISTRY: No lichen substances or traces of triterpenoids.

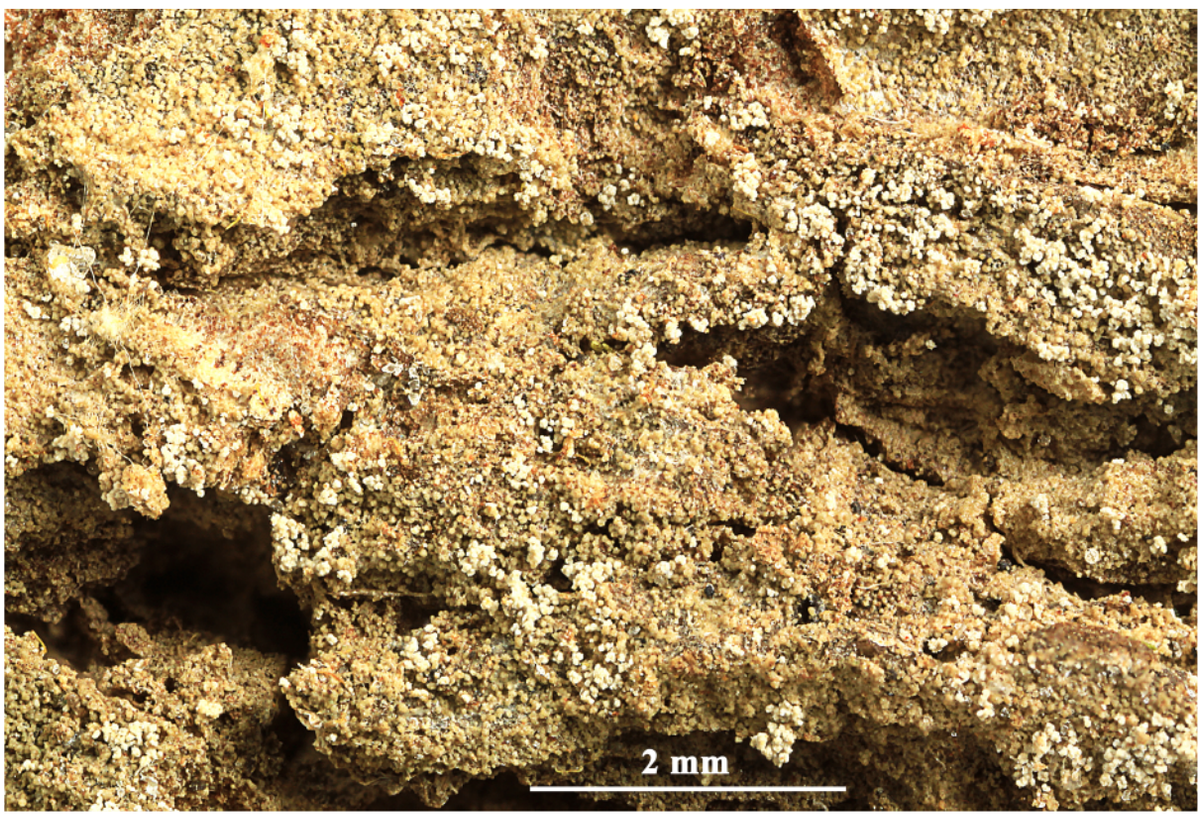




Phyllopsora confusa

Phyllopsora soralifera Timdal, Lichenologist 40(4): 358 (2008)

[ABL180768], Brazil, Sergipe, Santa Luzia do Itanhy, Mata do Crasto. 11°22" S, 37°25" W, 10 m. On tree bark in Atlantic rainforst. Leg. M. Cáceres & A. Aptroot, (no. 18768), 26. March 2014, det. A. Aptroot 2013. - Prothallus not present. Thallus squamulose, effuse. Squamules medium sized, up to 0.5 mm wide, adnate or sometimes weakly ascending, isodiametric or elongated, crenulate to incised, plane to weakly convex; upper side medium green, dull, epruinose; margin concolorous with upper side, not pubescent. Soralia common, developing from the margin of the squamule, soon capitate on the upper side, farinose; soredia up to 40 µm diam. Upper cortex 10–30 µm thick, not containing crystals. Medulla not containing crystals or containing small amounts of crystals not dissolving in K (possibly calcium oxalate) (P-, K-). Apothecia rare (seen in the type material only), up to 0.8 mm diam., rounded, simple or conglomerate, weakly to moderately convex, pale brown, with an indistinct, concolorous margin. Excipulum pale brown to colourless. Hypothecium pale brown to colourless. Epithecium colourless. No crystals in apothecia, all parts K-. Ascospores bacilliform to acicular, with (1–) 3 (–4) indistinct pseudosepta, 17–27.5 x 2–2·5 µm. Pycnidia not seen. Chemistry. No lichen substances detected by TLC.



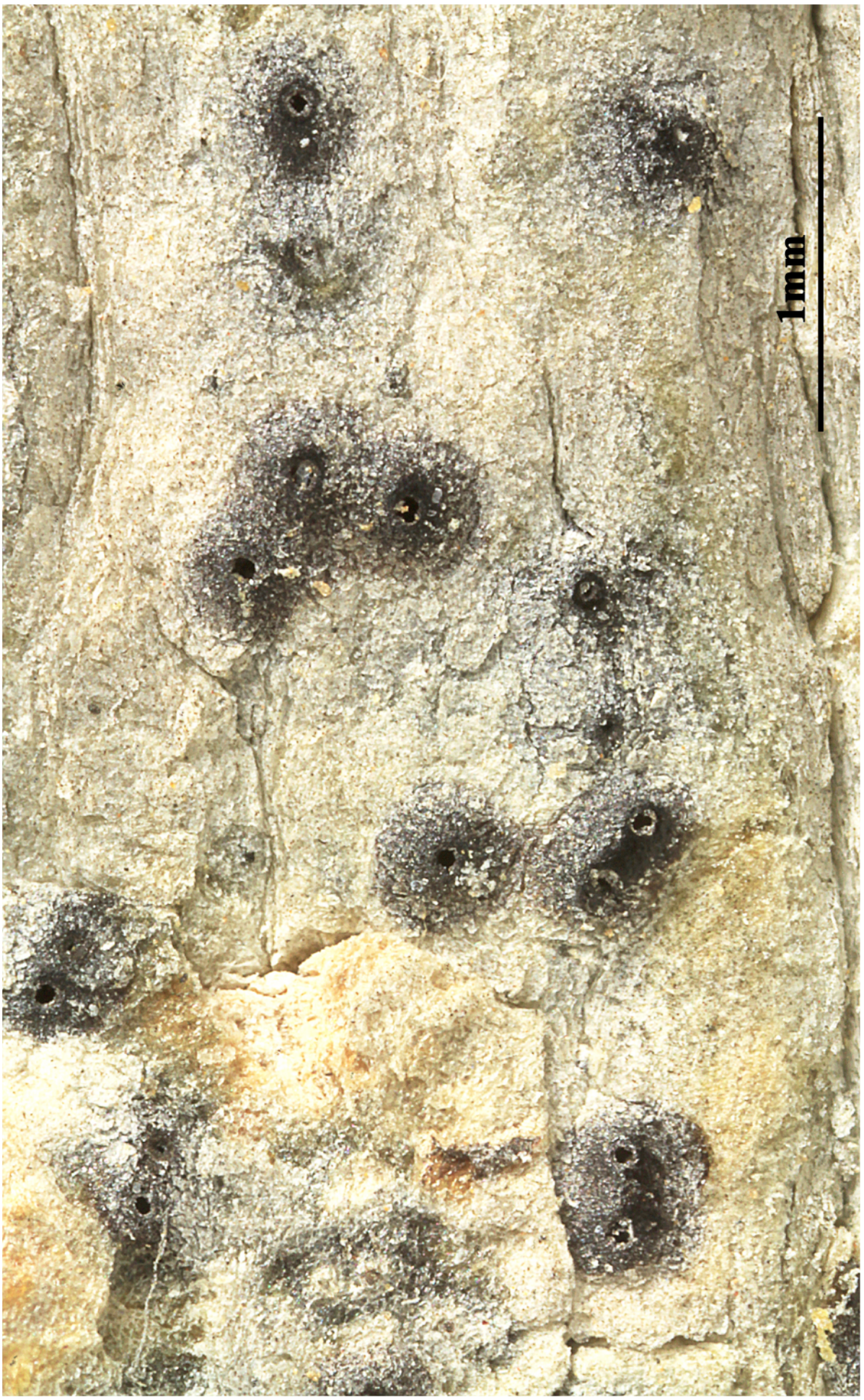


Phyllopsora soralifera

Polymeridium jordanii (C.W. Dodge) Aptroot, Nova Hedwigia 98(1-2): 18 (2013) [2014]
= *Pseudopyrenula jordanii* C.W. Dodge, Beih. Nova Hedwigia 12: 11 (1964)

[ABL48007], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Ecoparque. 09°39'43" S, 45°40'18" W, 30 m. On tree bark in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48007), 15. November 2018, det. A. Aptroot 2018. - Thallus ecorticate, white, UV–. Perithecia solitary. Ostiole apical. Hamathecium not inspersed, filaments profusely anastomosing. Ascospores 8/ascus, IKI–, 4–7-septate, 21–30 × 5–9 µm, not ornamented, wall not thickened. Chemistry: no substances detected.

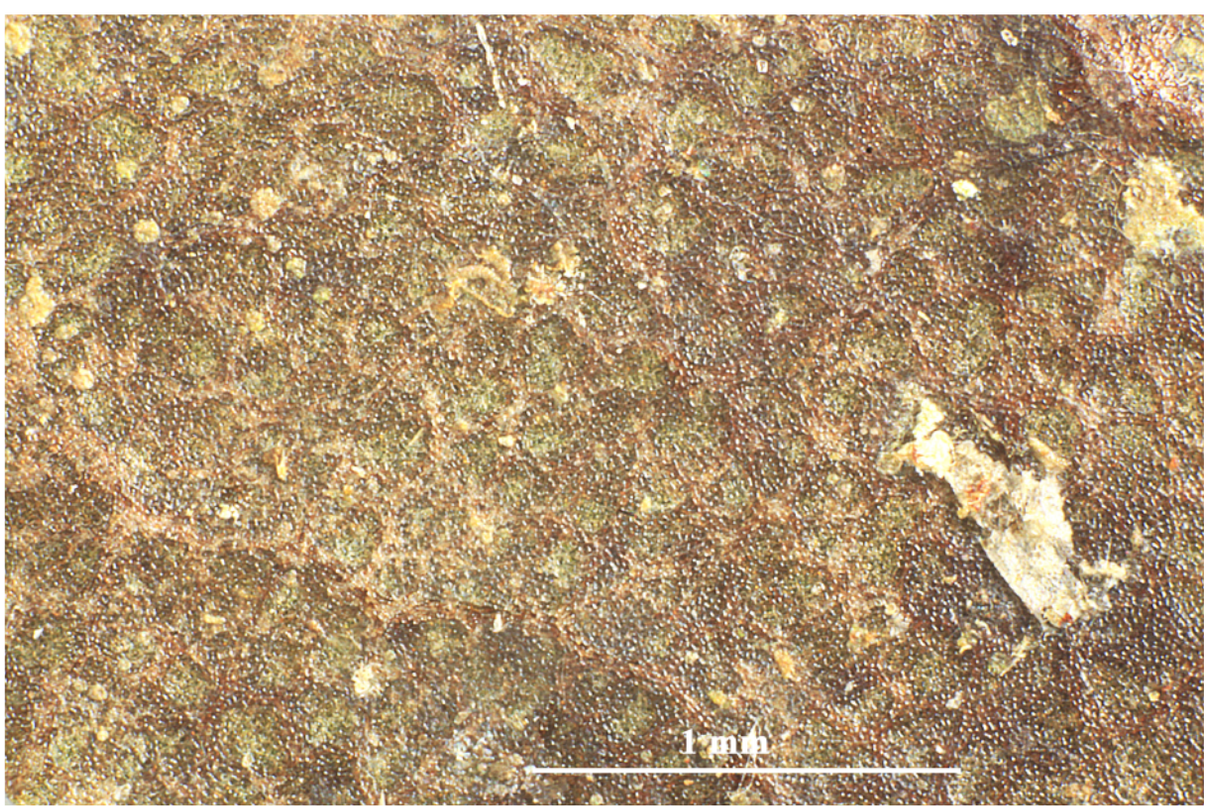




Polymeridium jordanii

Porina alba (R. Sant.) Lücking, Biblthca Lichenol. 88: 412 (2004)
= *Phyllophiale alba* R. Sant., Symb. bot. upsal. 12(no. 1): 557 (1952)

[ABL50710k], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710k), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, minutely uneven-rugose, 5–10 mm across and 10–15 µm thick, pale greyish yellow to greenish grey, slightly shiny, incrusted with calcium oxalate crystals, often isidiate; isidia (previously distinguished as *Phyllophiale alba*) scattered to dense (when perithecia are absent), discshaped, 0.15–0.25 mm diam., white. Photobiont cells angular-rounded, 12–22 x 3–5 µm, in irregular plates. Perithecia immersed-erumpent to adnate, young ones applanately lens-shaped, mature ones lens-shaped to applanately wart-shaped, not sharply delimited from surrounding thallus, 0.4–0.7 mm diam. and 120–180 µm high, glabrous, surface smooth, of same color as thallus but often with red tinge. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 10–15 µm thick, yellow, K+ brownish orange, externally covered by 8–12 µm thick crystallostratum and 5–10 µm thick, algiferous, thallus layer. Asci obclavate, 80–100 x 9–12 µm. Ascospores bacillar, 7-septate, without constrictions at septa, 35–45 x 3–4.5 µm, 10–13 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.

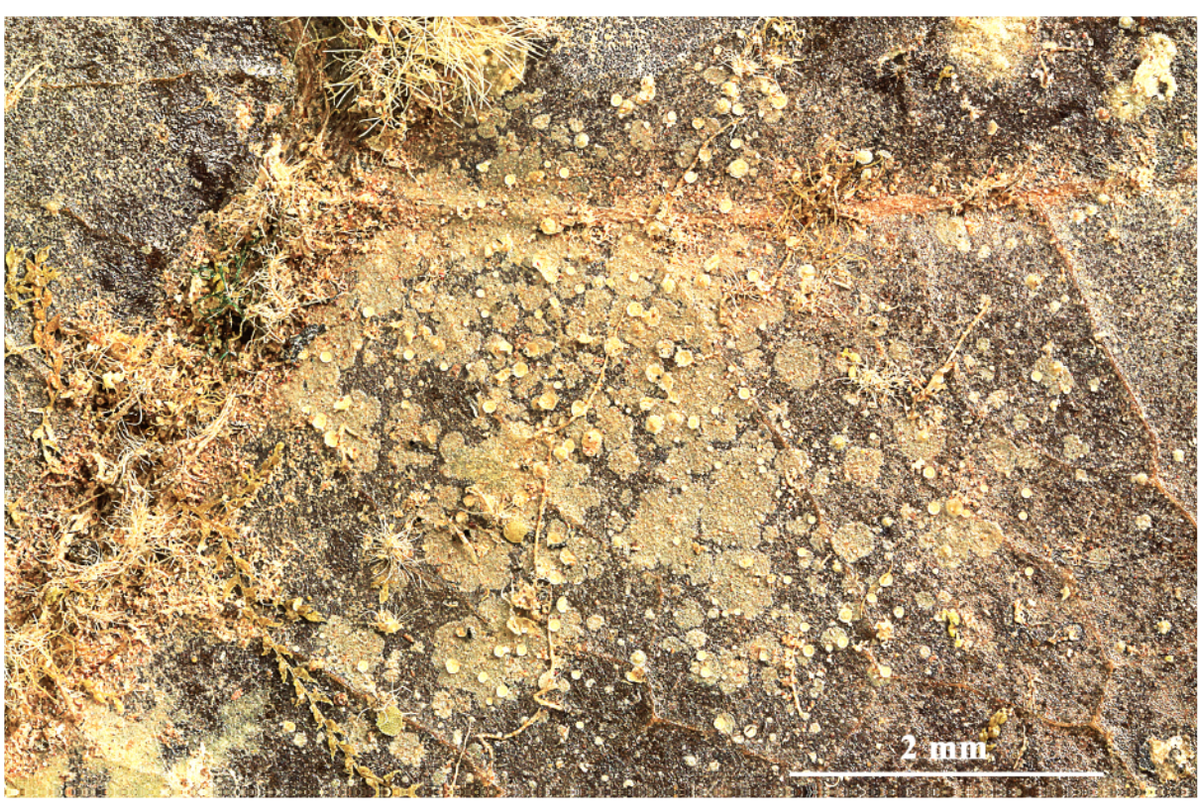




Porina alba

Porina alba (R. Sant.) Lücking, Biblthca Lichenol. 88: 412 (2004)
= *Phyllophiale alba* R. Sant., Symb. bot. upsal. 12(no. 1): 557 (1952)

[ABL18186], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18186), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous, minutely uneven-rugose, 5–10 mm across and 10–15 µm thick, pale greyish yellow to greenish grey, slightly shiny, incrusted with calcium oxalate crystals, often isidiate; isidia (previously distinguished as *Phyllophiale alba*) scattered to dense (when perithecia are absent), discshaped, 0.15–0.25 mm diam., white. Photobiont cells angular-rounded, 12–22 x 3–5 µm, in irregular plates. Perithecia immersed-erumpent to adnate, young ones applanately lens-shaped, mature ones lens-shaped to applanately wart-shaped, not sharply delimited from surrounding thallus, 0.4–0.7 mm diam. and 120–180 µm high, glabrous, surface smooth, of same color as thallus but often with red tinge. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 10–15 µm thick, yellow, K+ brownish orange, externally covered by 8–12 µm thick crystallostratum and 5–10 µm thick, algiferous, thallus layer. Asci obclavate, 80–100 x 9–12 µm. Ascospores bacillar, 7-septate, without constrictions at septa, 35–45 x 3–4.5 µm, 10–13 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.





Porina alba

Porina epiphylla Fée, Essai Crypt. Exot. (Paris): 76 (1825) [1824]
= *Lecanora epiphylla* (Fée) Fée, Dict. Class. Hist. Nat. 9: 575 (1826)
= *Phylloporina epiphylla* (Fée) Müll. Arg., Lichenes Epiphylli Novi: 21 (1890)
= *Pyrenula epiphylla* (Fée) Plitt, Bryologist 24(5): 74 (1921)
= *Verrucaria epiphylla* (Fée) Eschw., in Martius, Fl. bras. enum. pl. 1(1): 141 (1833)

[ABL50710g], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710g), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but sometimes marginally dispersed, minutely uneven, 10–25 mm across and 10–15 µm thick, pale greyish green (herbarium specimens often with yellow tinge), slightly shiny, incrusted with calcium oxalate crystals. Photobiont cells angular-rounded, 6–12 x 4–7 µm, in irregular plates. Perithecia adnate, young ones lens-shaped, mature ones lens-shaped to hemispherical, 0.25–0.45 mm diam. and 120–160 µm high, glabrous, surface smooth, of same color as thallus but sometimes with slight red tinge. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 8–15 µm thick, yellow, K+ brownish orange, externally covered by 7–12 µm thick crystallostratum and 5–12 µm thick, algiferous, thallus layer. Asci obclavate, 55–75 x 8–11 µm. Ascospores oblong, 7-septate, without constrictions at septa, 26–33 x 3–4 µm, 8–9 times as long as broad, colorless. Pycnidia not observed.





Porina epiphylla

Porina epiphylla Fée, Essai Crypt. Exot. (Paris): 76 (1825) [1824]
= *Lecanora epiphylla* (Fée) Fée, Dict. Class. Hist. Nat. 9: 575 (1826)
= *Phylloporina epiphylla* (Fée) Müll. Arg., Lichenes Epiphylli Novi: 21 (1890)
= *Pyrenula epiphylla* (Fée) Plitt, Bryologist 24(5): 74 (1921)
= *Verrucaria epiphylla* (Fée) Eschw., in Martius, Fl. bras. enum. pl. 1(1): 141 (1833)

[ABL50710ak], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ak), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous but sometimes marginally dispersed, minutely uneven, 10–25 mm across and 10–15 µm thick, pale greyish green (herbarium specimens often with yellow tinge), slightly shiny, incrusted with calcium oxalate crystals. Photobiont cells angular-rounded, 6–12 x 4–7 µm, in irregular plates. Perithecia adnate, young ones lens-shaped, mature ones lens-shaped to hemispherical, 0.25–0.45 mm diam. and 120–160 µm high, glabrous, surface smooth, of same color as thallus but sometimes with slight red tinge. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 8–15 µm thick, yellow, K+ brownish orange, externally covered by 7–12 µm thick crystallostratum and 5–12 µm thick, algiferous, thallus layer. Asci obclavate, 55–75 x 8–11 µm. Ascospores oblong, 7-septate, without constrictions at septa, 26–33 x 3–4 µm, 8–9 times as long as broad, colorless. Pycnidia not observed.

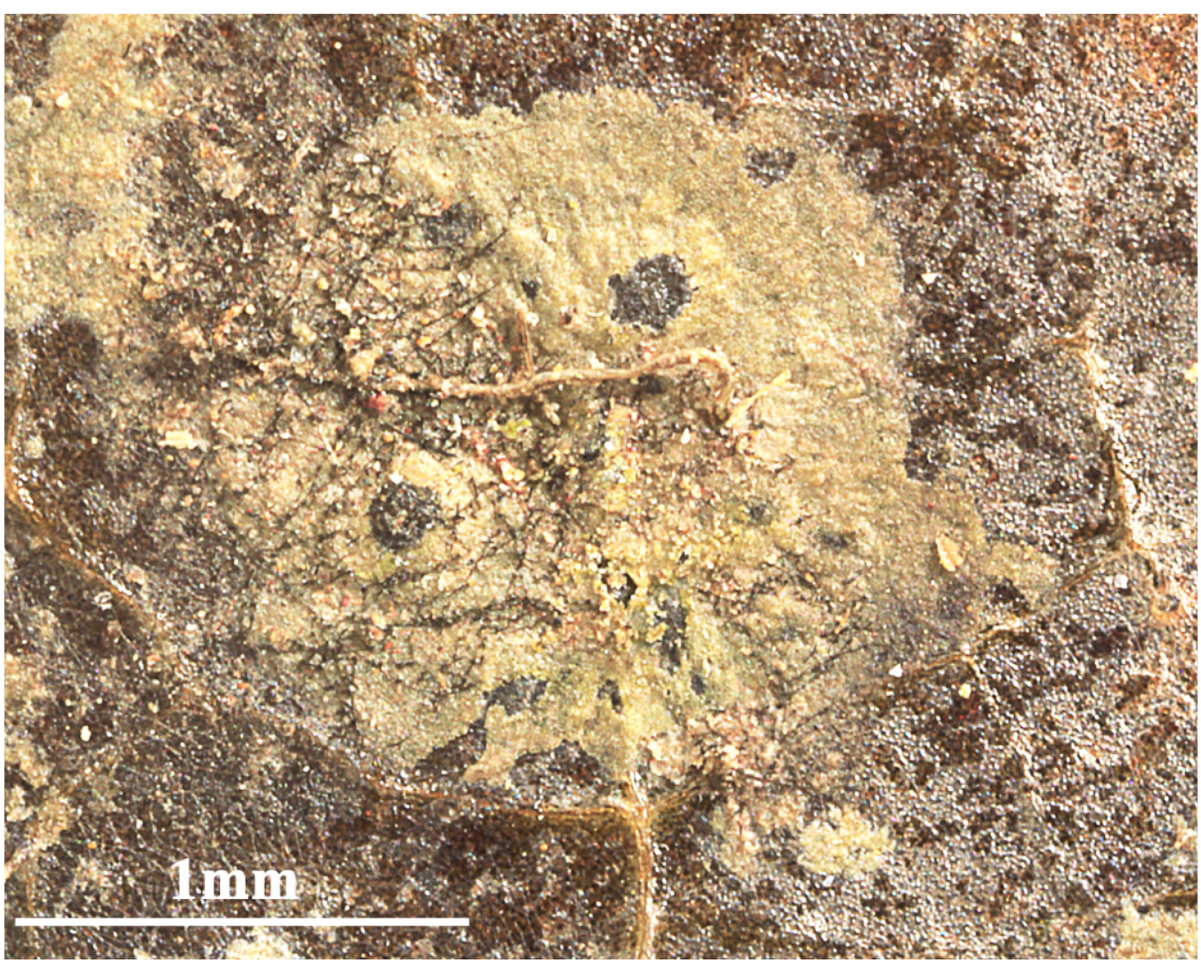




Porina epiphylla

Porina fusca Lücking, Nova Hedwigia 52(3-4): 283 (1991)

[ABL18182], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18182), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous but often laciniate, smooth, 5–15 mm across and 10–15 µm thick, yellowish brown to brown, slightly shiny, often isidiate; isidia (previously distinguished as Phyllophiale fusca) scattered to dense (when perithecia are absent), disc-shaped, 0.1–0.15 mm diam., brown. Photobiont cells angular-rounded, 6–12 x 4–6 µm, in irregular plates. Perithecia sessile, subglobose, 0.15–0.25 mm diam. and 120–150 µm high, glabrous, surface smooth, yellowish brown to brown, slightly shiny. Excipulum 5–10 µm thick, reddish yellow, K+ orange-red. Involucrellum not distinctly separated from excipulum and not reaching substratum, 5–10 µm thick, brownish yellow, K+ brownish red. Asci obclavate, 50–60 x 5–7 µm. Ascospores ellipsoid, 3-septate, without constrictions at septa, 13–18 x 3–3.5 µm, 4–6 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.



