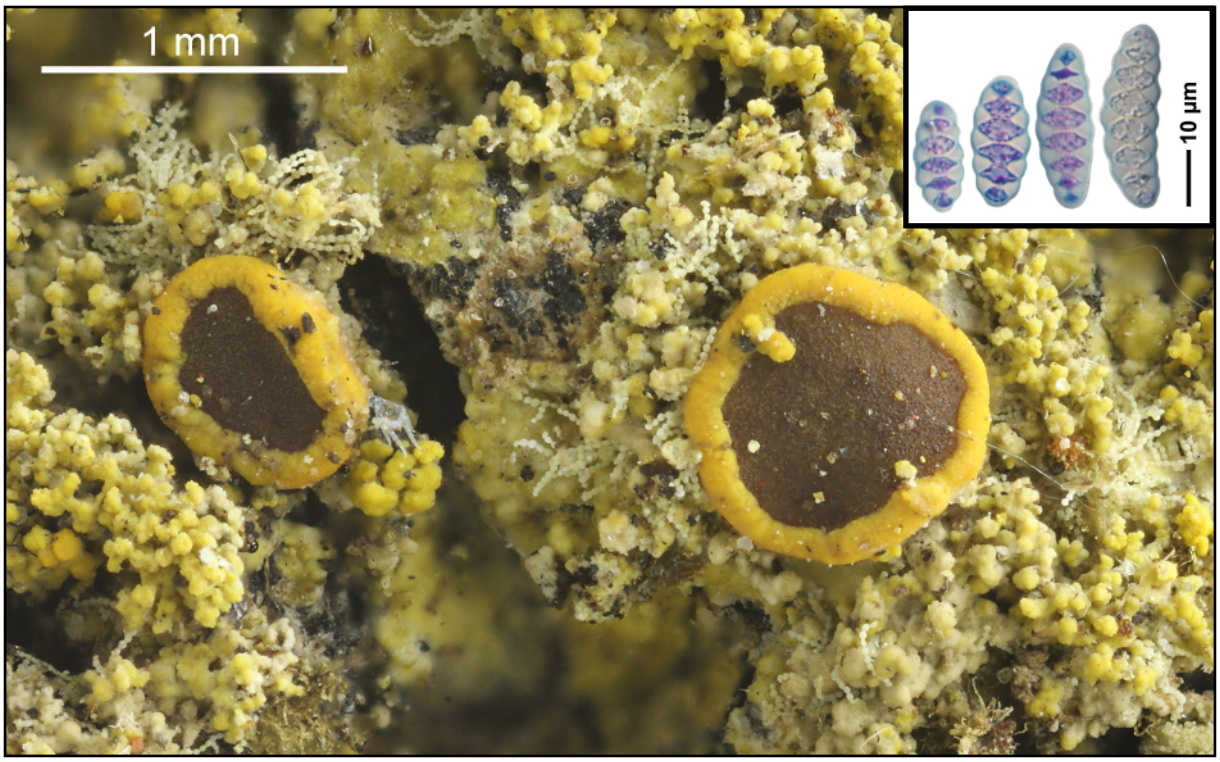


*F. Schumm & A. Aptroot*

# A microscopical Atlas of some tropical Lichens from SE-Asia

**(Thailand, Cambodia, Philippines,Vietnam)**

**VOLUME ONE**



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# A microscopical Atlas of some tropical Lichens from SE-Asia

**(Thailand, Cambodia, Philippines,Vietnam)**

**VOLUME ONE**

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CONTENTS

VOLUME ONE
Preface
Some frequently used abbreviations
*Anisomeridium - Lobaria* .....1-455

VOLUME TWO
*Malmidea - Trypethelium*..... 456-862
Literatur..... 863-874
Index to species and synonyms..... 875-881

# Preface

We present here pictures of lichens from SE-Asian countries (Thailand, Cambodia, Vietnam, Philippines, Indonesia). Some lichens described here comprises also species originating in other regions of the world but they are added here because we expect them to appear in Thailand as well.

The authors have the intent to let the pictures speak for themselves and descriptions usually refer to non-visible details like chemistry. In case further details were required the authors suggest to consult the relevant literature which cares about those information a lot, however, mostly without illustration.

The most time consuming has been to take pictures of stained sections. Nevertheless habitus pictures are presented too, but ususally in strong magnifications which can not be found elsewhere.

The pictures are intended to serve as an additional guide and as a kind of a „foto-exsiccat“ for the workshop IAL7 2012 about „Tropical Lichens“ in Bangkok which was held by Dr. André Aptroot. Of course, the book must be used with additional textbooks and keys and shall not substitute but primarily accompany these.

It must be mentioned that the tables are not made for lichen-beginners. It is required that the user is able to interpret the pictures and knows the terminology. There is no glossary et cetera, because such introductory chapters can be found in the standard literature anyway.

The pictures show mostly thick (in order to be compared with handcuts) and thin microtome-sections of appx. 8-25 µm. They are presented unstained or/and stained with cotton blue or fuchsin acid as described e.g. in F. SCHUMM (2008): „Flechten Madeiras, der Kanaren und Azoren“. Sometimes the blue colour is the result of staining with IKI. It should be easy for the reader to decide. Most pictures have an exact scale bar, which can be used for further measurements.

Generally species which have been shown already in our „Seychelles Lichen Guide“, a book which comprises also many asian species, are not repeated here. For example one can find many *Sticta* and *Pseudocyphellaria* species that book.

In the internet the reader will find an general index of all species published so far in our various books under the URL http://archive-for-lichenology.de

The texts ends always with the number in the herbarium F. SCHUMM (promised to Berlin) and the exact location, where the specimen had been gathered. Mostly it is also stated who was finally responsible for deciding the name of the specimen. We are grateful especially to A. Archer (Graphidaceae), J.A. Elix (Parmeliaceae), K. Kalb (Graphis, Ocellularia, Malmidea), P.M. Jørgensen (Coccocarpia, Pannariaceae) and H. Sipman (various genera) for their generous support.

Felix Schumm
André Aptroot

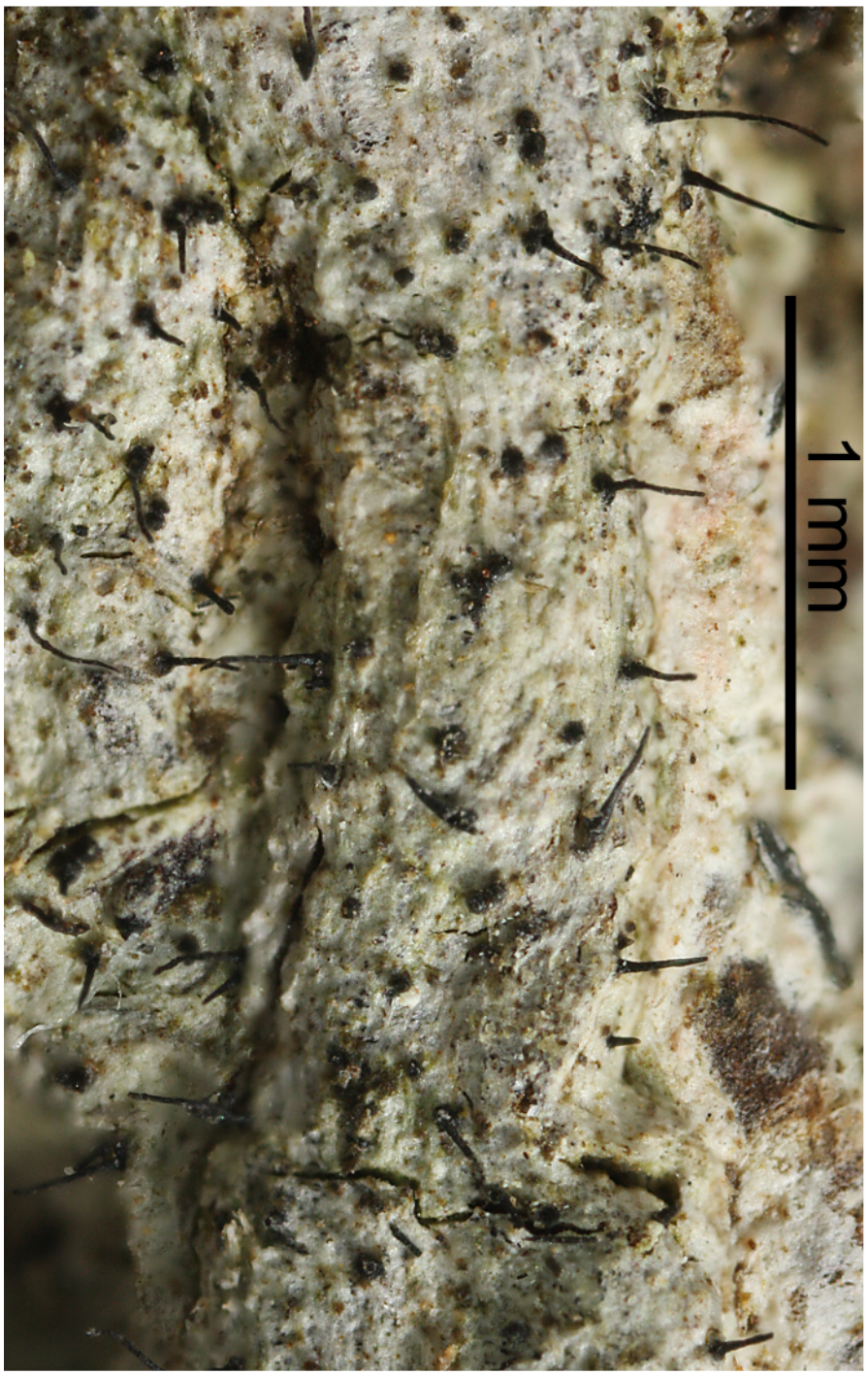
**Some frequently used abbreviations**:

C: chloride of lime (calcium hypochlorite, Chlorkalk in German) in water or undiluted commercial bleach e.g. in Germany „Dan Klorix“
HCL: hydrochloric acid, 20%
J, I, IKI: Lugol's iodine solution (J=Jod in German !)
K, KOH: potassium hydroxyde, 10-35 % in water (KOH= Kaliumhydroxid in German)
KC: K followed by C
K&J: K, washed with water then followed by J
N: nitric acid 53%
P, Pd: paraphenylendiamine in alcohol
UV: UVK and also UVL
UVK: ultra-violet light, 254 nm (Ultraviolett kurzwellig)
UVL: ultra-violet light, 366 nm (Ultraviolett langwellig)
TLC: thin-layer chromatography (DC = Dünnschicht Chromatogramm in German)
(maj): major component
(min) minor component
(tr): component only in traces
±: more or less

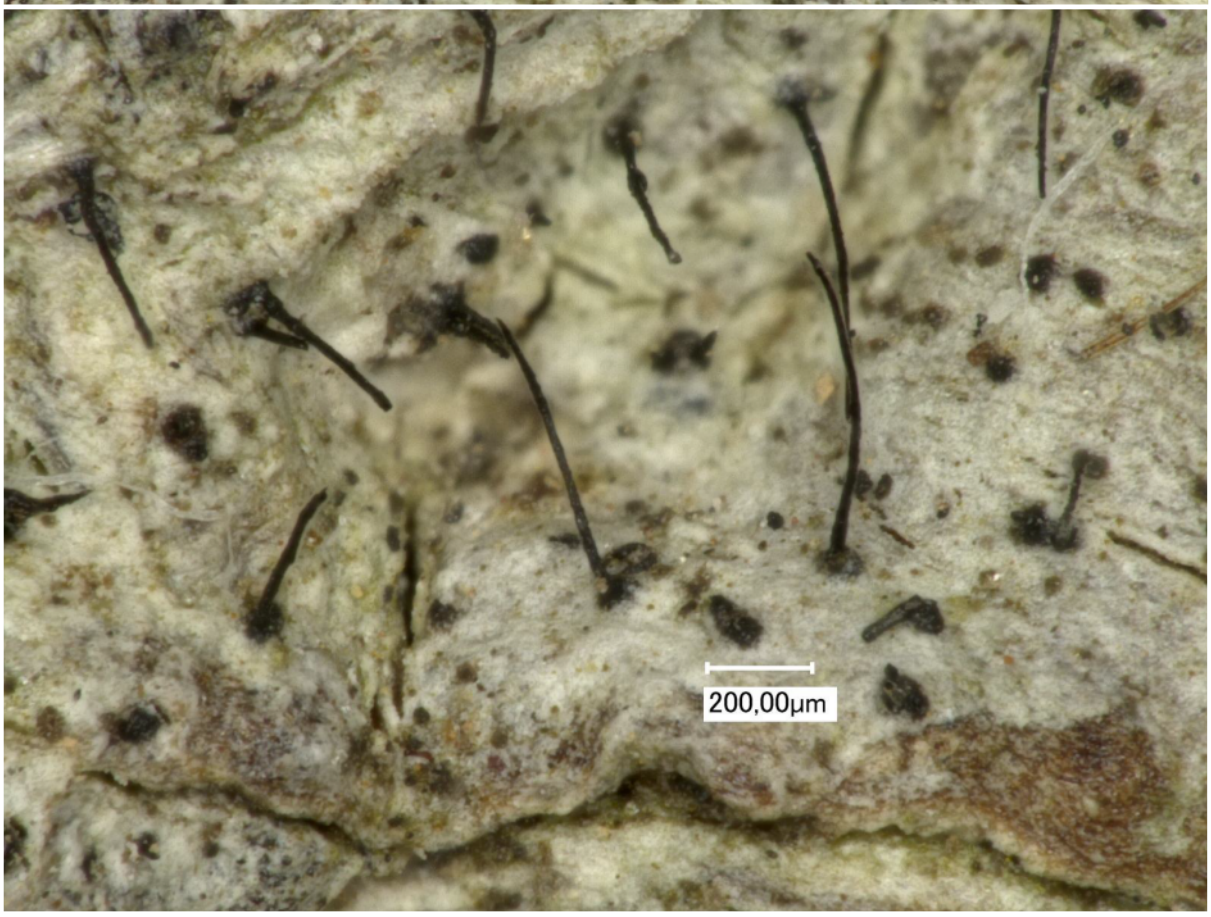
***Anisomeridium throwerae*** R.C.Harris

Macropycnidia with a long, to 1.5 mm, beak through which the macroconidia are extruded in single file; macroconidia oblong, constricted in middle, 8-10 x 4-5 µm.Thallus whitish to grey green, endophloeodal, UV-. Ascomata immersed, subglobose, ca. 0.2 mm diam.; ostiole apical. Asci cylindrical, ca. 45 x 9 µm, with 8 biseriate spores. Ascospores ovoid, hyaline, 1-septate, slightly constricted at submedian septum, 12-17 x 5-6.5 µm. Lit. Harris, R.C. - 1995: More Florida Lichens.

[17592], Thailand, Trat province, Ban Phu Resort, 12.16619° N, 102.56977° E, 8 m. Leg. Schumm (IAL 7) 17.01.2012, det. Aptroot 2012.





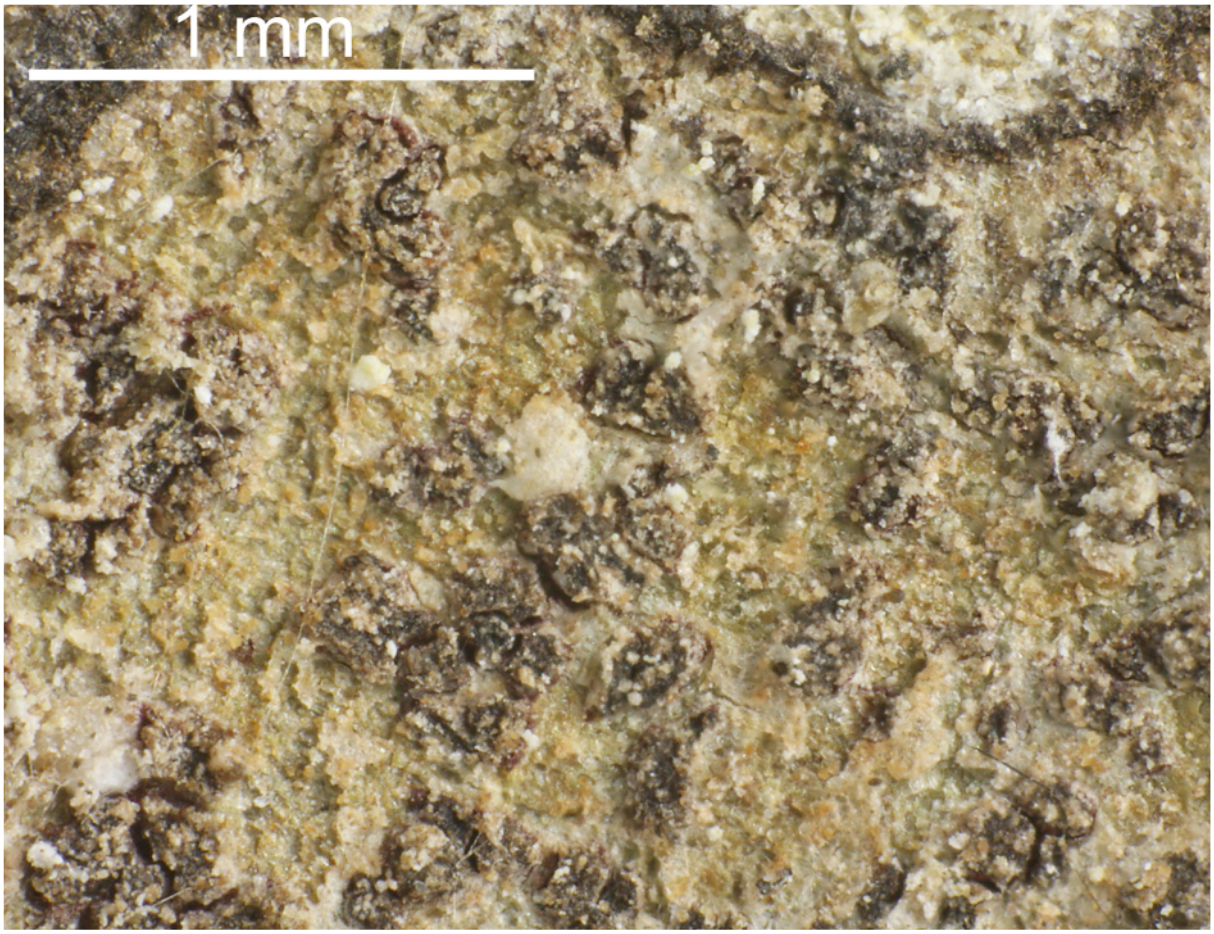



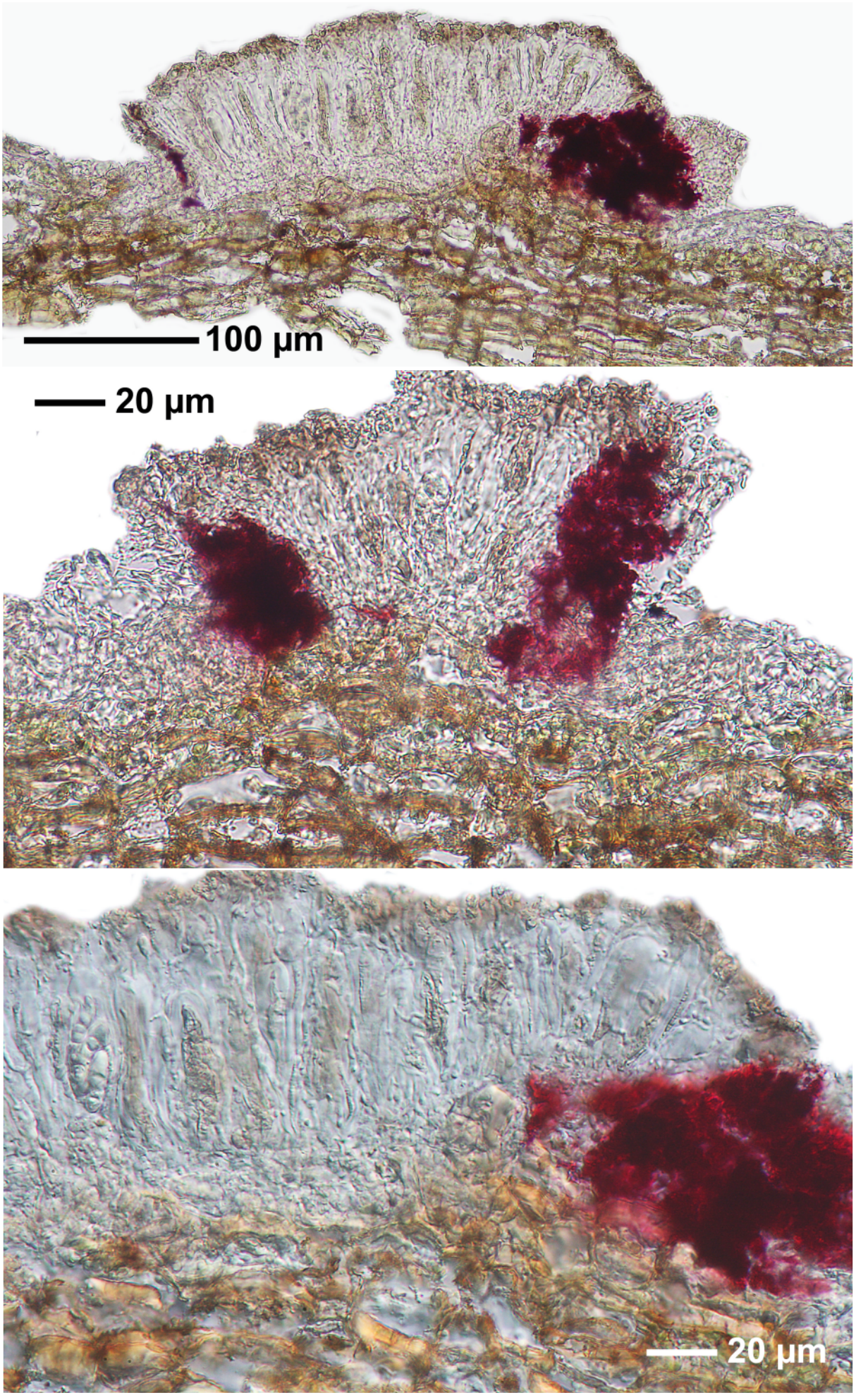

***Anisomeridium throwerae***

***Arthonia cinnabarina*** (DC.) Wallr.

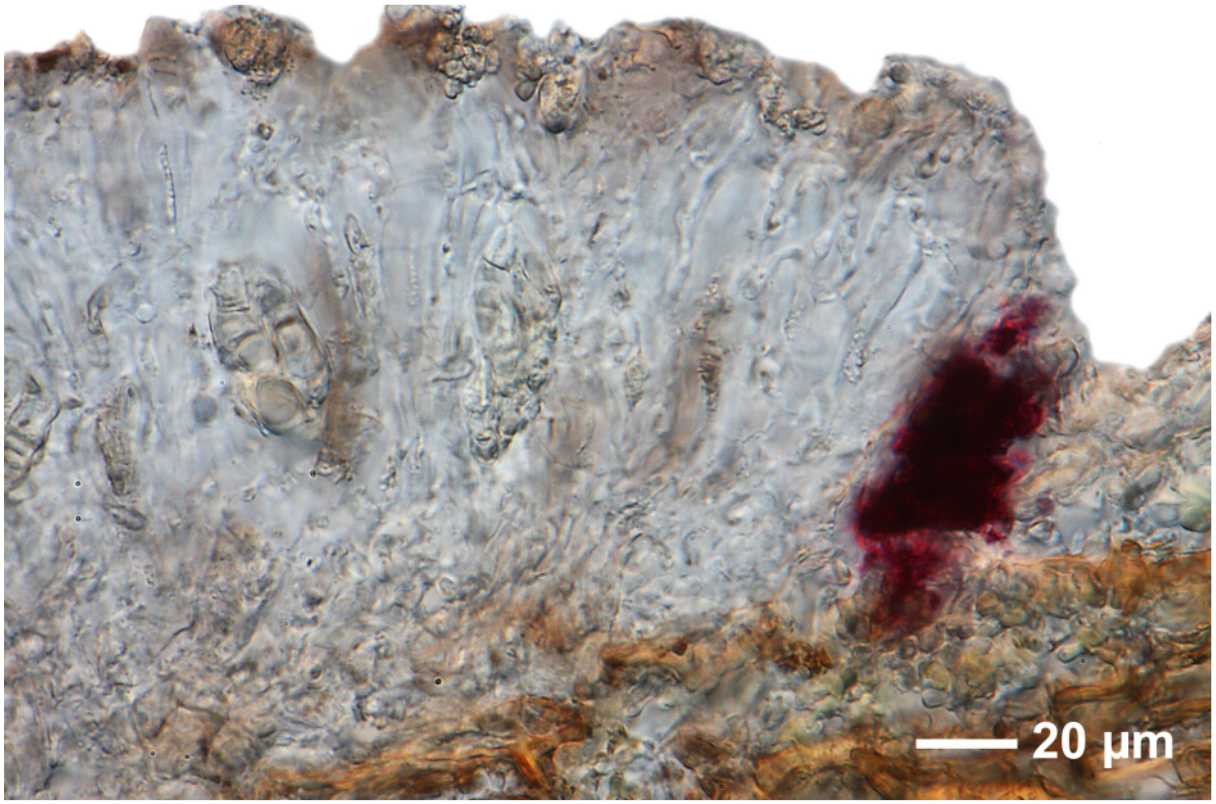
Apothecia with red, K+ purple margins, often visible with a 10 x lens, always in section. Paraphyses anastomosing. Ascospores hyaline, becoming brownish when old, 3-4-septate, upper cell largest, 15-17 x 5-6 mm, 8/ascus.

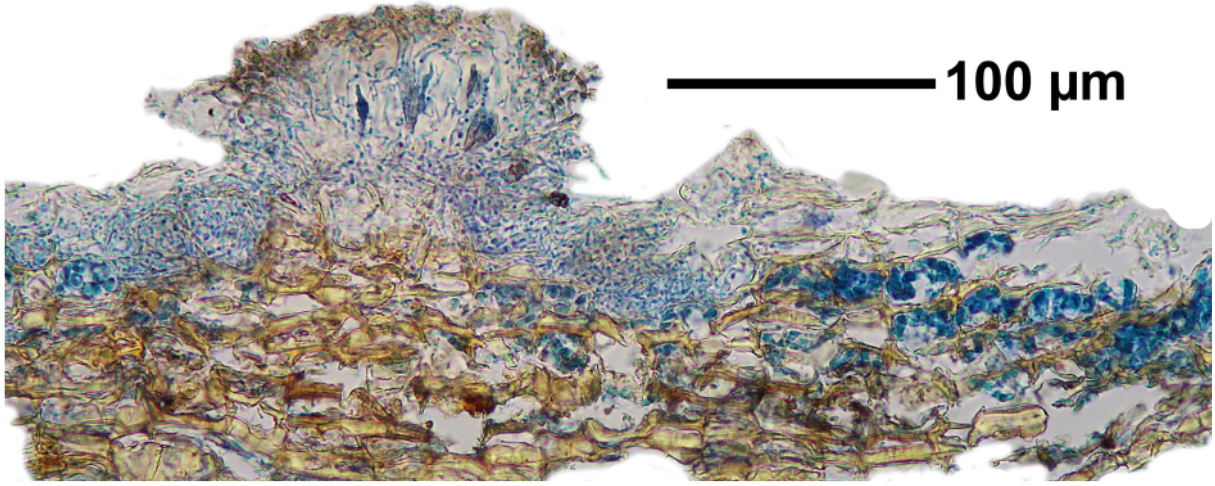
[9571], Thailand, Elefantenarbeitslager bei Chiang Mai. 19°14.859' N, 98°58.137' E, 330 m. Leg. Schumm 01.04.2002, det. Aptroot 2009.

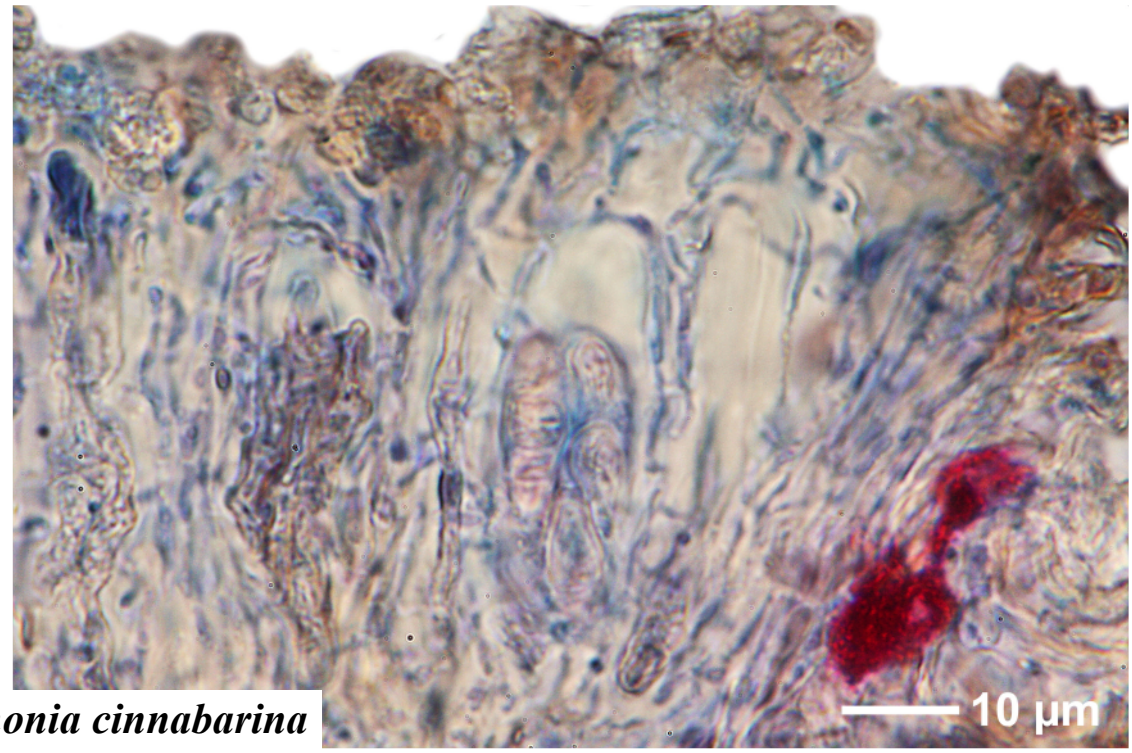




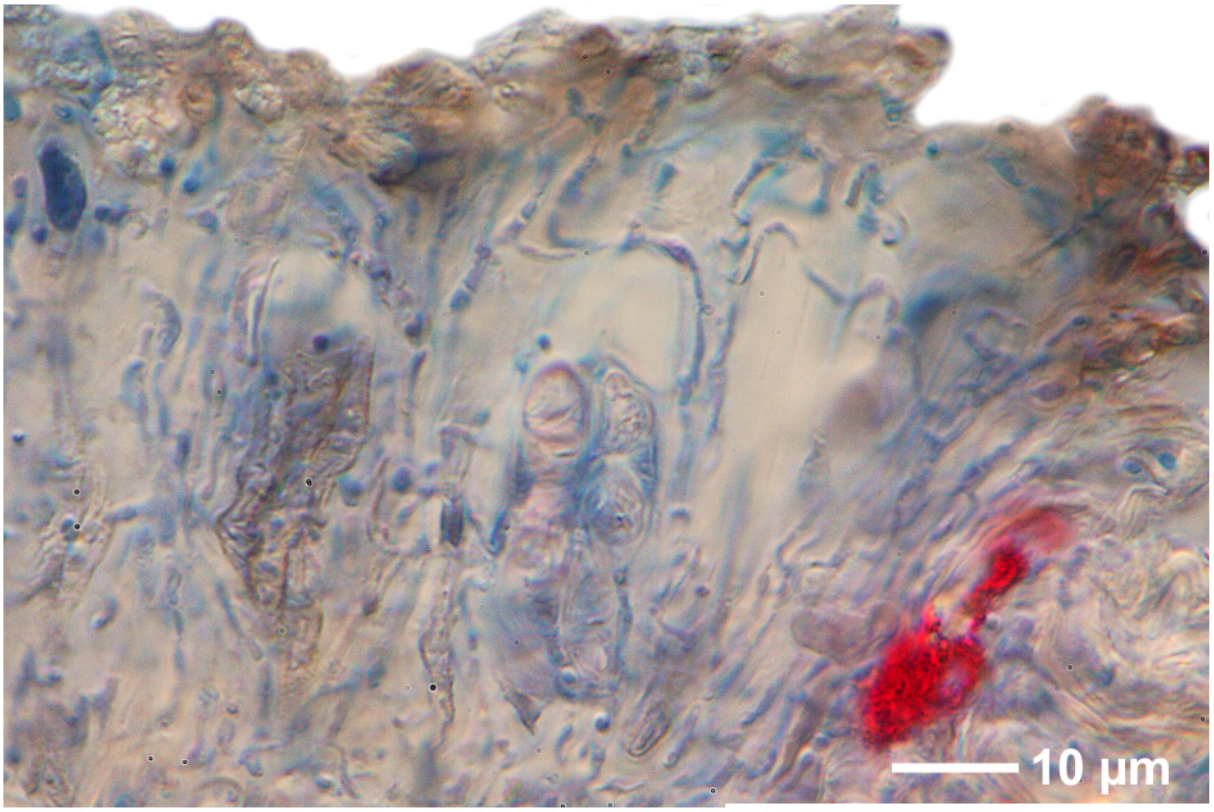

*Arthonia cinnabarina*




***Arthonia cinnabarina***





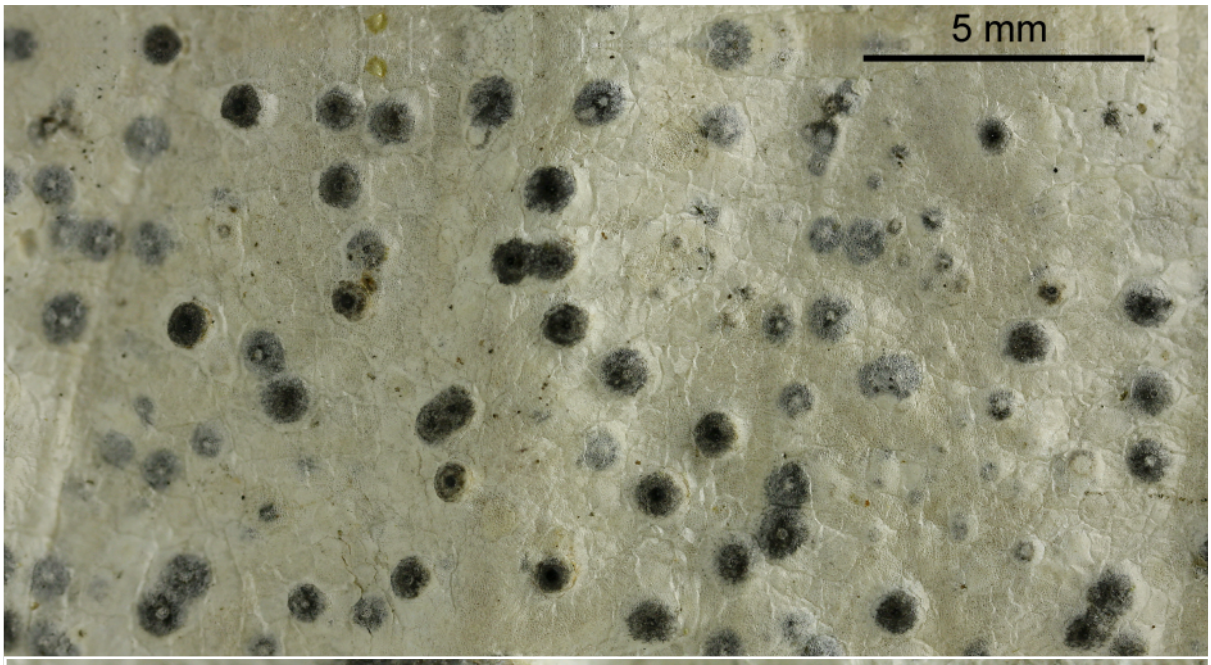


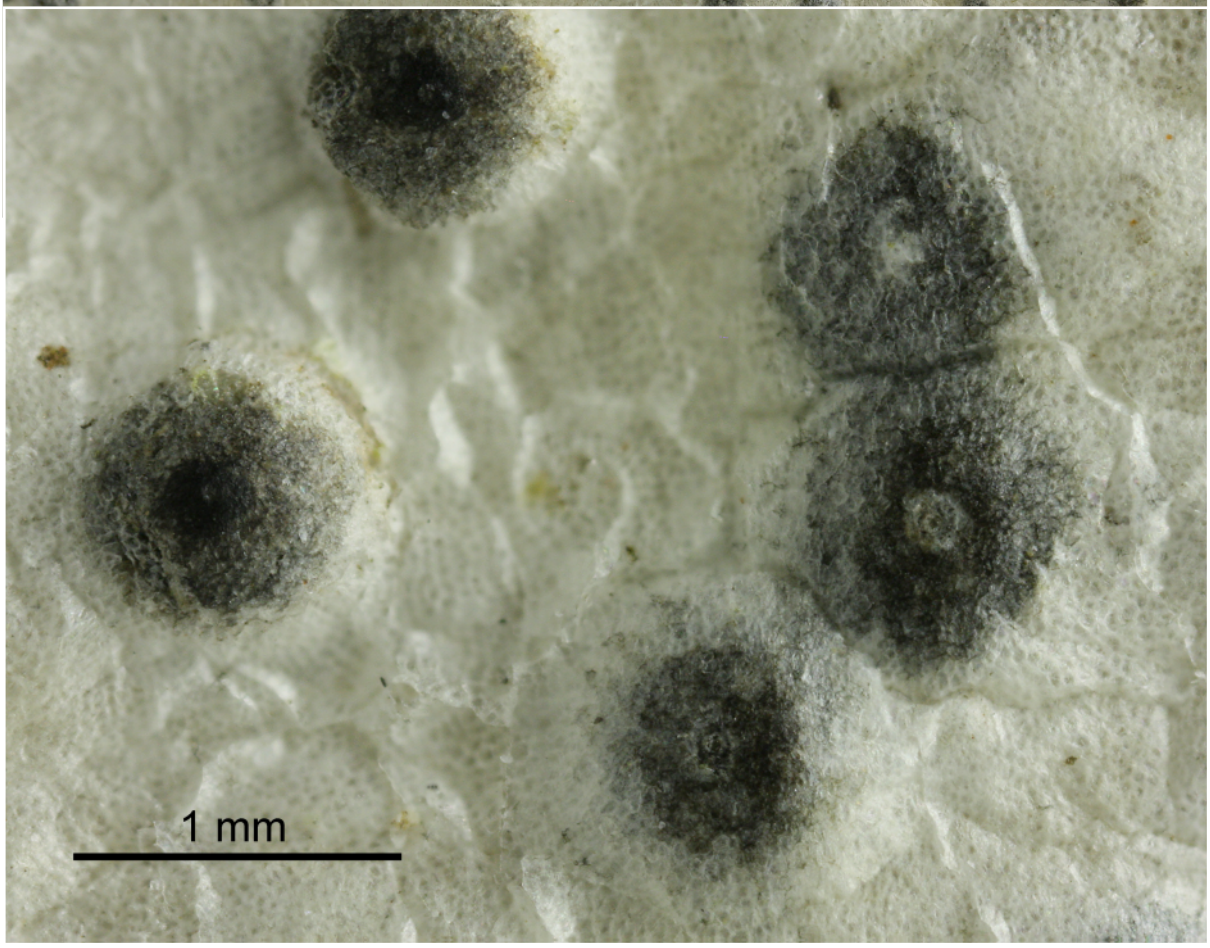
***Arthonia cinnabarina***

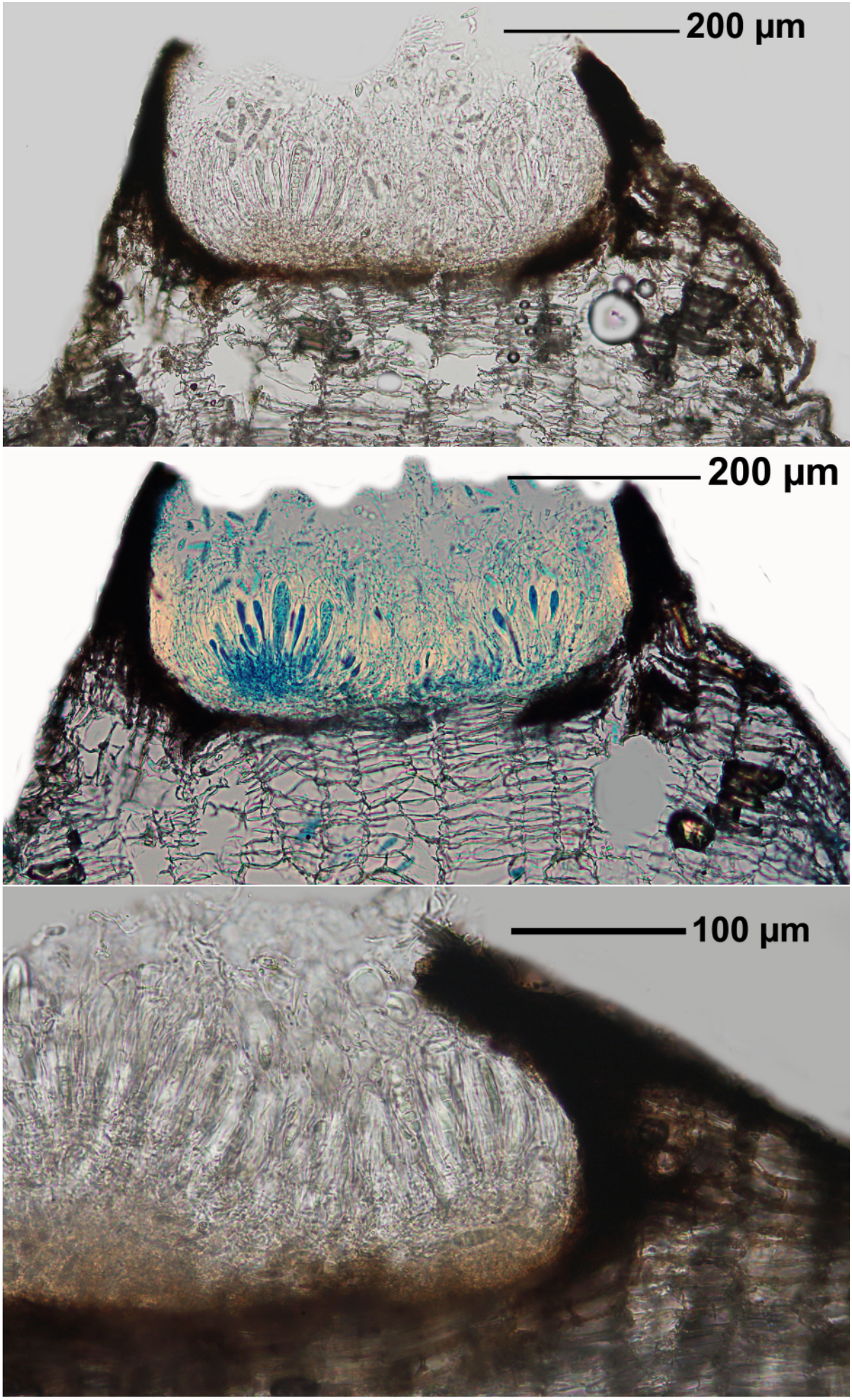
***Arthopyrenia majuscula*** (Nyl.) Zahlbr.

Ascospores hyaline, 3-septate, 29-30 x 8-9 µm, partly with warty epispor. Lit. Magnusson, A.H. (1956): A Catalog of the Hawaiian Lichens, p. 228.

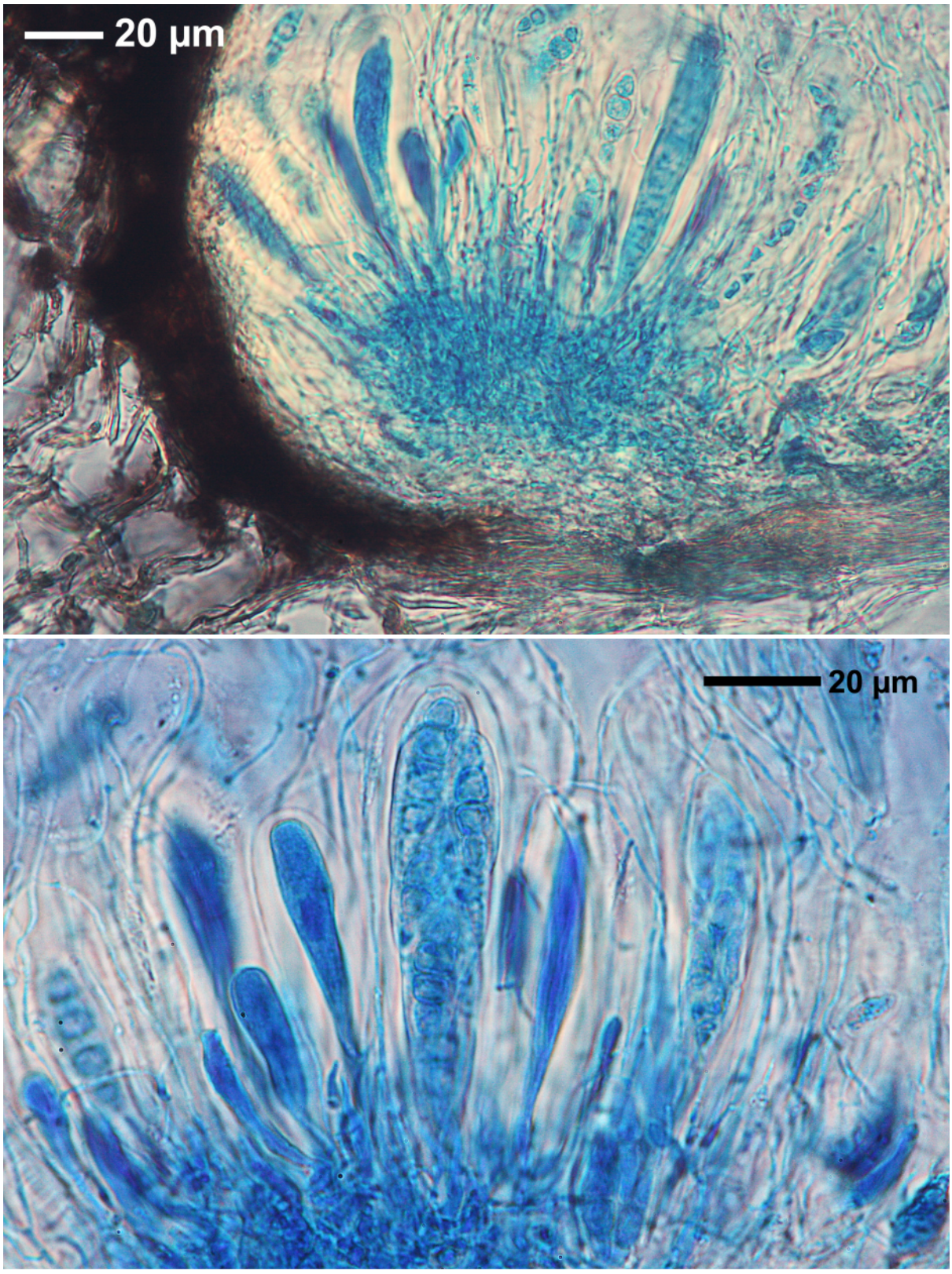
[15483], La Reunion, Südküste bei Le Baril, an Pandanus zwischen Meer und N2; 21,36851°S, 55,73691°E, 10 m. Leg. Schumm & Frahm 14.09.2009, det. Aptroot 2011.



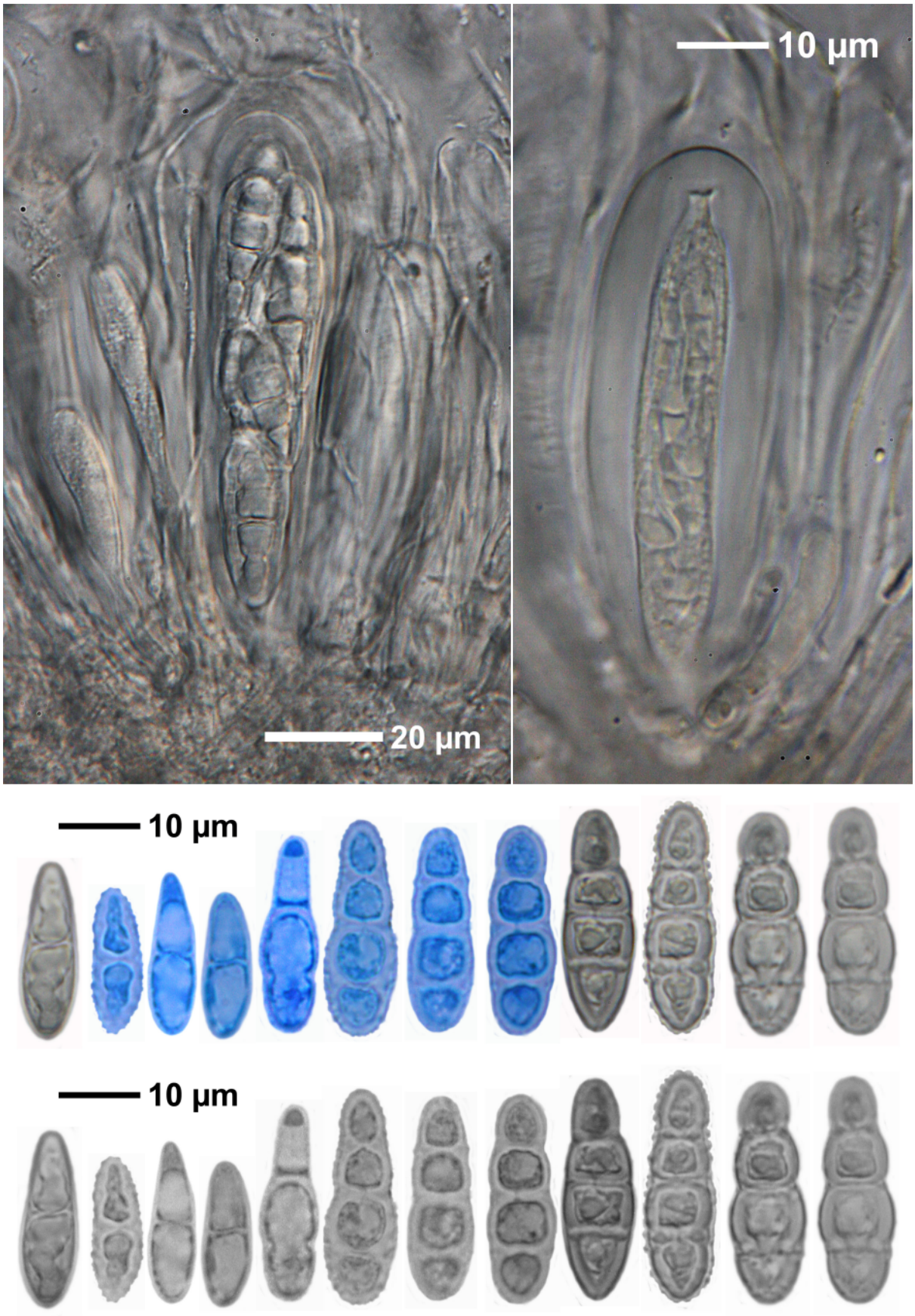






***Arthopyrenia majuscula***




*Arthopyrenia majuscula*



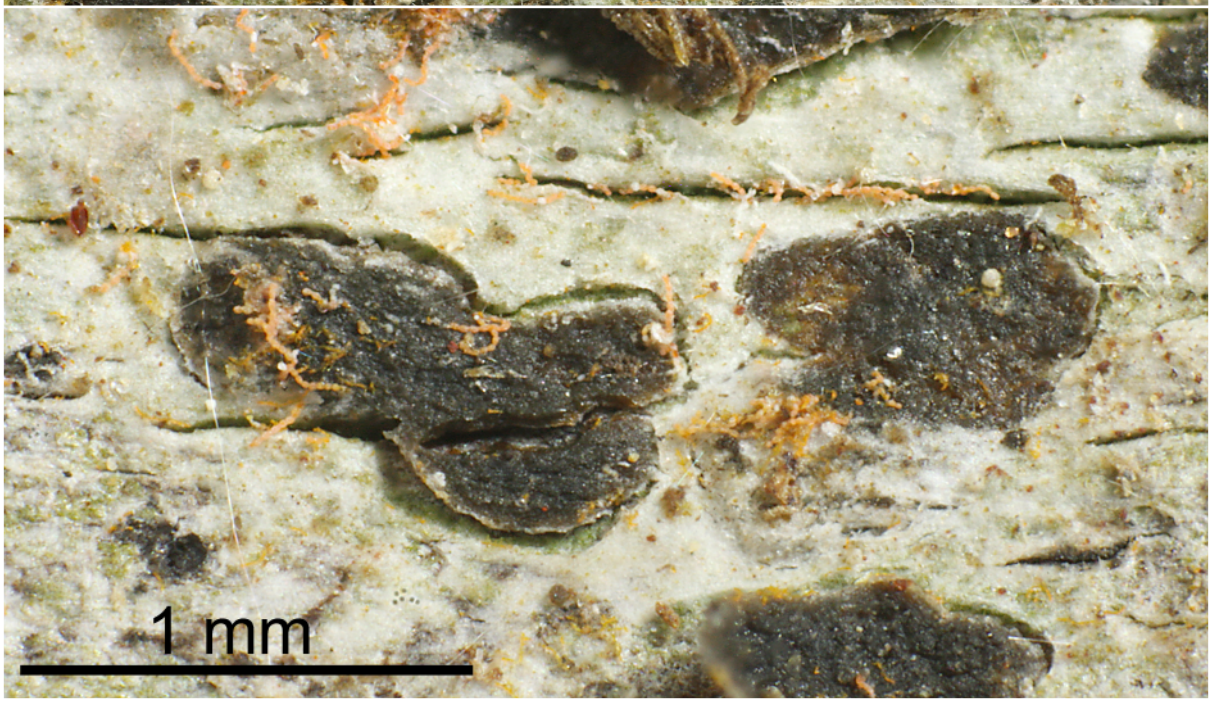

***Arthopyrenia majuscula***

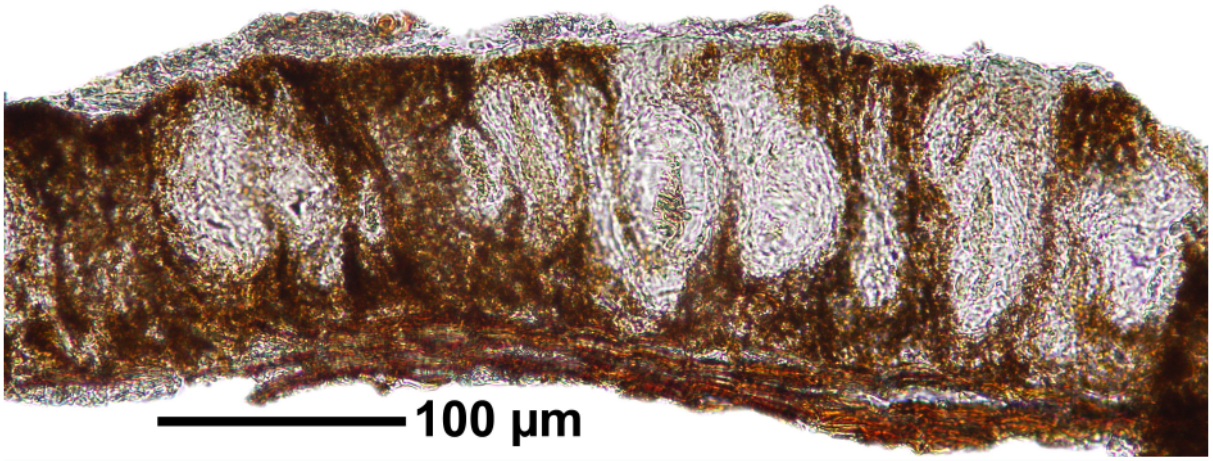
***Arthothelium*** cf. ***achromaticum*** Makhija & Padwardhan

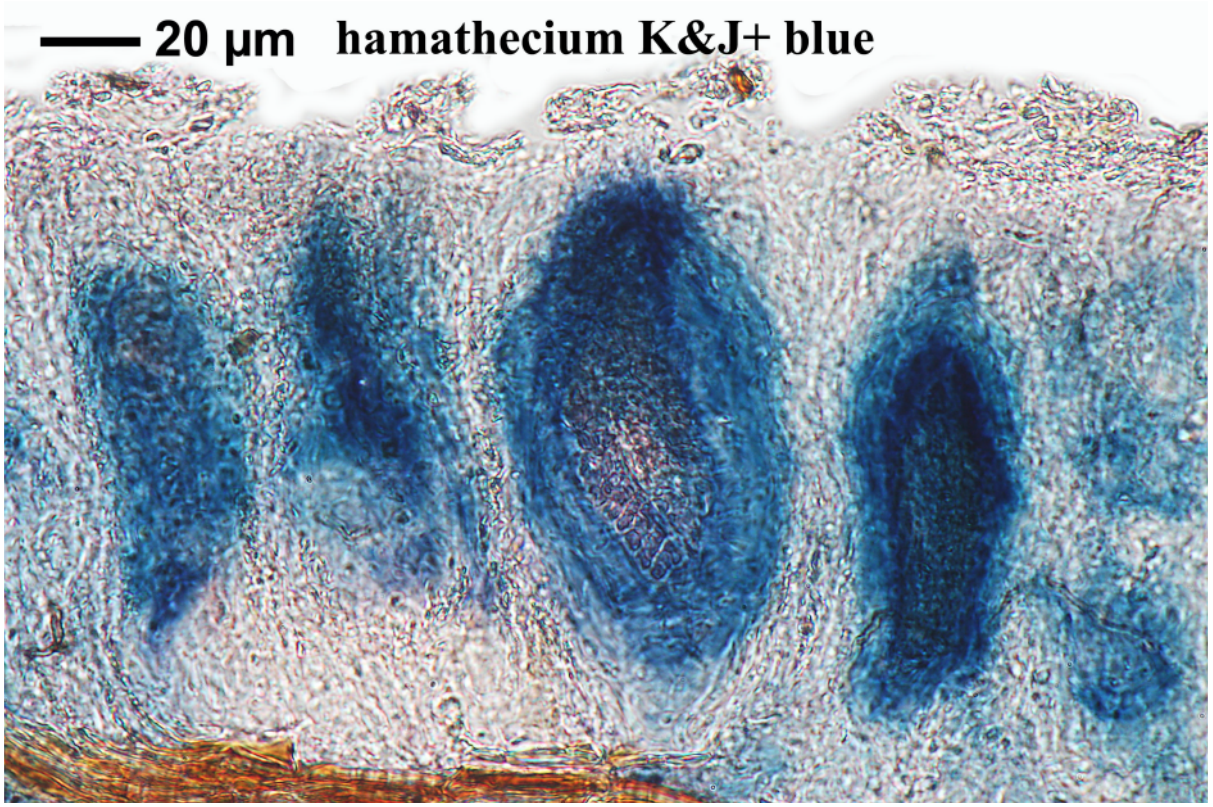
Thallus grey, very thin, K-, C-, KC-, P-. Photobiont: Trentepohlia. Ascocarps adnate, flacking, rounded to irregular, excipuloid tissue absent. Asci K&J blue. Ascospores becoming brown, muriform, 8/ascus, 50-53 x 17-20 µm, 12-13 transversal septae, each with 4-5 lumina.

[17534], Thailand, Trat province, Ban-Dan Kao island, Mangroven Wald, 12.21359° N, 102.55290° E, 5 m. Leg. Schumm (IAL 7) 15.01.2012, det. Schumm









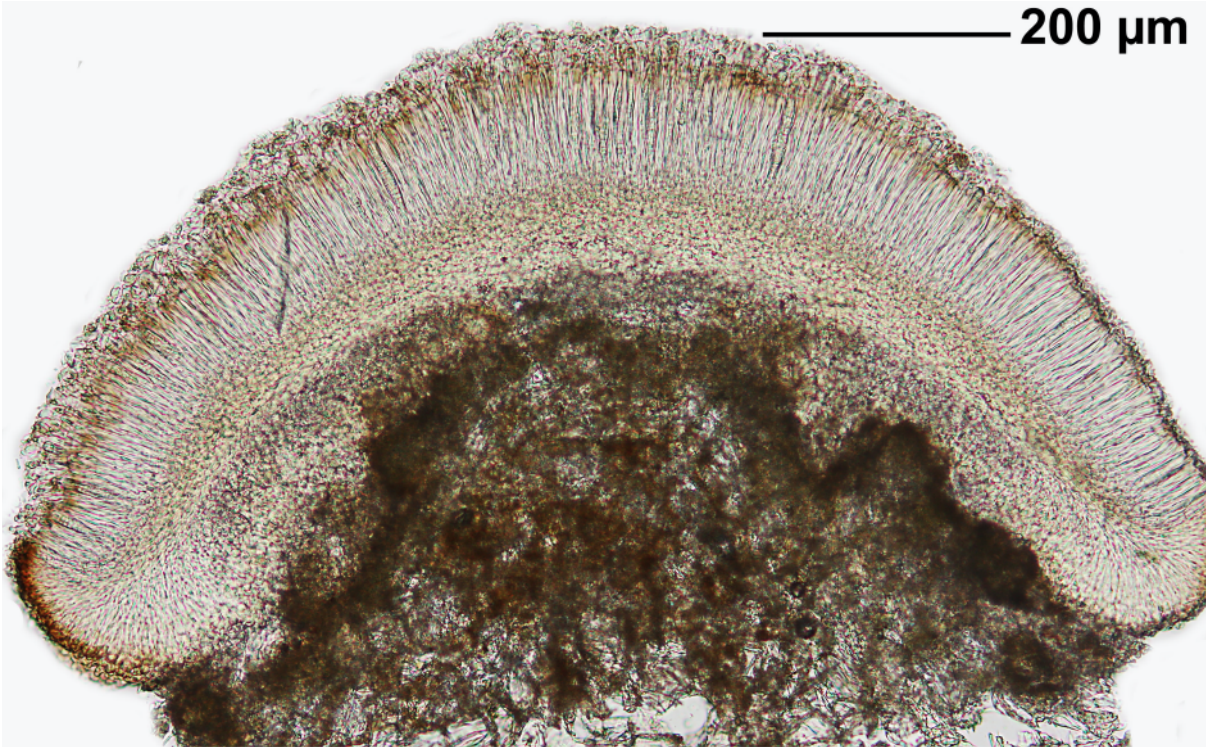
***Arthothelium*** cf. ***achromaticum***

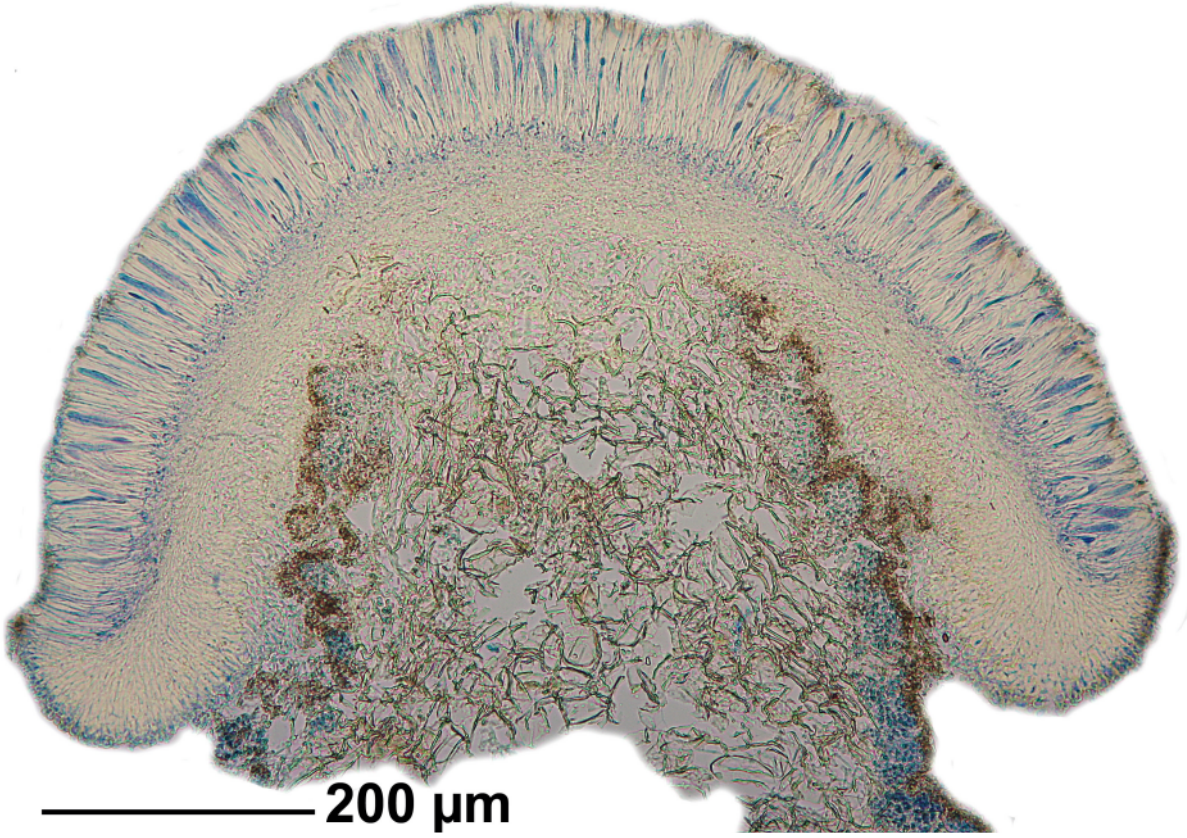
***Bacidia hostheleoides*** (Nyl.) Zahlbr.

Epihymenium and hypothecium pale brown, K-. Paraphyses branched, with some anastomoses. Ascospores hyaline, 8/ascus, 7-10 septate, 36-51 x 3-4 µm. Lit. Ekman, S. (1996, Opera Botanica)

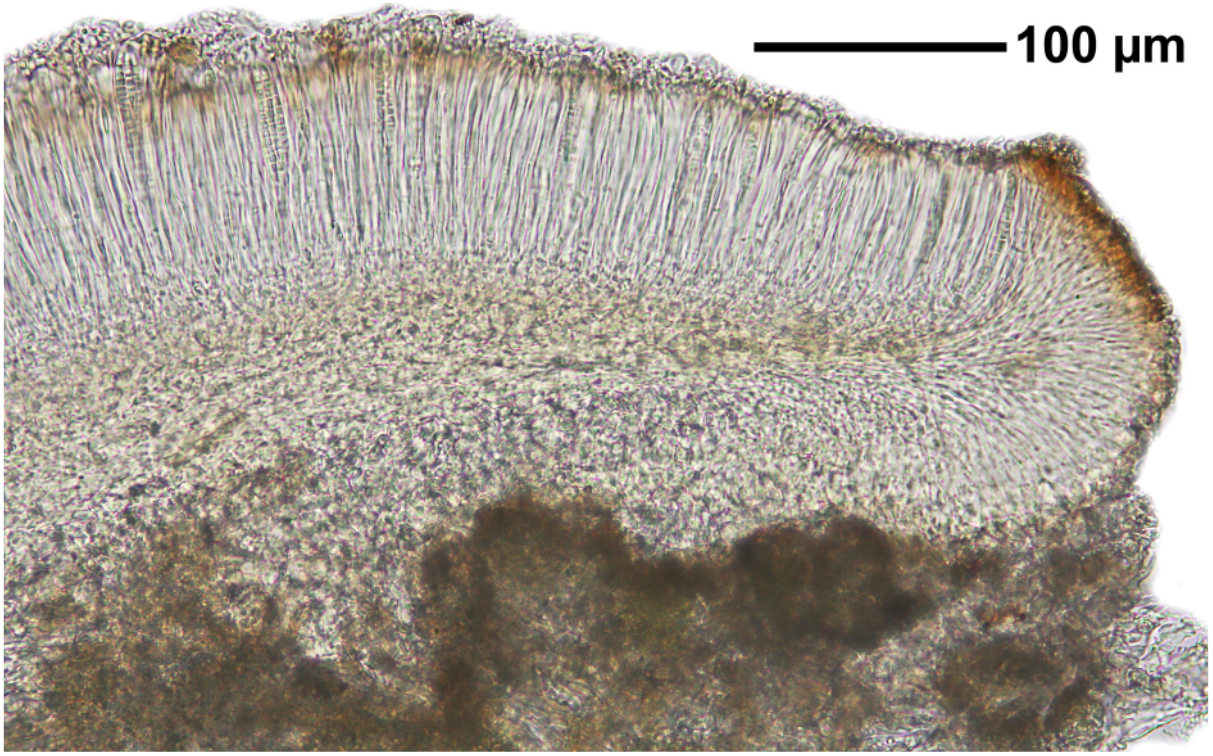
[9536], Thailand, Floatel Jungle Rafts am River Kwai Noi. 14°19.144' N, 98°58.089' E, 108 m. Leg. Schumm 27.03.2002, det. Aptroot 2009.

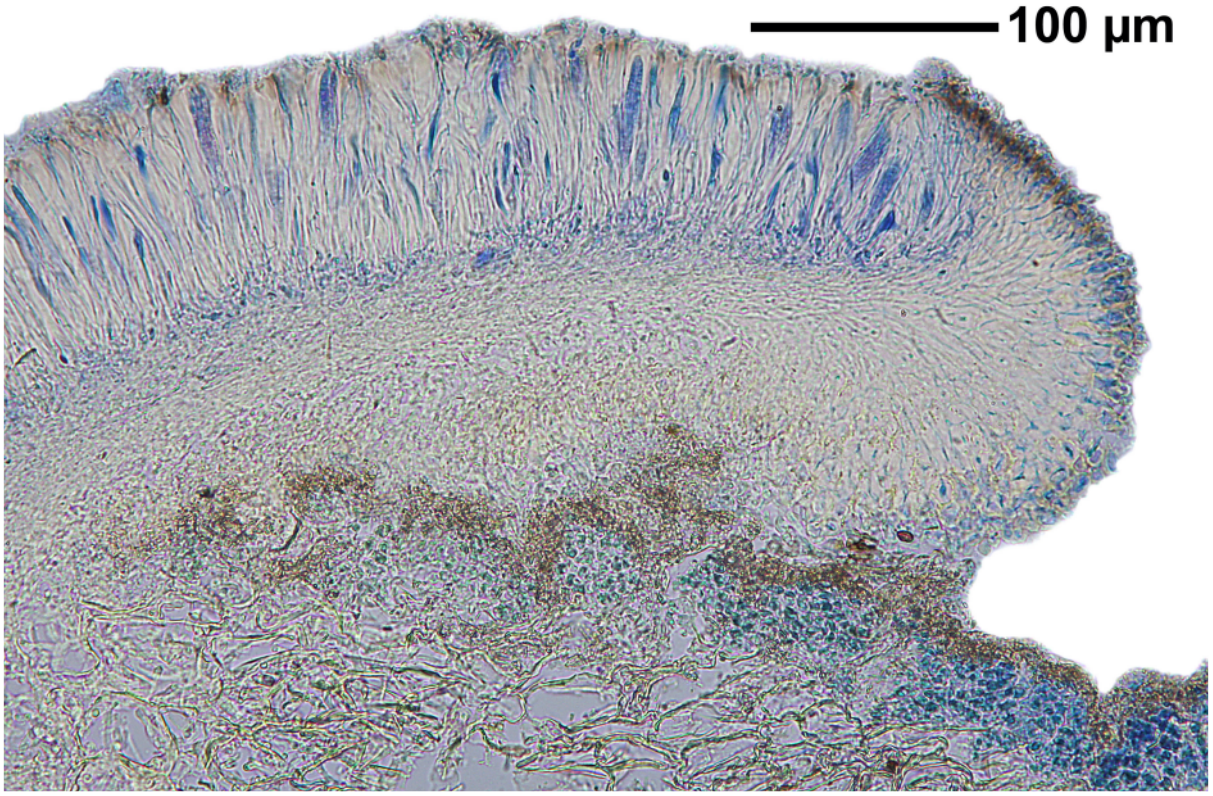




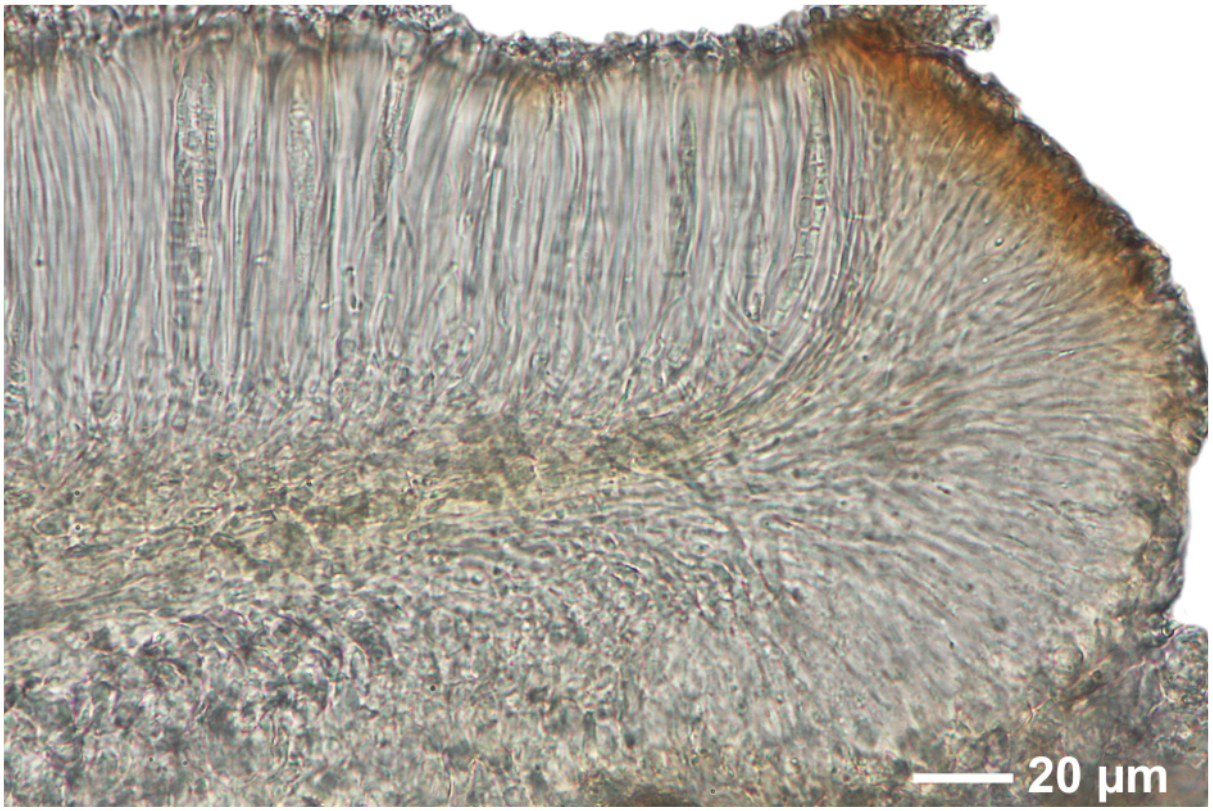



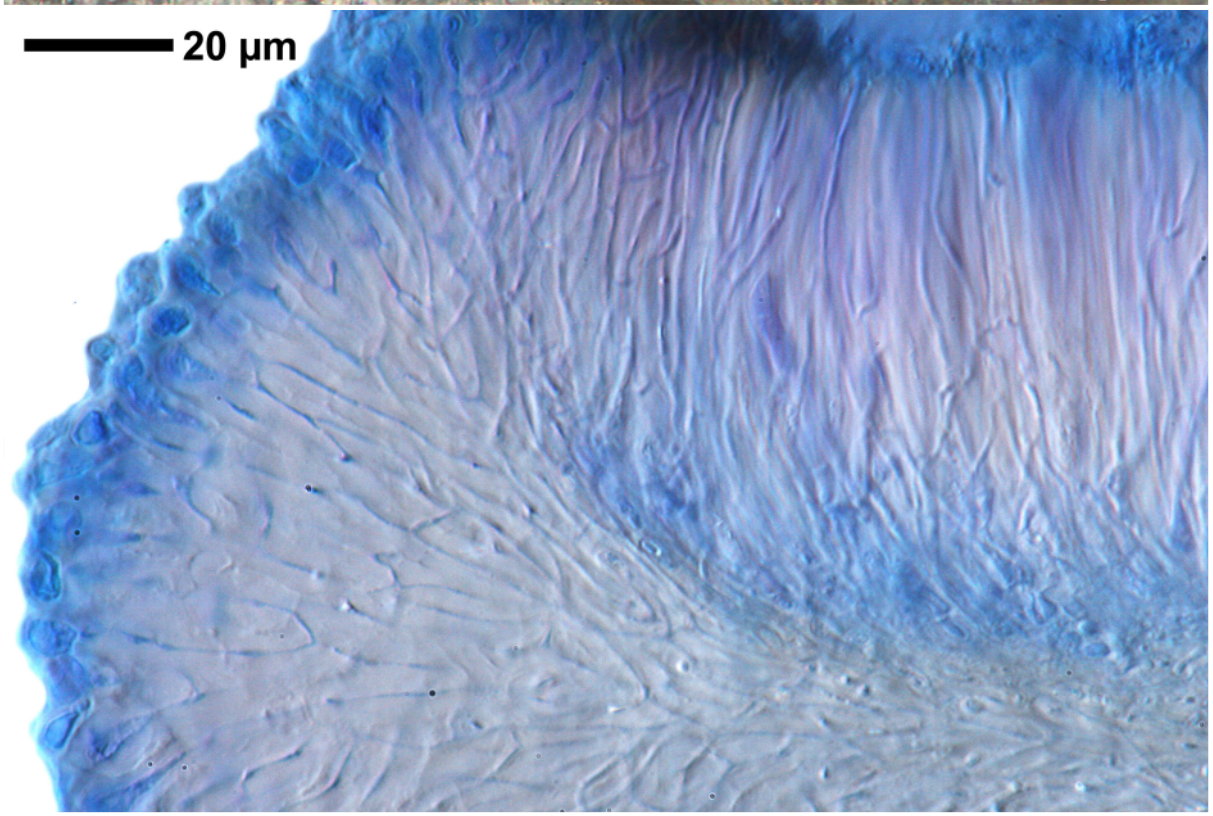

***Bacidia hostheleoides***




***Bacidia hostheleoides***

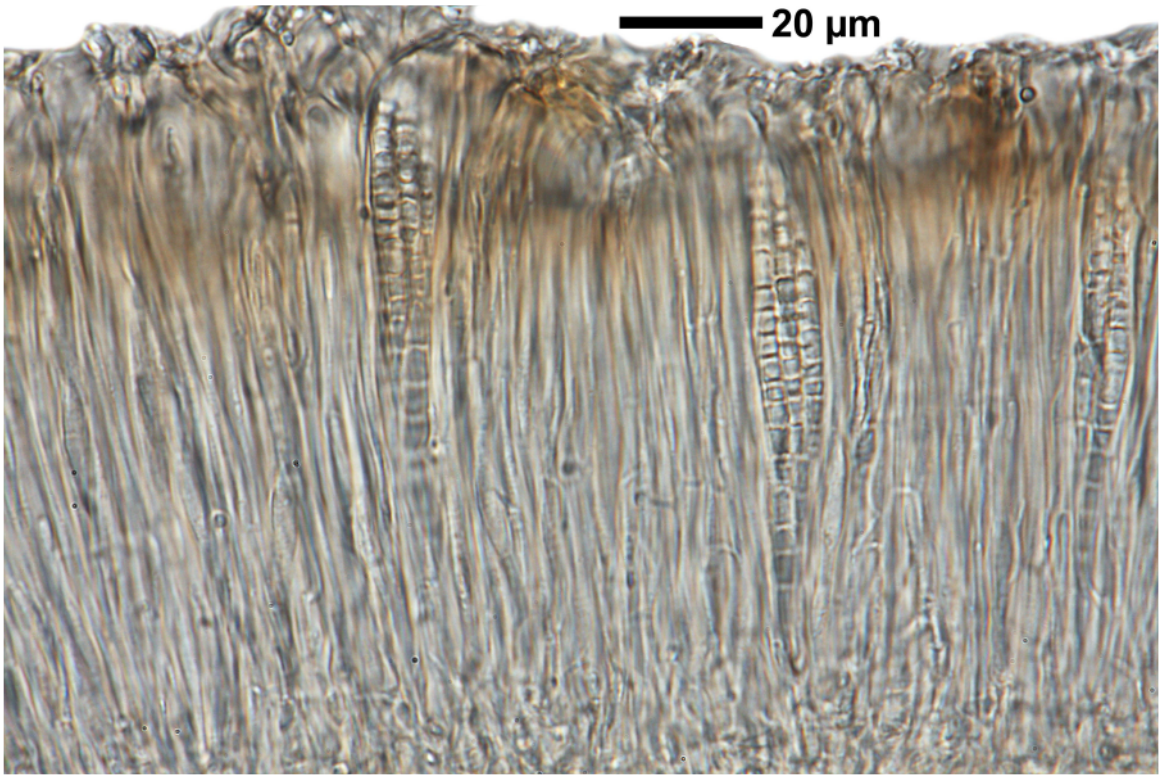


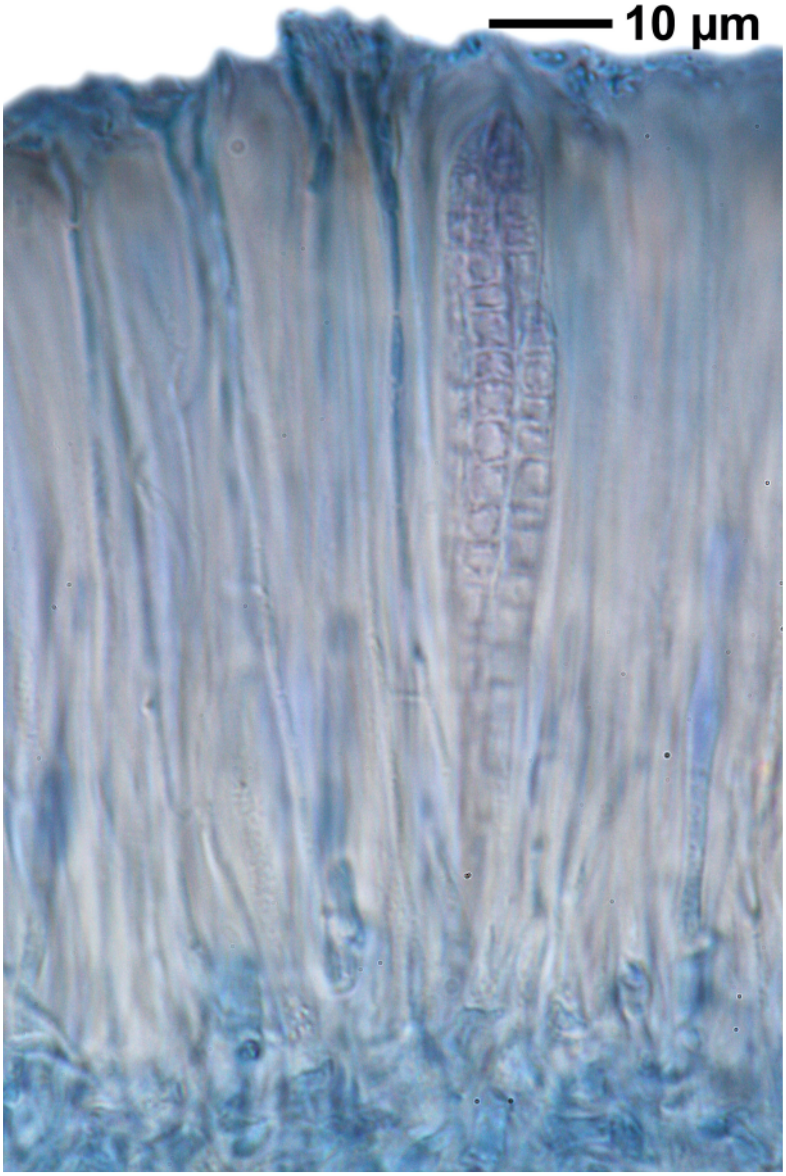




***Bacidia hostheleoides***




***Bacidia hostheleoides***



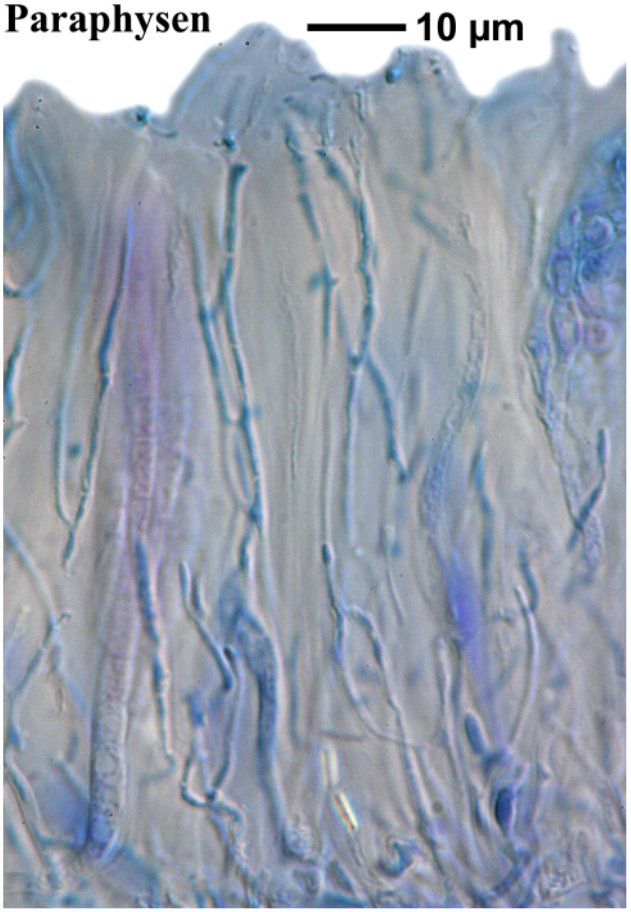

***Bacidia hostheleoides***

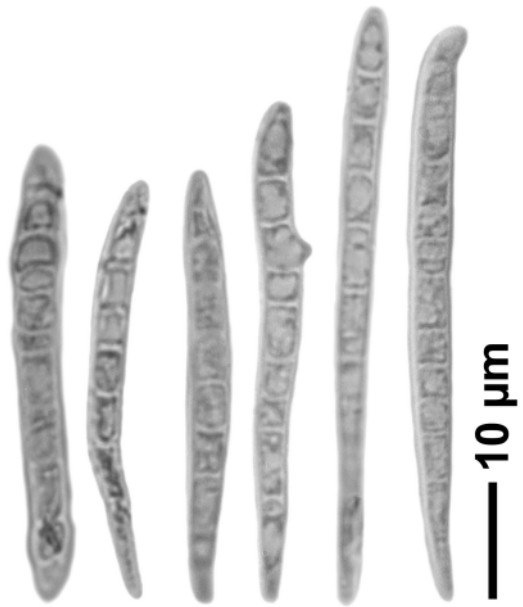






Paraphysen



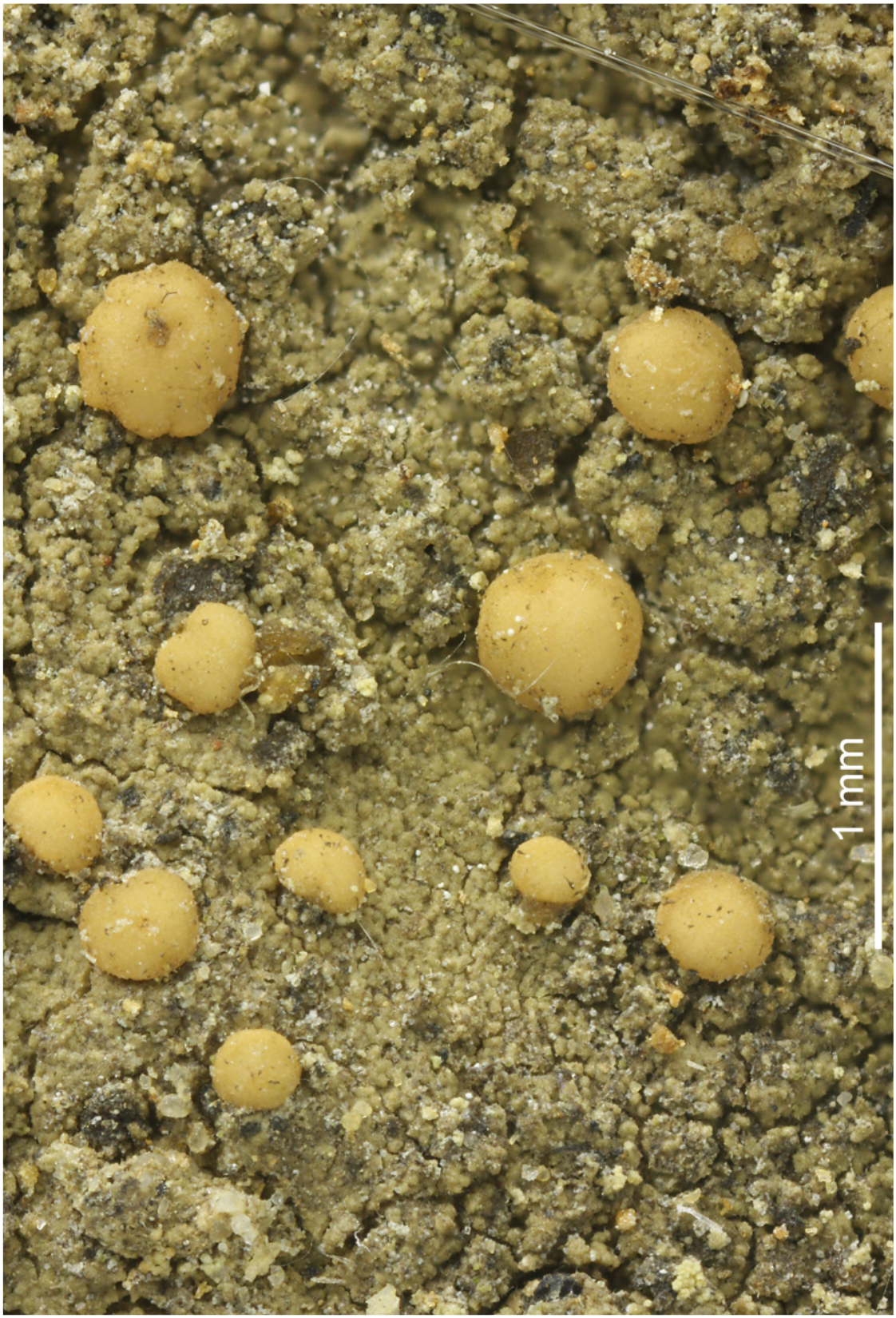



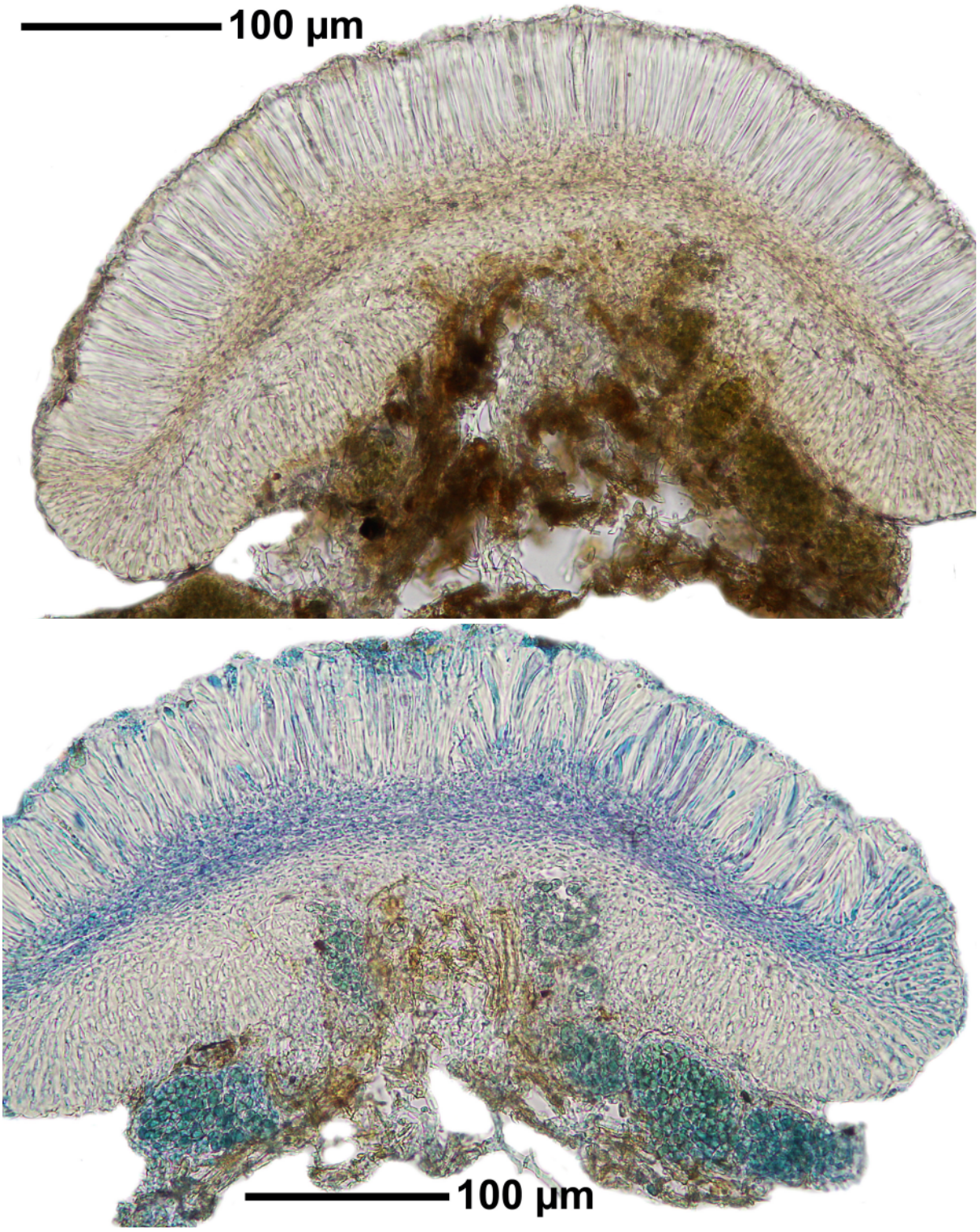

***Bacidia hostheleoides***

***Bacidia medialis*** (Tuck. ex Nyl.) de Lesd.

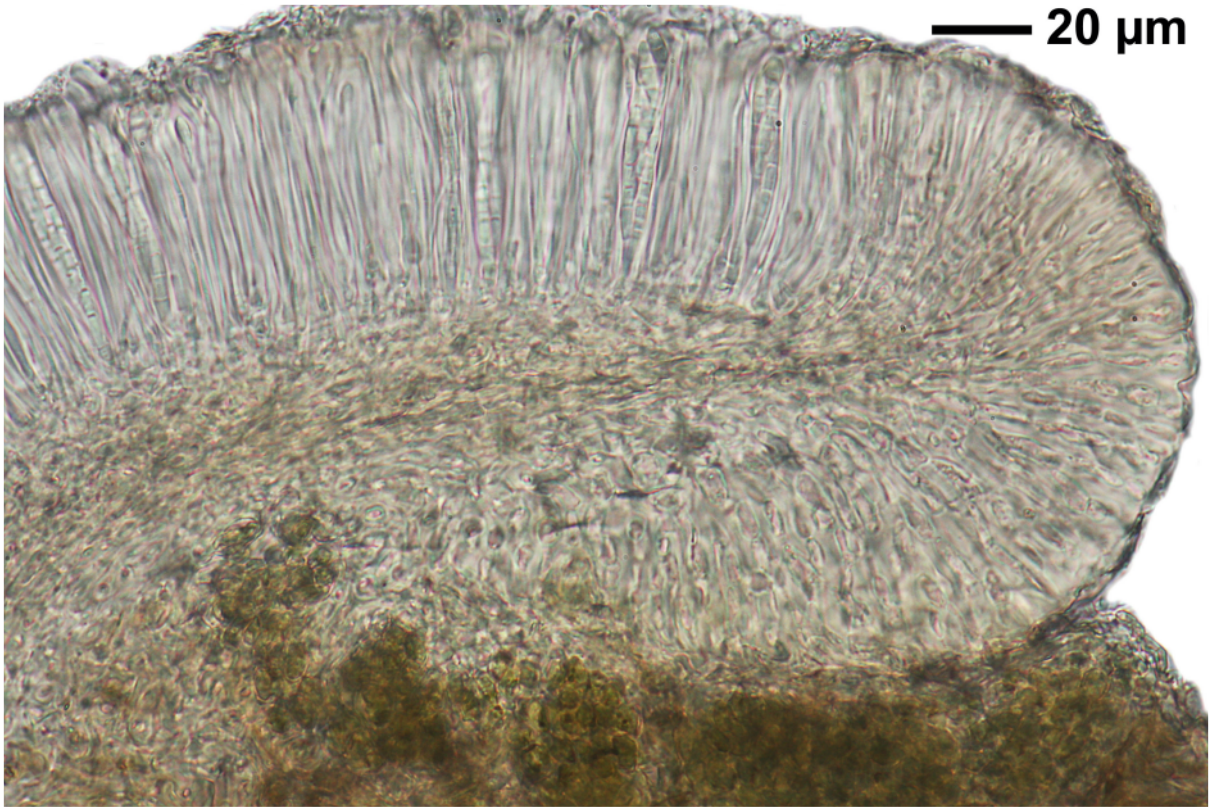
Epihymenium and hypothecium pale brown, K-. Paraphyses branched. Ascospores hyaline, 3-septate, 8/ascus, c. 20 x 3 µm.

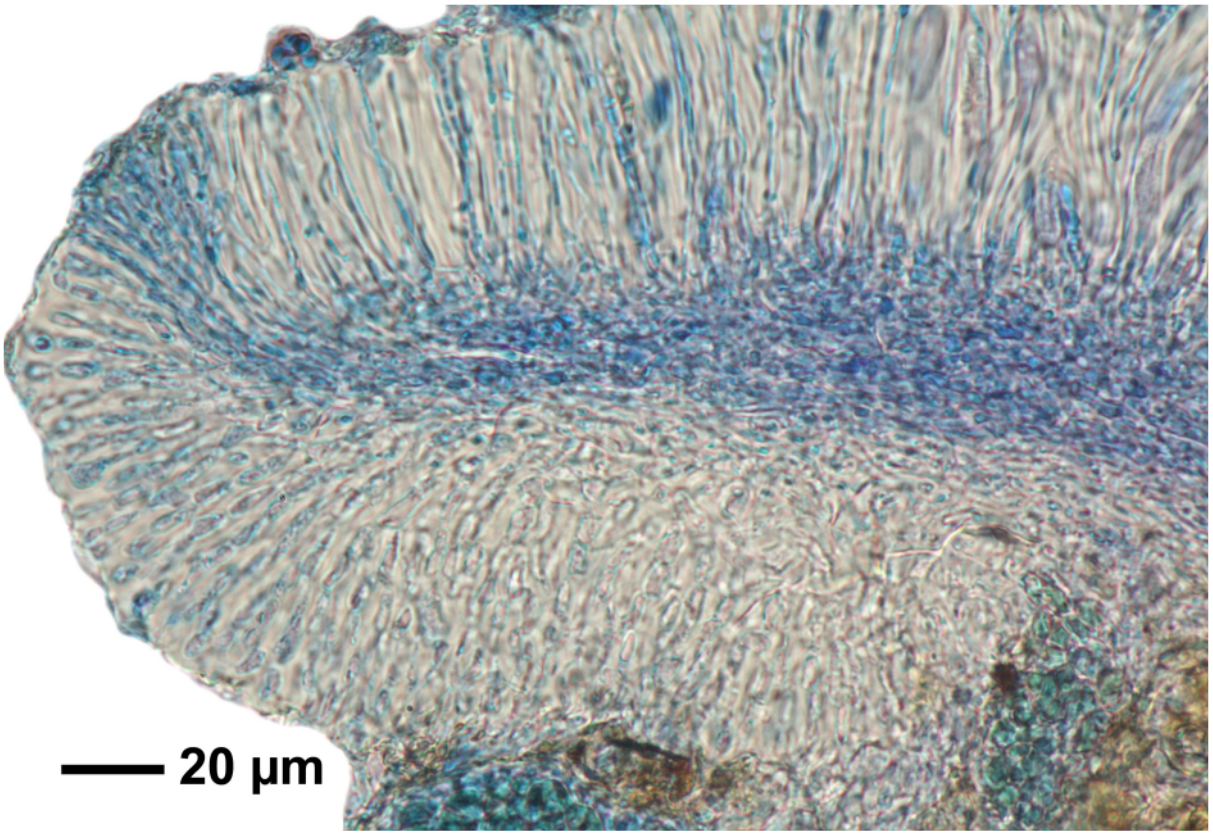
[9530], Thailand, bei den Kaeng Lava Höhlen am River Kwai Noi, 14°18.088' N, 98°59.011’ E, 123 m. Leg. Schumm 27.03.2002, det. Aptroot 2009.



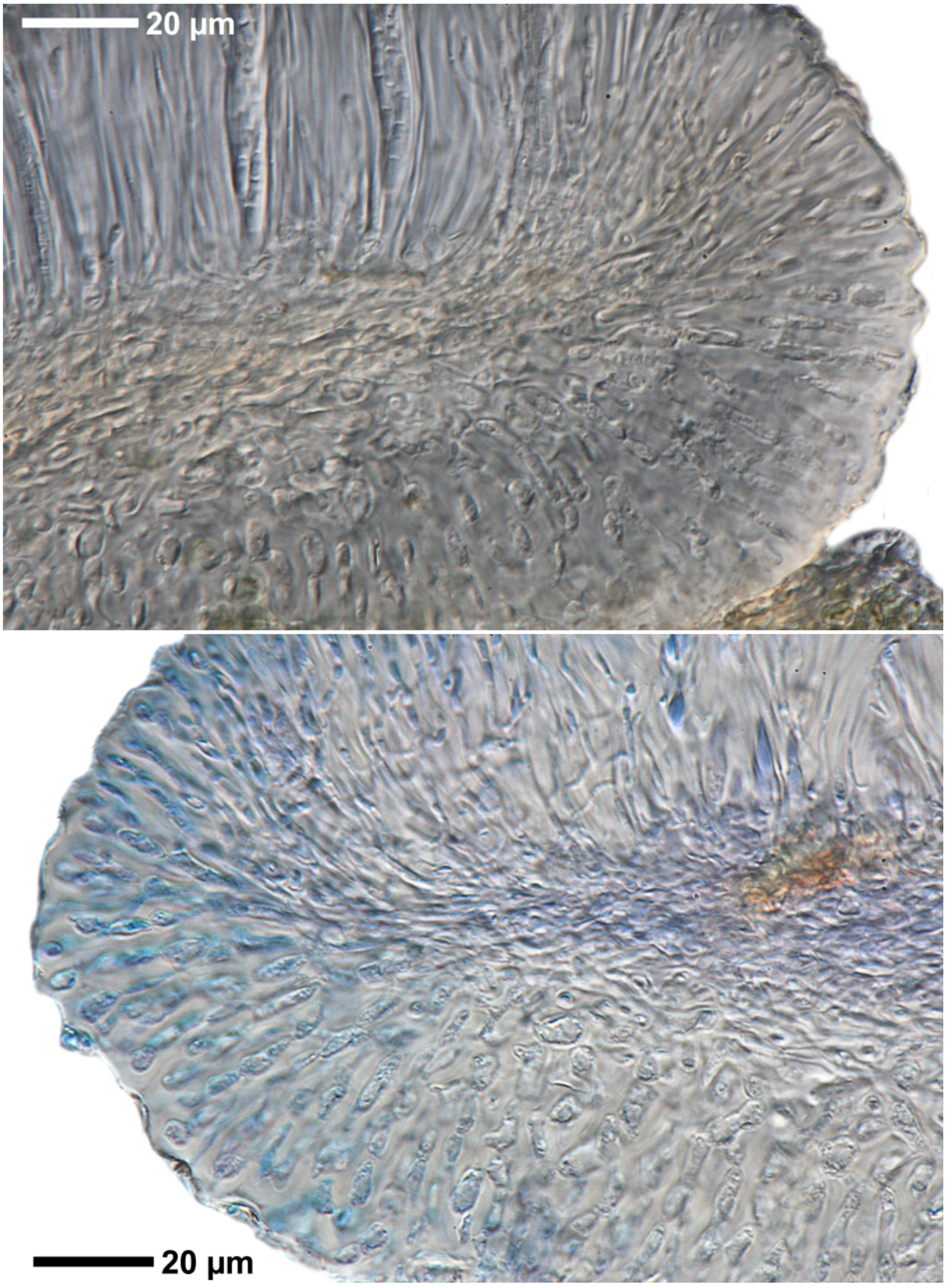



***Bacidia medialis***

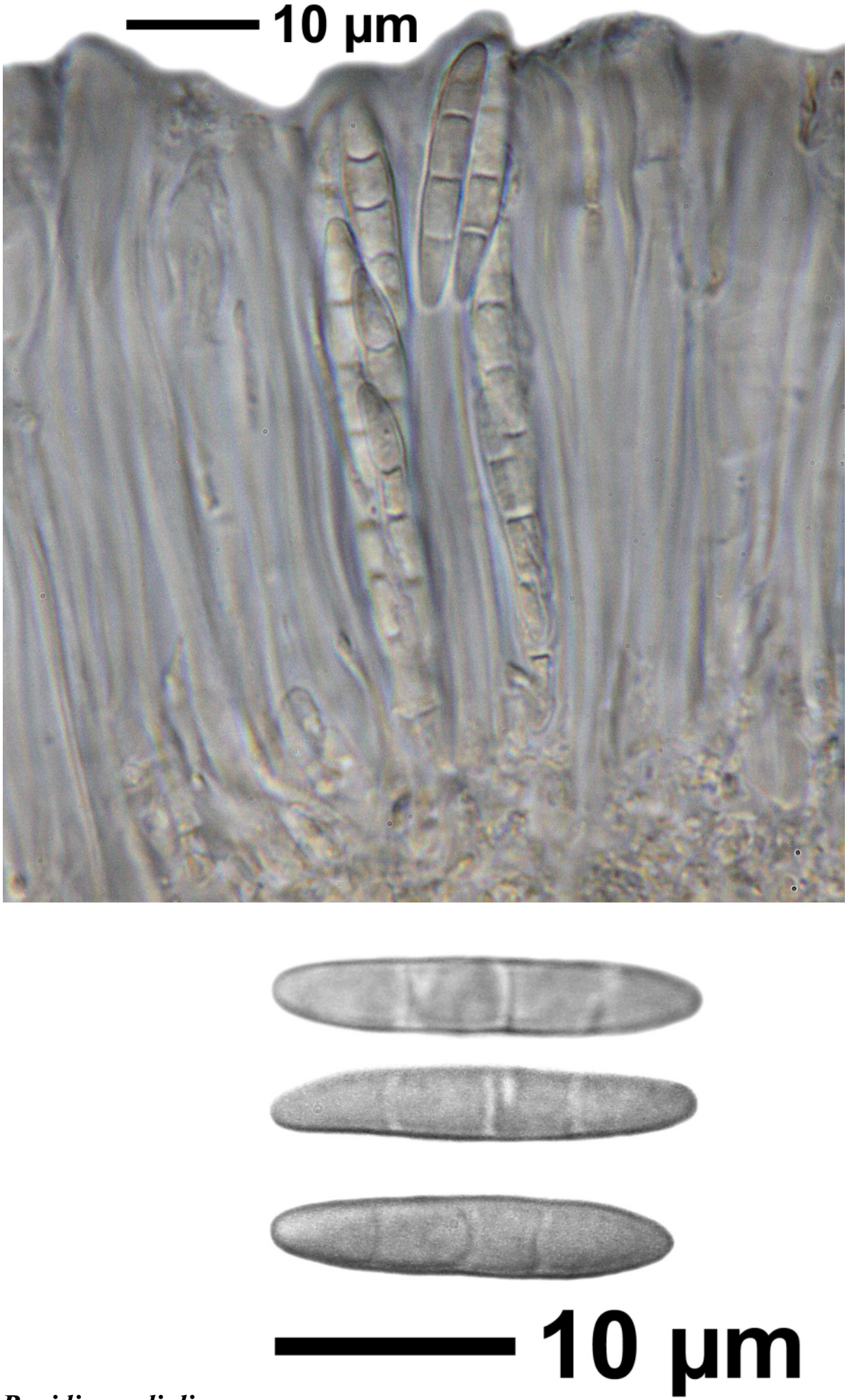


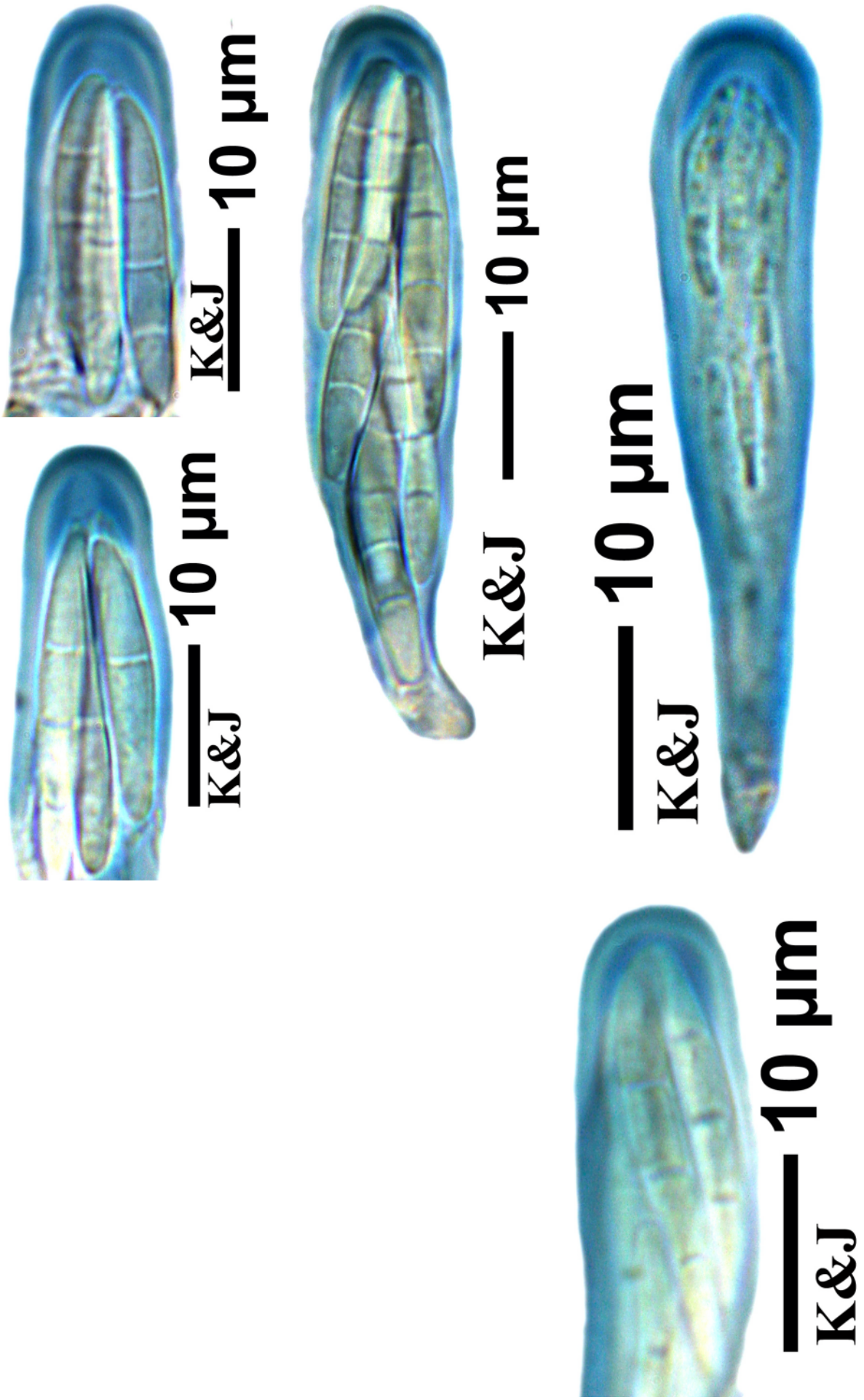

***Bacidia medialis***




***Bacidia medialis***




***Bacidia medialis***

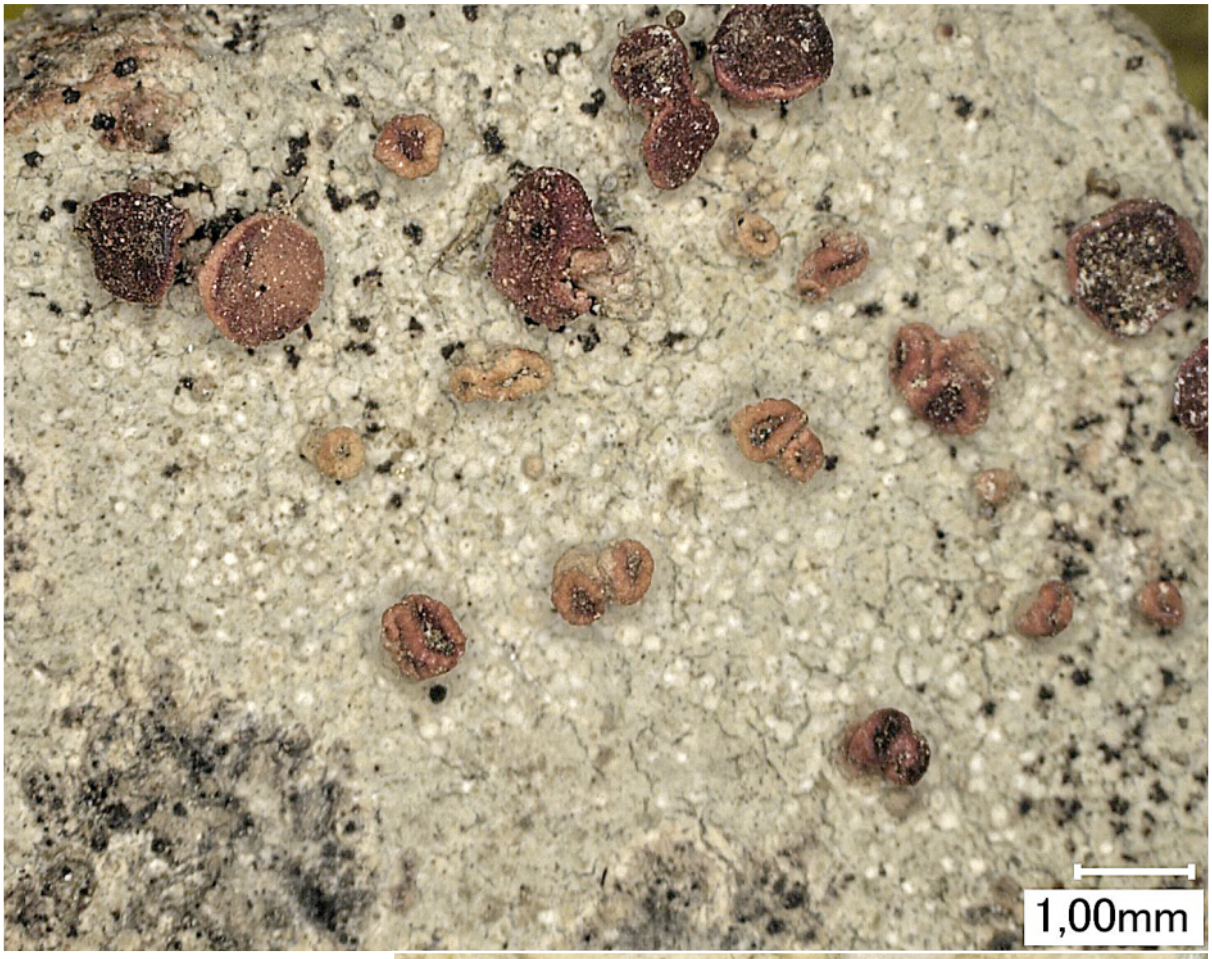


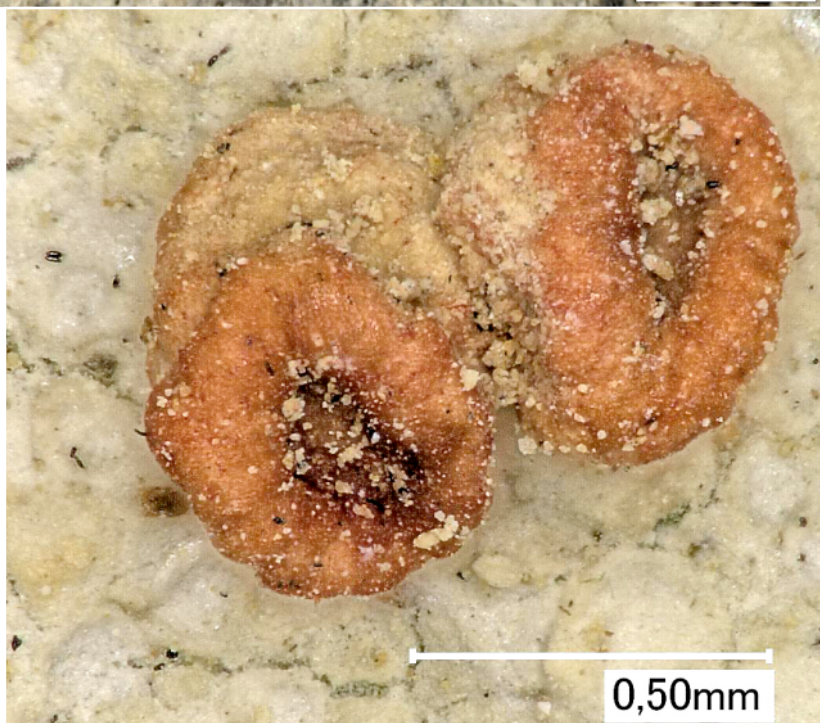

***Bacidia medialis***

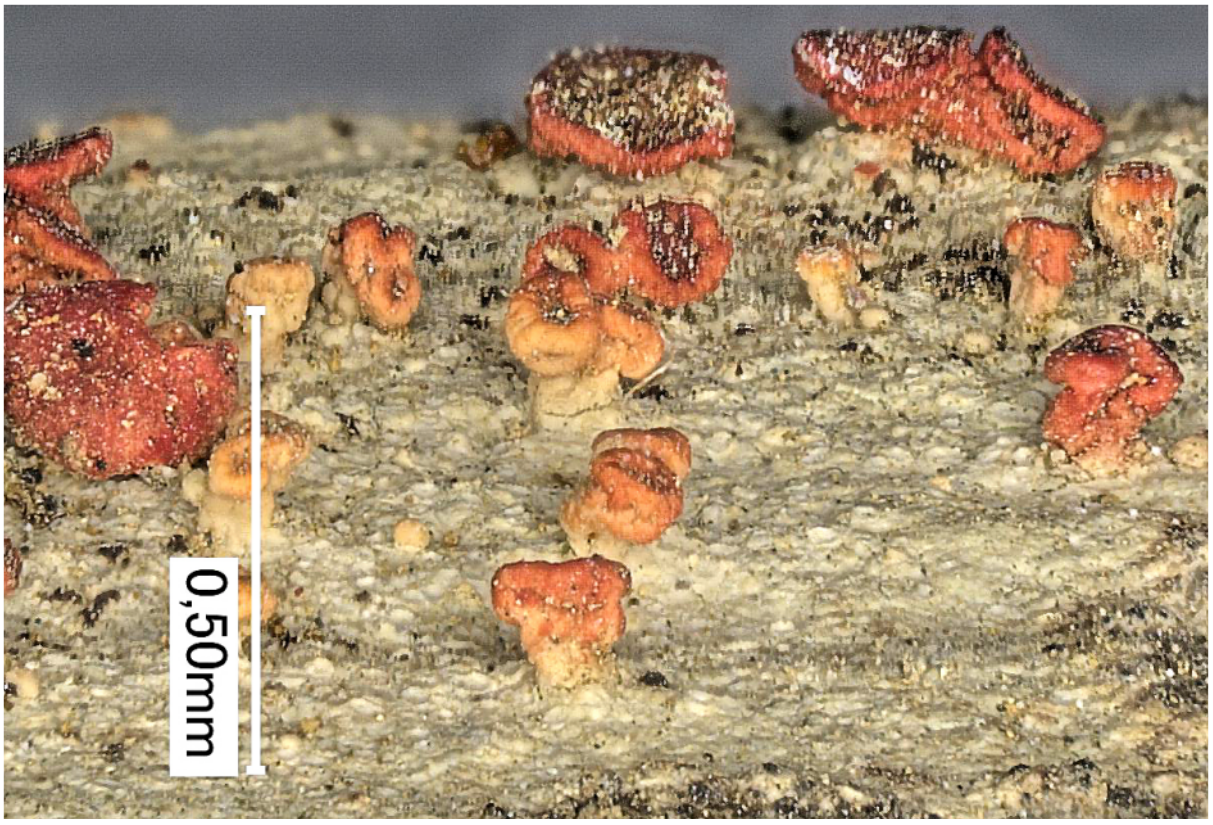
***Baeomyces heteromorphus*** Nyl. ex C. Bab. & Mitt.

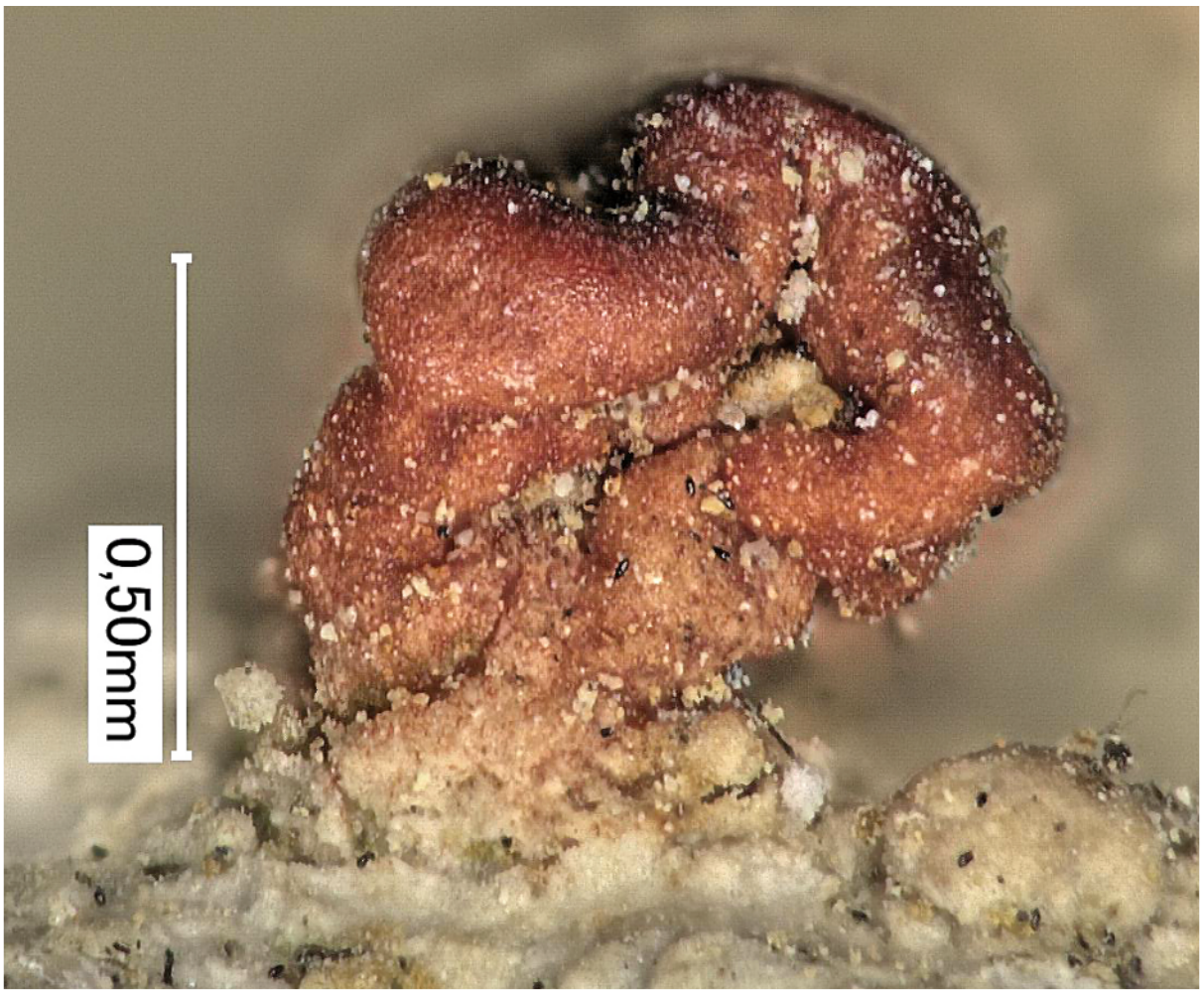
Apothecia stalked, disk rather flat, with discernable margins.

[6229], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay in Intavas am Fuß des Mt. Kitanglad, 08°11.883’ N, 124°56.721’ E, 1270 m. Leg. Schumm 18.08.1999, det. Aptroot 2009.





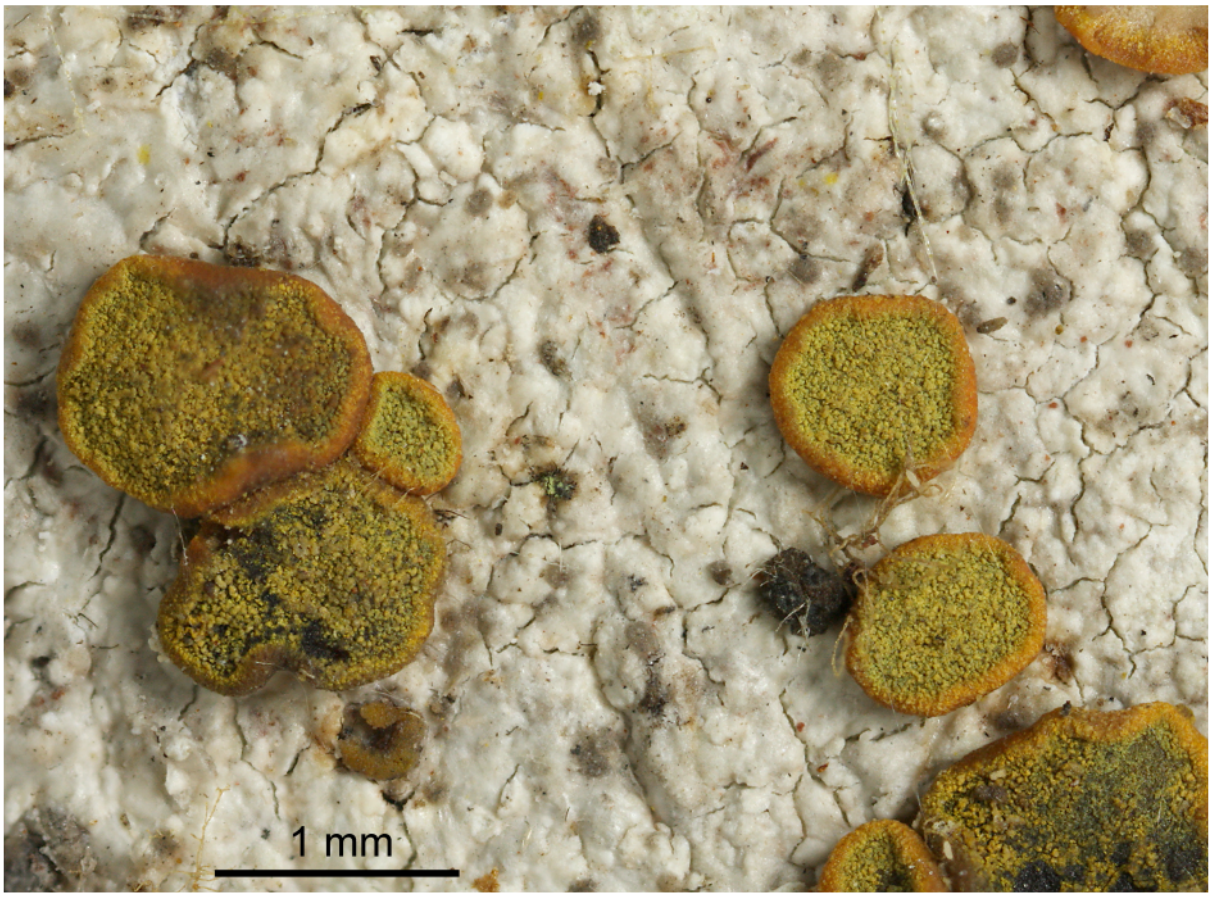



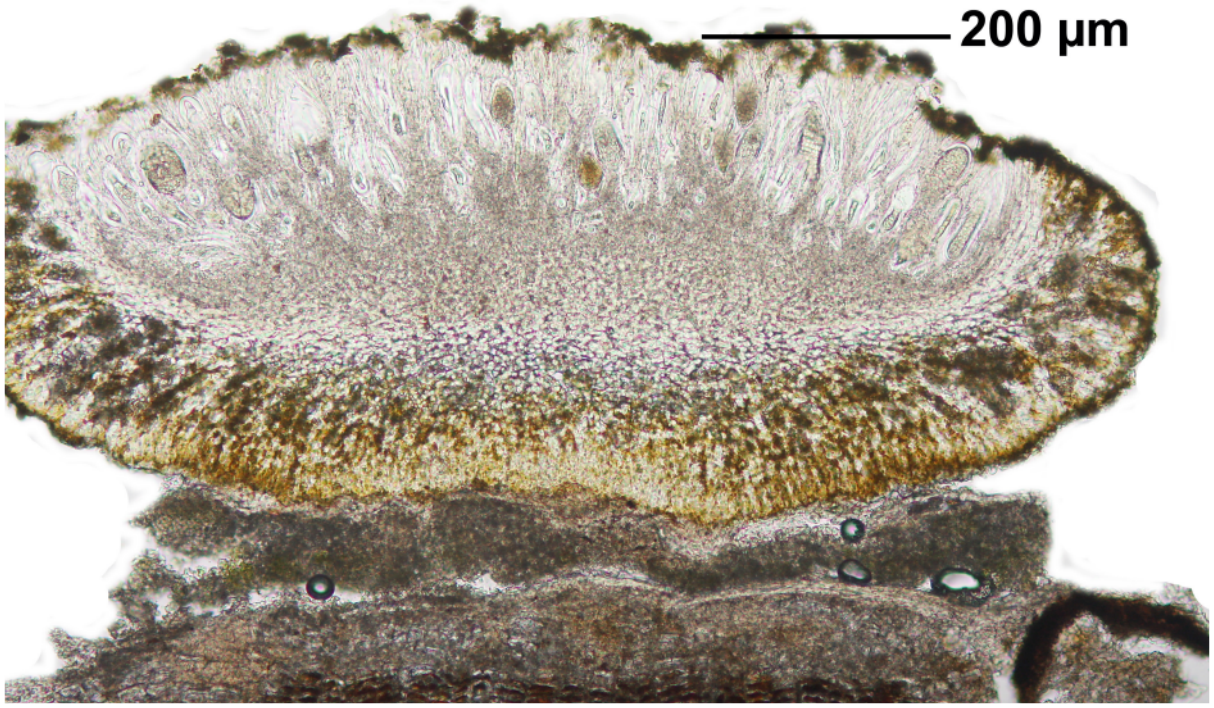

***Baeomyces heteromorphus***

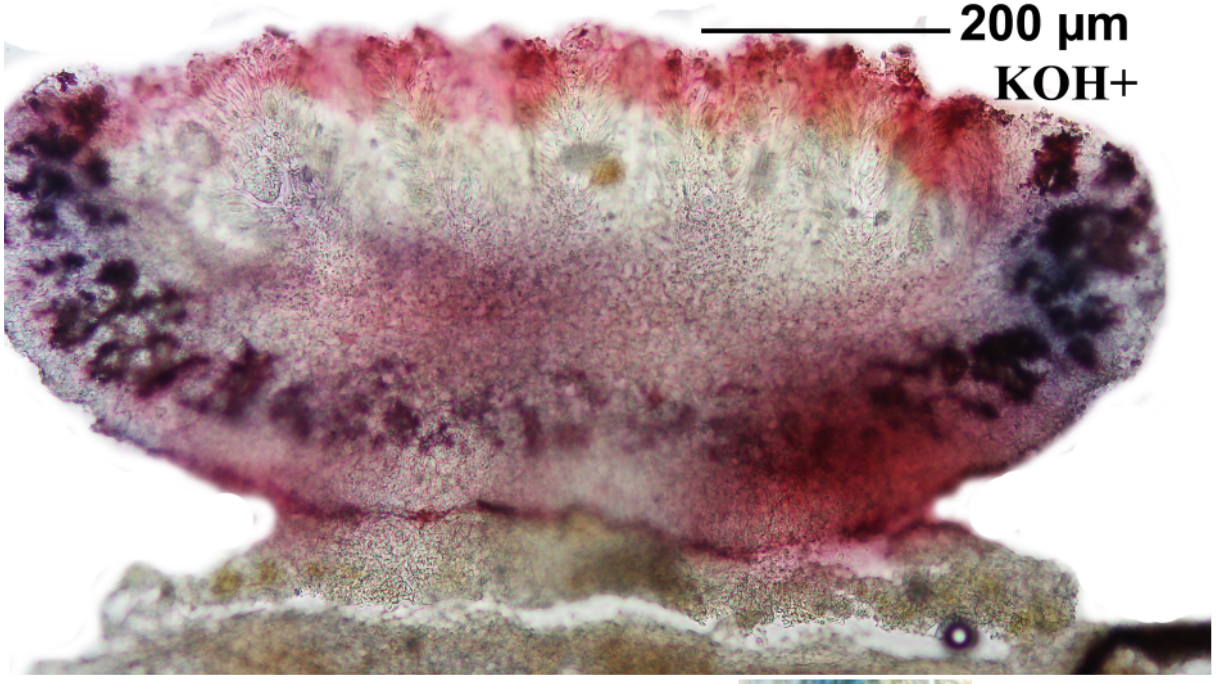
***Brigantiaea leucoxantha*** (Sprengel) R.Sant. & Hafellner

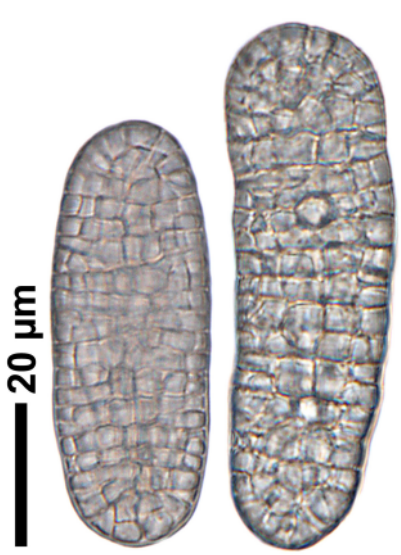
Very similar to *Brigantiaea tricolor*. Apothecium margin more vivid orange. Ascospores smaller, 65-105 x 21-40 µm, hyaline, muriform, 1/ascus. Epihymenium K+ carmine, excipulum K+ carmine to purple.

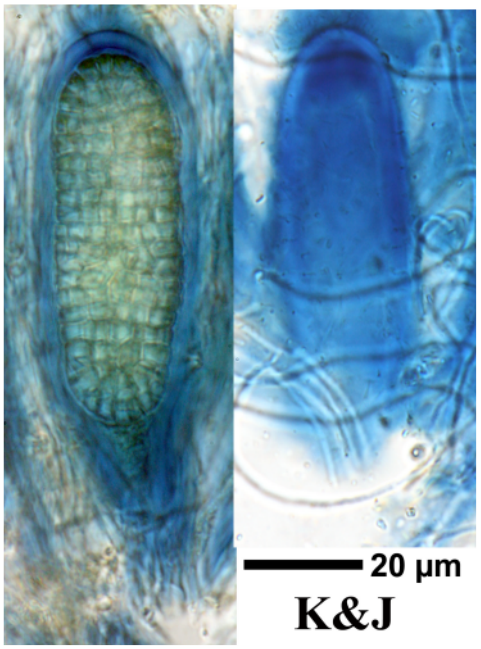
[7983], Philippinen, Leyte, Prov. Leyte, Lake Danao (11°03.920' N, 124°42.216' E, 630 m) bei Barangay Lake Danao, (East-District Ormoc-City). Leg. Schumm 26.08.2000, det. Aptroot 2009, teste Schumm 2011.



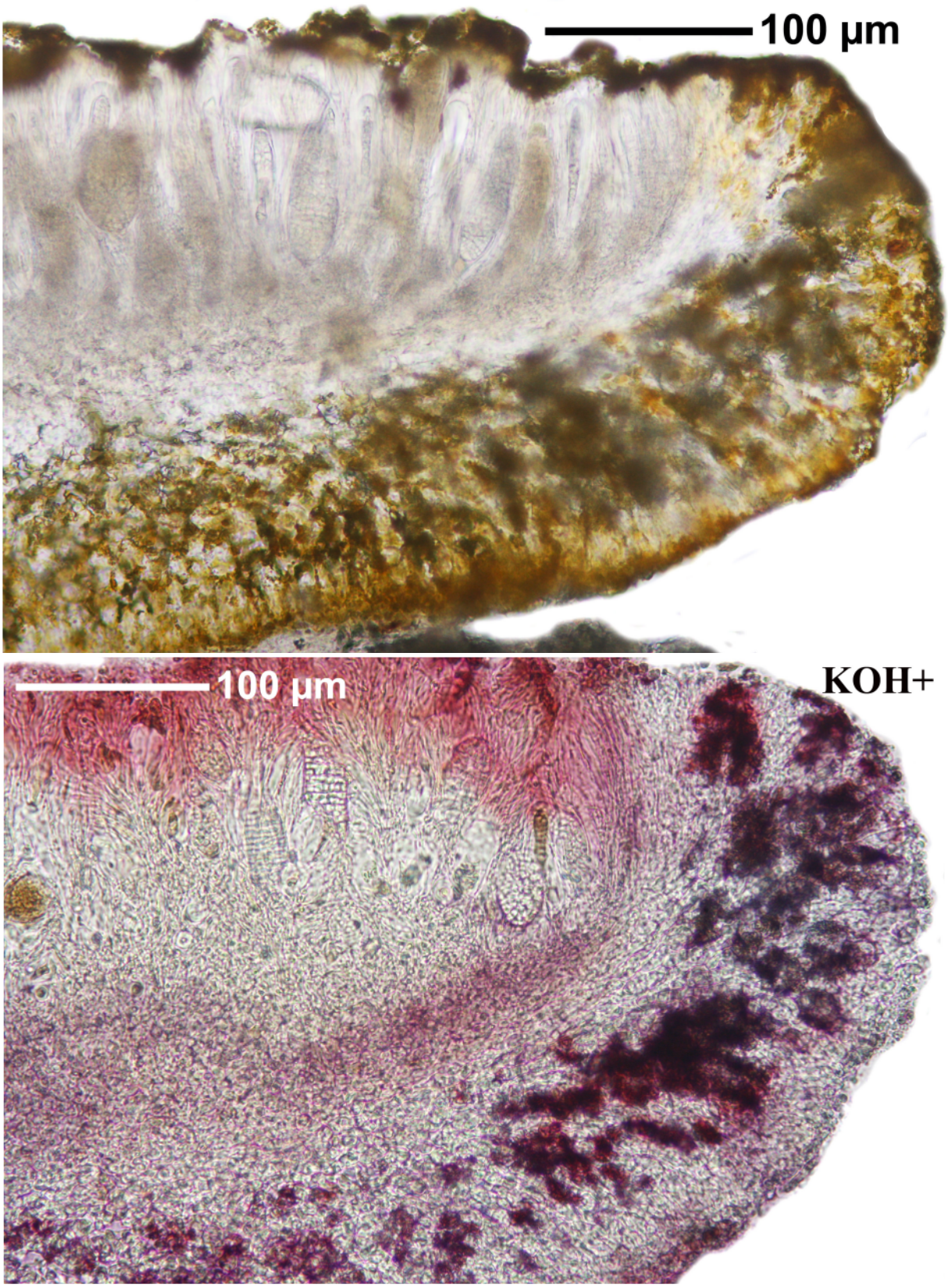



***Brigantiaea leucoxantha***



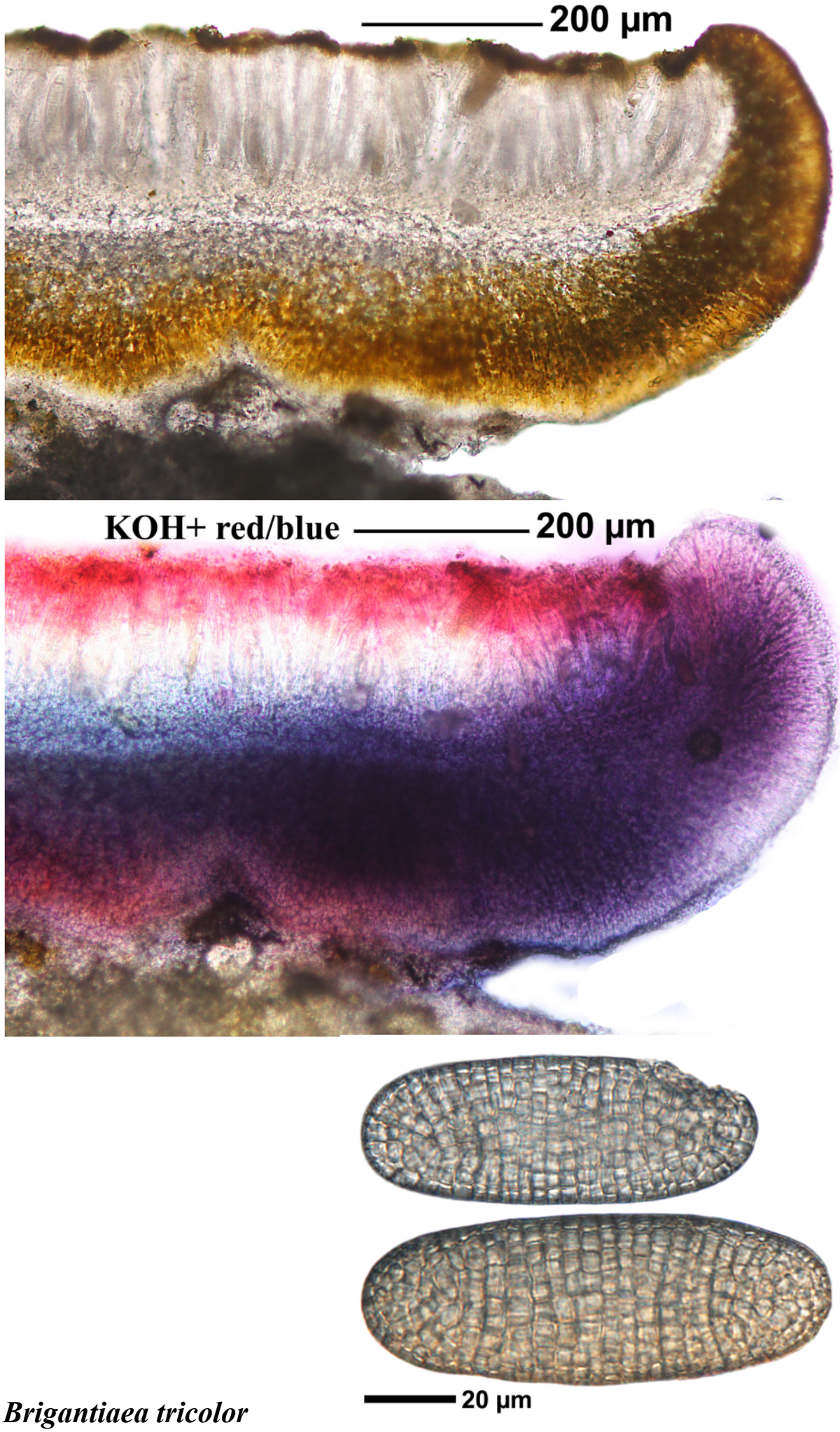

***Brigantiaea leucoxantha***

***Brigantiaea tricolor*** (Mont.) Trevis.

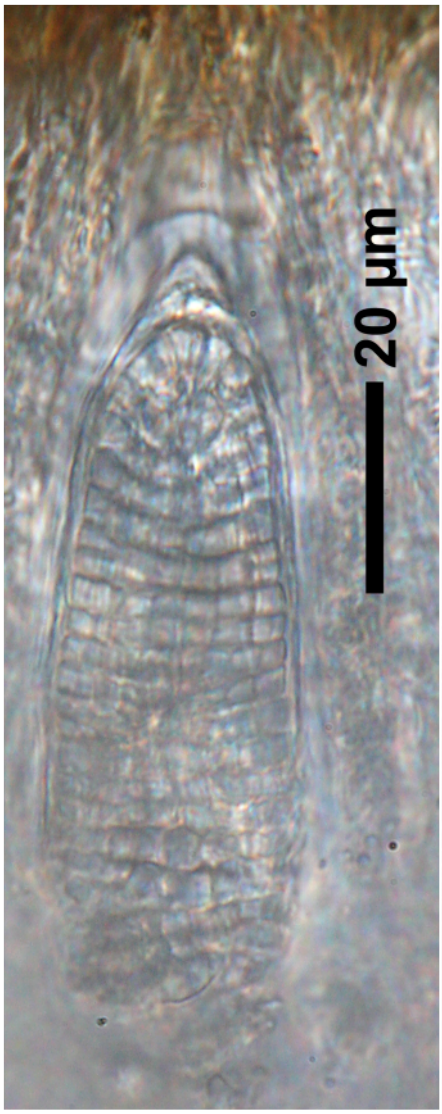
Thallus whitish grey to grey-green. Apothecia 0.4-2.0 mm wide, constricted at the base, disc orange to brown, yellow pruinose. Exciple biatorine without algae, with orange crystals. Hymenium slightly inspersed with small oil droplets, 120-150 µm thick. Ascospores muriform, hyaline, 1/ascus, 75-110 x 25-40 µm. Chemistry: Thallus K+ yellow, C-, P-; apothecial margin K+ blue, epihymenium K+ blue, pruina K+ purple; thallus: atranorin, zeorin; apothecia parietin, ligastroquinone, simonyellin (±). Lit. Hafellner (1997).

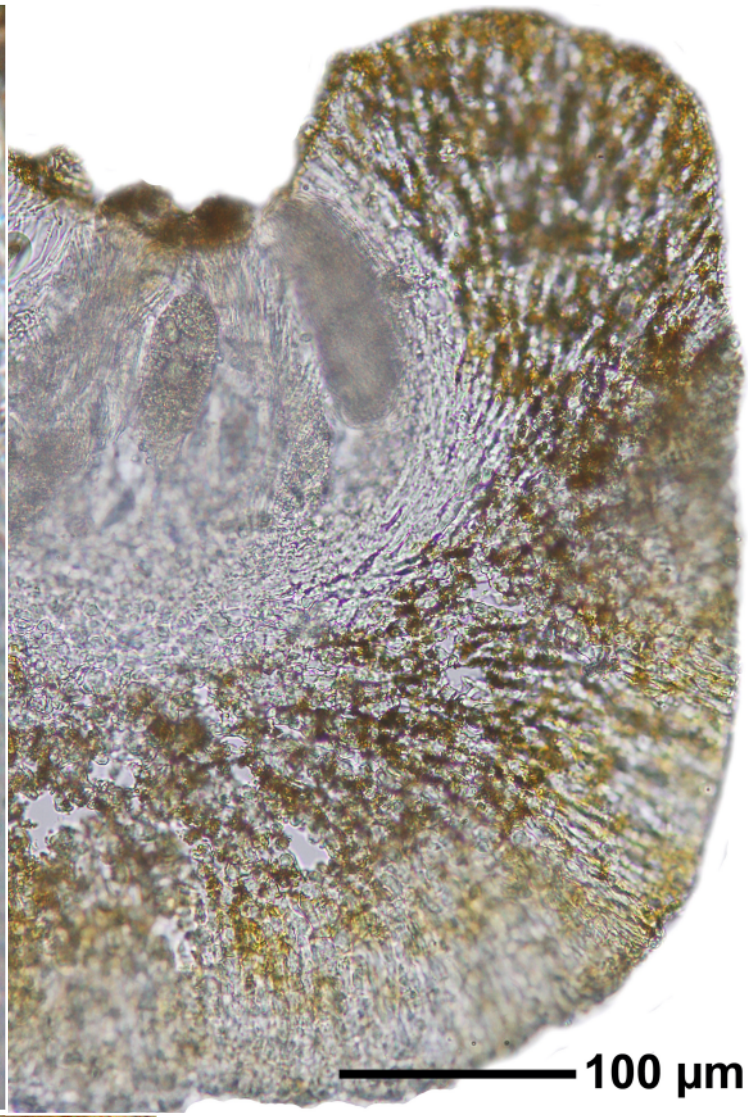
[6490], Philippinen, Mindanao, Prov. Misamis Oriental, südwestlich Gingoog City, Barangay Lunutan, 08°42.510’ N, 125°01.241’ E, 1120 m und am Weg auf den Mt. Lumot (Via Haruhay Trail) bis zum Zwischencamp im trop. Bergregenwald, 08°40.713’ N, 125°01.649’ E, 1680 m. Leg. Schumm 24.08.1999, det. Schumm 1999, teste Aptroot 2009.





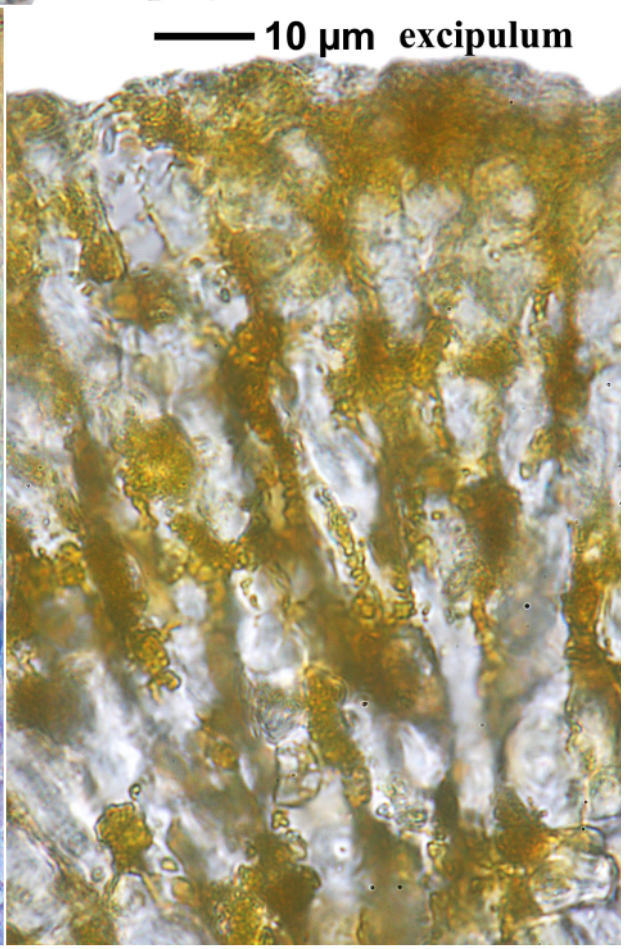

***Brigantiaea tricolor***










***Brigantiaea tricolor***

***Bulbothrix goebelii*** (Zenker) Hale

Lower surface variably dark brown to black. Isidia cylindrical, erect, up to 0.7 mm high. Lobes 0.5-1.5 mm wide. Cilia black, dense, with inflated base, apically branched. Chemistry: cortex K+ yellow; medulla K-, C+ rose, KC+ pink, P-; atranorin (minor), gyrophoric acid (major). Pantropical.

[7669], Philippinen, Leyte, Prov. Leyte, Weg zum Mt. Agipo zwischen Barangay San Agustin nahe VISCA (10°44.543' N, 124°47.402' E) und Camp Pandong Bato am Lumsok River (10°43.907' N, 124°48.701' E, 340 m); bei 40 m auf Cocos nucifera. Leg. Schumm 17.08.2000, det. J.A. Elix 06.11.2000.

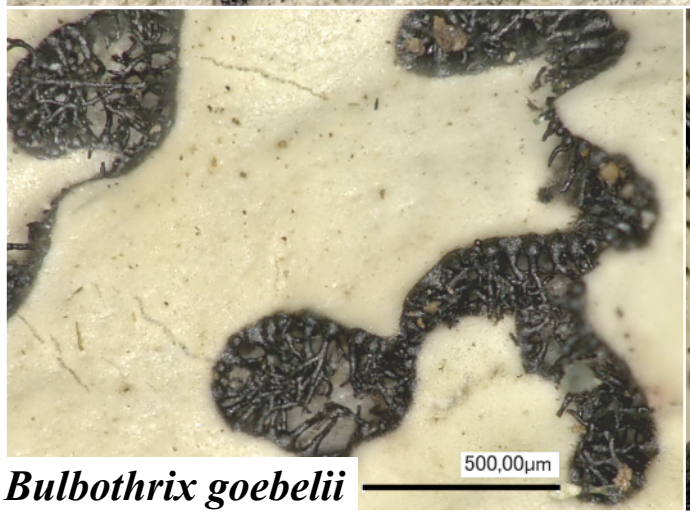


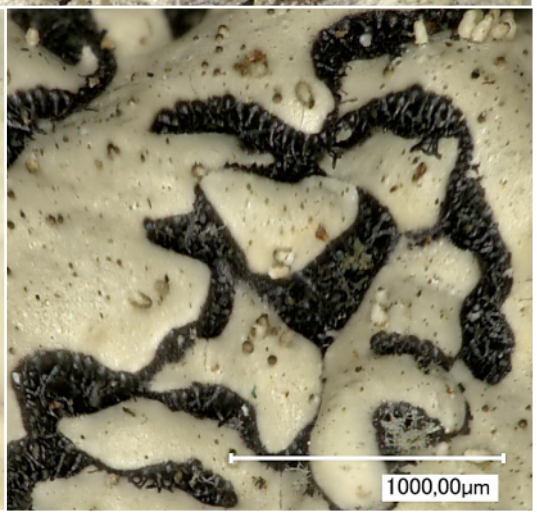








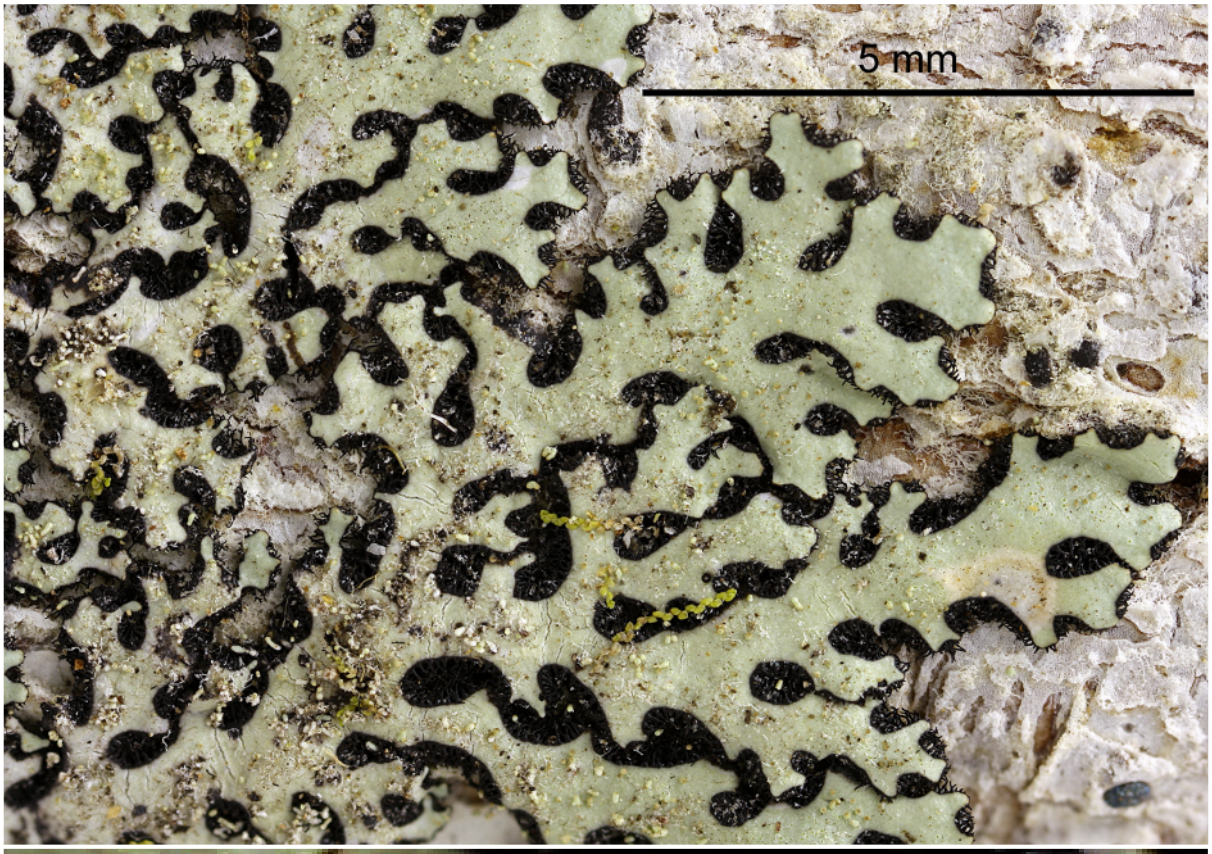




***Bulbothrix goebelii***

***Bulbothrix goebelii*** (Zenker) Hale

[14500], Seychelles, La Digue, zwischen Belle Vue (Nid d' Aigles) und Fond Piment, 4°22' S, 55°50' E, ca. 340 m, auf Cinnamomum verum. Leg. Schumm & Frahm 03.10.2008, det. Aptroot 2008.







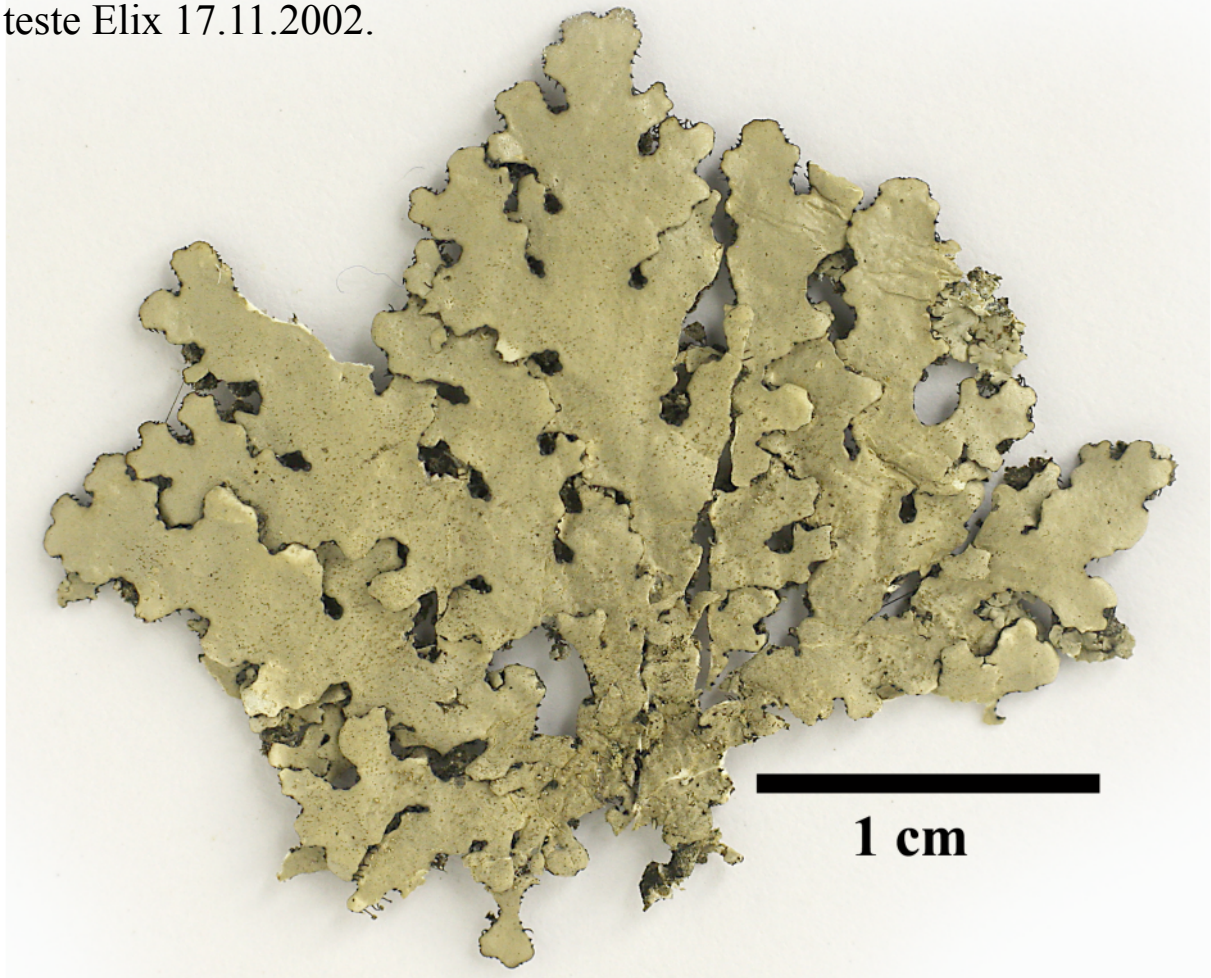


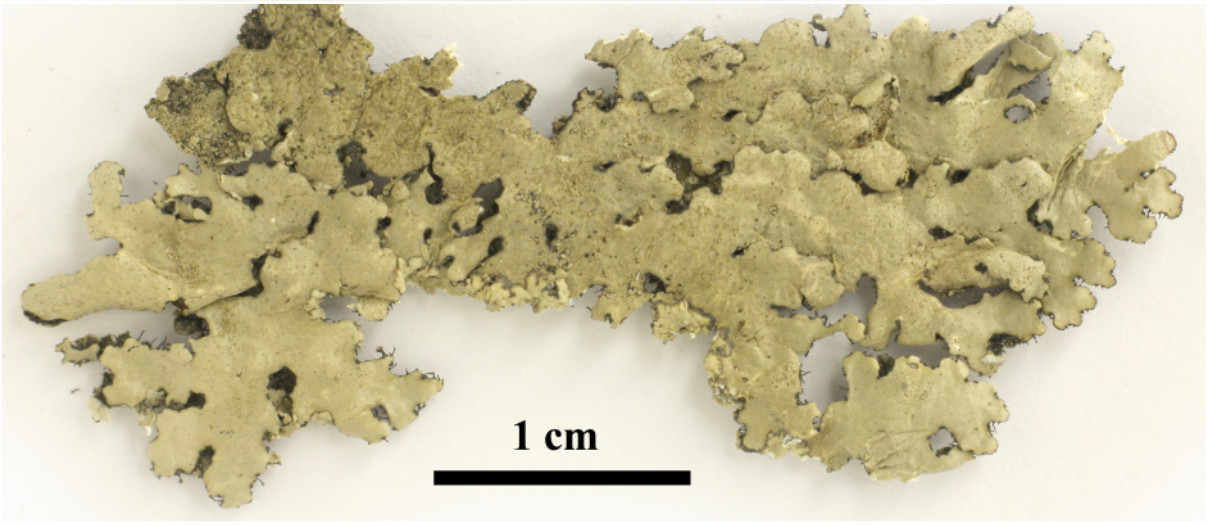
***Bulbothrix goebelii***

***Bulbothrix isidiza*** (Nyl.) Hale

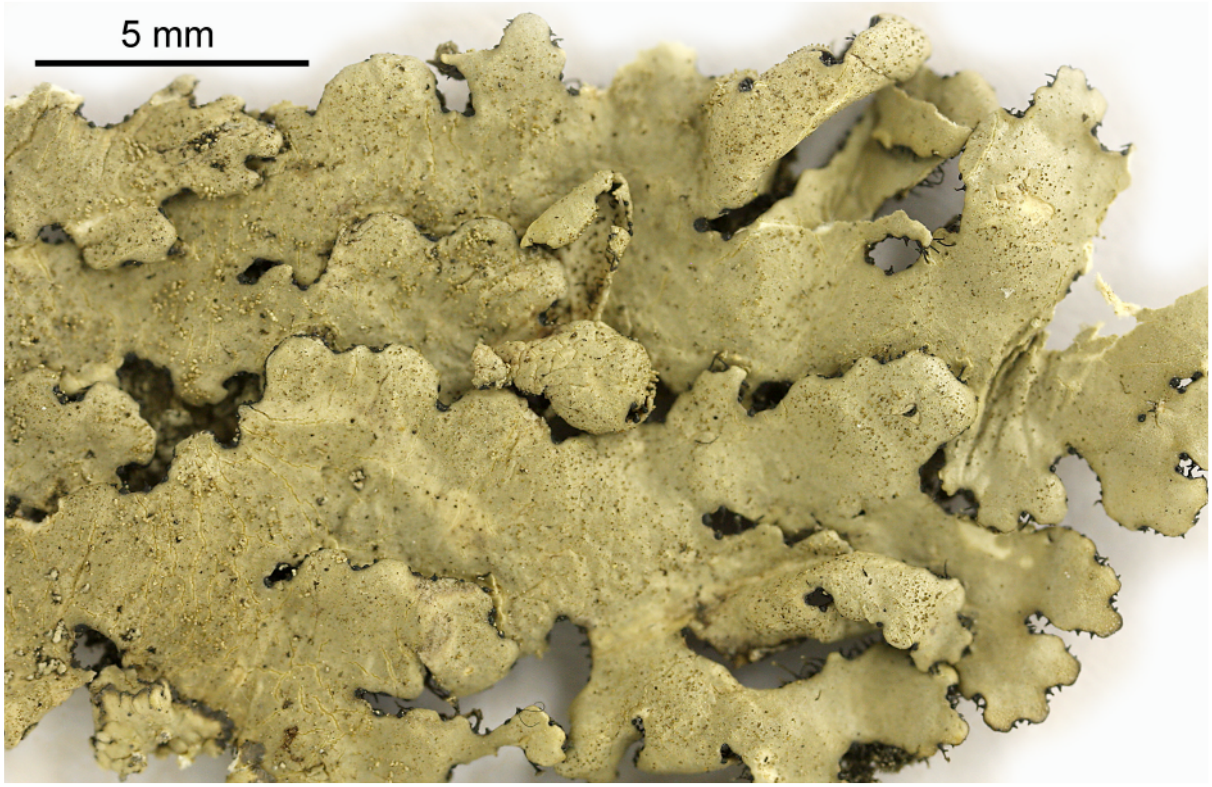
Thallus with simple, globose, cylindrical or branched isidia. Soralia absent. Lobes 1-4 mm wide. Loer surface pale. Marginal cilia black, with inflated base. Rhizines simple, black. Chemistry: cortex K+ yellow; medulla K+ yellow then red, C-, P+ orange; atranorin (min), chloroatranorin (min), salazinic acid (maj), consalazinic acid (min), secalonic acid A (min), secalonic acid W (min). Corticolous. Pantropical.