Porina guianensis Lücking & Vězda, Willdenowia 28(1/2): 205 (1998)
= *Porina guianensis* f. *pentaseptata* Lücking, Fl. Neotrop., Monogr. 103: 336 (2008)

[ABL18187], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18187), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous, distinctly verrucose-rugose, 3–7 mm across and 7–12 µm thick, pale greyish yellow to orange-yellow, matt; verrucae 0.07–0.1 mm diam., partly elongate (up to 0.3 mm long), filled with clusters of calcium oxalate crystals. Photobiont cells rectangular, 12–20 x 4–6 µm, in radiate plates. Perithecia adnate, young ones hemispherical, mature ones wart-shaped, 0.2–0.3 mm diam. and 120–160 µm high, glabrous, surface smooth, of same color as thallus but often with red tinge. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 5–15 µm thick, yellow, K+ brownish orange, externally covered by 8–12 µm thick crystallostratum and 5–10 µm thick, algiferous, thallus layer. Asci obclavate, 50–70 x 12–16 µm. Ascospores oblong-ellipsoid, 3–5-septate, without constrictions at septa, 18–24 x 3–4 µm, 6–7 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.





Porina guianensis

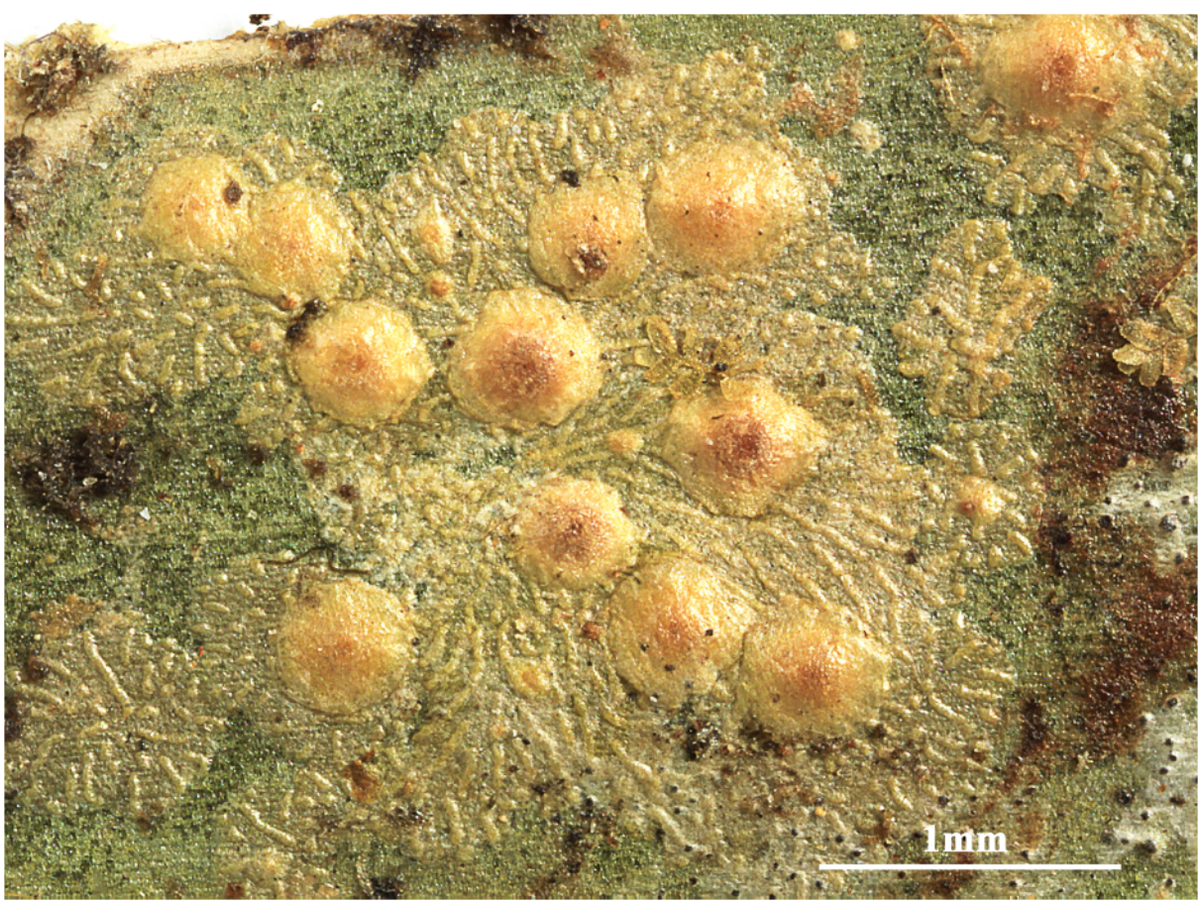
Porina imitatrix Müll. Arg., Flora, Regensburg 73: 196 (1890)

[ABL50710h], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710h), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, smooth or with uneven surface, 15–50 mm across and 15–30(–100) µm thick, green, shiny, evenly incrusted with calcium oxalate crystals in well-developed medullar layer; 1–3 mm broad, purplish black prothallus present. Photobiont *Trentepohlia*, cells angular-rounded, 6–12 x 4–6(–10) µm, in irregular plates or short threads. Perithecia immersed-erumpent to adnate, young ones lensshaped, mature ones lens-shaped to wart-shaped, 0.6–1.0 mm diam. and 170–220 µm high, glabrous, surface smooth to slightly uneven, of same color as thallus. Excipulum 15–30 µm thick, colorless to pale yellow, K+ orange. Involucrellum 20–40 µm thick, yellow, K+ brownish orange, externally covered by 7–15 µm thick crystallostratum and 5–15 µm thick, algiferous, thallus layer. Asci obclavate, 100–150 x 15–35 µm. Ascospores fusiform, 7(–9)-septate, without constrictions at septa, 40–65 x 6–10 µm, 5–6 times as long as broad, colorless, with 1–3 µm thick halo. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.



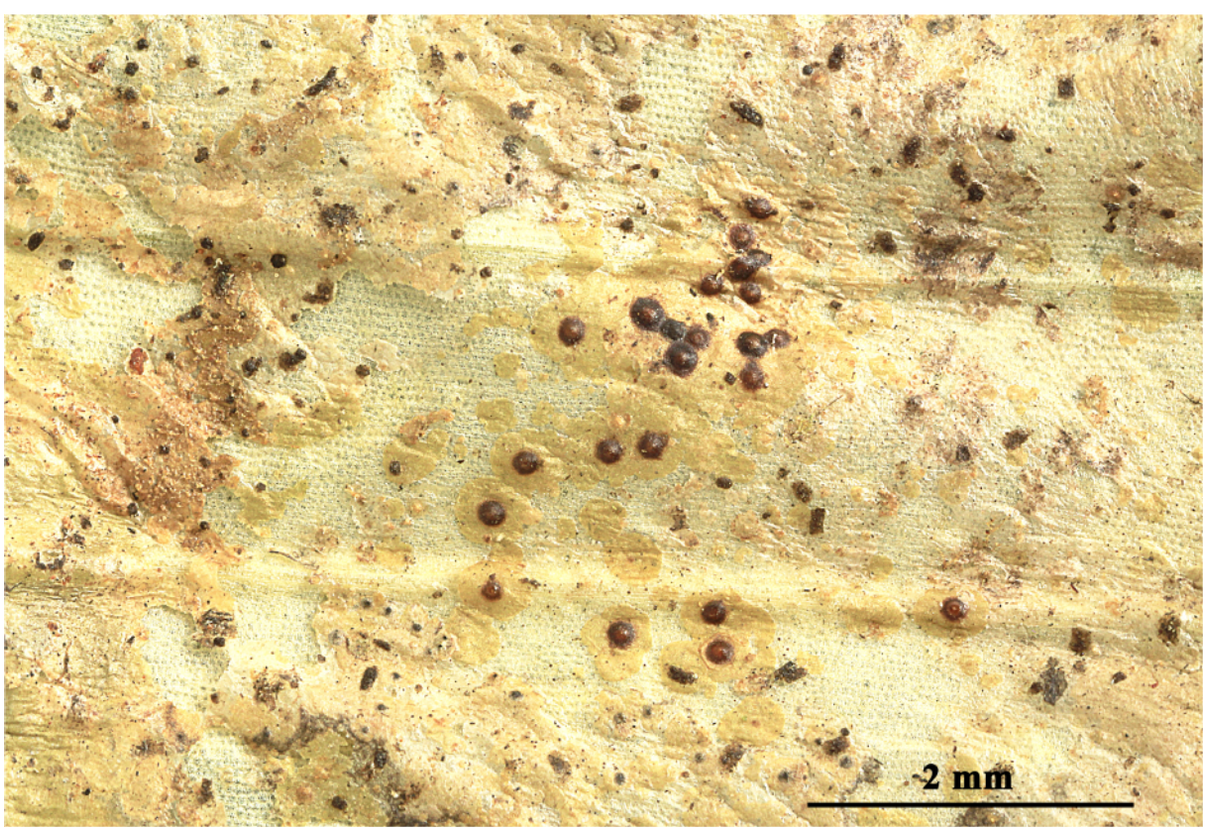
Porina radiata Kalb, Lücking & Vězda, in Lücking & Vězda, Willdenowia 28(1/2): 214 (1998)
= *Porina rugosa* Kalb & Vězda, Nova Hedwigia 55(1-2): 205 (1992)

[ABL50710i], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710i), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, usually confluent patches, distinctly rugose with radiate ridges, 10–20 mm across and 7–12 µm thick, pale greyish green, slightly shiny; ridges 0.07–0.1 mm broad, filled with clusters of calcium oxalate crystals. Photobiont cells rectangular, 10–18 x 4–5 µm, in radiate plates. Perithecia adnate, lens-shaped, 0.3–0.5 mm diam. and 150–200 µm high, glabrous, surface smooth, of same color as thallus but sometimes with brown spot around ostiole. Excipulum 5–10 µm thick, colorless to pale yellow, K+ orange. Involucrellum 7–12 µm thick, yellow, K+ brownish orange, externally covered by 6–12 µm thick crystallostratum and 5–10 µm thick, algiferous, thallus layer. Asci obclavate, 80–100 x 11–14 µm. Ascospores oblong, 7-septate, without constrictions at septa, 28–35(–43) µm 3.5–4.5 µm, 8–10 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.



Porina rubentior (Stirt.) Müll. Arg., Flora, Regensburg 66: 26 (1883)
= *Segestria rubentior* (Stirt.) R.C. Harris, More Florida Lichens, Incl. 10 Cent Tour Pyrenol. (New York): 176 (1995)
= *Phylloporina rubentior* (Stirt.) Müll. Arg., Lichenes Epiphylli Novi: 21 (1890)
= *Verrucaria rubentior* Stirt., Proc. Roy. phil. Soc. Glasgow 11: 107 (1879) [1878]

[ABL11499AAG], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11499AA), 15. March 2012, det. A. Aptroot 2012. - Thallus continuous or dispersed into rounded, usually confluent patches, smooth, 3–8 mm across and 5–8 µm thick, green, shiny. Photobiont cells rectangular, 9–14 x 4–5 µm, in radiate plates. Perithecia adnate, lens-shaped, 0.15–0.2(–0.3) mm diam. and 60–90 µm high, glabrous, surface smooth, dark red to blackish red, shiny. Excipulum 3–6 µm thick, colourless to pale yellow, K+ orange. Involucrellum 7–10 µm thick, dark reddish brown, K+ brownish red, externally covered by 4–7 µm thick, algal layer. Asci obclavate, 35–50 x 7–10 µm. Ascospores oblong, 3-septate, without constrictions at septa, 14–21 x 2.5–3.5 µm, 5–7 times as long as broad, colourless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.





Porina rubentior

Porina rubentior (Stirt.) Müll. Arg., Flora, Regensburg 66: 26 (1883)
= *Verrucaria rubentior* Stirt. 1879
= *Segestria rubentior* (Stirt.) R.C. Harris 1995

[ABL50710b], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710b), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous or dispersed into rounded, usually confluent patches, smooth, 3–8 mm across and 5–8 µm thick, green, shiny. Photobiont cells rectangular, 9–14 x 4–5 µm, in radiate plates. Perithecia adnate, lens-shaped, 0.15–0.2(–0.3) mm diam. and 60–90 µm high, glabrous, surface smooth, dark red to blackish red, shiny. Excipulum 3–6 µm thick, colorless to pale yellow, K+ orange. Involucrellum 7–10 µm thick, dark reddish brown, K+ brownish red, externally covered by 4–7 µm thick, algal layer. Asci obclavate, 35–50 x 7–10 µm. Ascospores oblong, 3-septate, without constrictions at septa, 14–21 x 2.5–3.5 µm, 5–7 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.

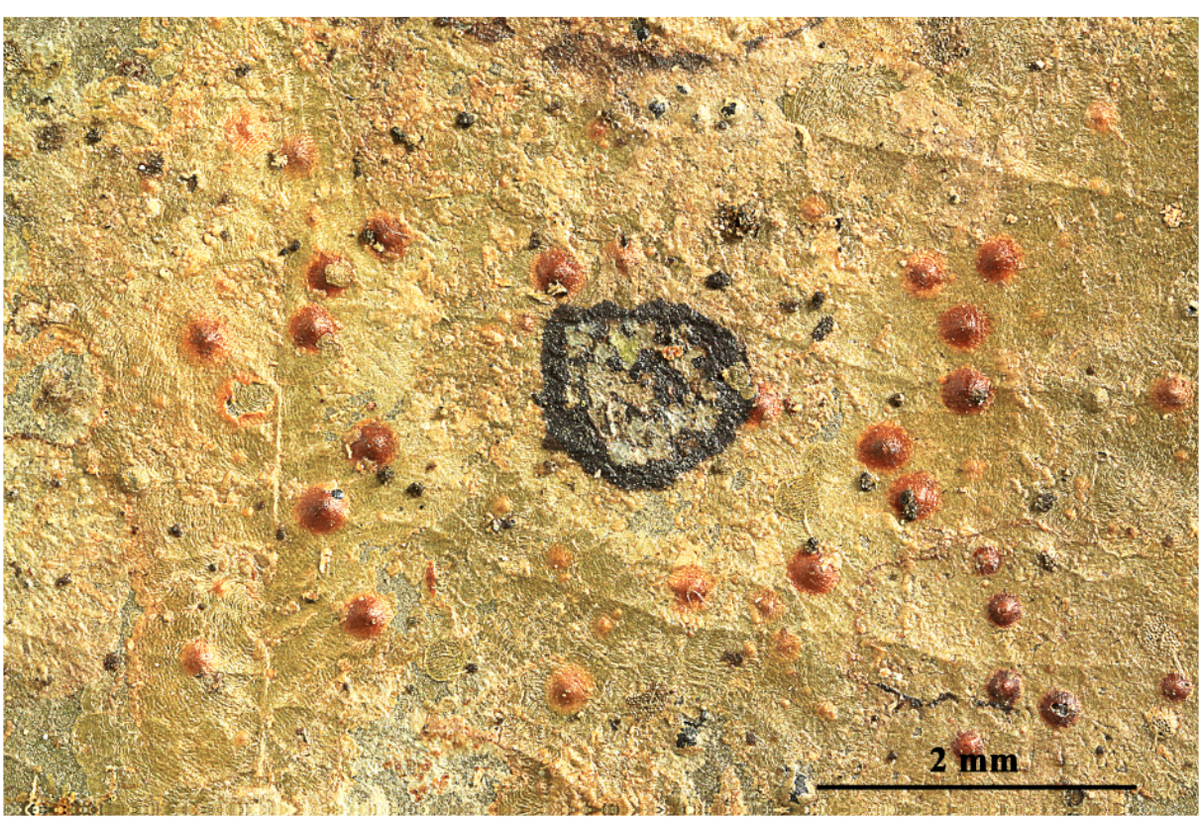




Porina rubentior

Porina rufula (Kremp.) Vain., Acta Soc. Fauna Flora fenn. 7(no. 2): 227 (1890)
= *Phylloporina rufula* (Kremp.) Müll. Arg., Lichenes Epiphylli Novi: 21 (1890)
= Porina pseudofulvella Sérus., Lichenologist 11(2): 182 (1979)
= *Verrucaria rufula* Kremp., Lich. Foliic. Leg. Beccari: 20 (1874)

[ABL50710m], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710m), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, usually confluent patches, smooth, 3–10 mm across and 5–8 µm thick, usually green but becoming yellow in necrotic specimens, slightly shiny. Photobiont cells rectangular, 8–13 x 3–5 µm, in radiate plates. Perithecia adnate, lens-shaped but with central part prominent, hemispherical, 0.15–0.3 (–0.4) mm diam. and 80–120 µm high, glabrous, surface smooth, orange (to light cherry-red), central part translucent. Excipulum 5–10 µm thick, colorless, K+ yellowish orange. Involucrellum 8–12 µm thick, orange, K+ brownish red, externally covered by 3–5 µm thick, algal layer. Asci obclavate, 50–70 x 8–12 µm. Ascospores oblong, 3-septate, without constrictions at septa, 18–27(–31) x 3–5(–6) µm, 5–6 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Porina yellow in perithecial wall.

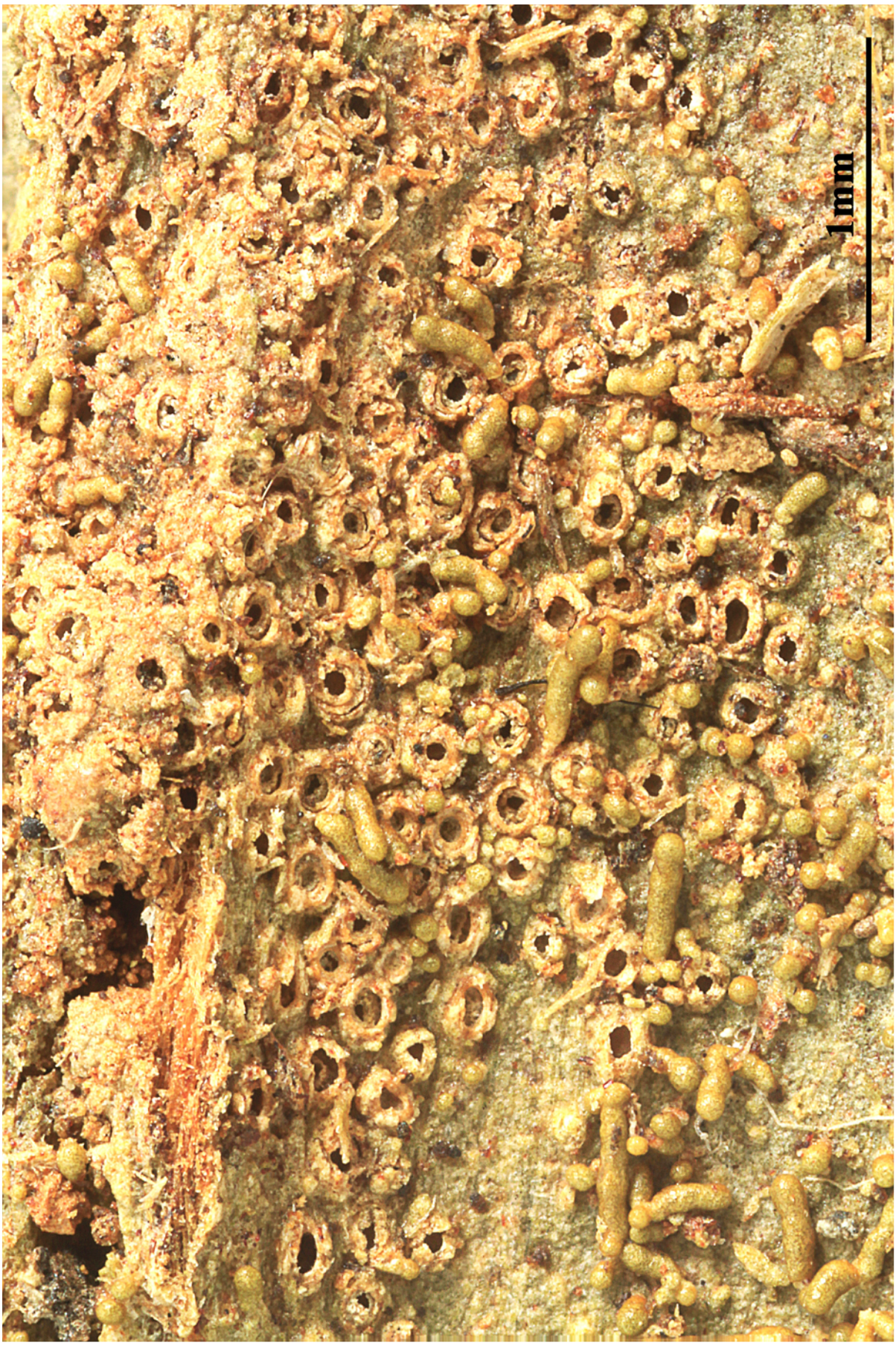




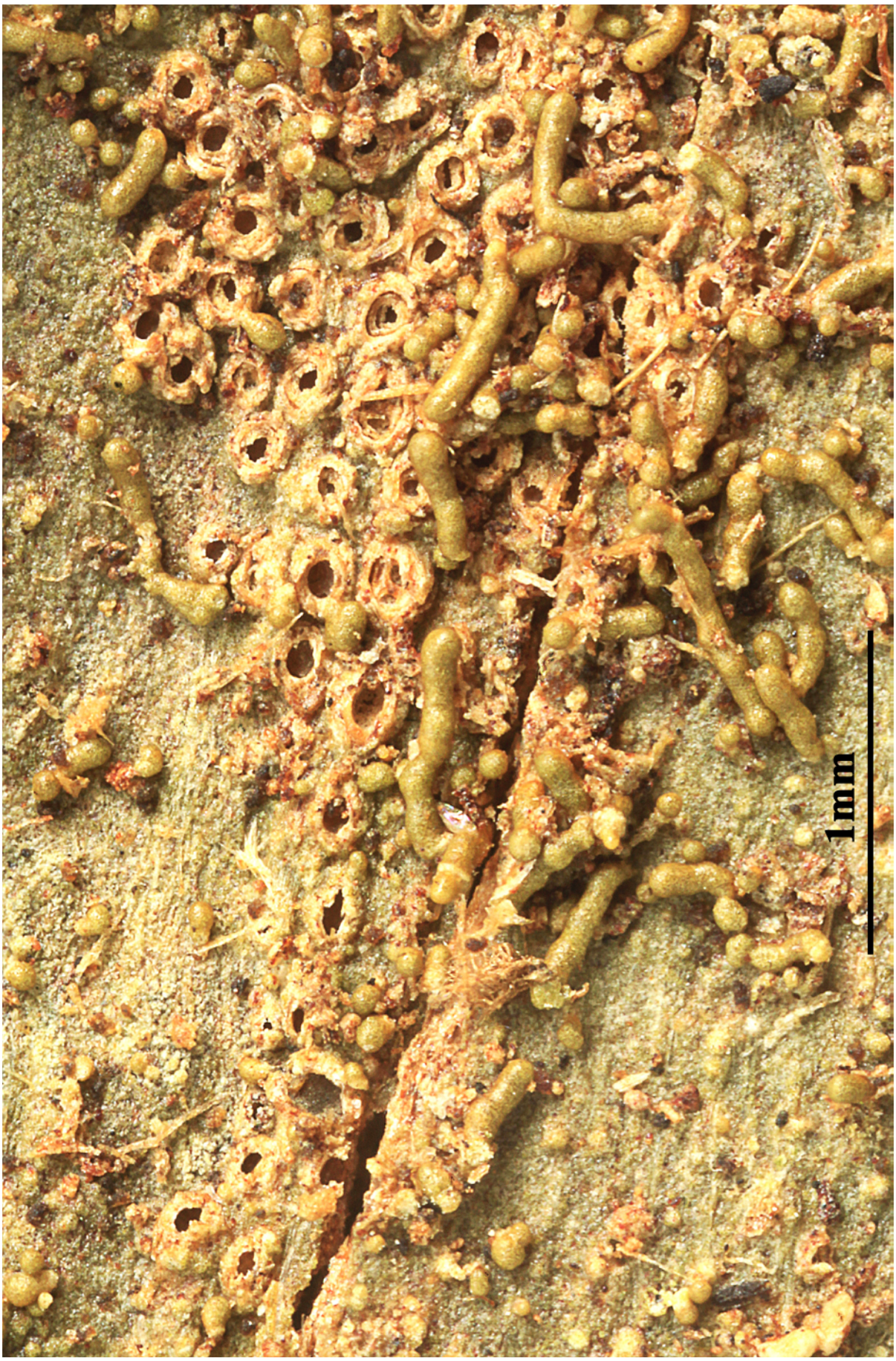
Porina rufula

Pseudochapsa subdactylifera (Sipman) Lücking, in Cáceres, Aptroot, Parnmen & Lücking, Phytotaxa 189(1): 120 (2014)
= *Myriotrema subdactyliferum* Sipman, Trop. Bryol. 5: 86 (1992)