[9553], Thailand, Bergdorf der Akha in der Nähe von Chiang Saen, 20°06.275'N, 99°37 24' E, 700 m. Leg. et det. Schumm 31.03.2002, teste Elix 17.11.2002.

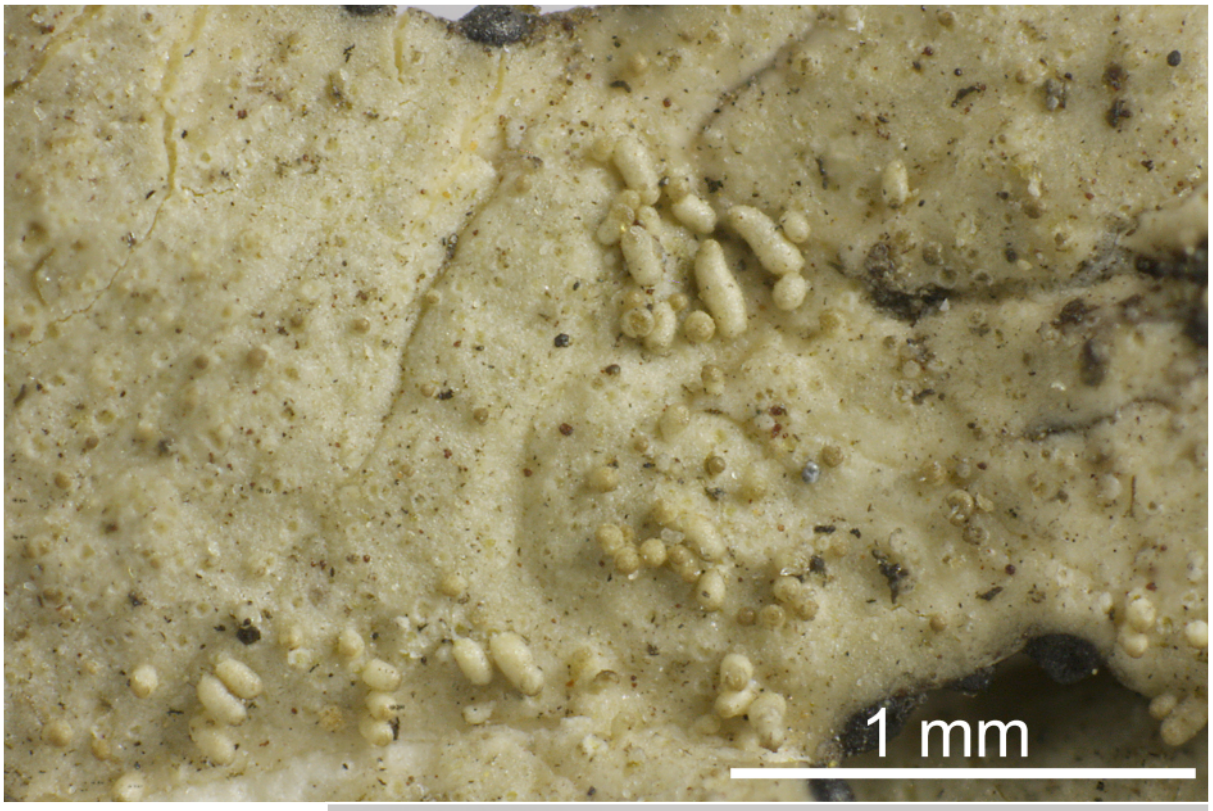





***Bulbothrix isidiza***



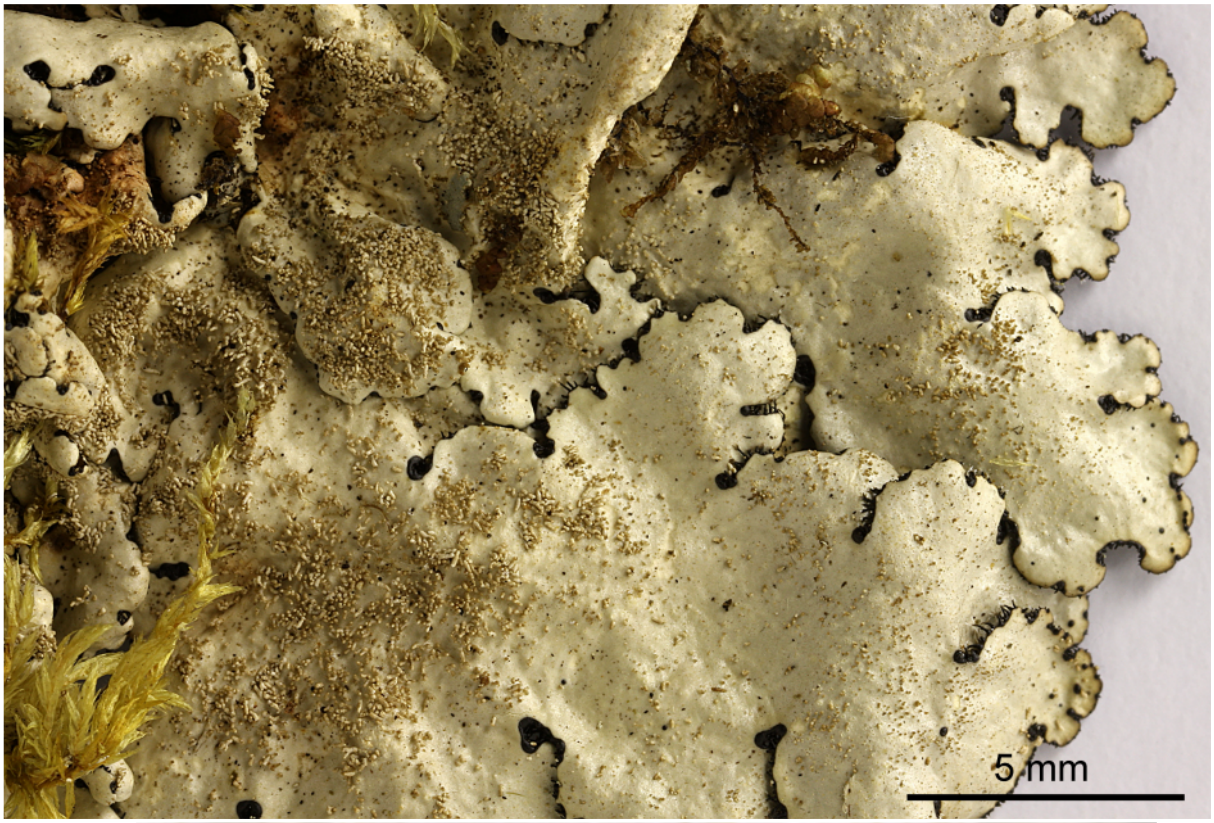


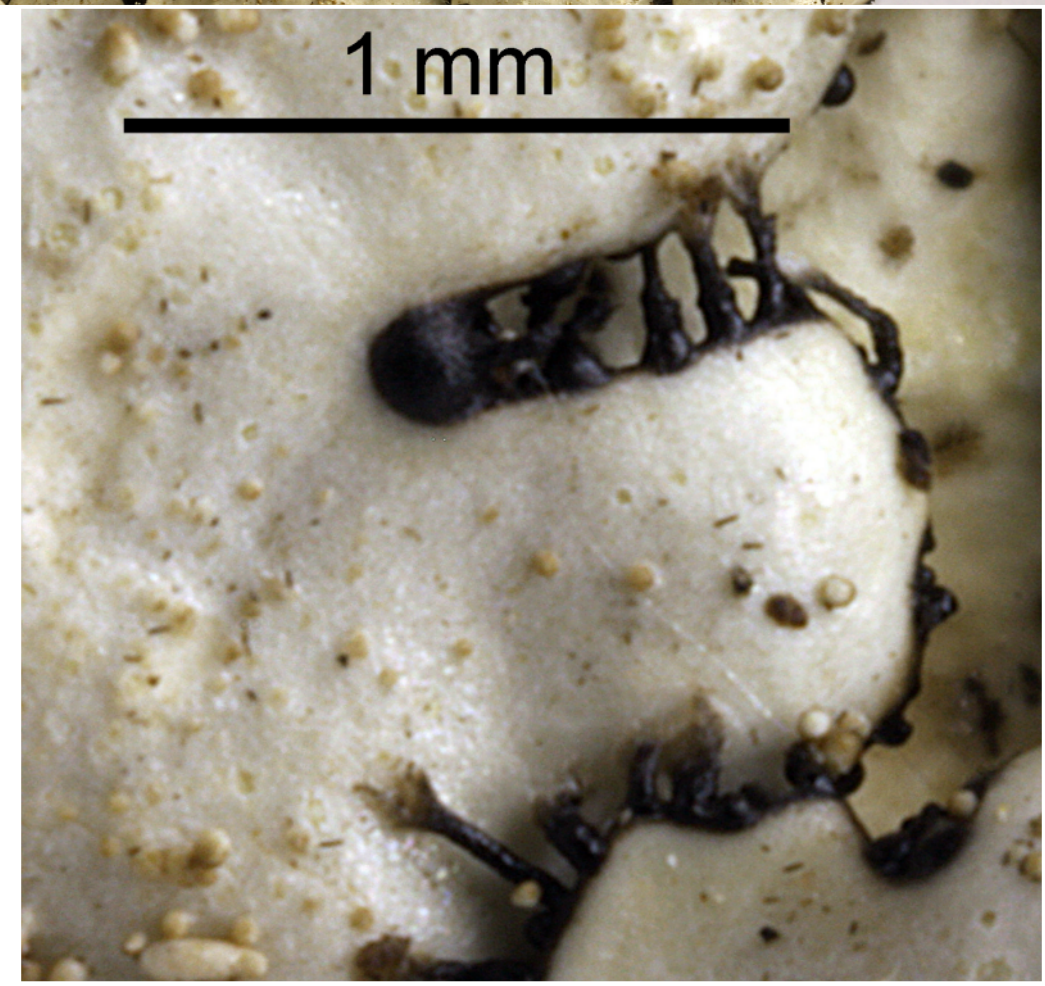


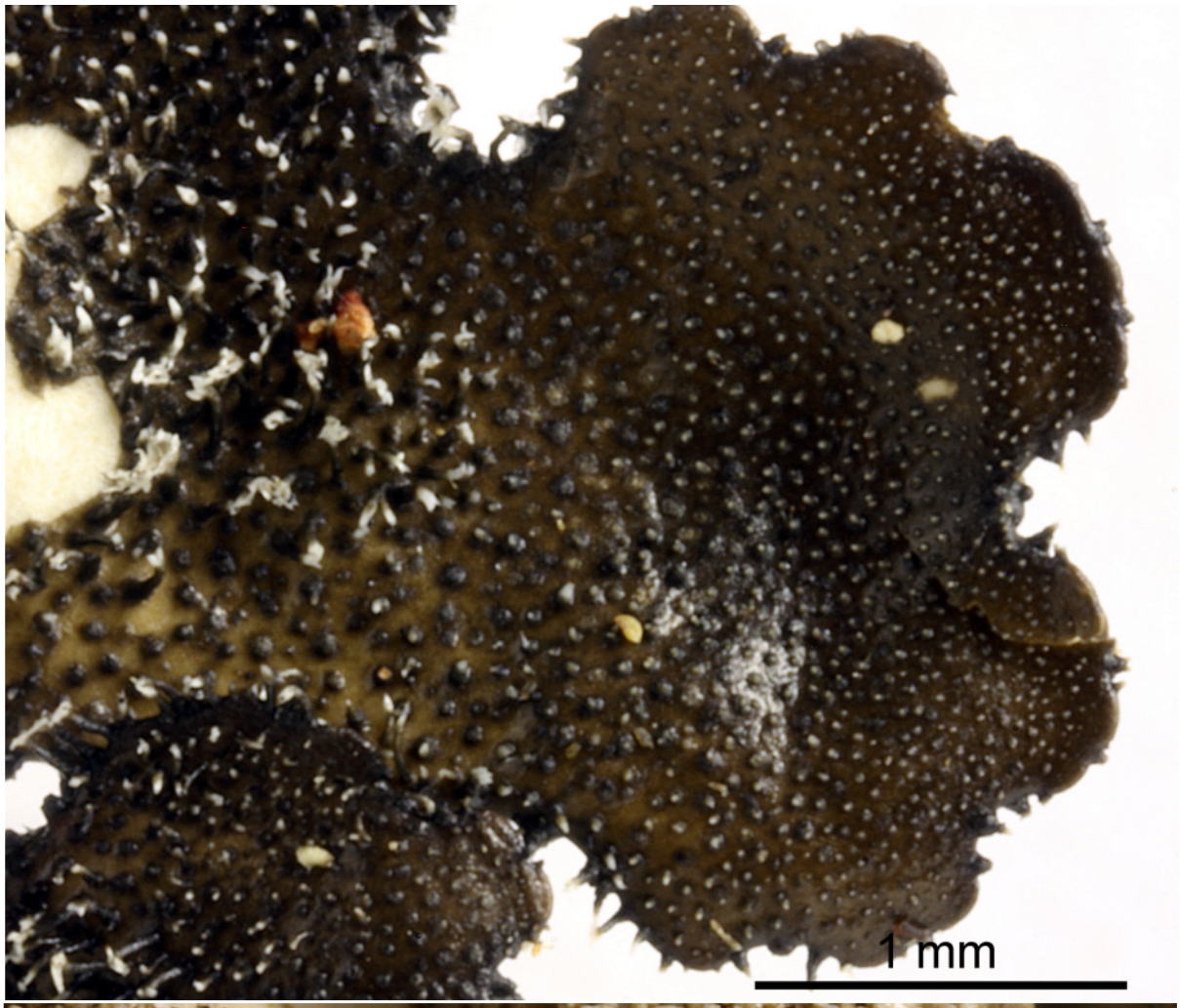
***Bulbothrix isidiza***

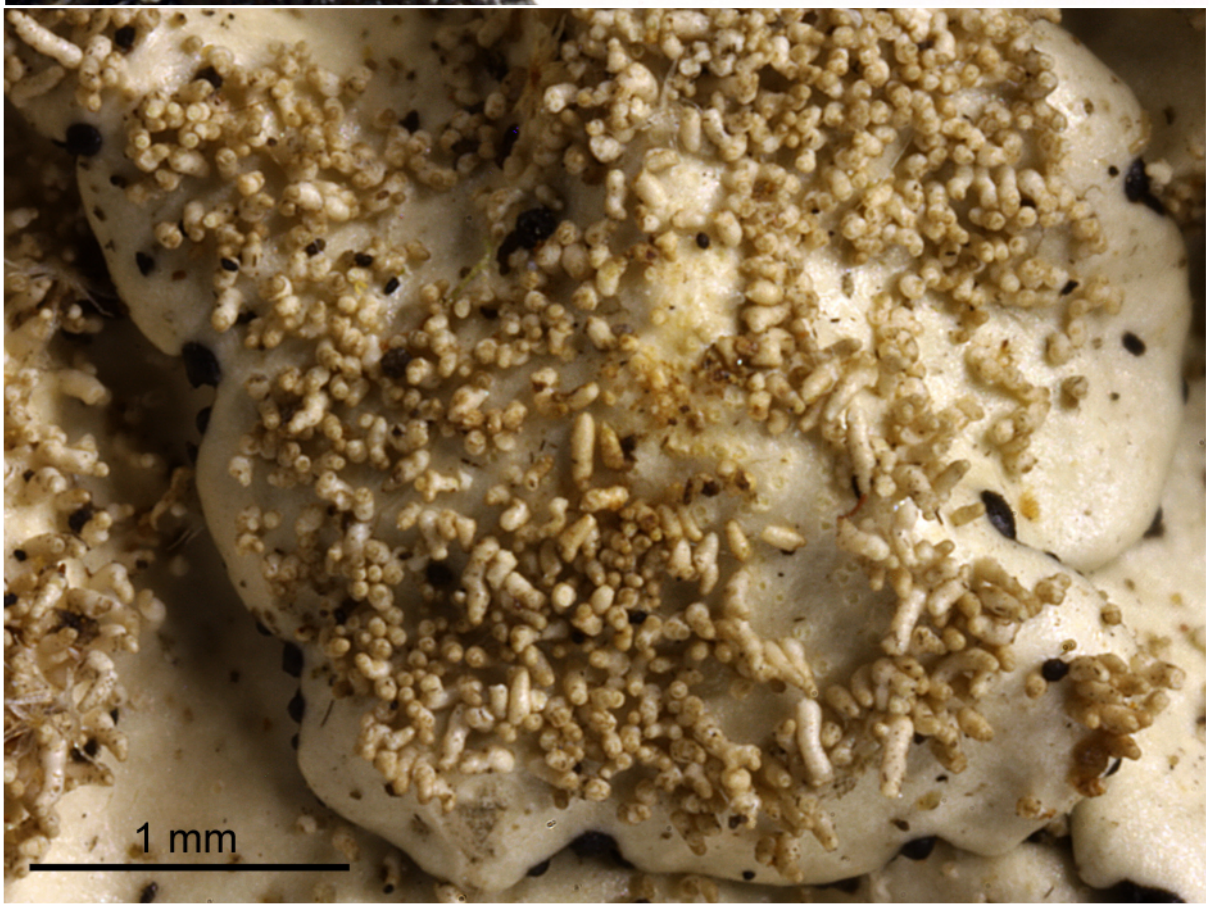
***Bulbothrix isidiza*** (Nyl.) Hale

[7934], Philippines, Leyte, Prov. Leyte, Lake Kasudsuran (N 11°01.539, E 124°44.931, 740 m) bei Barangay Liberty (Ormoc-City). Leg. Schumm 23.08.2000, det. J.A. Elix 21.11.2000.





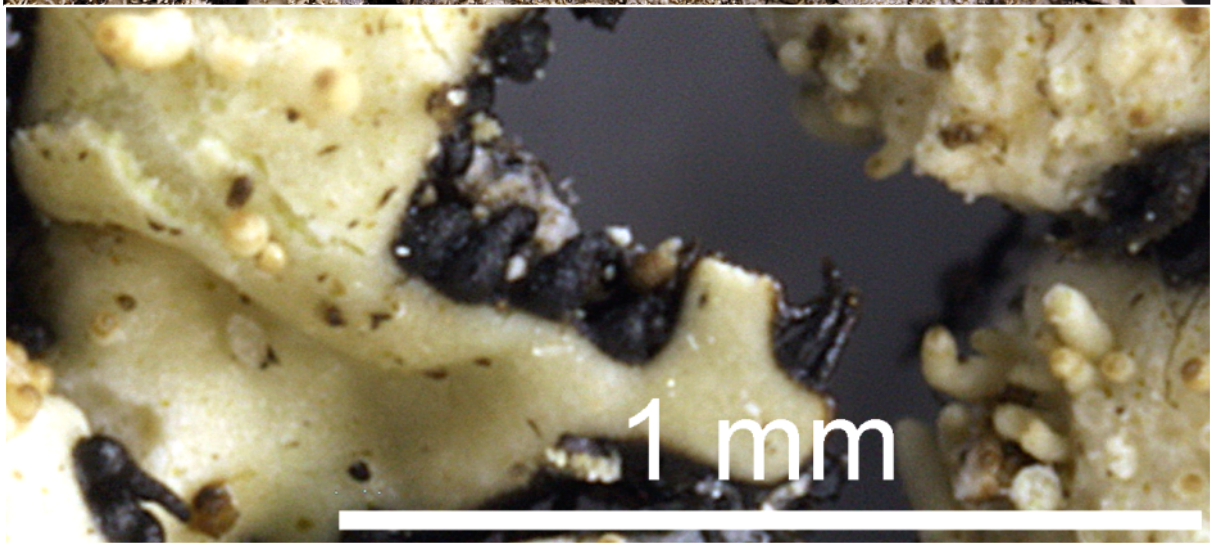

***Bulbothrix isidiza***

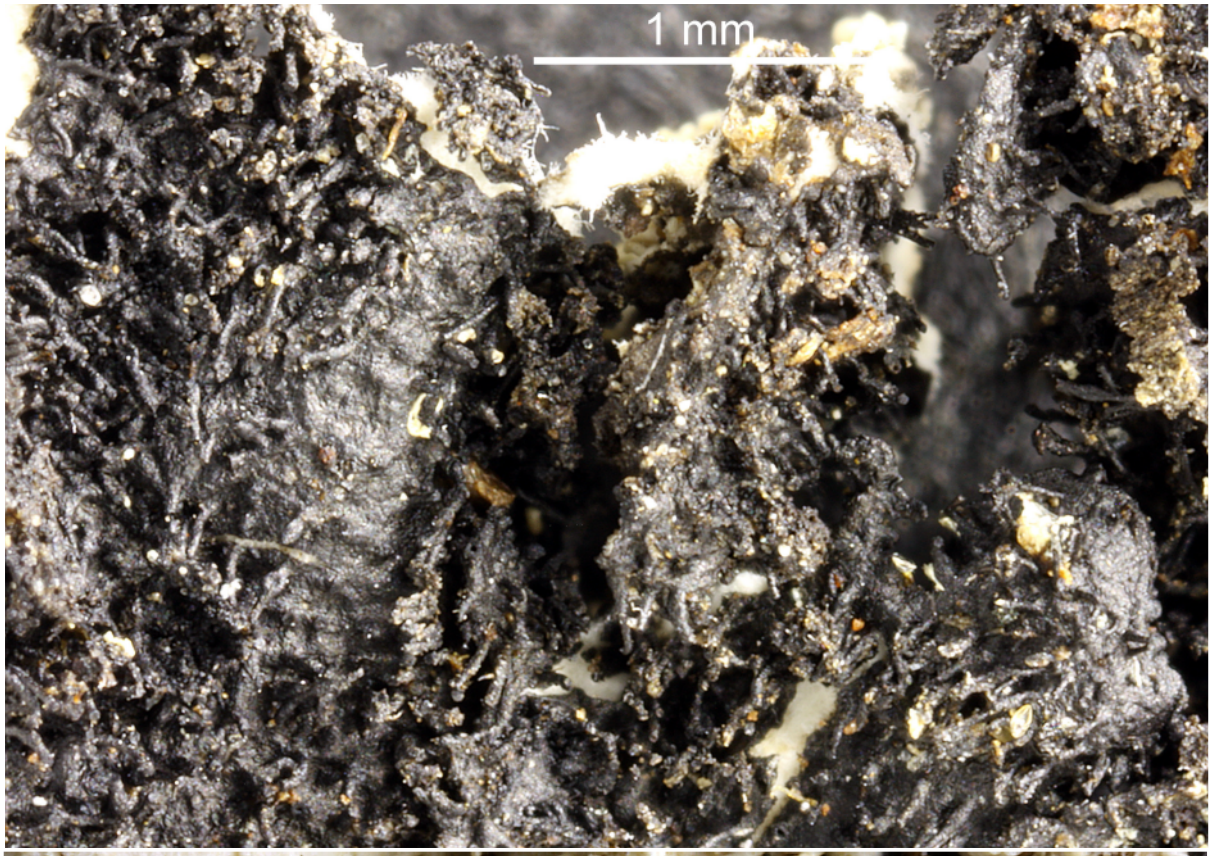
***Bulbothrix tabacina*** (Mont. & Bosch) Hale

Lower surface black. Thallus with cylindrical isidia, lobes 1.5-5 mm wide. Chemistry: cortex K+ yellow; medulla K+ yellow then red, C-, P+ orange; atranorin (min), salazinic acid (maj), consalazinic acid (min), norstictic acid (tr). Corticolous, rarely saxicolous. Pantropical.

[7379], Philippines, Negros, Prov. Negros Oriental, beim Mt. Talinis (Cuernos de Negros), Valencia Barangay Lunga, 9°16.676'N, 123°13.839' E, 330-540 m; bei 540 m auf Cocos nucifera. Leg. Schumm 08.08.2000, det. J.A. Elix 13.11.2000.









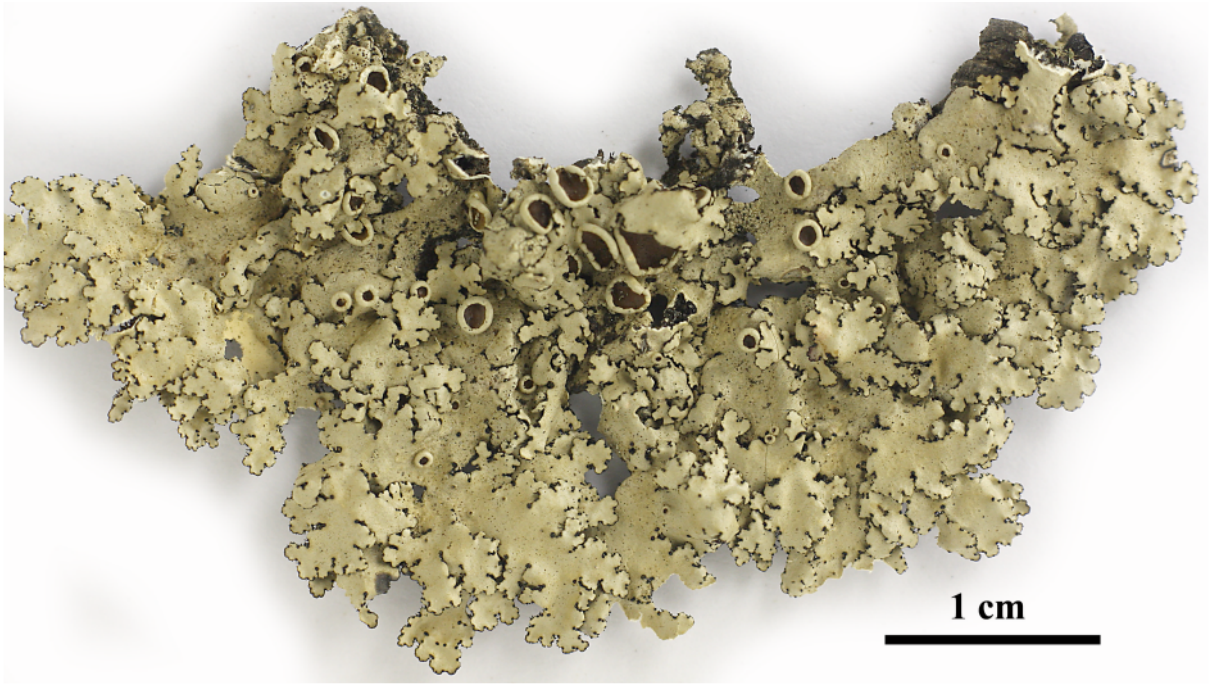
***Bulbothrix tabacina***

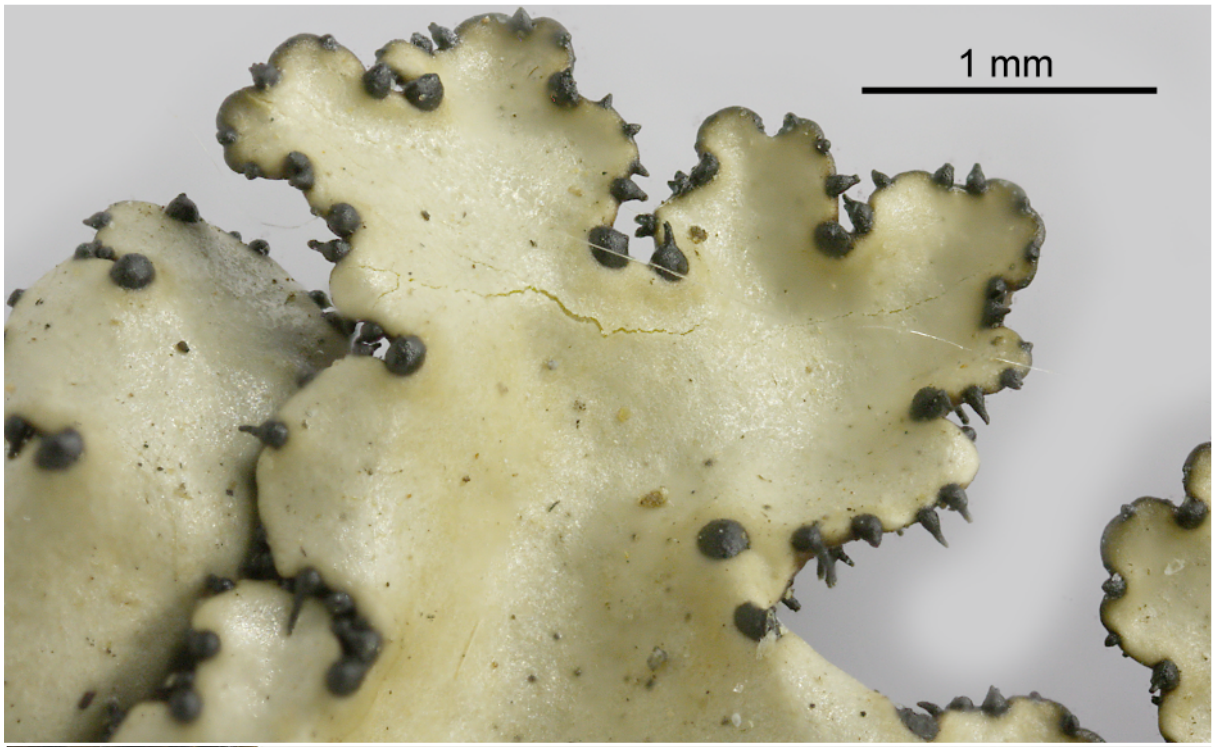
***Bulbothrix meizospora*** (Nyl.) Hale

Upper surface without isidia, without soralia. Cilia black with inflated base. Lower surface mostly black. Rhizines black, simple or branched. Apothecia without cilia. Ascospores elliptical, 16.4-18.5 x 6.5-9.5 µm. Chemistry: atranorin (min), salazinic acid (maj), consalazinic acid (min).

[9562], Thailand, Bergdorf der Akha in der Nähe von Chiang Saen. 20°06.275' N, 99°37.524' E, 700 m. Leg. et det. Schumm 31.03.2002, test. Elix 18.11.2002.







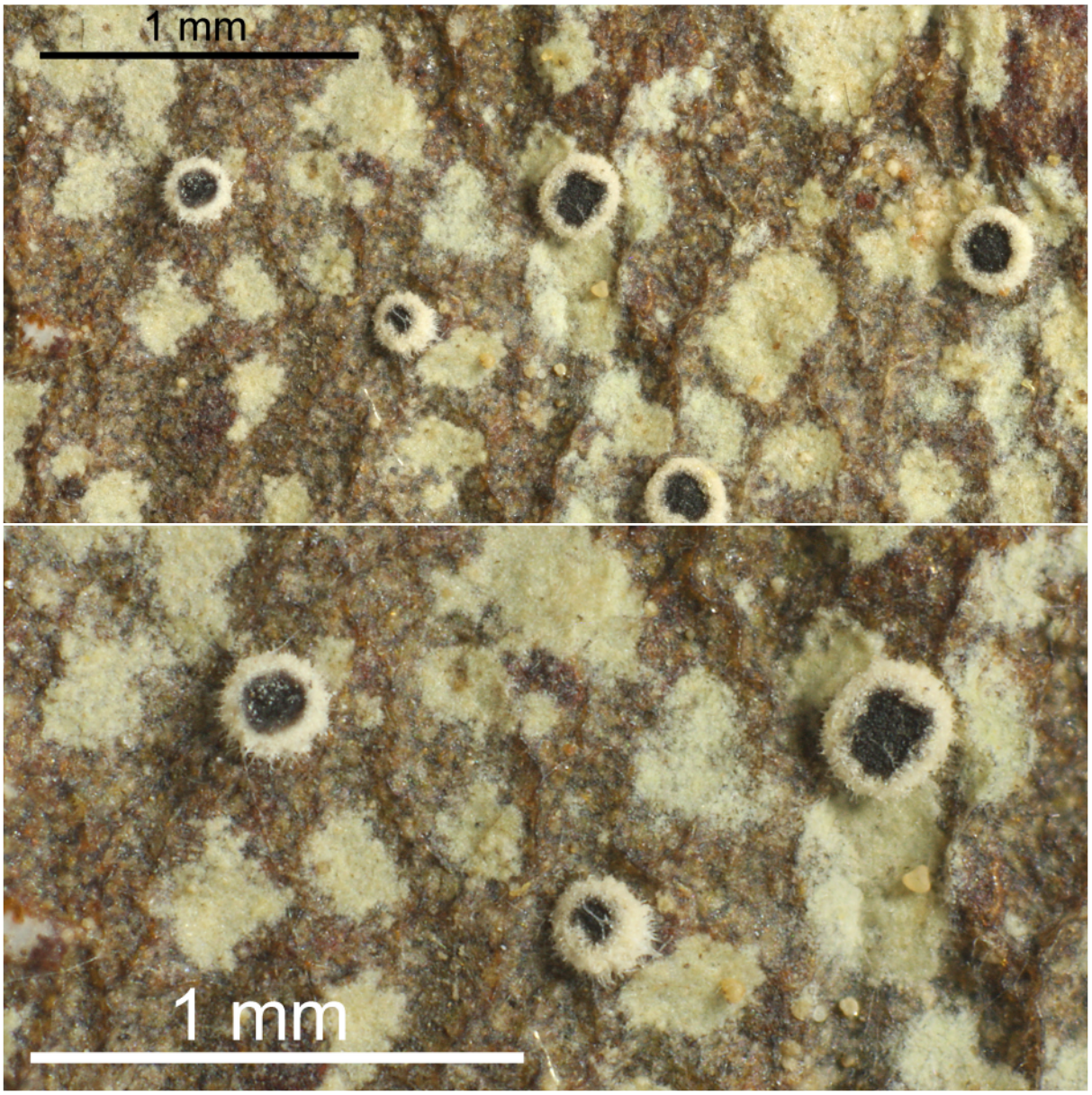


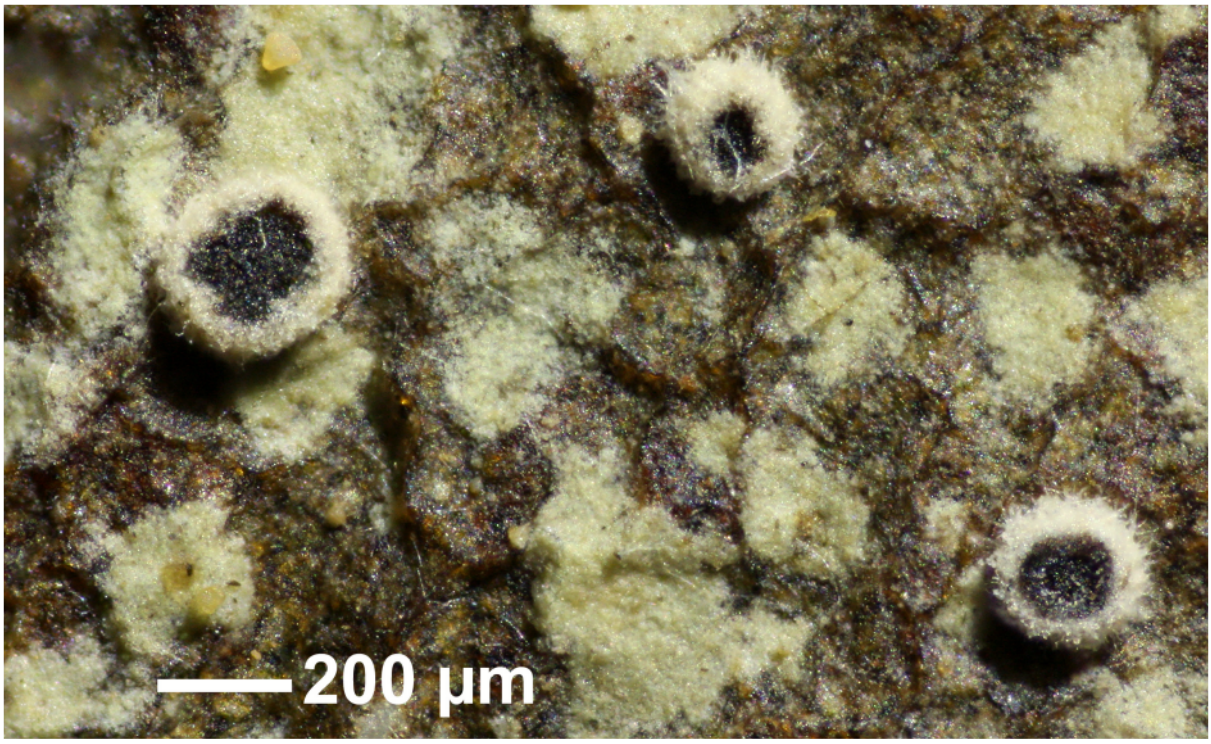
***Bulbothrix meizospora***

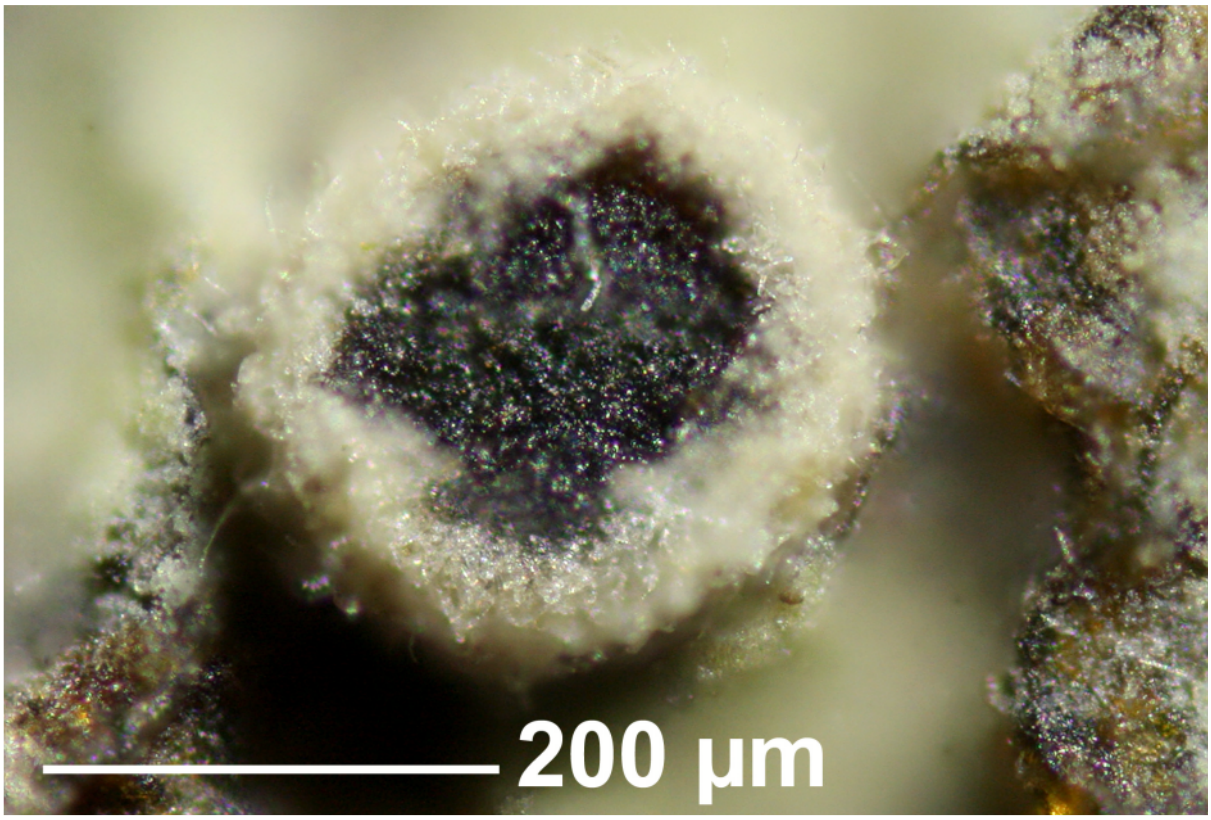
***Byssoloma discordans*** (Vain.) Zahlbr. var. ***flavescens*** Thor, Lücking & Matsumoto

Thallus continuous, often with gaps, smooth, grey to almost white. Apothecia 0.2-0.5 mm. Disc dark brown to black. Margin white, well developed, densely byssoid. Hypothecium browenish black, K-. Epithecium browenish or indistinct. Ascospores hyaline, 3-septate, 11-16 x 3-5 µm. Var. *flavescens* differs from *B. discordans* in that the excipulum is inspersed with greyish diffuse granules, which dissolve in K with yellowish reaction. Lit. Thor et al. (2000), Lücking (2008, Flora Neotrop. 103).

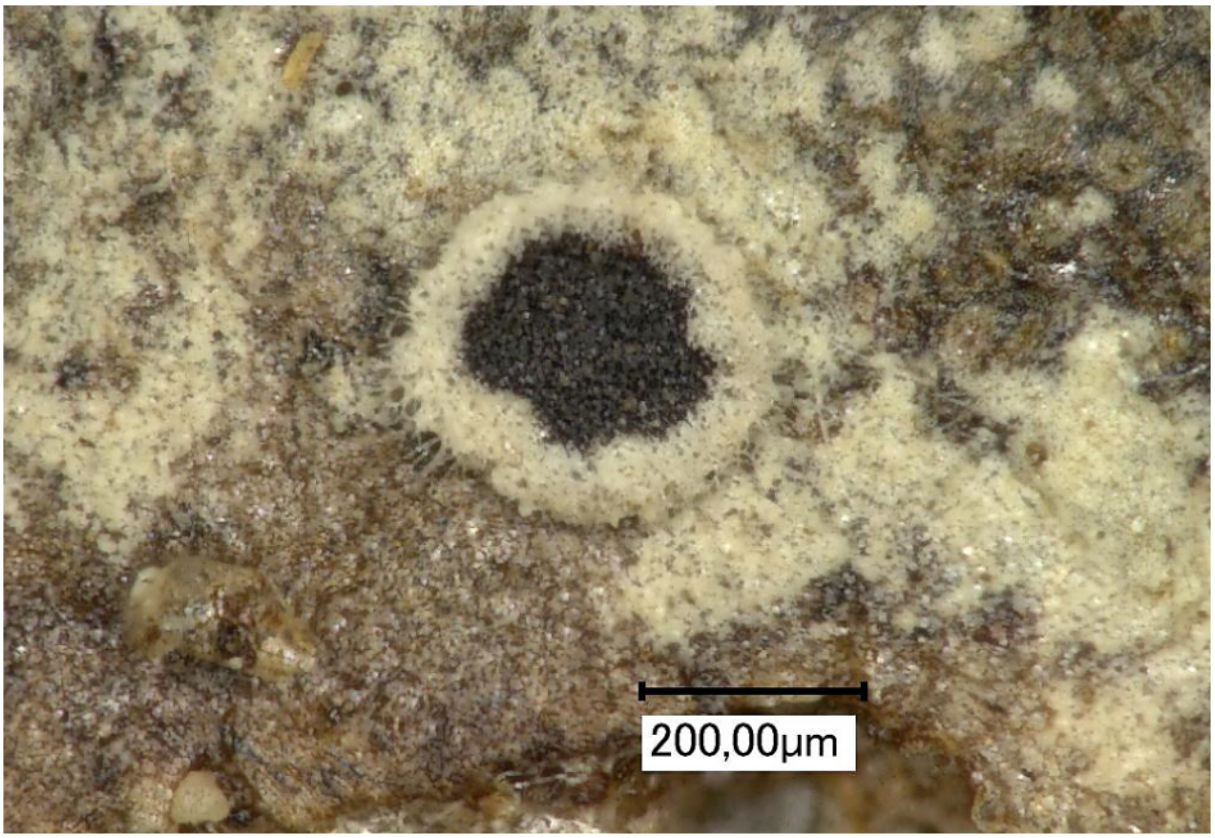
[10970], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail vom Camp Vendiola (09°16.281' N, 123°11.410' E) bis zum Lake Nailig (9°14.882' N, 123°10.490' E), ca. 1180 m. Leg. Schumm 10.08.2000, det. Lücking 2002.

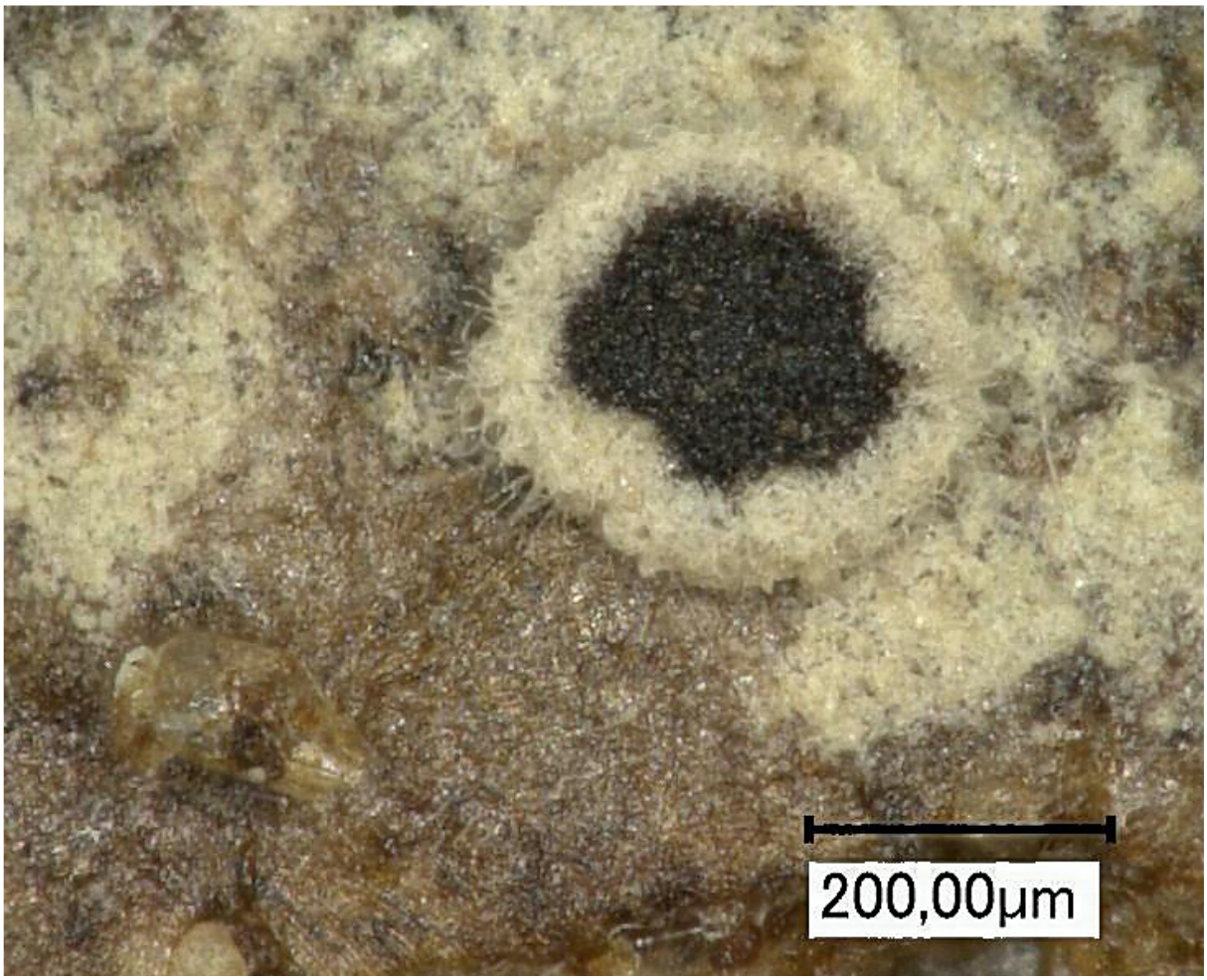




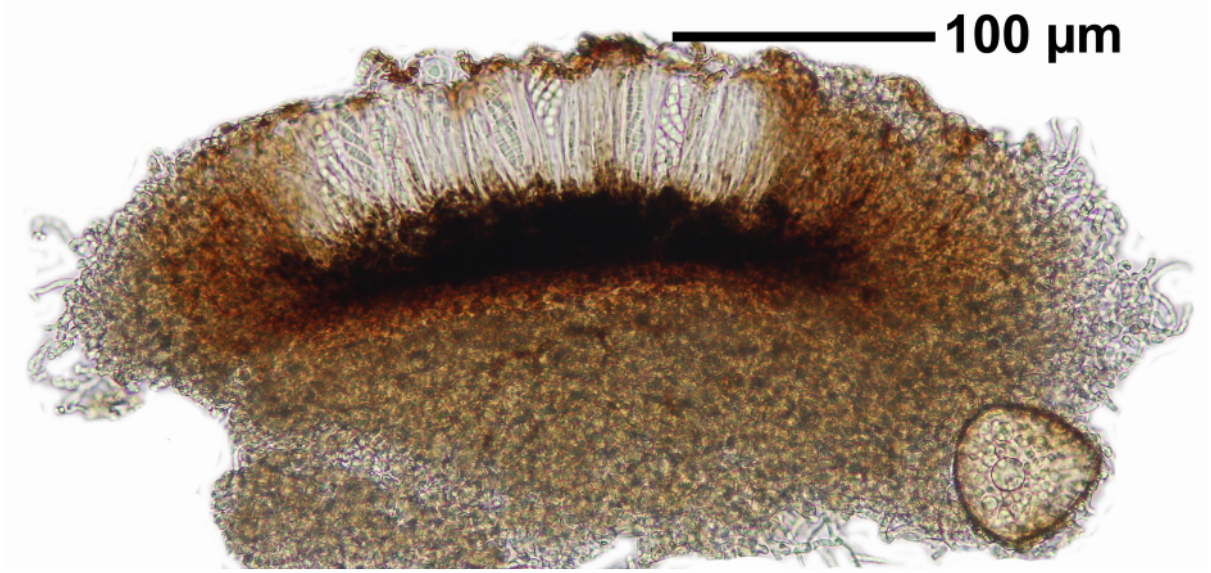



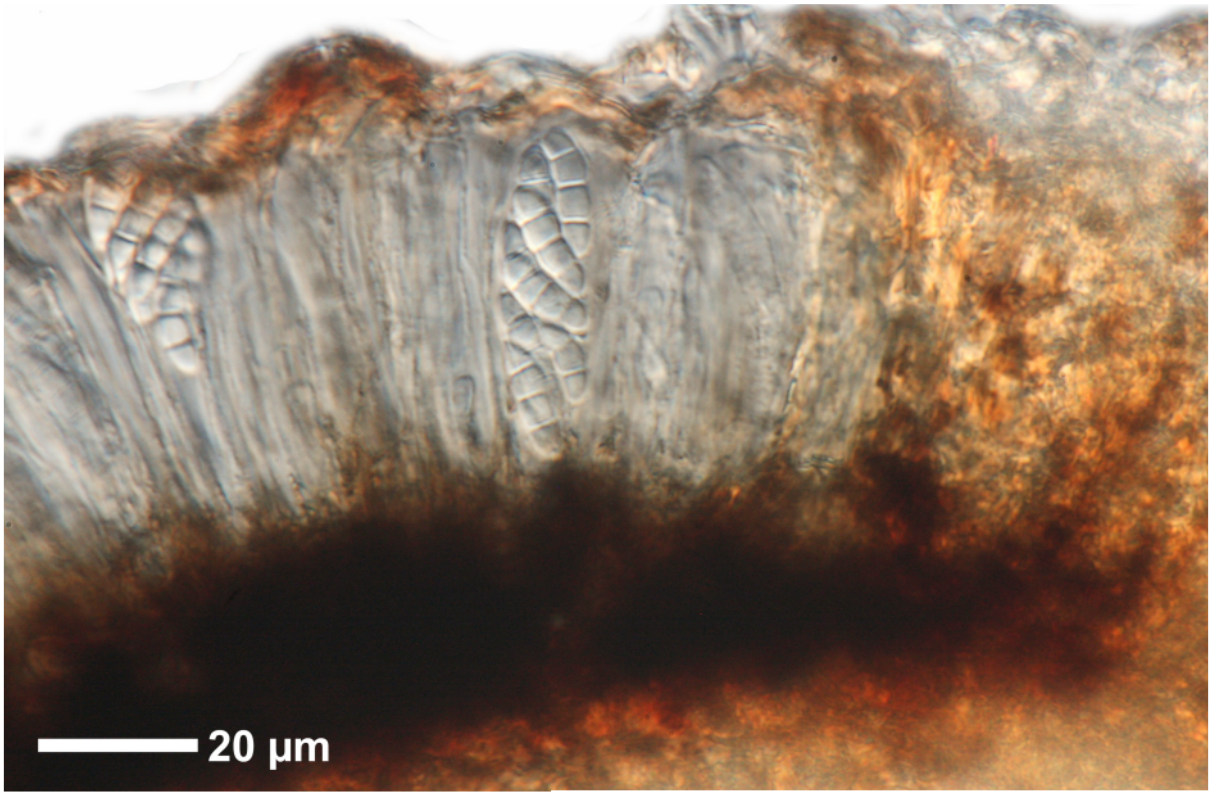

***Byssoloma discordans*** var. ***flavescens***




***Byssoloma discordans*** var. ***flavescens***

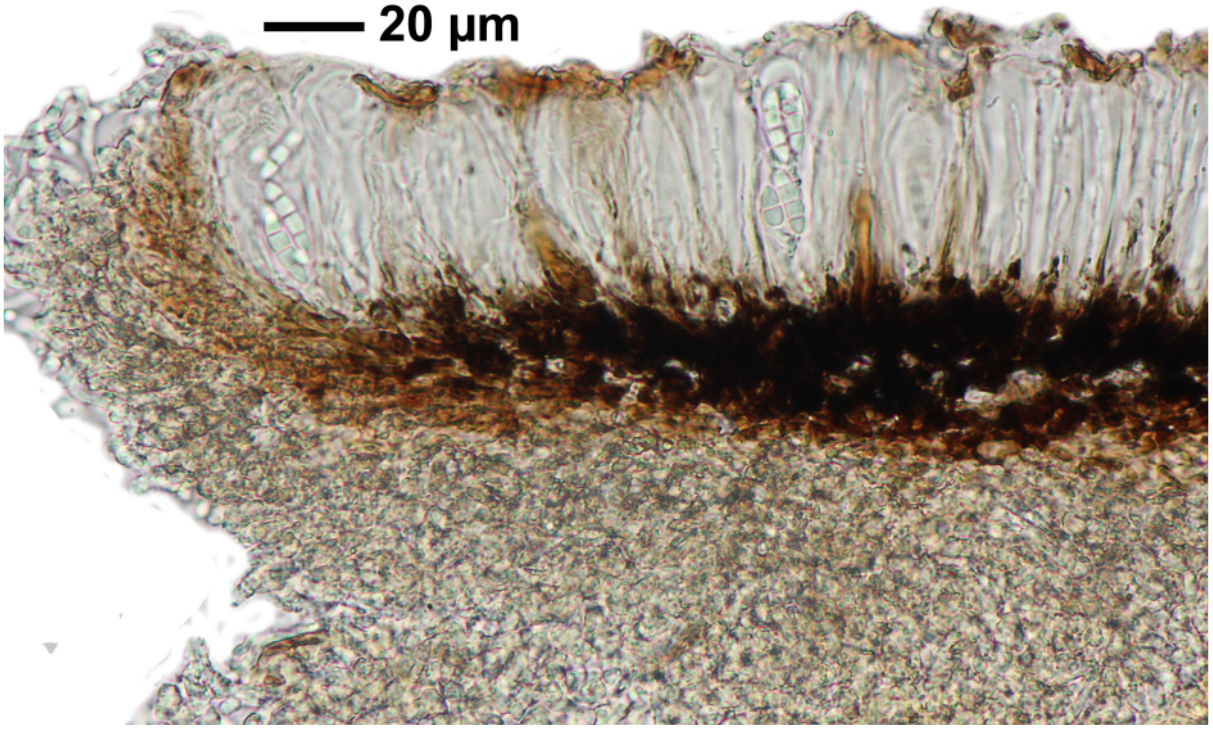


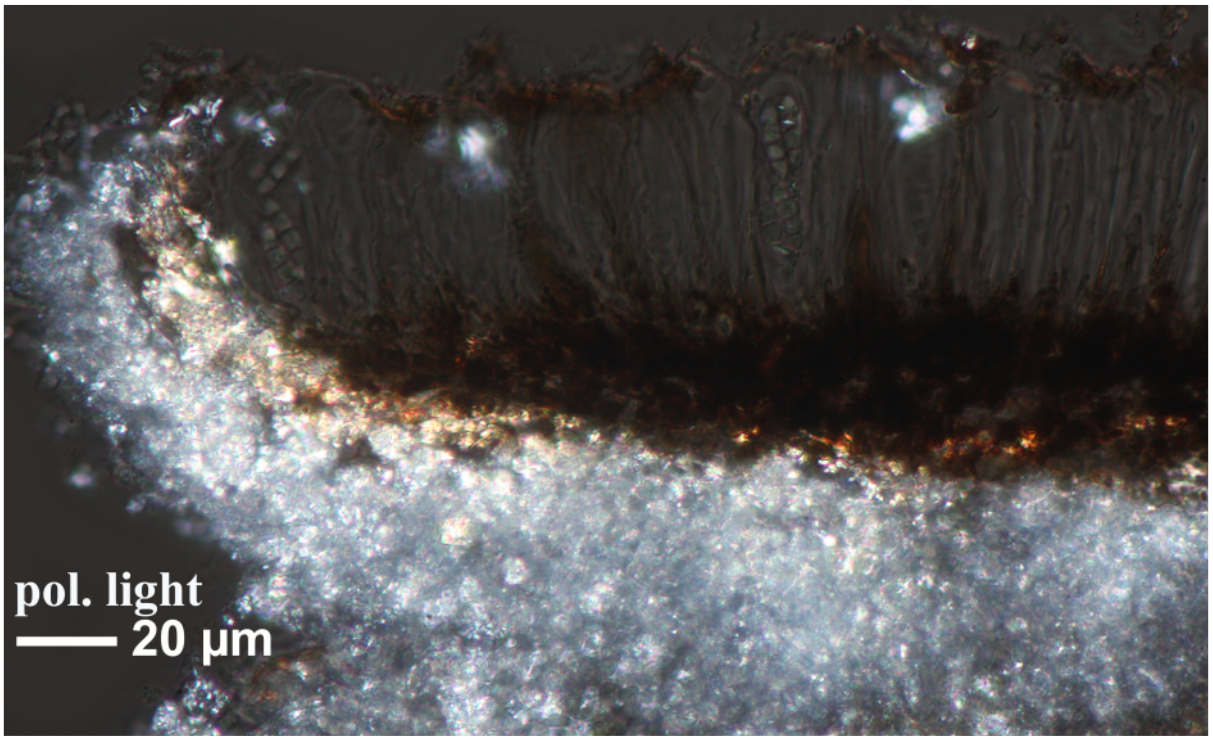





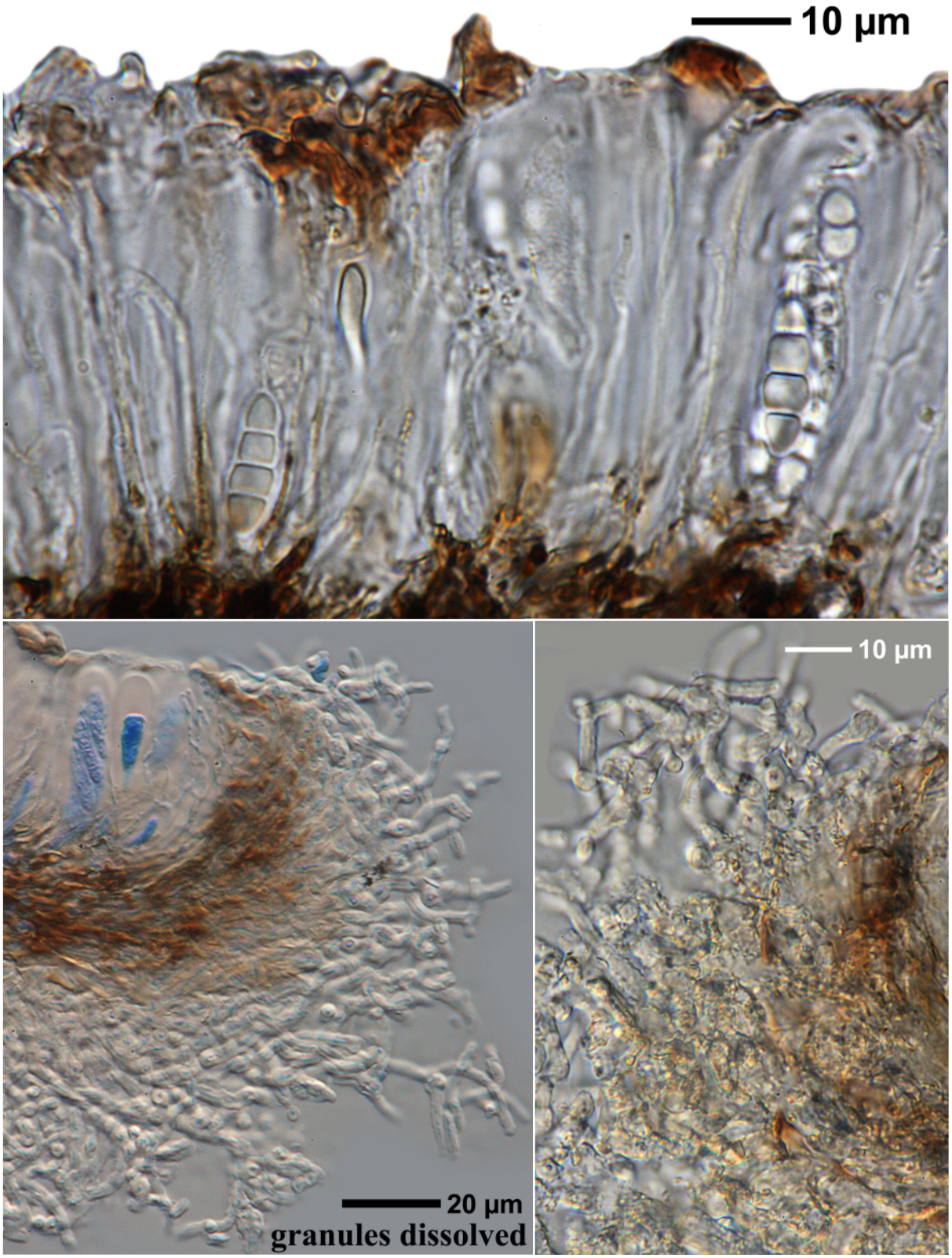


***Byssoloma discordans*** var. ***flavescens***




***Byssoloma discordans*** var. ***flavescens***



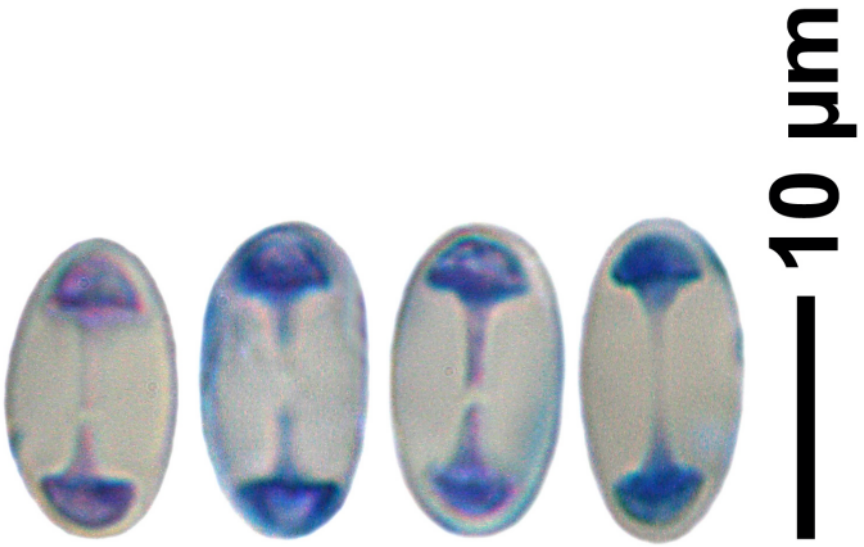

***Byssoloma discordans*** var. ***flavescens***

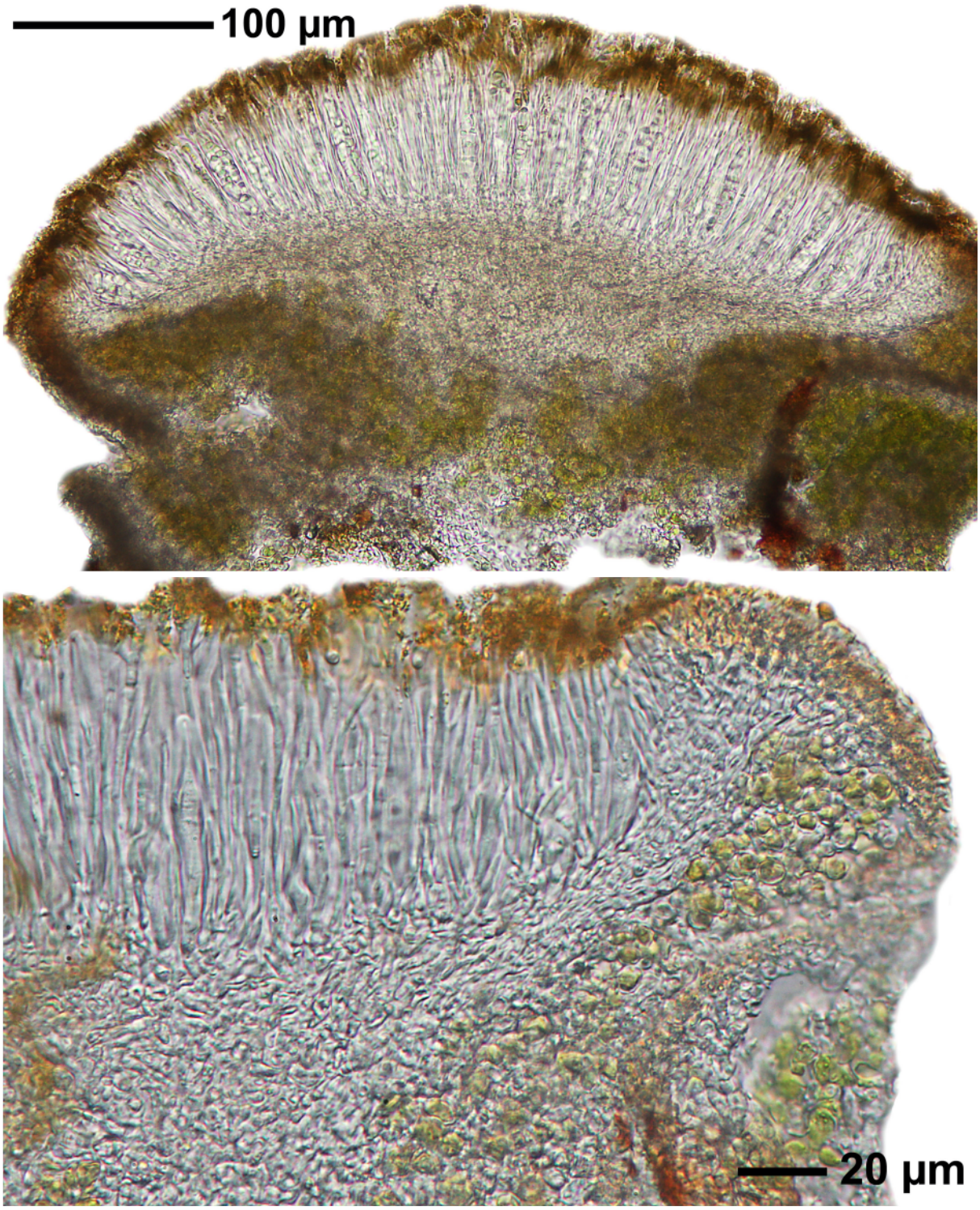
***Caloplaca subsquamosa*** (Müll.Arg.) Zahlbr.

Thallus subsquamose, grey, with black, 0,2-0,3 mm wide pycnidia (ostiolum 0.09 mm). Conidia c. 3.5 x 0.5 µm. Apothecia 0.22-0.44 mm wide, orange, flat, margo proprius thin. Ascospores hyaline, 8/ascus, polarilocular, 12-13 x 6-7 µm, length/septum = 1.7-1.8.

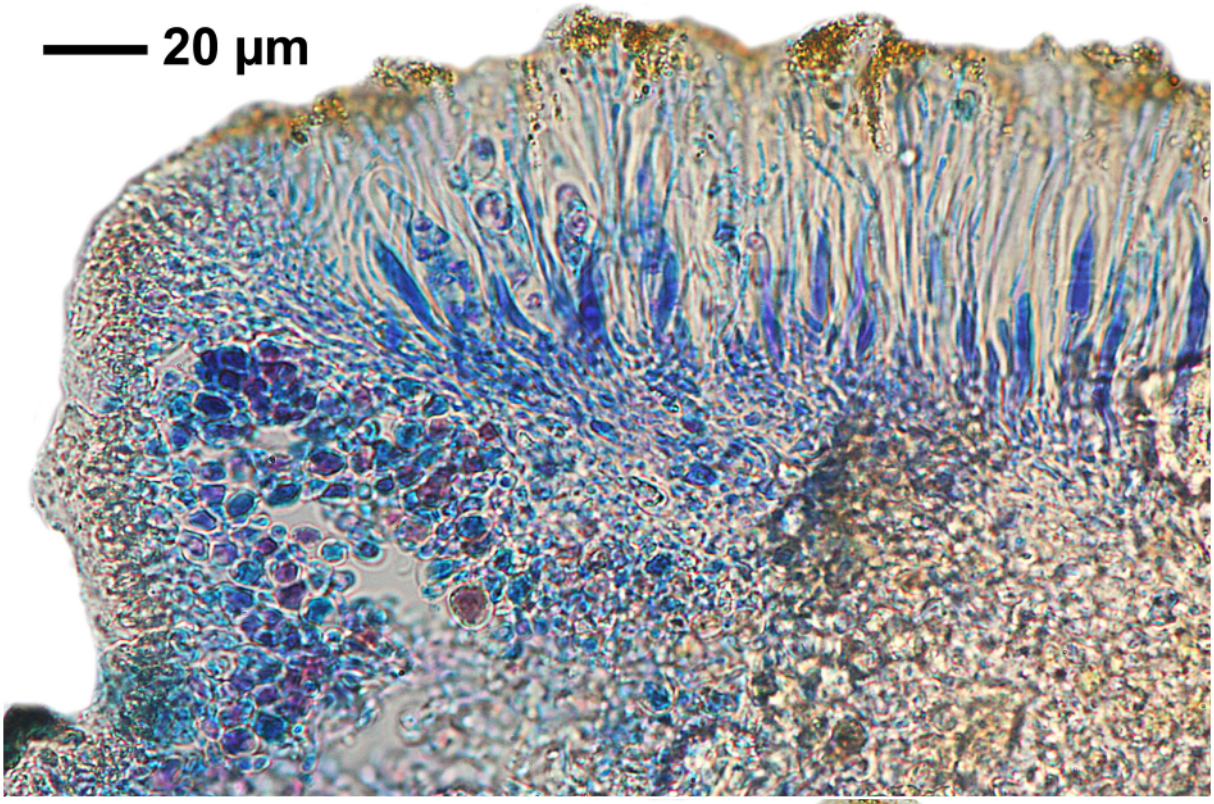
[4851], Kambodscha, Provinz Siem Reap, östlicher Mebon, 12 km NO Siem Reap, auf Mörtel (Die Unterlage reagiert aber mit HCl negativ!!), 13°17'17" n.B., 101°36'29" ö.L., ca. 100 m. Leg. Uwe Schwarz 16.02.1998 (als Nr. 3029), det. Aptroot 2009.

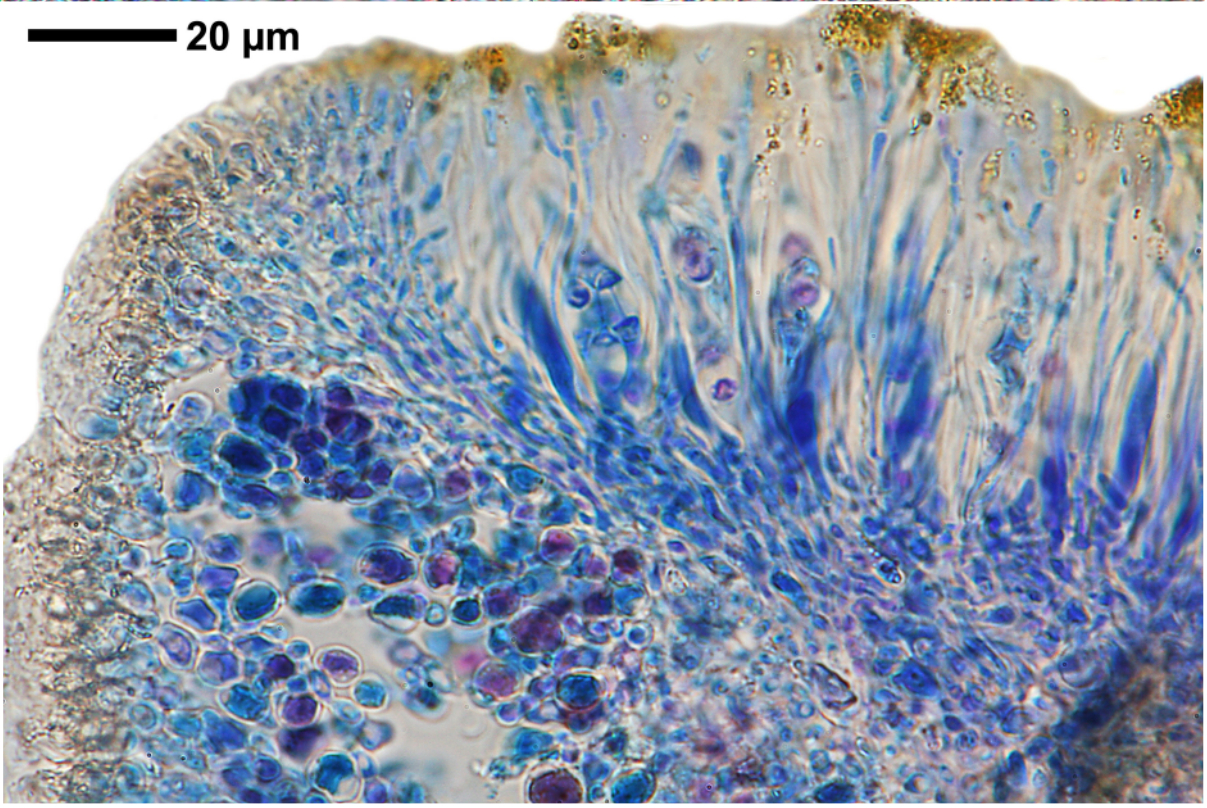


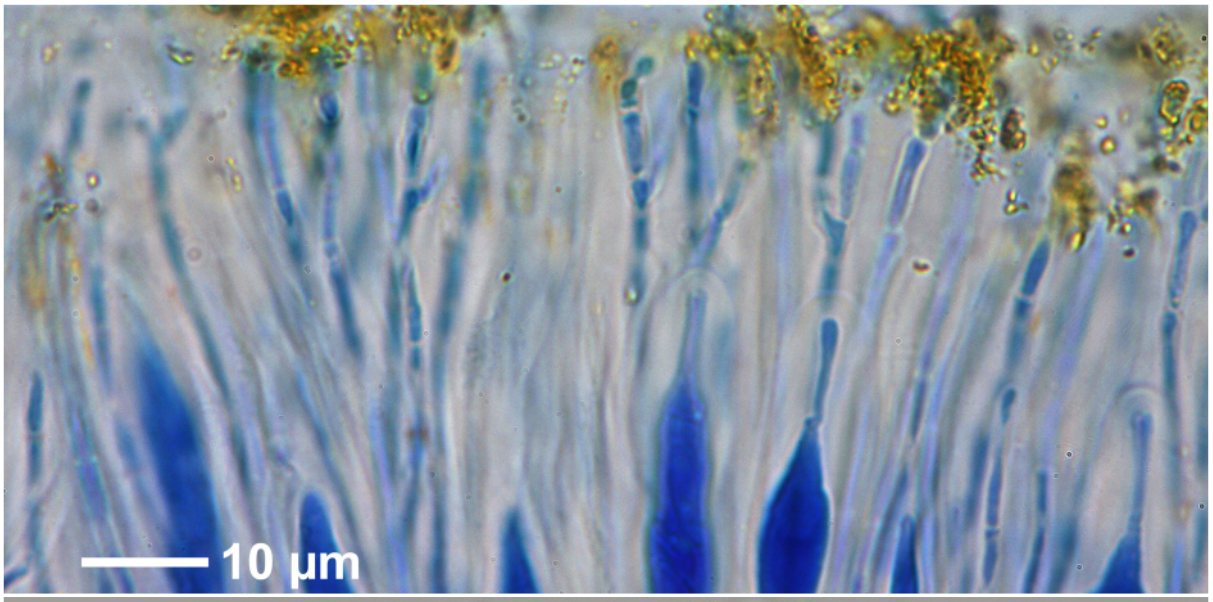


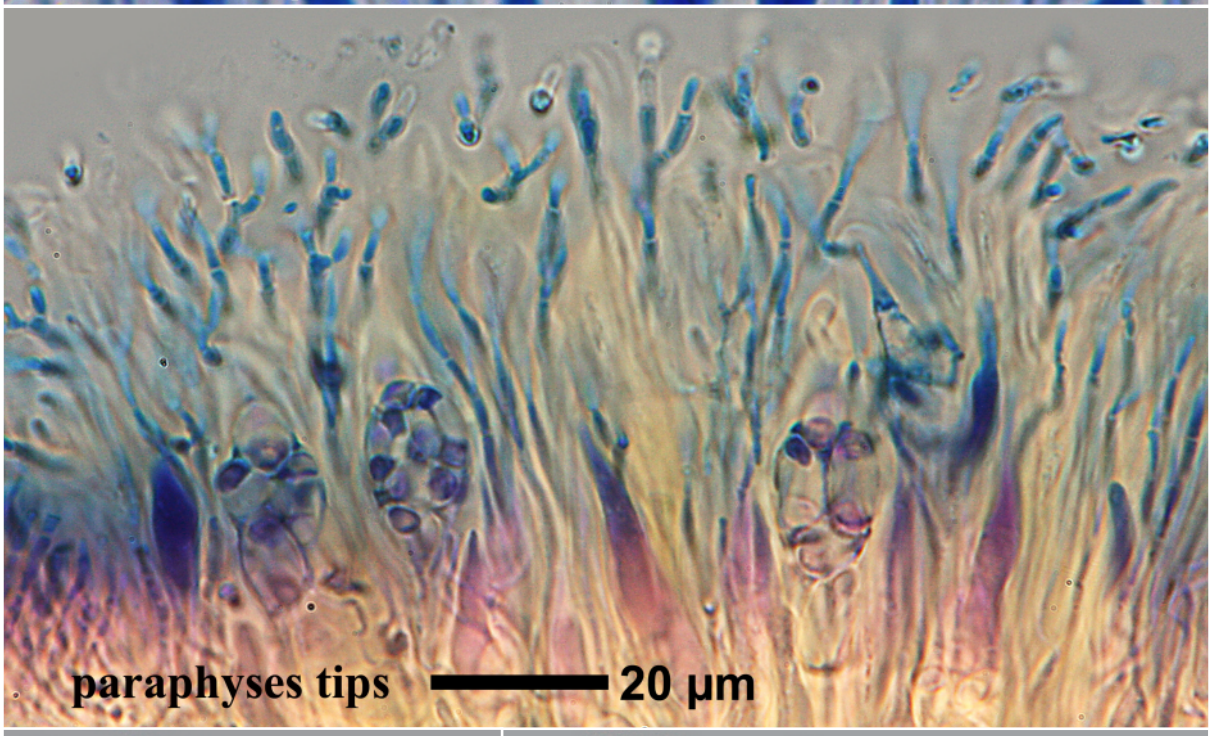

*Caloplaca subsquamosa*

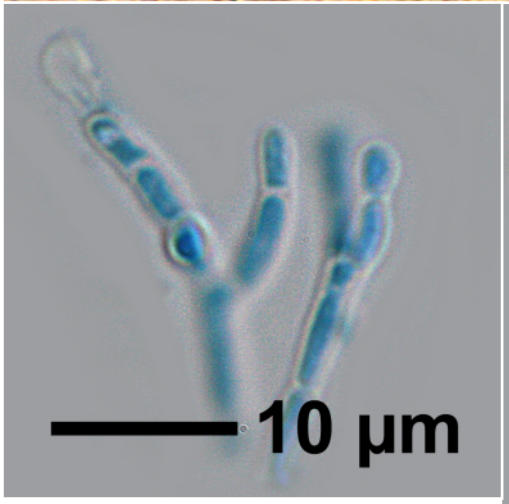


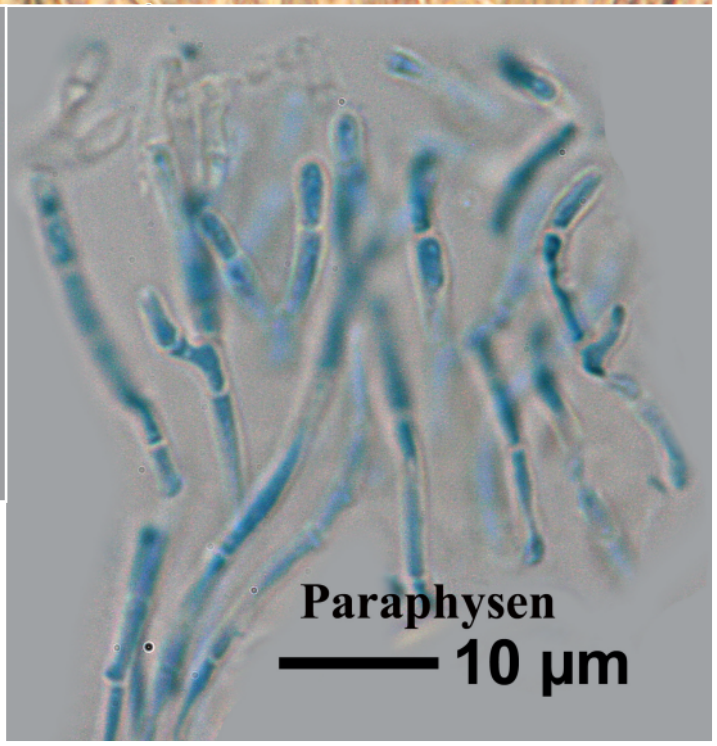




***Caloplaca subsquamosa***



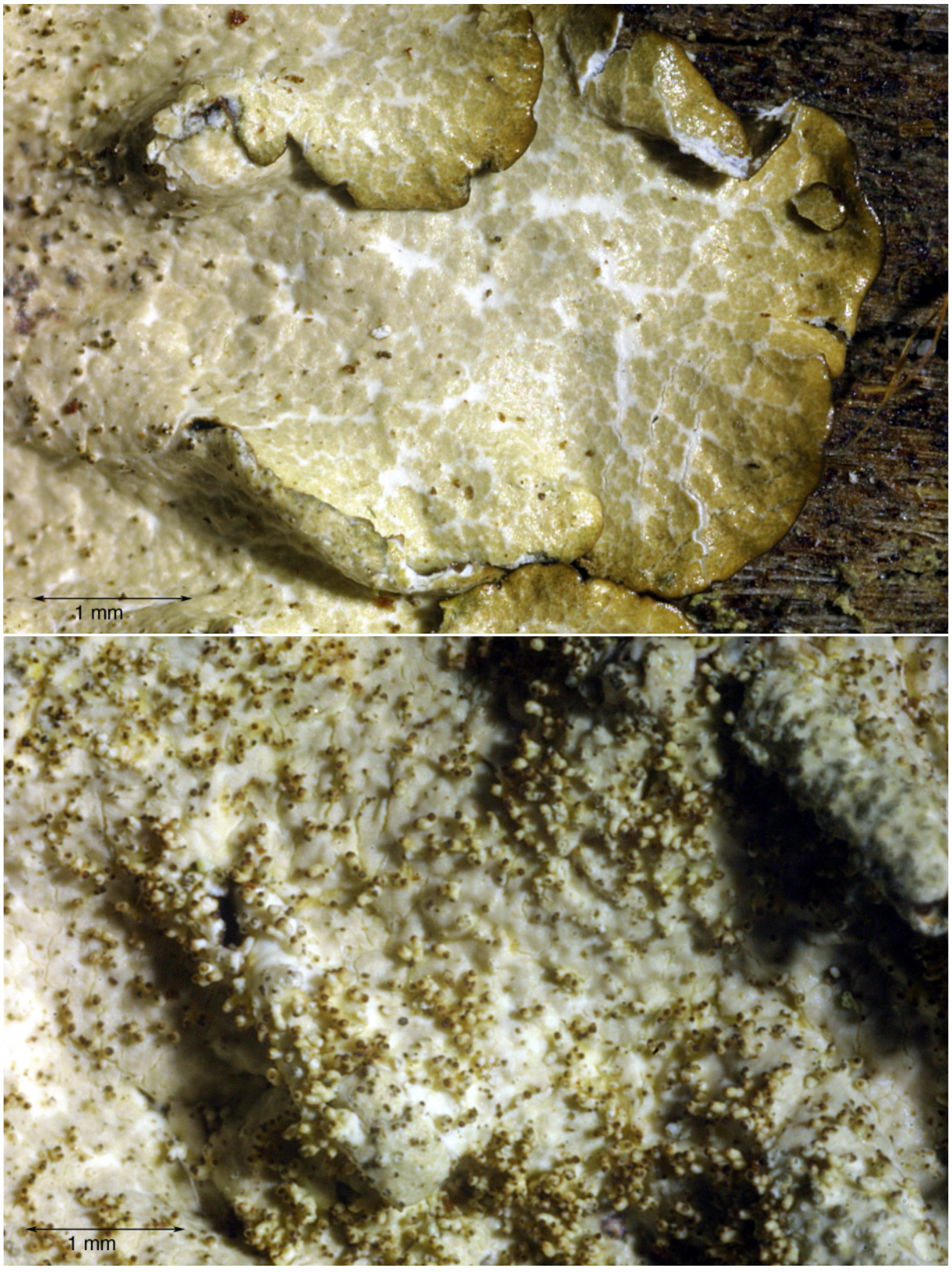

***Caloplaca subsquamosa***

***Canoparmelia caroliniana*** (Nyl.) Elix & Hale

Thallus grey, loosely adnate. Lobes 2-5 mm wide. Upper surface reticulate-maculate. Under surface black. Isidia thin, 0.07 mm thick. Without soredia and cilia. Chemistry: cortex K+ yellow, C-, P-; medulla K-, C+ pink, P-; atranorin (min) chloroatranorin (min), stenosporic acid (maj), perlatolic acid (submaj), glomelliferic acid (min). Corticolous, rare saxicolous. Pantropical.

[10769], Portugal, Azoren, Sao Miguel, an der Straße SW von Lagoa das Fumas beim Parkplatz Reservada Florestal de Recreiro do Cerrado Bezerros, 37°44.632' N, 25°21.939' W, 430 m. Leg. Schumm 03.06.2003, det. J.A. Elix 22.10.2003.






***Canoparmelia caroliniana***

***Carbacanthographis hertelii*** Kalb & Staiger ISOTYPUS

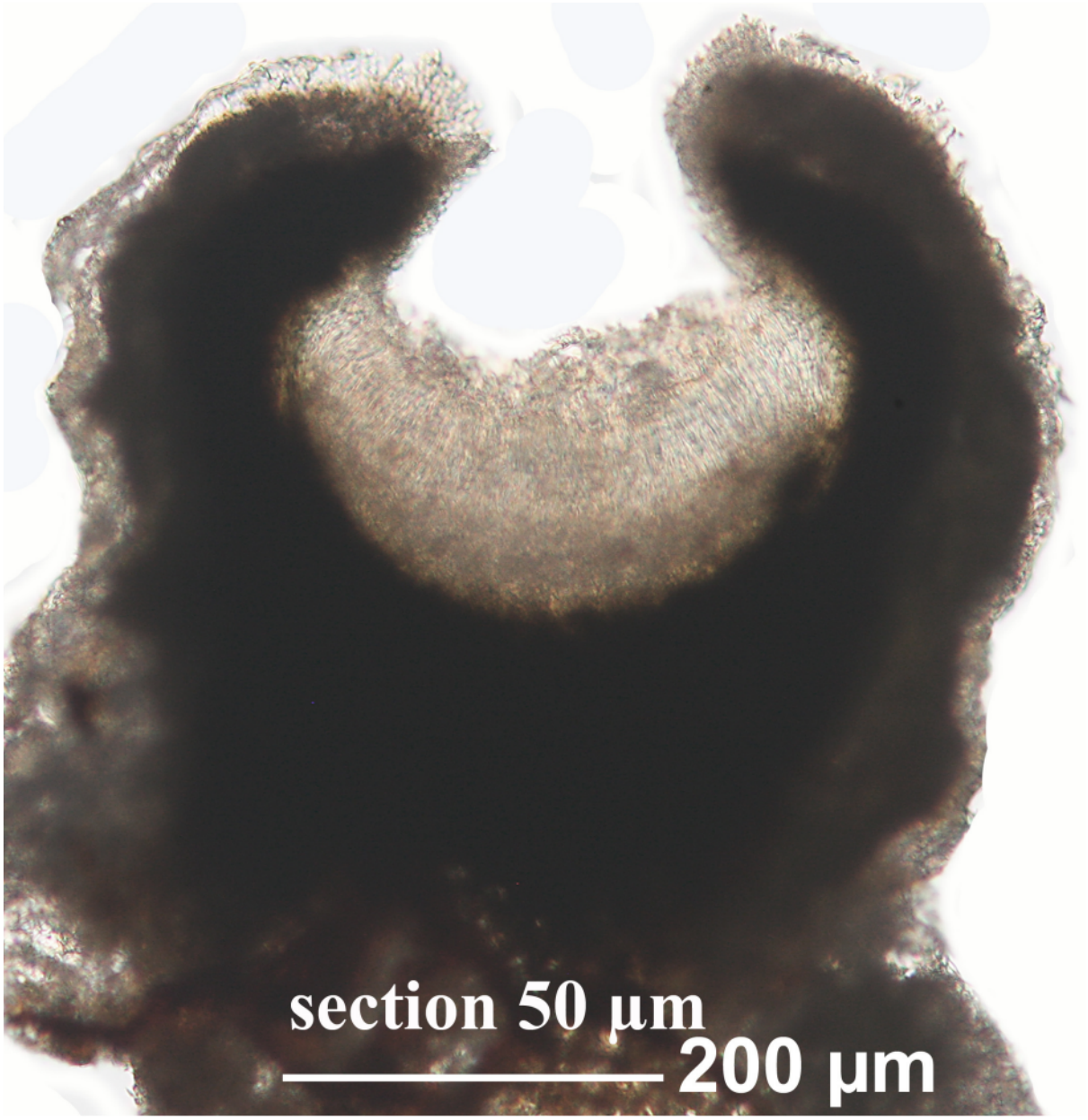
Thallus whitish, isidiate. Apothecia 0.5-4 mm long, 0.5 mm wide, completely covered by a concolorous thalline margin. Periphysoids warty (typical for Carbacanthographis). Hymenium not inspersed, J-. Excipulum entirely carbonised. Ascospores (4-)6-8/ascus, hyaline, J-, 3-septate. Chemistry: Protocetraric acid.
Lit. Kalb (2004, Bibl. Lich. 88: 308), Staiger (2002, Bibl. Lich. 85: 98 ff)

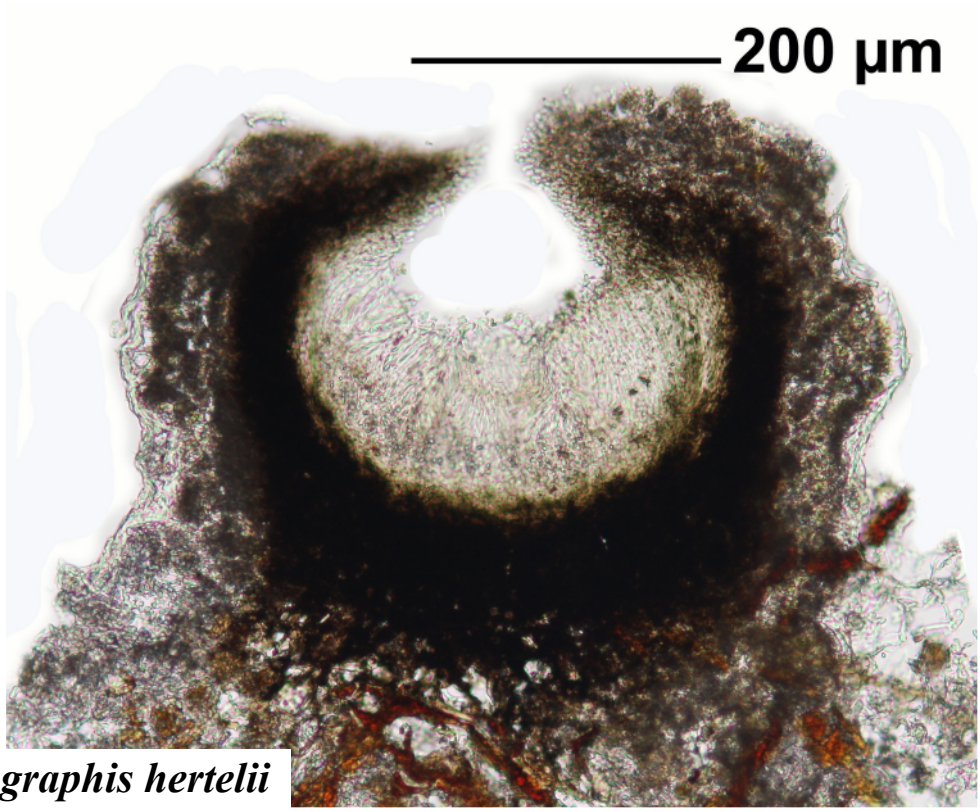
[17220], Kalb: Lichenes Neotropici Nr. 584. Australien/Queensland. Darlington Range, etwa 15 km, südsüdwestlich von Canungra. An morscher Baumrinde in einem kühlgemäßigten, submontanem Regenwald, 940 m. 28°13'32" S, 153°07'42" E. Leg. Kalb 16.08.2002, det. Kalb



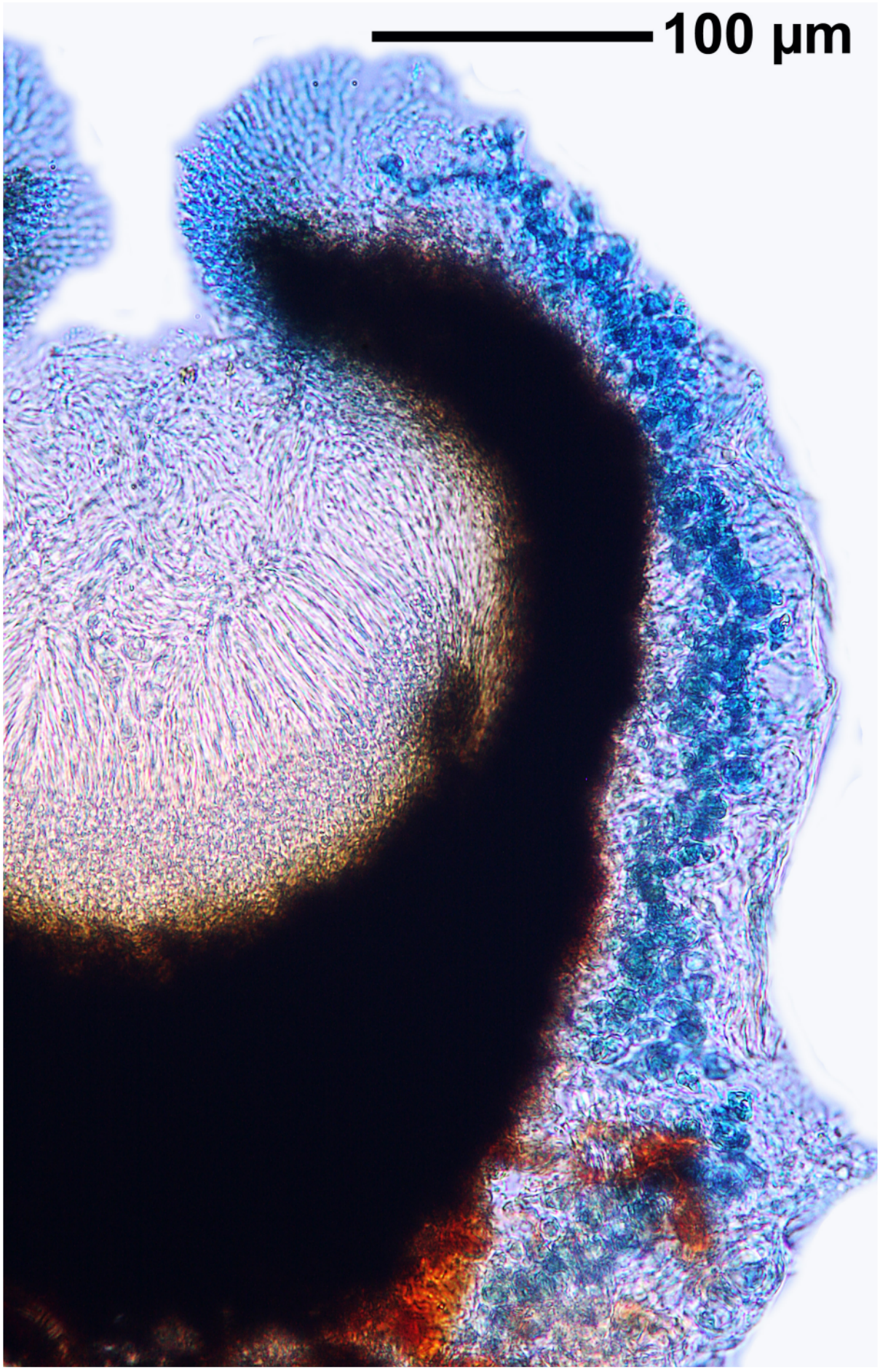



***Carbacanthographis hertelii***

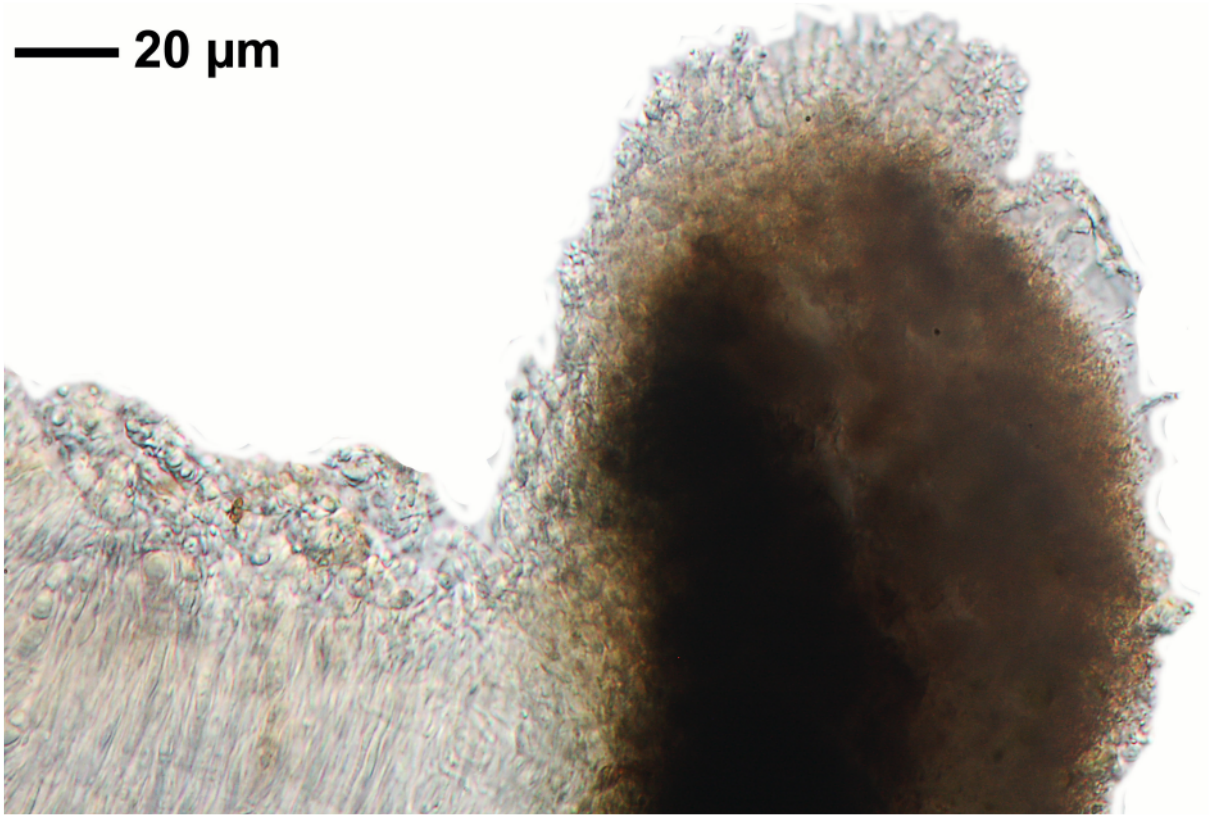


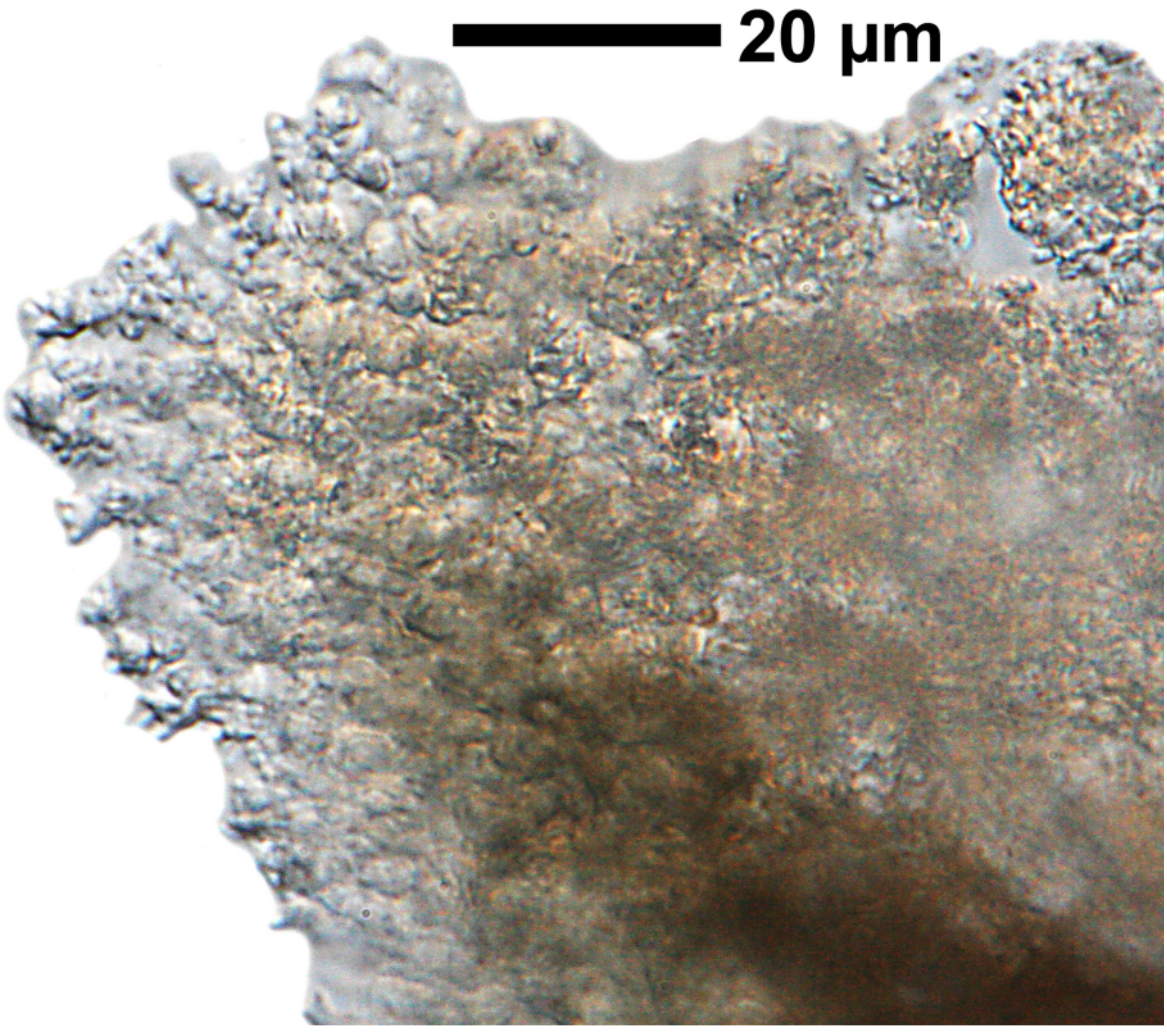




***Carbacanthographis hertelii***

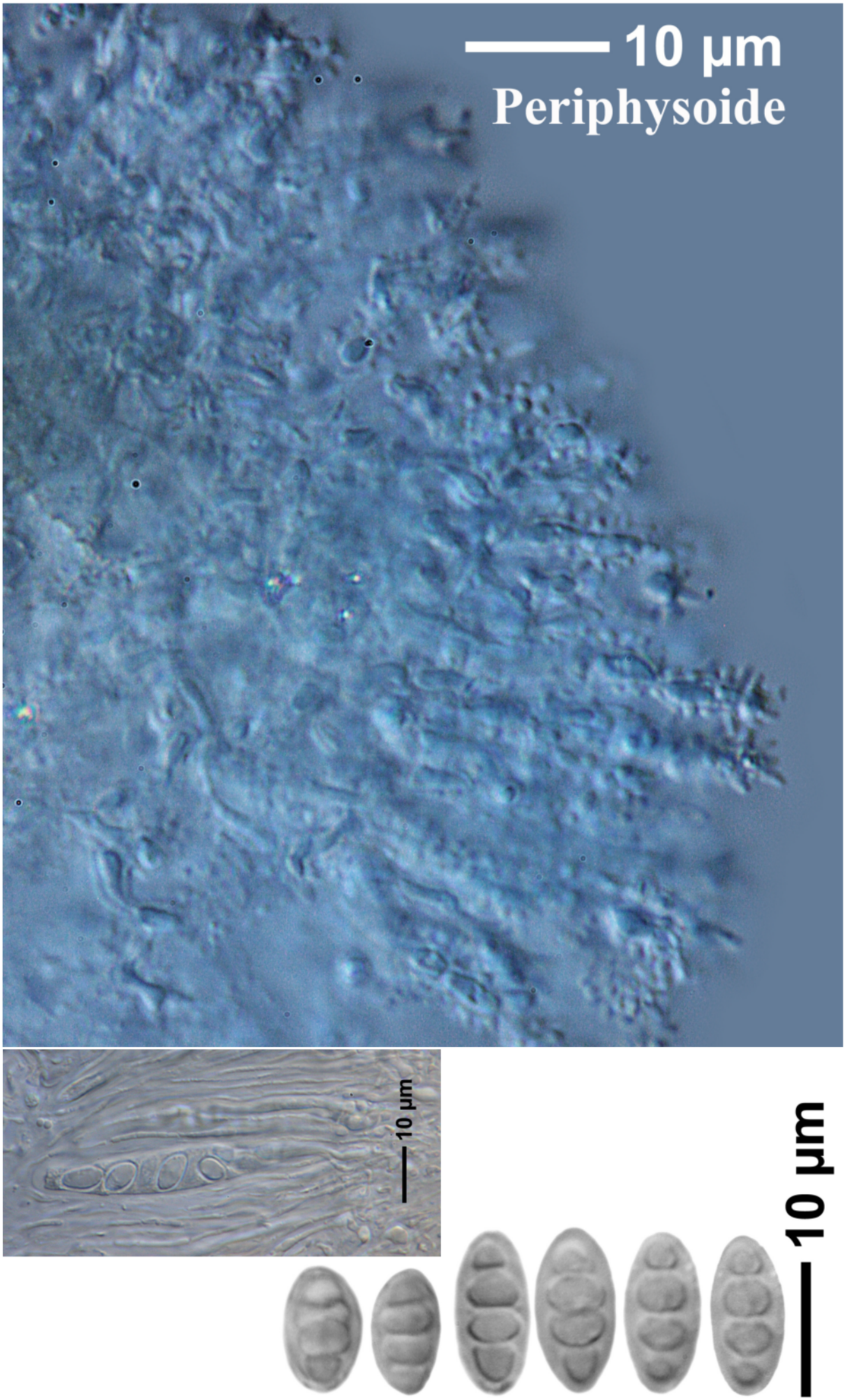



***Carbacanthographis hertelii***




***Carbacanthographis hertelii***




***Carbacanthographis hertelii***

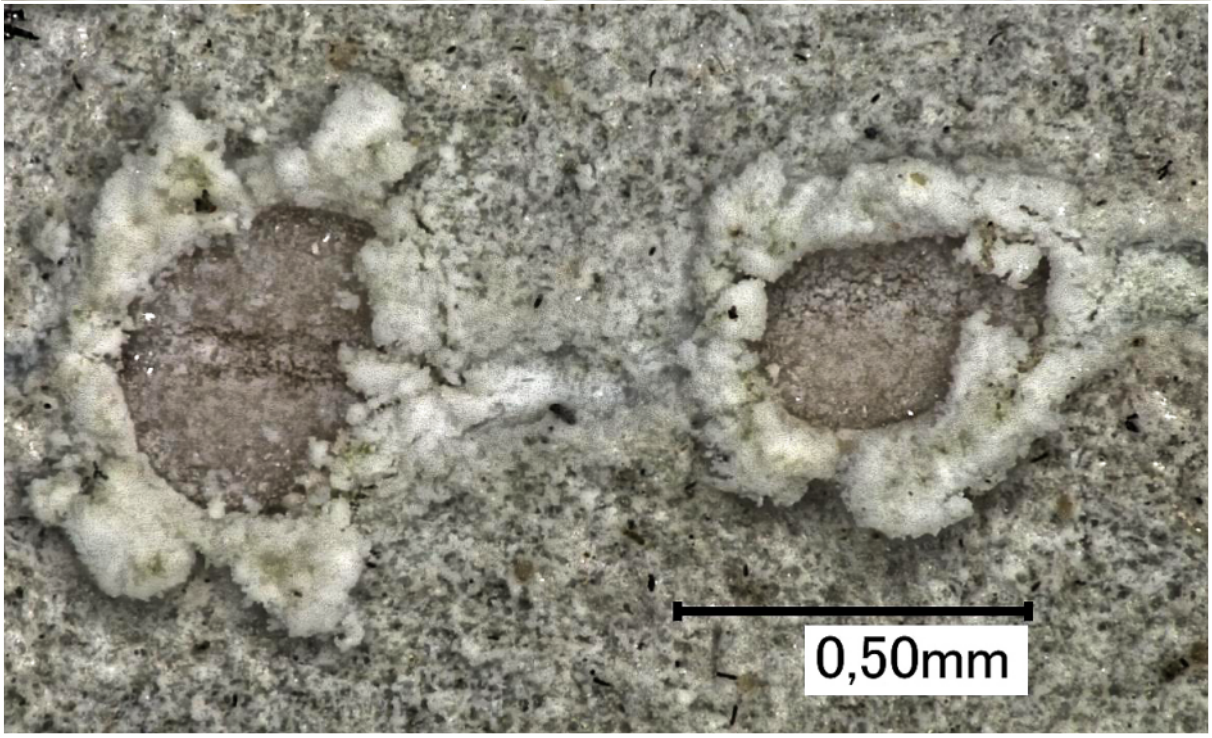
***Chapsa alborosella*** (Nyl.) A.Frisch
[= ***Ocellularia alborosella*** (Nyl.) Santesson]
[= ***Chroodiscus alborosellus*** (Nyl.) Kalb]

Thallus corticolous, pale olive-grey, continous, matt. Apothecia 0.6-1 mm wide. Disc pale brown, covered with white pruina. Proper exciple cupular, hyaline. Periphysoids indistinctly moniliform. Paraphyses simple, tips slightly thinkened and indistinctly moniliform. Ascospores hyaline, transversely 4-8 septate, 17-22 x 4.5-5 µm, J- (brown, not blue). TLC: nil.

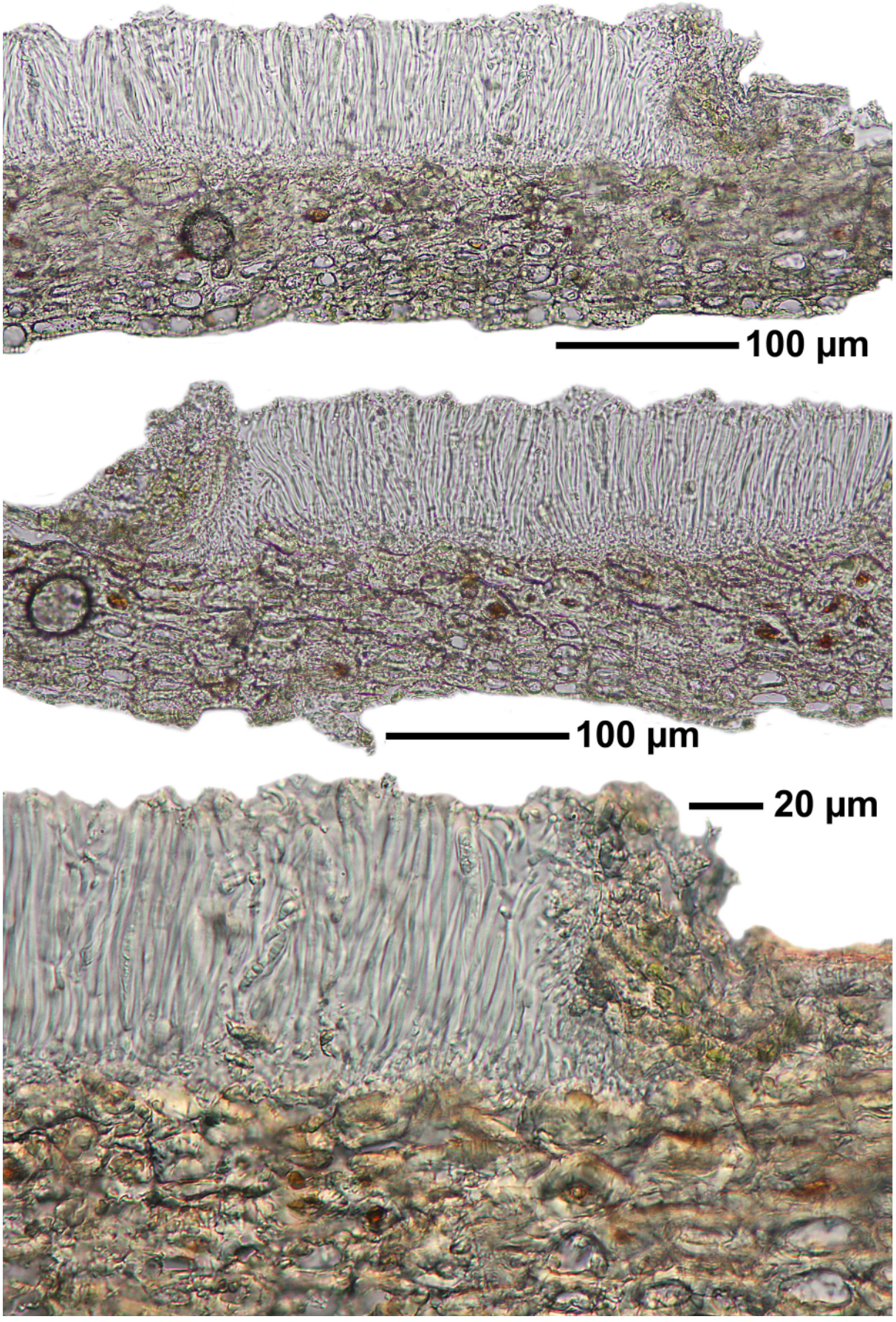
[17219], Venezuela/Bolivar. Gran Sabana: wenige km südlich der Süd-Grenze des Nationalparks Canaim, südlich des Flusses Kukenan. An einem Laubbaum in einem Galeriewald, 800 m, 4°42'46" N, 61°03'35" W. Leg. Kalb & J.Hernandez 27.07.2010, det. Kalb. Ex Kalb: Lichenes Neotropici 585. Inhaltsstoffe mittels TLC nicht nachweisbar (anal. Kalb).



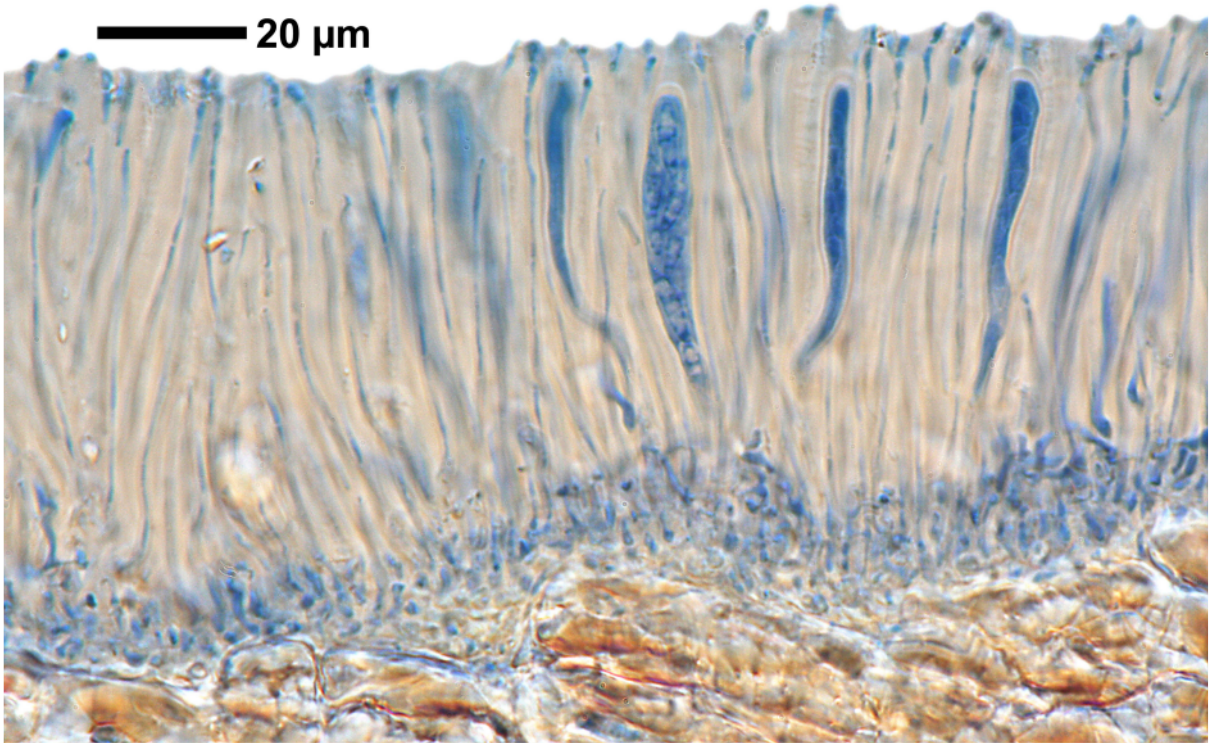


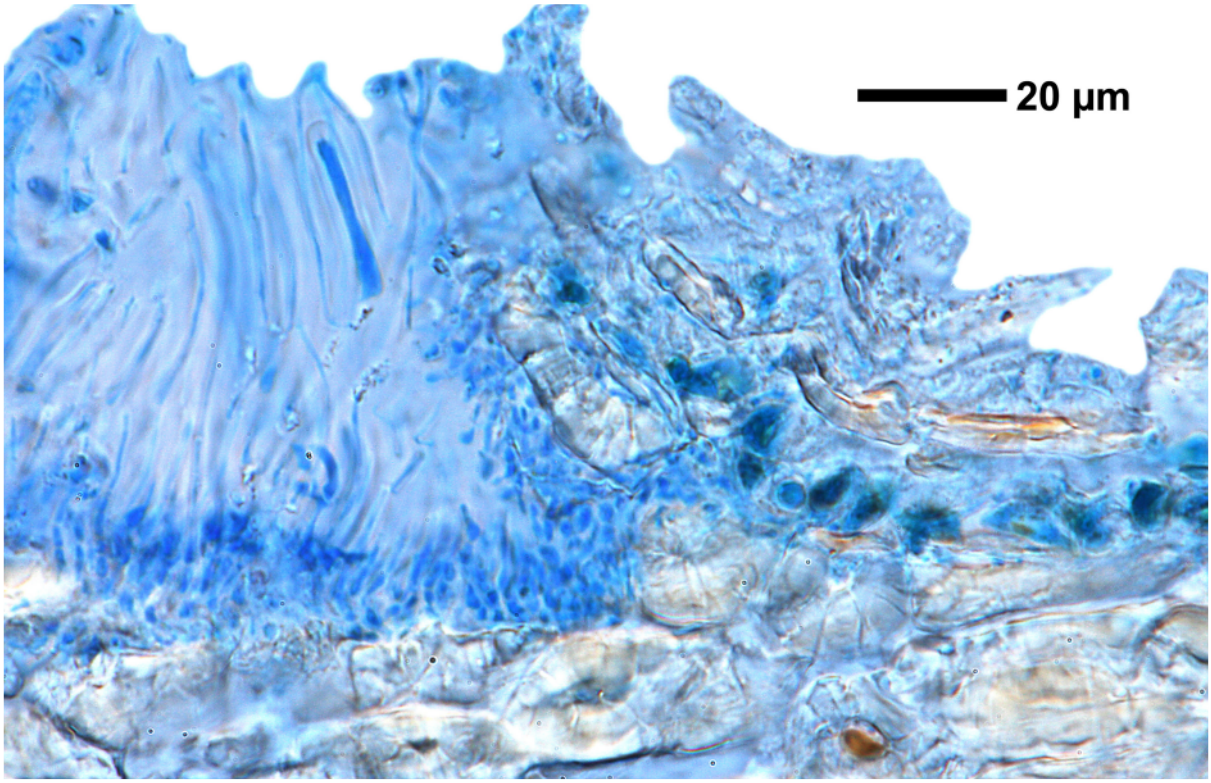




***Chapsa alborosella***




***Chapsa alborosella***



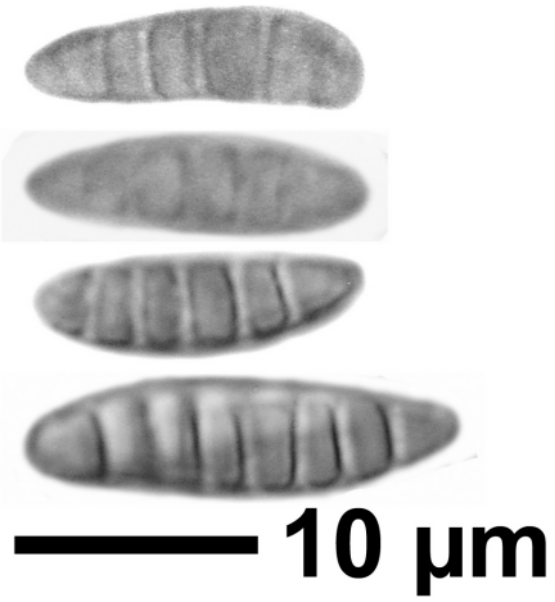




***Chapsa alborosella***





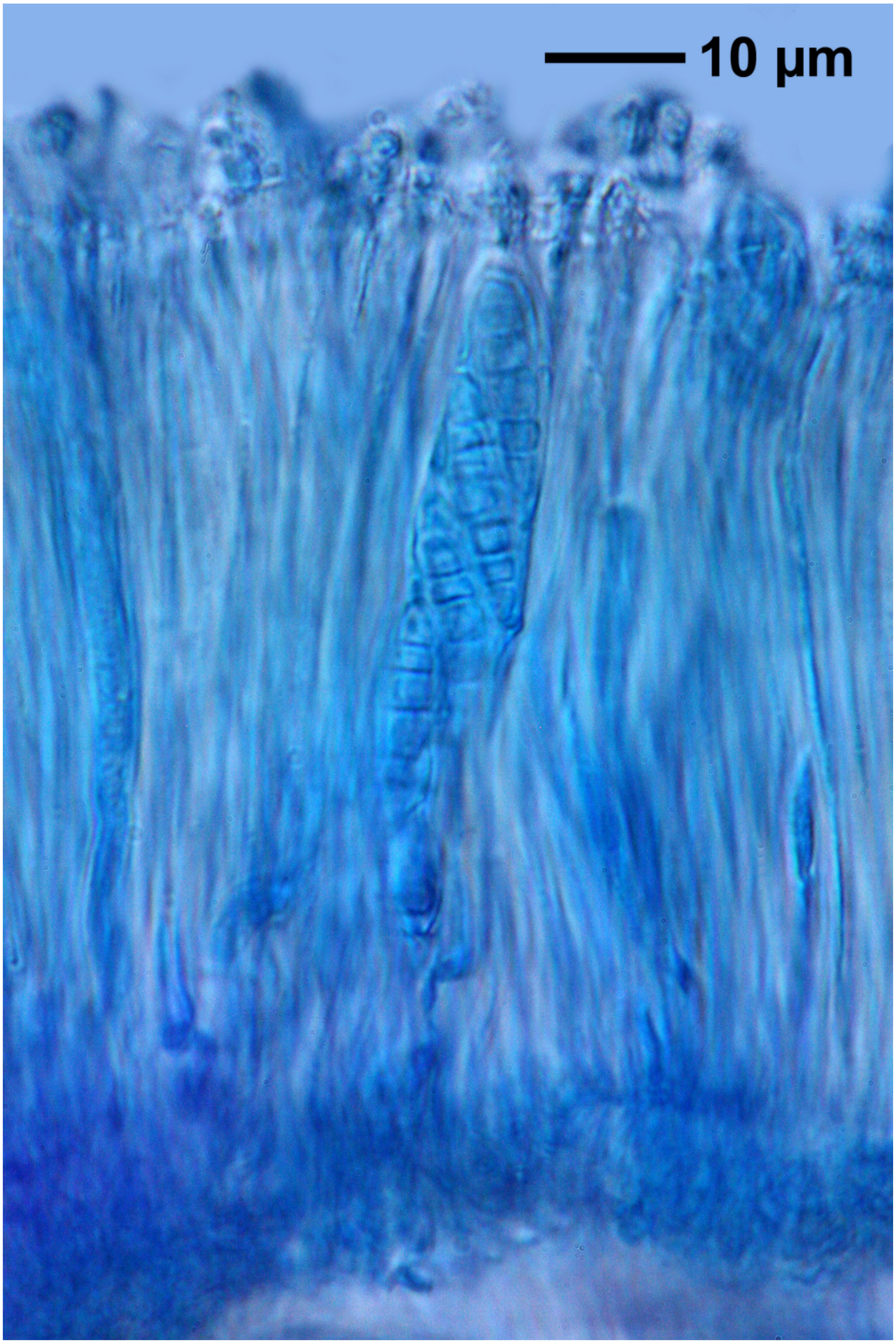








***Chapsa alborosella***

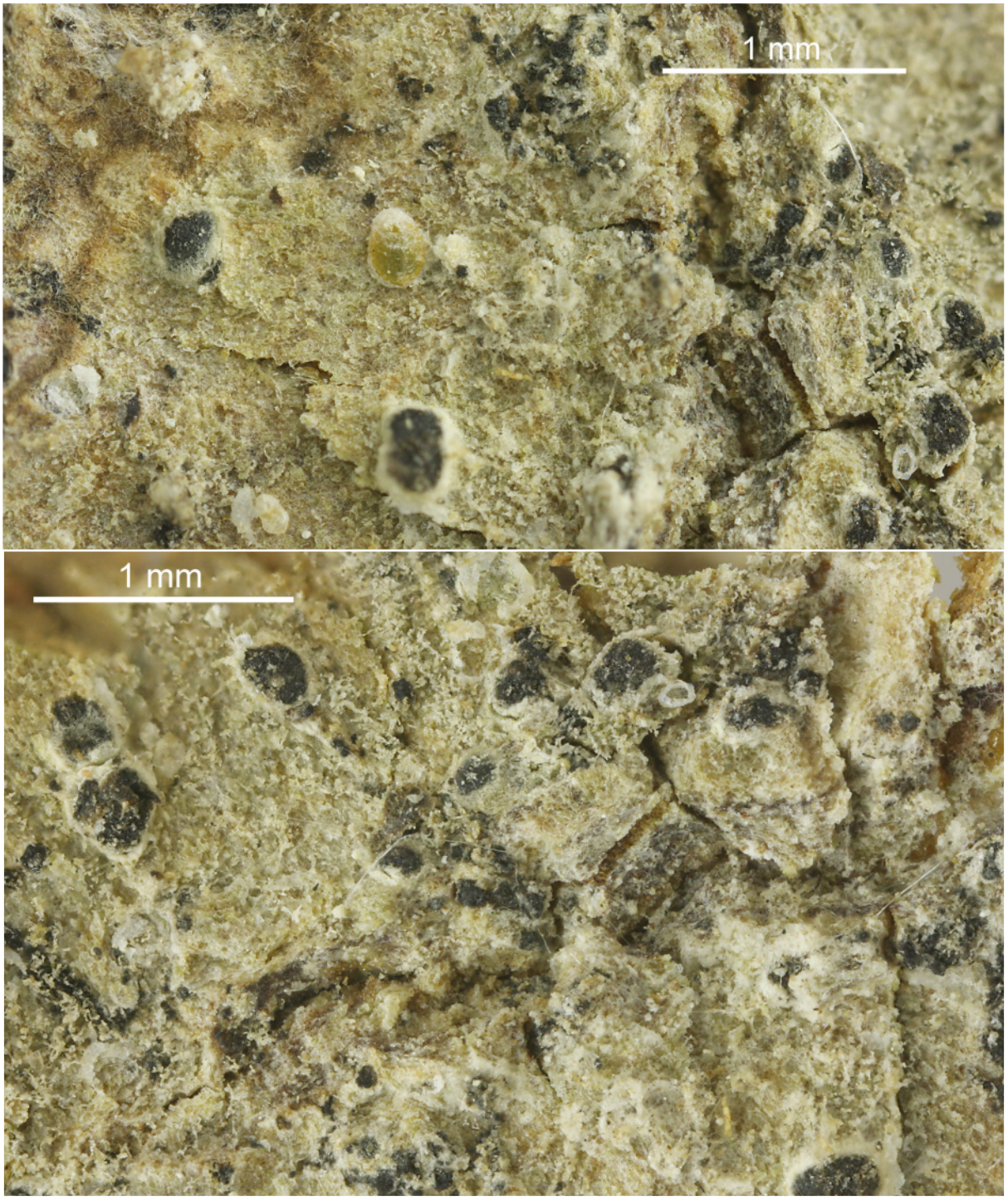


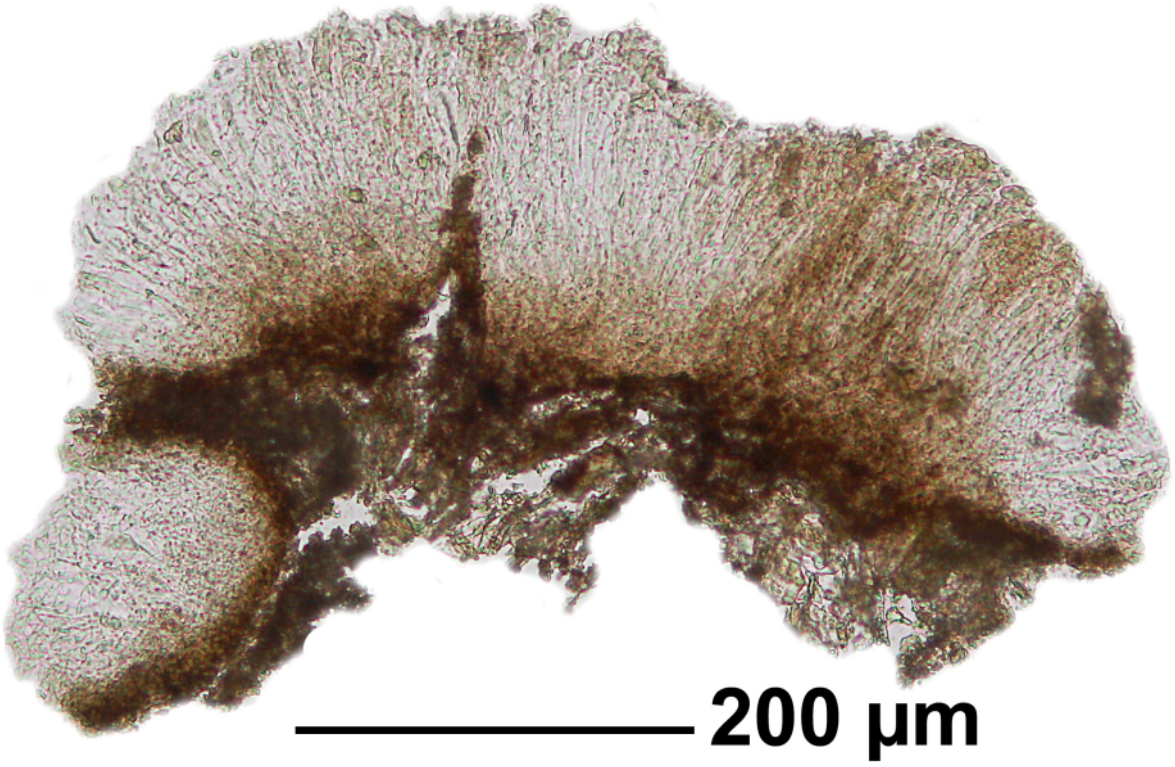

***Chapsa alborosella***

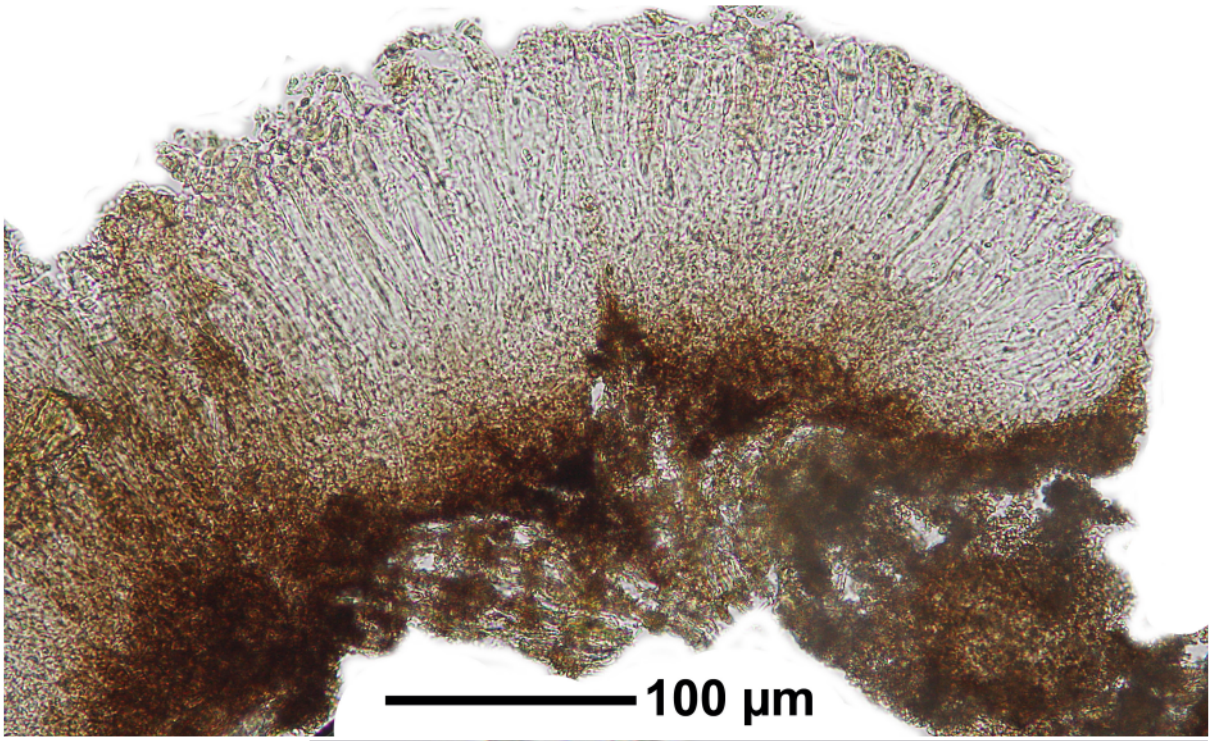
***Chiodecton mucorinum*** Zahlbr.

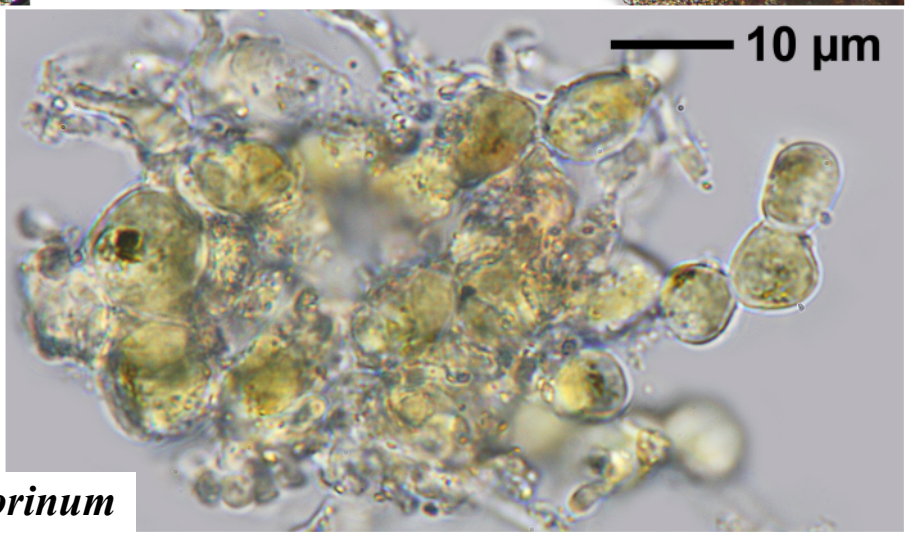
Thallus greyish green, smooth to verruculose. Ascocarps solitary or rarely united, aggregated into stroma-like structures. Hamathecium not inspersed, J+ red. Paraphysoids strongly branched, reticulate. Hypothecium brownish, in K greenish. Asci J-. Ascospores 6-10 septate, 35-50 x 2-3 µm. Chemistry: K-, C-, P-, UV- (margin of ascocarps white), roccellic acid.
Lit. Thor, G. (1990)

[9572], Thailand, Elefantenarbeitslager bei Chiang Mai, 19°14.859' N, 98°58.137' E, 330 m. Leg. Schumm 01.04.2002, det. Aptroot 2009.

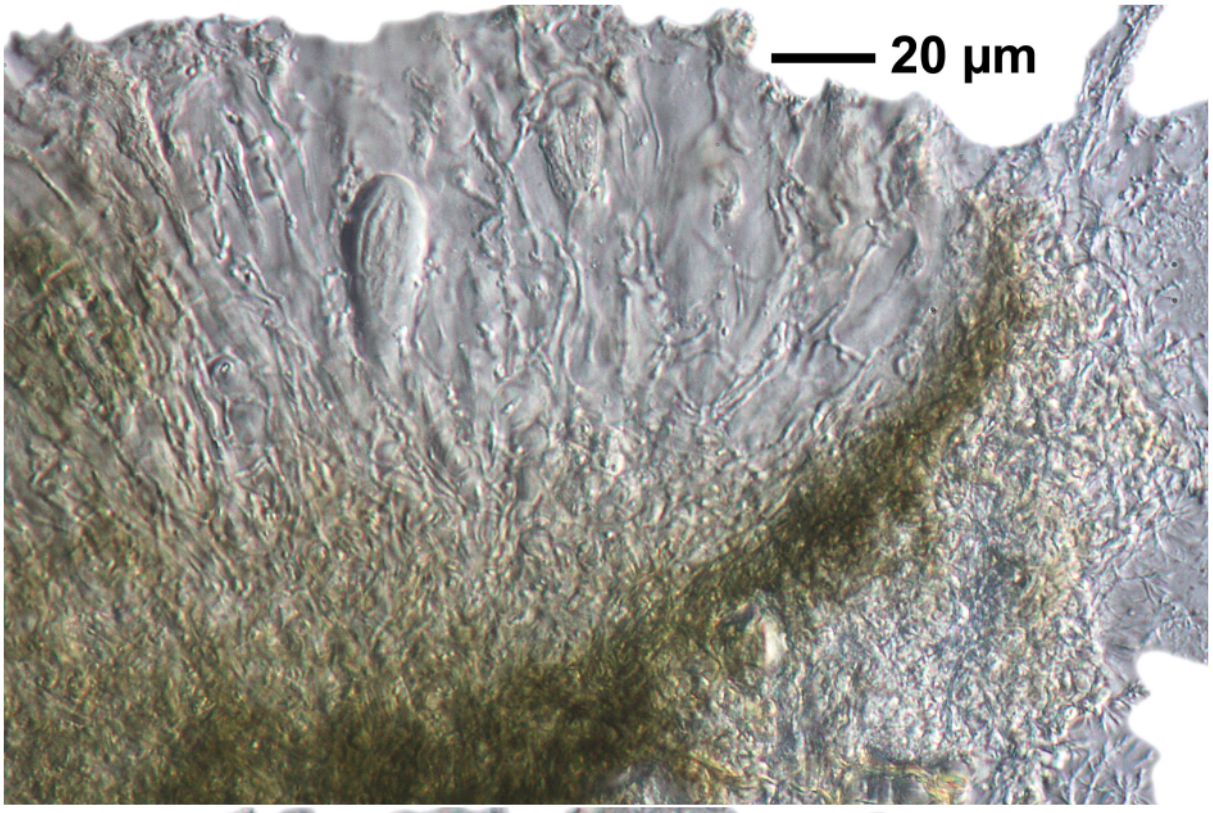


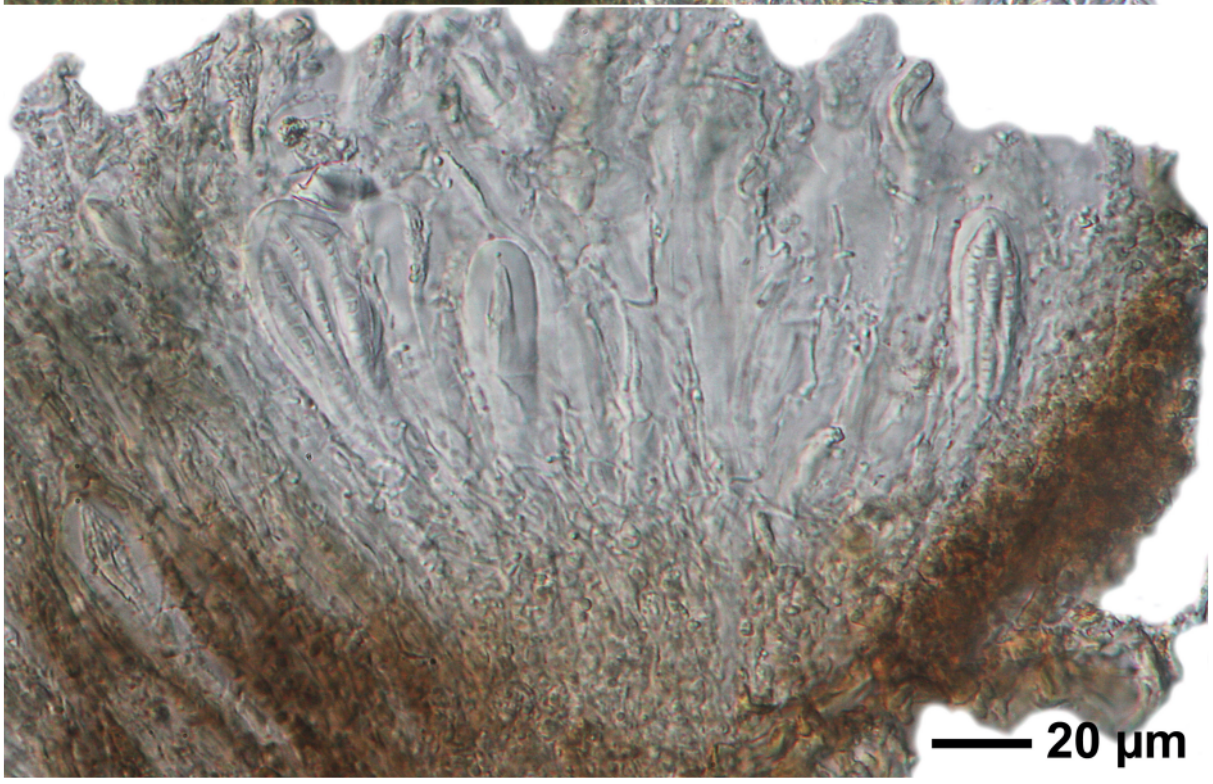


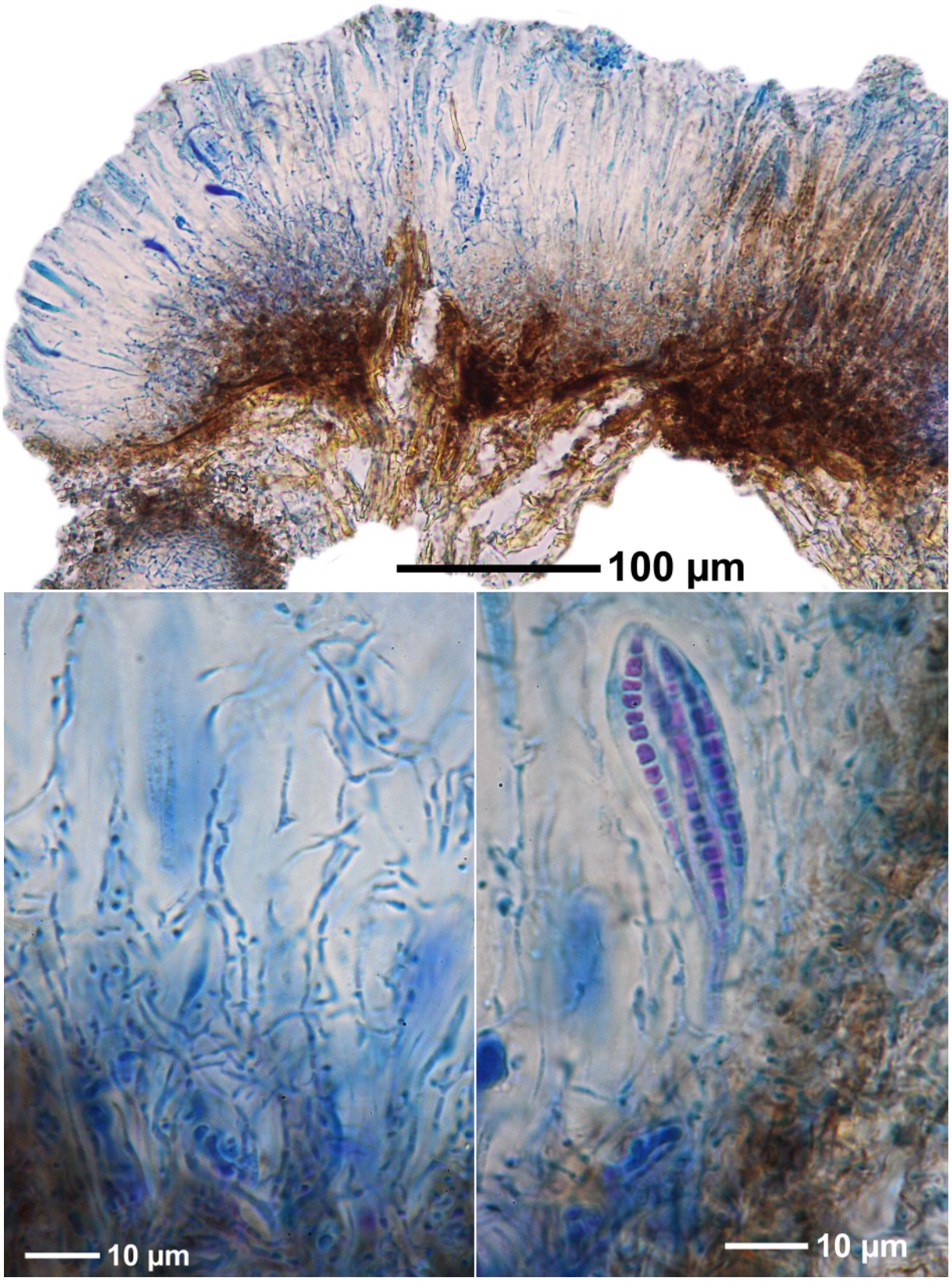




***Chiodecton mucorinum***




***Chiodecton mucorinum***



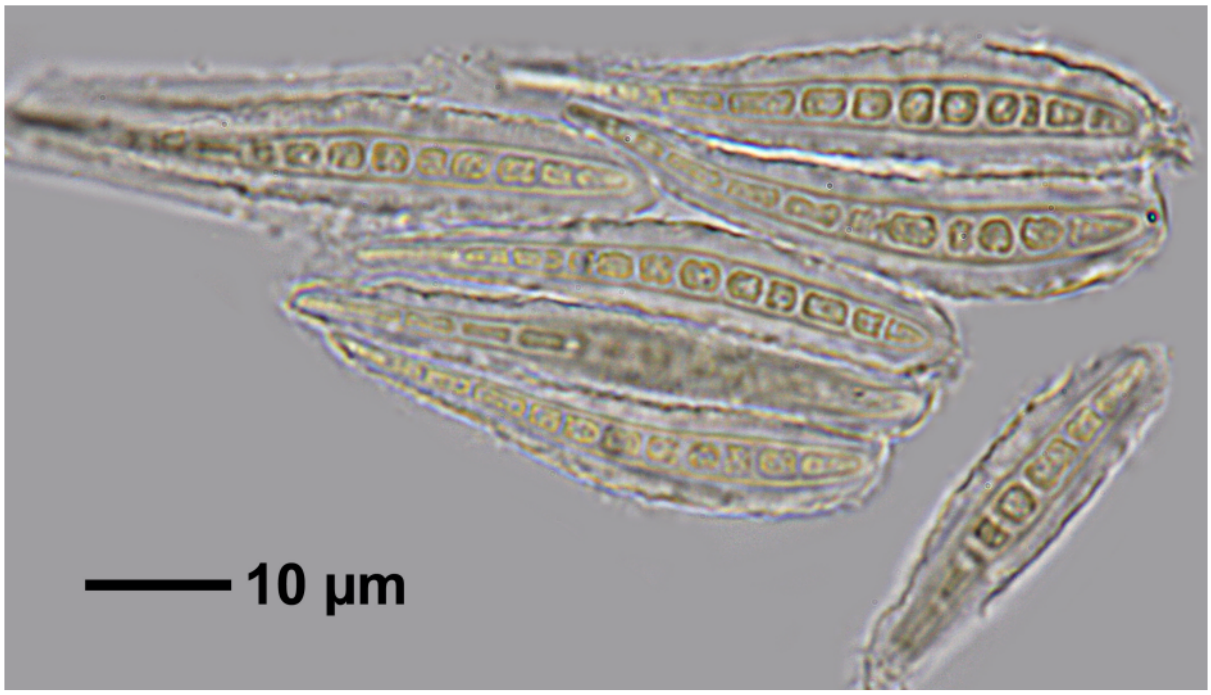

***Chiodecton mucorinum***










***Chiodecton mucorinum***



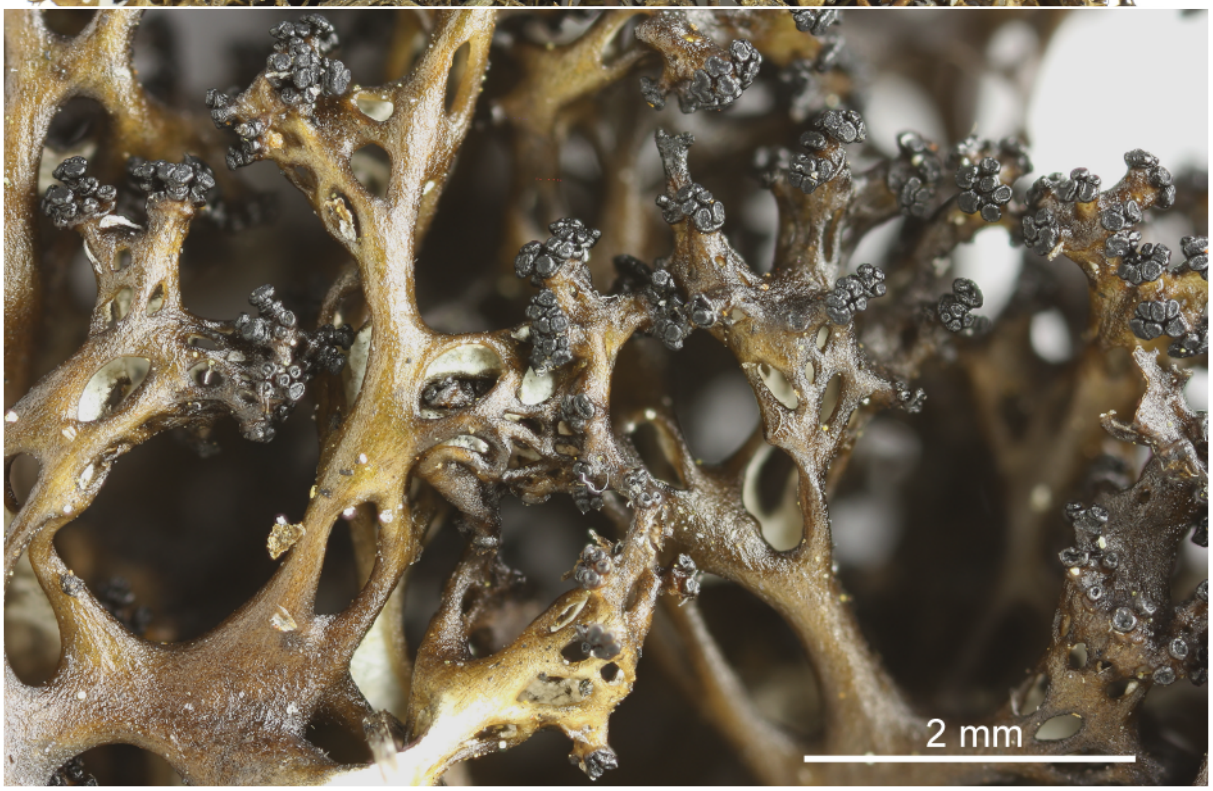

***Chiodecton mucorinum***

***Cladia aggregata*** (Sw.) Nyl.

Podetia 1-10 cm tall, hollow, fragile, green (shadow), brown to almost black, 0,5-8 mm wide, with perforations. Chemistry: barbatic, 4-O-demethylbarbatic, fumarprotocetraric (min), ursolic acids, triterpenes und further unidentified products. K-, C-, KC-, P-. On soil and rotten wood.

[15748], Australien (West). Zwischen Manjimup und Mt. Baker. Lake Muir; 34,44142° S, 116,64809° E, 186 m. Leg. Schumm & Stocker 23.10.2009, det. Schumm

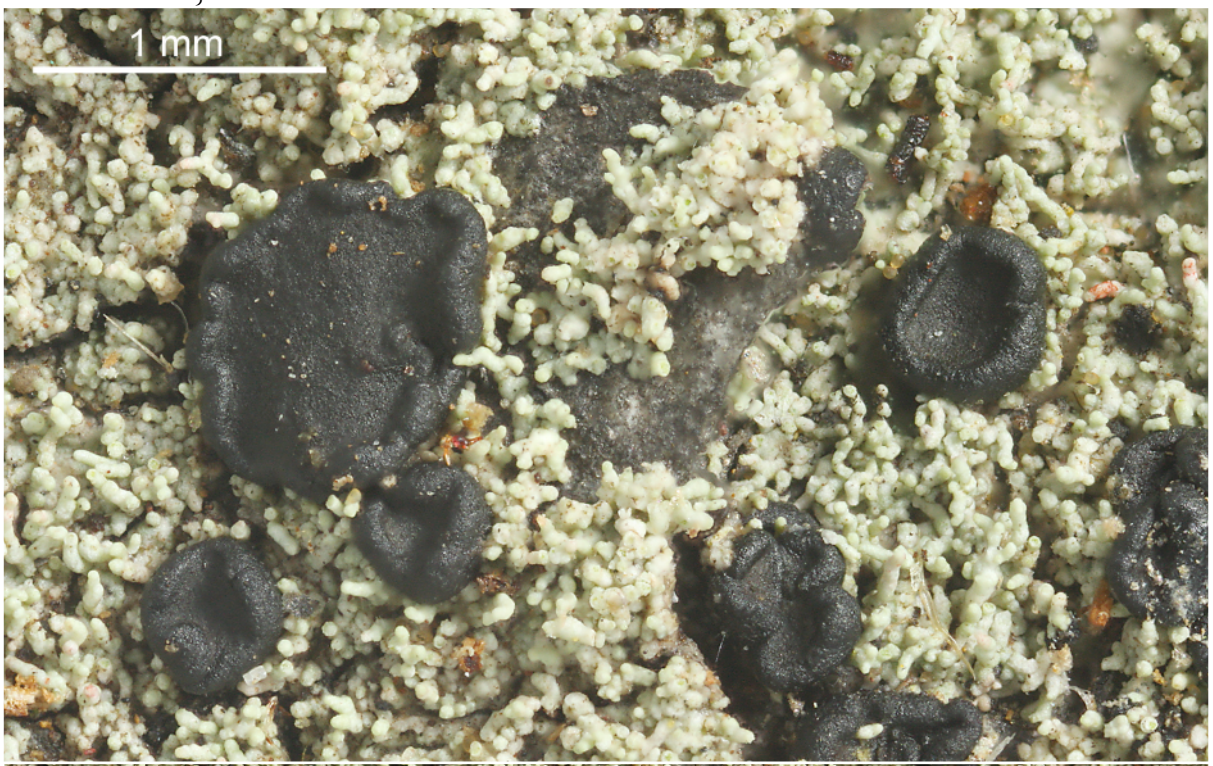


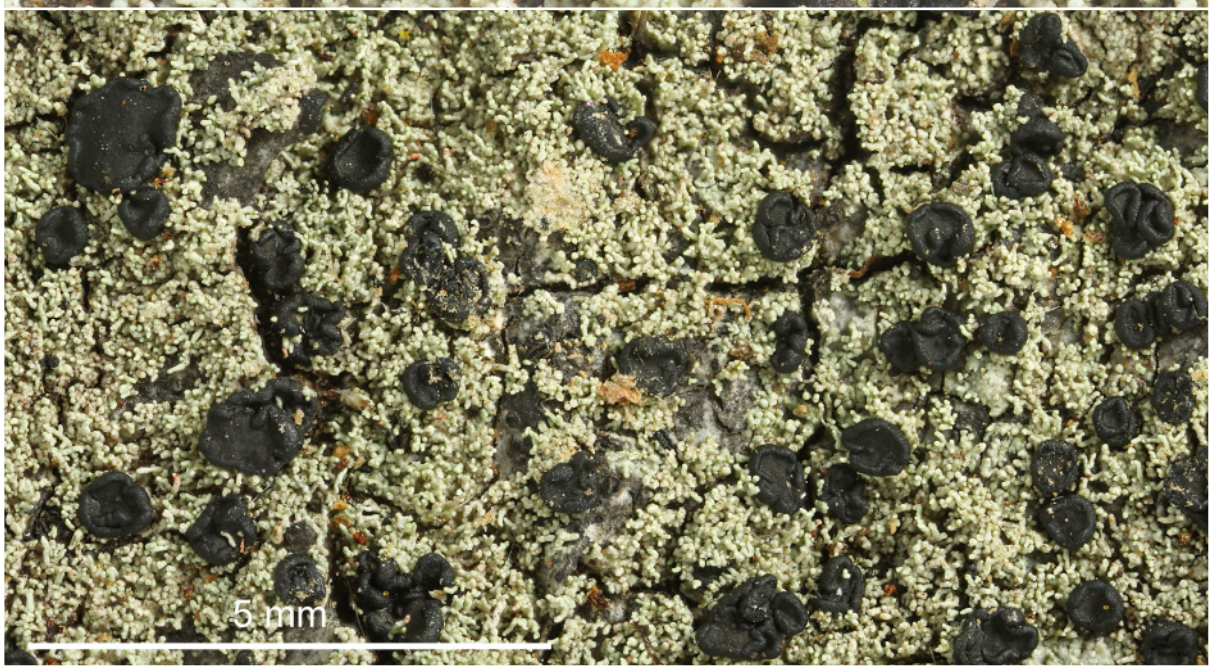



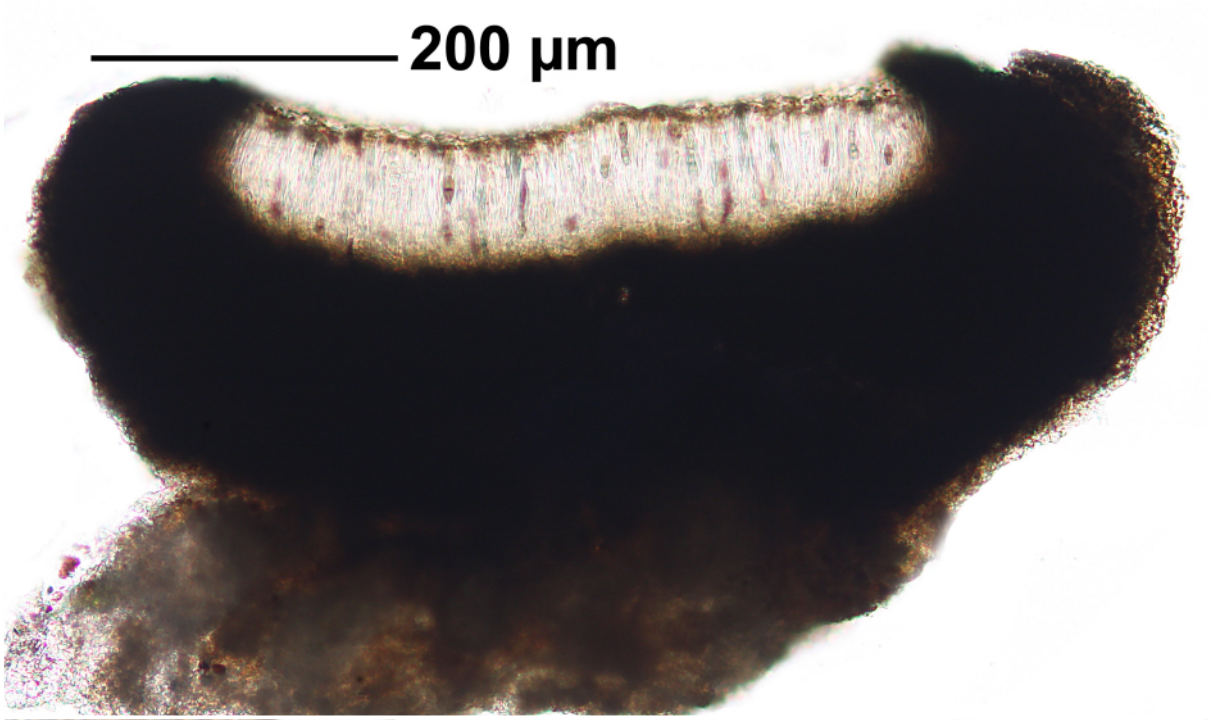
***Cratiria dissimilis*** (Nyl.) Marbach
[= ***Buellia dissimilis*** (Nyl.) Müll.Arg.]

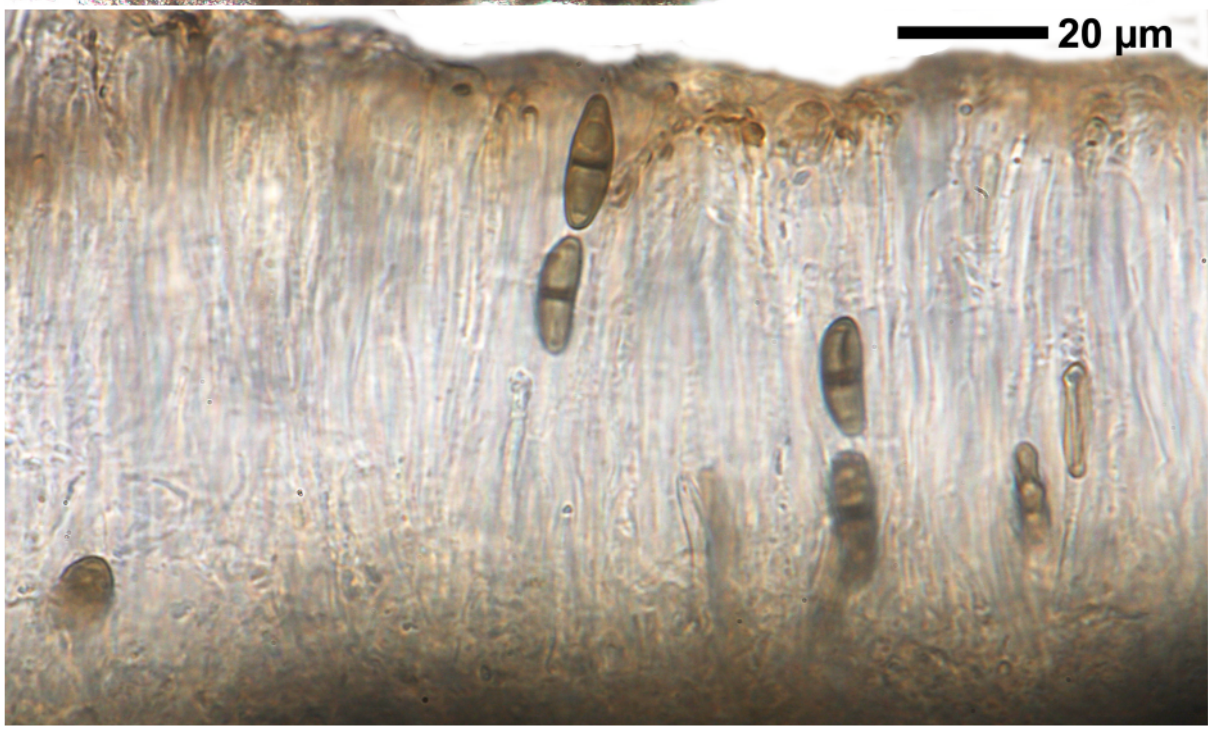
Thallus greenish grey, strongly isidious. Apothecia black, without pruina, 0.4-0.8 mm. Excipulum spotty brownblack, K+yellow->red needles. Epihymenium brown; paraphyses simple or furcate at the tips, with brown caps. Ascospores brown, 1-septate, 13-20 x 5-8 µm. Chemistry atranorin, norstictic acid, connorstictic acid; Thallus K+ yellow->red, UV-. Pantropical

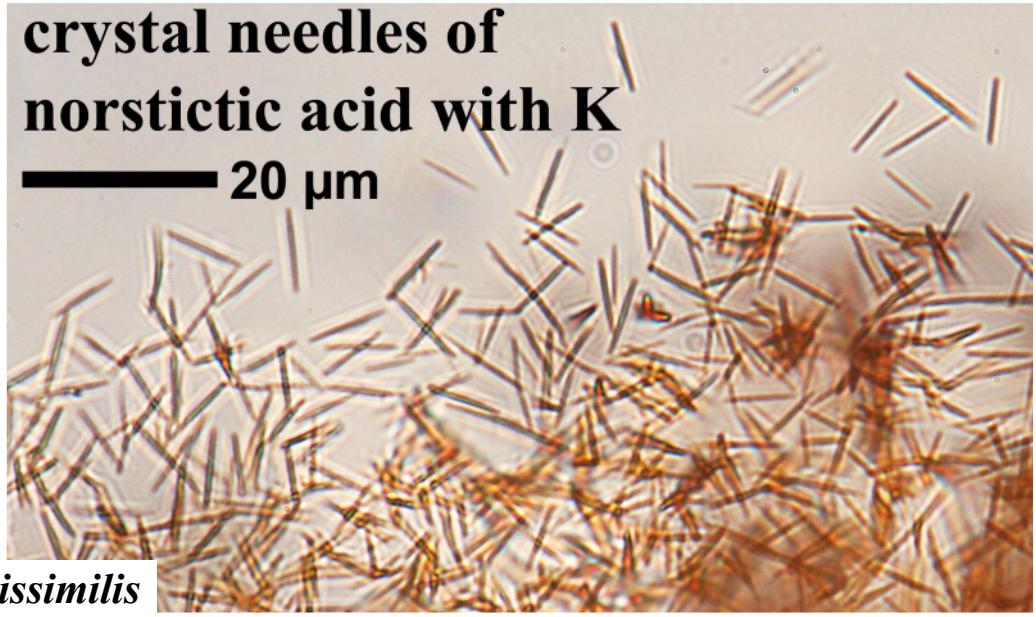
[17501], Thailand, Trat province, Ban-Dan Kao island, Mangroven Wald, 12.21359° N, 102.55290° E, 5 m. Leg. Schumm (IAL 7) 15.01.2012, det. K.Kalb 06.2012.