[ABL50726], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50726), 22. June 2019, det. A. Aptroot 2019. - Thallus corticolous, epiperidermal, up to c. 5 cm diam., continuous; surface uneven, olive-green; prothallus absent. Thallus in section 100–150 µm thick, with prosoplectenchymatous cortex, 10–15 µm thick, photobiont layer 15–25 µm thick, and irregular medulla, 70–100 µm thick, strongly encrusted with numerous small, grey crystals that partially dissolve in K, and clusters of calcium oxalate crystals. Photobiont Trentepohlia; cells rounded to irregular in outline, in irregular groups, yellowish green, 6–11 × 6–10 µm. Ascomata rounded, prominent, 1–1.5 mm diam., 0.3–0.5 mm high; disc covered by 0.3–0.6 mm wide pore, invisible, the pore completely filled with the white-topped columella; proper margin distinct, visible as white rim around the pore; thalline margin smooth, olive-green. Excipulum entire, carbonized, 40–70 µm wide, fused with covering thalline layer; laterally covered by algiferous, corticate thallus containing orange-brown, amorphous periderm layer, 100–200 µm thick; columella present, broad-stump-shaped, not divided, completely carbonized but upper part with thick cover incrusted with numerous, small, grey crystals, 300–700 µm wide, carbonized part up to 120 µm high, white cover up to 300 µm high; hypothecium prosoplectenchymatous, 10–20 µm high, hyaline; hymenium 100–120 µm high, hyaline, clear; epithecium indistinct, 5–10 µm high, hyaline. Paraphyses unbranched, apically smooth; periphysoids absent; asci cylindrical to narrowly clavate, 90–110 × 10–12 µm. Ascospores 8 per ascus, ellipsoid, 5–7-septate, 15–20 × 5–6 µm, 3–3.5 times as long as wide, hyaline, distoseptate with lens-shaped lumina, I+ violet-blue. Secondary chemistry: Psoromic, subpsoromic, and 2'-*O*-demethylpsoromic acids; medulla P+ yellow, microscopic section K–.



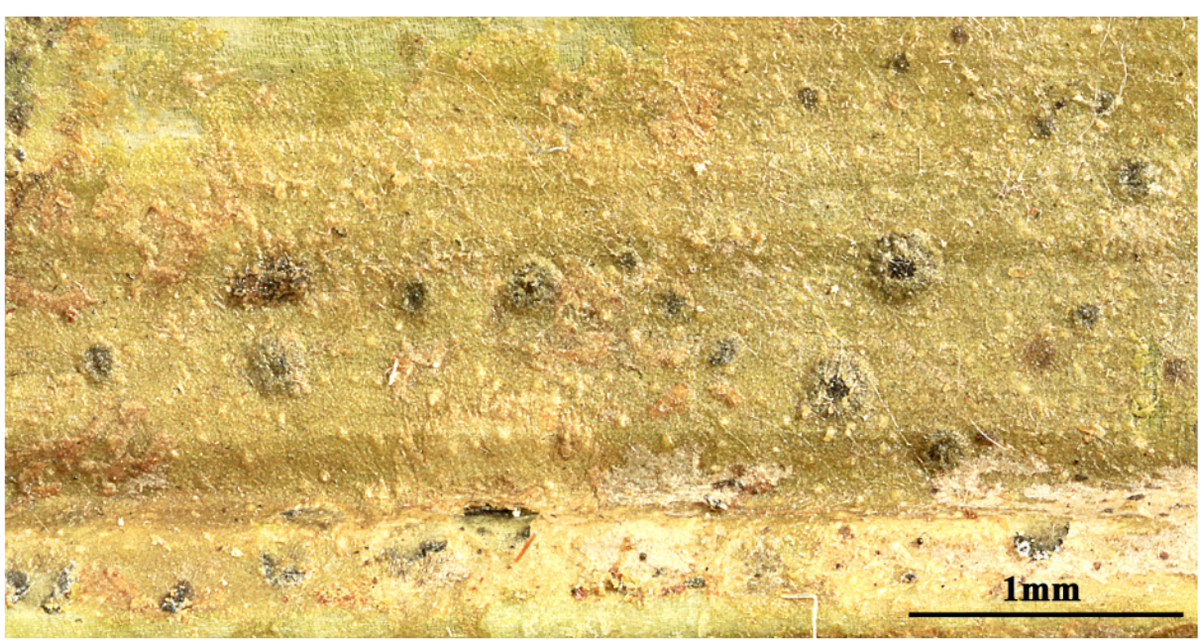
Pseudochapsa subdactylifera



Pseudochapsa subdactylifera

Pseudosagedia nitidula (Müll. Arg.) Hafellner & Kalb, Biblthca Lichenol. 57: 173 (1995)
= *Phylloporina nitidula* (Müll. Arg.) Müll. Arg., Denkschr. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 81: 233 (1890)
= *Porina nitidula* Müll. Arg., Flora, Regensburg 66(21): 336 (1883)
= *Trichothelium nitidulum* (Müll. Arg.) R.C. Harris, More Florida Lichens, Incl. 10 Cent Tour Pyrenol. (New York): 180 (1995)

[ABL50710j], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710j), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous or dispersed into rounded patches, smooth, 10–20 mm across and 10–15 µm thick, pale grey to greenish grey, matt. Photobiont cells angular-rounded, 7–15 x 4–6 µm, in irregular plates. Perithecia sessile, subglobose, 0.15–0.3 mm diam. and 120–200 µm high, around the ostiolum usually shortly pilose to tomentose or almost papillose, black or rarely dark grey, matt to slightly shiny, tomentose cover pale grey to white. Excipulum 5–15 µm thick, dark brown, K–. Involucrellum not distinctly separated from excipulum, 10–20 µm thick, bluish to purplish black, K–, externally covered by 5–10 µm thick, thallus layer. Asci obclavate, 50–70 x 8–13 µm. Ascospores fusiform, 5-septate, without constrictions at septa, 20–32 x 4–5.5 µm, 5–6 times as long as broad, colorless. Pycnidia not observed. Chemistry: no substances detected by TLC; Pseudosagedia violet in perithecial wall.



Pseudopyrenula endoxanthoides Vain., Hedwigia 46: 180 (1907)

[42897], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42897), 27. October 2017, det. A. Aptroot 2017. - Thallus ecorticate, white, smooth to uneven. Ascomata with apical ostioles, solitary, 0.3–0.5 mm diam., prominent, hemispherical, exposed and black. Hamathecium yellow inspersed. Spores 8/ascus, hyaline, 3-septate, fusiform-ellipsoid, loculi diamond shaped, 18–22 × 6–8 µm, IKI-, not ornamented. Chemistry: Thallus and ascomata UV-, K-; hamathecium K+ weakly purplish with yellow pigment.





Pseudopyrenula endoxanthoides

Puiggariella nemathora (Mont.) S.H. Jiang, Lücking & J.C. Wei, in Jiang, Lücking, Xavier-Leite, Cáceres, Aptroot, Portilla & Wei, Fungal Diversity 102: 282 (2020)

= *Strigula nemathora* Mont., in Sagra, Hist. phys. Cuba, Bot. Pl. Cell. 9: 96 (1845)

[ABL50710ap], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ap), 21. June 2019, det. A. Aptroot 2019. - Thallus subcuticular, continuous or laciniate and forming thin to rather broad, radiating, often confluent lobes, 5–25 mm across and 25–50 µm thick, minutely papillose, pale greenish grey and sometimes with a slight blue tinge; papillae formed on thallus surface or bordering individual lobes, 0.02–0.03 mm diam., white. Photobiont a species of *Cephaleuros*, cells angular-rounded, 5–17 x 5–9 µm, in irregular plates forming 1 to several layers. Perithecia semi-immersed and covered by a thick, thallus layer up to ostiole, wart-shaped and often ridged, 0.4–0.7 mm diam. and 150–300 µm high, pale greenish grey to white but upper part often darker grey. Excipulum prosoplectenchymatous, 10–15 mm thick, colorless. Involucrellum confluent with excipulum, 20–40 µm thick, colorless to pale brown. Paraphyses unbranched. Asci cylindrical, 70–100 x 7–10 µm. Ascospores irregularly biseriate, fusiform, 1-septate, with distinct constriction at septum, 15–22 x 4–6 µm, 3–4 times as long as broad. Pycnidia immersed-erumpent, wart-shaped, those producing macroconidia 0.1–0.15 mm, those producing microconidia 0.05–0.1 mm diam., pale to dark brownish grey. Macroconidia bacillar, 1-septate, 9–12 x 2.5–3 µm. Microconidia fusiform, non-septate, 3–5 x 1.3–1.7 µm. Chemistry: no substances detected by TLC.





Puiggariella nemathora

Pyrenula astroidea (Fée) R.C. Harris, Mem. N. Y. bot. Gdn 49: 87 (1989)
= *Heufleria pentagastrica* Müll. Arg., Linnaea 43(9): 45 (1880)
= *Heufleridium pentagastricum* (Müll. Arg.) Müll. Arg., Flora, Regensburg 66(16): 244 (1883)
= *Parmentaria astroidea* Fée, Essai Crypt. Exot. (Paris): xci, 70 (1825) [1824]
= *Parmentaria astroidea* Fée, Essai Crypt. Exot., Suppl. Révis. (Paris): 67 (1837)
= *Verrucaria aspistea* var. *astroidea* (Fée) Nyl., Annls Sci. Nat., Bot., sér. 4 11: 247 (1859)

[42981], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42981), 27. October 2017, det. A. Aptroot 2017. - Thallus yellowish to olive-green, lacking pseudocyphellae, corticate. Ascomata occasionally solitary, but usually in groups of 2–7 with fused ostioles, flask-shaped, erumpent from the substratum, mostly covered by the thallus, occasionally completely exposed, c. 0.5–1.0 mm diam. Ascomatal wall with crystals, to 100 µm thick; ostiole lateral, pale. Hamathecium not inspersed with oil droplets, IKI+ orange. Ascospores 8 per ascus, irregularly uniseriate, grey to brown, muriform, with c. 8 rows of c. 3–8 locules, fusiform, with rounded ends, 35–45 x 12–18 µm; lumina rounded to somewhat angular. Chemistry: No substances detected.





Pyrenula astroidea

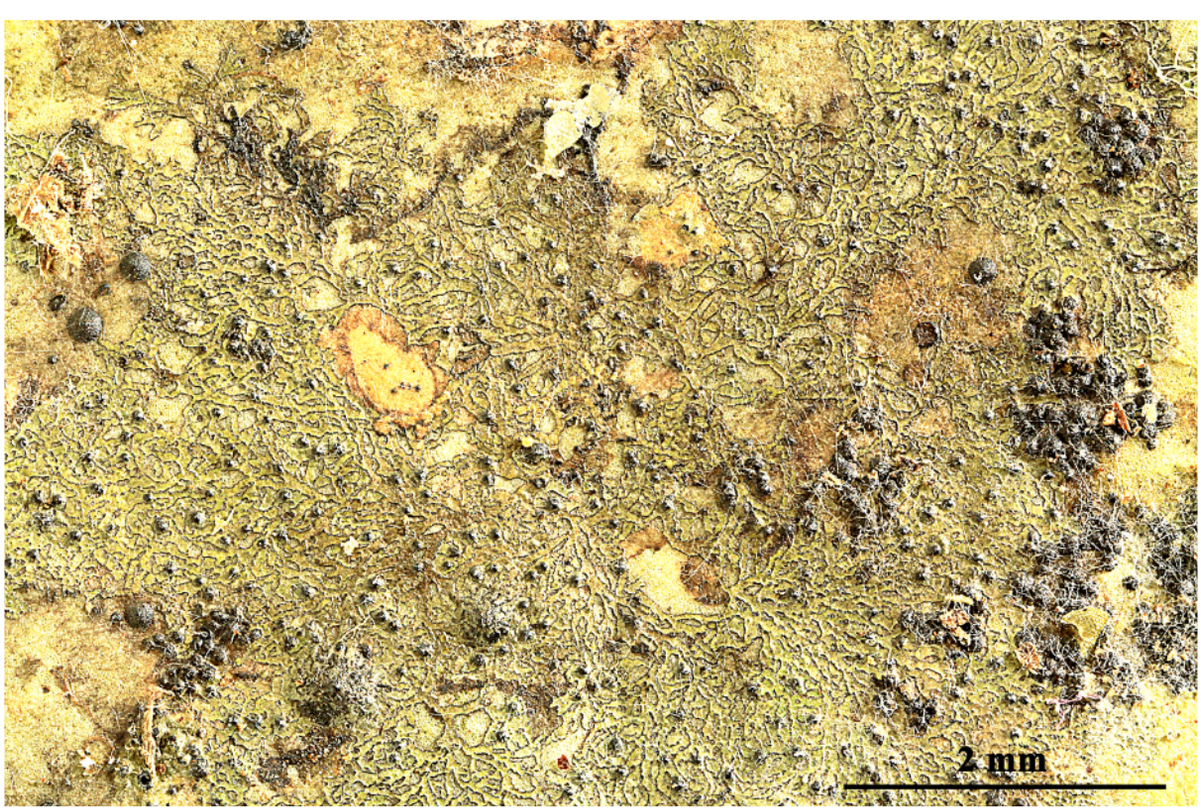
Racoplaca melanobapha (Kremp.) S.H. Jiang, Lücking & J.C. Wei, in Hongsanan et al., Fungal Diversity 105: 152 (2020)

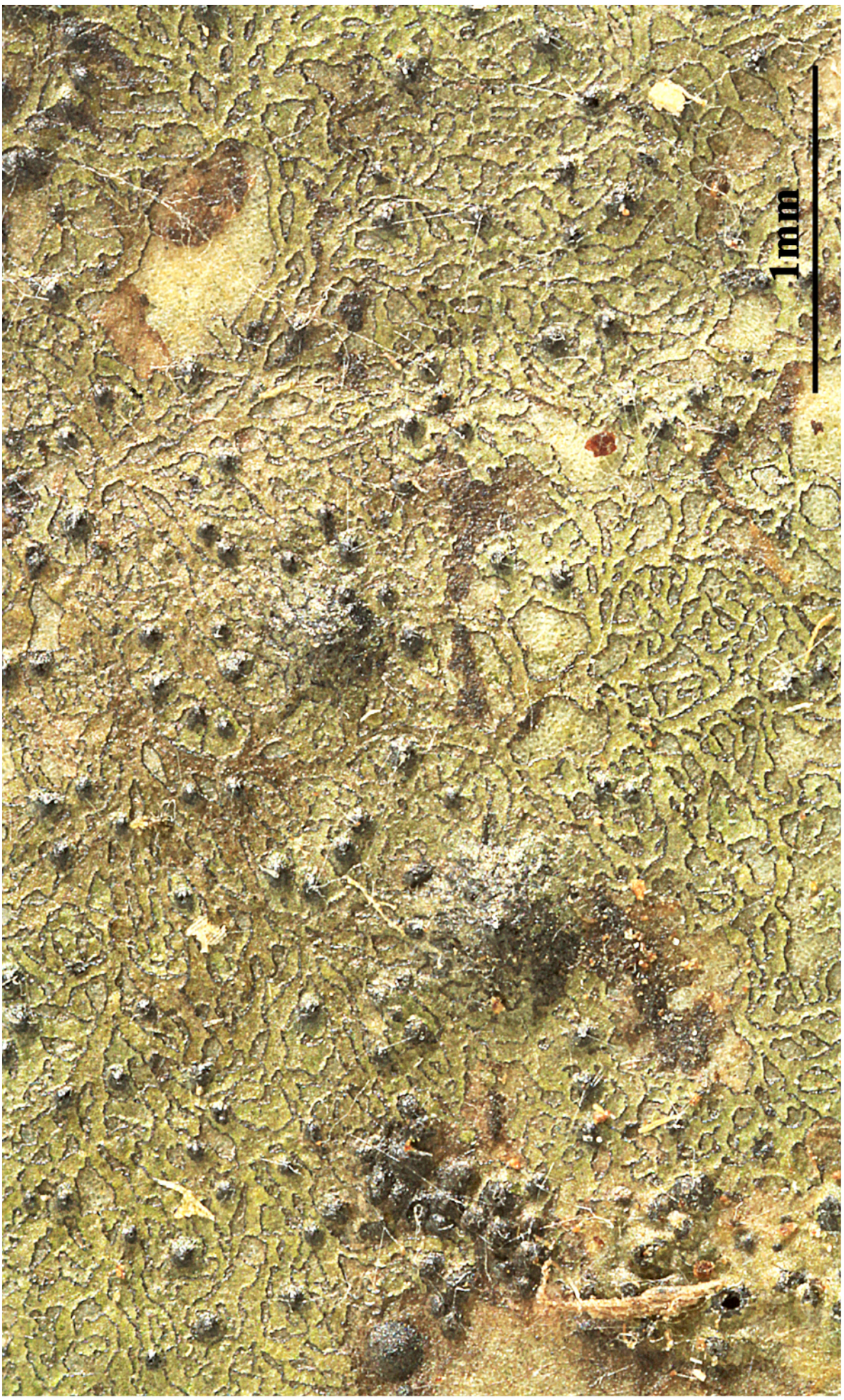
= *Racoplaca melanobapha* (Kremp.) S.H. Jiang, Lücking & J.C. Wei, in Jiang, Lücking, Xavier-Leite, Cáceres, Aptroot, Portilla & Wei, Fungal Diversity 102: 286 (2020)

= *Strigula melanobapha* (Kremp.) R. Sant., Symb. bot. upsal. 12(no. 1): 188 (1952)

= *Verrucaria melanobapha* Kremp., Lich. Foliic. Leg. Beccari: 18 (1874)

[ABL50710ao], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ao), 21. June 2019, det. A. Aptroot 2019. - Thallus subcuticular, ± dichotomously branched, linear lobes, the margins of the lobes bordered by a thin black line. Perithecia 0.45-0.7 mm diam., paraphyses simple. Spores 1(-3)-septate, fusiform, with acute ends, slightly constricted at the septum, 14-22 x 3-5 µm. Pycnidia 0.2-0.3 mm diam., numerous. Macroconidia 10-12 x 2-3 µm, simple, bacillar.



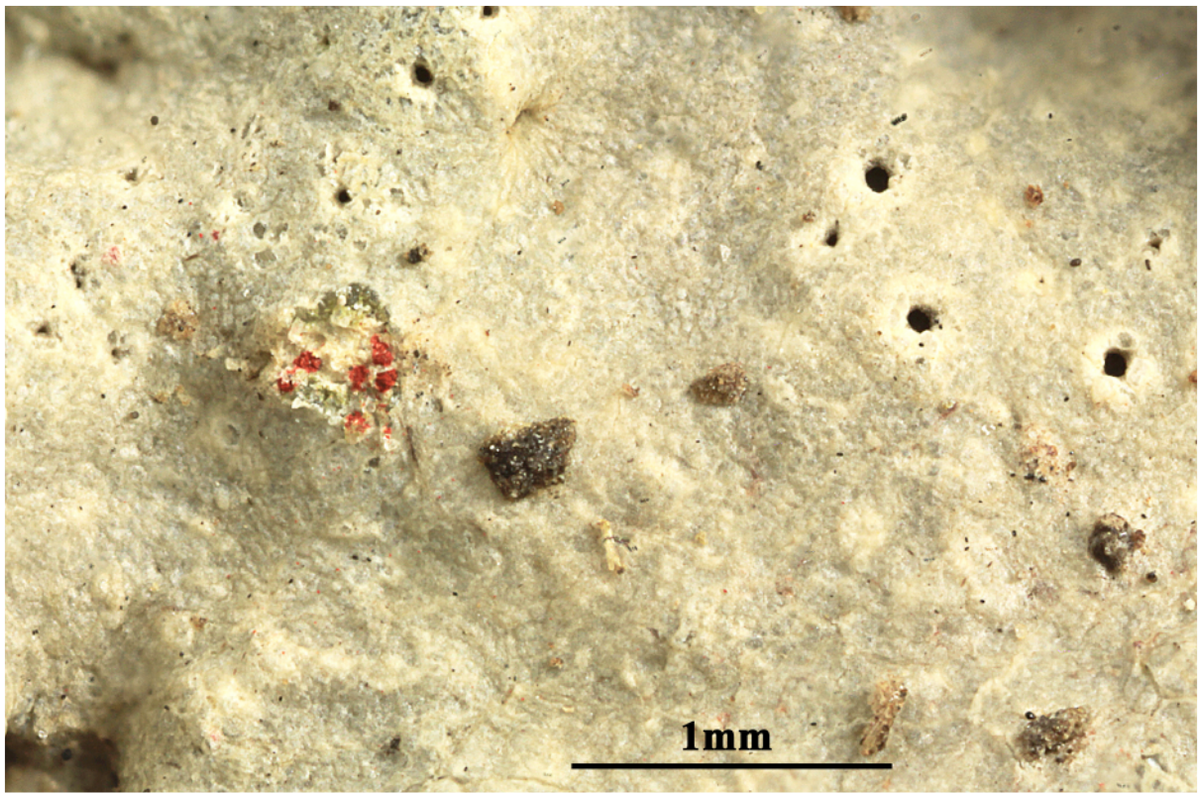


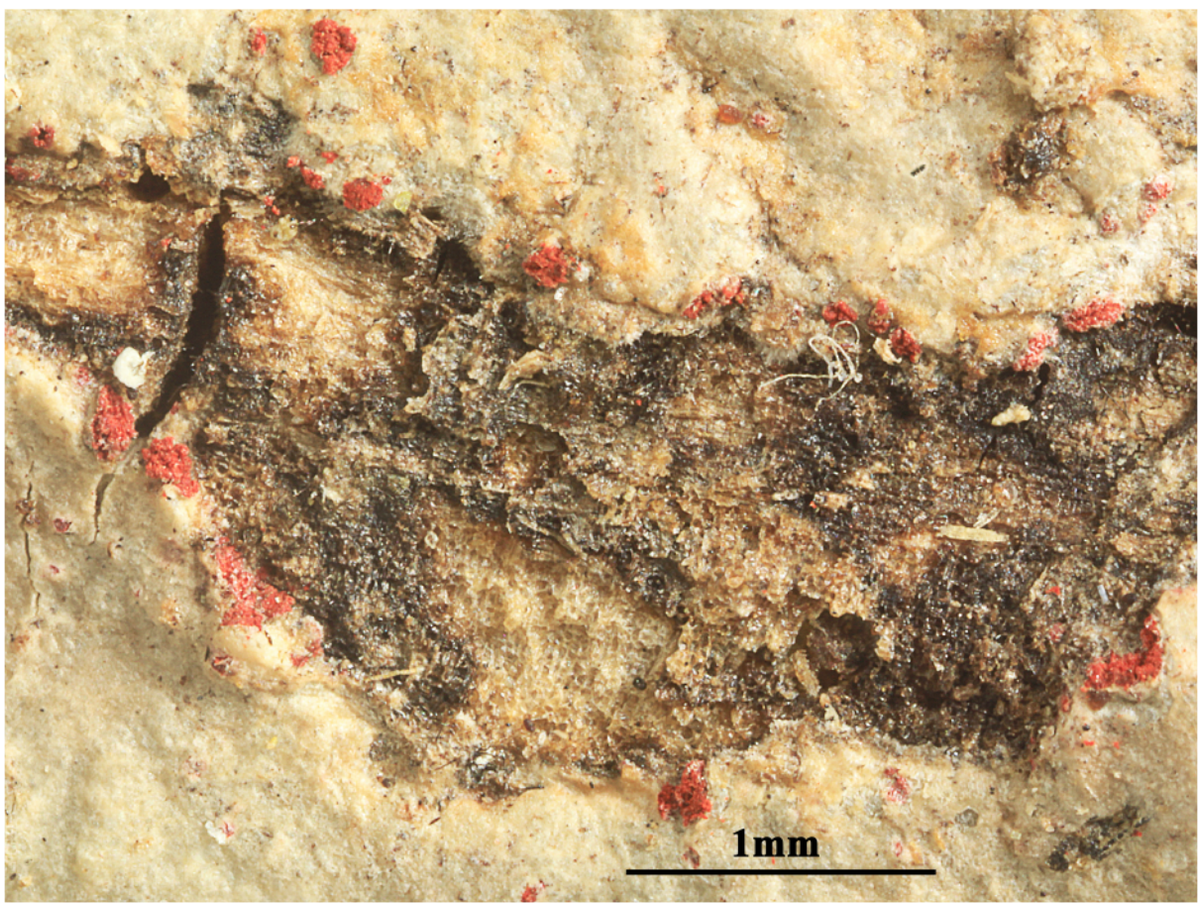
Racoplaca melanobapha

Sanguinotrema wightii (Taylor) Lücking, in Lücking, Mangold, Plata, Parnmen, Kraichak & Lumbsch, Bot. J. Linn. Soc. 436: 441 (2015)
= *Endocarpon baileyi* Stirt., Trans. & Proc. Roy. Soc. Victoria 17: 74 (1881)
= *Endocarpon wightii* Taylor, London J. Bot. 6: 155 (1847)
= Leptotrema baileyi (Stirt.) Shirley, Proc. R. Soc. Qd. 6: 194 (1889)
= *Leptotrema wightii* (Taylor) Müll. Arg., Flora, Regensburg 65: 499 (1882)
= *Myriotrema wightii* (Taylor) Hale, Mycotaxon 11(1): 135 (1980)
= *Phaeotrema wightii* (Taylor) Zahlbr., in Magnusson & Zahlbruckner, Ark. Bot. 31A(no. 1): 48 (1944)
= *Thelotrema wightii* (Taylor) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 118 (1858)