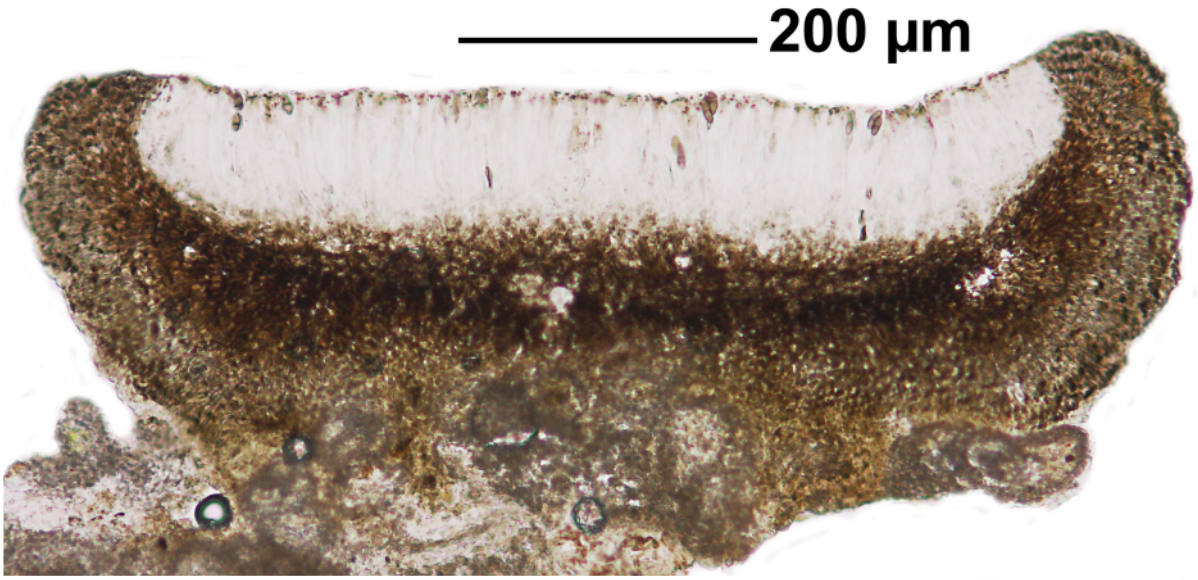



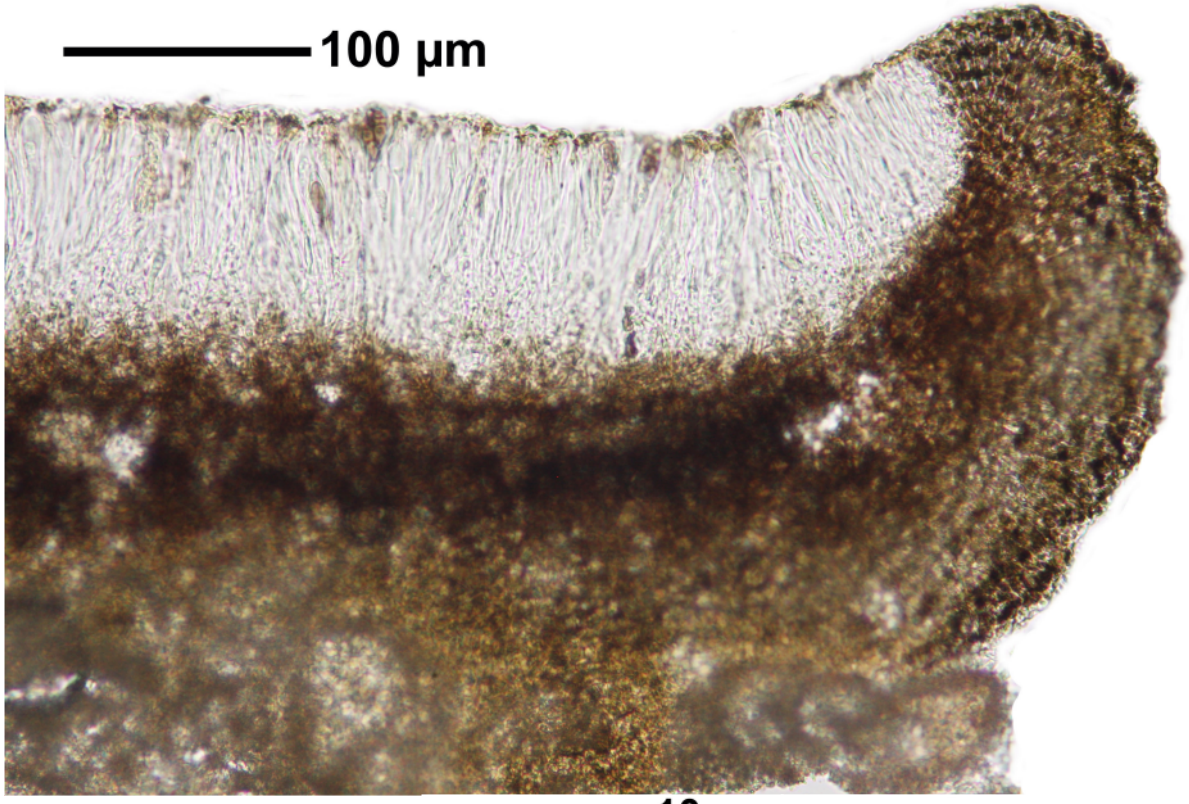


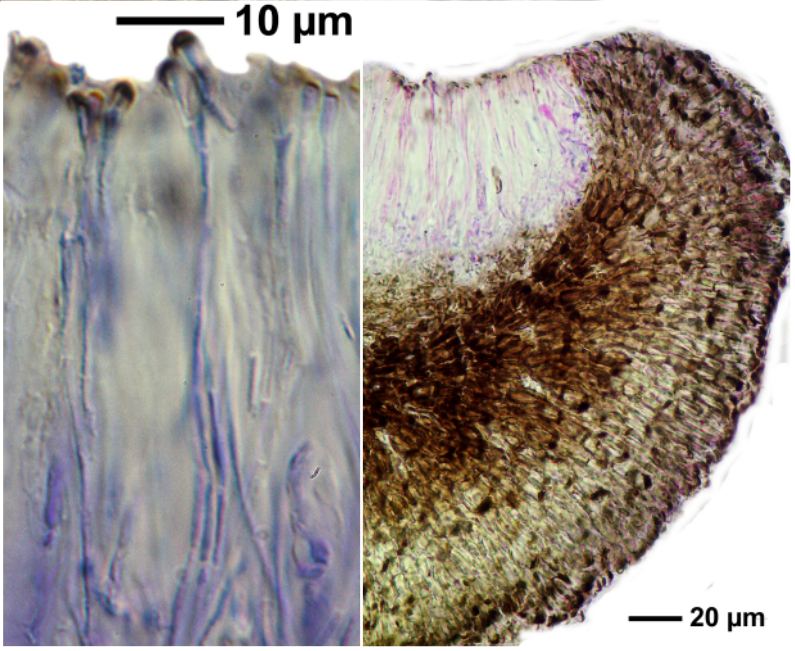



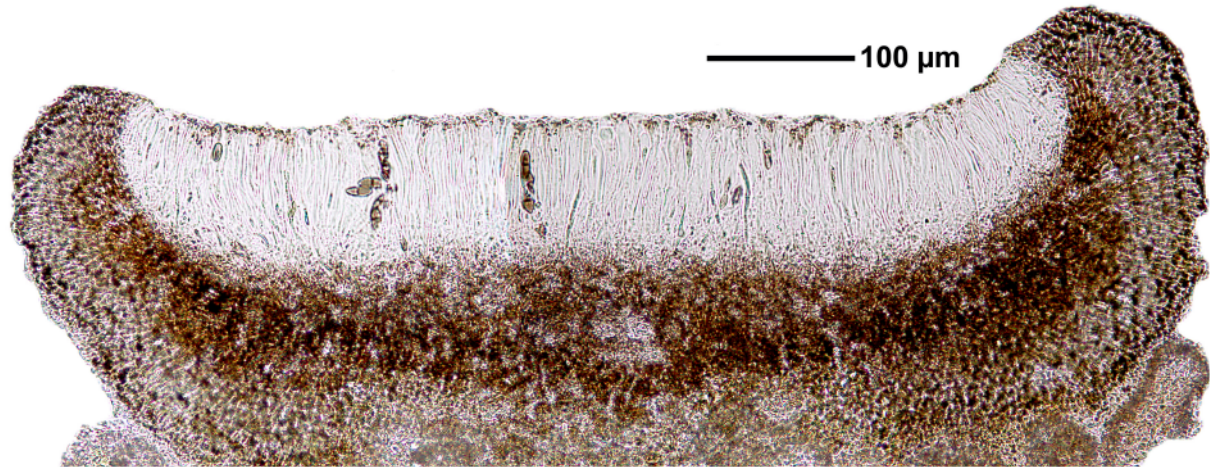

***Cratiria dissimilis***

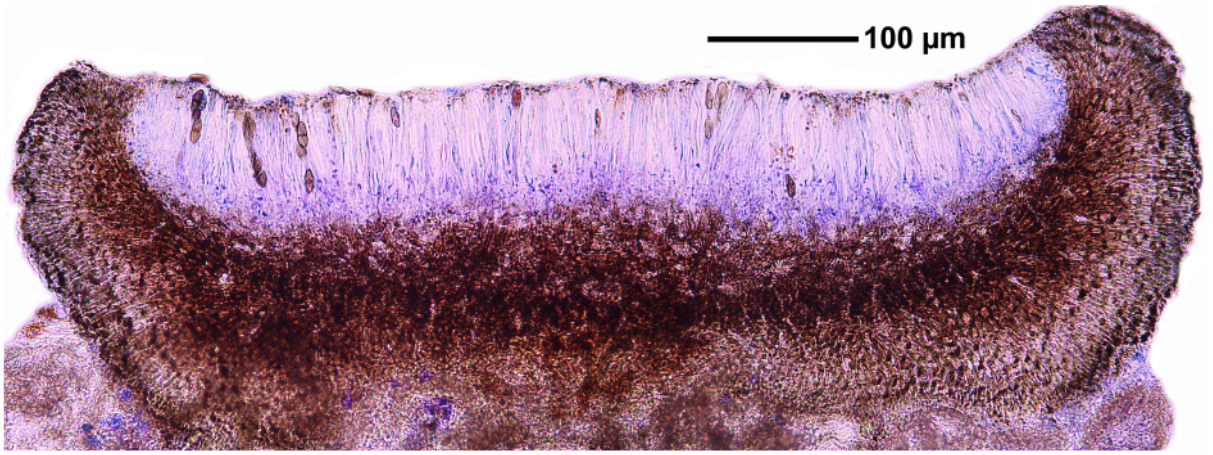


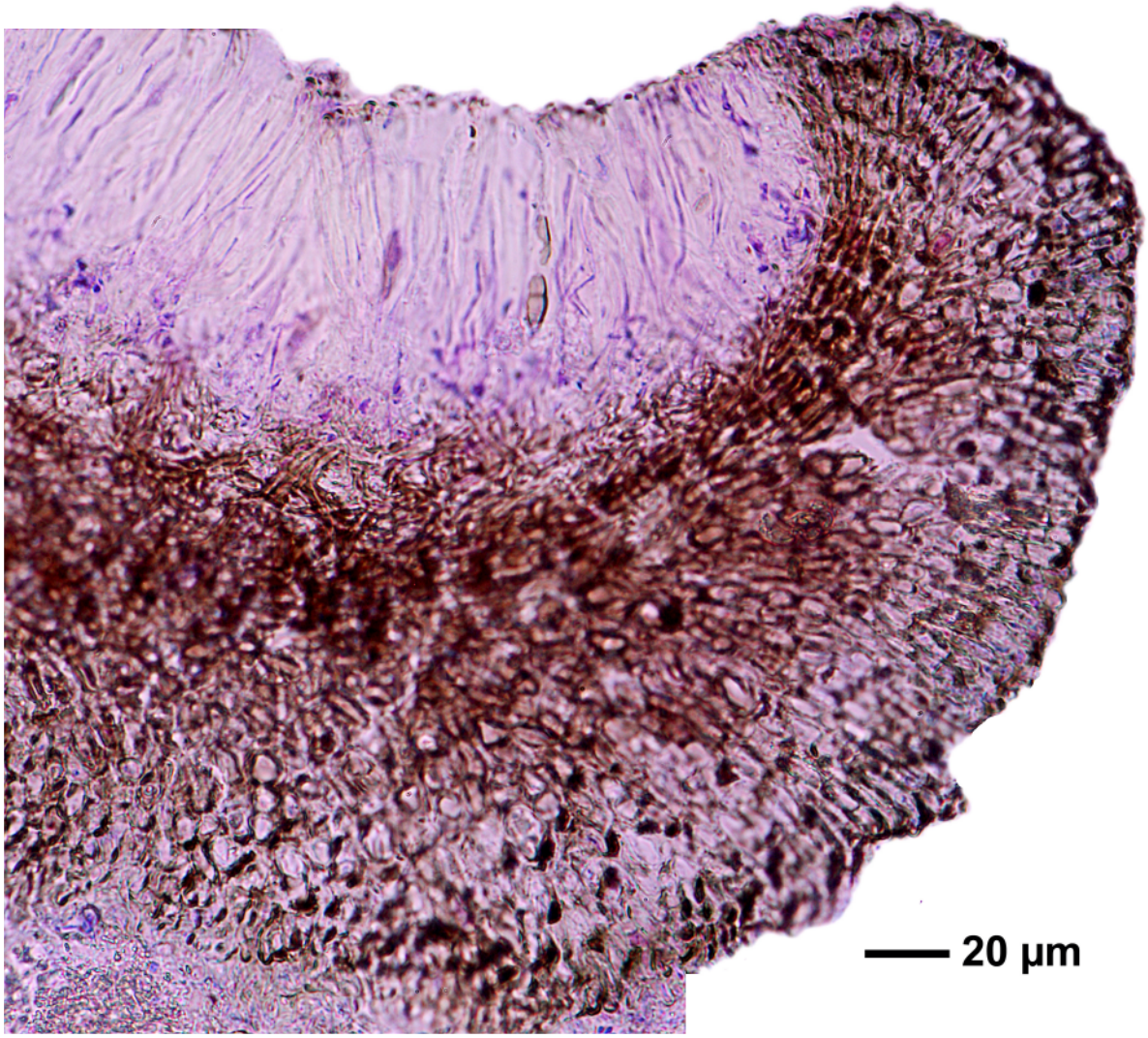



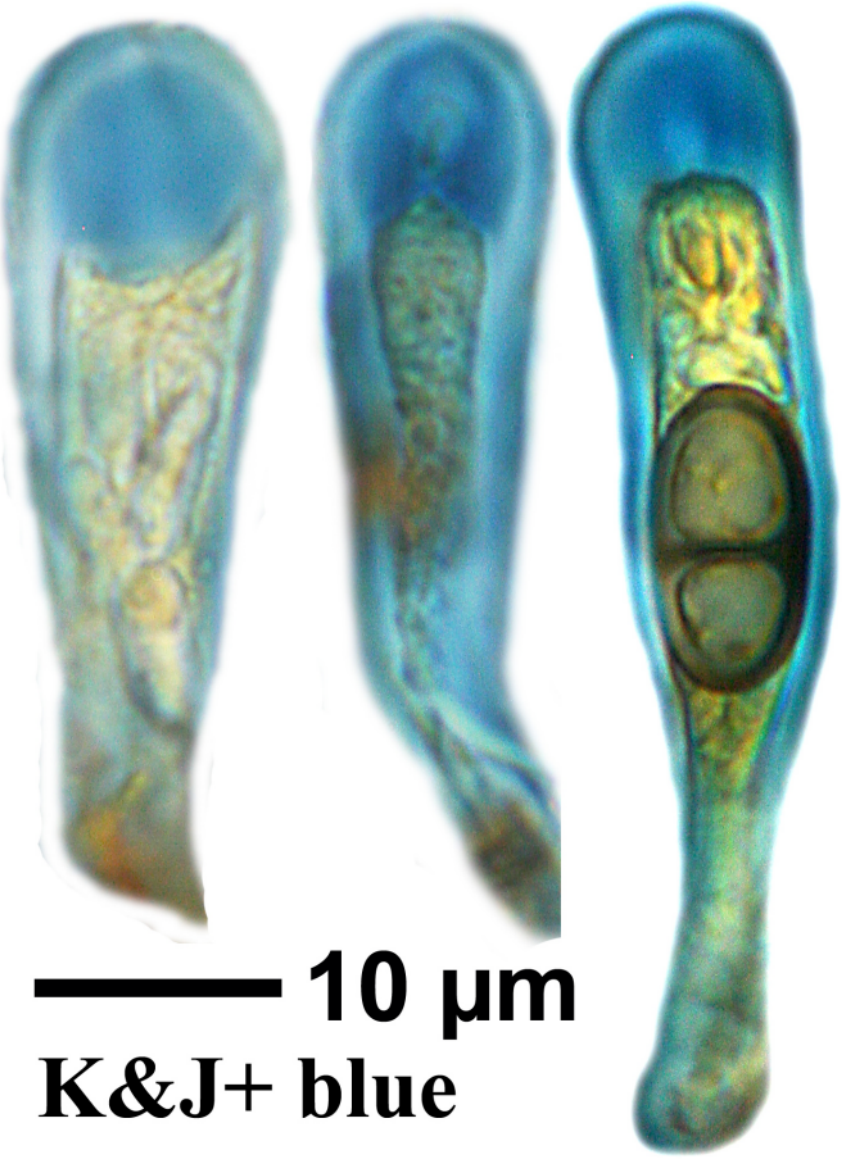

***Cratiria dissimilis***

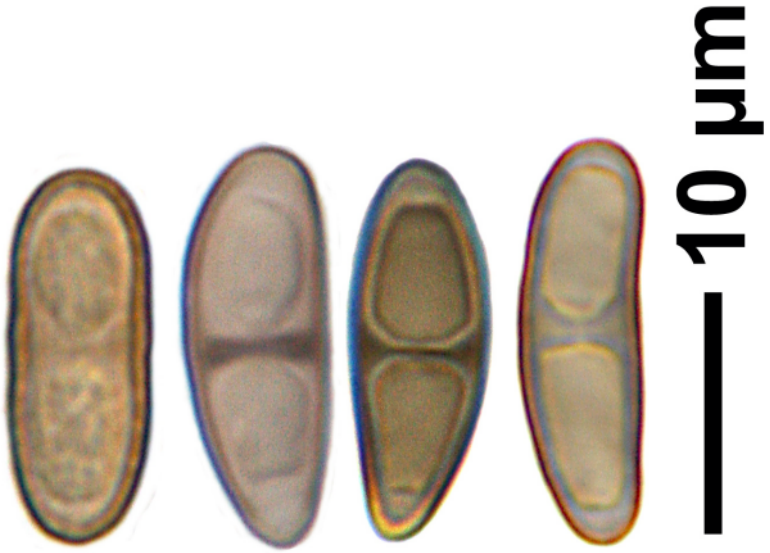



***Cratiria dissimilis***



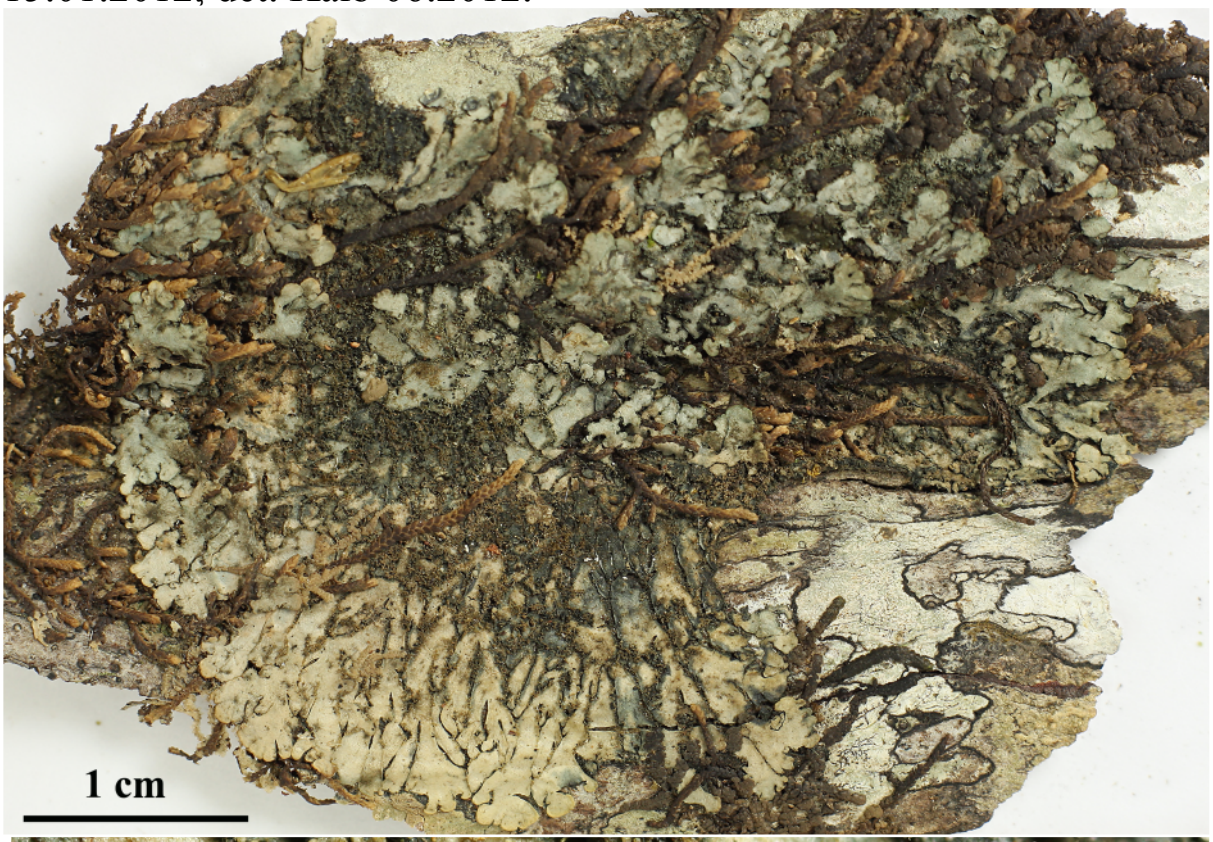



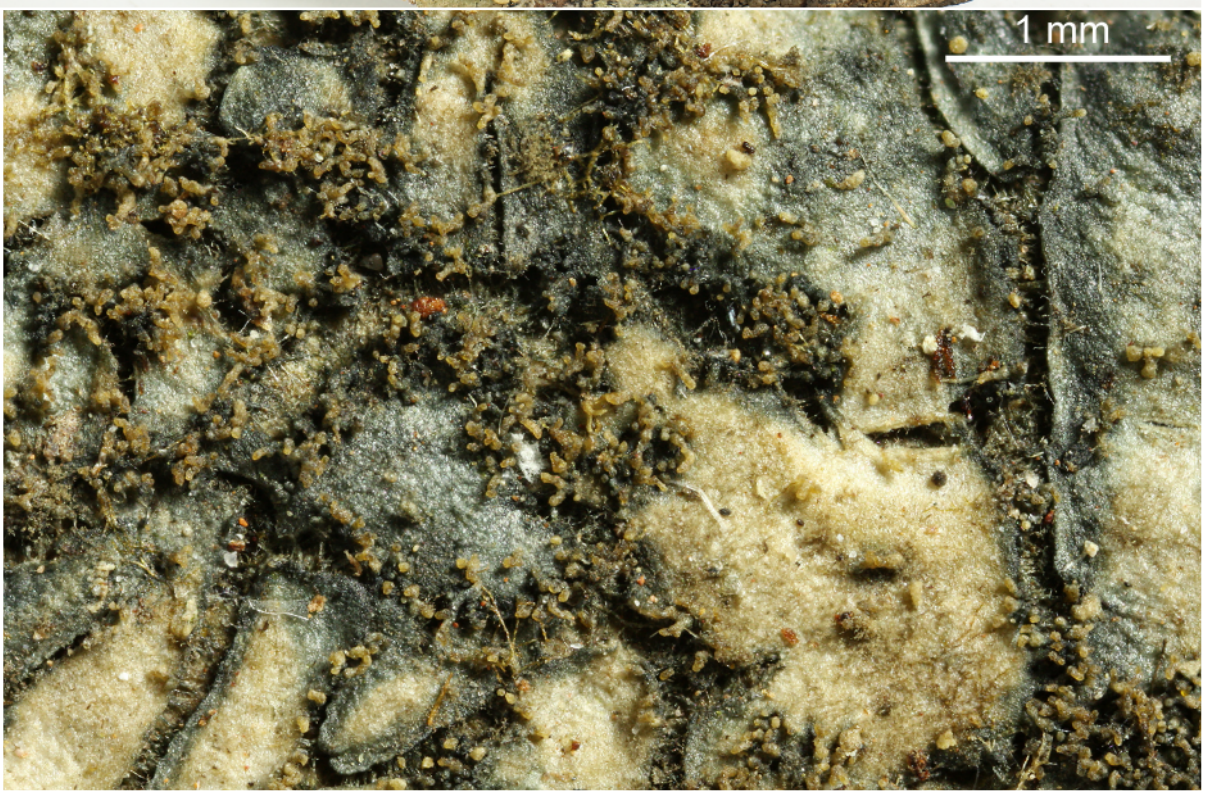

***Cratiria dissimilis***

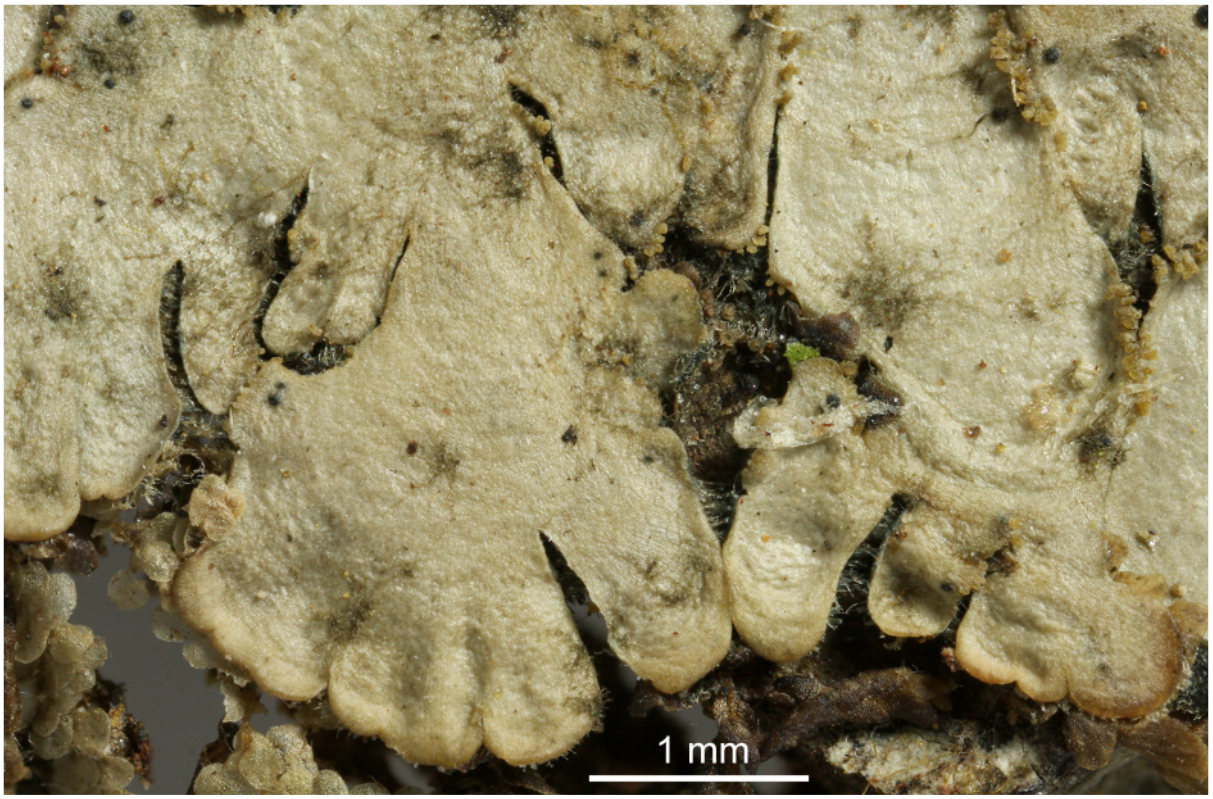
***Coccocarpia glaucina*** Kremp.

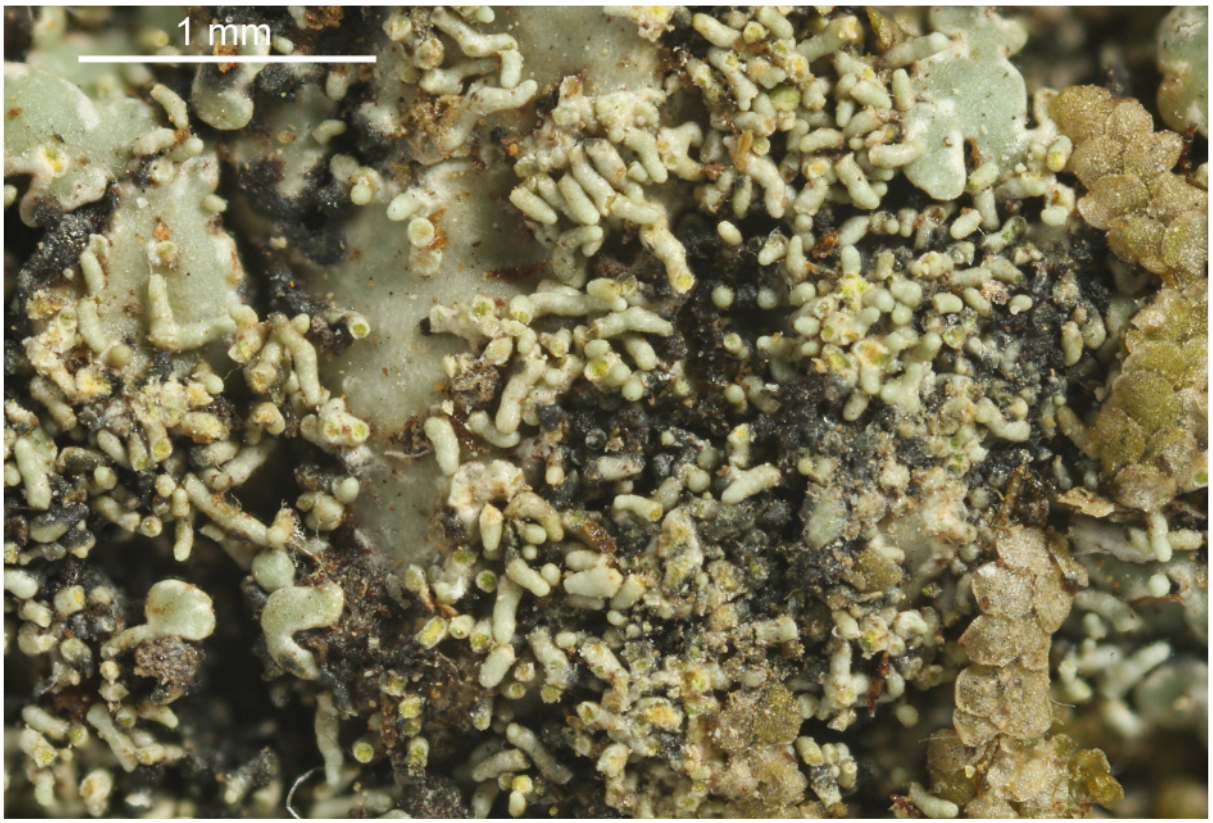
Isidia terete or slightly flattened, often becoming coralloid branched when old, usuaöly mariginal sometimes also laminal, concolorous with thallus. Apothecia rare. TLC: Nil.. Lit. Arvidsson (1982).

[17518], Thailand, Trat province, Ban-Dan Kao island, Mangroven Wald, 12.21359° N, 102.55290° E, 5 m. Leg. Schumm (IAL7) 15.01.2012, det. Kalb 06.2012.



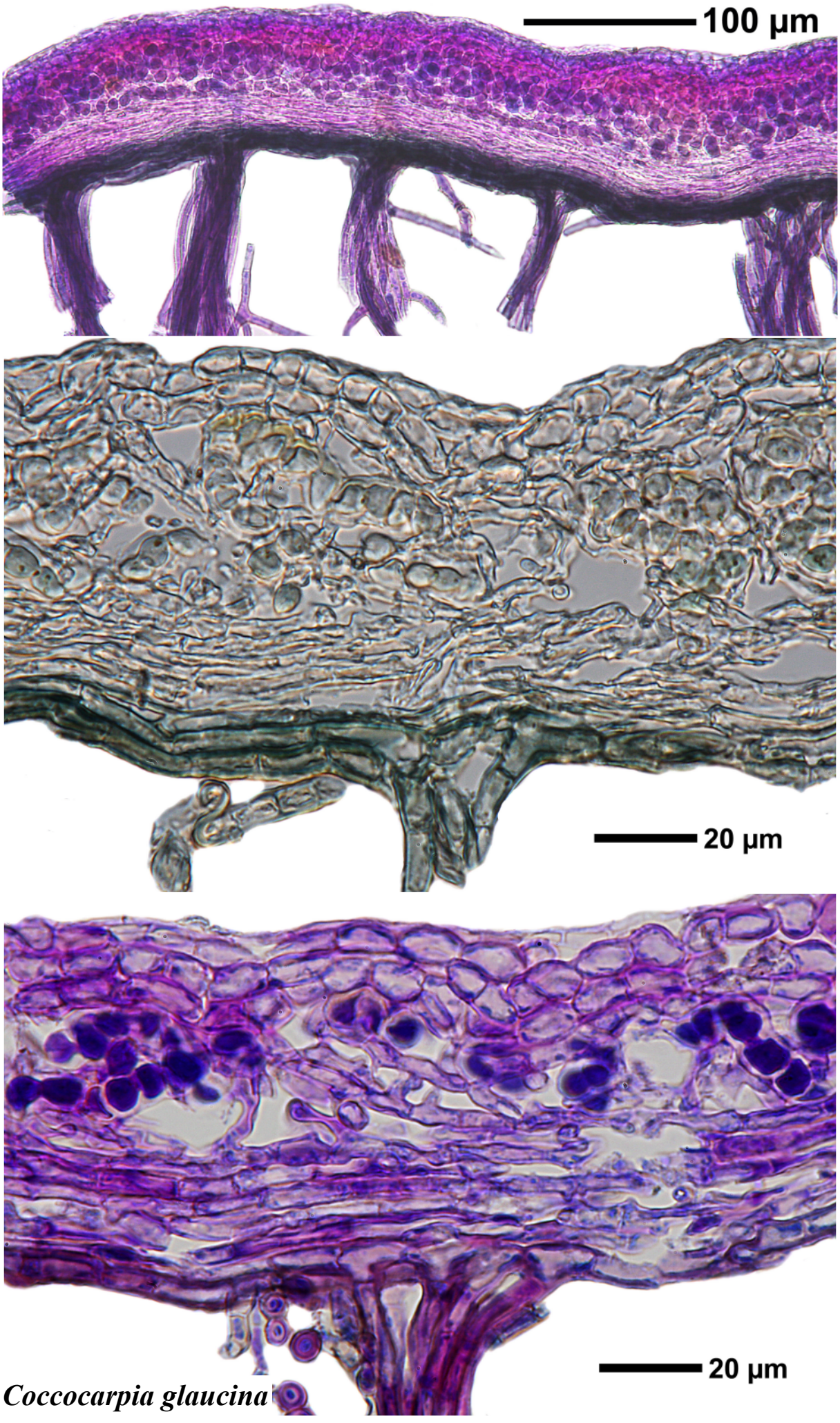






***Coccocarpia glaucina***

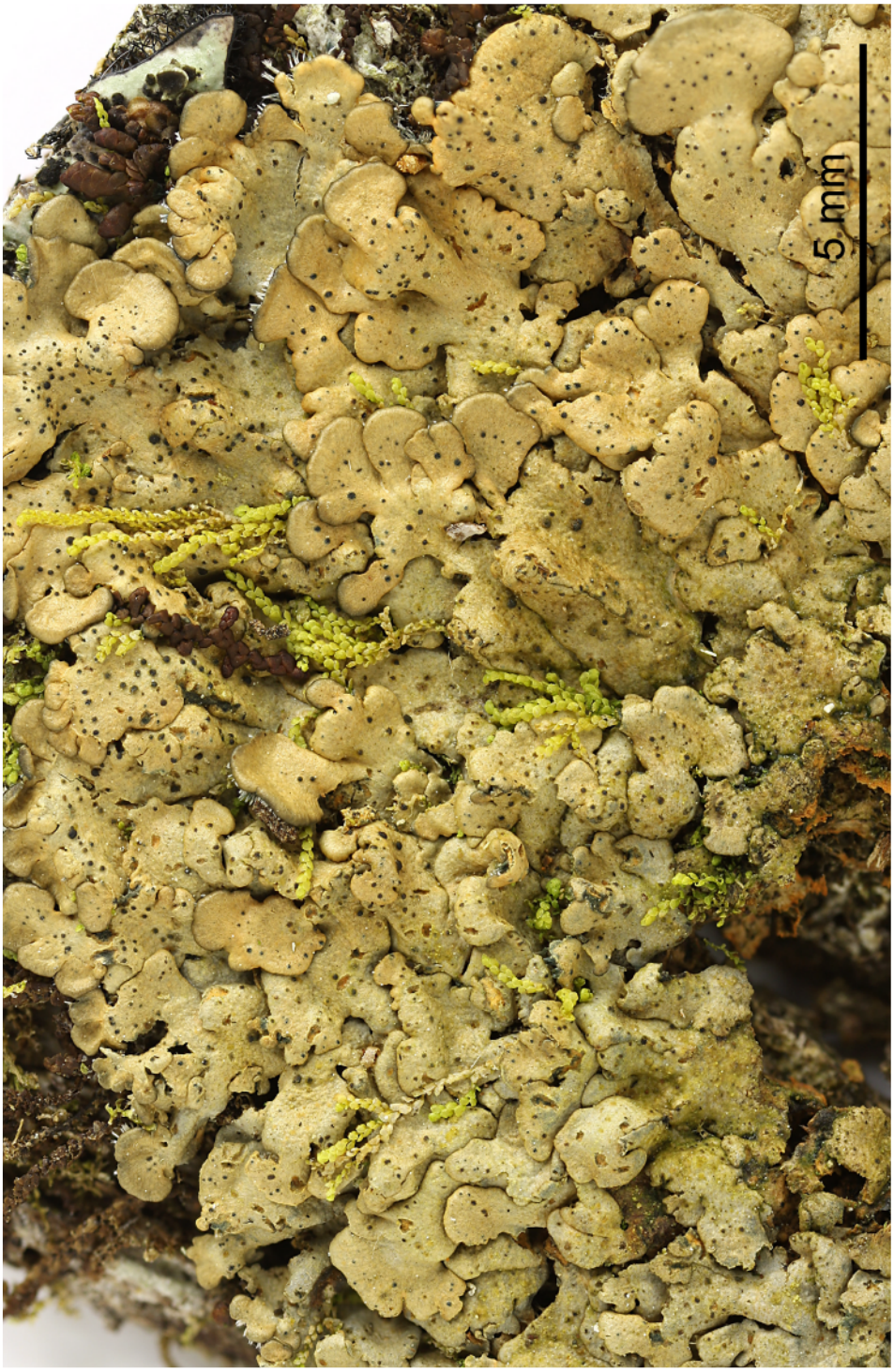



***Coccocarpia glaucina***

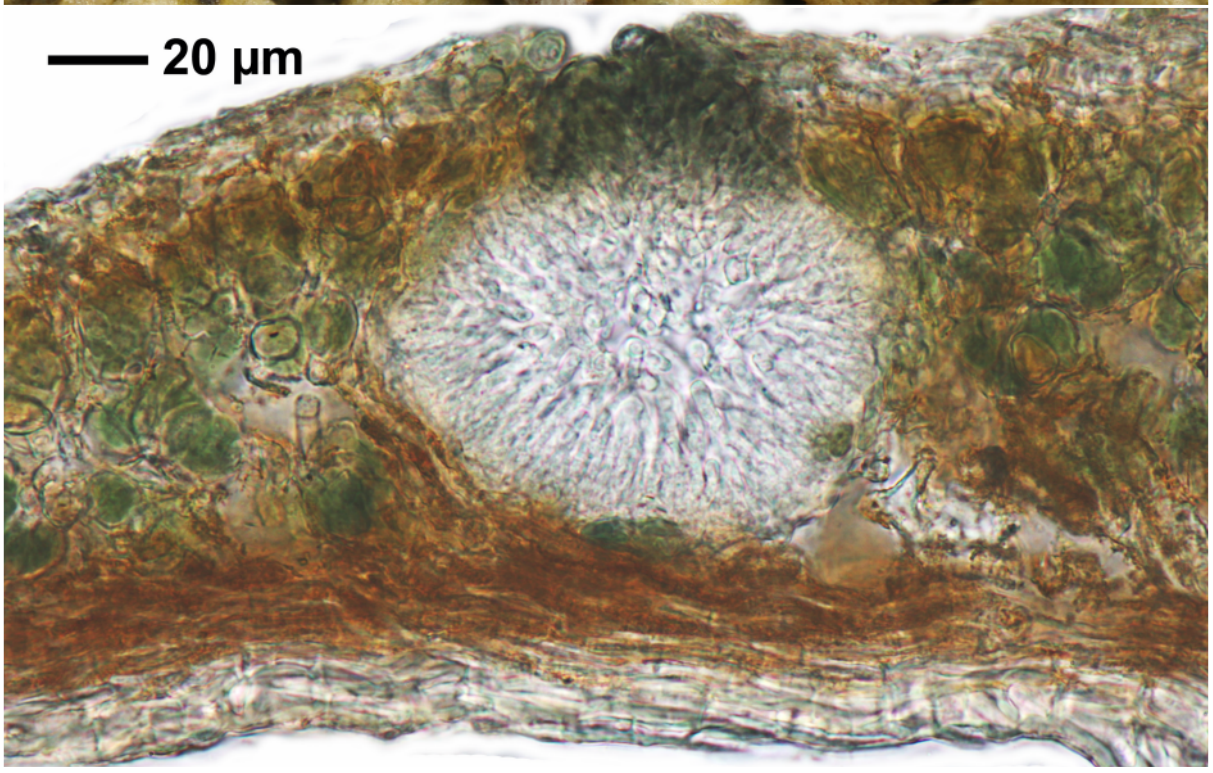
***Coccocarpia endoferruginea*** (Räs.) Arvidsson

Thallus yellowish grey, without isidia. Upper surface with or without concentric ridges; medulla orange, K-. Lower surface pale creamish to black, rhizinate. Apothecia up to 2.5 mm, adnate, without a visible proper margin; disc black. Ascospores fusiform, 8/ascus, 9-14 x 3-5 µm. Pycnospores 2-4 x 1 µm. Chemistry: K- or yellowish, C-, KC-, P-, UV-. Corticolous.

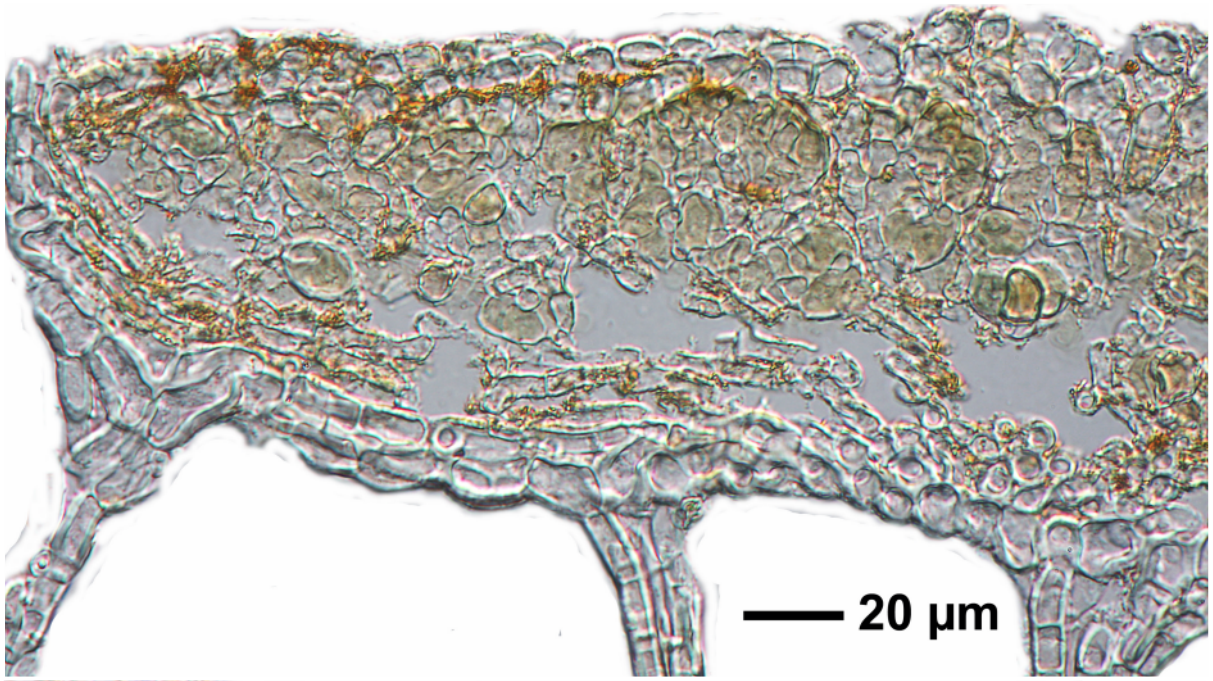
[15573], La Reunion, Wanderpfad westlich Col de Bellevue in Richtung Col de Bébour; 21,14605° S, 55,57029° E, 1550 m. Leg. Schumm & Frahm 16.09.2009, det. P.M. Jorgenson 2009 .

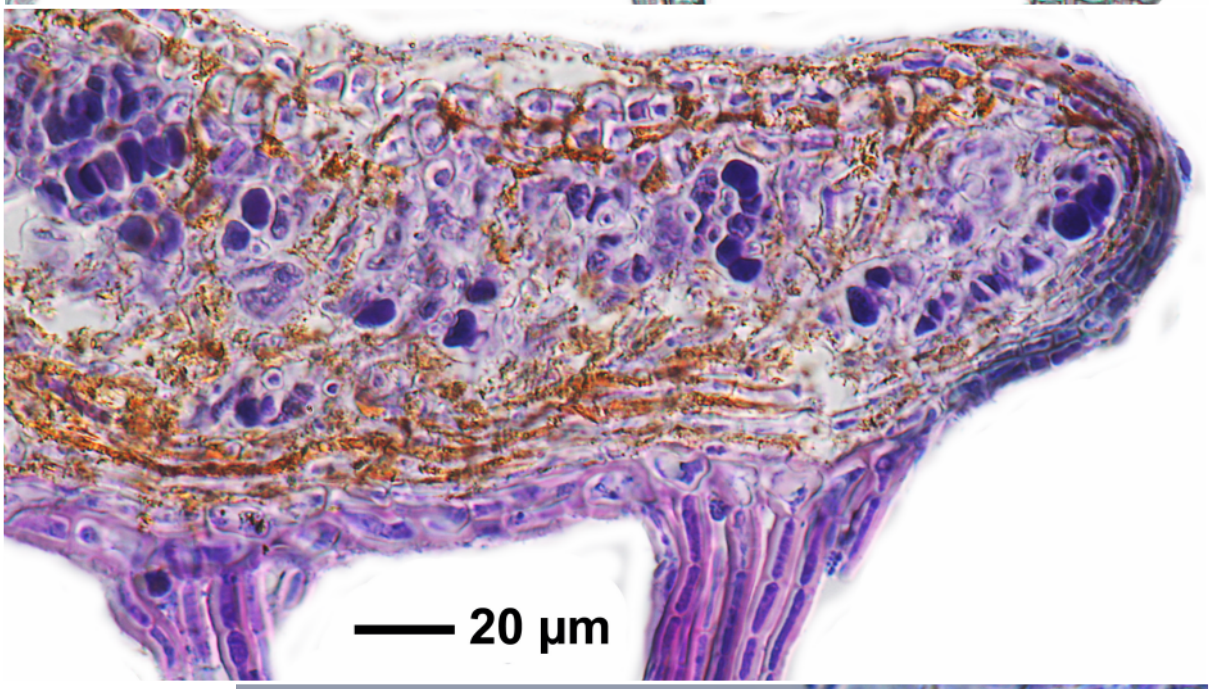


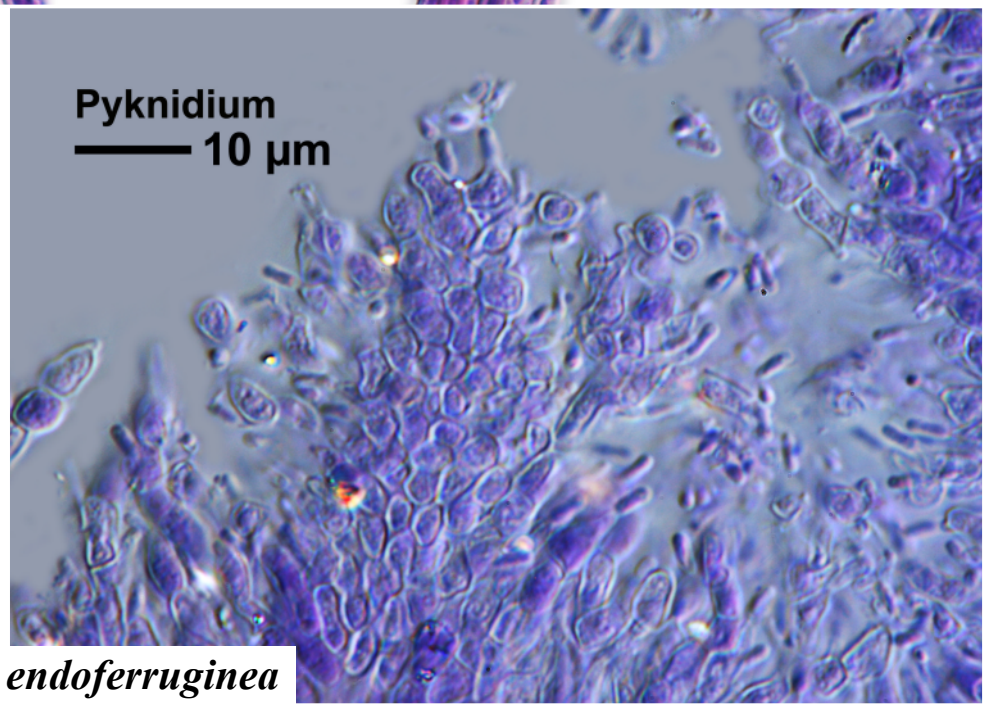



***Coccocarpia endoferruginea***




***Coccocarpia endoferruginea***

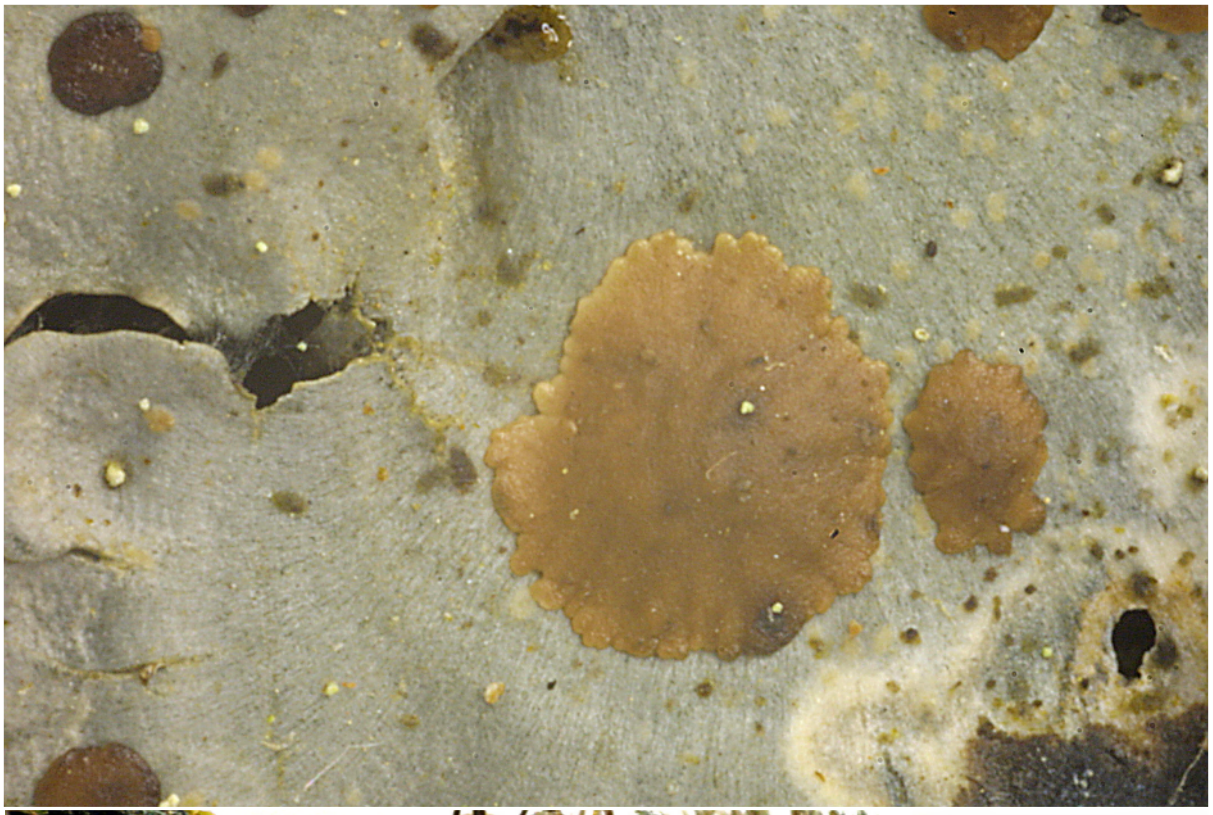
***Coccocarpia erythroxyli*** (Spreng.) Swinscow & Krog

Without isidia, usualy with adnate apothecia. Upper cortex built out of 2-3 rows of short-rectangular, periclinally orientated cells. Medulla and lower surface consist of long, thick walled, periclinale orientated hyphae with narrow lumina.

[11774], Thailand, Prov. Chiang Mai, Doi Inthanon, am Rande des immergrünen Regenwaldes nördlich des Checkpoints (gegenüber der Abzweigung nach Mae Chaem), an freistehendem Baum, 1720 m. Leg. Schäfer-Verwimp 08. April 2004 Nr. 23855, det. Schumm 2004.



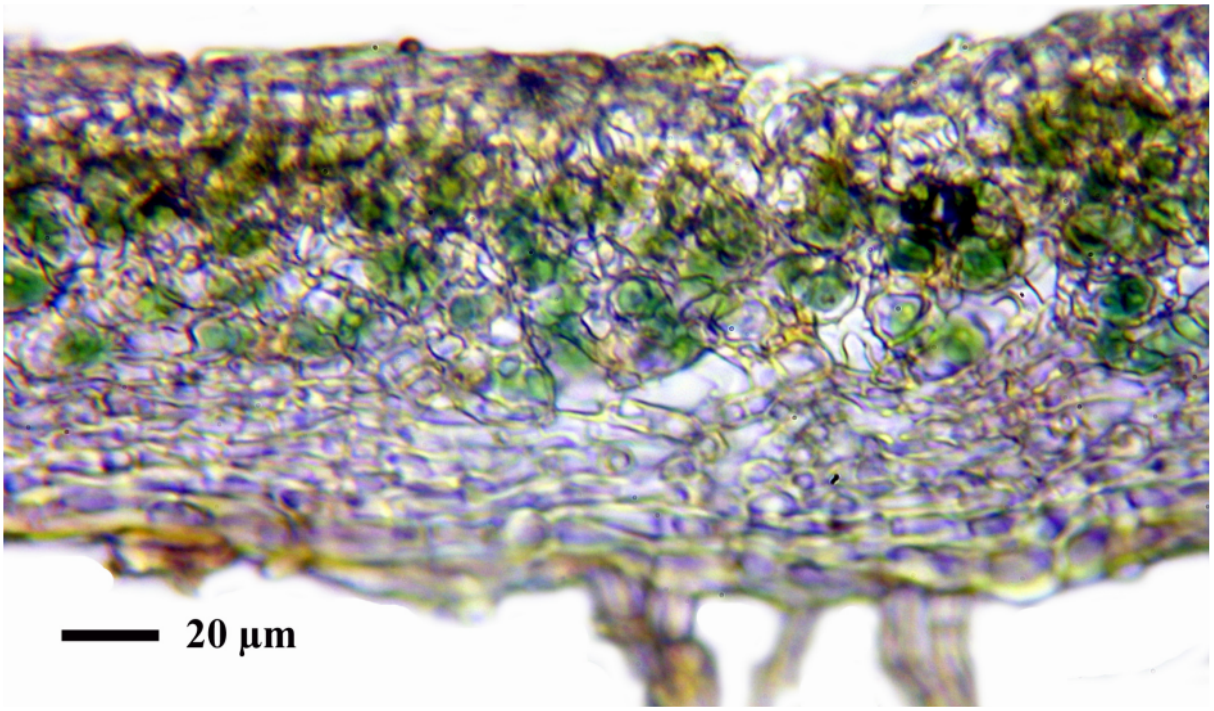


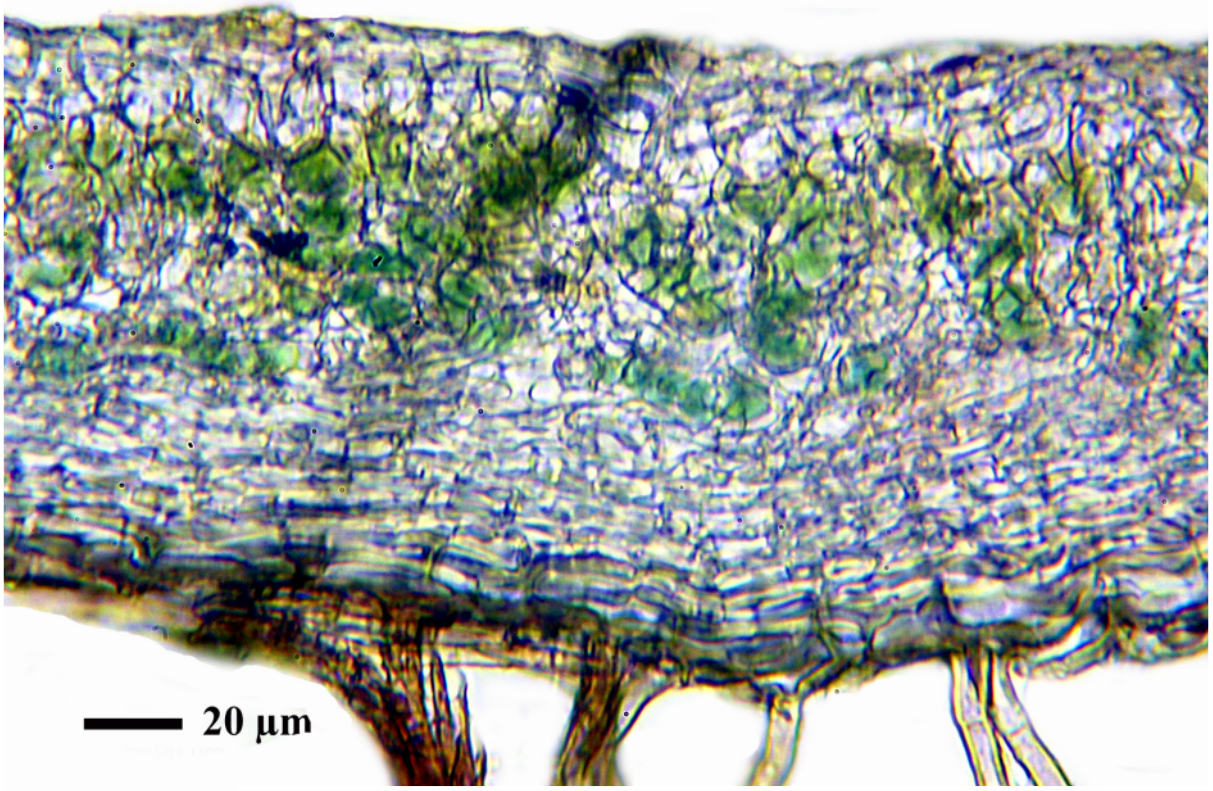



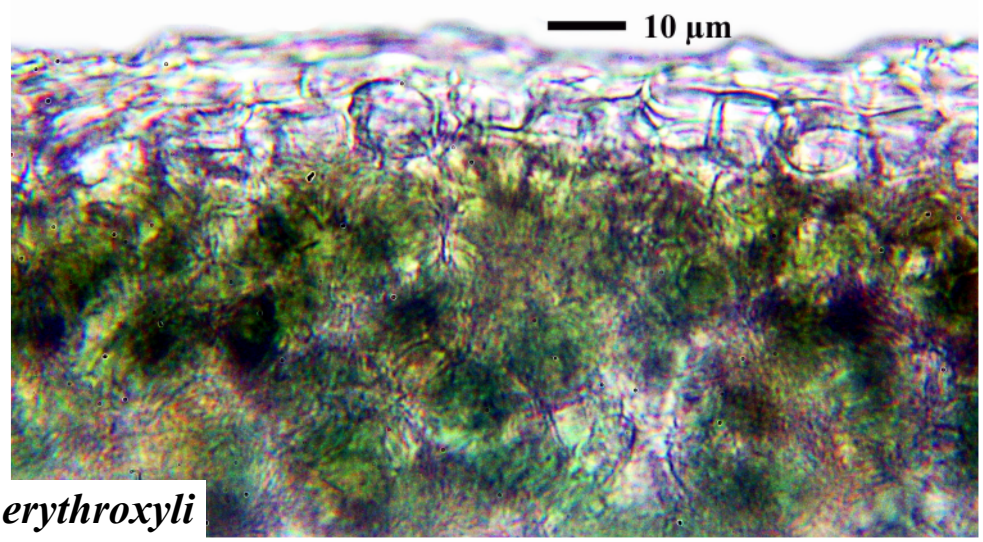




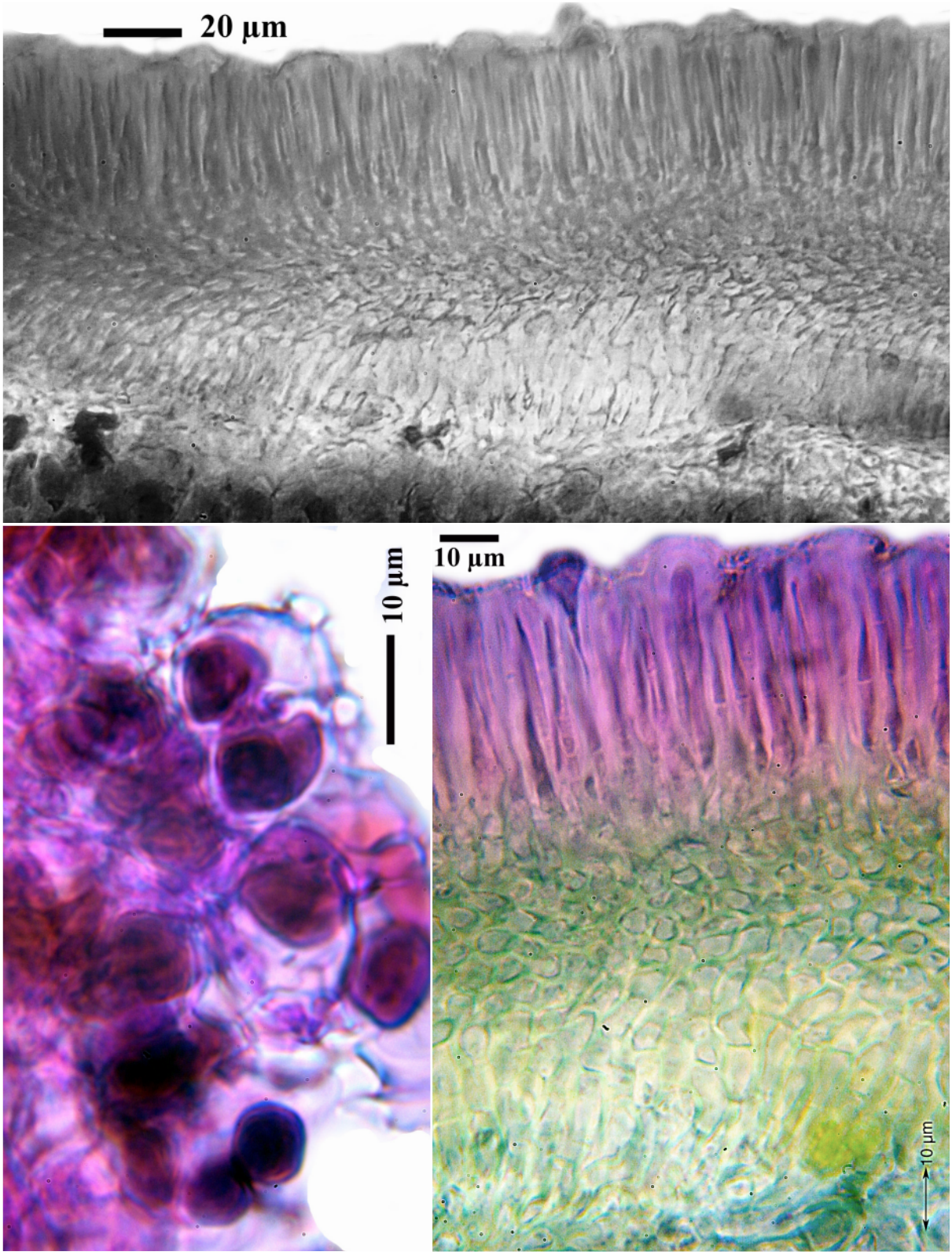
***Coccocarpia erythroxyli***




***Coccocarpia erythroxyli***



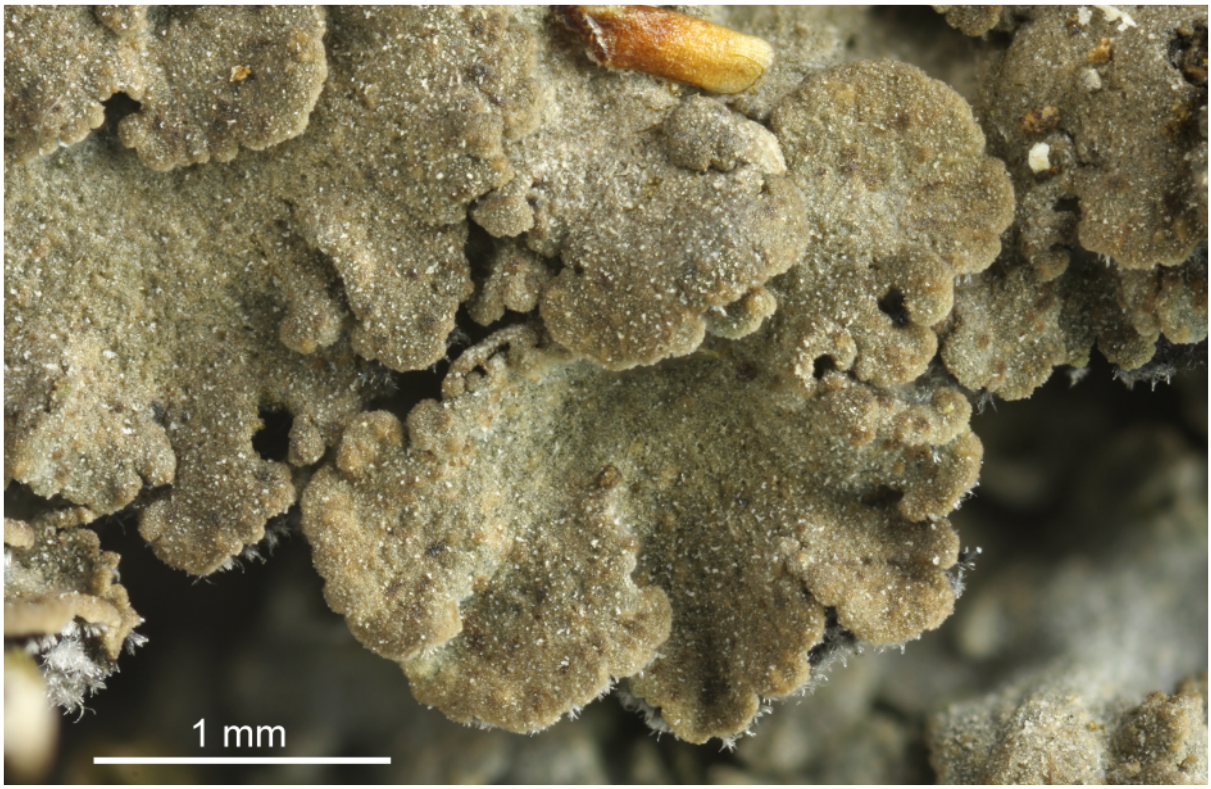

***Coccocarpia erythroxyli***

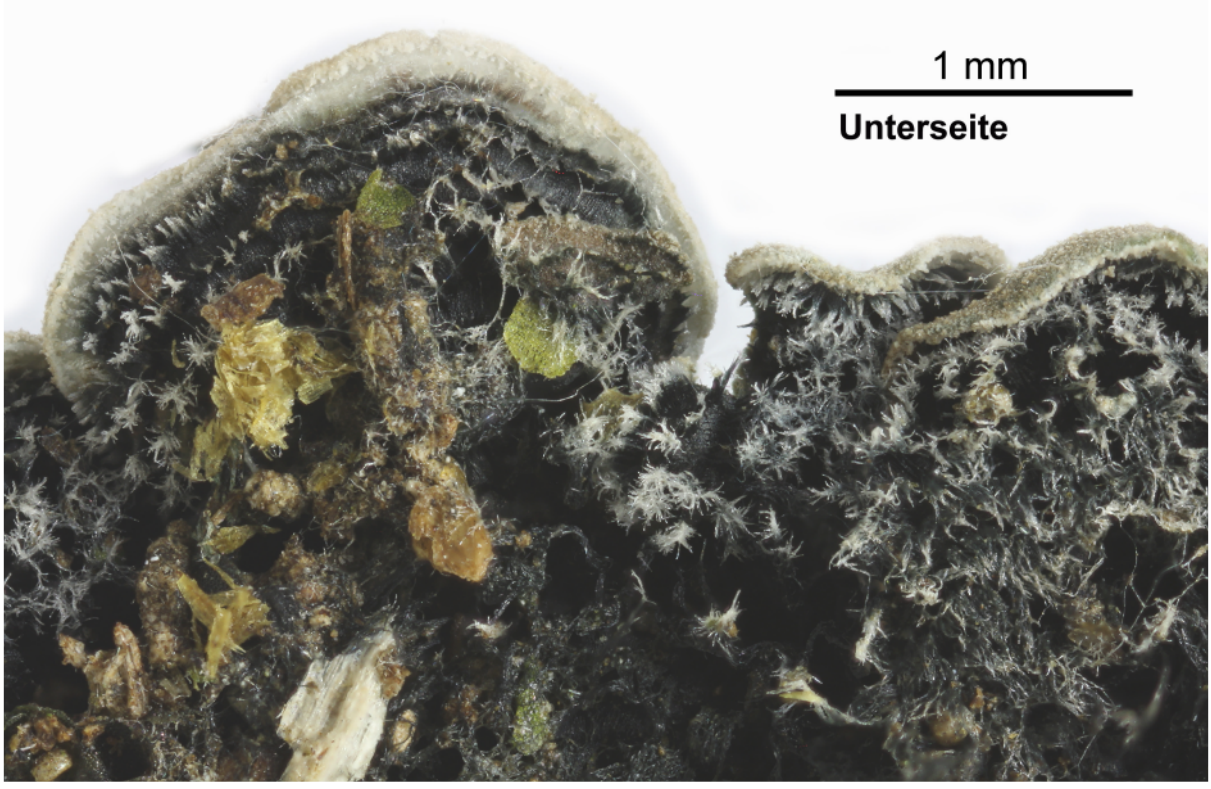
***Coccocarpia imbricascens*** Nyl.

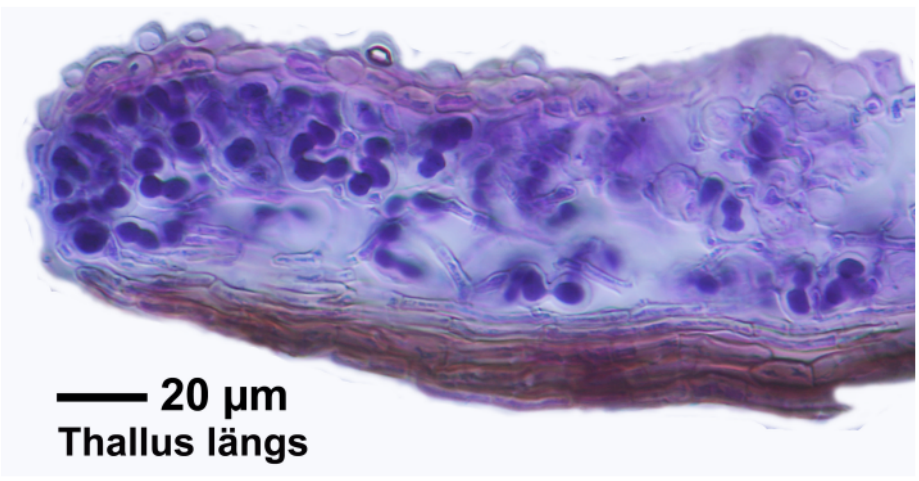
Thallus dark browenish grey. Lobes imbricate, not pruinose, usually ± shining, without isidia and traverse concentric ridges. Lower surface creamish to black, rhizinate. Spores globose, 8/ascus, 4-5 µm.
Chemistry: K-, C-, KC-, P-, UV; TLC: nil.

[15267], La Reunion, Takamaka, feuchte waldige Felshänge bei der Elektrostation; 21,09105° S, 55,61998° E, 800 m. Leg. Schumm & Frahm 10.09.2009, det. P.M. Jorgensen 2009.

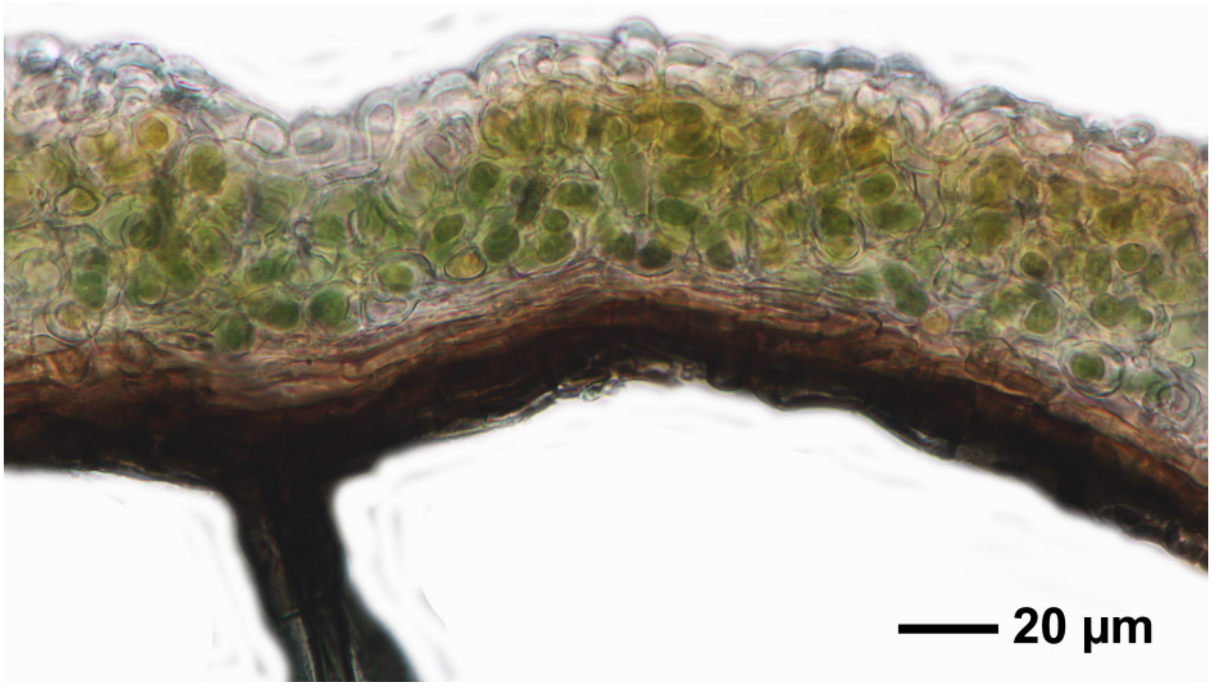


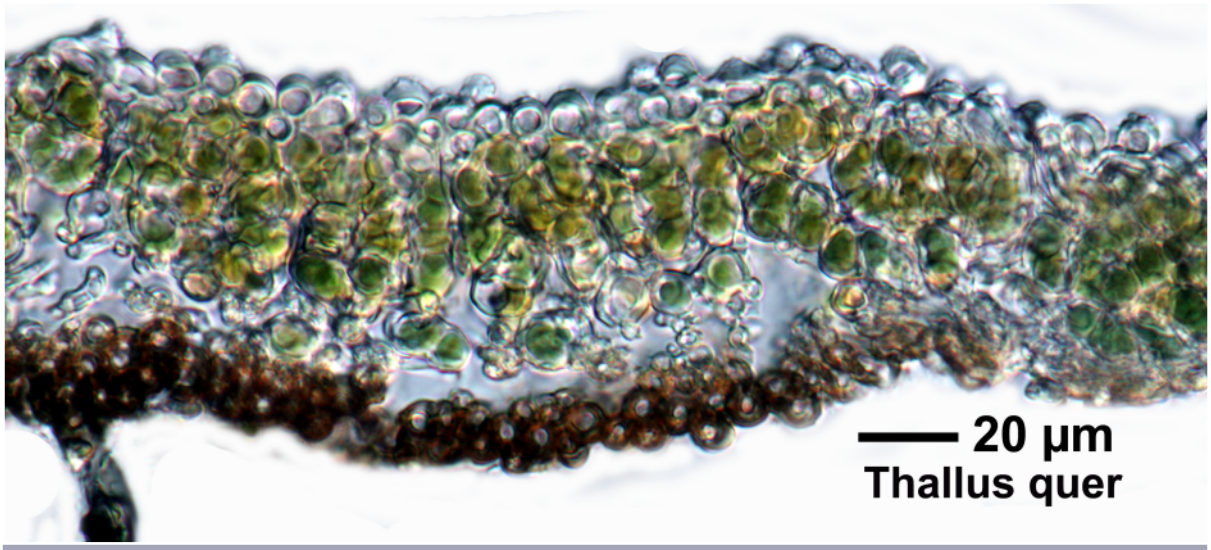


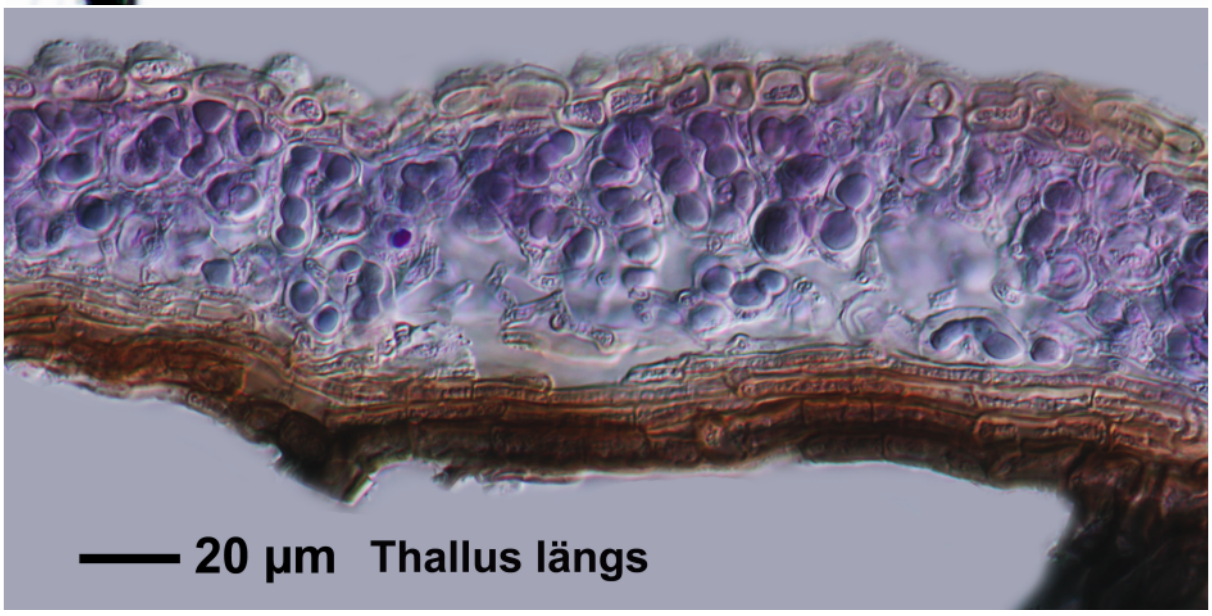




***Coccocarpia imbricascens***




***Coccocarpia imbricascens***

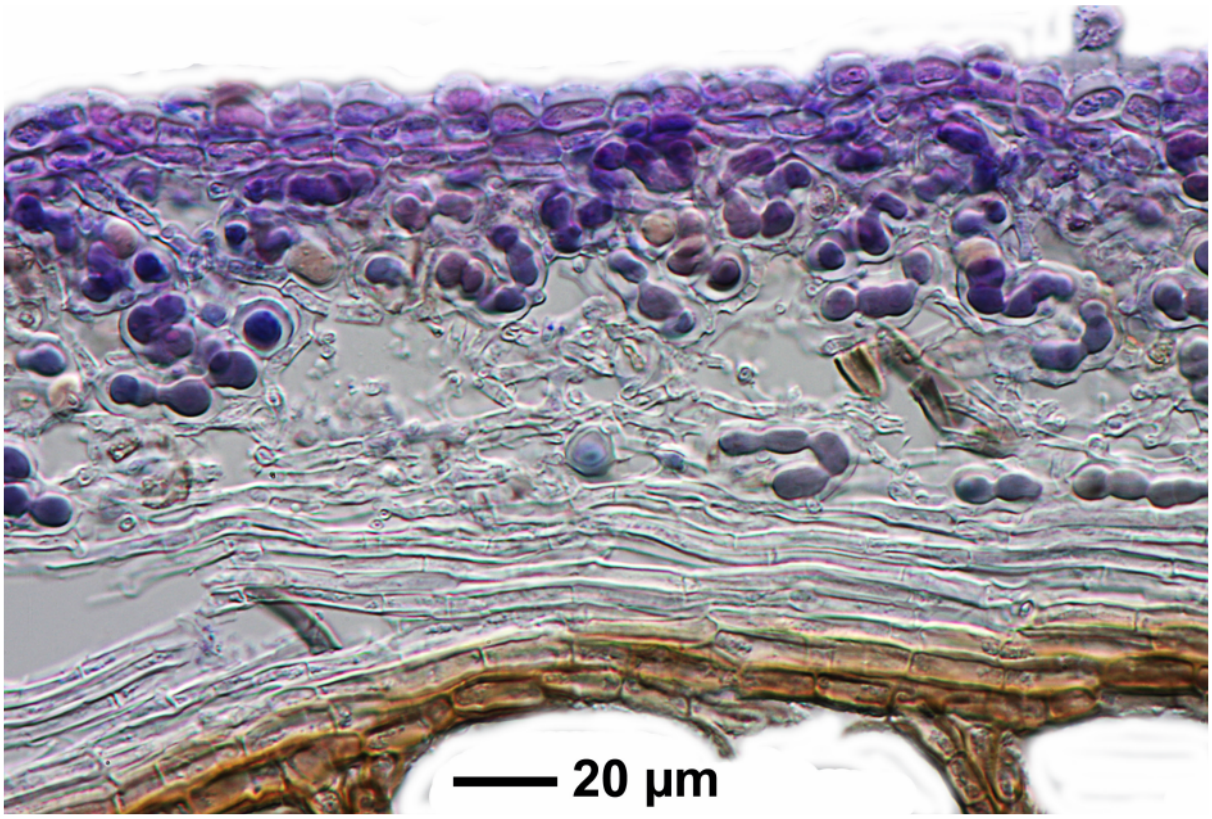
***Coccocarpia smaragdina*** Pers.