[ABL18361], Brazil, Sergipe, Povoado Pedrinhas, Mata da Fazenda Cafuz. 10°47'22" S, 37°26'46" W, 75 m. In Atlantic forest remnant, on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 18361), 20. Sept 2013, det. A. Aptroot 2013. - Thallus corticolous, epiphloeodal, thick, the surface smooth but with a grainy appearance, the cortex columnar, the medulla with conspicuous red crystal masses, greenish mineral gray, up to 10 cm broad: apothecia numerous, separate, immersed, 0.2-0.3 mm in diameter, non carbonized and without a columella, the pore round, about 0.1 mm in diameter; spores 8/ascus, 9-11 x 20-28 µm, 0-2 x 4-6 loculate. Chemistry: no substances present except for unidentified red anthraquinone.



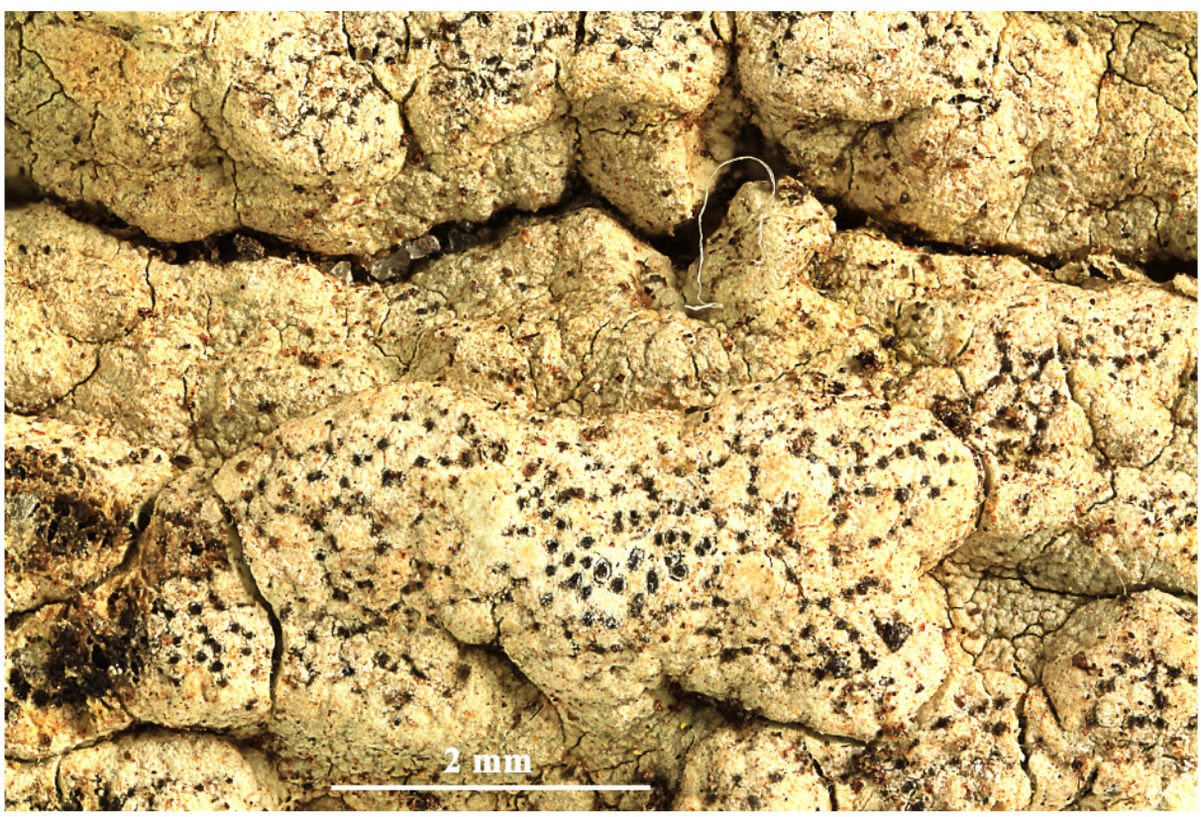




Sanguinotrema wightii

Sclerophyton perithecioideum Aptroot,in Aptroot, Souza, Santos, Oliveira Junior Cardosa & Cáceres, Bryologist 125(3): 458 (2022)

[ABL50801], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50803), 23. June 2019, det. A. Aptroot 2019. - UV-, Ü+ yellow, not inspersed; spores 3-(4)-septate, 27-30 x 7-8 µm. - Description. Thallus crustose, continuous, not corticate, dull, pale grayish white, covering areas of up to 8 cm, up to 0.1 mm thick, not surrounded by a prothallus. Photobiont trentepohlioid. Ascomata punctiform, seemingly perithecioid, immersed in groups of 15–35 in pseudostromatata, 0.1–0.15 mm wide, disc black. Pseudostromata almost white, lobate, raised above the thallus but not constricted at the base, 0.6–1.9 mm diam., up to 0.3 mm high. Epihymenium pale brown. Hamathecium not inspersed, IKI+ deep blue. Ascospores 8/ascus, hyaline, 3(–4)-septate, clavate, macrocephalic, 28–31 x 7.5–8.5 µm, not surrounded by a gelatinous sheath. Pycnidia not observed. Chemistry: Thallus UV–, C–, K–, KC–, P+ yellow. TLC: psoromic acid.

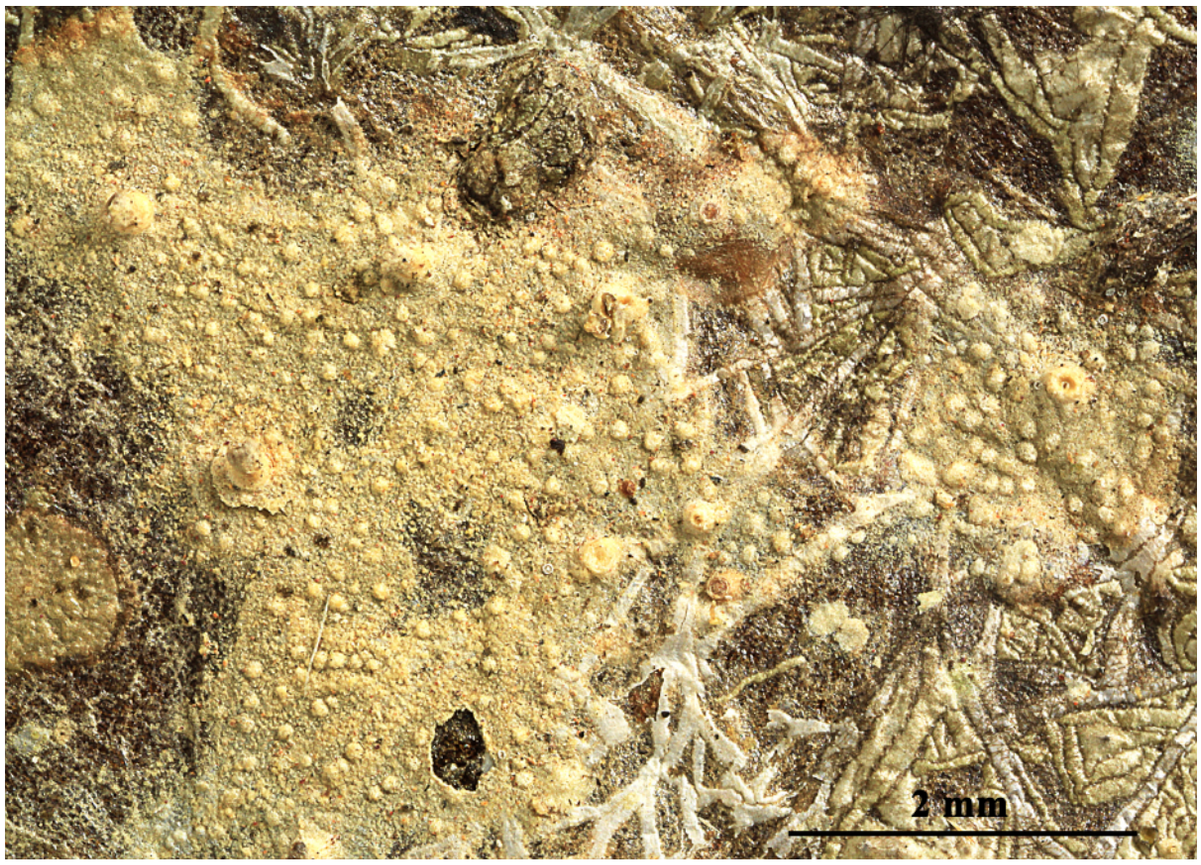




Sclerophyton perithecioideum

Sporopodium antonianum Elix, Lumbsch & Lücking , Biblthca Lichenol. 58: 88 (1995)

[ABL18202], Brazil, Sergipe, Parque National Serra de Itabaiana, 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18202), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous to irregularly incised, up to 50 mm across and 10–20 µm thick, minutely pulveraceous and with dense verrucae, pale greenish grey; verrucae hemispherical, 0.07–0.15 mm diam., paler than thallus to white; woolly, pale prothallus usually developed in incisions of thallus. Apothecia rounded, 0.4–1.0 mm diam. and 150–250 µm high; disc plane, light (to dark) brown and sometimes with orange tinge; margin distinct, white to chamois-colored. Excipulum 40–70 µm broad, in marginal parts with hairs formed by simple or basally branched, colorless, up to 100 µm long and 3.0–3.5 µm thick hyphae. Hypothecium up to 80 µm high, dark brown. Epithecium indistinct; epithecial algae sparse or absent. Hymenium 100–130 µm high, colorless. Asci 100–120 x 17–25 µm. Ascospores single, oblong, muriform, 85–115 x 12–16 µm, 7–8 times as long as broad, colorless. Campylidia numerous, sessile, 0.4–0.6 mm broad; lobe well-developed, musselshaped, pale brownish grey; socle reduced; wall proso- to paraplectenchymatous at base, colorless but innermost part dark brown, K+ yellowish brown, basal parts forming socle strongly incrusted with colorless crystals; peripheral parts of lobe formed by parallel hyphae that terminate in cluster of free hairs resembling periphysoids; conidiogeneous layer covering internal, wall surface; conidiogeneous cells filiform, unbranched, 20–35 x 1.5–2.0 µm. Conidia drop-shaped, non-septate, 7–8 x 2.5–3.0 µm. Chemistry: argopsin, zeorin, thiophanic acid, arthothelin, isoarthothelin, asemone.





Sporopodium antonianum



Sporopodium antonianum

Sporopodium aeruginascens Lücking & Lumbsch, Mycotaxon 78: 23 (2001)

[ABL11799ad], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799ad), 15. March 2012, det. A. Aptroot 2012. - Thallus continuous, up to 100 mm across and 15–20 µm thick, minutely pulveraceous and with scattered to dense verrucae, pale bluish grey to turquoisecolored, with slight yellow tinge; verrucae irregularly papillose, 0.05–0.2 mm diam., paler than thallus, with pruinose to finely pilose surface. Apothecia known only from immature stages, rounded to slightly irregular in outline, 0.2–0.3 mm diam. and 150–200 µm high; disc plane, brown but with pale pruina; margin distinct, white pruinose and with irregular surface. Excipulum 30–50 µm broad. Hypothecium 30–60 µm high, brown. Hymenium 80–100 µm high, colorless. Asci 70–90 x 15–20 µm. Ascospores single, ellipsoid, muriform, 40–70 x 10–15 µm (only immature ascospores seen), 4–6 times as long as broad, colorless. Campylidia numerous, sessile, 0.4–0.6 mm broad, at first seen as white to bright yellow ring on thallus surface; lobe well-developed, hood- to mussel-shaped, bright yellow but usually white pruinose; socle not apparent; wall paraplectenchymatous, colorless, externally with thin layer of free, sparsely branched, colorless hyphae incrusted with yellowish brown crystals that dissolve in K; basal portion filled with hemispherical, paraplectenchymatous bulge; conidiogeneous layer covering internal, wall surface and bulge; conidiogeneous cells bacillar, unbranched, 7–10 x 1 µm, densely inspersed with algal cells 5–8 µm diam. Conidia drop-shaped, non-septate, 5–7 x 1.8–2.0 µm, intermingled with small, algal cells 3–4 µm diam., formed by division of larger cells in conidial layer. Chemistry: usnic acid, isousnic acid, arthothelin, 4,5-dichloro-norlichexanthone, thiophanic acid.



Sporopodium aeruginascens





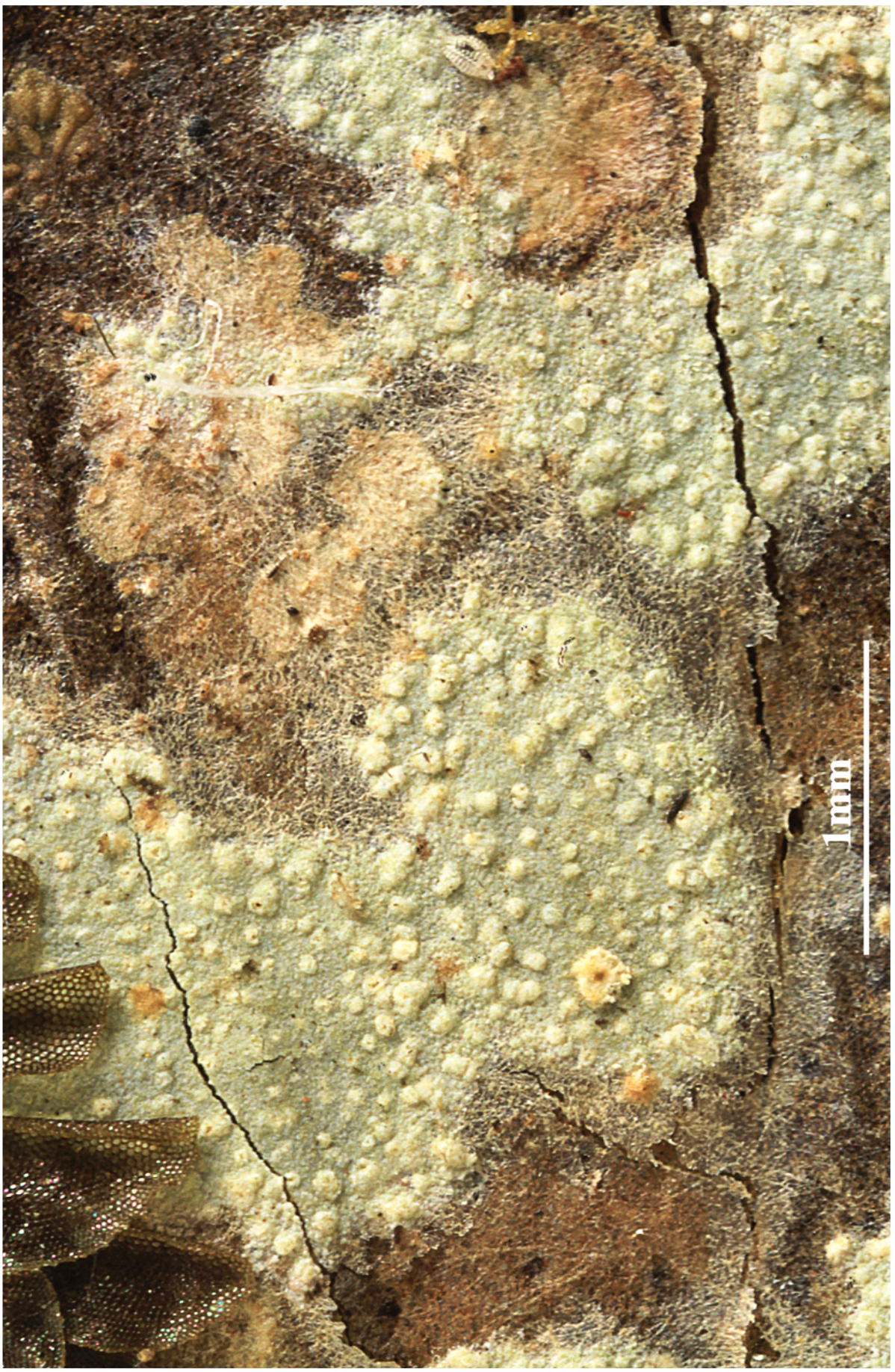
Sporopodium aeruginascens

Sporopodium leprieurii Mont., Annls Sci. Nat., Bot., sér. 3 16: 54, pl. 16, fig. 1 (1851)
= *Lecidea reveniens* Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 5: 123 (1858)
= *Lopadium leprieurii* (Mont.) Müll. Arg., Flora, Regensburg 73: 190 (1890)

[ABL50710e], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710e), 21. June 2019, det. A. Aptroot 2019. - Thallus continuous, 5–20 mm across and 10–15 µm thick, minutely pulveraceous and with dense verrucae, pale greenish grey; verrucae hemispherical, 0.05–0.1 mm diam., paler than thallus to white. Apothecia sometimes formed marginally hypophyllous on mycelium free of algae but mostly epiphyllous on thallus, rounded, 0.3–0.7 mm diam. and 200–300 µm high; disc plane to slightly convex, dark brown to blackish brown; margin distinct to slightly prominent, chamois-colored, with slightly rough surface. Excipulum 30–70 µm broad, lateral margins rather irregular but without hairs. Hypothecium up to 50–80(–120) µm high, very dark brown. Epithecium indistinct but upper part of hymenium pale brown; epithecial algae sparse or absent. Hymenium 100–130 µm high, colorless. Asci 100–120 x 17–25 µm. Ascospores single, oblong, muriform, 70–110 x 15–24 µm, 4–6 times as long as broad, colorless. Campylidia numerous, sessile, 0.2–0.3 mm broad; lobe rather small, mussel-shaped, dark brown; socle well-developed and usually slightly inflated, white to chamois-colored; wall proso- to paraplectenchymatous at base, colorless but innermost part dark brown, K–; basal parts forming socle strongly incrusted with colorless crystals; peripheral parts of lobe formed by parallel hyphae that terminate in cluster of free hairs resembling periphysoids; conidiogeneous layer covering internal, wall surface; conidiogeneous cells bacillar to filiform, unbranched, 15–25 x 1.5–2.5 µm. Conidia oblong-ellipsoid, non-septate, 8–11 x 2.0–2.5 µm. Chemistry: argopsin, zeorin, arthothelin, isoarthothelin, asemone, thiophanic acid.



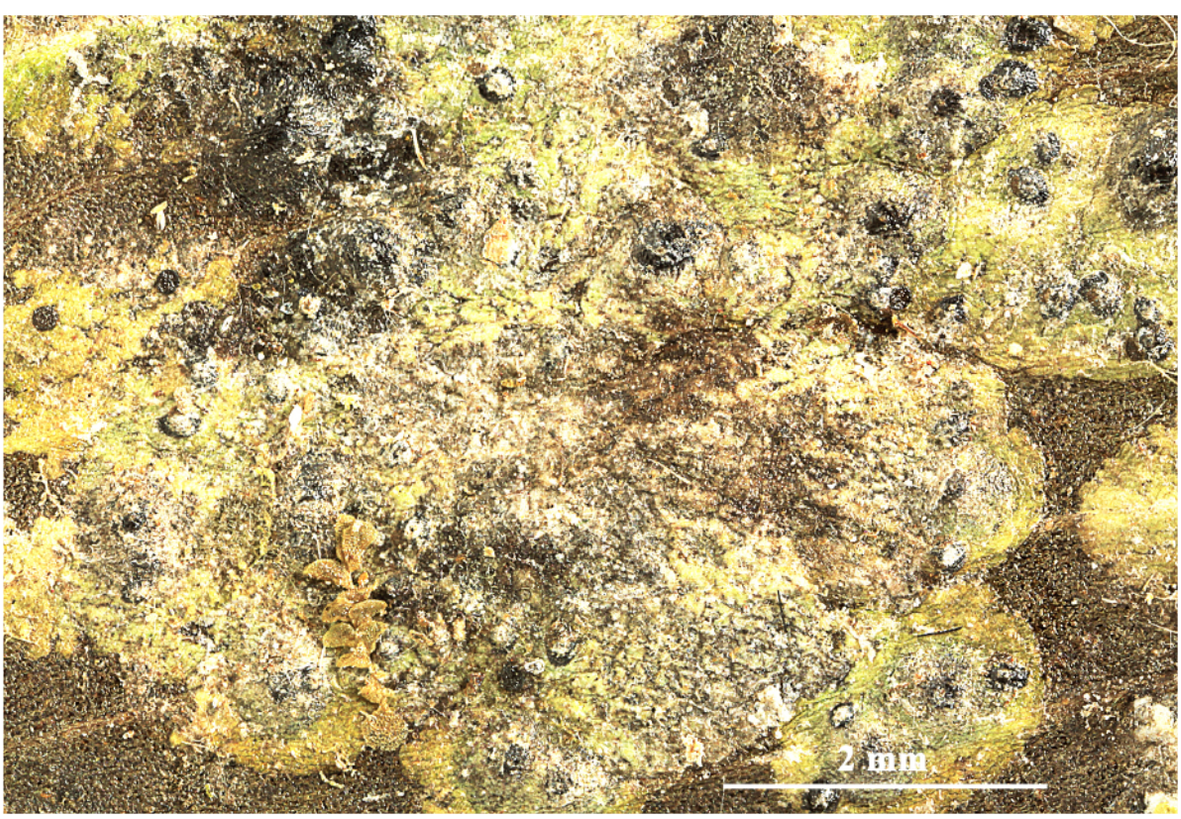
Sporopodium leprieurii



Sporopodium leprieurii

Strigula prasina Müll. Arg., Flora, Regensburg 68(18): 343 (1885)
= *Raciborskiella prasina* (Müll. Arg.) R. Sant., Symb. bot. upsal. 12(no. 1): 197 (1952)

[ABL50710al], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710al), 21. June 2019, det. A. Aptroot 2019. - Thallus mostly hypophyllous, subcuticular, dispersed into rounded to irregular, partly confluent patches, 5–25 mm across and 20–30 µm thick, with entire or crenulate margins, pale greyish green and usually with blue tinge. Photobiont a species of *Cephaleuros*, cells angular-rounded, 8–12 x 4–6 µm, in irregular plates forming 1 to several layers. Perithecia immersed only at base, otherwise exposed, hemispherical to wart-shaped, 0.2–0.4 mm diam. and 100–150 µm high, black. Excipulum prosoplectenchymatous, 7–12 µm thick, colorless to brown. Involucrellum carbonaceous, 15–25 µm thick, black. Paraphyses slighty branched and anastomosing. Asci cylindrical, 50–70 x 7–10 µm. Ascospores uniseriate or irregularly arranged, fusiform-ellipsoid, 1-septate, without or with slight constriction at septum, 12–17 x 4–5 µm, 3–3.5 times as long as broad. Pycnidia semi-immersed, wart-shaped, those producing macroconidia 0.1–0.15 mm, those producing microconidia 0.05–0.1 mm diam., black. Macroconidia bacillar, non-septate, 10–15 x 3–4 µm, colorless. Microconidia fusiform, non-septate, 4–5 x 1.5–2 µm. Chemistry: no substances detected by TLC.

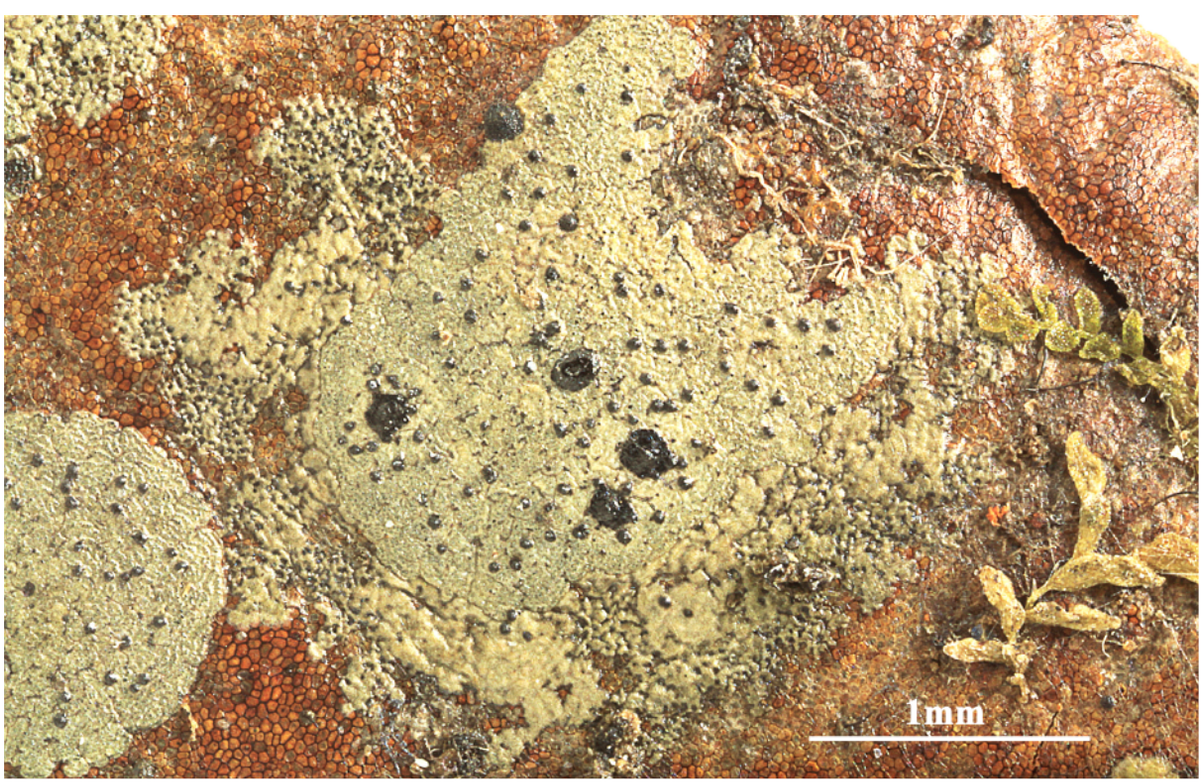




Strigula prasina

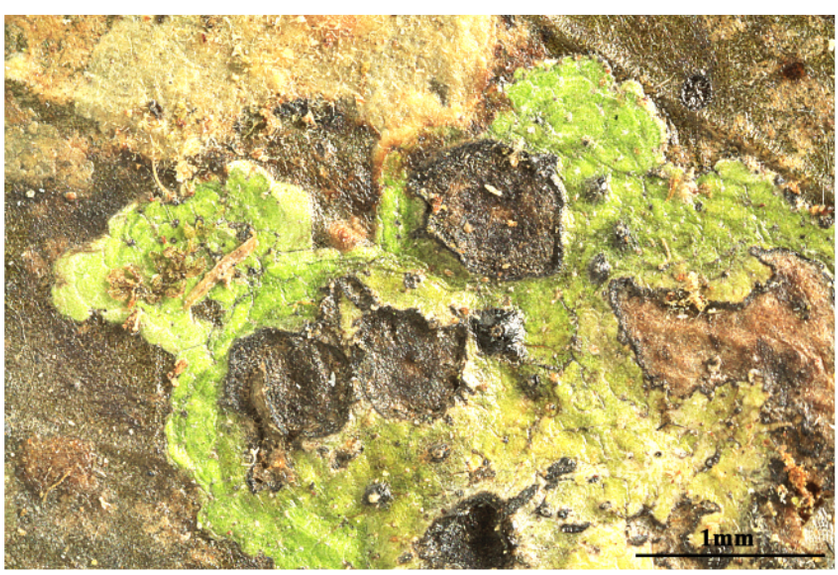
Strigula nitidula Mont., in Sagra, Hist. phys. Cuba, Bot. Pl. Cell. 9: 93 (1845)
= *Haploblastia nitidula* (Mont.) Trevis., Conspect. Verruc.: 16 (1860)

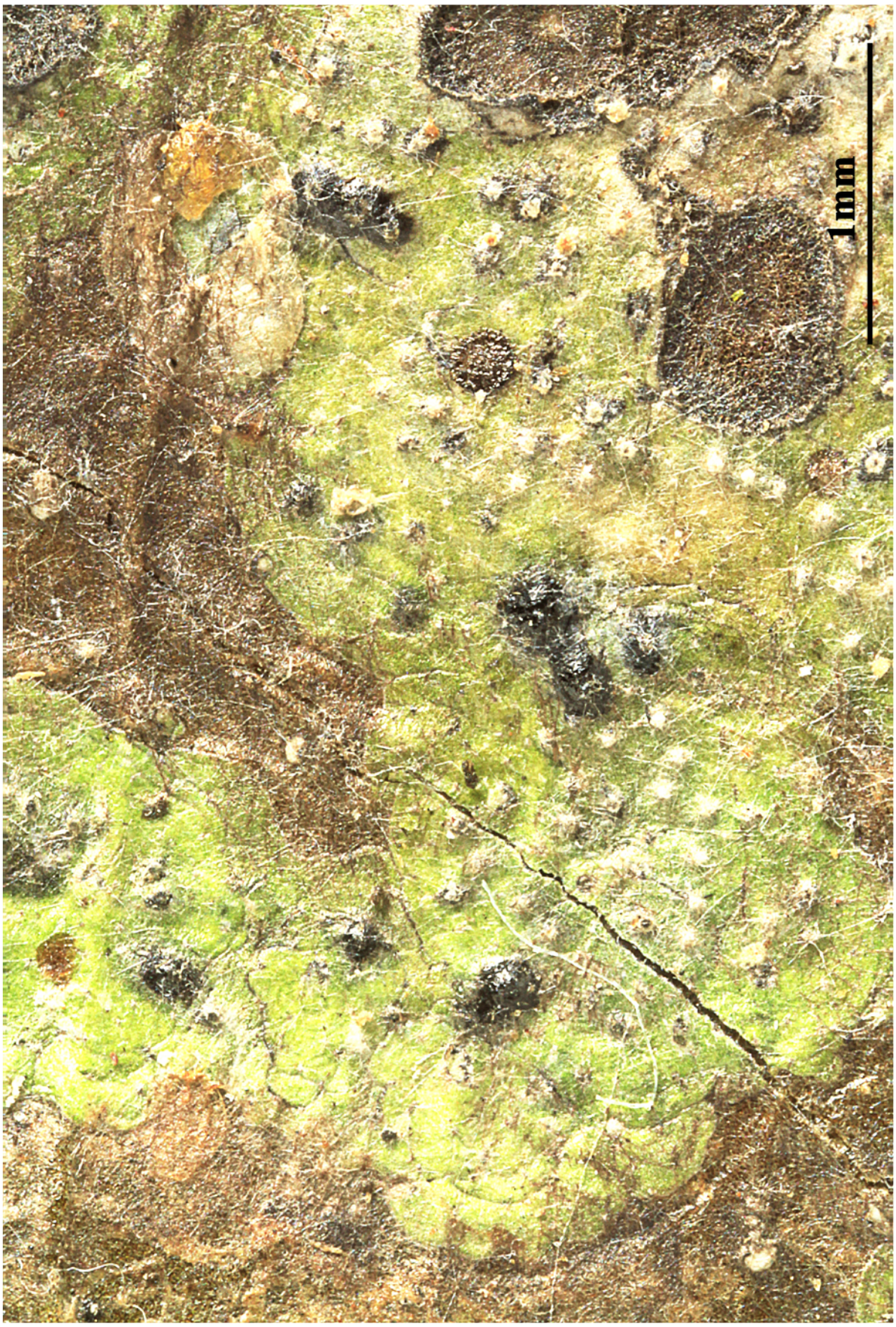
[ABL50710am], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710am), 21. June 2019, det. A. Aptroot 2019. - Thallus subcuticular, continuous or dispersed into rounded to irregular, partly confluent patches, more rarely laciniate, 5–25 mm across and 8–15µm thick, often with crenulate to lobulate margins and margin or individual lobes usually bordered by thin, black line, bright green with distinct metallic look. Photobiont a species of *Cephaleuros*, cells angular-rounded, 8–18 x 4–7 mm, in irregular plates forming single layer. Perithecia completely exposed, wart-shaped to almost conical, 0.3–0.6 mm diam. and 130–200 µm high, black and shiny. Excipulum prosoplectenchymatous, 7–15 µm thick, colorless to brown. Involucrellum carbonaceous, 15–30 µm thick, black. Paraphyses unbranched. Asci cylindrical, 50–80 x 4–5 µm. Ascospores uniseriate, ellipsoid, 1-septate, with distinct constriction at septum and often broken into parts outside asci, 8–12 x 2.5–3 µm, 3–4 times as long as broad. Pycnidia exposed, wart-shaped, those producing macroconidia 0.1–0.15 mm, those producing microconidia 0.05–0.1 mm diam., black. Macroconidia bacillar, non-septate, 4–6 x 1.8–2.2 µm. Microconidia fusiform, non-septate, 4–5 x 1.5–2 µm. Chemistry: no substances detected by TLC.



Strigula smaragdula Fr., Linnaea 5: 550 (1830)
= *Phyllocharis elegans* Fée, Essai Crypt. Exot. (Paris): xciv, c (1825) [1824]
= *Stigmatidium elegans* (Fée) Spreng., Syst. veg., Edn 16 4(1): 243 (1827)
= *Strigula elatior* Stirt., Trans. & Proc. Roy. Soc. Victoria 17: 75 (1881)
= *Strigula elegans* (Fée) Müll. Arg., Flora, Regensburg 63(3): 41 (1880)
= *Strigula elegans* var. *elatior* (Stirt.) Zahlbr., Cat. Lich. Univers. 1: 539 (1922)
= *Strigula elegans* var. *eumorpha* Müll. Arg., Flora, Regensburg 68(18): 342 (1885)

[ABL50710an], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710an), 21. June 2019, det. A. Aptroot 2019. - Thallus subcuticular, continuous or dispersed into rounded to irregular, partly confluent patches, 5–25 mm across and 20–80 µm thick, with entire to crenulate or lobulate margins, sometimes whole thallus lobate-laciniate, bright green. Photobiont a species of *Cephaleuros*, cells angular-rounded, 5–15 x 4–10 µm, in irregular plates forming 1 to several layers. Perithecia immersed-erumpent, covered by algiferous, thallus tissue mostly up to ostiolum, hemispherical, 0.3–0.6 mm diam. and 120–180 µm high, dark green but uppermost part often black. Excipulum prosoplectenchymatous, 5–15 µm thick, colorless to brown. Involucrellum carbonaceous, 20–30 µm thick, black. Paraphyses unbranched. Asci obclavate, 60–80 x 8–12 µm. Ascospores biseriate, fusiform, 1-septate, with distinct constriction at septum, 14–24 x 4–6 µm, 3–4 times as long as broad. Pycnidia semi-immersed, wart-shaped, those producing macroconidia 0.1–0.15 mm, those producing microconidia 0.05–0.1 mm diam., black. Macroconidia bacillar, 1-septate, 12–20 x 3–4 µm. Microconidia fusiform, non-septate, 4–5 x 1.5–2 µm. Chemistry: no substances detected by TLC.

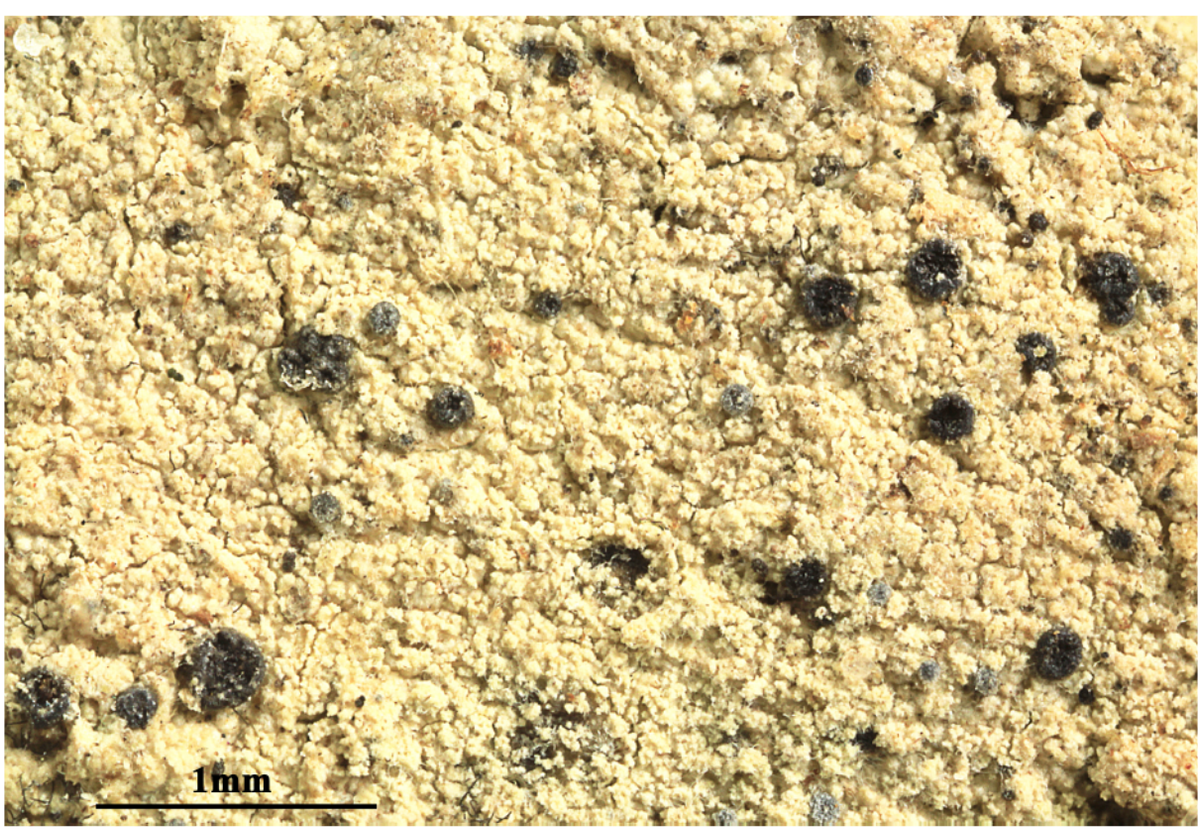




Strigula smaragdula

Tapellaria malmei R. Sant., Symb. bot. upsal. 12(no. 1): 502 (1952)

[42904], Brazil, Sergipe, São Cristovão, Mata do IFS (Instituto Federal de Sergipe) on BR 101, 10 km W of Aracaju. 10°4'30" S, 37°11'40" W, 50 m. In Atlantic rain forest on tree bark. Leg. M. Cáceres & A. Aptroot, (no. 42904), 27. October 2017, det. A. Aptroot 2017. - Thallus dispersed into rounded patches, 10–40 mm across and 20–30 µm thick, ecorticate, smooth, pale grey to yellowish white. Apothecia rounded, 0.3–0.6 mm diam. and 170–250 µm high; disc plane, black; margin thin, black or greyish black. Excipulum 20–40 µm broad, aeruginous brown. Hypothecium 10–30 µm high, dark purplish brown, K+ purplish. Apothecial base dark purplish brown. Epithecium distinct, 10–15 µm high, aeruginous brown. Hymenium 90–110 µm high, colorless. Asci 80–90 x 18–30 µm. Ascospores (2–)4(–6) per ascus, broadly ellipsoid, muriform, 25–35 x 14–20 µm, 1.5–2 times as long as broad, colorless. Campylidia sessile, 0.3–0.5 mm broad; lobe well-developed, hood-shaped, dark grey; socle not apparent. Conidia filiform with slightly clavate apex, usually enrolled, 3–7-septate, 30–40 x 2–2.5 µm, associated with scattered, algal cells. Chemistry: not tested.





Tapellaria malmei

Trapeliopsis gelatinosa (Flörke) Coppins & P. James, Lichenologist 16(3): 258 (1984)
= *Biatora decolorans* f. *escharoides* (Hoffm.) Durieu & Mont., in Durieu, Expl. Sci. Alg.: 266 (1847)
= *Biatora decolorans* var. *escharoides* (Hoffm.) Torss., Enum. Lich. Byssac. Scandin. (Upsaliae): 31 (1843)
= *Biatora gelatinosa* (Flörke) Flot., Flechten Hirschberg-Warmbrunn: 13 (1839)
= *Biatora granulosa* f. *escharoides* (Hoffm.) Arnold, Verh. Kaiserl.-Königl. zool.-bot. Ges. Wien 30: 132 (1881) [1880]
= *Biatora granulosa* var. *escharoides* (Hoffm.) Arnold, Flora, Regensburg 67: 433 (1884)
= *Biatora viridescens* f. *gelatinosa* (Flörke) Tuck., Syn. N. Amer. Lich. (Boston) 2: 17 (1888)
= *Biatora viridescens* var. *gelatinosa* (Flörke) Fr., Summa veg. Scand., Sectio Prior (Stockholm): 112 (1845)
= *Helocarpon gelatinosum* (Flörke) M. Choisy, Bull. mens. Soc. linn. Soc. Bot. Lyon 19: 12 (1950)
= *Helocarpon granulosum* f. *escharoides* (Hoffm.) M. Choisy, Bull. mens. Soc. linn. Soc. Bot. Lyon 19: 12 (1950)
= *Lecidea decolorans* f. *escharoides* (Hoffm.) Leight., Lich.-Fl. Great Brit., Edn 3: 258 (1879)
= *Lecidea decolorans* var. *escharoides* (Hoffm.) Grognot, Pl. crypt.-cellul. Saône-et-Loire: 71 (1863)
= *Lecidea decolorans* ß *escharoides* (Hoffm.) Mudd, Man. Brit. Lich.: 197 (1861)
= *Lecidea escharoides* (Hoffm.) Ach., Lich. Univ.: 167 (1810)
= *Lecidea gelatinosa* Flörke, Mag. Gesell. naturf. Freunde, Berlin 3(1-2): 201 (1809)
= *Lecidea granulosa* f. *escharoides* (Hoffm.) Schaer., Enum. critic. lich. europ. (Bern): 137 (1850)
= *Lecidea granulosa* var. *escharoides* (Hoffm.) H. Olivier, Fl. Lich. Orne 2: 210 (1884)
= *Lecidea viridescens* var. *gelatinosa* (Flörke) Nyl., Mém. Soc. Imp. Sci. Nat. Cherbourg 3: 182 (1855)
= *Lichen escharoides* Ehrh., Pl. crypt. exsicc.: no. 313 (1795)
= *Lichen escharoides* (Hoffm.) Ach., Lich. suec. prodr. (Linköping): 77 (1799)
= *Micarea gelatinosa* (Flörke) Brodo, Bryologist 70: 216 (1967)
= *Patellaria gelatinosa* (Flörke) Duby, Bot. Gall., Edn 2 (Paris) 2: 649 (1830)
= *Trapelia gelatinosa* (Flörke) V. Wirth, in Hoffman & Türk, Ber. naturw.-med. Ver. Innsbruck 78: 46 (1991)
= *Verrucaria escharoides* Hoffm., Deutschl. Fl., Zweiter Theil (Erlangen): 194 (1796) [1795]

[ABL11813], Brazil, Amazonas, Fazenda São Francisco off BR 319, 30 km N of Porto Velho. On tree bark in primary rain forest. 8°243'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11813), 15. March 2012, det. A. Aptroot 2012.

Thallus and soralia C- (all parts, sometimes KC + dull orange-red).c; spores < 15 µm long. Thallus thin and membranous. Apothecia dark green-grey to grey-black, 0.2 -1(-1.6) mm diam, Apothecia adnate, immarginate or with a thin pale rim not exceeding the level of the disc; epithecium green, K.+ brown; spores 8-14 x 4.5-6 µm.



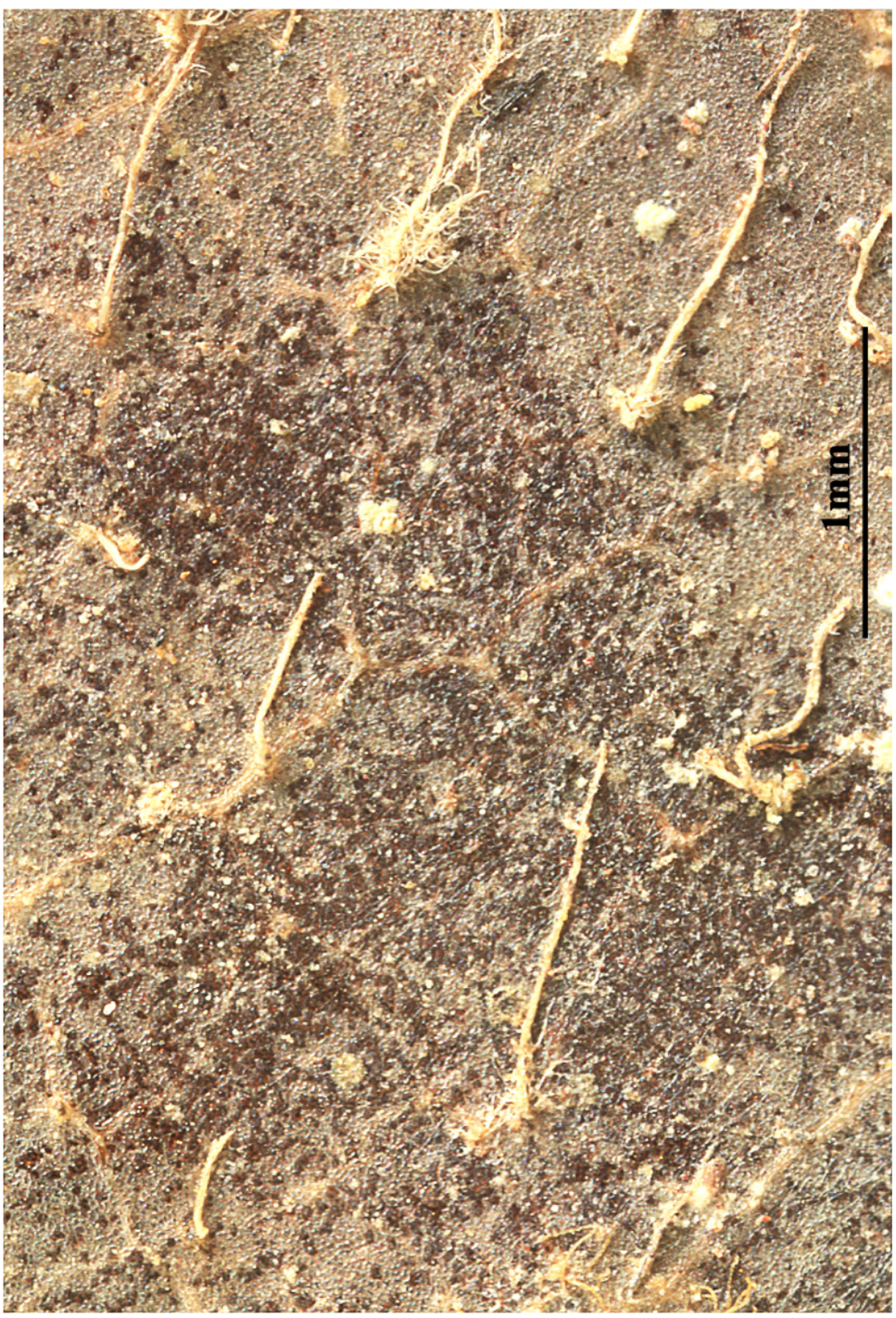
Trapeliopsis gelatinosa



Trapeliopsis gelatinosa

Tricharia leucothrix Fée, Essai Crypt. Exot. (Paris): xcviii, cii (1825) [1824]

[ABL18190], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18190), 27. July 2013, det. A. Aptroot 2013. - The foliicolous lichen furnished with sterile, white or yellowish fungal hairs on the surface of their halli do not belong to one genus, but no less then four different genera, and to several species. In the sterile state, only one of the species, *Gyalectidium aspidotum*, can be positively recognized. Contrary to Tricharia melanothrix, the white hairs named Tricharia leucothrix. (Sec. R. Santesson 1952).