Thallus grey to bluish grey, not zonate, not isidiate, without soralia; lobes 0.5-0.7 cm wide, surface distincly white pruinose, especially towards lobe apices; margins of lobes deflexed; lower surface cream to black, densely rhizinate. Apothecia adnate, 1-4 mm, yellowish brown. Spores fusiform, hyaline, 8/ascus, 1-locular, young with plasmatic appendices, 7-13 x 3-5 µm. Chemistry: K-, C-, KC-, P-, UV-; TLC: nil.

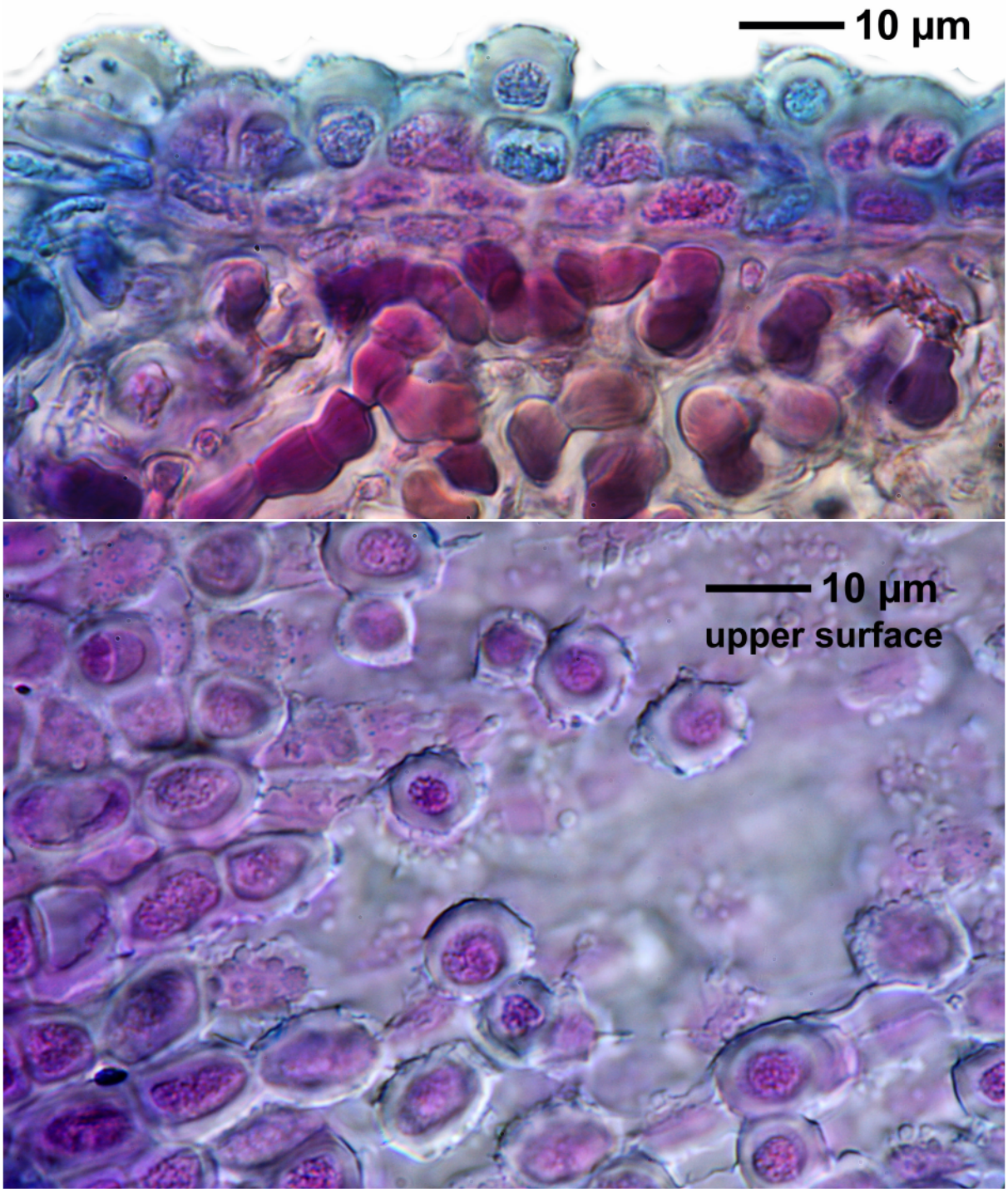
[15249], La Reunion, Takamaka, feuchte waldige Felshänge bei der Elektrostation; 21,09105° S, 55,61998° E, 800 m. Leg. Schumm & Frahm 10.09.2009, det. P.M. Jorgensen 2009.





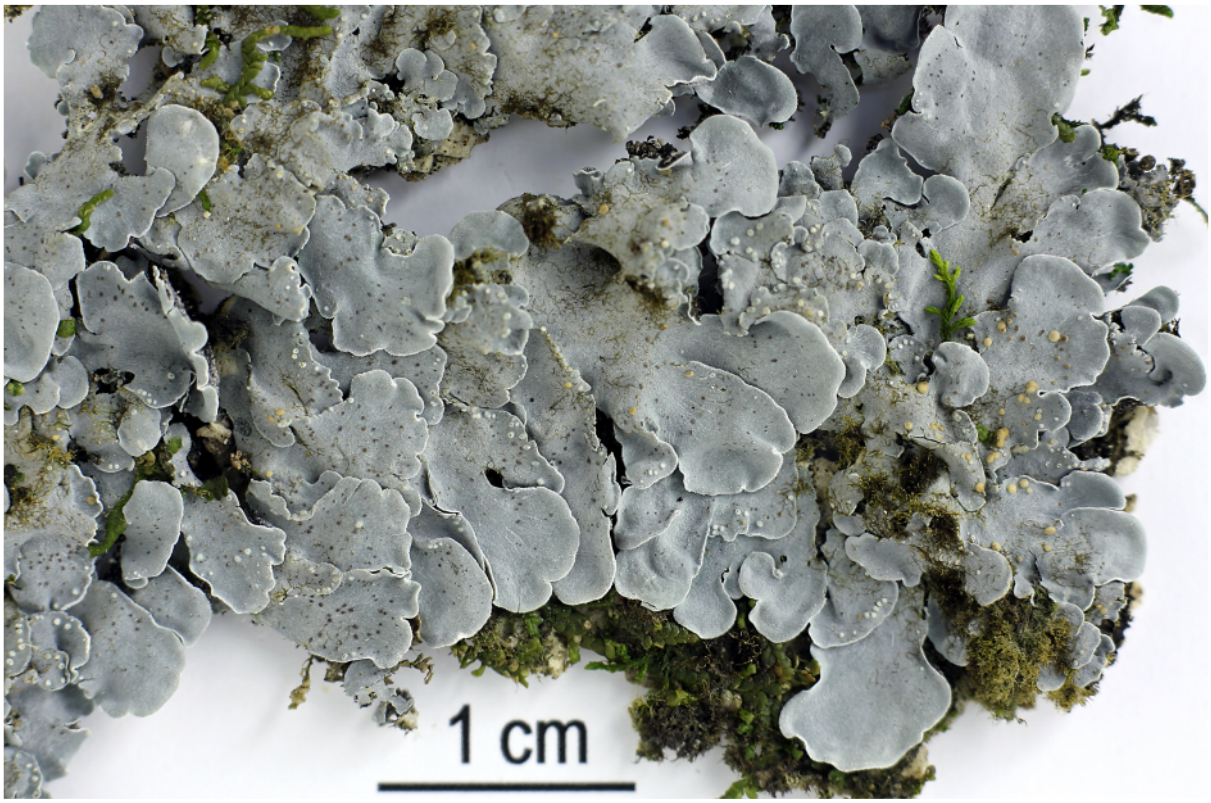

***Coccocarpia smaragdina***



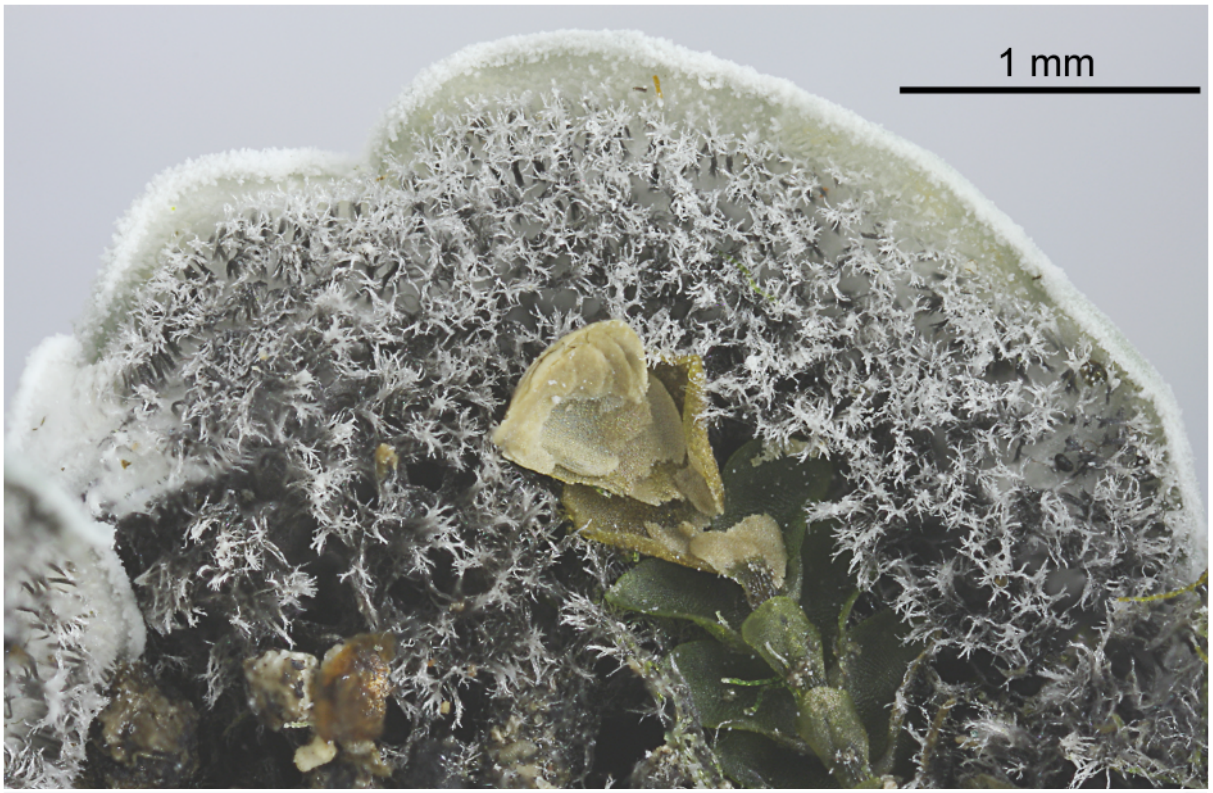

***Coccocarpia smaragdina***

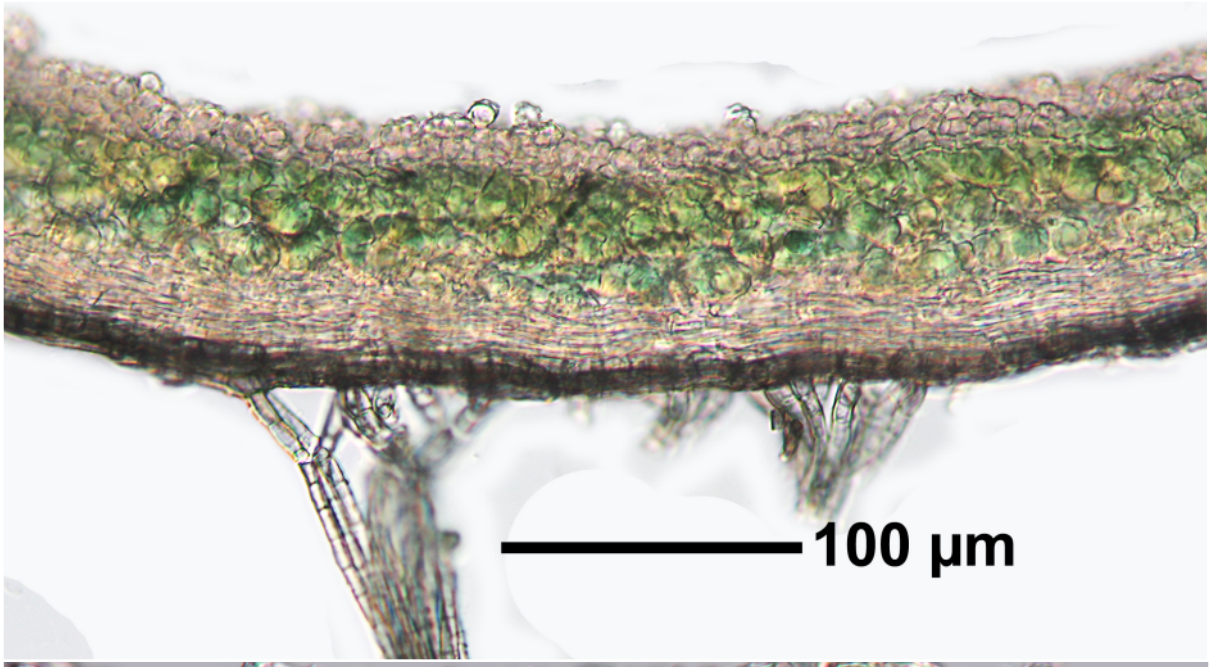
***Coccocarpia smaragdina*** Pers.

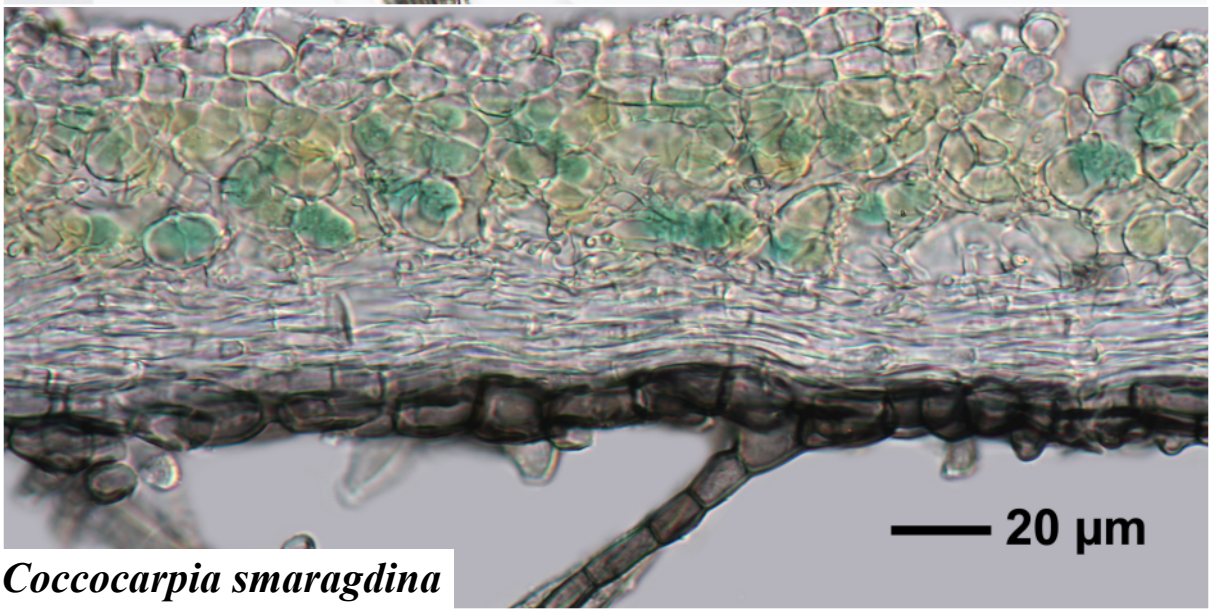
[15505], La Reunion, Südostküste zwischen Saint Philippe und Pointe du Tremblet, 21.29508° S, 55.79921° E, 140 m. Leg. Schumm & Frahm 14.09.2009, det. P.M. Jorgensen.





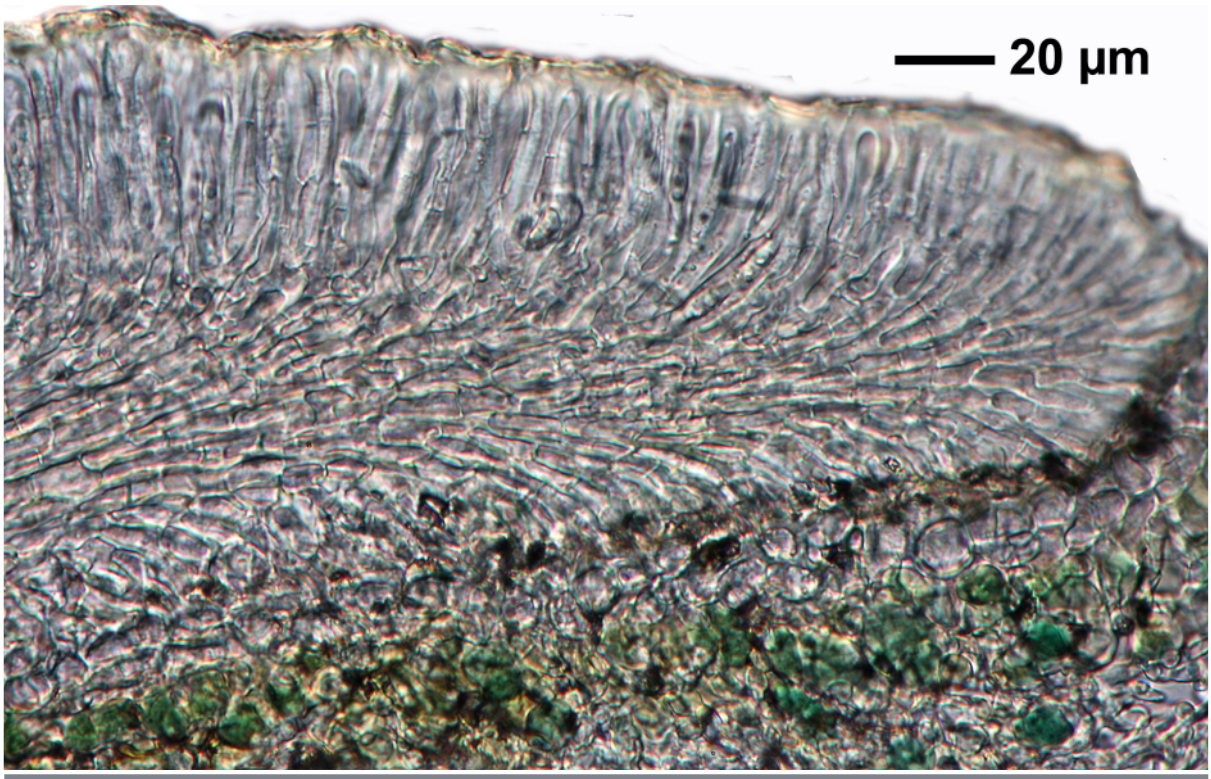



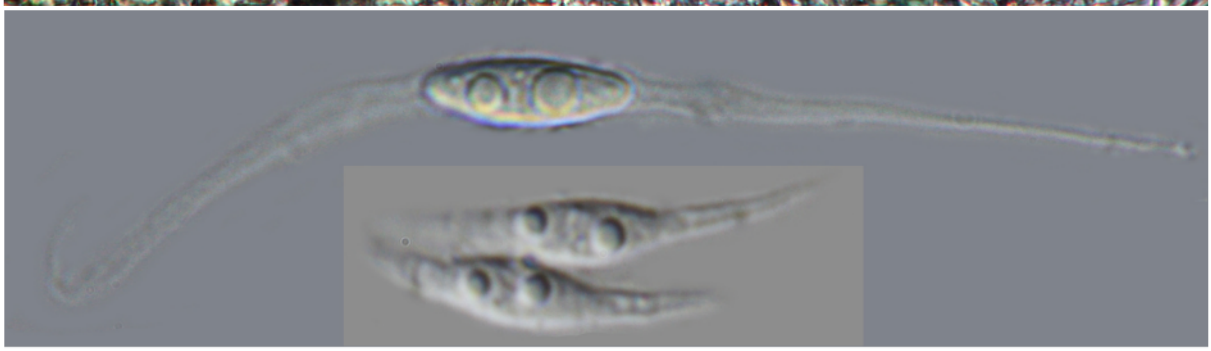




***Coccocarpia smaragdina***



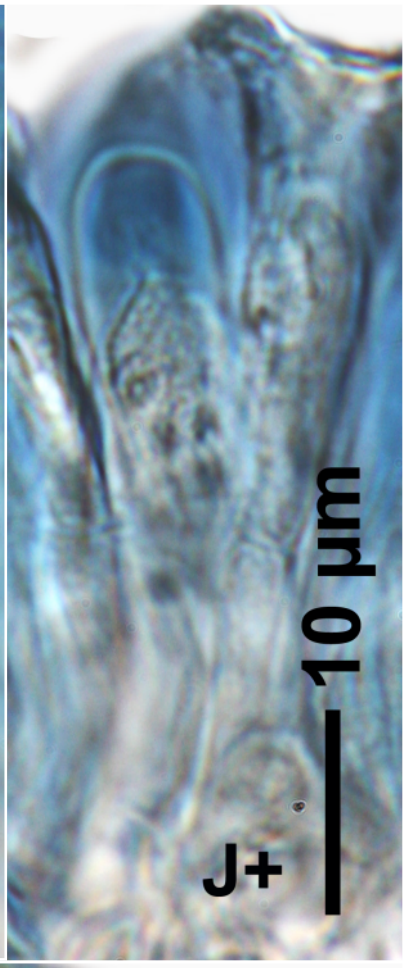



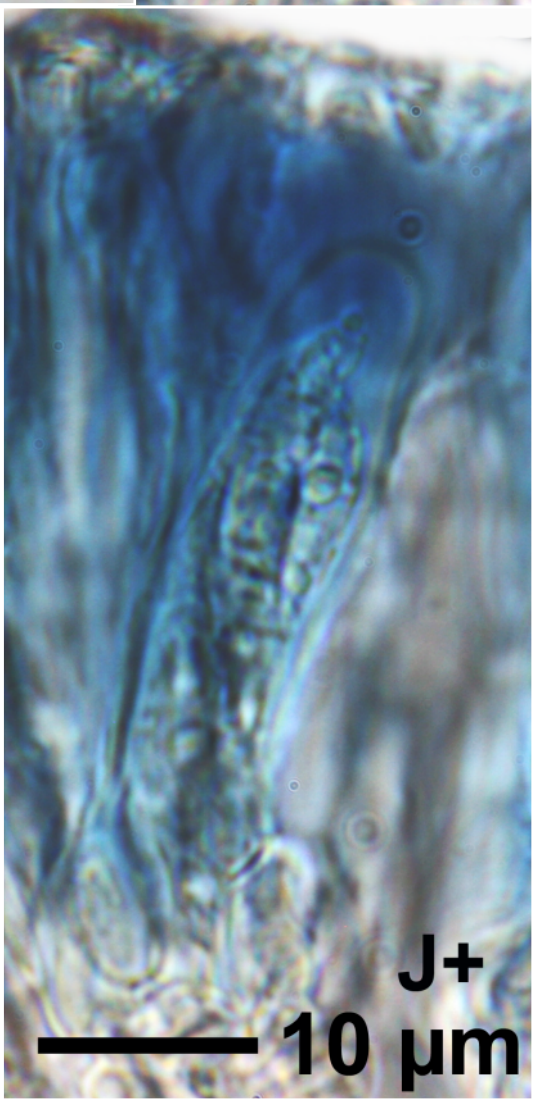






***Coccocarpia smaragdina***



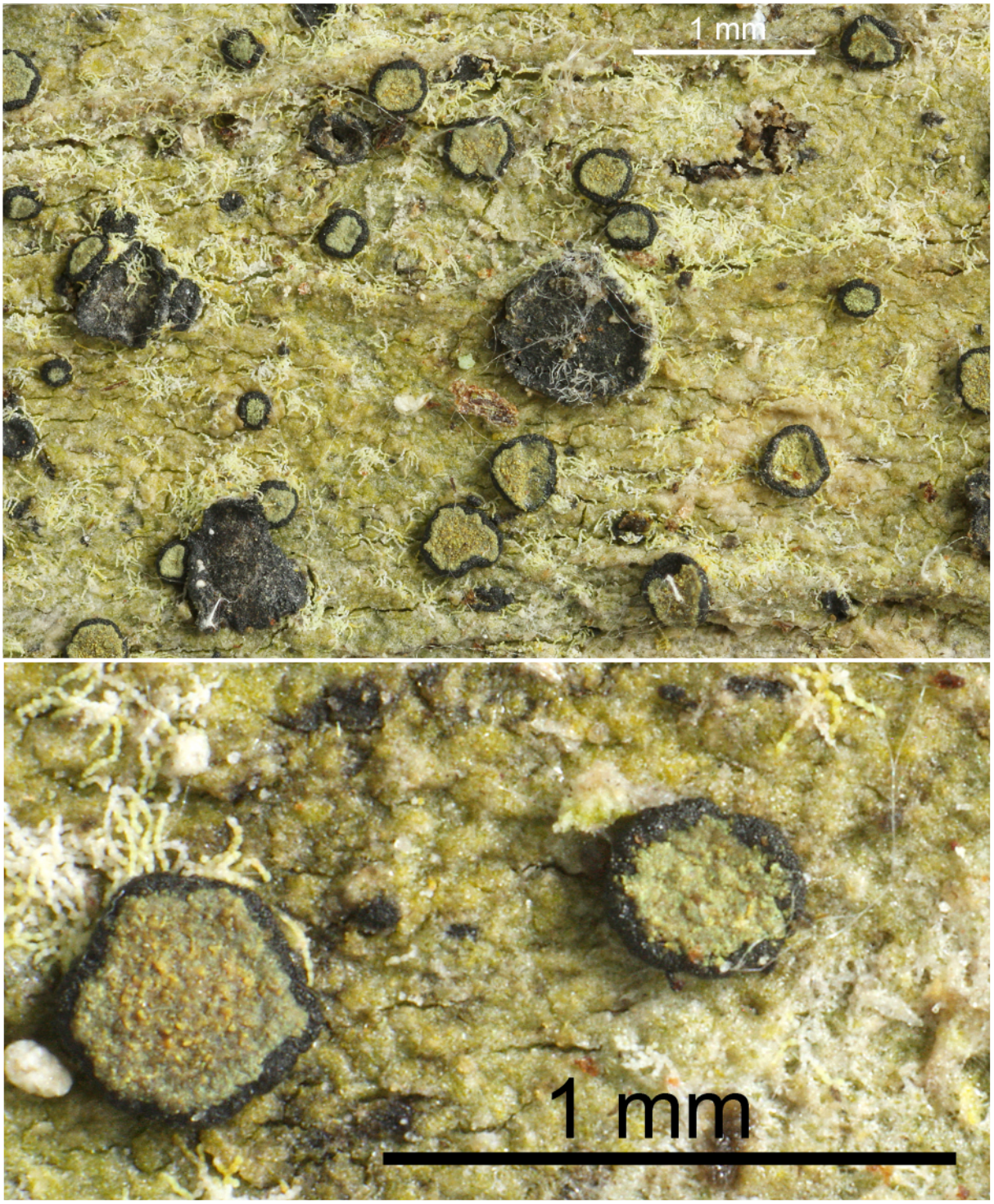



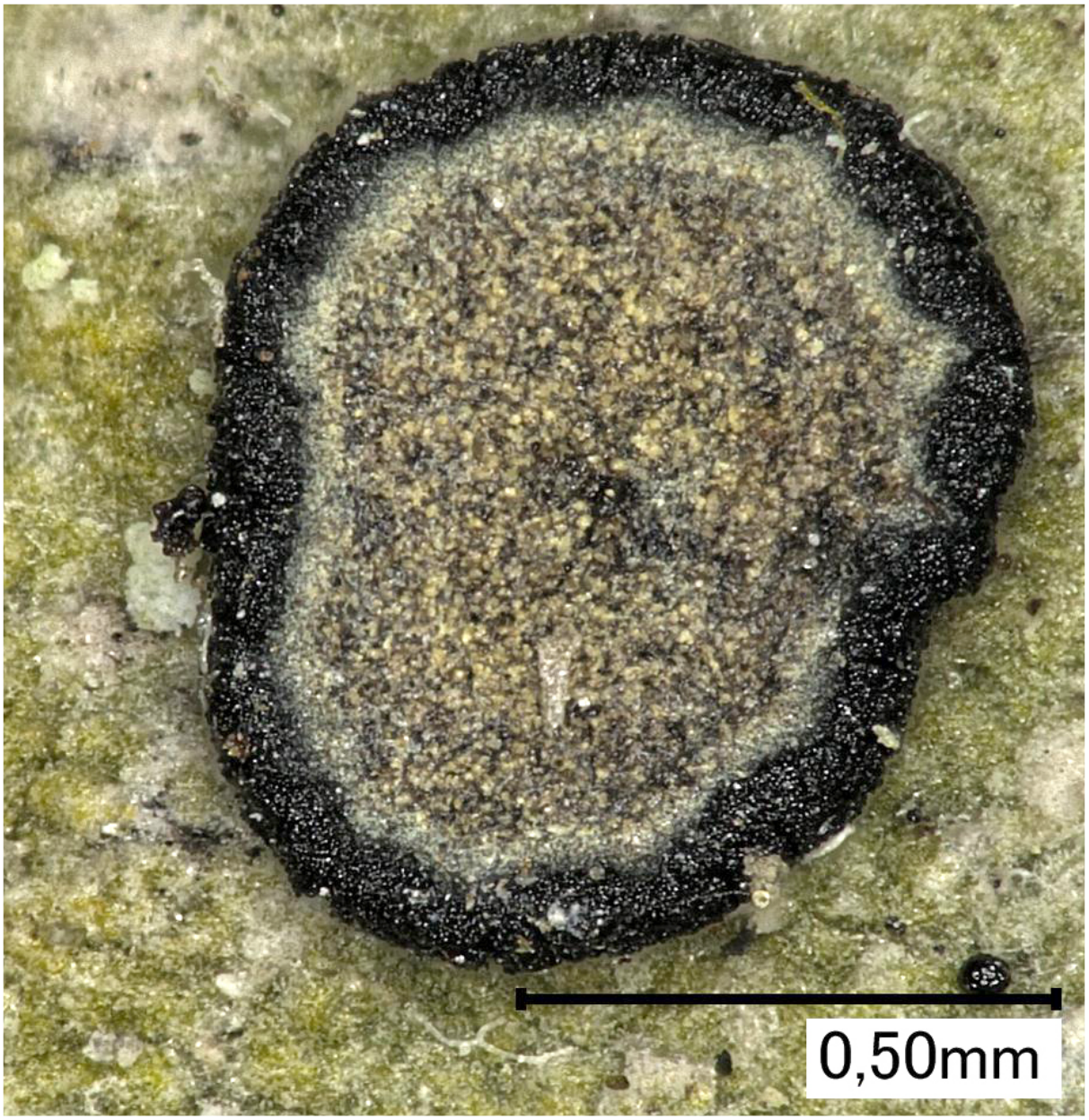

***Coccocarpia smaragdina***

***Cresponea proximata*** (Nyl.) Egea & Torrente

Thallus greenish. Apothecia black, disk yellow pruinose (pol. light +). Hypothecium and excipulum carbonized, without algae. Paraphyses branched at the ends (visible in K!). Spores hyaline, 5-7 septate, c. 25-32 x 5-6 µm.

[17578], Thailand, Trat province, Had Sai Dum, Mangroven Wald, 12.17332° N, 102.40616° E, 0 m. Leg. Schumm (IAL 7) 16.01.2012, det. Schumm 2012.

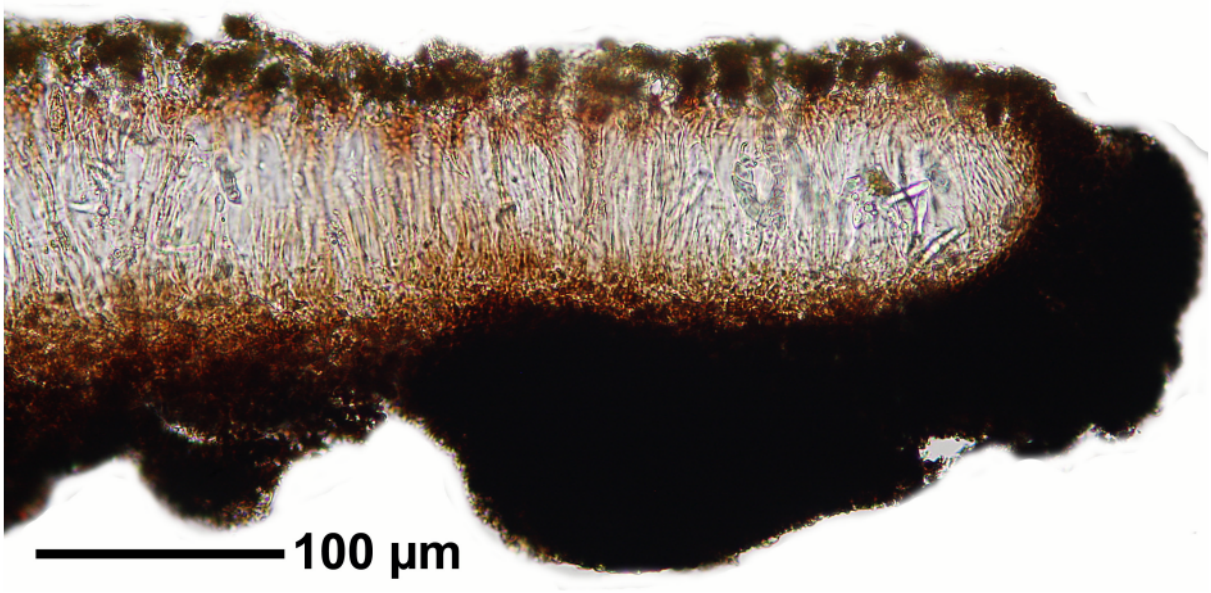


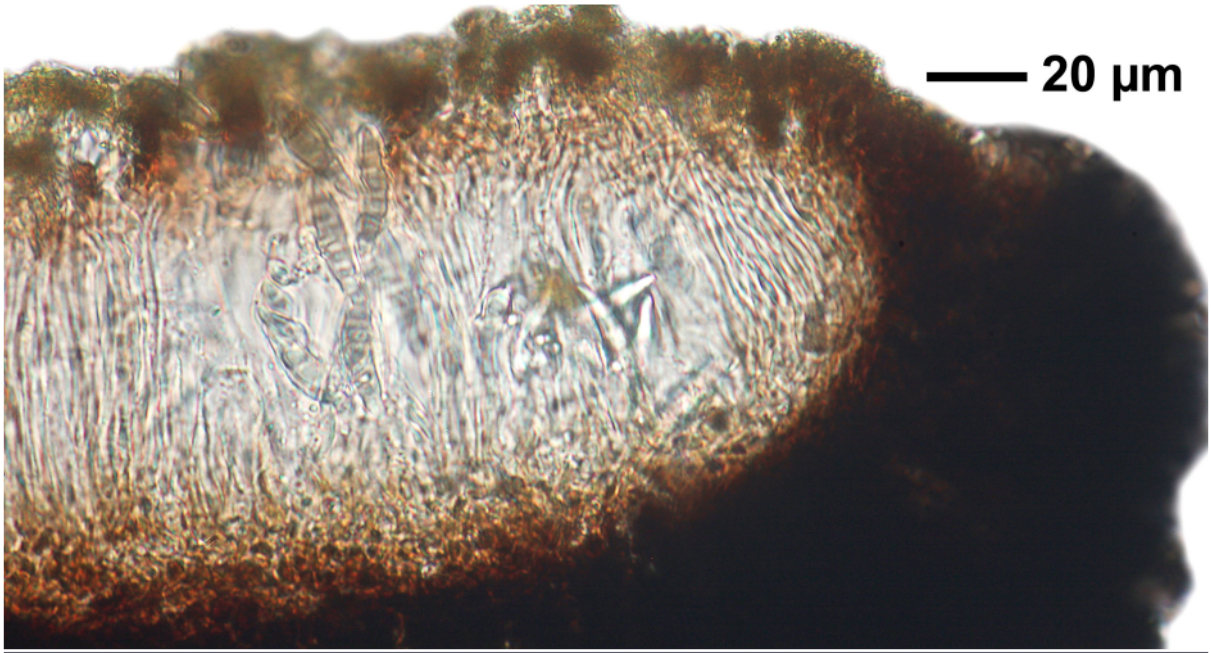


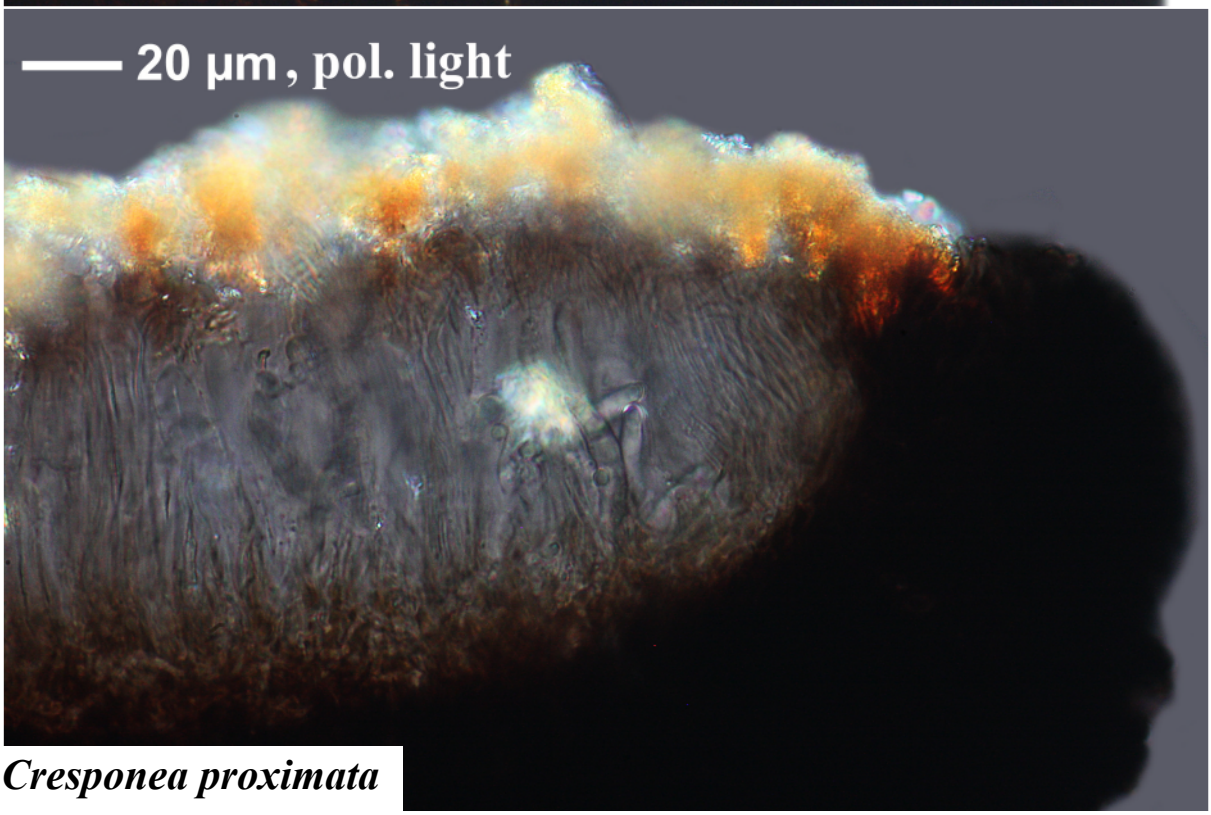




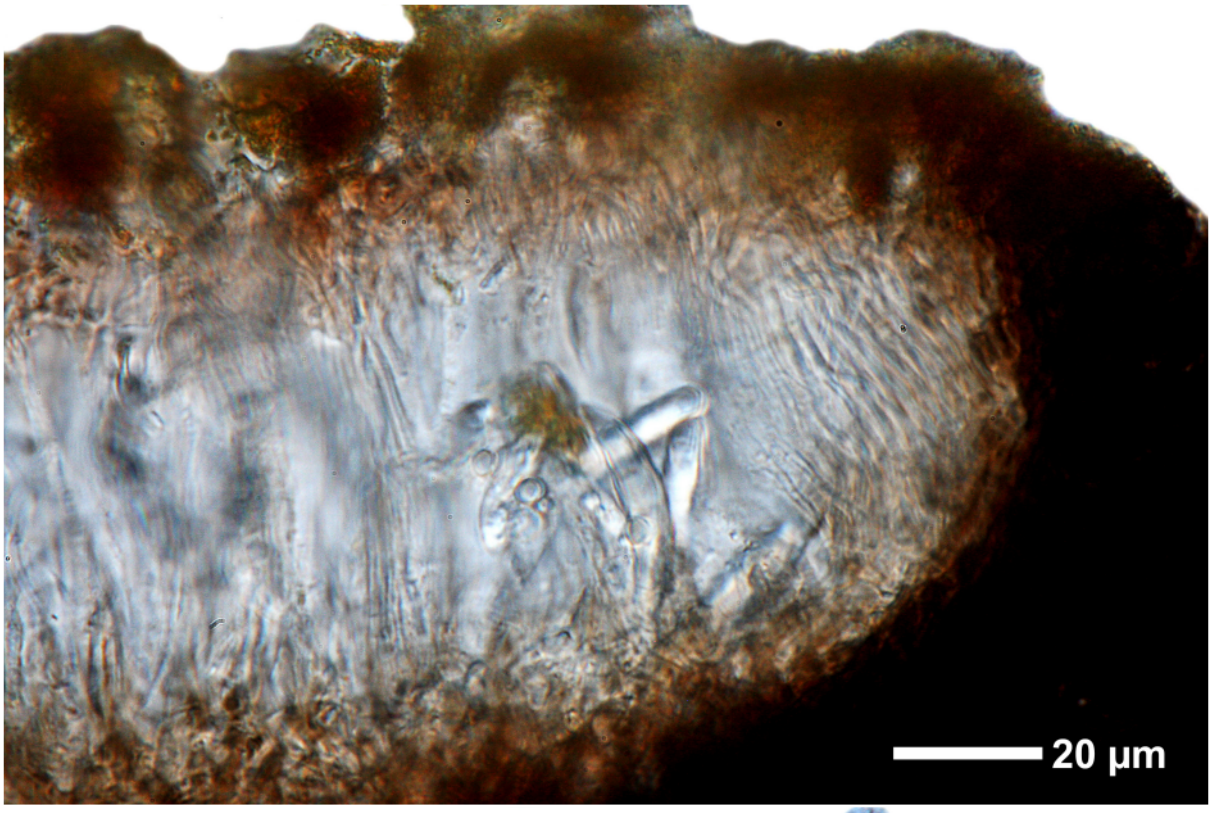
***Cresponea proximata***

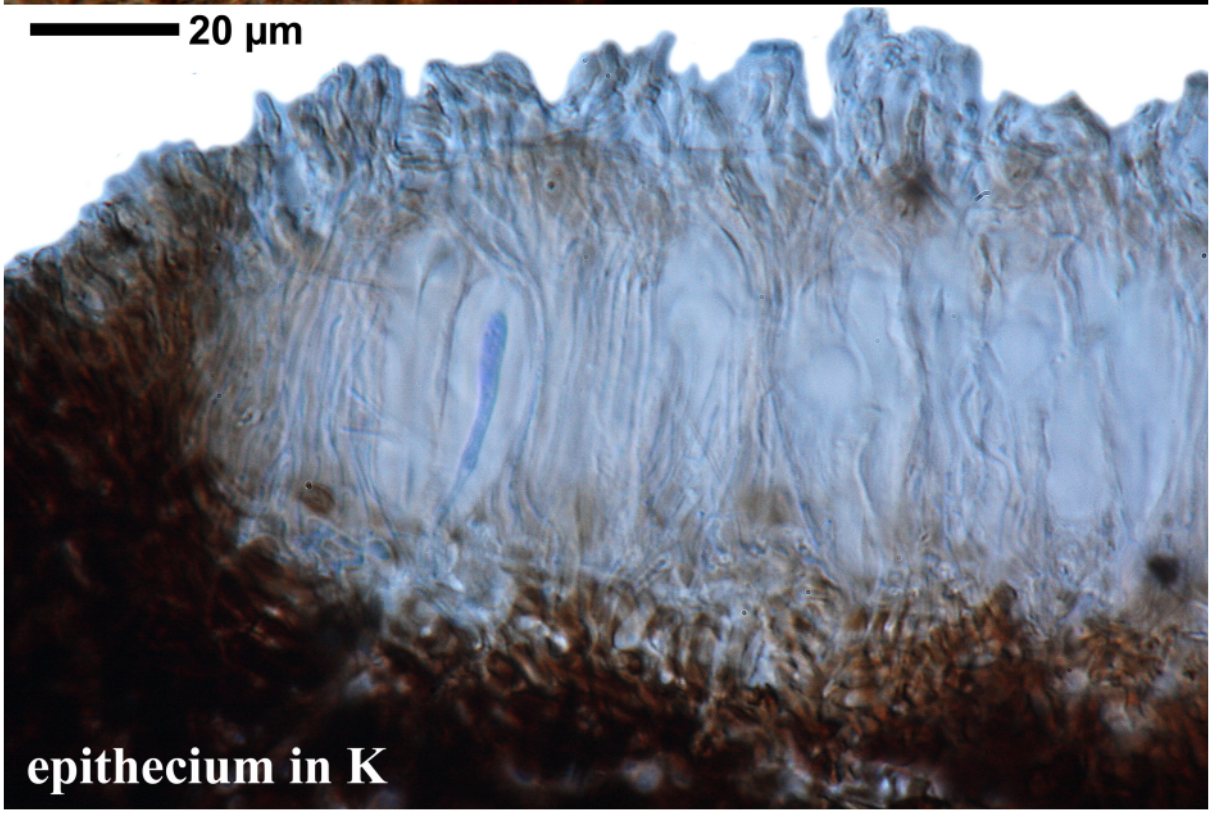


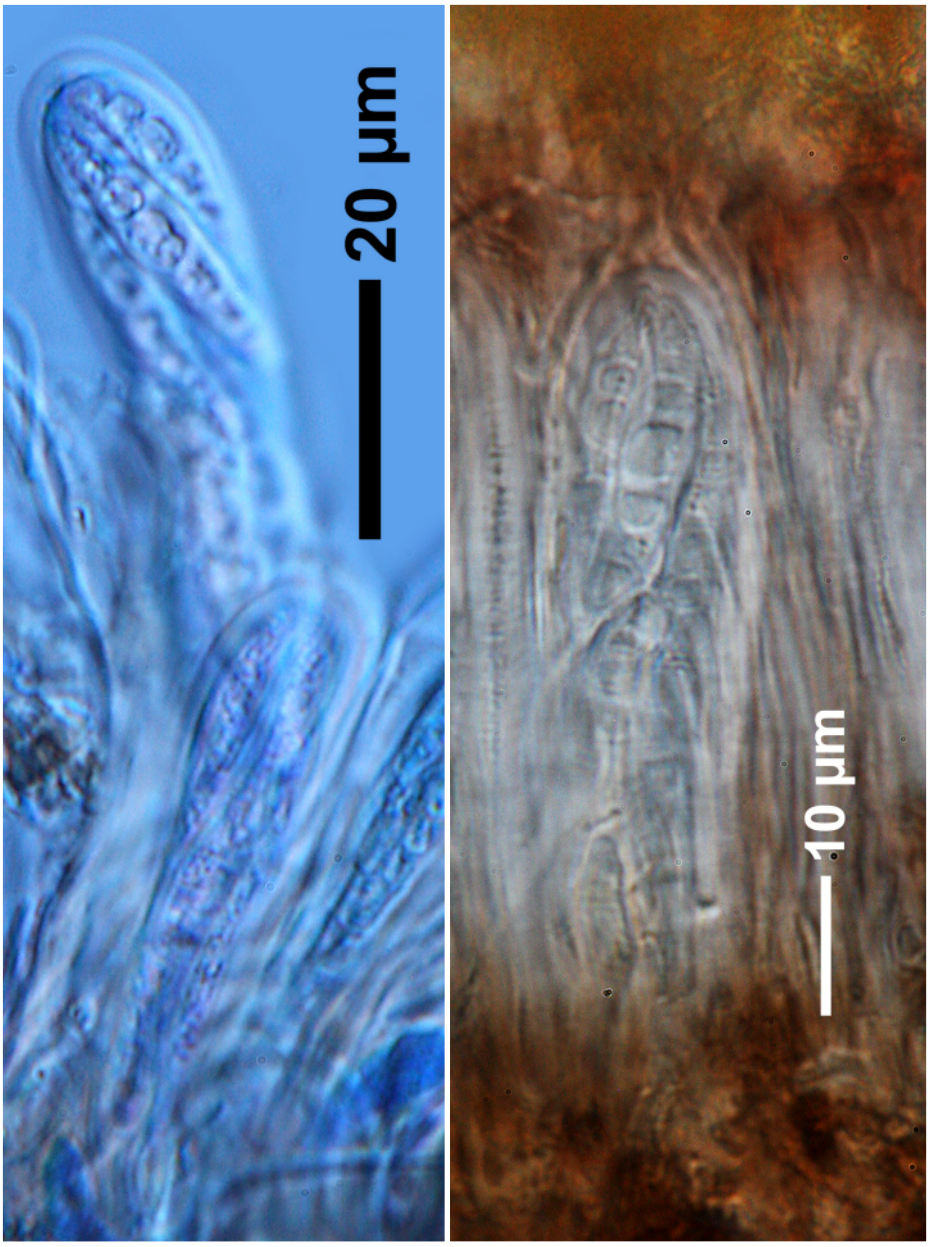




***Cresponea proximata***




***Cresponea proximata***







***Cresponea proximata***

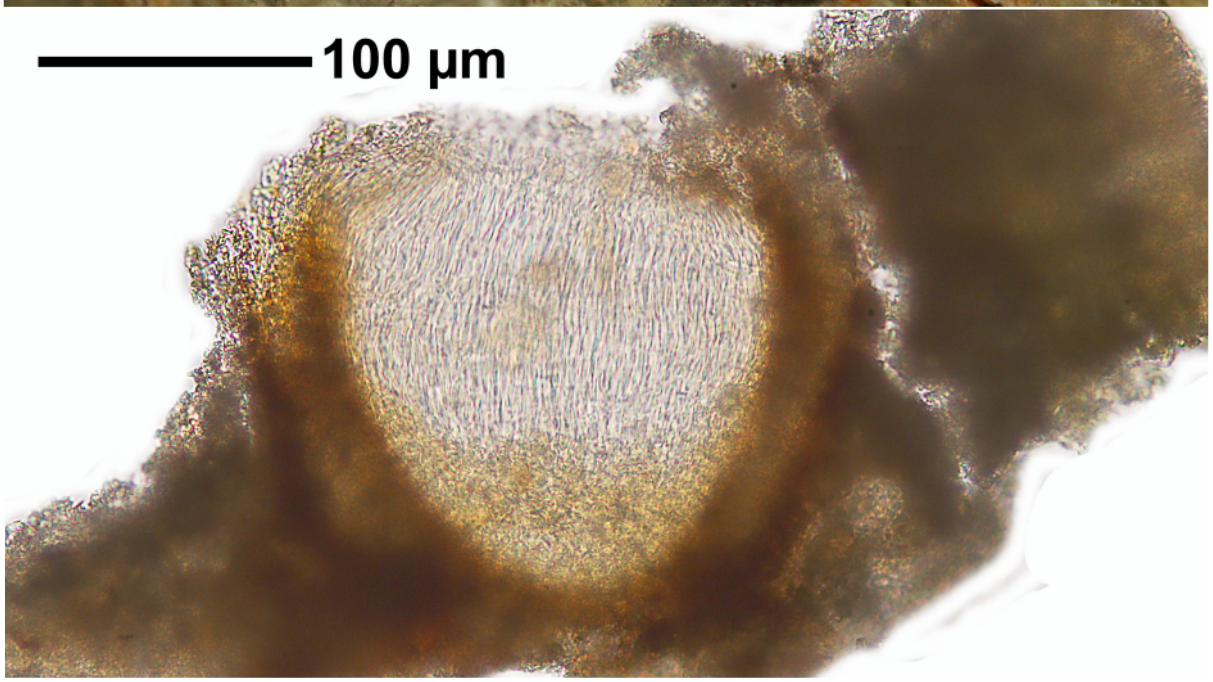
***Diorygma erythrellum*** (Mont. & Bosch) Kalb, Staiger & Elix
[= ***Graphina erythrellum*** (Mont. & Bosch) Zahlbr.]

Thallus grey to pale brownish, uneven or with small warts, surface matt or glossy, not powdery, 50-100 µm thick. Lirellae 0.7-7 x 0.3-0.5 mm, young slit-like, later open and elevated. Disk reddish to brown, thinly white pruinose. Excipulum more or less divergent, not carbonized, yellowish to pale brown. Hymenium not inspersed, 120-150 µm high. Epithecium appr. 5 µm, brown. Paraphyses with thin lumina and thick gelatinous cover, rarely anastomosing, tips of paraphyses nearly not branched, ending in gelatinous cover. Ascospores 8/ascus, hyaline, muriform, 35-57 x 9-18 µm, J± violet. Chemistry: medulla K yellow>orange-red, P+ yellow; norstictic acid (major), connorstictic acid (minor). Note: similar to *Platythecium dimorphodes* and *P. colliculosum*, but ascospores larger and paraphyses with thin lumina and thick gelatinous cover.

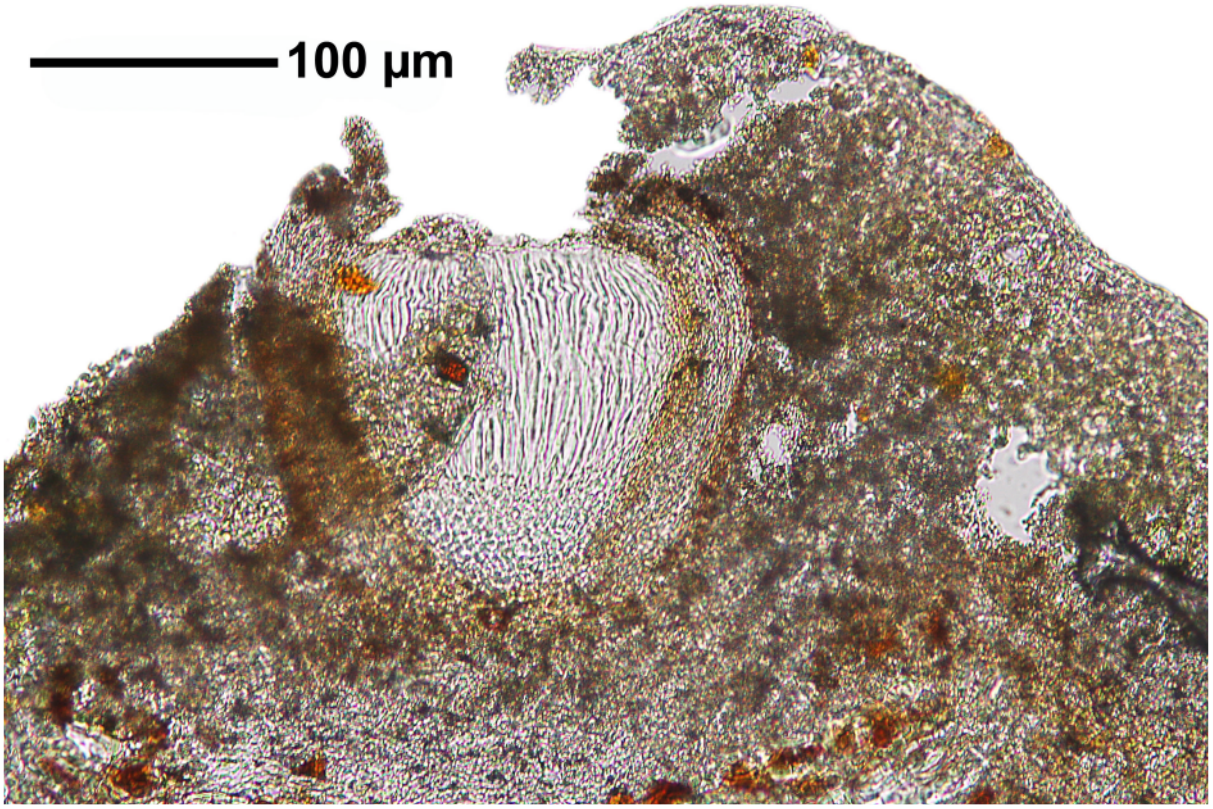
[5872], Philippinen, Mindanao, Provinc Cotabato, bei Ilomavis an der Straße nach Kidapawan, 07°02.069’ N, 125°11.367’ E, 730 m. Leg. Schumm 07.08.1999, det. Schumm conf. Staiger. (Specimen mentioned in Kalb, Staiger & Elix- 2004)

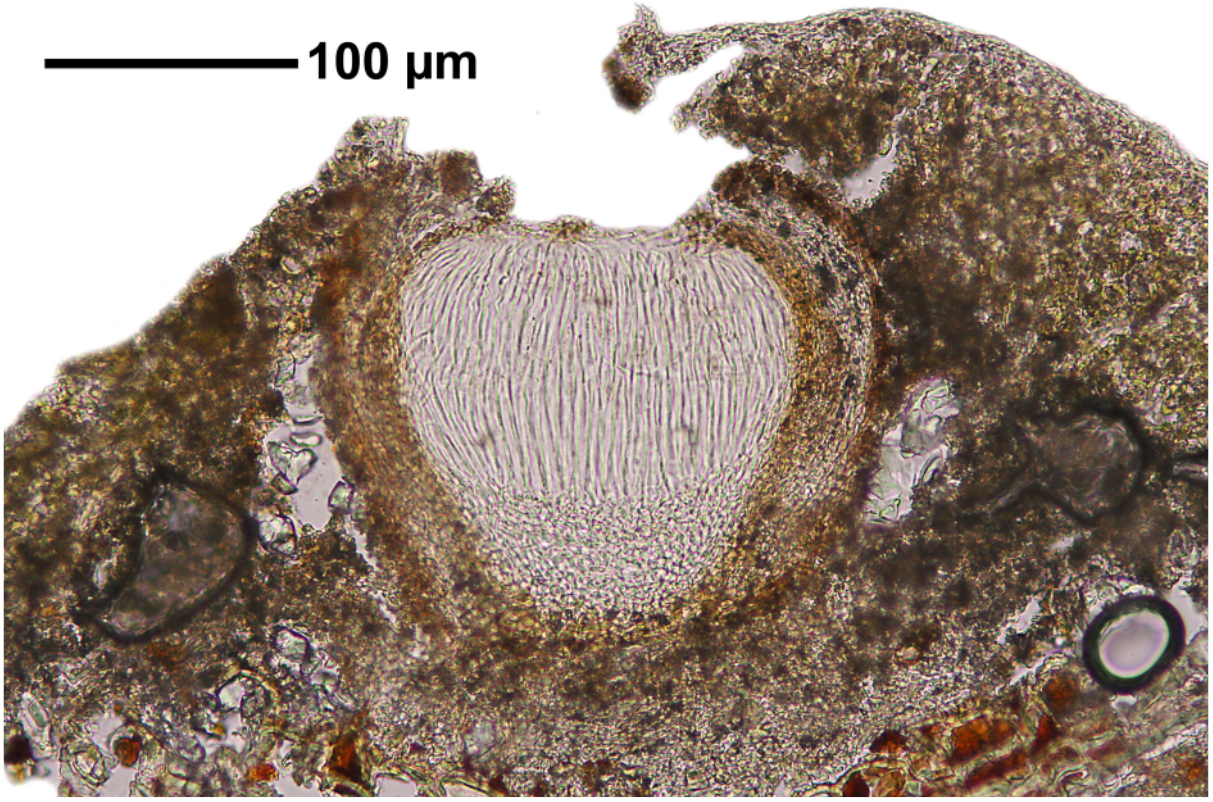




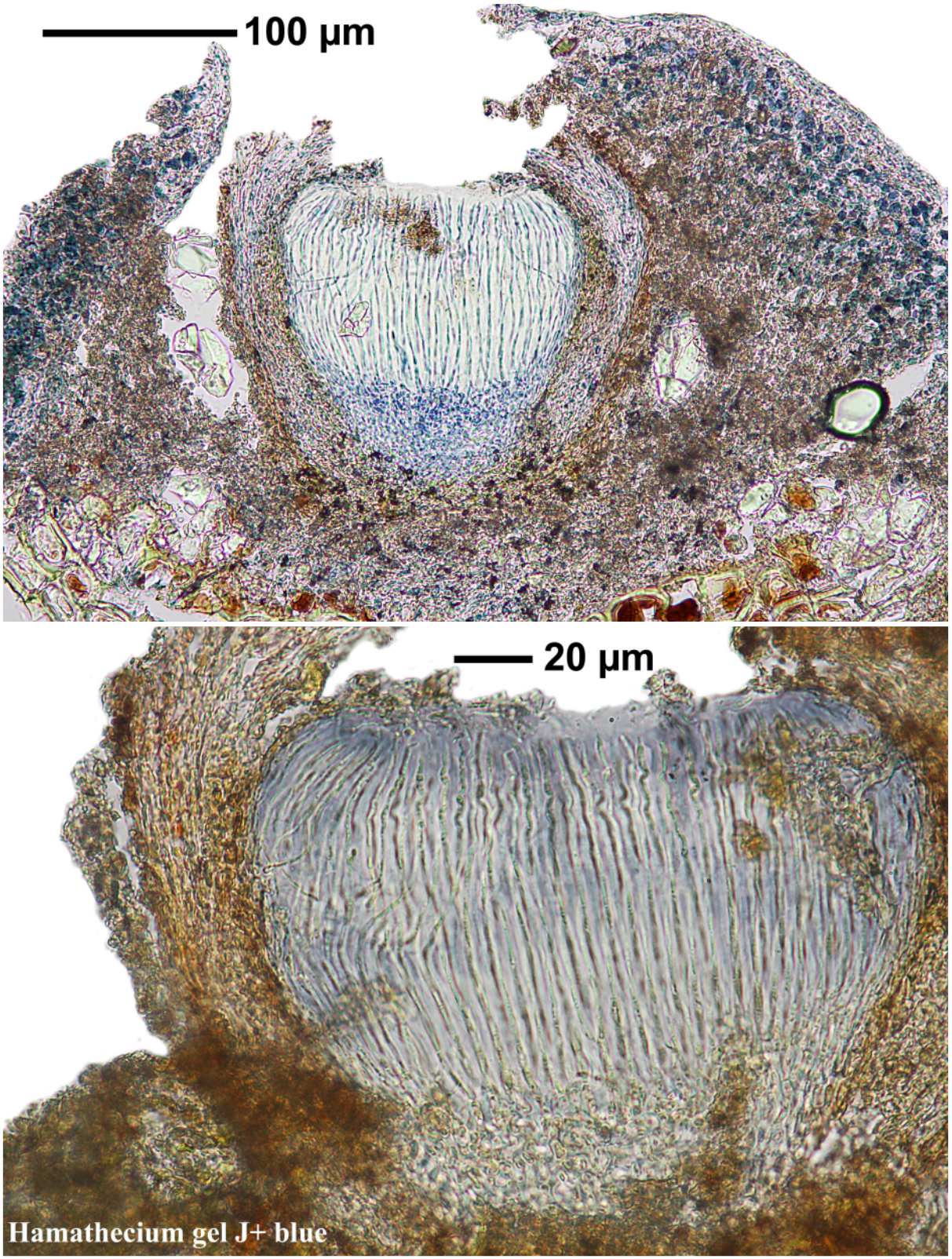




***Diorygma erythrellum***

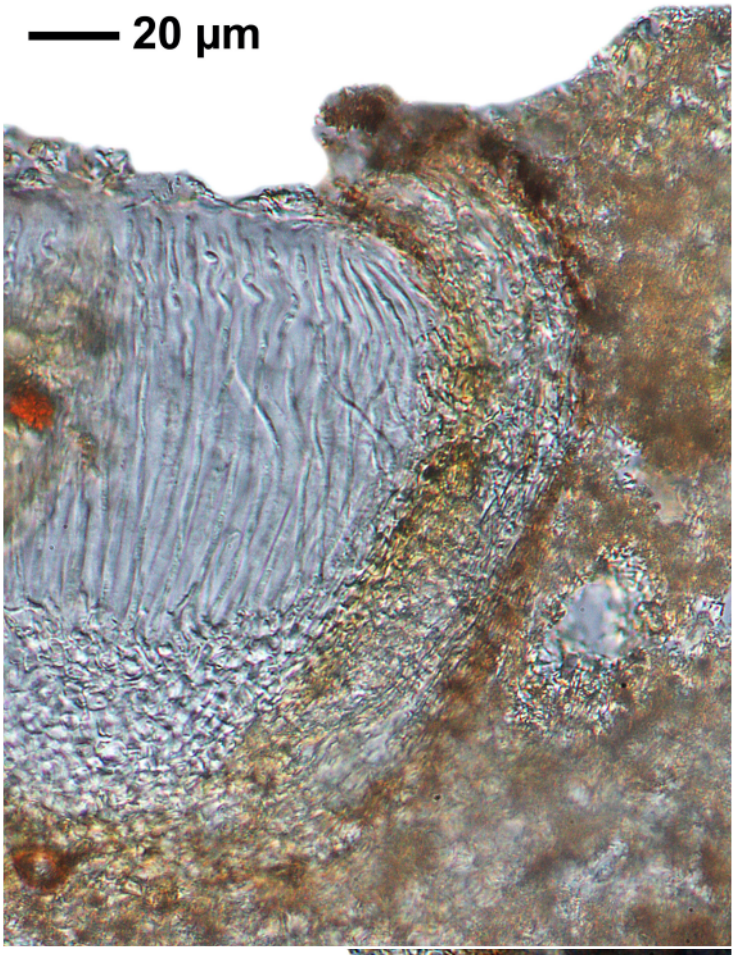


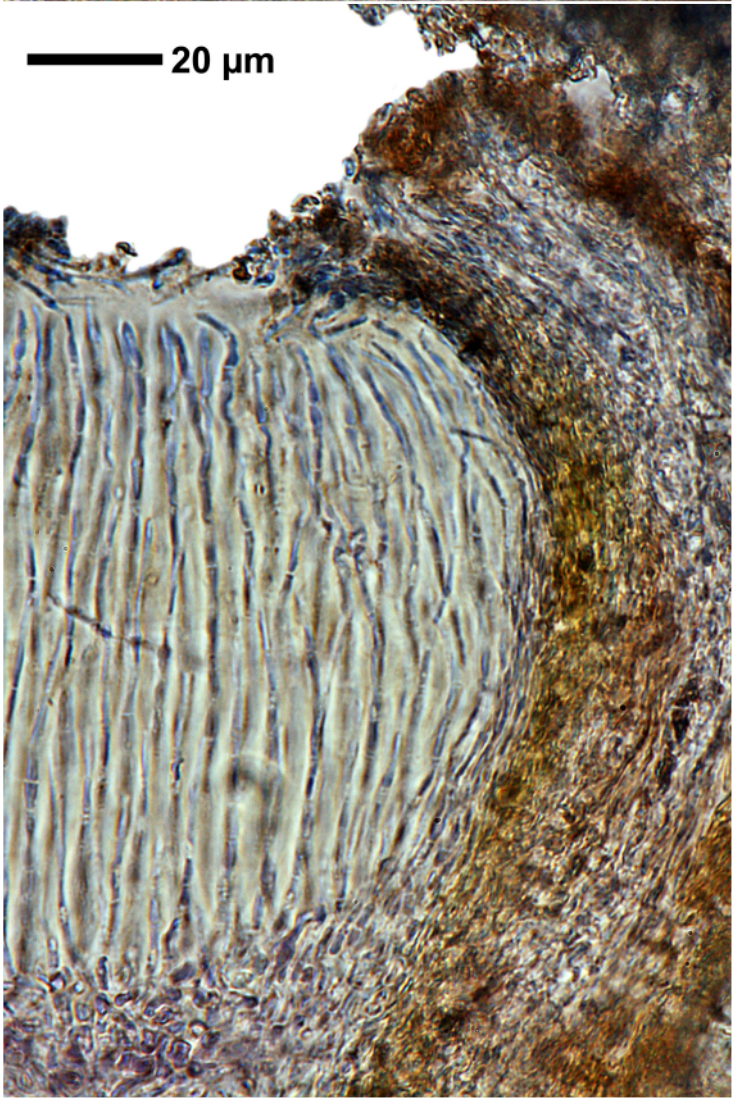




***Diorygma erythrellum***

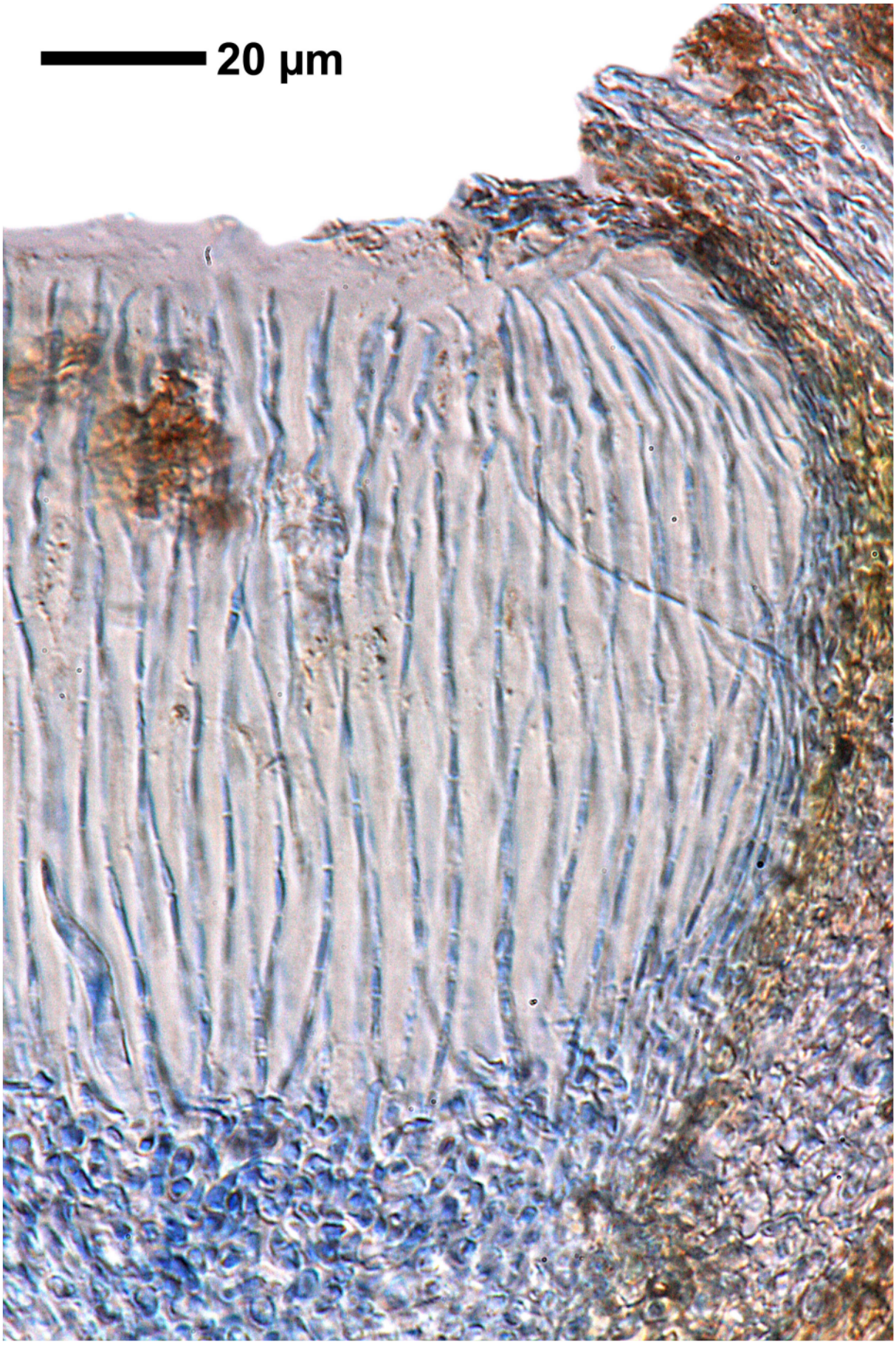



***Diorygma erythrellum***

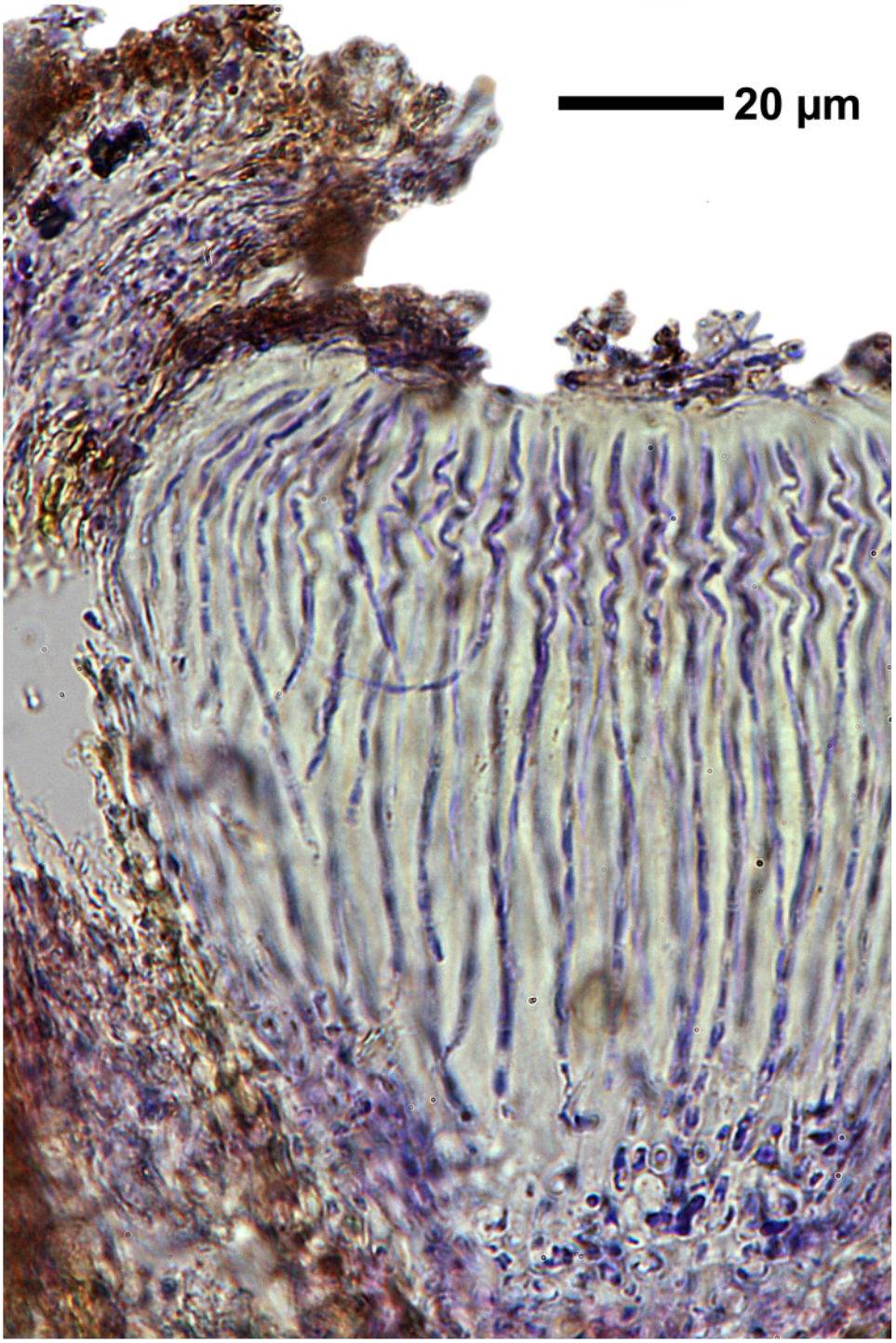



***Diorygma erythrellum***



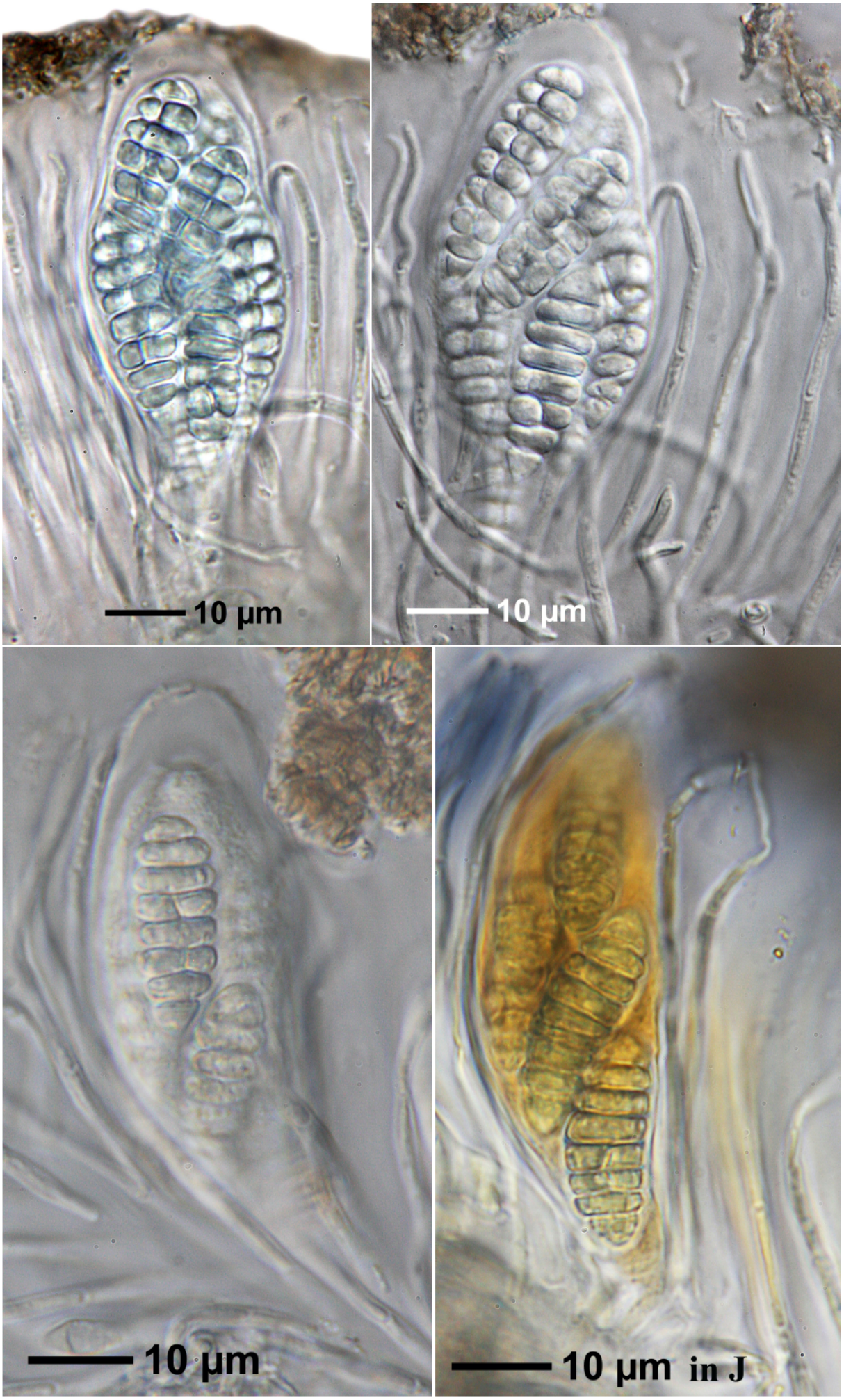

***Diorygma erythrellum***



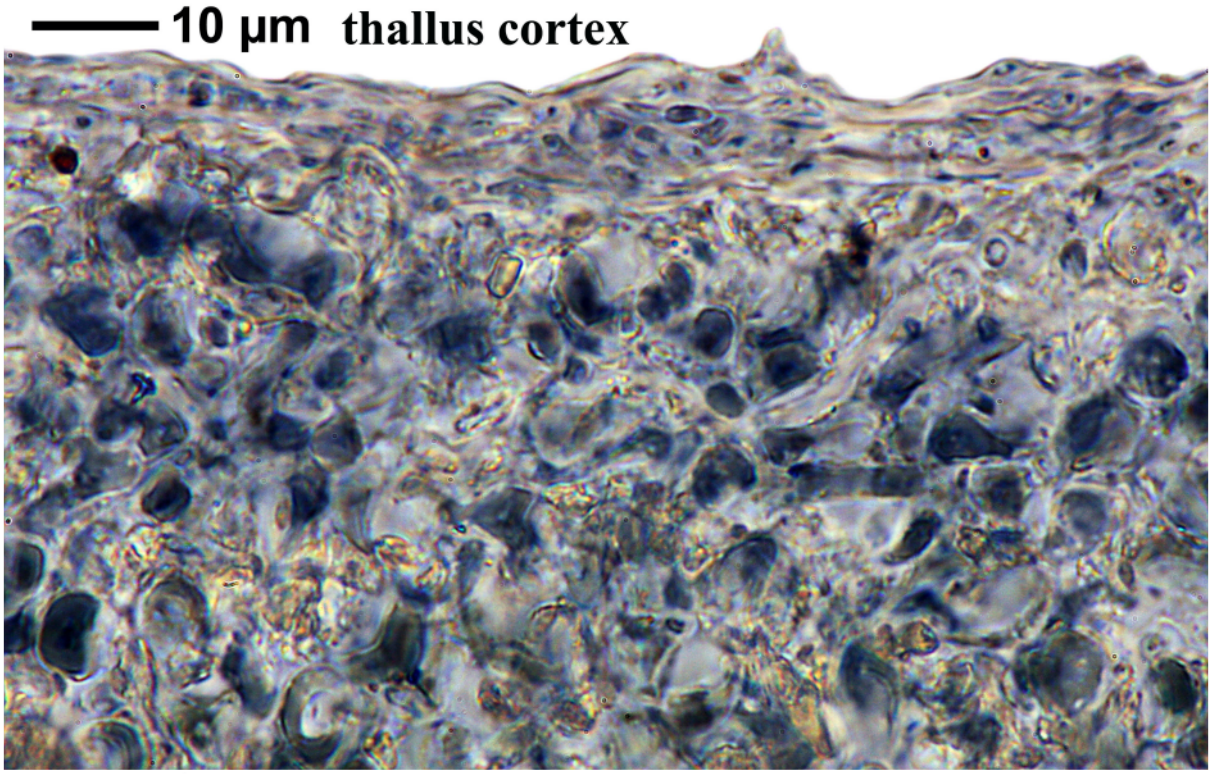


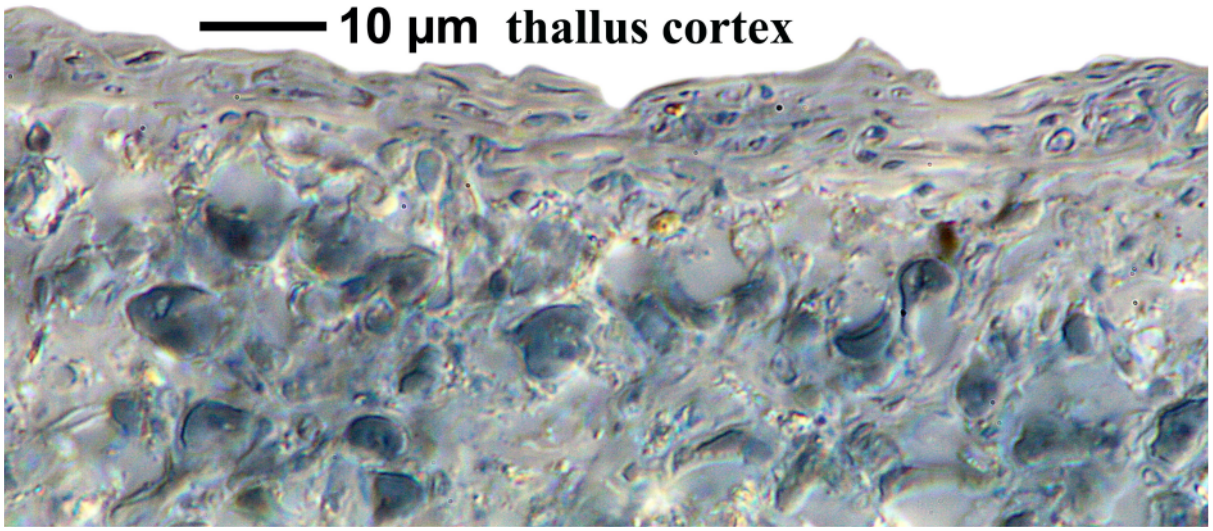


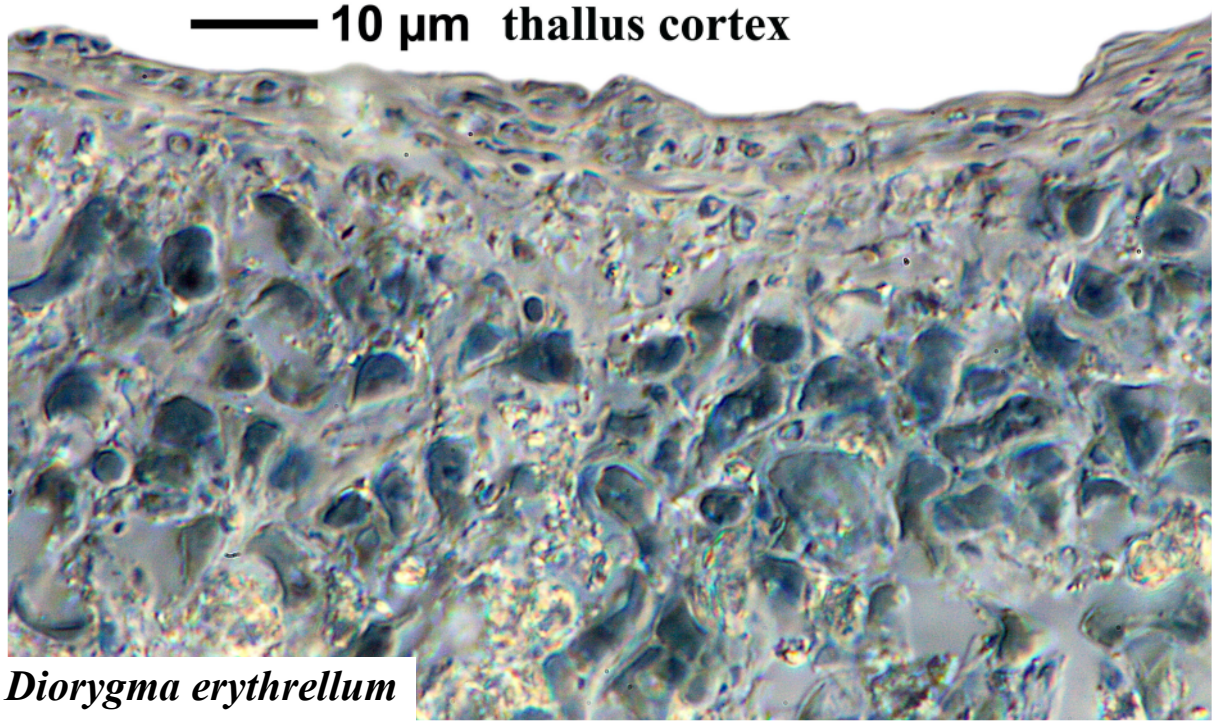
***Diorygma erythrellum***




***Diorygma erythrellum***




***Diorygma erythrellum***

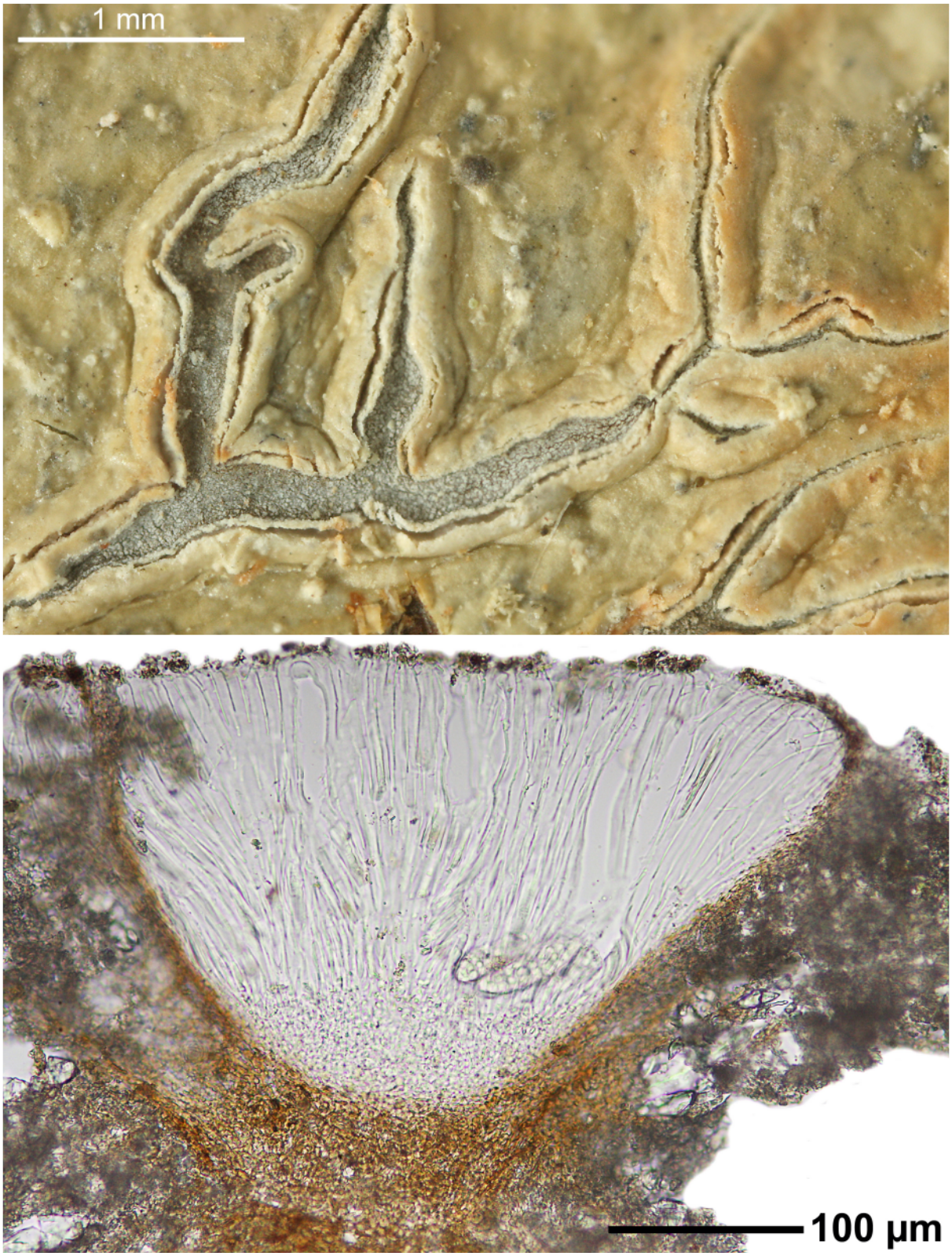
***Diorygma erythrellum*** (Mont. & Bosch) Kalb, Staiger & Elix
[= ***Graphina erythrellum*** (Mont. & Bosch) Zahlbr.]

[6425], Philippinen, Mindanao, Prov. Misamis Oriental, südwestl. Gingoog City, Barangay Lunutan N 08°42.510, E 125°01.241, 1120 m und am Weg zum Mt. Lumot (Via Haruhay Trial) bis zum Zwischencamp im trop. Bergregenwald 08°40.713' N, 125°01.649' E, 1680 m. Leg. Schumm 24.08.1999, det. Schumm, test. Archer and Staiger. Specimen mentioned in Kalb,Staiger & Elix (2004).

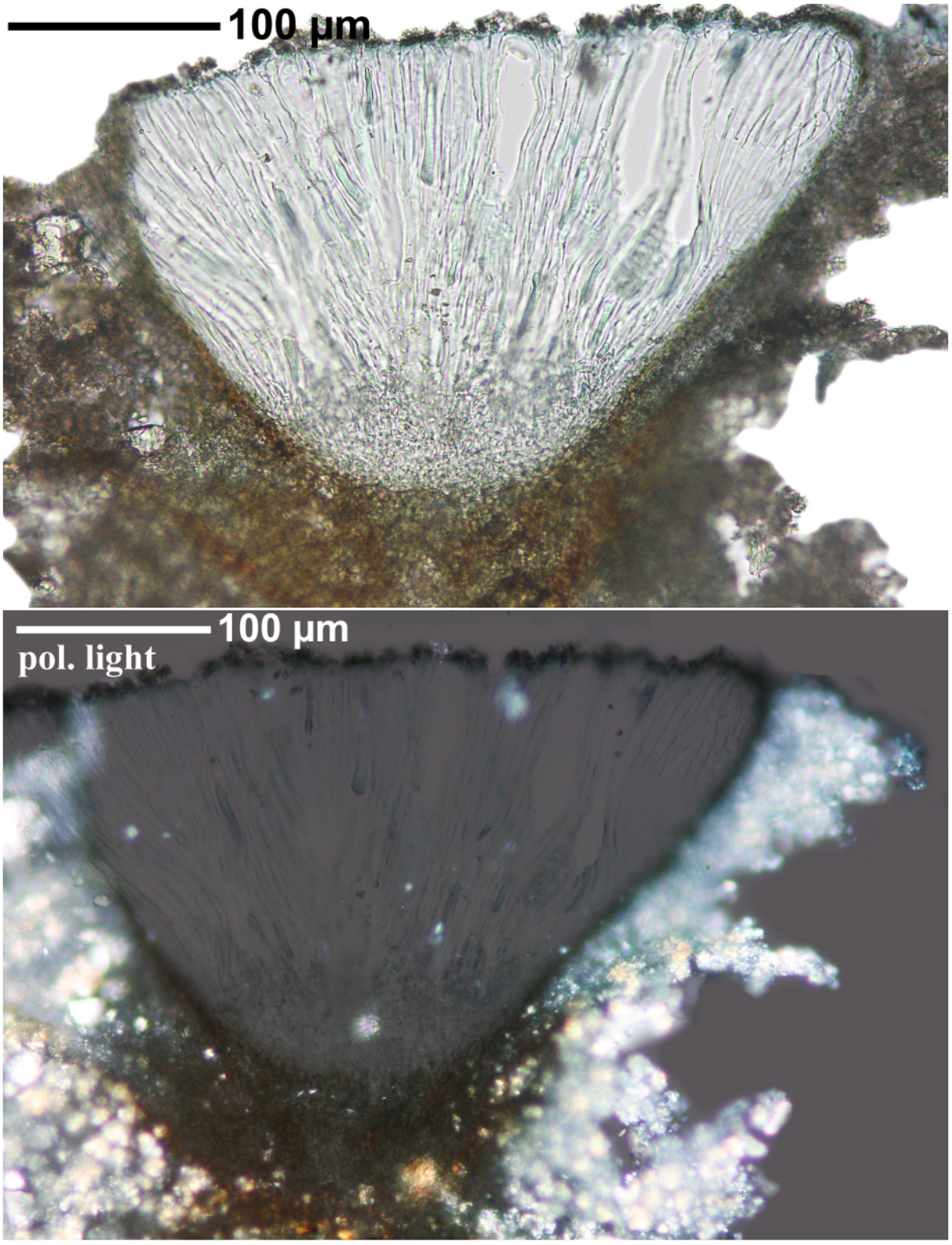




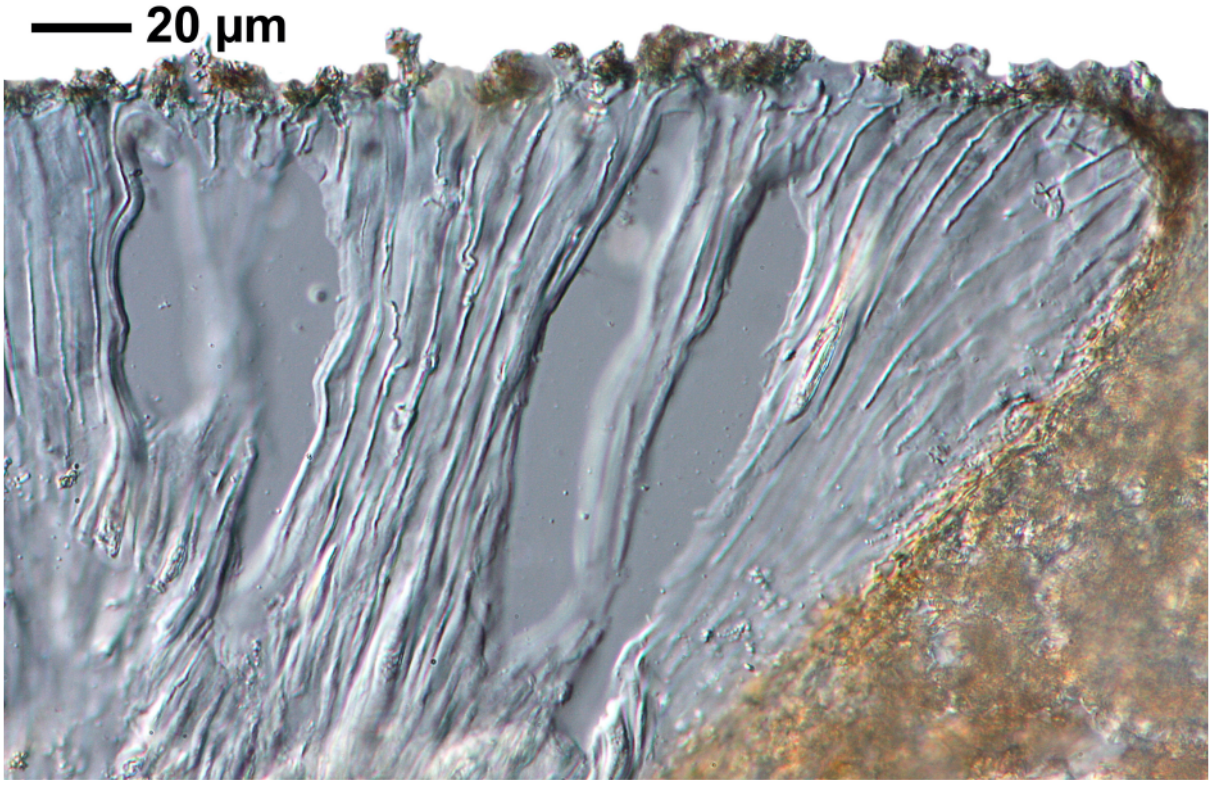

***Diorygma erythrellum***

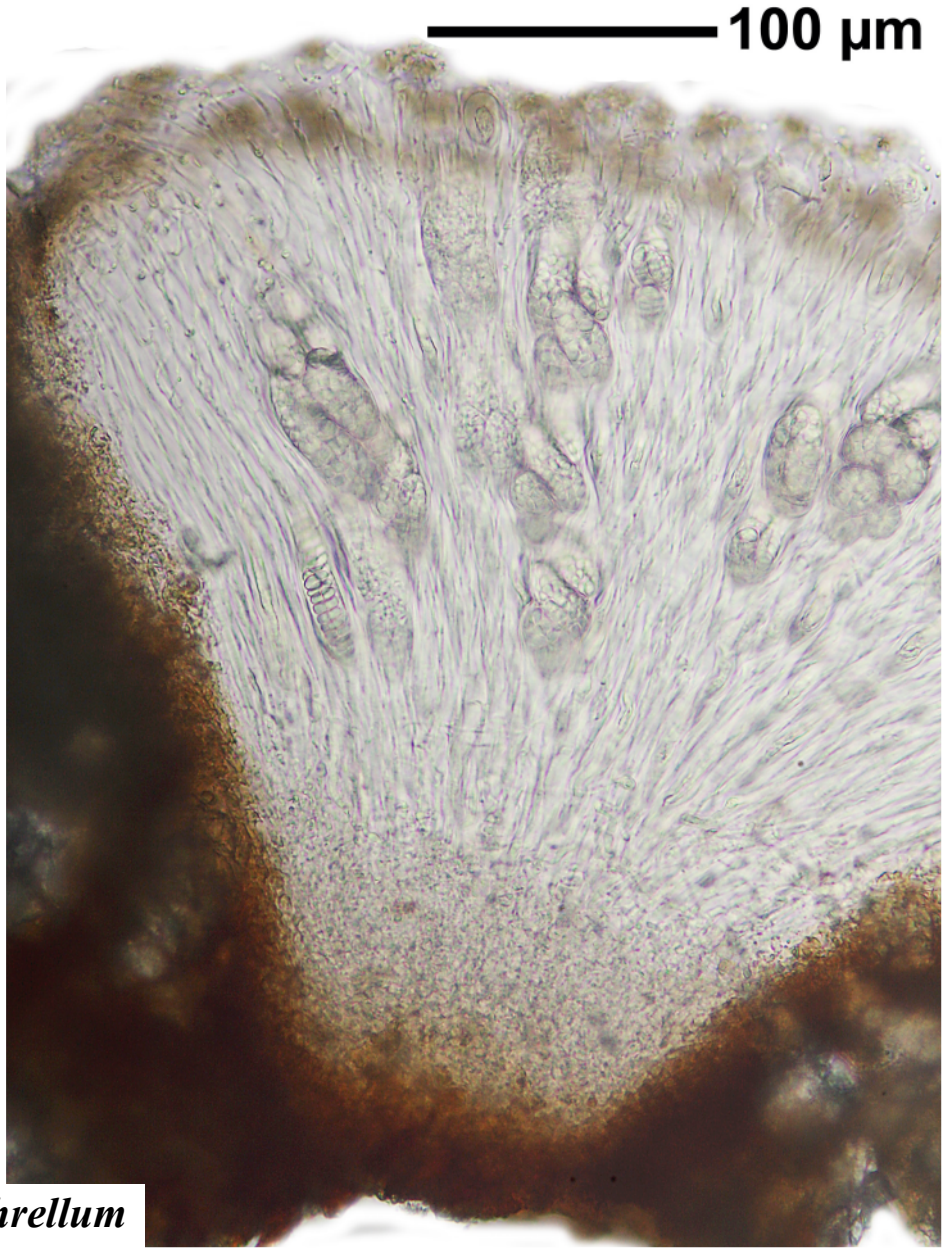



***Diorygma erythrellum***

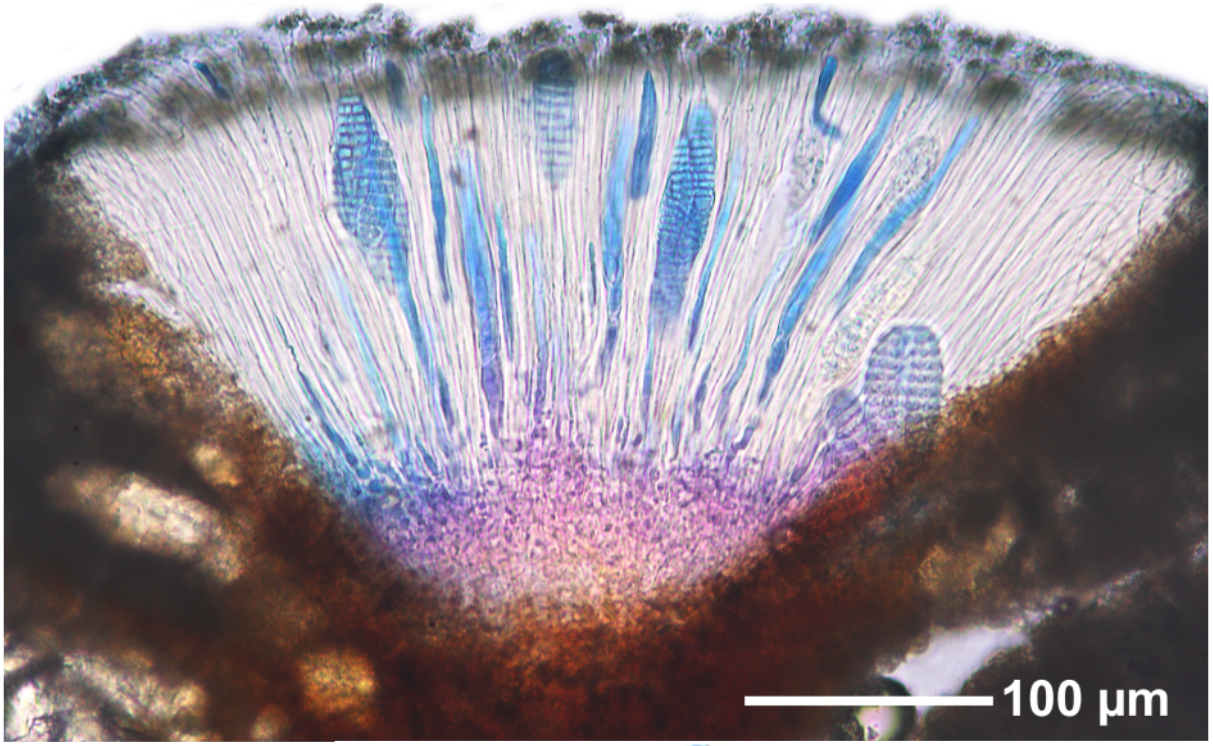



***Diorygma erythrellum***



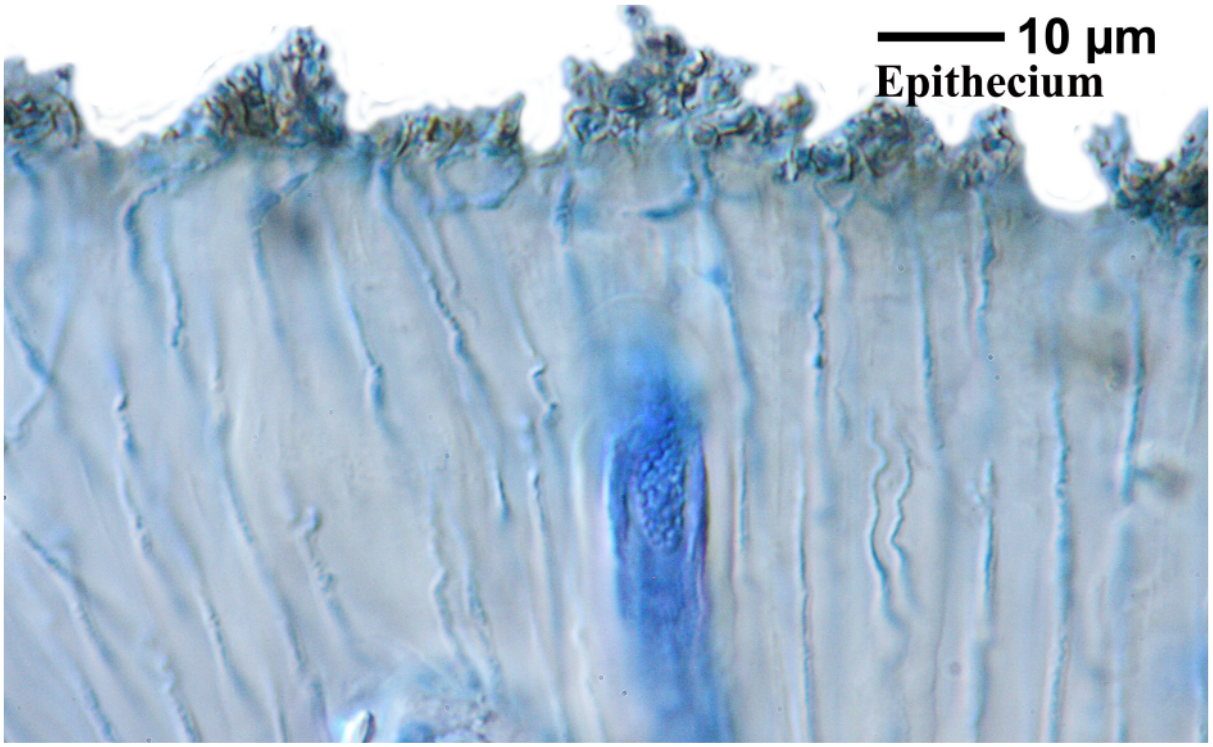

***Diorygma erythrellum***

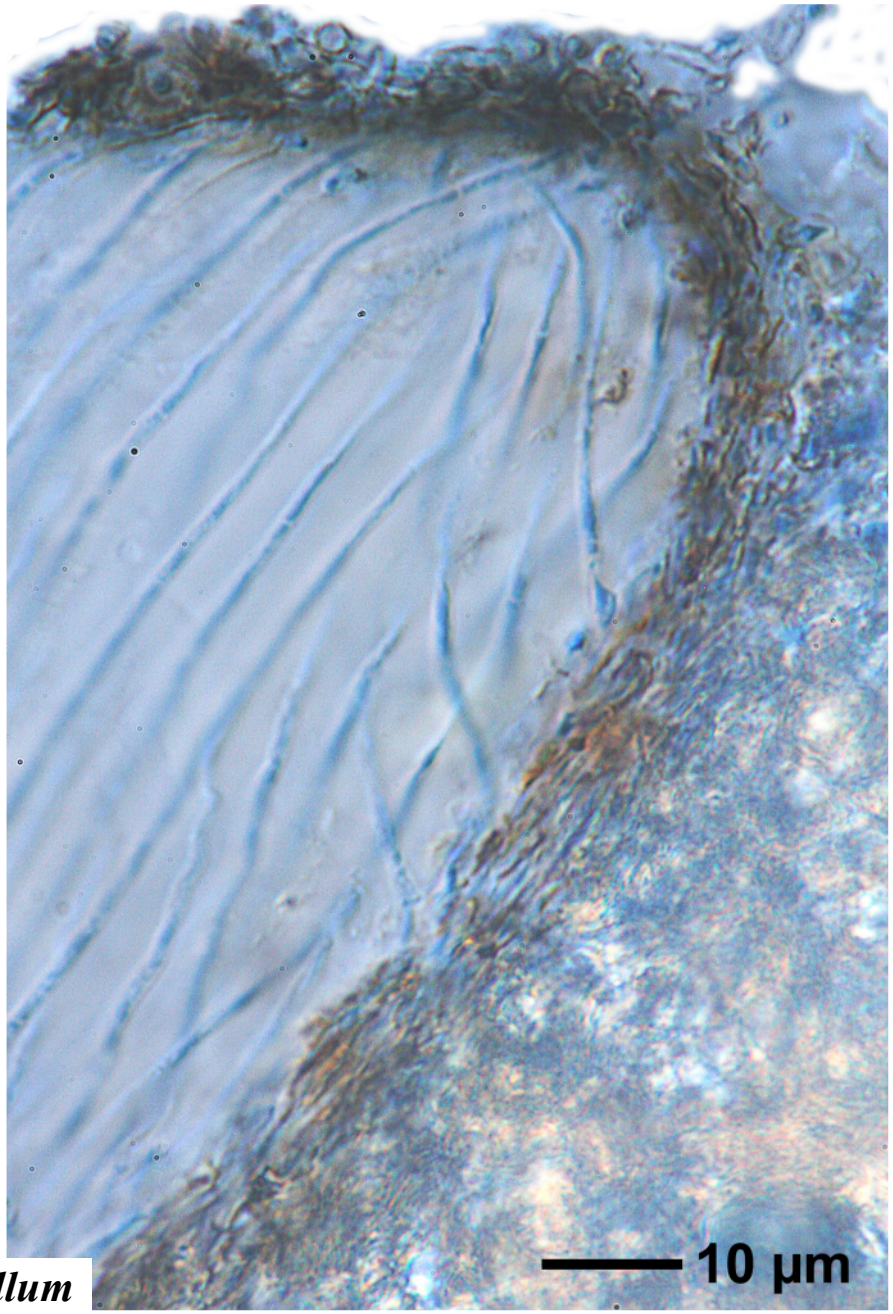






***Diorygma erythrellum***




***Diorygma erythrellum***







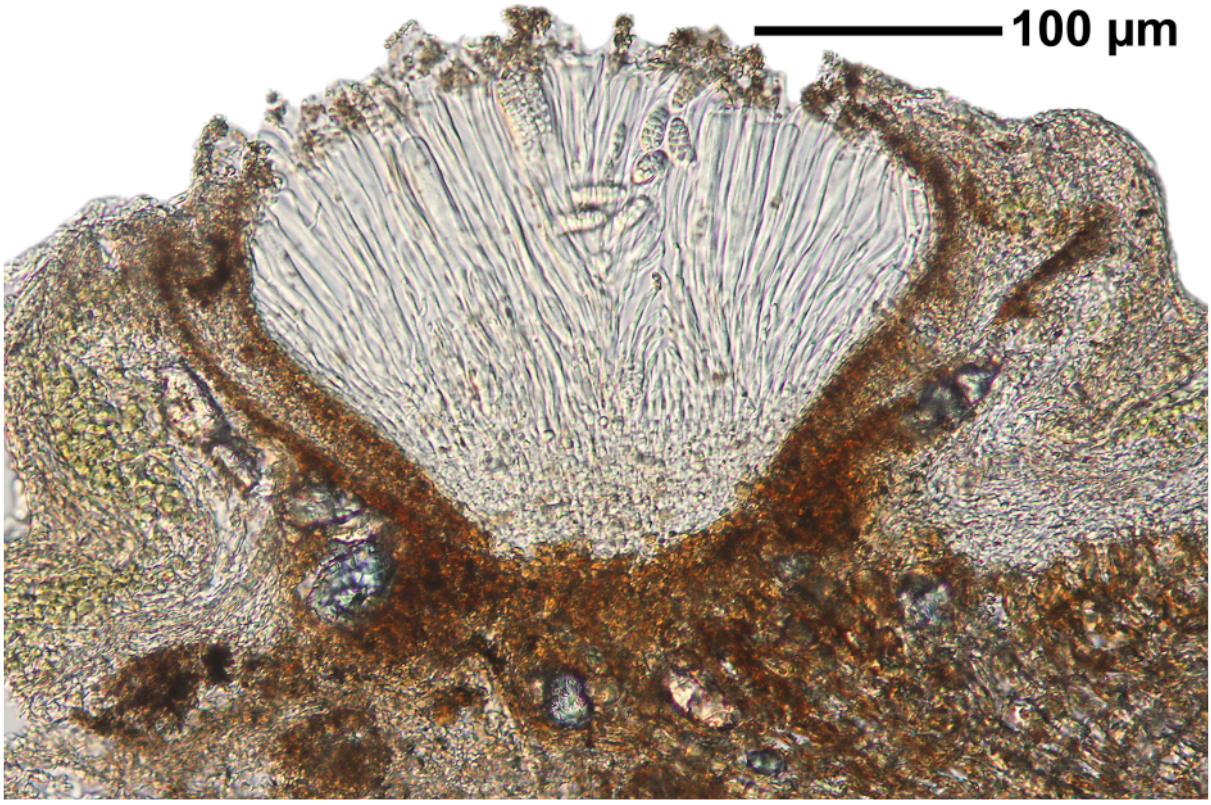
***Diorygma erythrellum***

***Diorygma erythrellum*** (Mont. & Bosch) Kalb, Staiger & Elix

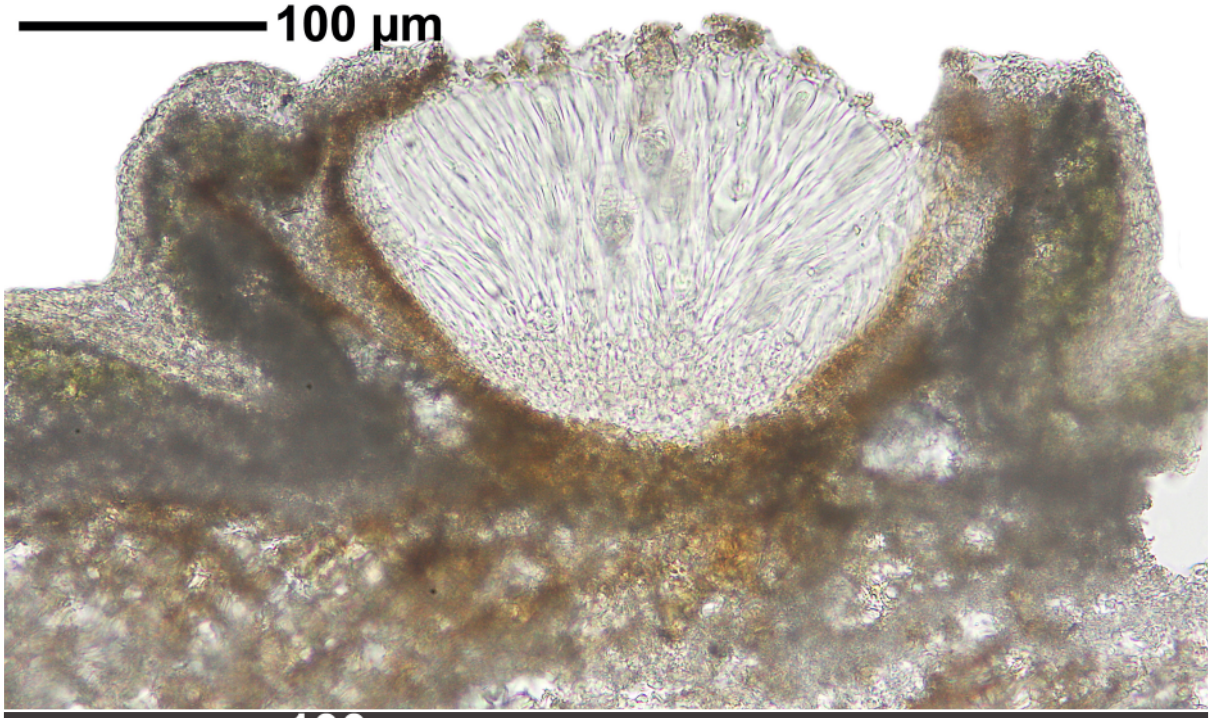
[7999], Philippinen, Leyte, Prov. Leyte, Lake Danao (11°03.920’ N, 124°42.216’ E, 630 m) bei Barangay Lake Danao, (East-District Ormoc-City). Leg. Schumm 26.08.2000, det. Aptroot 2012.

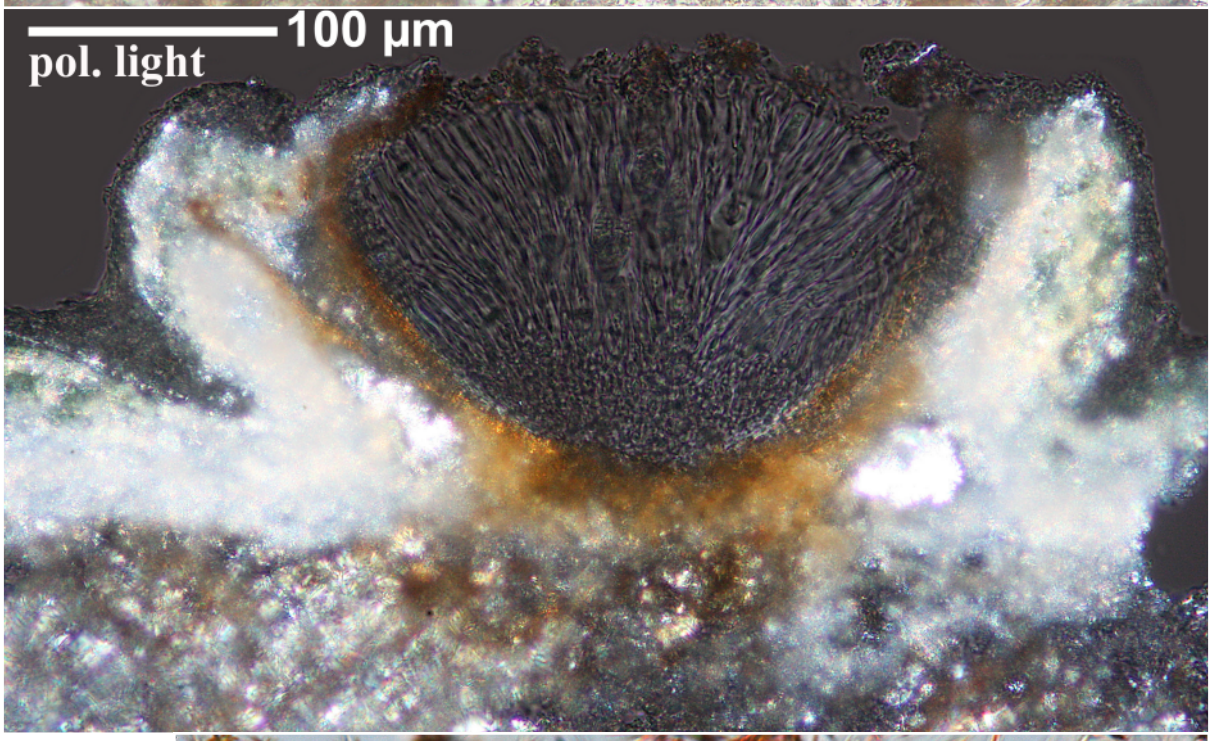


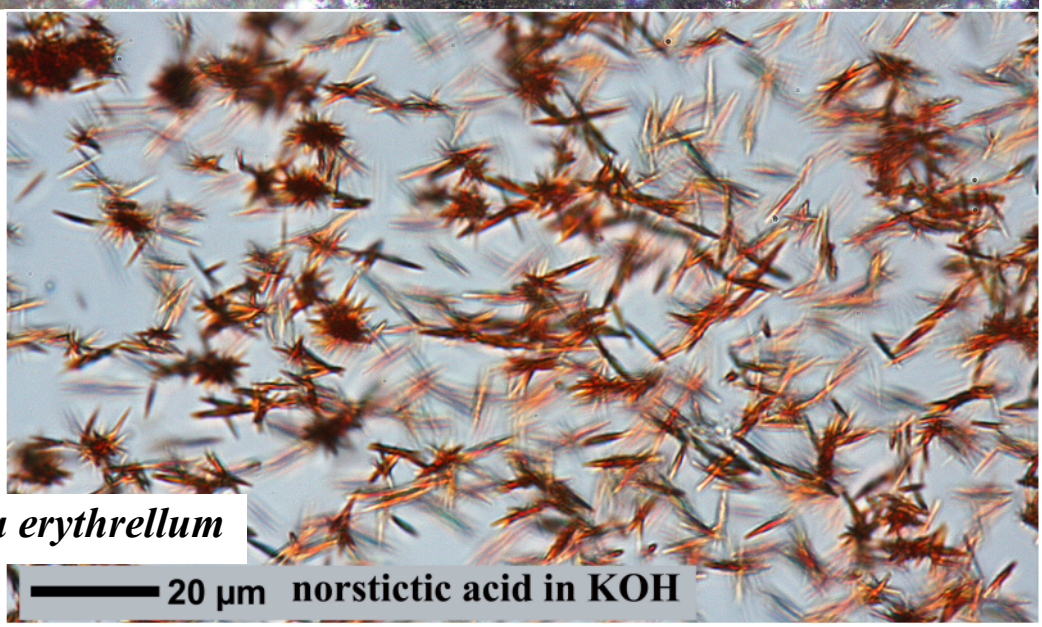


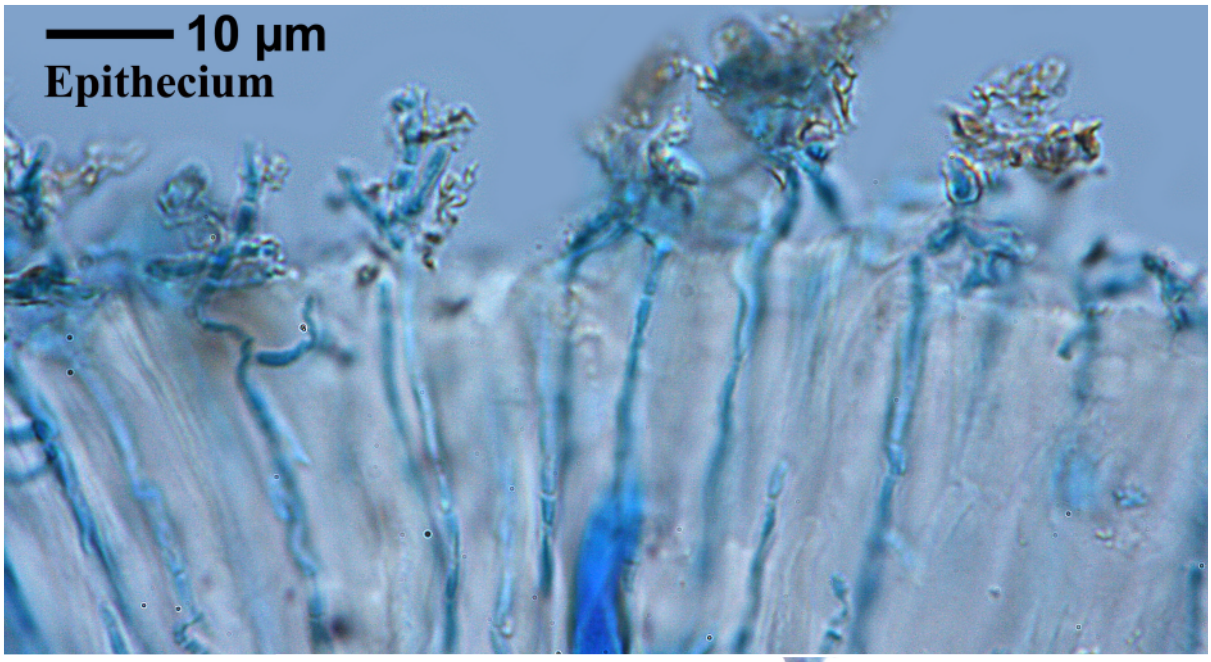

***Diorygma erythrellum***

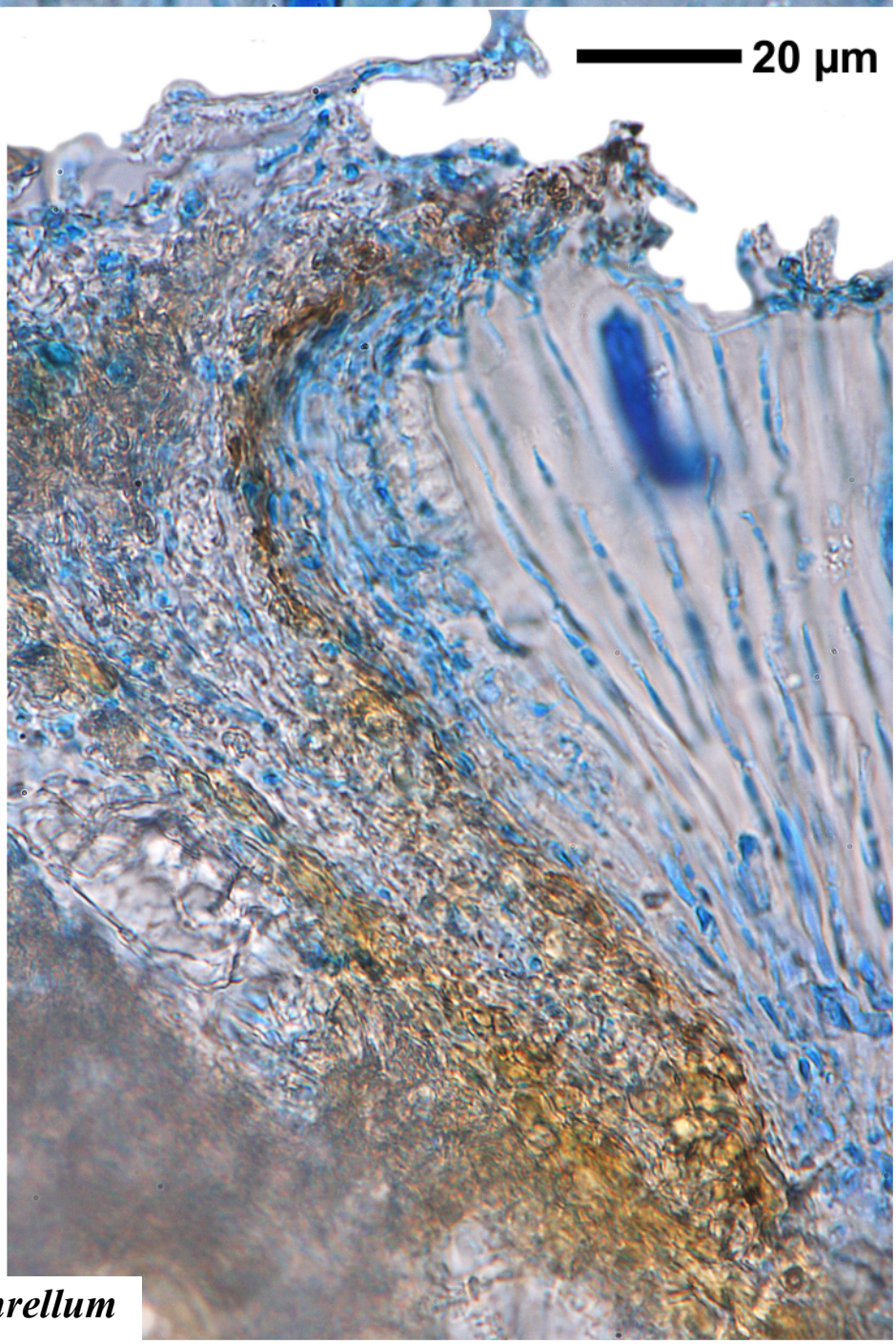


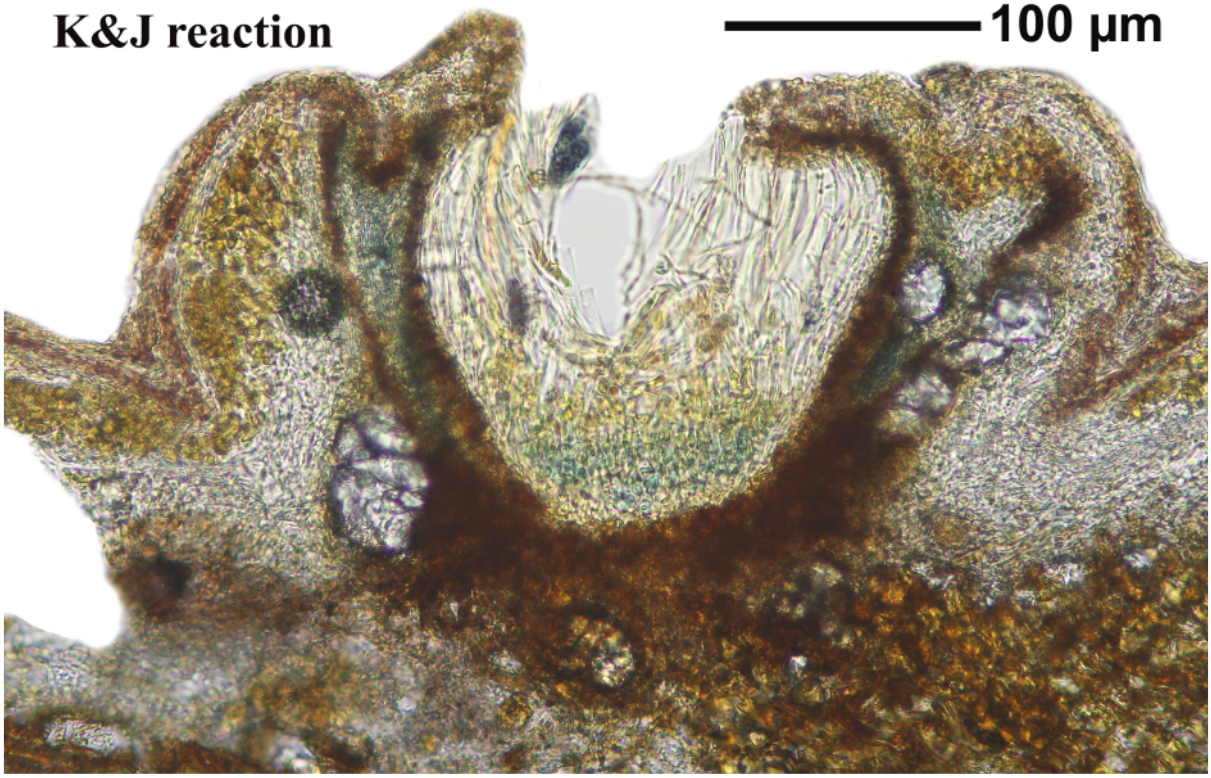



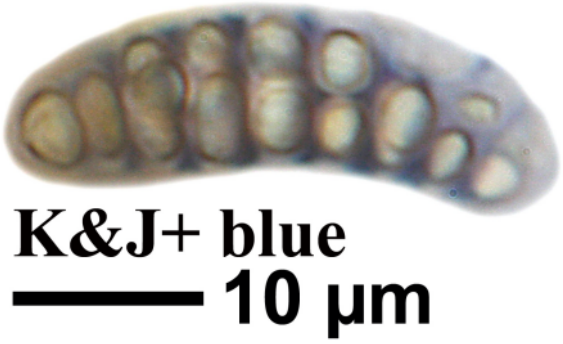

***Diorygma erythrellum***

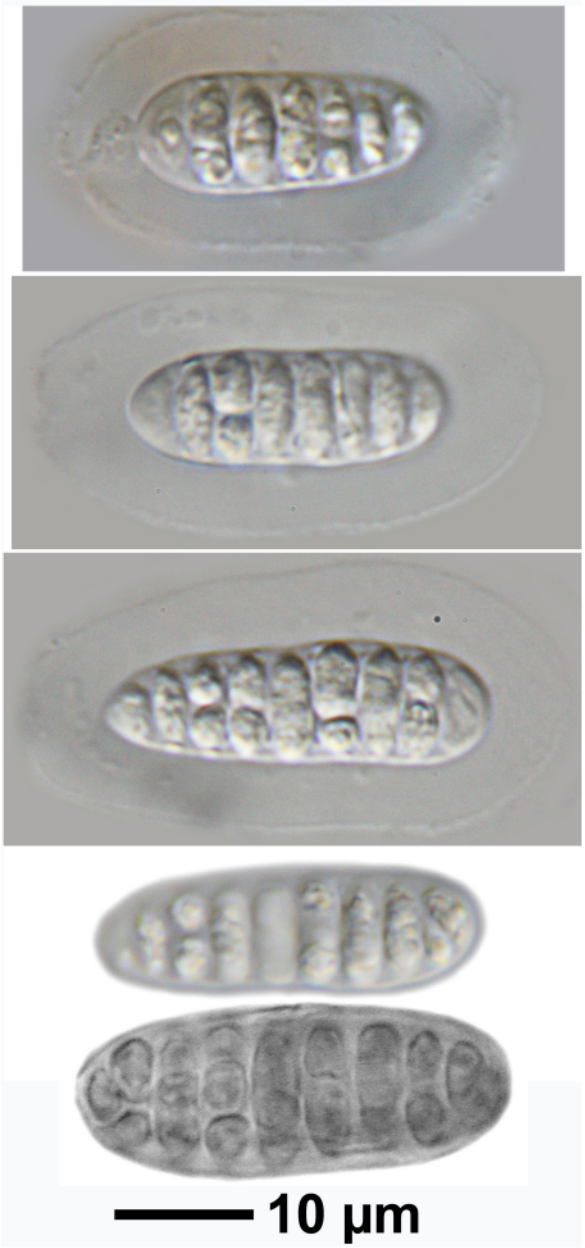



***Diorygma erythrellum***




*Diorygma erythrellum*

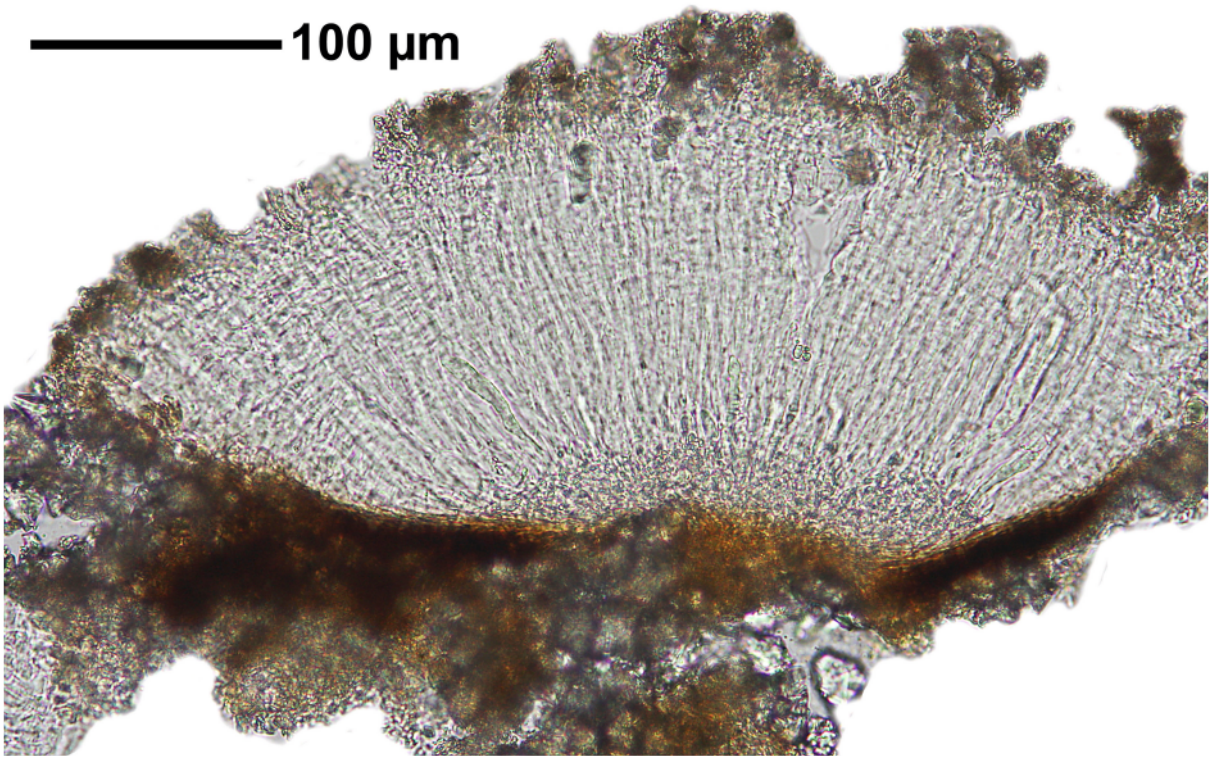
***Diorygma hieroglyphicum*** (Pers.) Staiger & Kalb
[= ***Graphina pallido-ochracea*** (Kremp.) Zahlbr.]

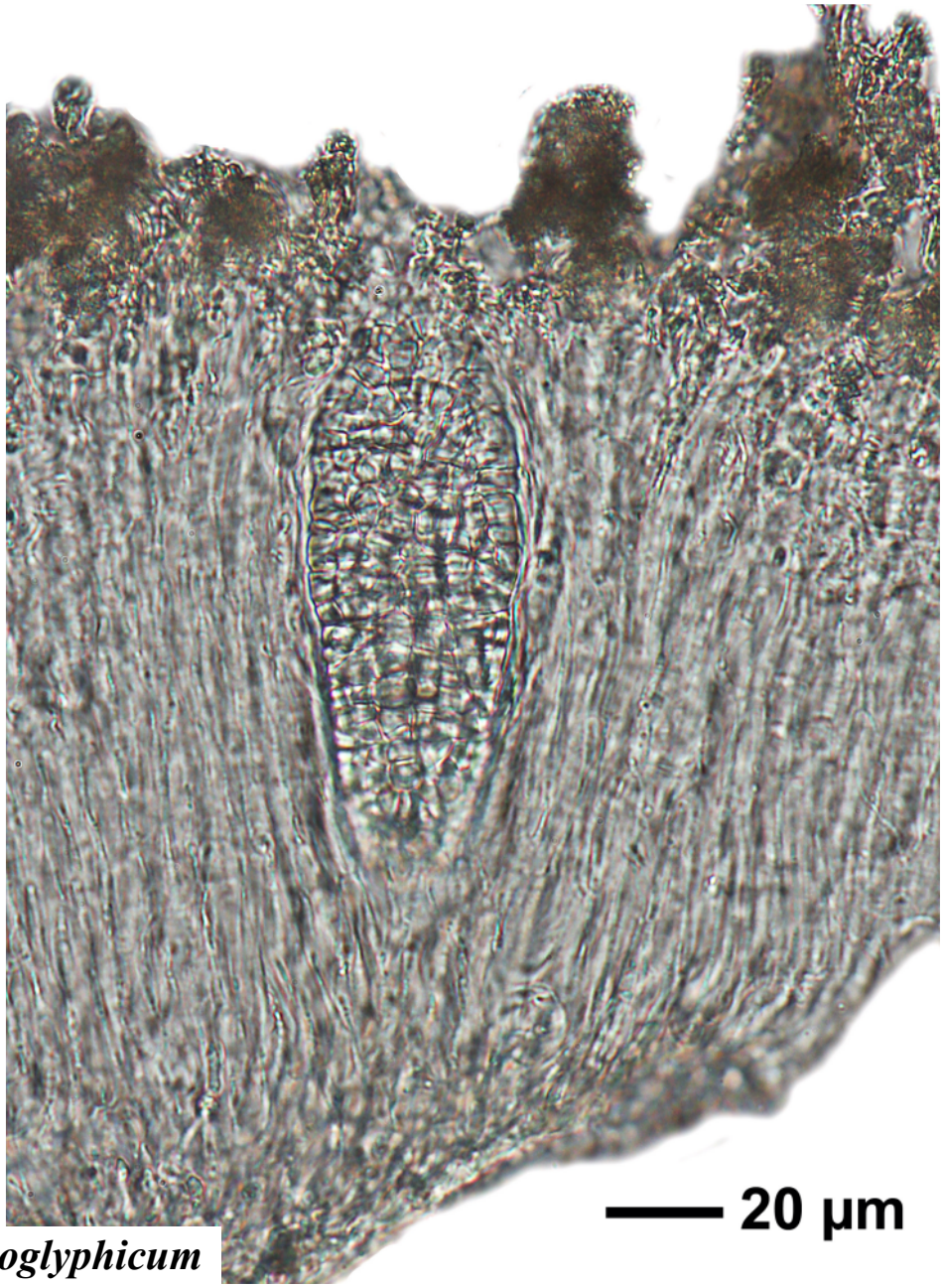
Ascospores 114-120 x 30-36 µm, muriform. Chemistry: stictic acid.

[7649], Philippinen, Cebu, Prov. Cebu, auf dem Tops ca. 7 km NW von Cebu-City, bei 660 m. Leg. Schumm 14.08.2000, det. Archer 25.8.2003

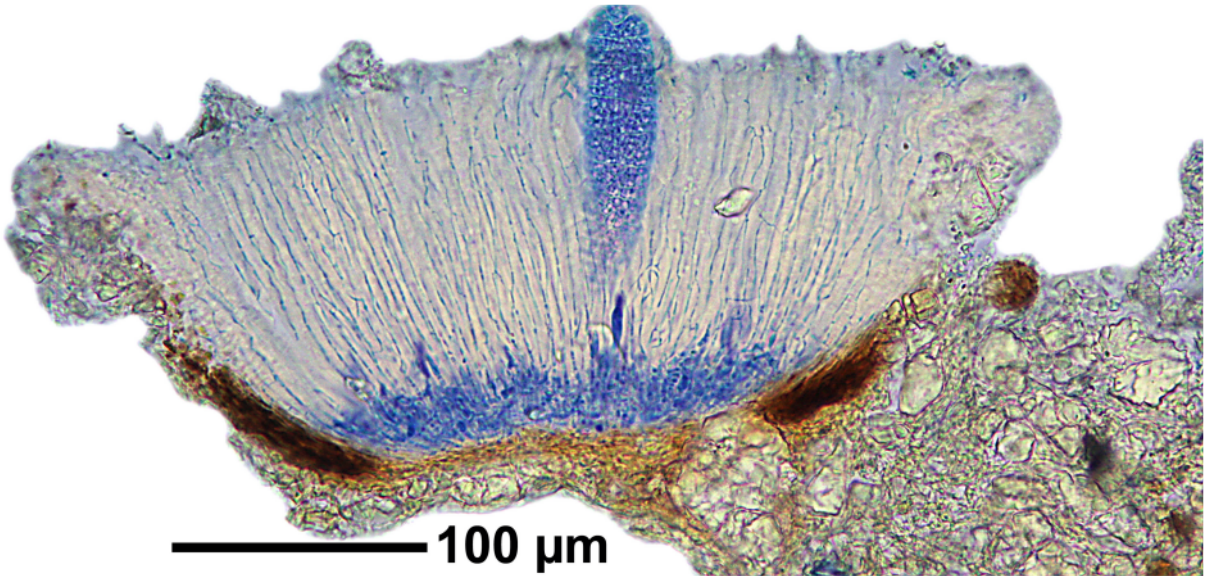


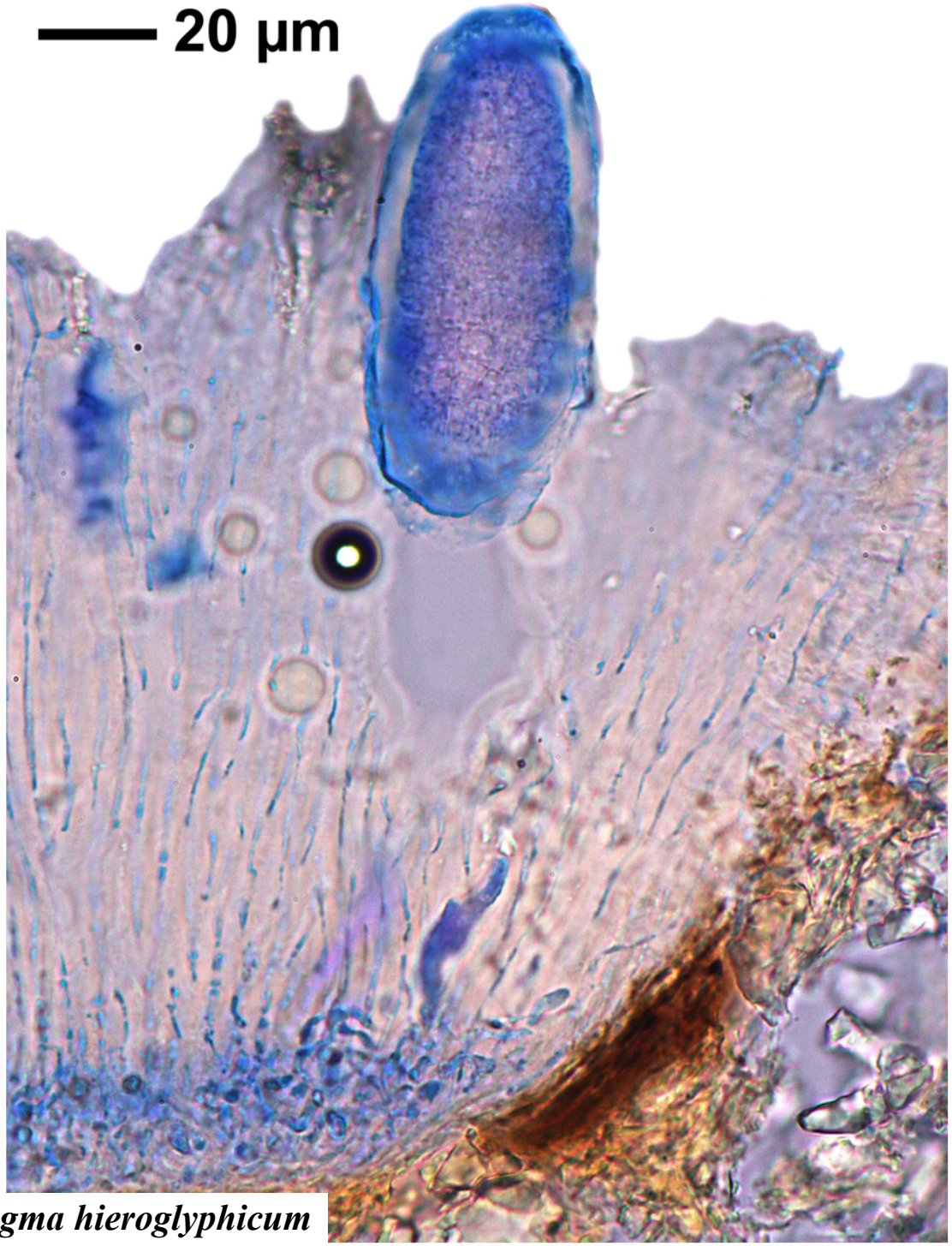


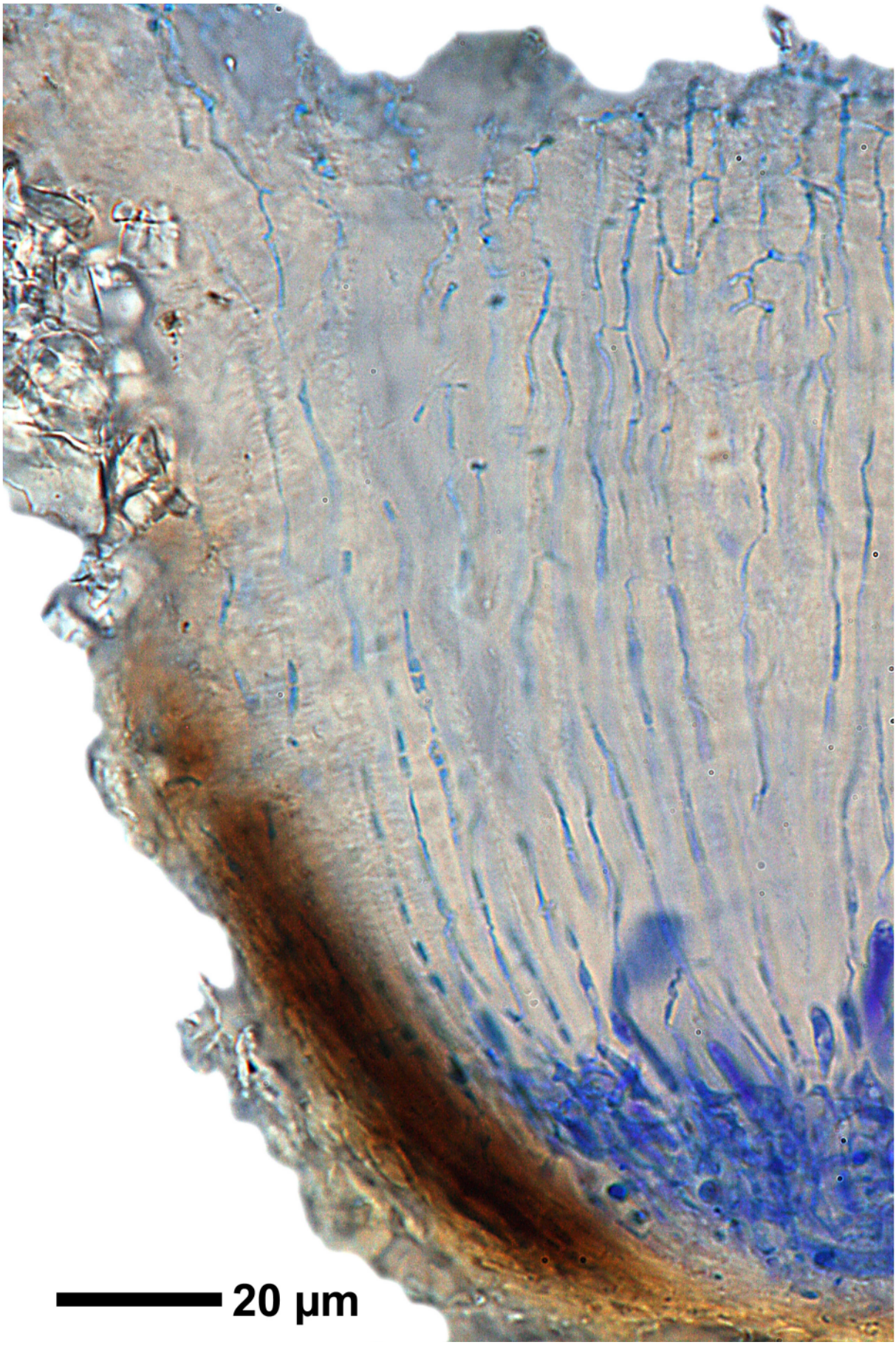




***Diorygma hieroglyphicum***

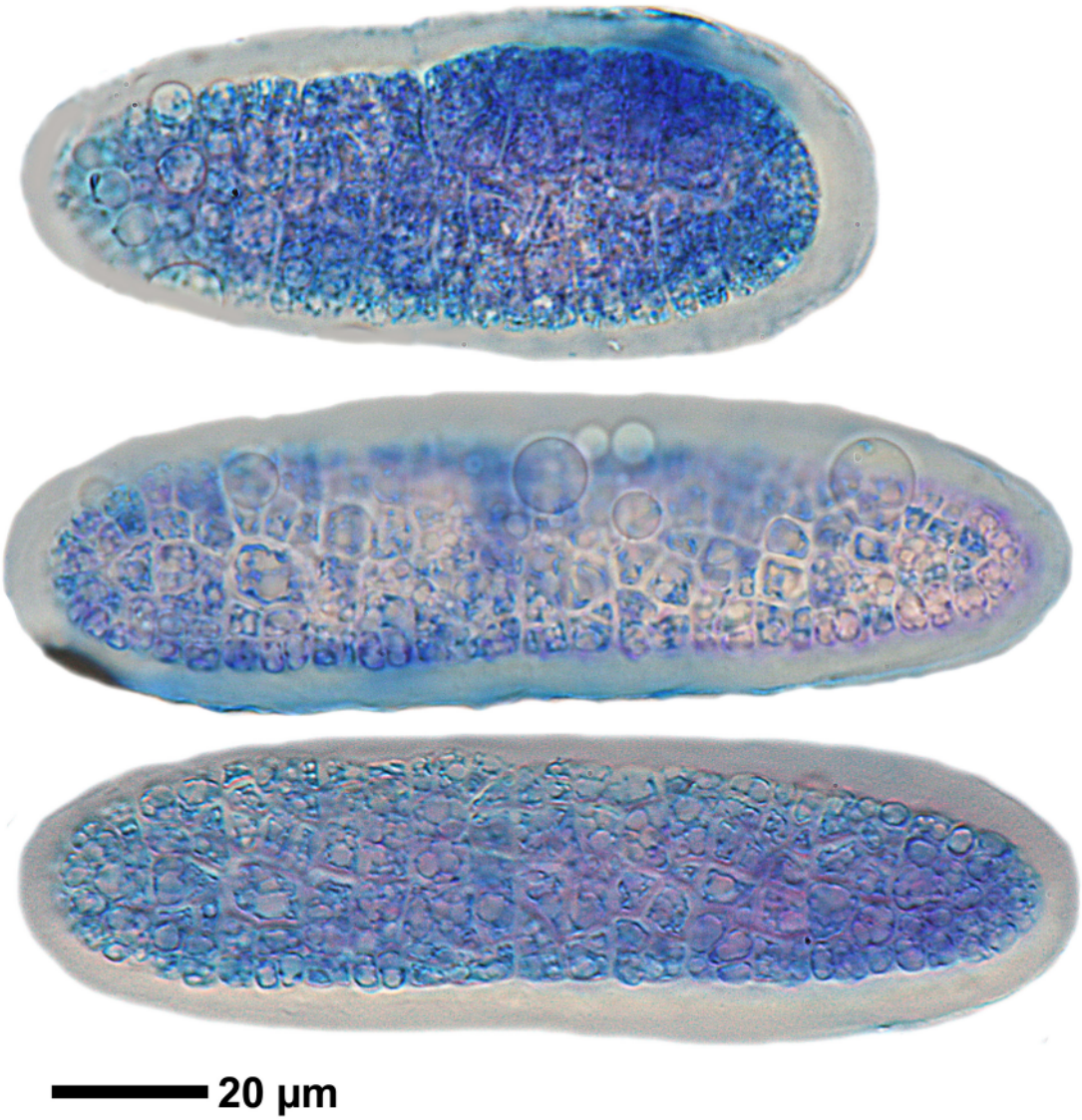



***Diorygma hieroglyphicum***




***Diorygma hieroglyphicum***

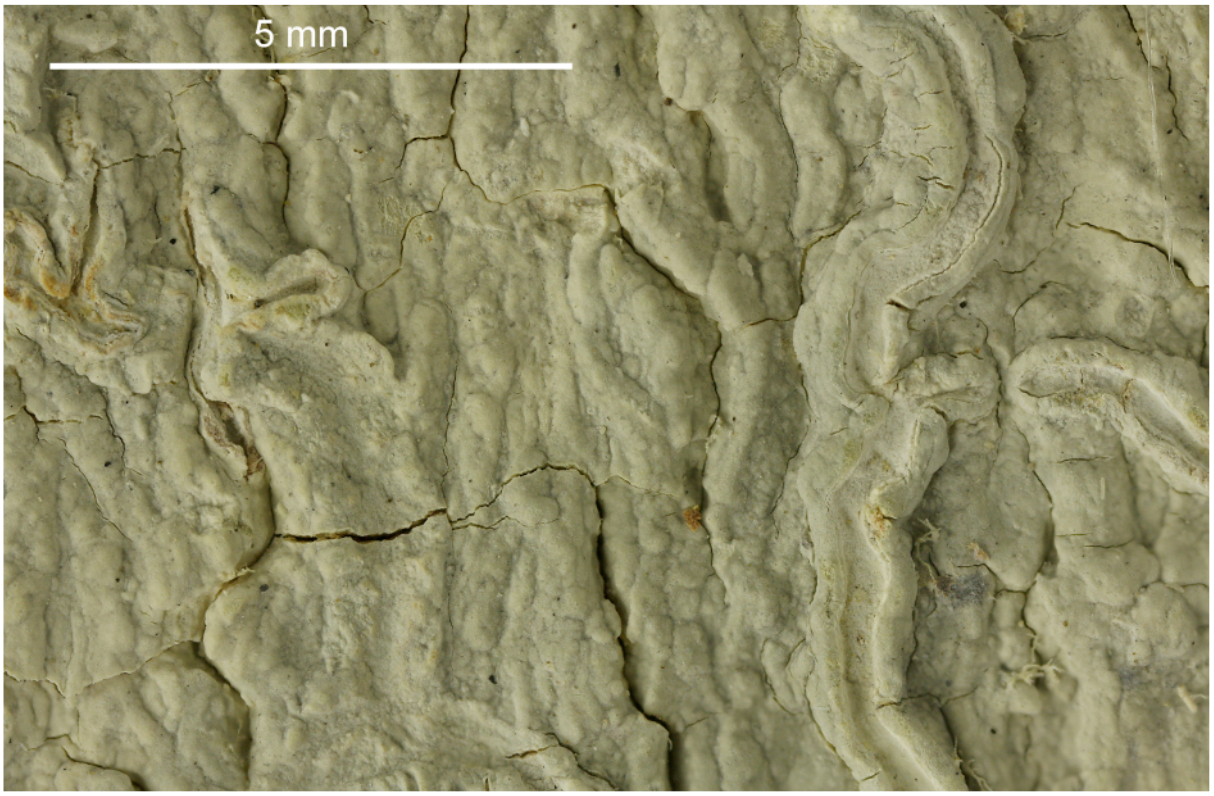


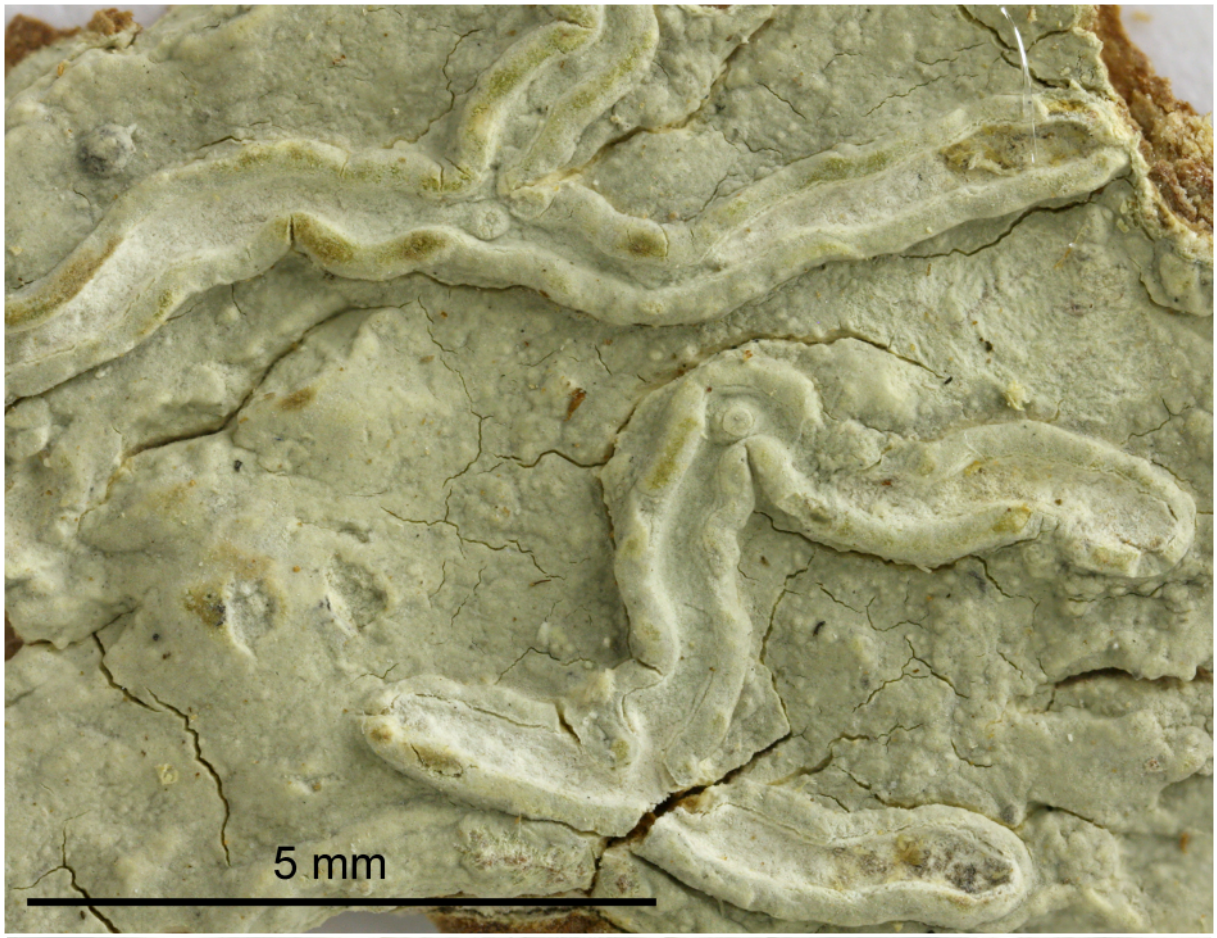

***Diorygma hieroglyphicum***

***Diorygma hololeucum*** (Mont.) Kalb, Staiger & Elix
[= ***Graphina hololeuca*** (Mont.) Müll.Arg.]

Lirellae 1-10 x 0.6-1 mm, long, bent, branched, with thick thallin margin. Disc open, sunken between margins, white pruinose. Excipulum divergent, weak developed, not carbonized. Hymenium J+ pale bluish. Epithecium well developed, c. 50 µm high, full with crystals, which hide details. Ascospores (1-)2-4(-9)/ascus, hyaline, densely muriform,125-230(-250) x 30-45(-50) µm, J+ violet. Chemistry: medulla K+ yellow, P+ red, protocetraric acid (maj). Lit. Kalb, Staiger & Elix (2004, Symb. Bot. Ups. 34).

[5929], Philippinen, Mindanao, Provinz Cotabato, tropischer Bergregenwald nahe der Lake Agko campsite am Fuß des Mt. Apo, 07°01.167' N, 125°13.375' E, 1240 m. Leg. Schumm 07.08.1999, det. Schumm 2000, test. Archer 22.8.2003.