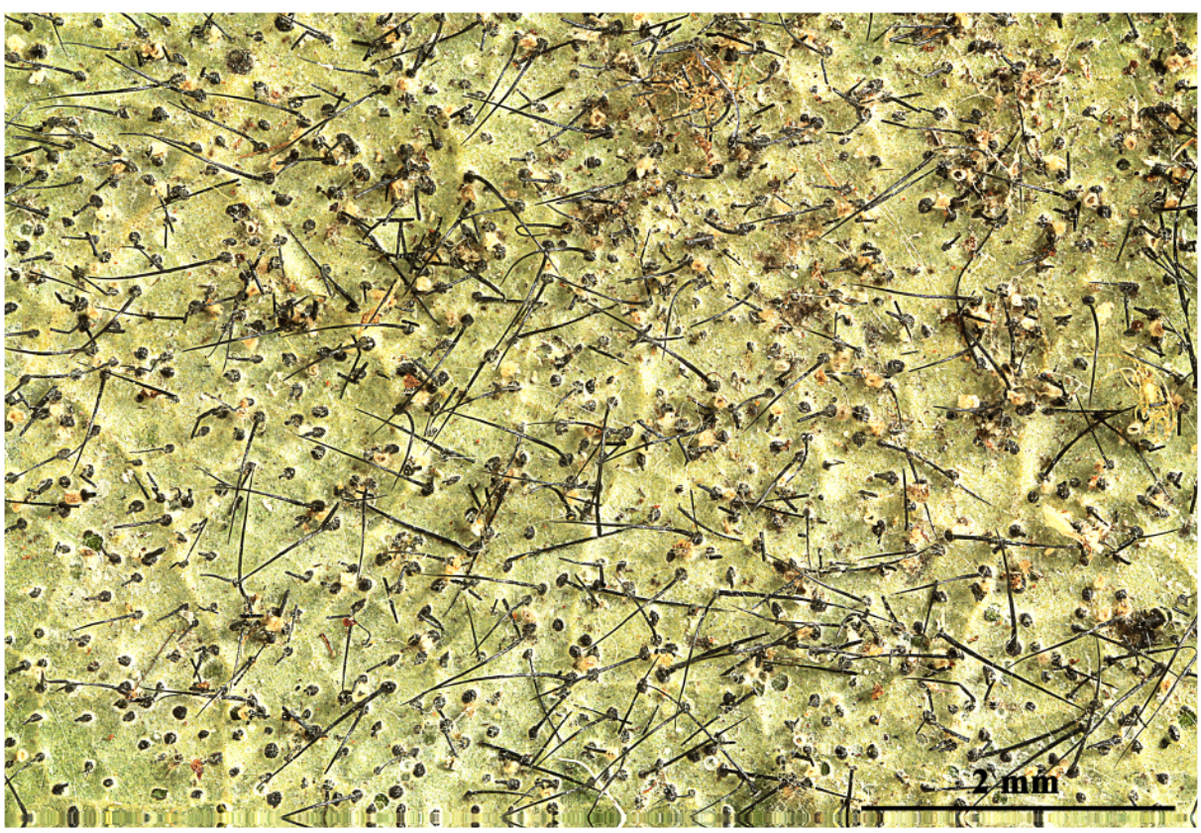




Tricharia leucothrix

Tricharia melanothrix Fée, Essai Crypt. Exot. (Paris): xcviii, cii (1825) [1824]

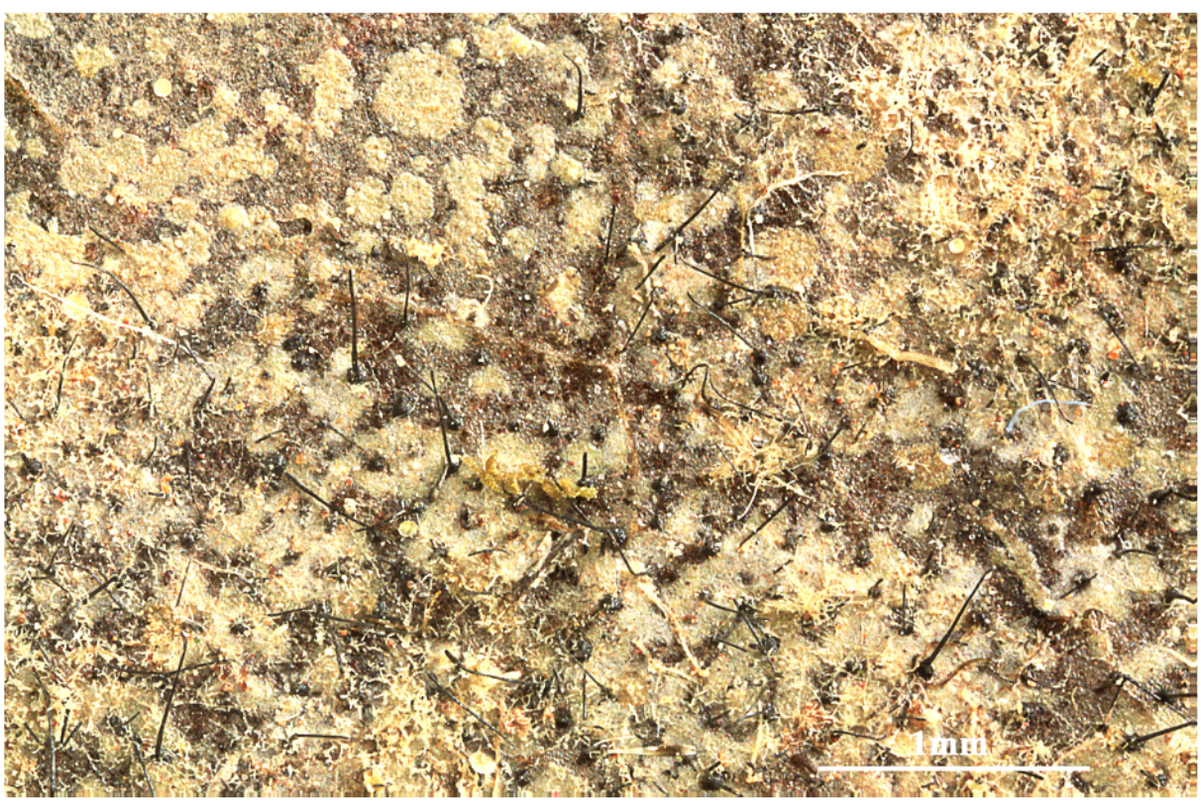
[ABL50710ay], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ay), 21. June 2019, det. A. Aptroot 2019. - Stiff, black hairs formed by the fungal component occur on the thallus surface of various foliicolous lichens. These sterile hairs are not to be confused with the somewhat reminiscent beaked pycnidia which occur in *Psorotheciopsis* and occasionally in some *Strigula* ssp. Black sterile hairs, 0.1-3 mm long, 30-50 µm thick, occur in *Aulaxina multiseptata*, *Bacidia cinnamomea*, and in most *Tricharia* species. In some cases, the anatomy or general appearance of the hairs is very characteristic. For the present, at least, mot black-haired Tricharia species cannot definitifly identified in the sterile state. However, since this sterile condition is by no means uncommon, such species could be designated collectiverly as "*Tricharia melanothrix*", should such a designation be needed, e.g. in ecological literature.





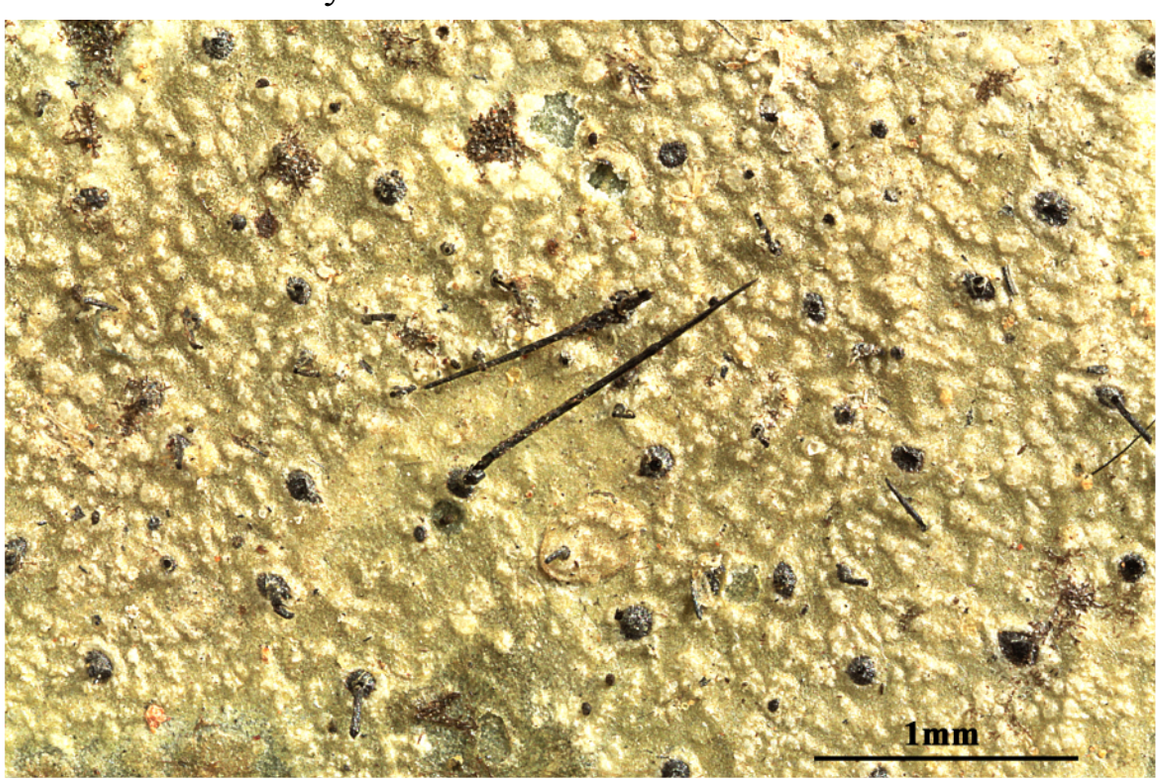
Tricharia melanothrix

[ABL18189], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18189), 27. July 2013, det. A. Aptroot 2013. - Stiff, black hairs formed by the fungal component occur on the thallus surface of various foliicolous lichens. These sterile hairs are not to be confused with the somewhat reminiscent beaked pycnidia which occur in *Psorotheciopsis* and occasionally in some *Strigula* ssp. Black sterile hairs, 0.1-3 mm long, 30-50 µm thick, occur in *Aulaxina multiseptata*, *Bacidia cinnamomea*, and in most *Tricharia* species. In some cases, the anatomy or general appearance of the hairs is very characteristic. For the present, at least, mot black-haired Tricharia species cannot definitifly identified in the sterile state. However, since this sterile condition is by no means uncommon, such species could be designated collectiverly as "*Tricharia melanothrix*", should such a designation be needed, e.g. in ecological literature.



Tricharia urceolata (Müll. Arg.) R. Sant., Symb. bot. upsal. 12(no. 1): 384 (1952)
= *Lopadium urceolatum* Müll. Arg. 1881

[ABL18191], Brazil, Sergipe, Parque National Serra de Itabaiana. 10°44'35" S, 37°20'25" W, 400 m. On living leaves in transitional forest to caatinga. Leg. M. Cáceres & A. Aptroot, (no. 18191), 27. July 2013, det. A. Aptroot 2013. - Thallus continuous, 5–20mm across and 15–20 µm thick, with cartilaginous, corticiform layer, finely verrucose due to incrustation with calcium oxalate crystals, with numerous, sterile setae, pale greenish grey; verrucae 0.05–0.1 mm diam., white; setae 1–2 mm long, black. Apothecia broadly sessile, biatorine, rounded to slightly irregular in outline, 0.2–0.4 mm diam. and 100–150 µm high; disc concave, pale yellowish brown to dark flesh-colored; margin thin, prominent, usually wavy-flexuose, yellowish brown to dark flesh-colored. Excipulum paraplectenchymatous, 30–50 µm broad, colorless to pale brown. Hypothecium 10–15 µm high, colorless to pale yellow. Epithecium 5–8 µm high, pale yellow. Hymenium 80–100 µm high, colorless. Asci clavate to ellipsoid, 70–90 x 20–40 µm. Ascospores single, oblong-ellipsoid, muriform, with slight constrictions at septa, 60–80 x 20–35 µm, 2.5–3 times as long as broad; postmature ascospores sometimes disintegrating into secondary conidia within asci. Hyphophores frequent, setiform with blunt to acute apex, 0.3–0.4 mm high, black. Diahyphae inserted apically, branched throughout, filiform, terminal segments slightly fusiform, 8–14 x 2–3 µm. Chemistry: no substances detected by TLC.

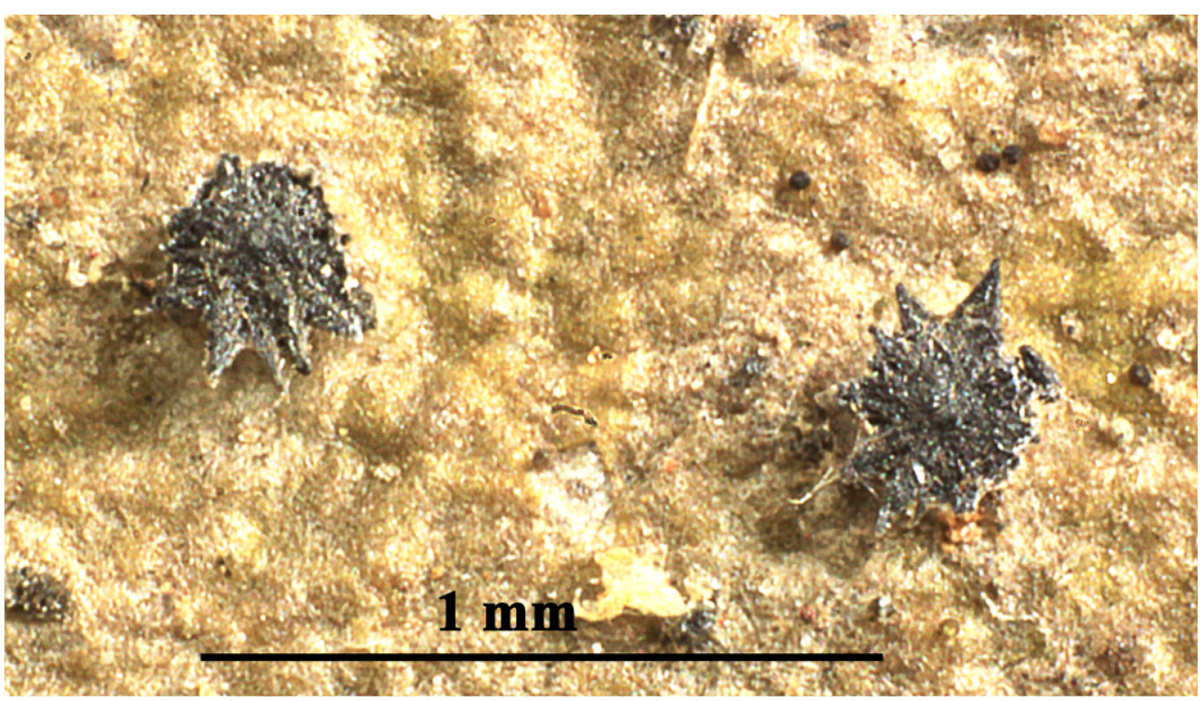


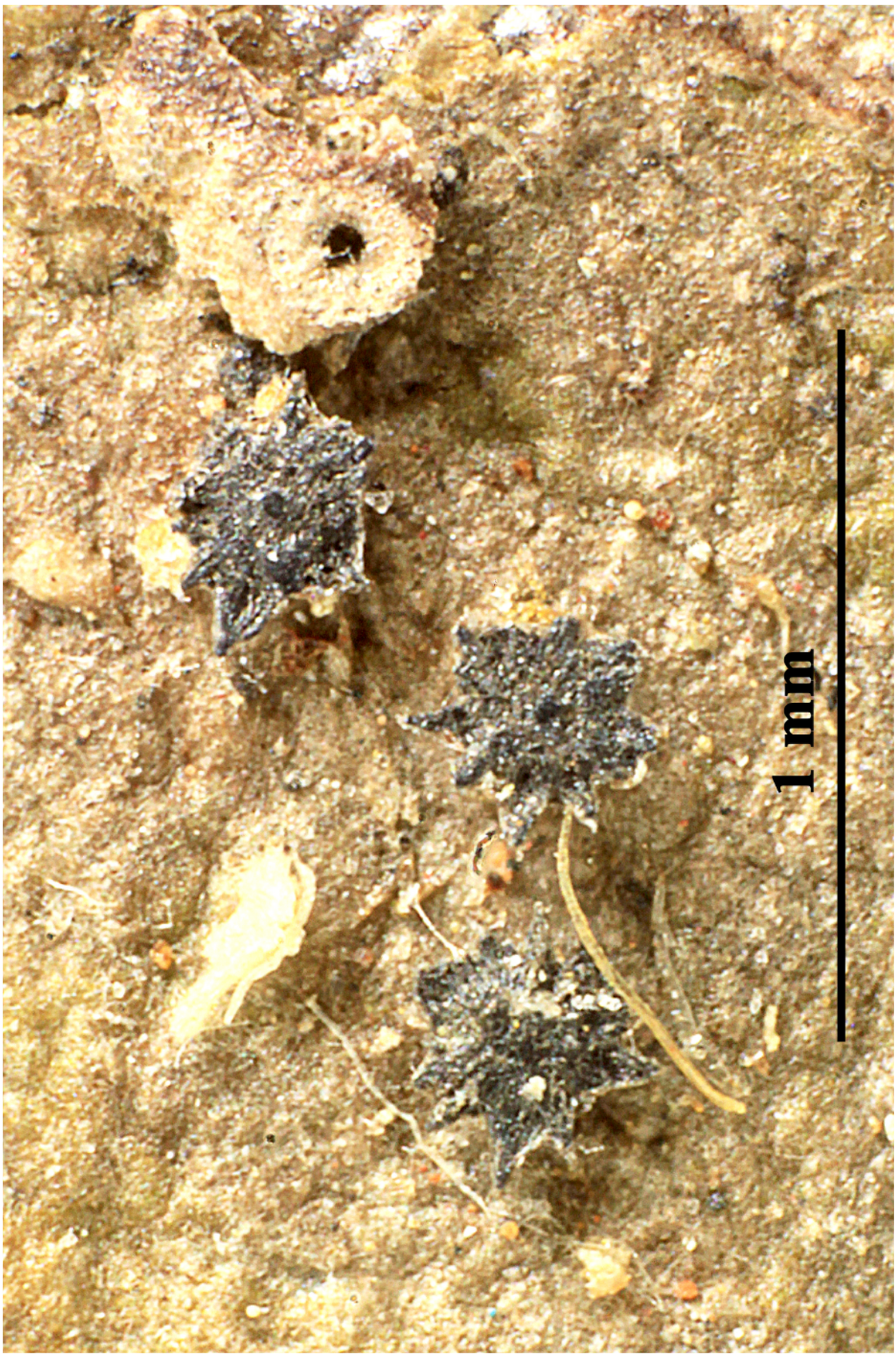


Tricharia urceolata

Trichothelium argenteum Lücking & L.I. Ferraro, Lichenologist 29(3): 217 (1997)

[ABL21581c], Brazil, Sergipe, Ribeiropolis, Serra do Machado. 10°33' S, 37°22' W, 250 m. On living leaves in secondary rainforest. Leg. M. Cáceres & A. Aptroot, (no. 21581c), 9. May 2014, det. A. Aptroot 2014. - Thallus continuous but with irregular marginal parts, smooth, pale brownish to greenish grey, up to 20 mm across. Photobiont cells angular-rounded, irregularly arranged. Perithecia hemispherical to subglobose, 0.3–0.35 mm diam., black; setae 20–30, forming horizontal crown, narrowly acute, 0.3–0.6 mm long and 20–40 µm broad at base, apically silvery white but basally black, in young perithecia forming continuous disc of completely confluent setae. Involucrellum brownish black, K–, externally covered by pale brown, thallus tissue without algae. Excipulum brownish black, K–. Asci obclavate, 70–90 x 13–16 µm. Ascospores oblong to narrowly fusiform, 7-septate, without constrictions at septa, colorless, 30–40 x 4.0–5.5 µm, 7–8 times as long as broad. Pycnidia hemispherical, 0.1–0.15 mm diam., brownish black. Conidia fusiform, non-septate, 3 x 1 µm, colorless. Chemistry: no substances detected by TLC; Pseudosagedia violet in perithecial wall.



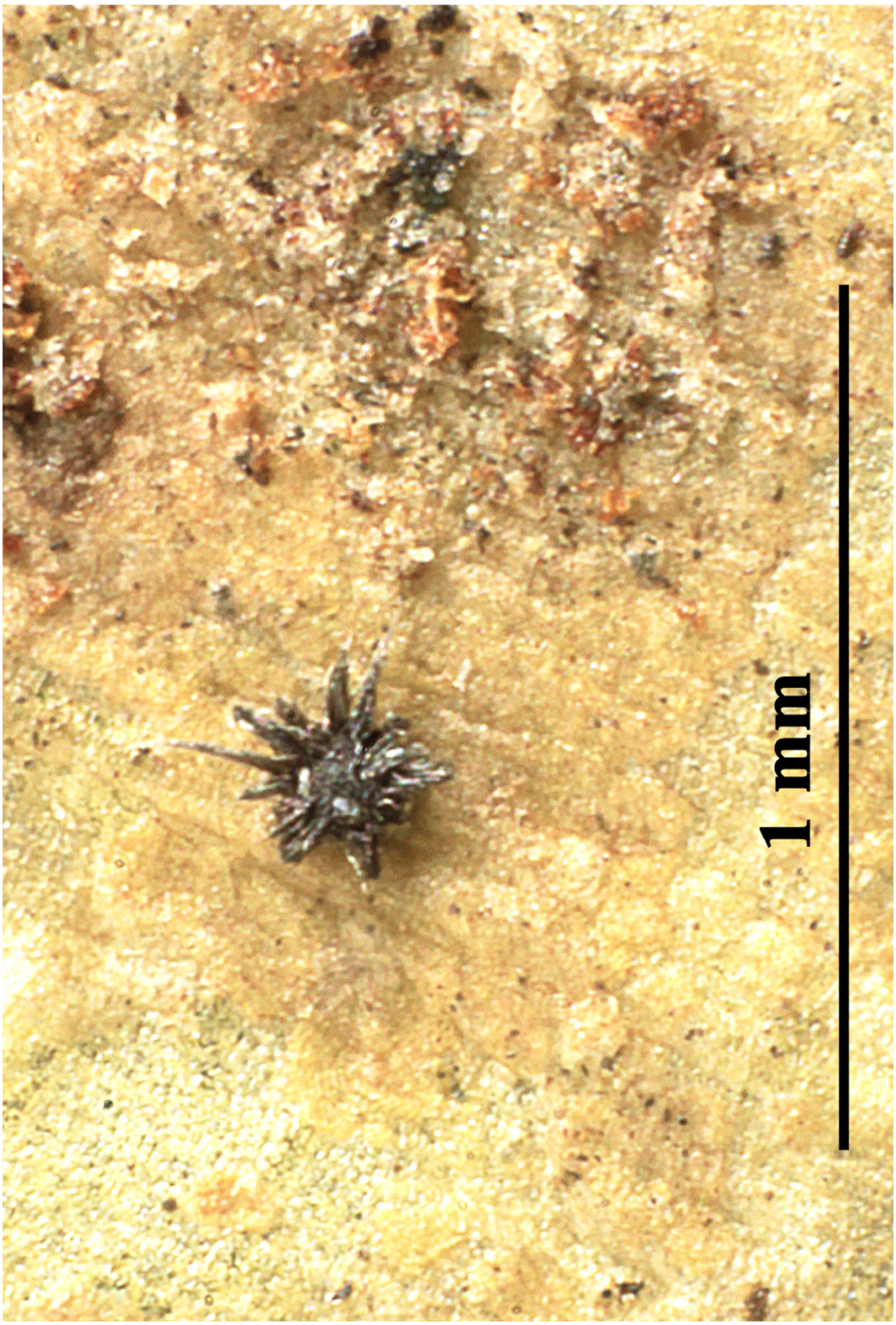


Trichothelium argenteum

Trichothelium bipindense F. Schill., Hedwigia 67: 278 (1927)

[ABL11799ag], Brazil, Amazonas, Fazenda São Francisco off BR 319 30 km N of Porto Velho. On leaves in primary rain forest. 8°24'33" S, 63°58'56" W, 100m. Leg. M. Cáceres & A. Aptroot, (no. 11799ag), 15. March 2012, det. A. Aptroot 2012. - Thallus dispersed into rounded, sometimes confluent patches, smooth, pale greyish to brownish green, up to 15 mm across. Photobiont cells rectangular, in regularly radiate rows. Perithecia subglobose, (0.1–)0.15–0.25 mm diam., black; setae 6–11, forming horizontal crown, narrowly acute to lanceolate, 0.15–0.4 mm long and 20–50 µm broad, pure black, very rarely with pale tips. Involucrellum black, K–. Excipulum brownish black, K–. Asci obclavate, 90–120 x 12–15 µm. Ascospores bacillar to tapering, (8–)9–11(–12)-septate, without constrictions at septa, colorless, 45–65 x 3.5–4.5 µm, 13–14 times as long as broad. Pycnidia not observed. Chemistry: no substances detected by TLC; Pseudosagedia violet in perithecial wall.

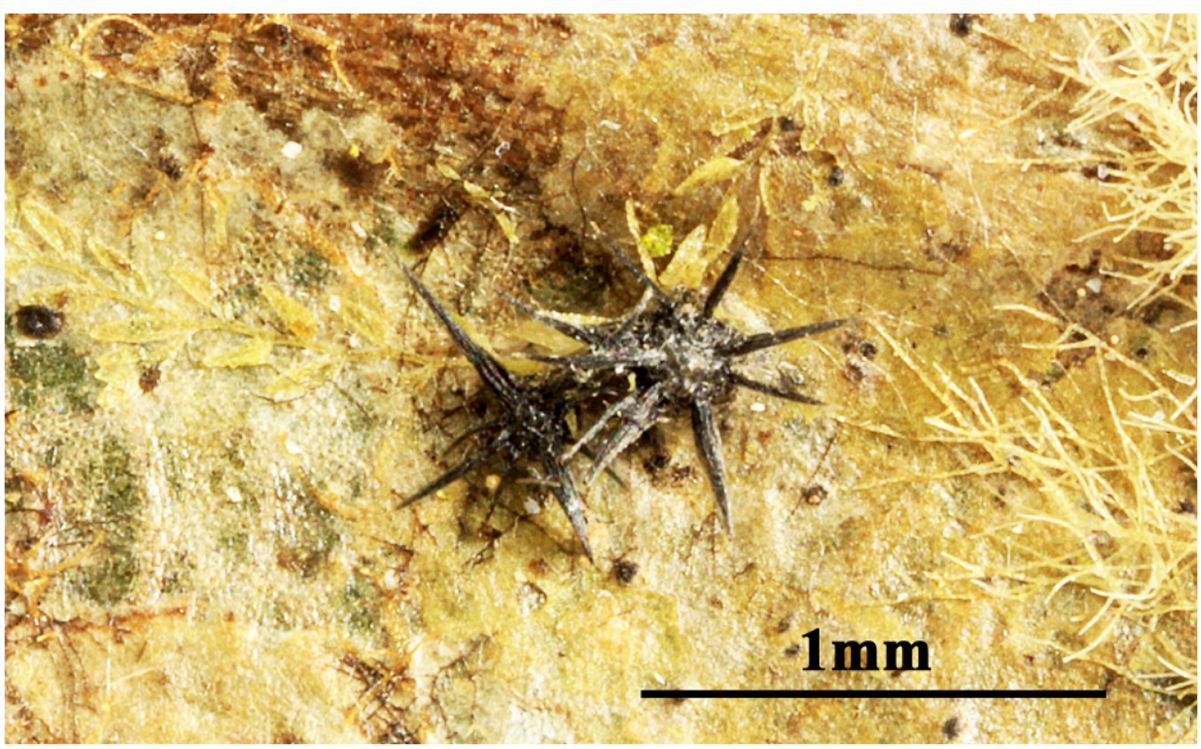


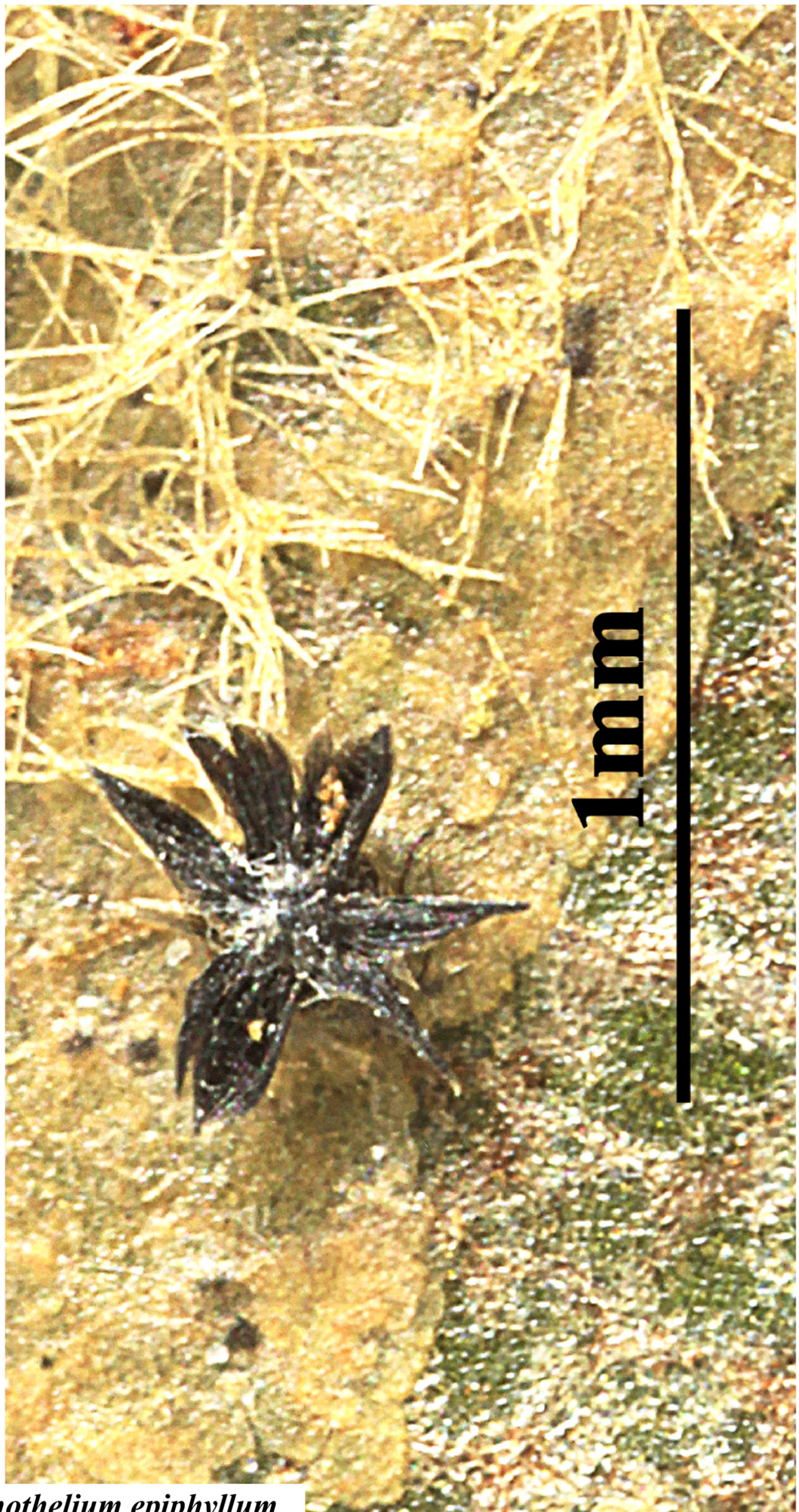


Trichothelium bipindense

Trichothelium epiphyllum Müll. Arg., Bot. Jb. 6: 418 (1885)
= *Trichothelium akeassii* U. Becker & Lücking [as 'ake-assii'] 1995

[ABL50710ar], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710ar), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, sometimes confluent patches, smooth, pale greyish to brownish green, up to 15 mm across. Photobiont cells rectangular, in regularly radiate rows. Perithecia subglobose, 0.15–0.3 mm diam., black; setae 3–6(–10), forming horizontal or slightly decurved crown, finshaped to lanceolate or acute, rarely brush-shaped in old perithecia, 0.3–0.5 mm long and 100–150 µm broad, pure black or with white apical zone, especially in old perithecia. Involucrellum brownish black to black, K–. Excipulum black, K–. Asci obclavate, 75–95 x 10–15 µm. Ascospores oblong, 7-septate, without constrictions at septa, colorless, 35–45 x 4–5 µm, 8–11 times as long as broad. Pycnidia hemispherical, 0.1–0.15 mm diam., brownish black. Conidia fusiform, non-septate, 3 x 1 µm, colorless. Chemistry: no substances detected by TLC; Pseudosagedia violet in perithecial wall.

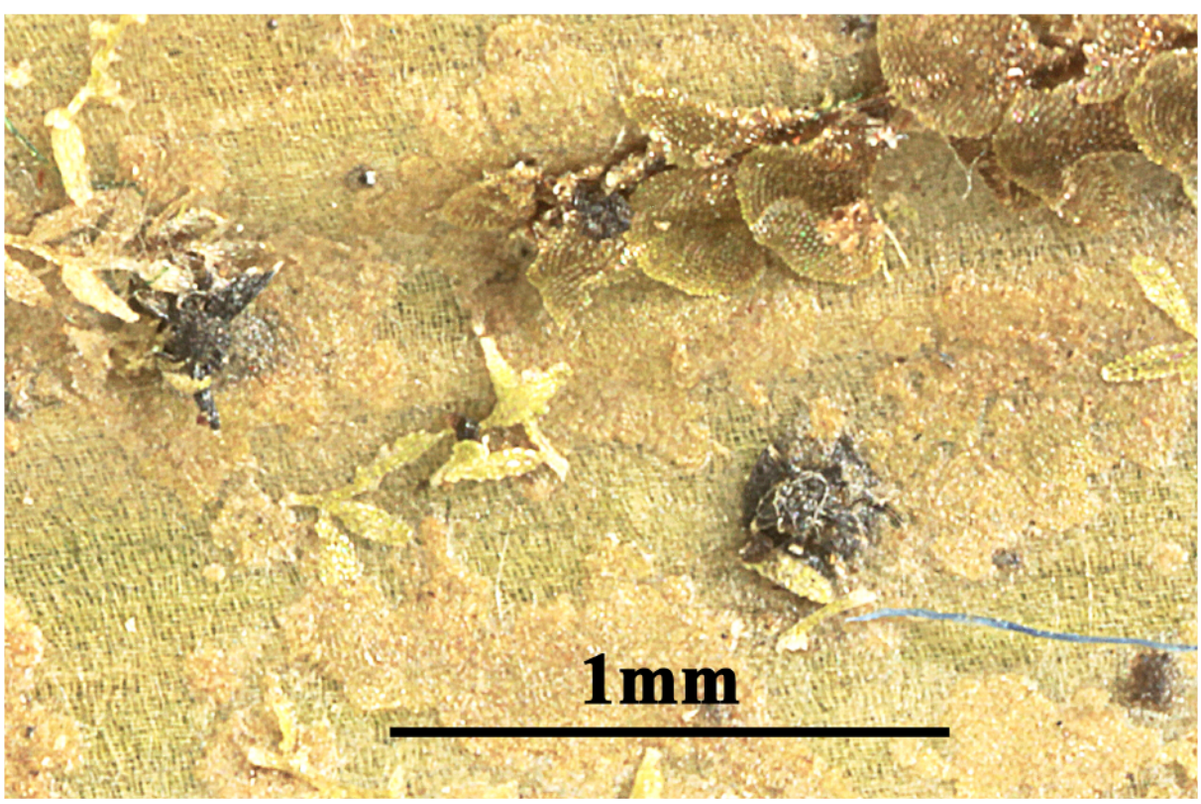




Trichothelium epiphyllum

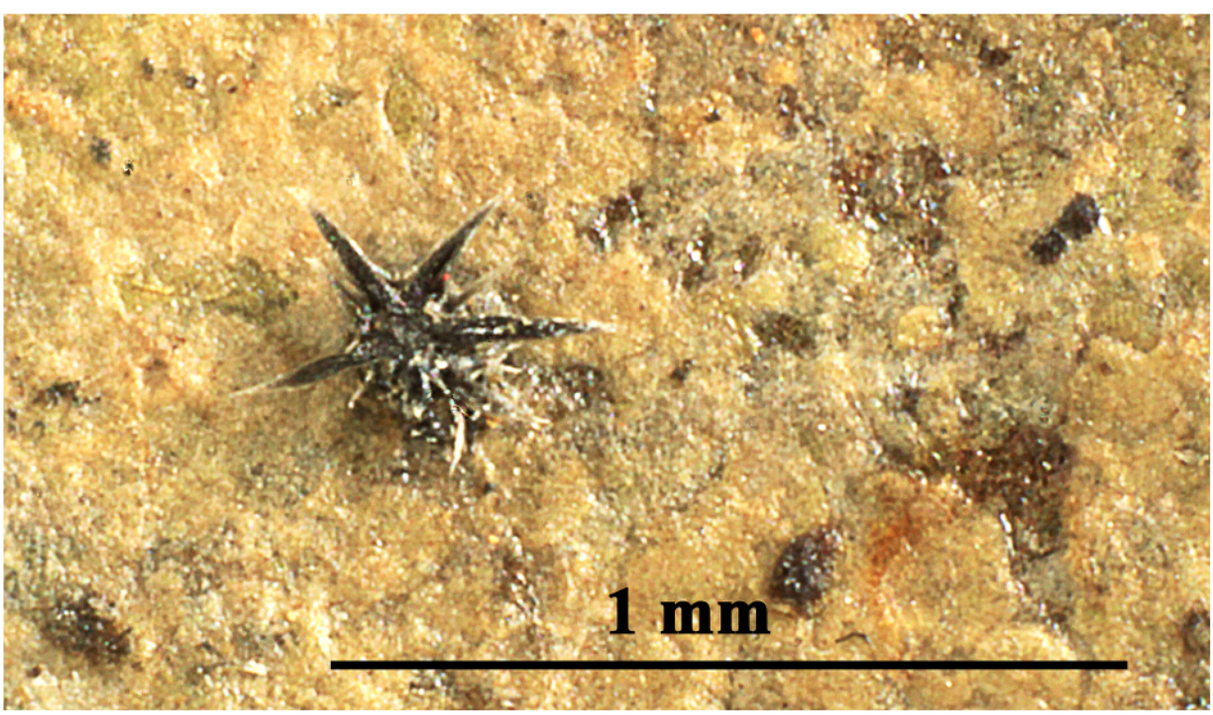
Trichothelium minutum (Lücking) Lücking, Nova Hedwigia 66(3-4): 397 (1998)
= *Trichothelium epiphyllum var. minutum* Lücking 1991

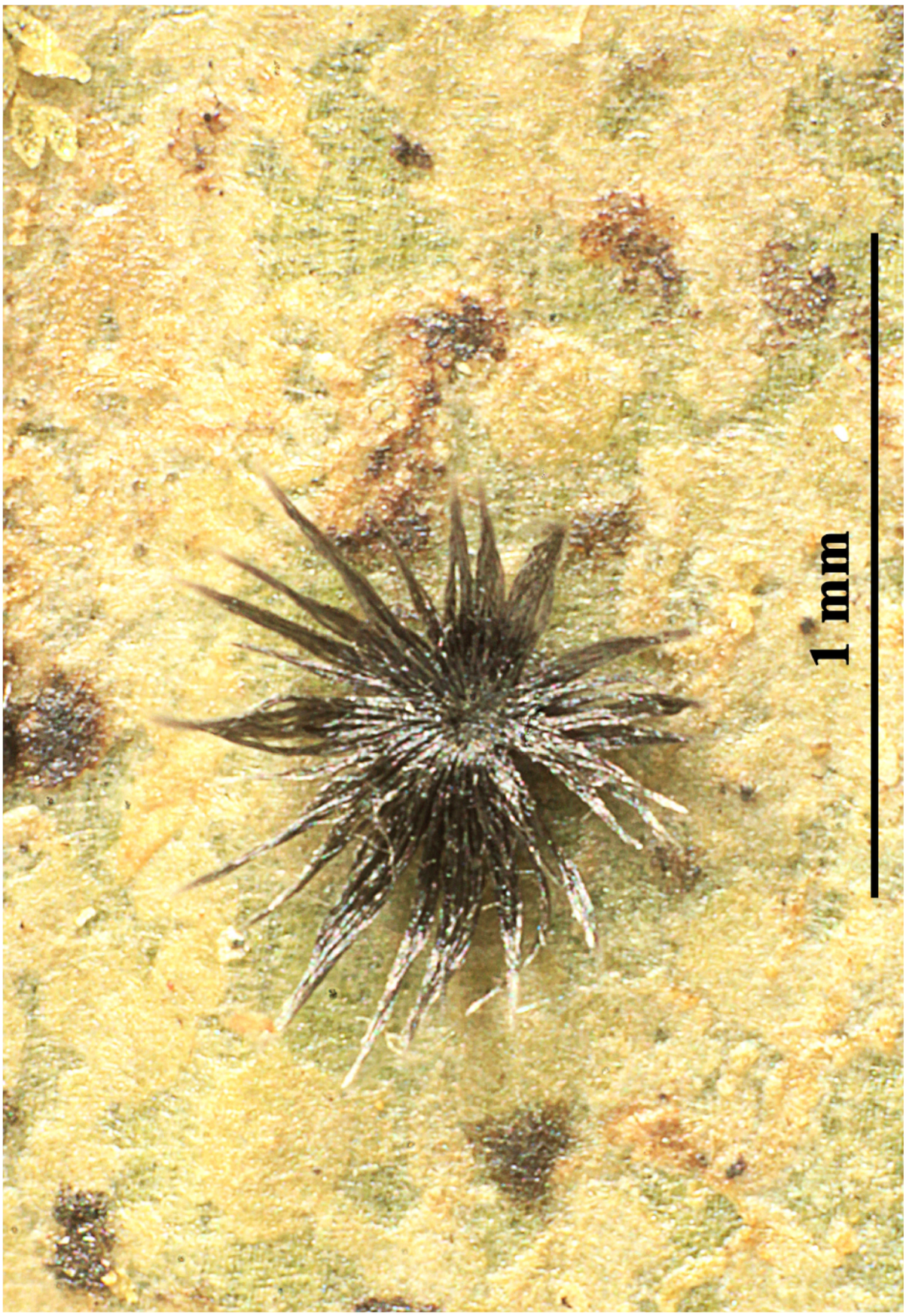
[ABL50710at], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710at), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, sometimes confluent patches, smooth, pale greyish green, up to 10 mm across. Photobiont cells rectangular or angular-rounded, in ± radiate rows. Perithecia subglobose, 0.1–0.15 mm diam., black; setae 5–8, irregularly scattered around top of perithecia and usually incurved, bristle-shaped, 0.1–0.2mm long and 10–15 µm broad, pure black or with pale tips. Involucrellum brownish black, K–. Excipulum dark brown to black, K–. Asci obclavate, 80–90 x 10–12 µm. Ascospores bacillar, 7-septate, without constrictions at septa, colorless, 35–45 x 3–4 µm, 11–12 times as long as broad. Pycnidia not observed. Chemistry: not tested; Pseudosagedia violet in perithecial wall.



Trichothelium ulei F. Schill., Hedwigia 67: 280, tab. IV, fig. 5 (1927)

[ABL50710as], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on living leaves. 2°56' S, 59°57' W, 650 m. Leg. A. Aptroot, (no. 50710as), 21. June 2019, det. A. Aptroot 2019. - Thallus dispersed into rounded, sometimes confluent patches, smooth, pale greyish green, up to 10 mm across. Photobiont cells rectangular, in regularly radiate rows. Perithecia subglobose to globose, 0.15–0.25 mm diam., black; setae (10–)15–20, forming horizontal crown or sometimes obliquely upright, narrowly acute, 0.25–0.4 mm long and 30–60 µm broad, pure black and usually shiny. Involucrellum brownish black to black, K–. Excipulum black, K–. Asci obclavate, 80–100 x 10–13 µm. Ascospores bacillar, 7-septate, without constrictions at septa, colorless, 35–50 x 3–4 µm, 11–13 times as long as broad. Pycnidia not observed. Chemistry: no substances detected by TLC; Pseudosagedia violet in perithecial wall.



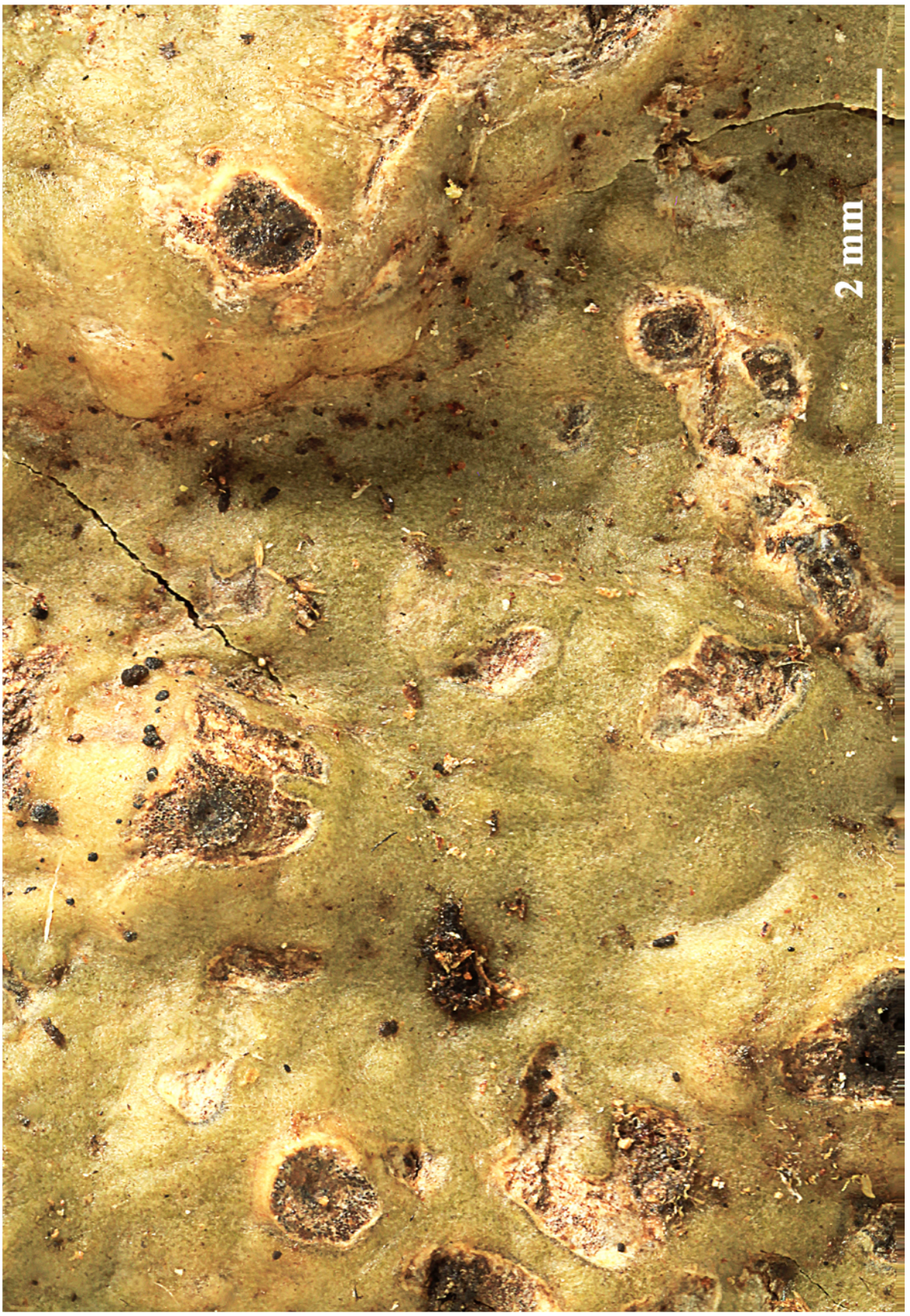


Trichothelium ulei

Viridothelium ustulatum M. Cáceres & Aptroot, Bryologist 120(2): 179 (2017)

[ABL50659], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50659), 21. June 2019, det. A. Aptroot 2019. - Thallus dull, olivaceous green, not surrounded by a prothallus. Ascomata globose to pyriform, 0.4–0.7 mm diam., immersed in pseudostromata, in groups of 9–25. Pseudostroma distinctly raised with steep sides and flat tops, c. 2–6 mm diam., roundish to ellipsoid, ochraceous, not pigmented, margin often somewhat crenate. Ostioles eccentric, fused, conical, black, surrounded by a c. 0.1 mm wide black ring. Hamathecium not inspersed, IKI–. Ascospores 8/ascus, hyaline, 3-septate, 17–20 x 6.5–7.5 µm, long-ellipsoid, not surrounded by a gelatinous sheath. Pycnidia not observed. Chemistry. Thallus and pseudostroma UV–, C–, K–, KC–, P–. No lichen substances detected with TLC. This species would key out as follows in the world key to Viridothelium species by Aptroot & Lücking (2016): Couplet 3: Ascospores 17–20 x 6.5–7.5 µm (all other species have much longer ascospores). It should also be given as a note in the Astrothelium key 4, at couplet 12: Ascomata aggregated in rounded, raised pseudostromata of c. 3–5 mm diam. with black center and creamish margins; ascospores 17–20 x 6.5–7.5 µm, see *Viridothelium ustulatum*.

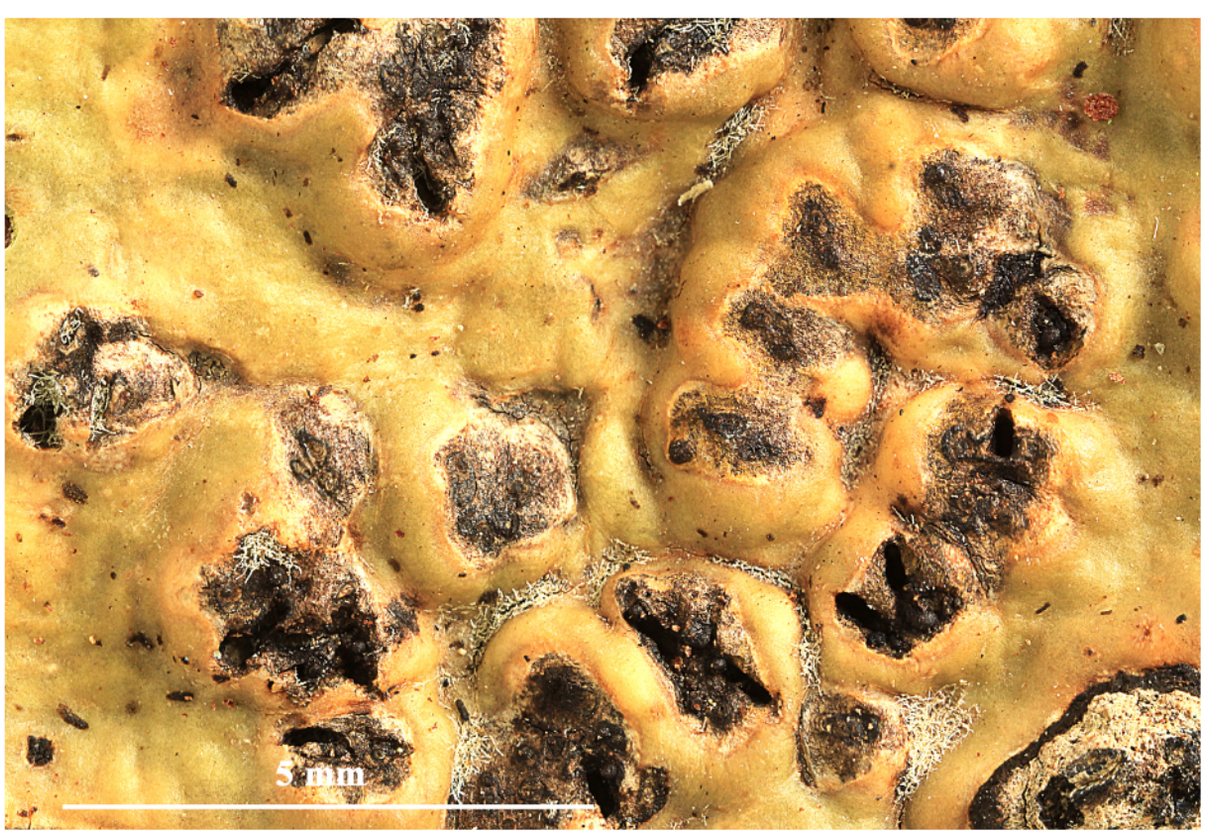




Viridothelium ustulatum

Viridothelium ustulatum M. Cáceres & Aptroot, Bryologist 120(2): 179 (2017)

[ABL50682], Brazil, Amazonas, Manaus, Reserva Florestal Ducke, along trails in vincity of field station, in primary tropical rain forest on tree bark. 2°56' S, 59°57' W, 50 m. Leg. A. Aptroot, (no. 50682), 21. June 2019, det. A. Aptroot 2019. - Thallus dull, olivaceous green, not surrounded by a prothallus. Ascomata globose to pyriform, 0.4–0.7 mm diam., immersed in pseudostromata, in groups of 9–25. Pseudostroma distinctly raised with steep sides and flat tops, c. 2–6 mm diam., roundish to ellipsoid, ochraceous, not pigmented, margin often somewhat crenate. Ostioles eccentric, fused, conical, black, surrounded by a c. 0.1 mm wide black ring. Hamathecium not inspersed, IKI–. Ascospores 8/ascus, hyaline, 3-septate, 17–20 x 6.5–7.5 µm, long-ellipsoid, not surrounded by a gelatinous sheath. Pycnidia not observed. Chemistry. Thallus and pseudostroma UV–, C–, K–, KC–, P–. No lichen substances detected with TLC. This species would key out as follows in the world key to Viridothelium species by Aptroot & Lücking (2016): Couplet 3: Ascospores 17–20 x 6.5–7.5 µm (all other species have much longer ascospores). It should also be given as a note in the Astrothelium key 4, at couplet 12: Ascomata aggregated in rounded, raised pseudostromata of c. 3–5 mm diam. with black center and creamish margins; ascospores 17–20 x 6.5–7.5 µm, see *Viridothelium ustulatum*.

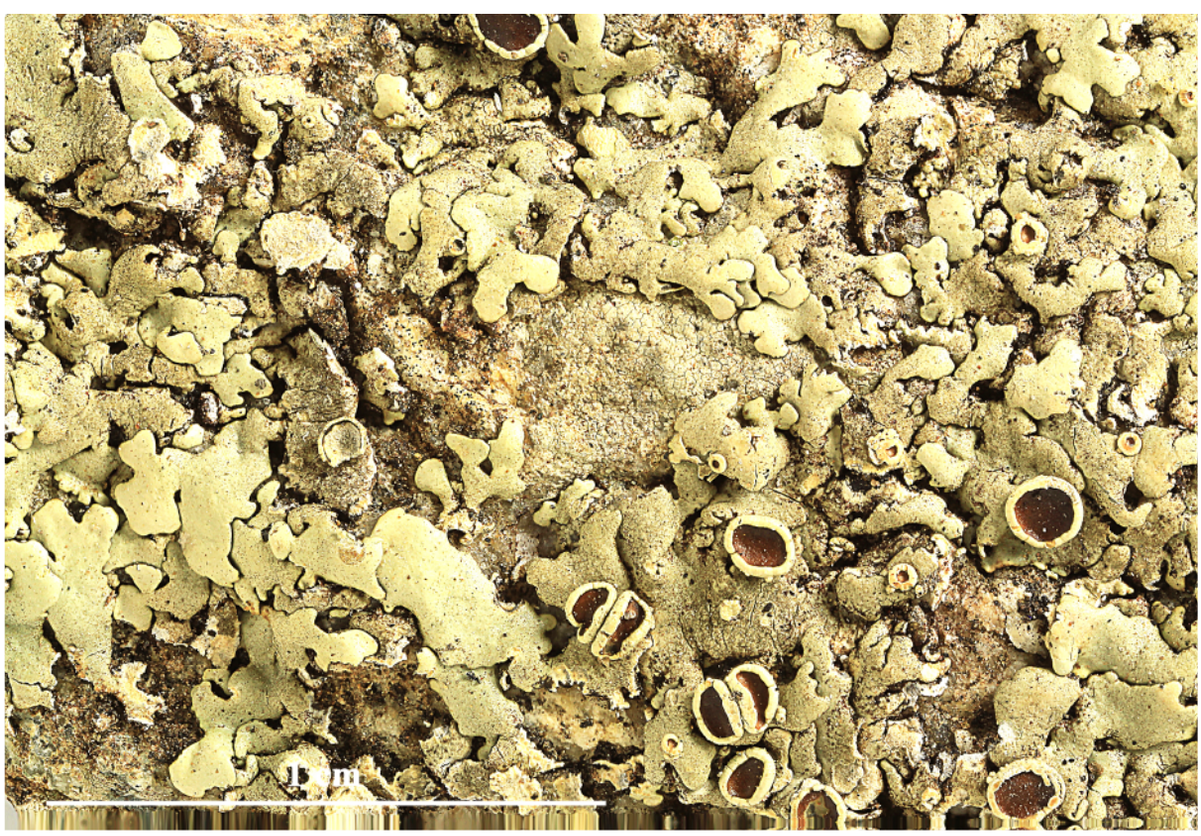


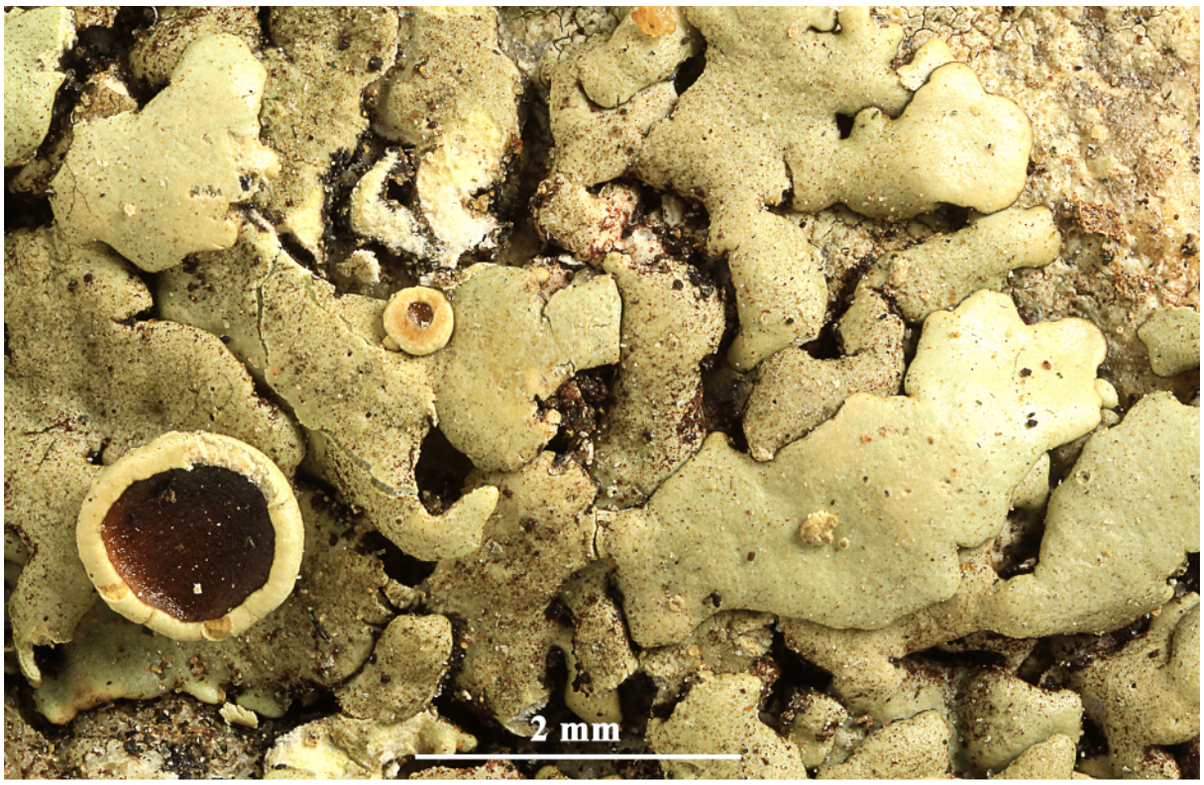


Viridothelium ustulatum

Xanthoparmelia neocumberlandia T.H. Nash & Elix, in Nash, Gries & Elix, Biblthca Lichenol. 56: 79 (1995)

[ABL48043], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Eco-parque. 09°39'43" S, 45°40'18" W, 30 m. On siliceous rock in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48043), 15. November 2018, det. A. Aptroot 2018. - Thallus foliose, appressed to tightly appressed to rocks, yellowish green to dark olive green with age, 6-12 cm diam.; lobes subirregular, 1-2 mm wide, contiguous or rarely imbricate, lacking lacinae. Upper surface shiny, continuous, emaculate, isidia and soredia lacking; medulla white. Lower surface plane, pale brown or darkening, moderately rhizinate, rhizines pale brown, simple, 0.3-0.8 mm long. Apothecia numerous, substipitate, 2-10 mm diam.,; spores 7-9 x 4-5 µm; pycnidia common, conidia bifusiform, 5-7 x 0.5 µm. Chemistry: Thallus K-; medulla K+ yellow to orange, C-, KC-,P+ orange; usnic acid, norstictic acid (trace), stictic acid (major), constictic acid (minor), cryptostictic acid (trace).



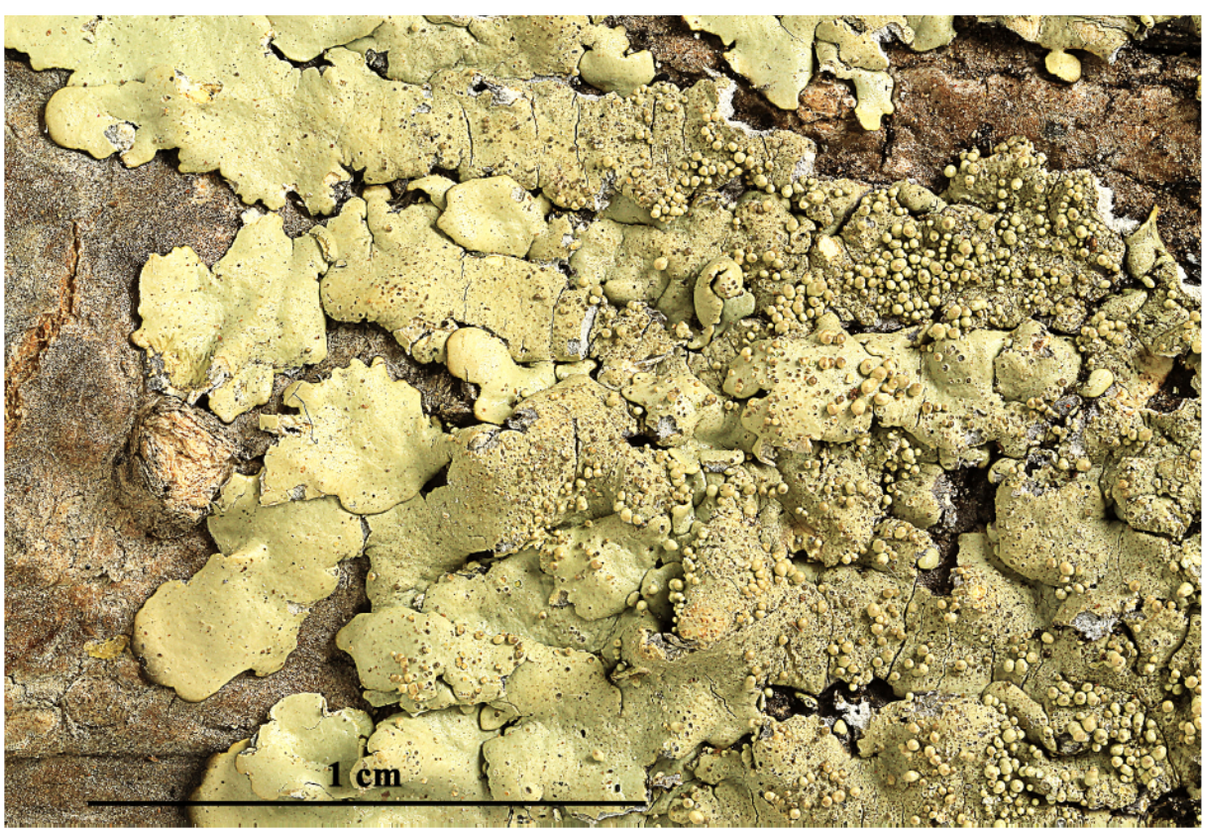




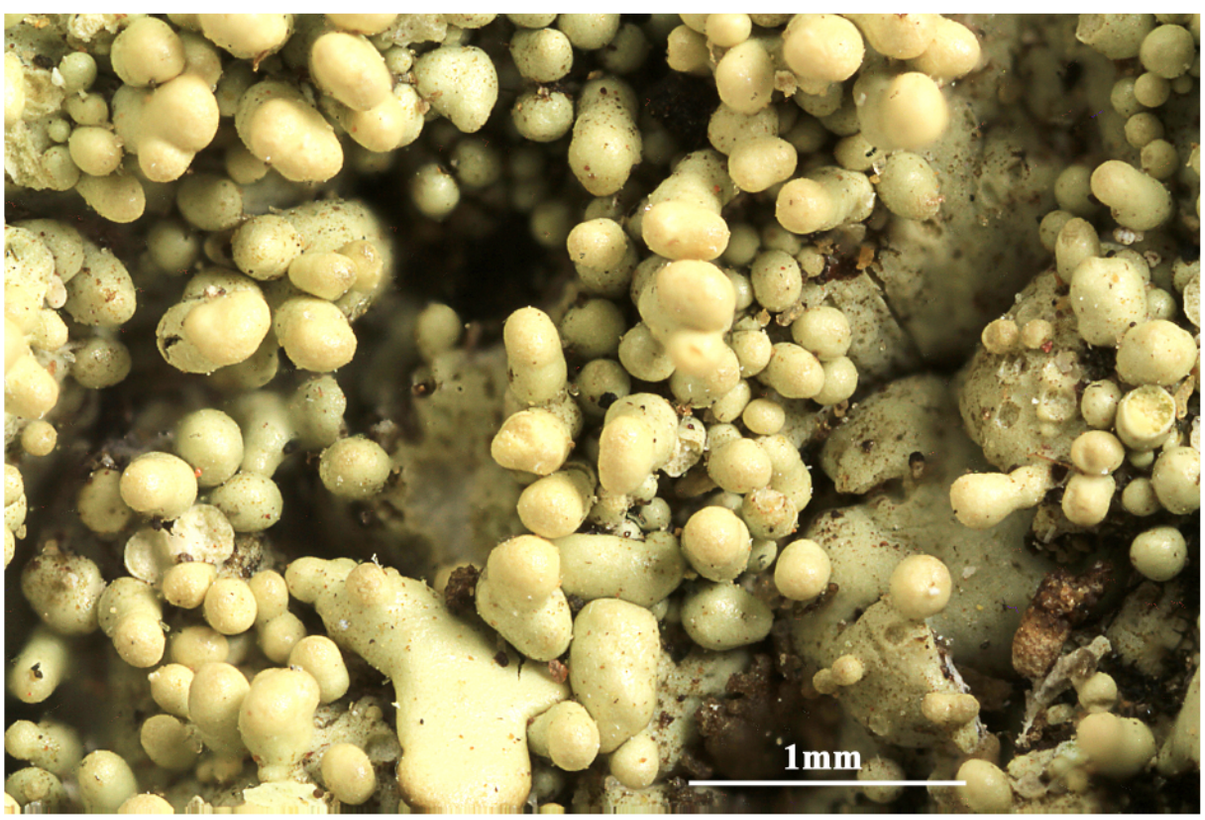
Xanthoparmelia neocumberlandia

Xanthoparmelia succedans Elix & J. Johnst., in Elix, Johnston & Armstrong, Bull. Br. Mus. nat. Hist., Bot. 15(3): 333 (1986)

[ABL48020], Brazil, Sergipe, Poço Redondo, Cajueiros, Trilha Ecoparque. 09°39'43" S, 45°40'18" W, 30 m. On tree bark in Caatinga. Leg. M. Cáceres & A. Aptroot, (no. 48020), 15. November 2018, det. A. Aptroot 2018. - Thallus foliose, moderately to tightly adnate on rocks, yellow-green, darkening to olive-green or blackish with age, forming patches to 10 cm diam.; lobes elongate, not or hardly imbricate, irregularly crowded, 2-2.5 (-3.0) mm wide. Upper surface smooth or rugulose, opaque but shining and black-margined towards apices, without maculae or soredia, isidiate, isidia slender, cylindrical, simple or becoming extensively branched, sparse to moderate, often covering centre of thallus; medulla white. Lower surface pale tan to brown, moderately rhizinate, rhizines simple, concolorous with lower surface or blackening and tufted. Apothecia rare, adnate, 2-4 mm diam., disc dark brown, concave and then flat or nearly so, with stellate cracks, margin thick and involute at first, persistent, becoming undulate, exciple isidate; spores 7-9 x 4-5.5 µm. Chemistry: Thallus K-; medulla K+ yellow, C-, KC-, P+ yellow-orange; containing usnic acid, stictic acid (major), constictic acid (minor), salazinic acid (minor), and traces of norstictic acid and cryptostictic acid.







Xanthoparmelia succedans

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Sergipe and Amazonas are the smallest and biggest states of Brazil. The Amazone is famous because it is the richest biome for most terrestrial organism groups. Lichens are no exception, even though they are not very abundant in rainforest. Lichens are very species rich in the Amazon, and a single tree easily harbours 100 different species, and a small location up to 500 species. Also, many species grow on living leaves, easily up to 50 on a large, well-placed palm frond. In this book, some of these species are illustrated, in many cases for the first time, or for the first time in colour.

New species

Myriotrema psormuriforme Aptroot & Schumm, sp. nov

Paraporpidia neotropica Aptroot & Schumm sp. nov

New combination

Fissurina bothynocarpa (Redinger) Aptroot & Schumm new comb. = *Graphina bothynocarpa* Redinger