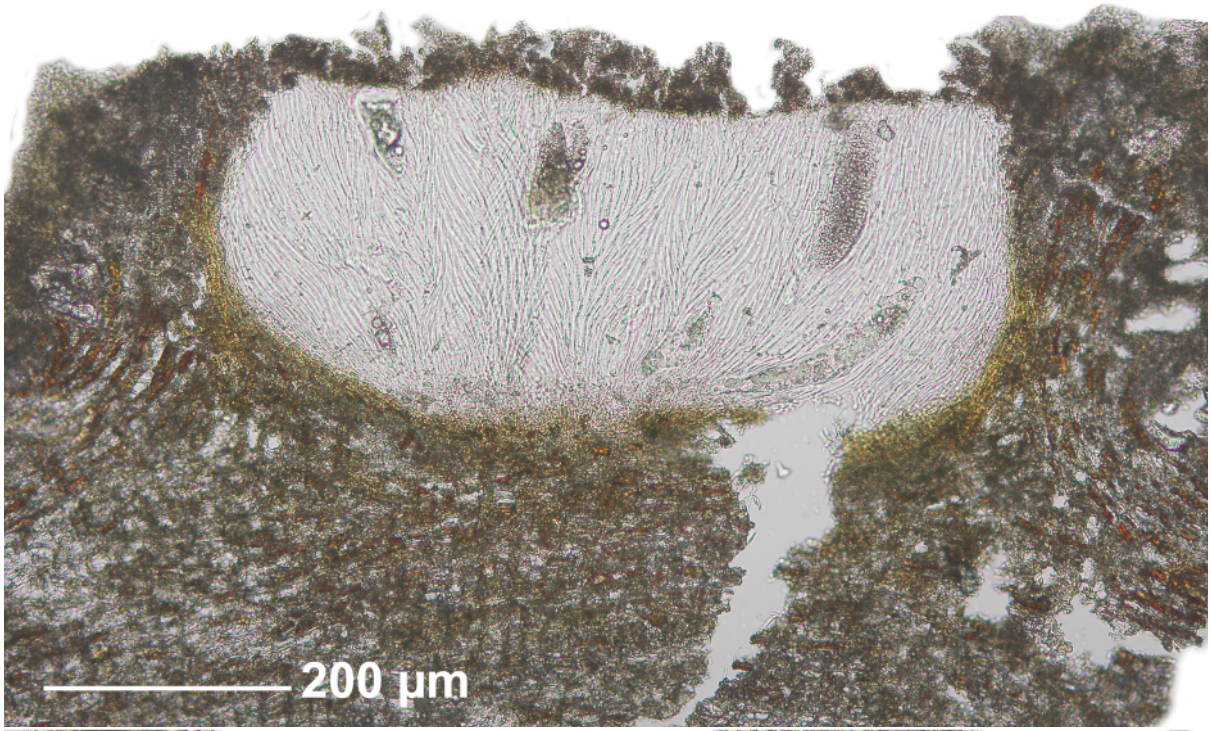


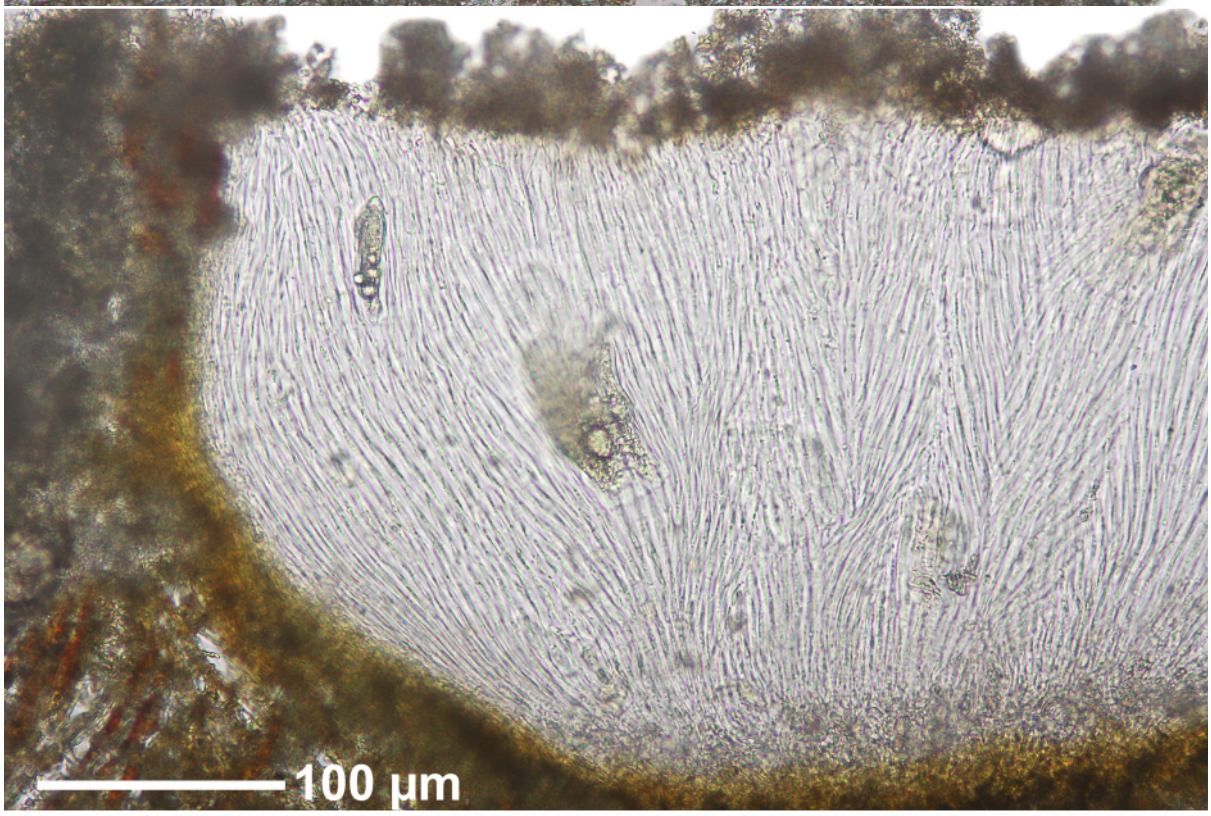


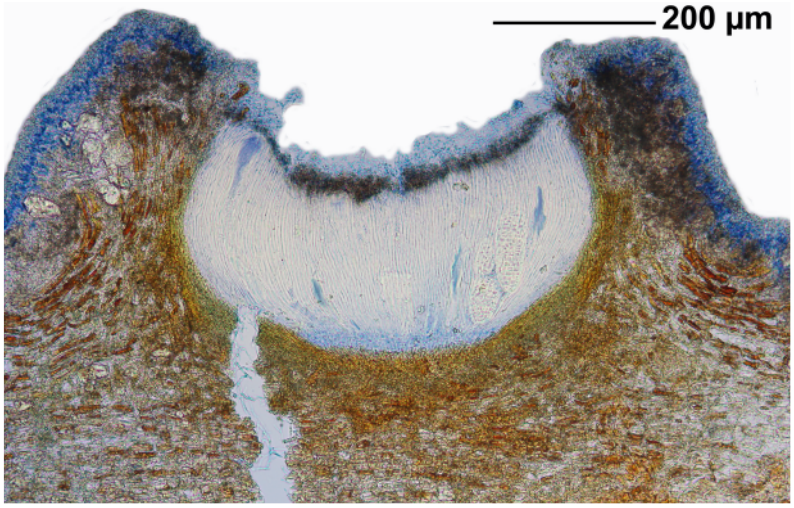




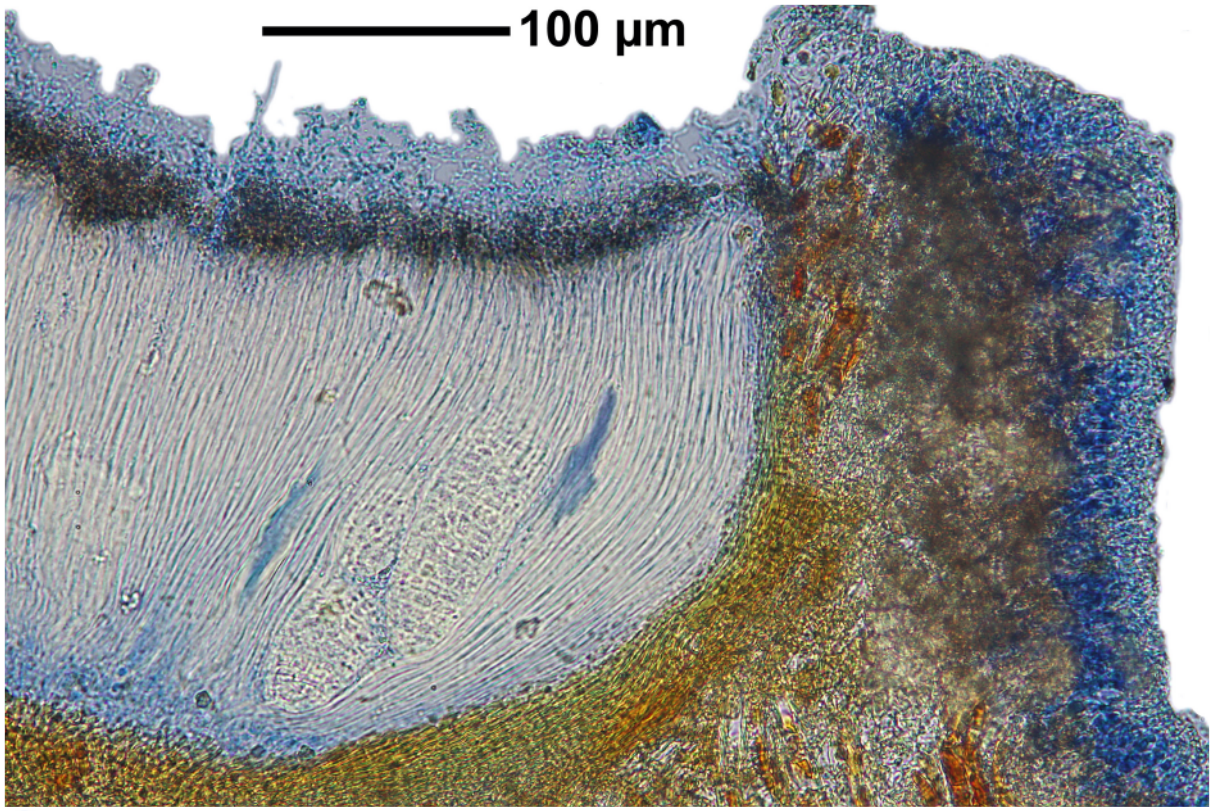
***Diorygma hololeucum***

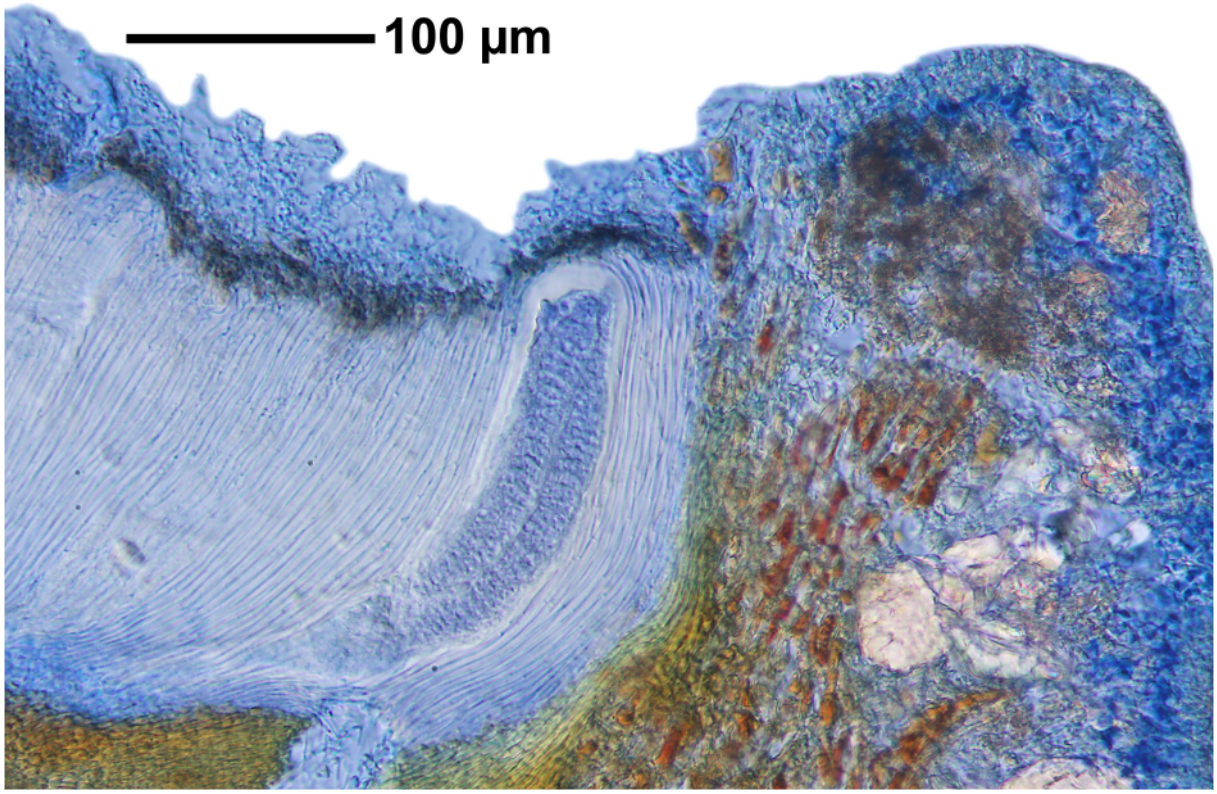


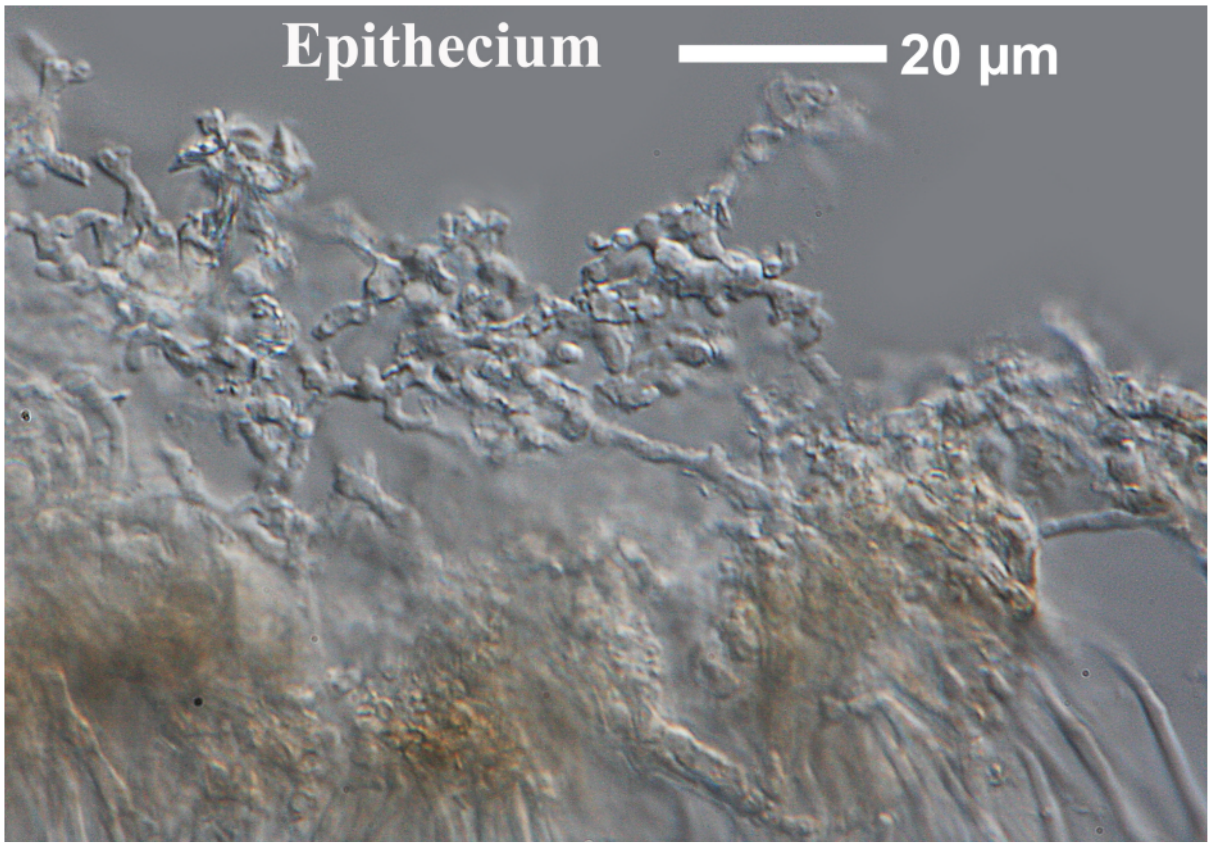



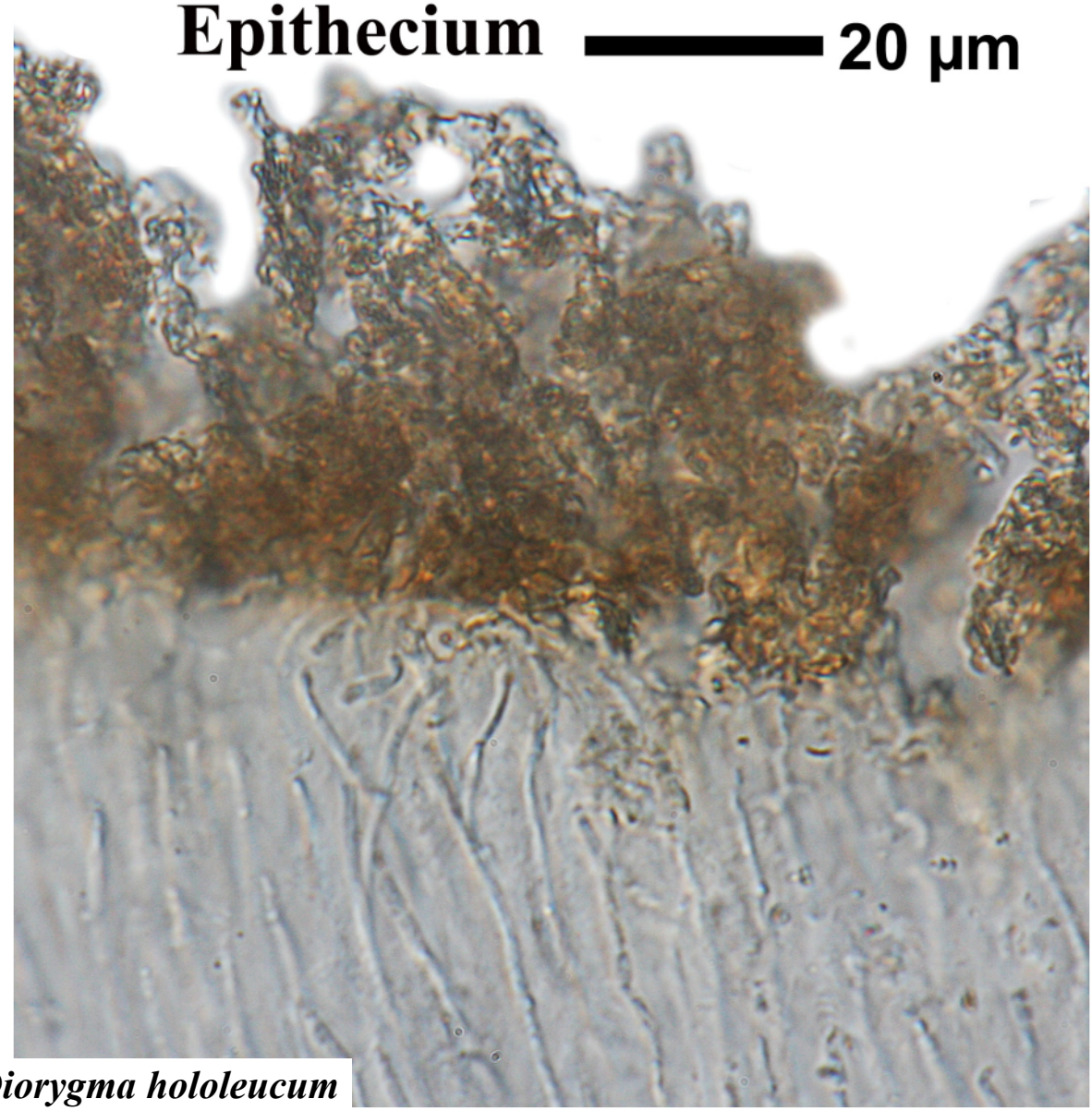

***Diorygma hololeucum***



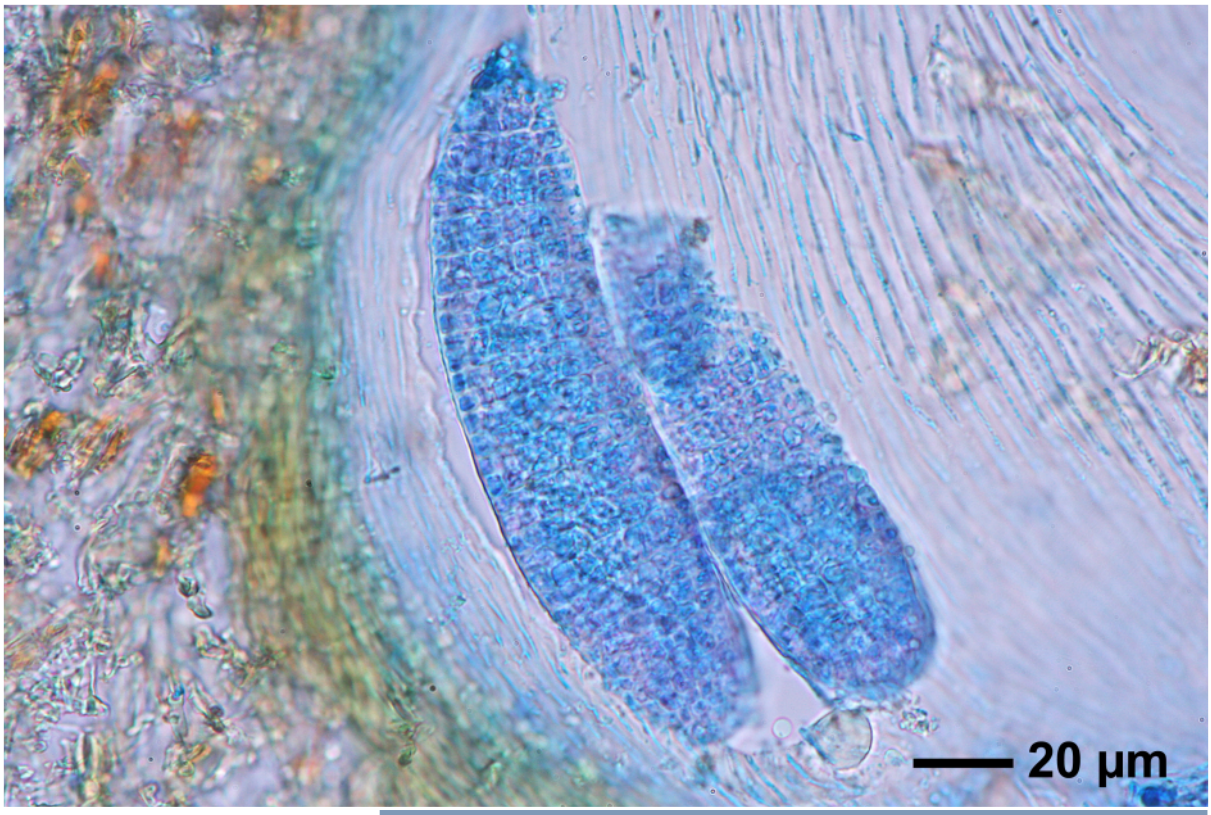



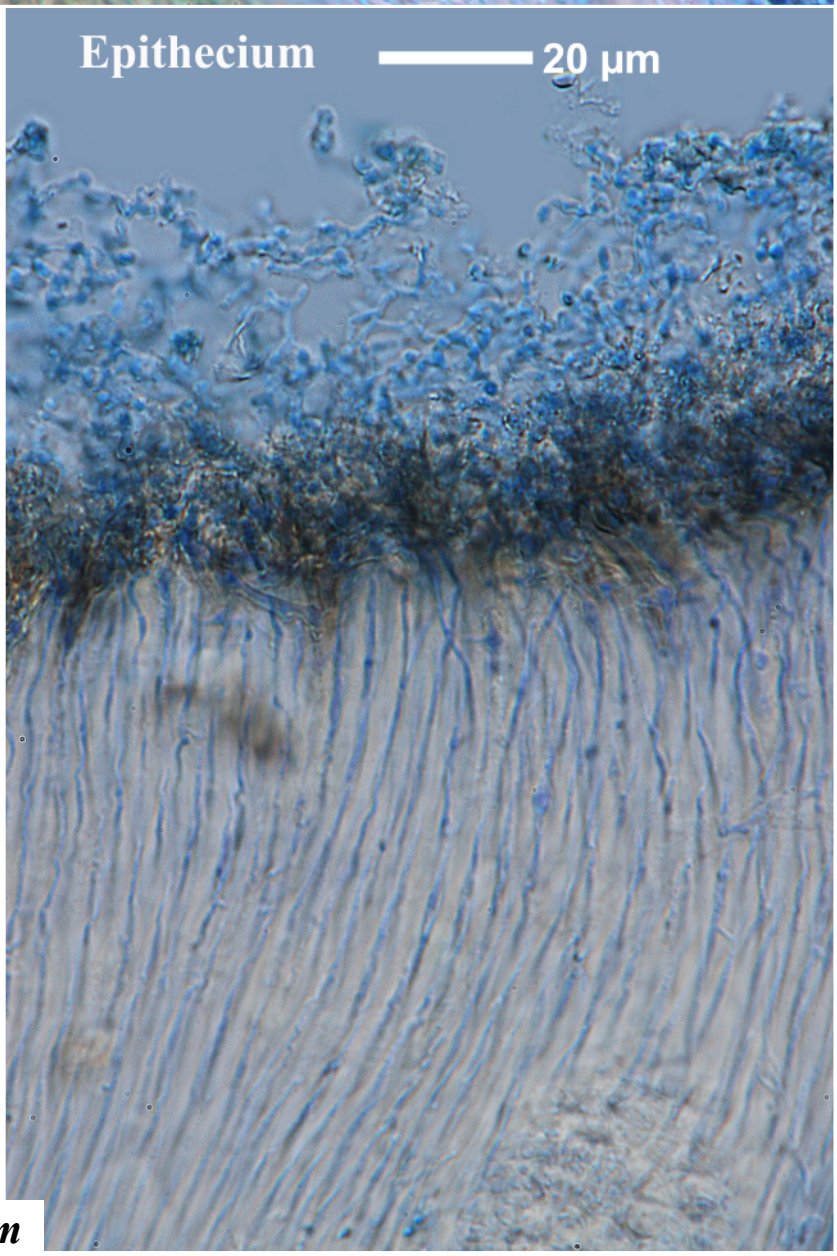

***Diorygma hololeucum***



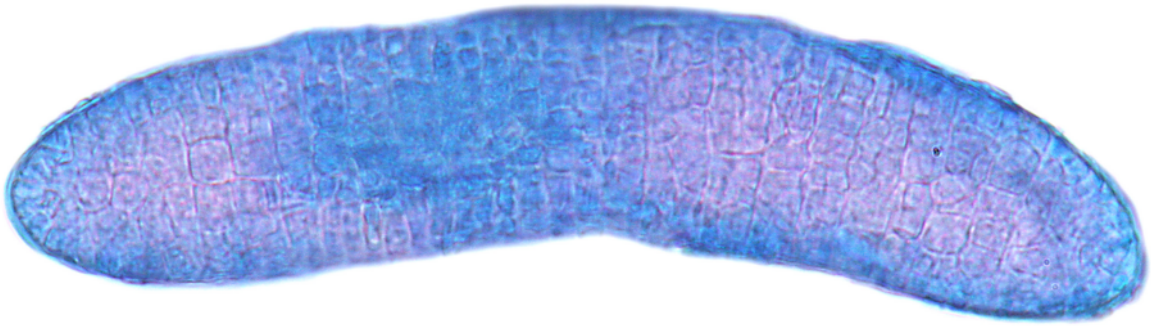



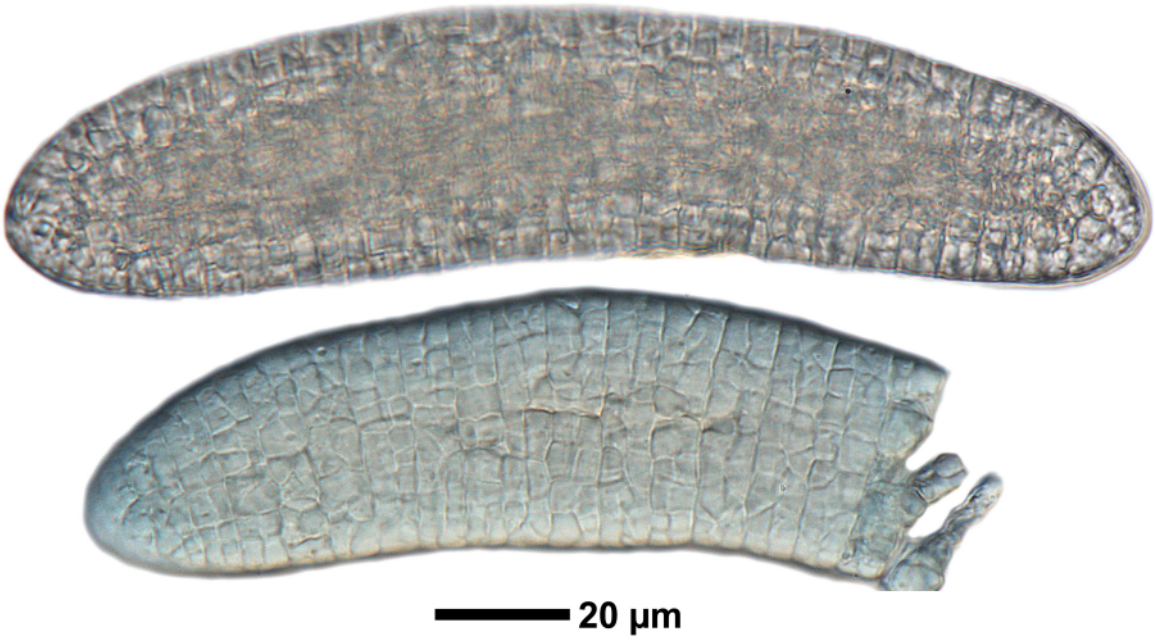

***Diorygma hololeucum***

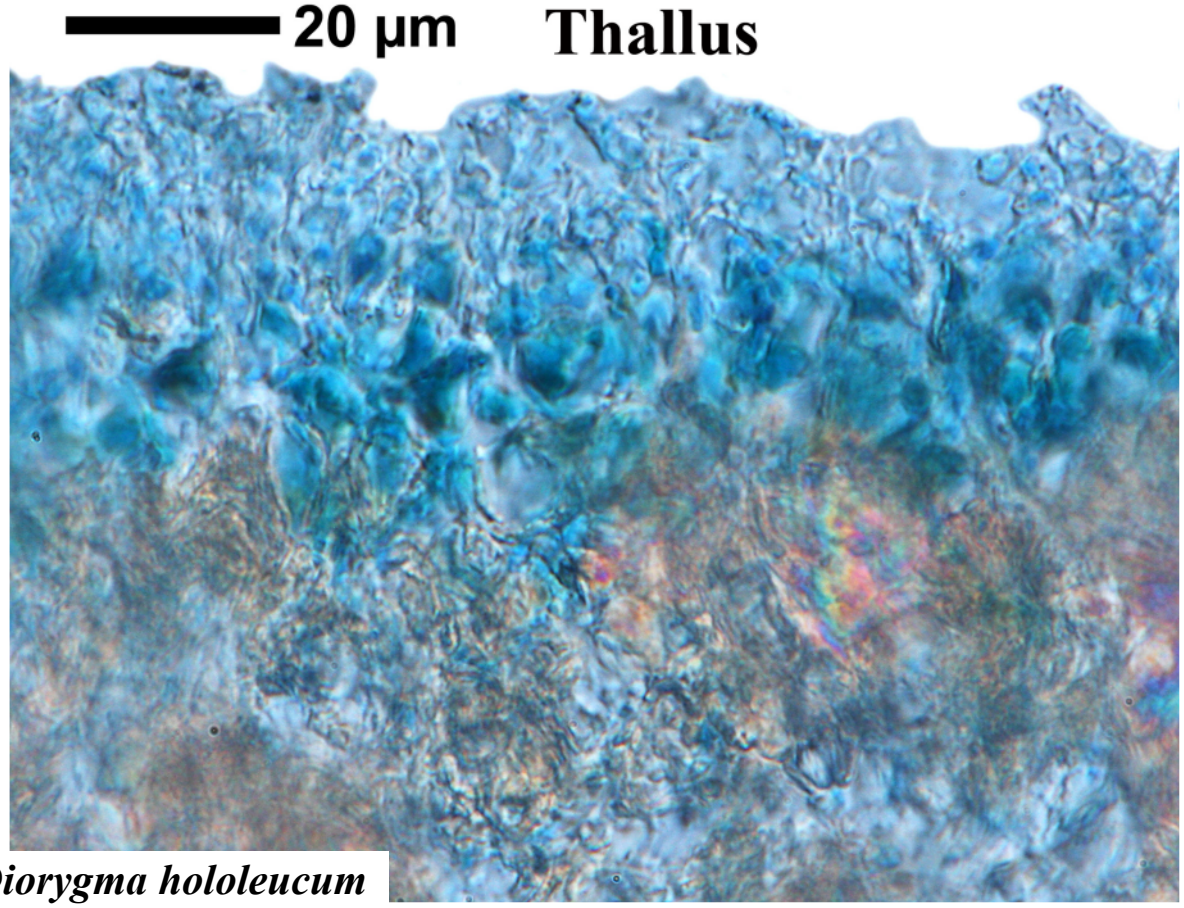



***Diorygma hololeucum***



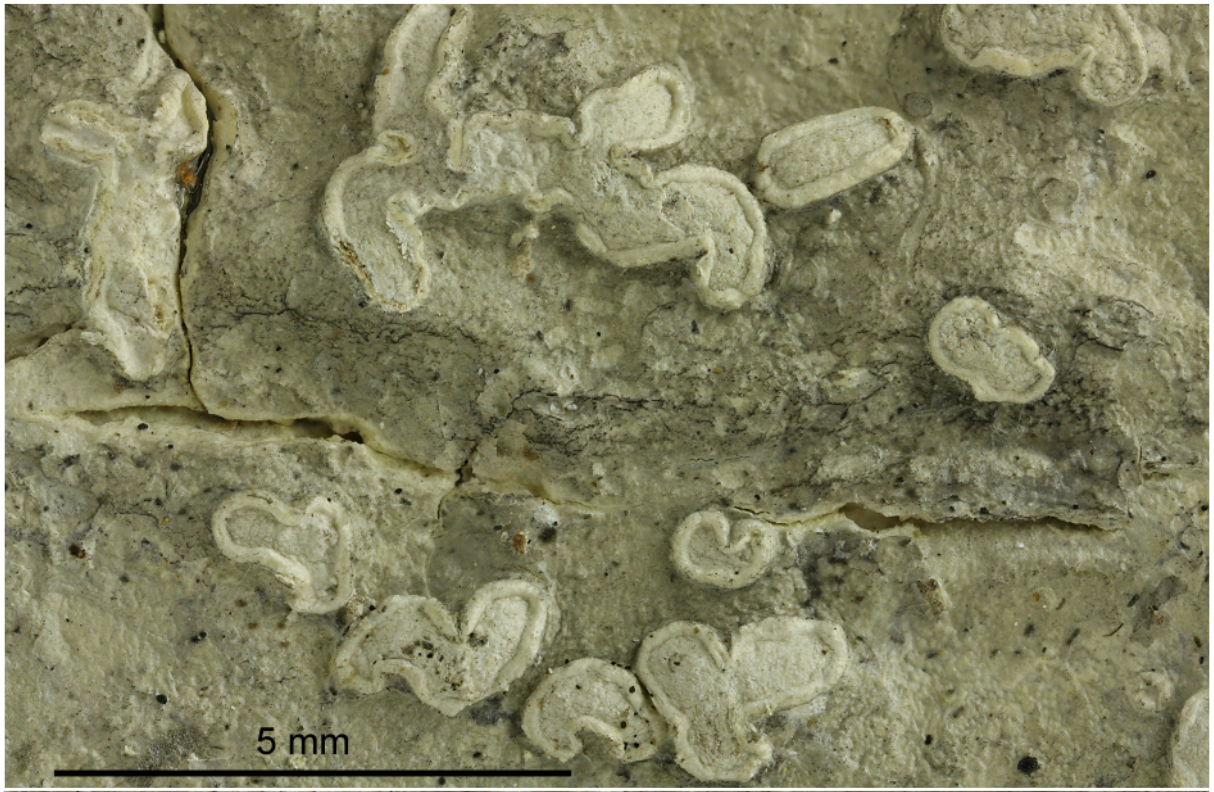




***Diorygma hololeucum***

***Diorygma pruinosum*** (Eschw.) Kalb, Staiger & Elix
[= ***Graphina platyleuca*** (Nyl.) Zahlbr.]

Ascospores 130-145 x 32-38 µm, muriform. Chemistry: protocetraric acid.

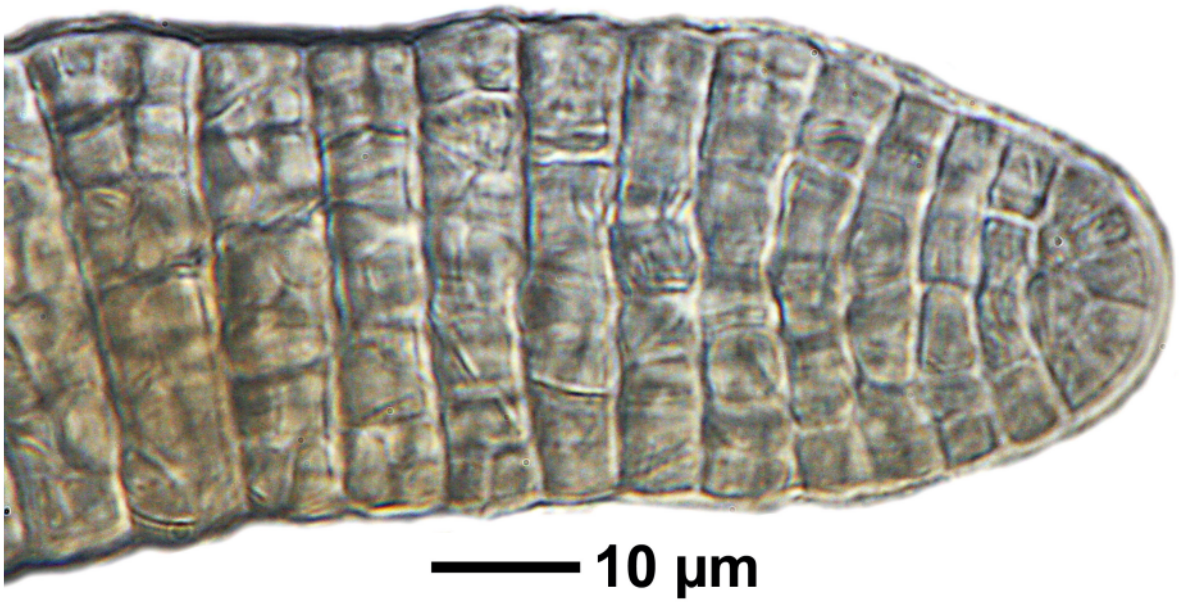
[7938], Philippinen, Leyte, Prov. Leyte, Lake Kasudsuran, 11°01.539' N, E 124°44.931' E, 740 m, bei Barangay Liberty (Ormoc-City). Leg. Schumm 23.08.2000, det. Archer 25.8.2003.

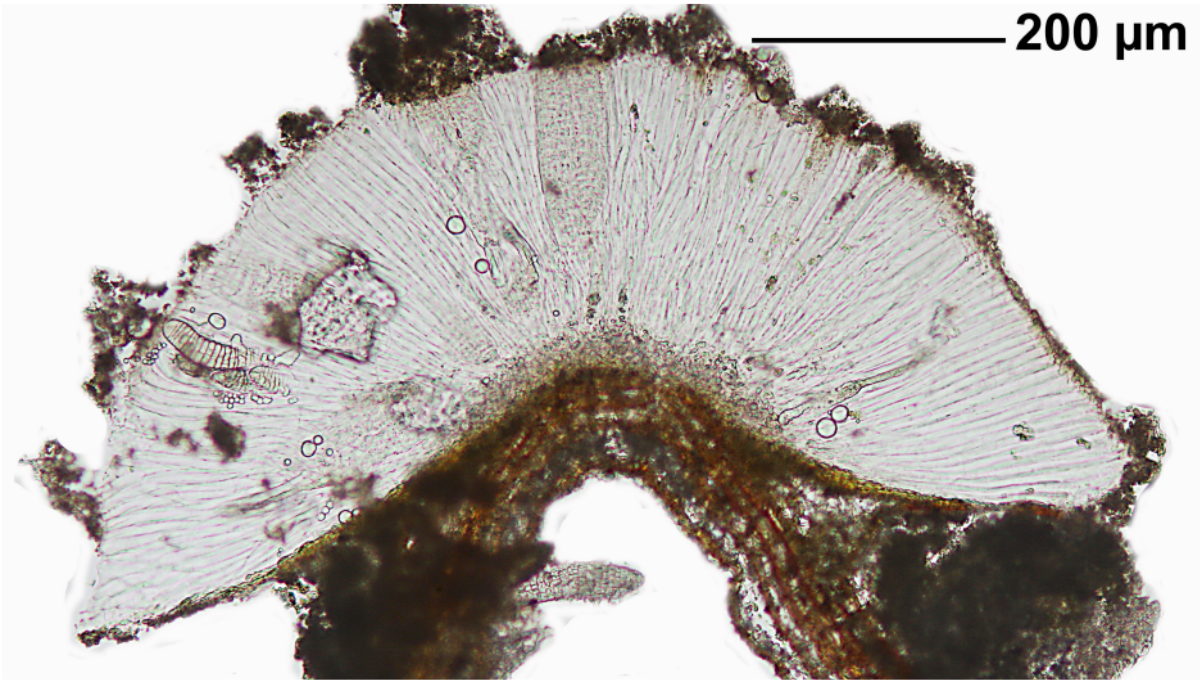




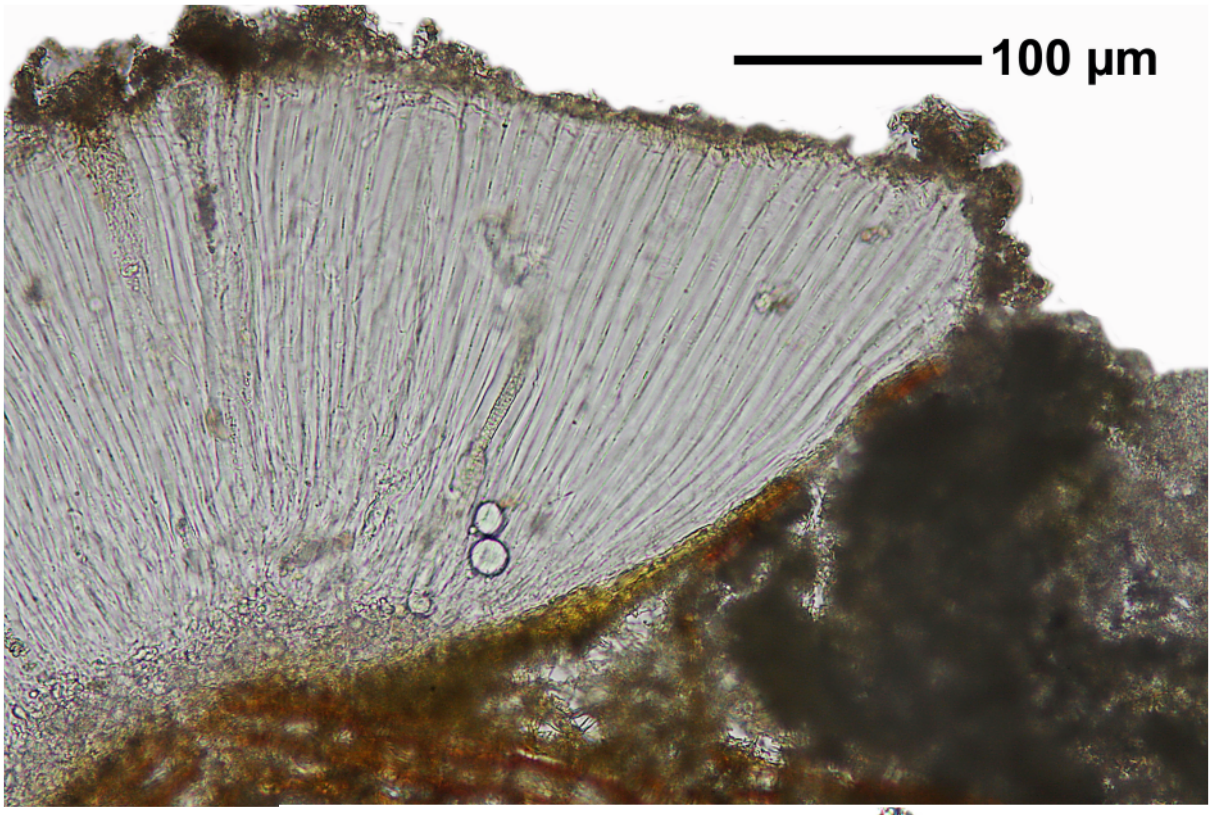


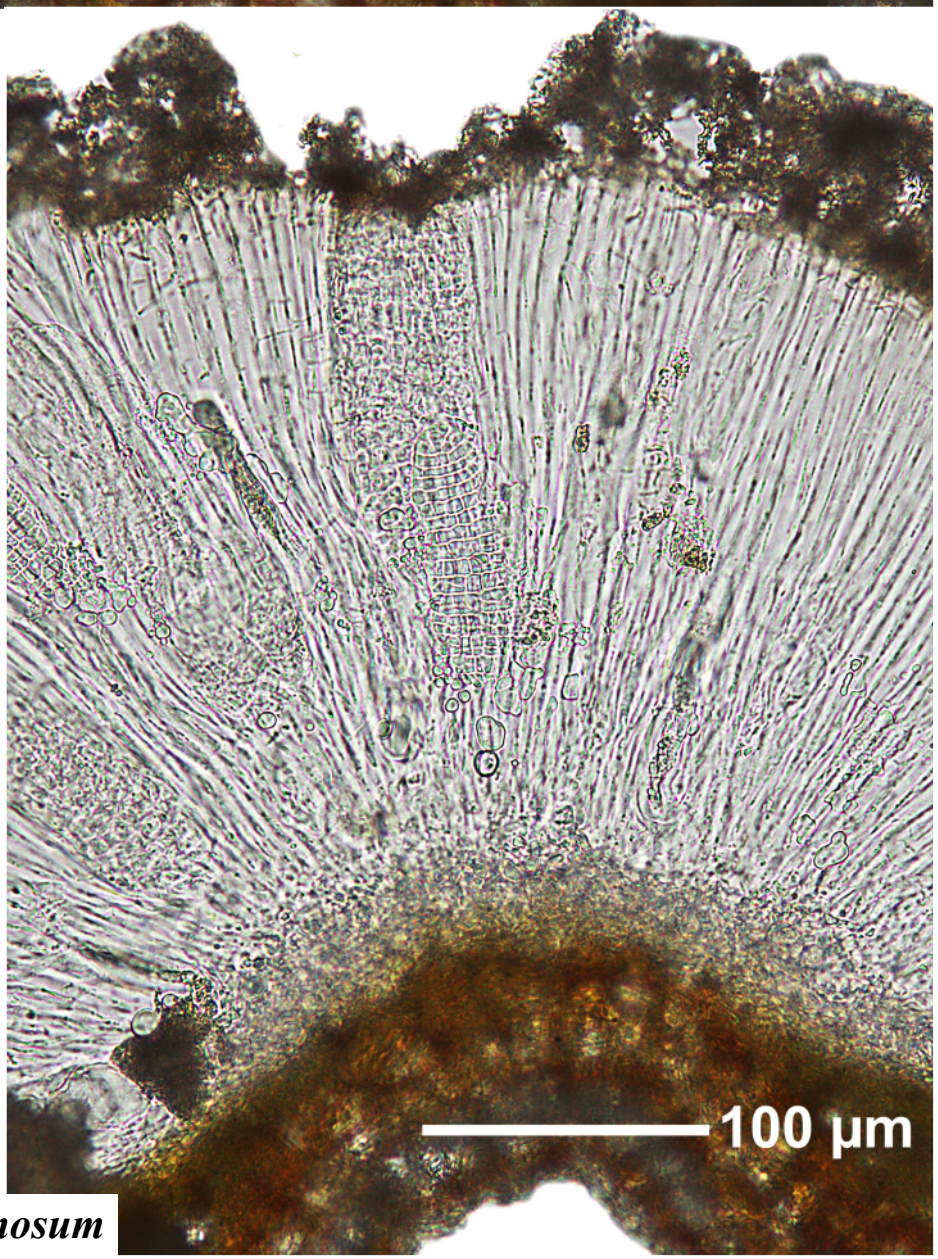




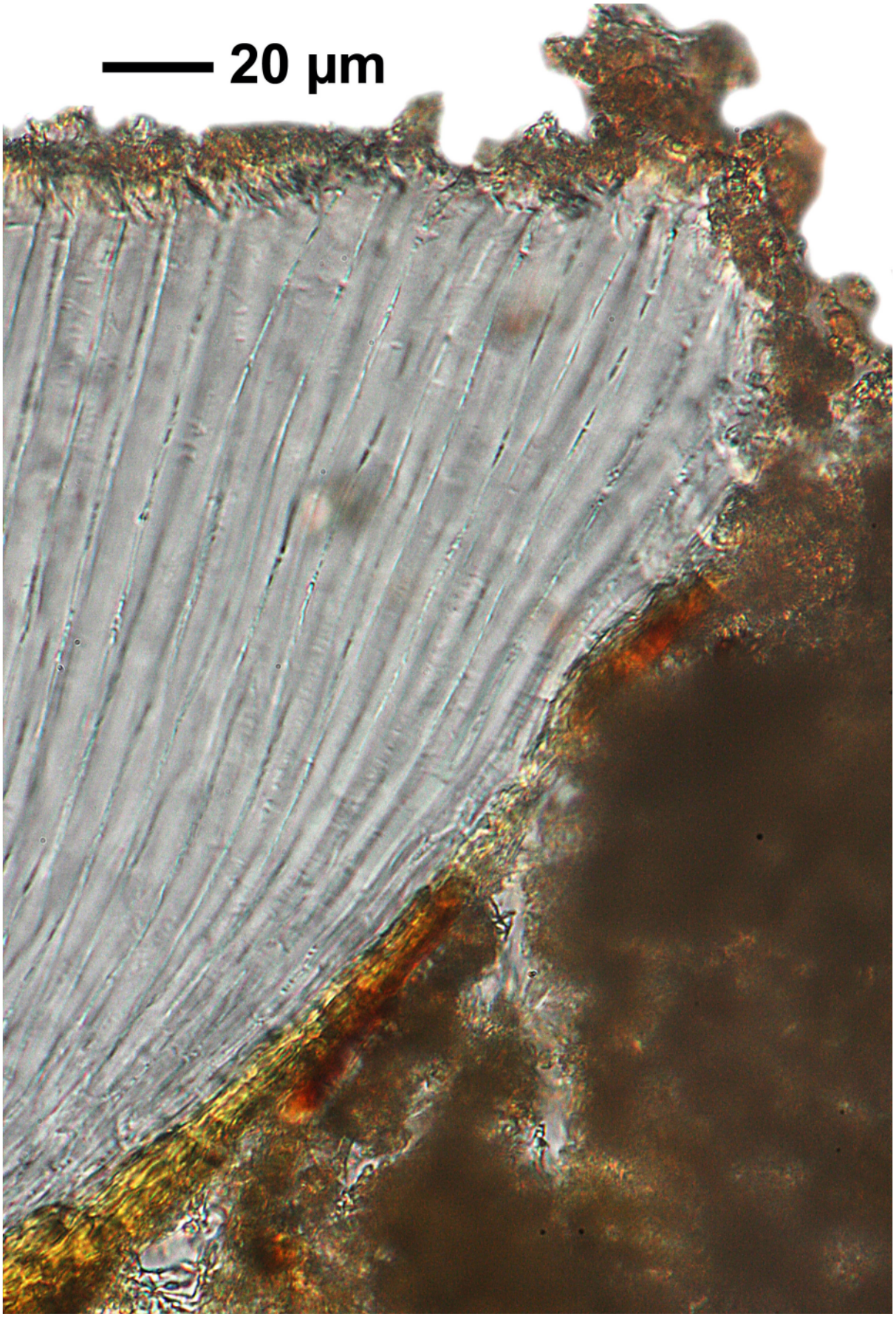




***Diorygma pruinosum***

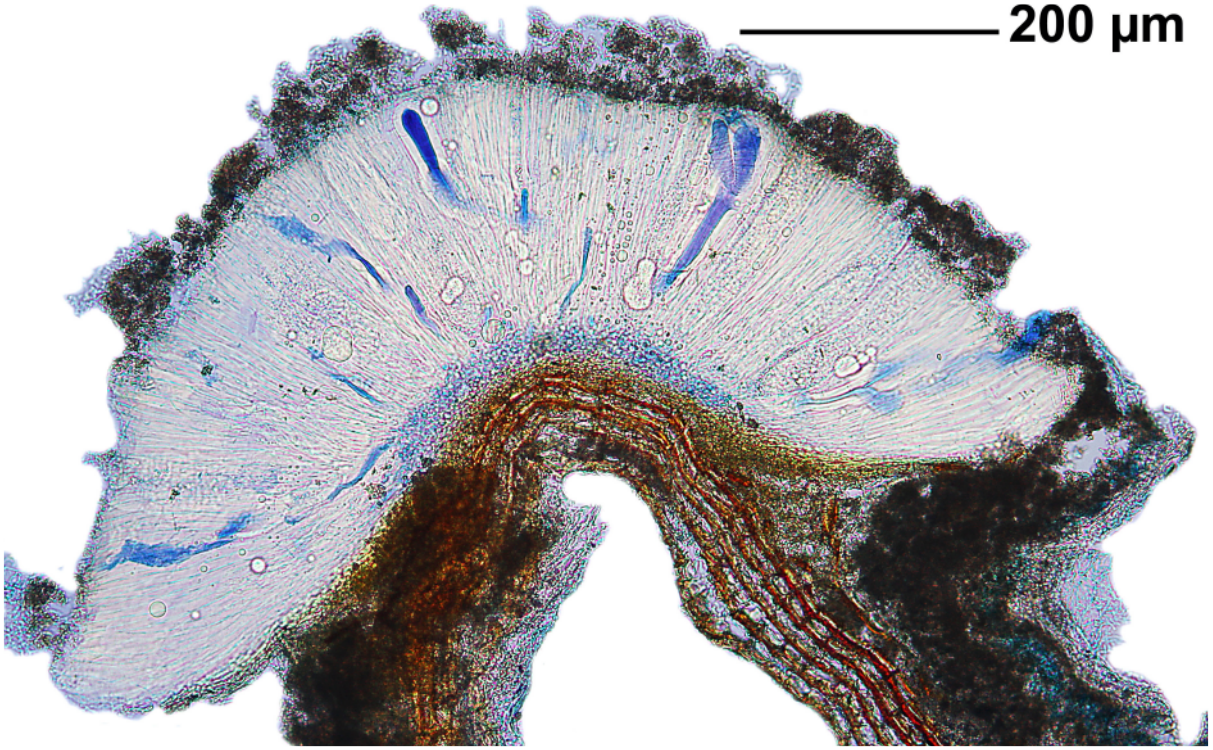


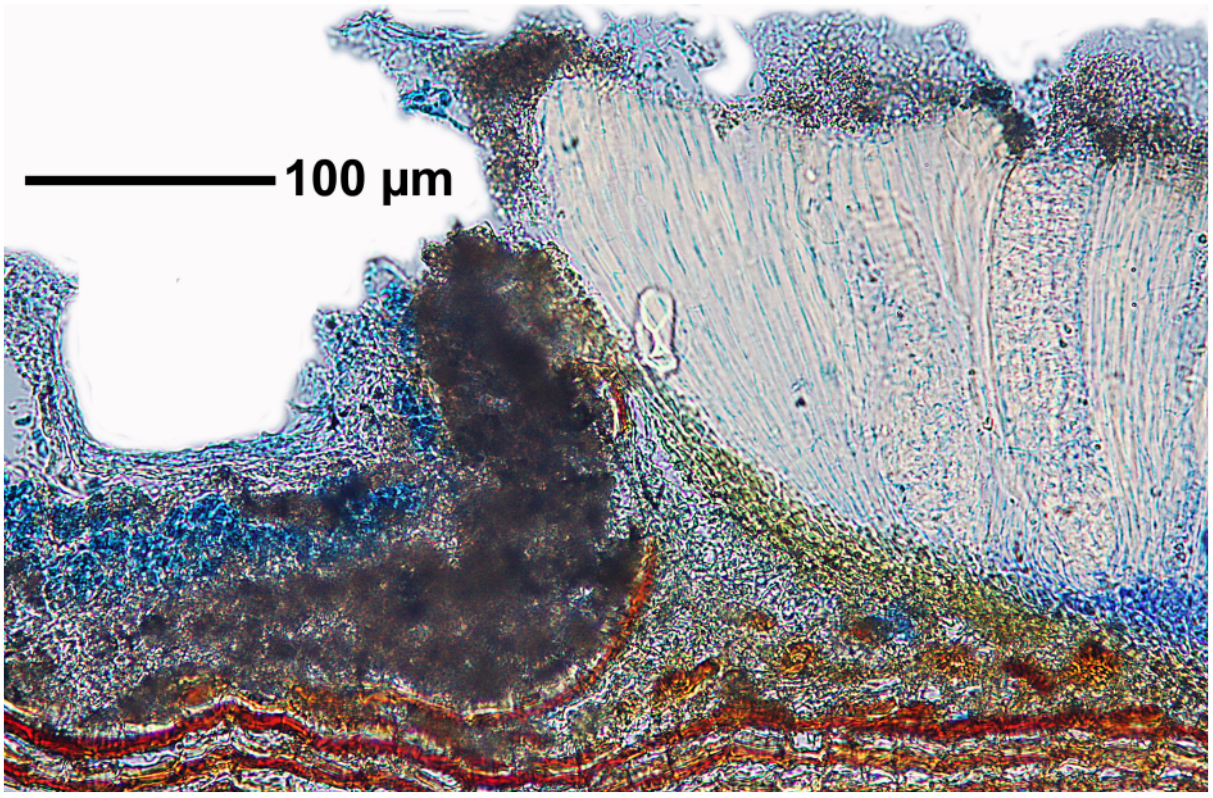




***Diorygma pruinosum***

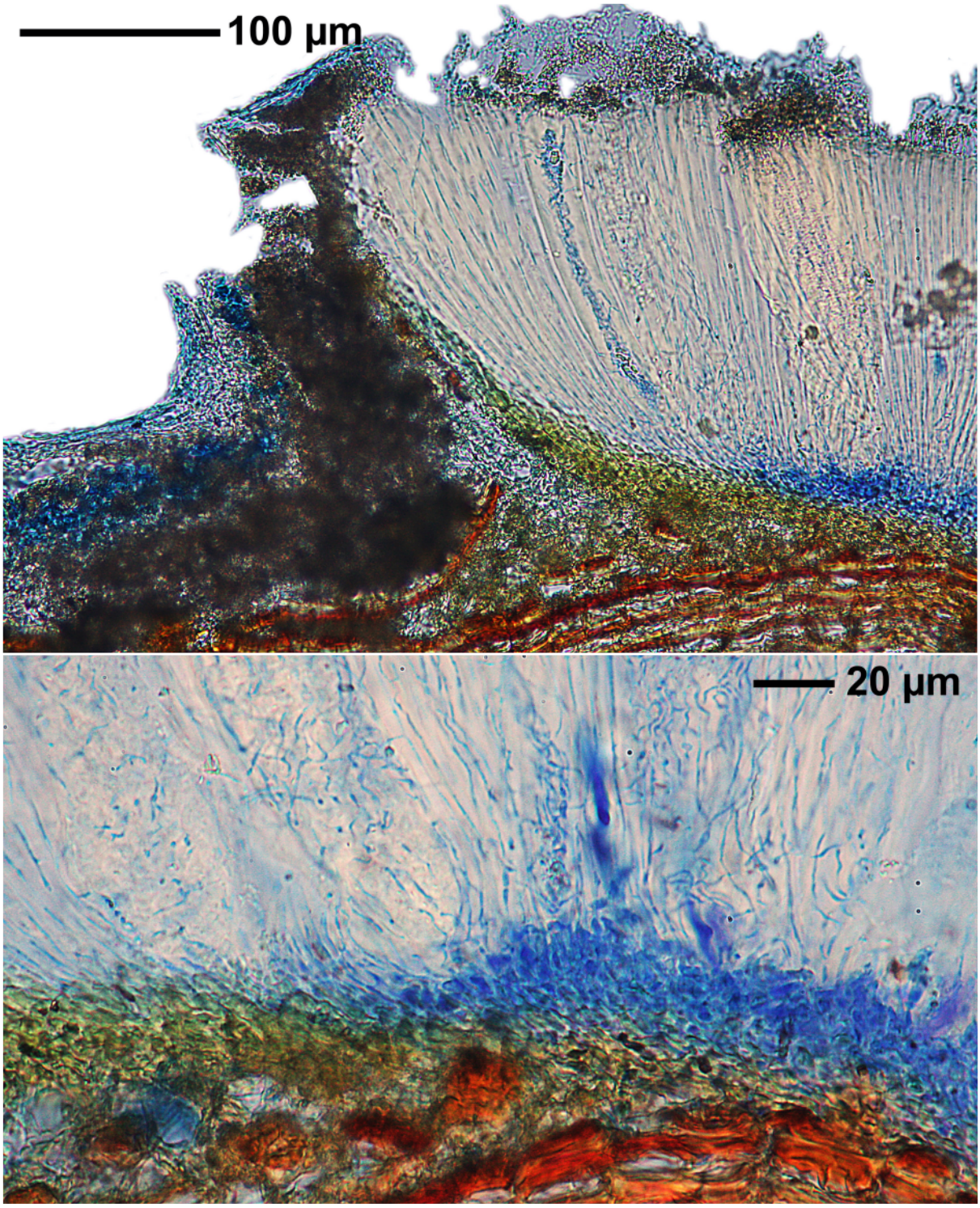



***Diorygma pruinosum***

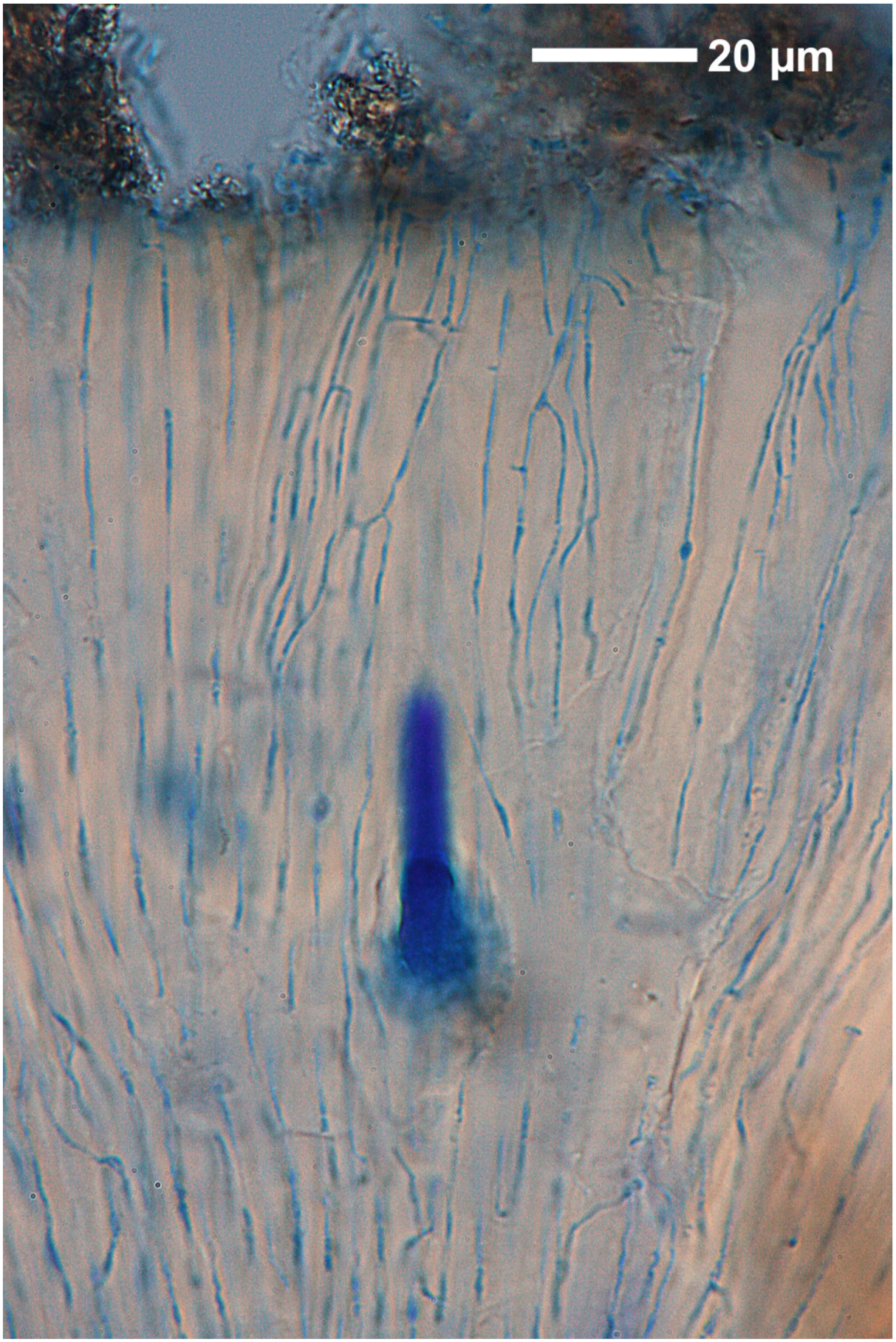



***Diorygma pruinosum***




***Diorygma pruinosum***



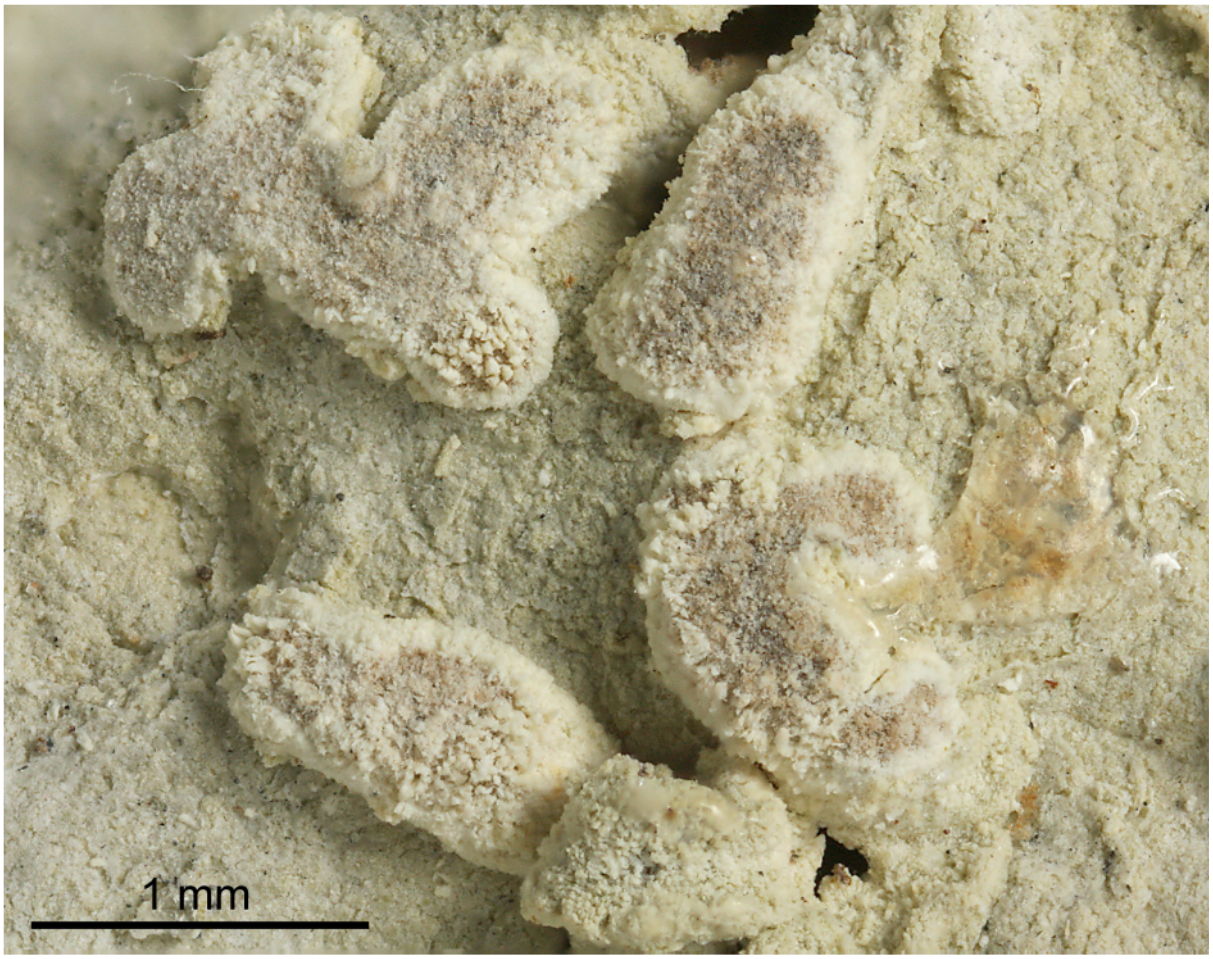

***Diorygma pruinosum***

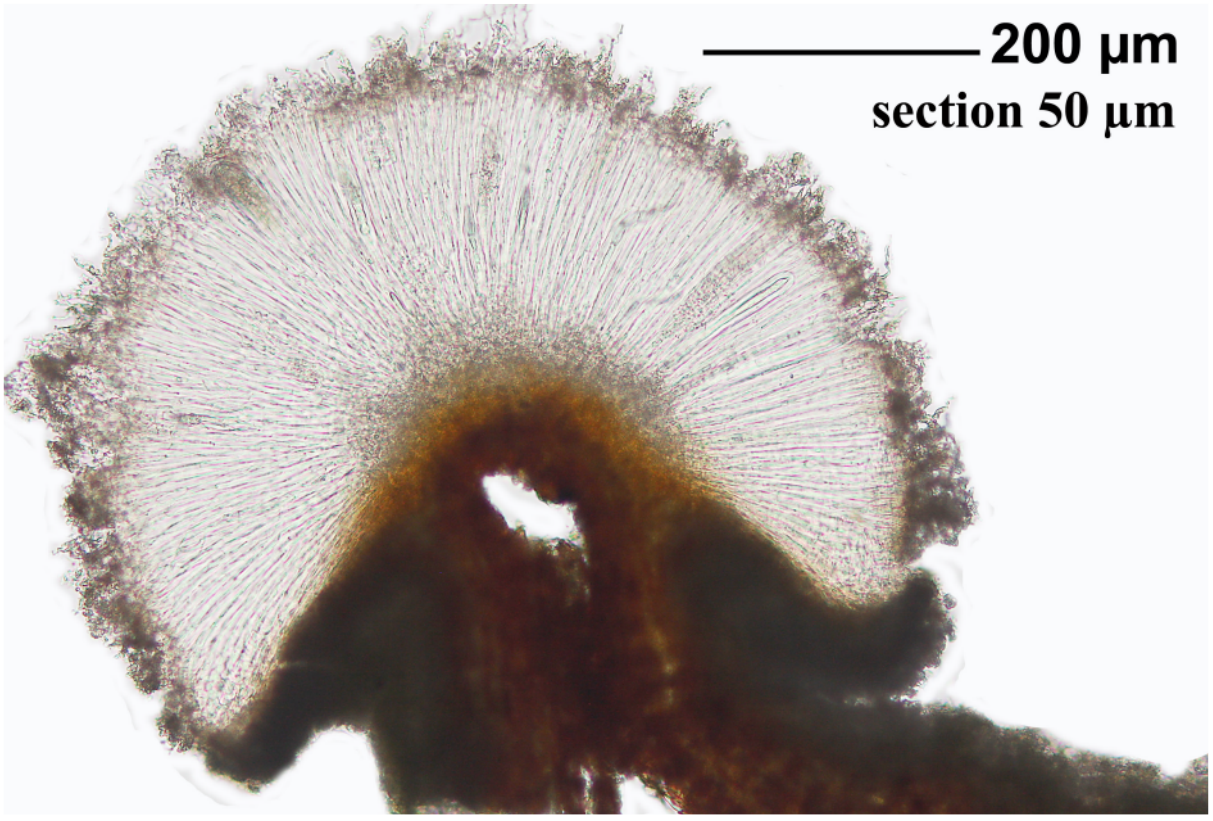
***Diorygma rufopruinosum*** (A.W.Archer) Kalb, Staiger & Elix

Thallus corticolous, whitish, pale grey, 70-100 µm thick; surface matt, farinose-granular; medulla white with many crystals. Ascocarps 1-4 x 0.4-0.8 mm; disc wide or narrow, flat with thick whitsh brown to light brown, lax pruina; exciple uncarbonised, rudimentary, yellowish hyphae only present basally. Hymenium not inspersed, J- or J+ pale bluish; epithecium well developed, partly over 40 µm high. Ascospores 1/ascus, hyaline, muriform, 120-155(-215) x 30-45(-63) µm, J+ blue-violet. Chemistry: protocetraric acid (maj), ± salazinic acid, ± norstictic acid. Lit. Kalb, Staiger & Elix (2004, Symb. Bot. Ups. 34:1).

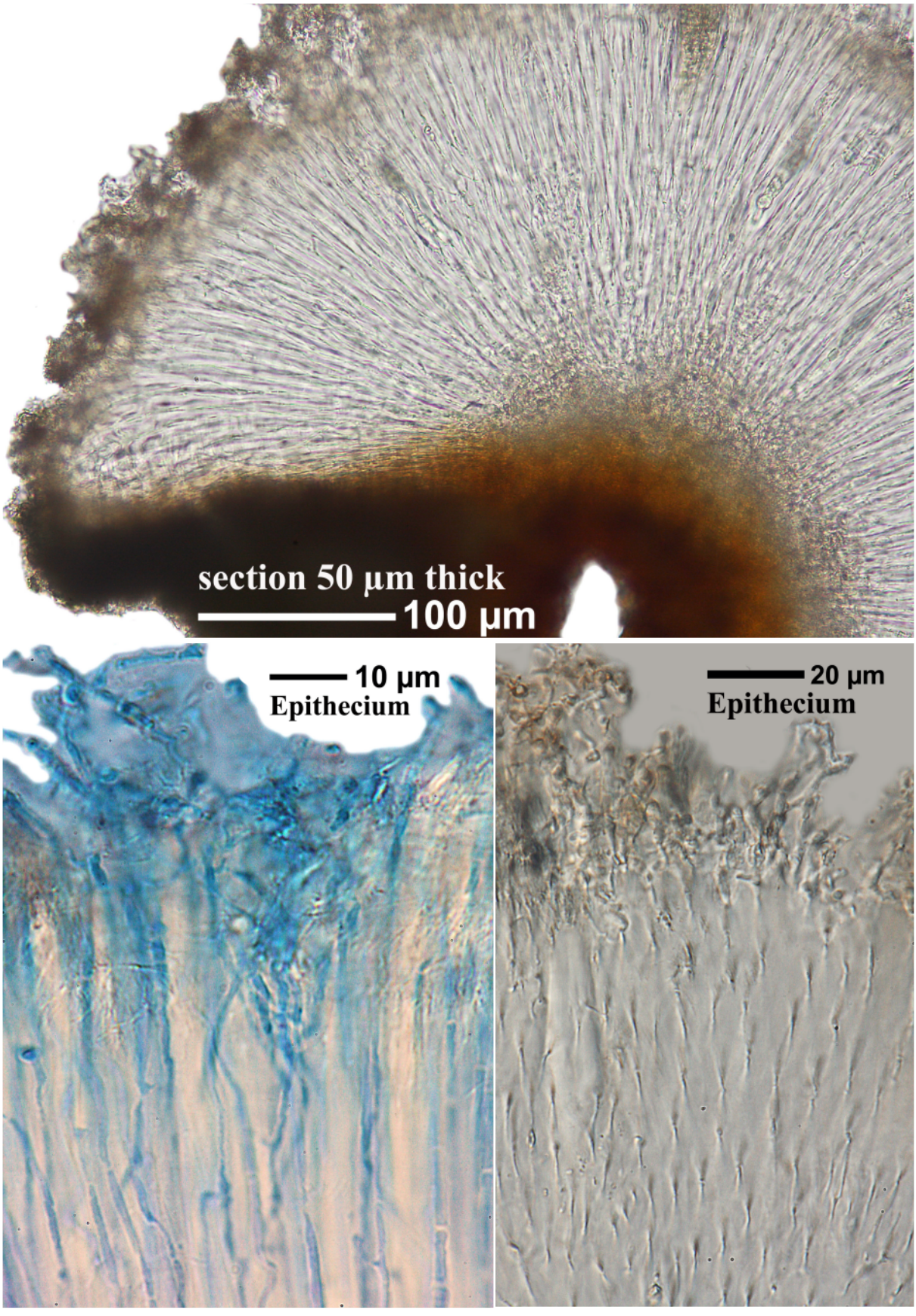
[17222], Kalb: Lichenes Neotropici 588. Australien/Queensland. Wenige km nördlich von Cardwell. In einem tropischen Küsten-Regenwald mit *Avicennia mariana*, *Lumnitzera ramosa*, *Xylocarpus granatum* etc., 5 m, 18°12'48" S, 146°00'44" E. Leg. K. & J. Kalb 23.08.2002, det. K. Kalb.



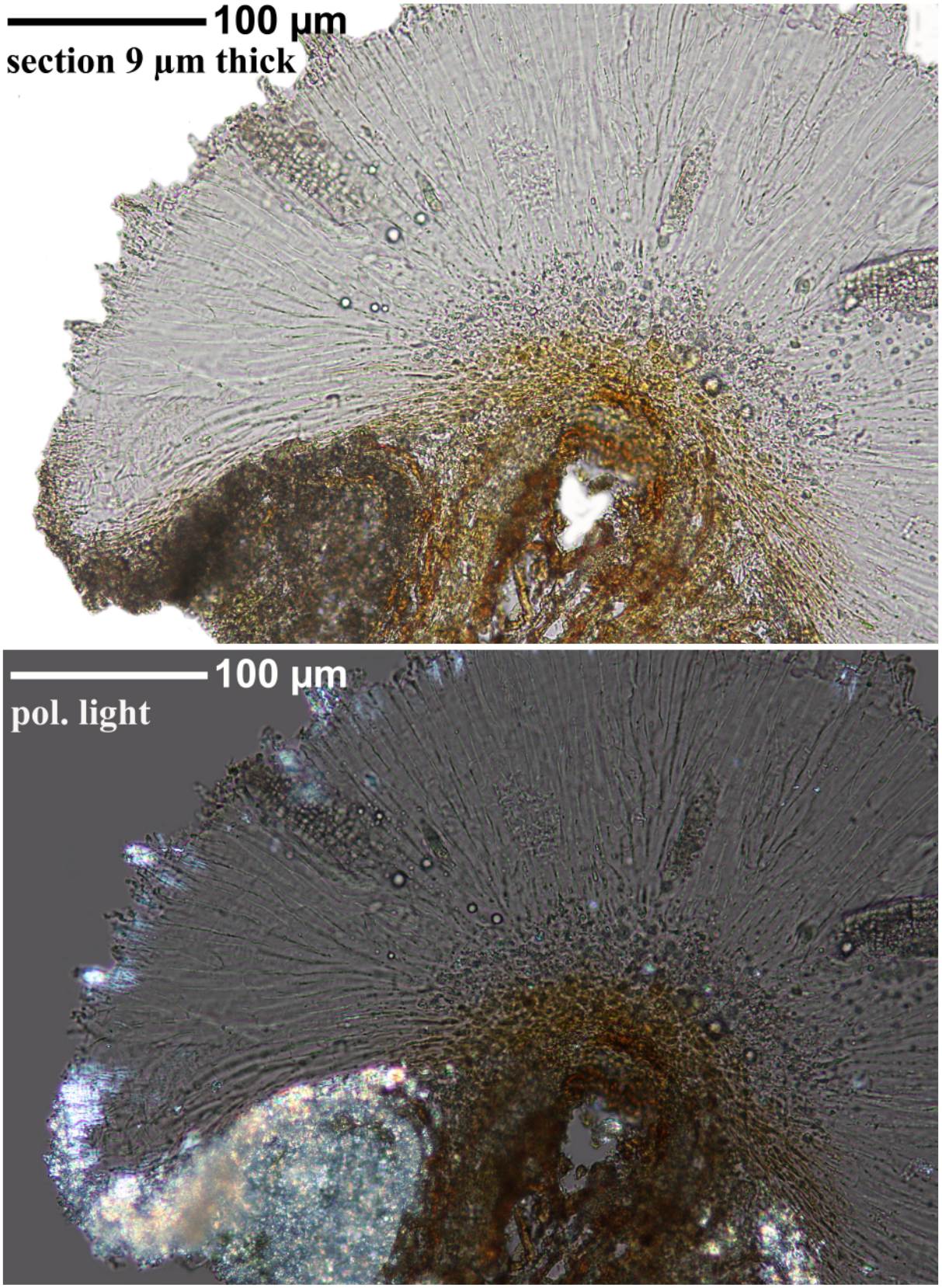


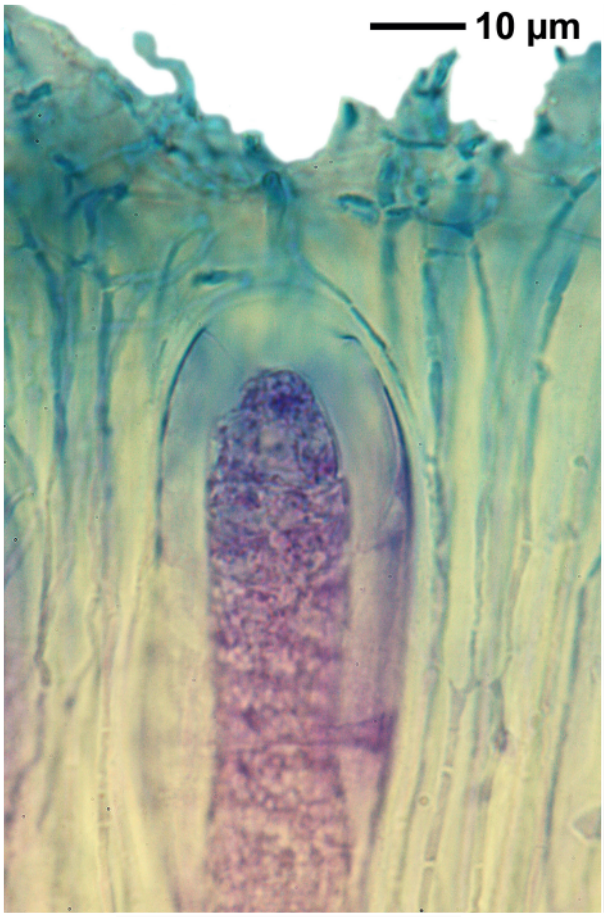

***Diorygma rufopruinosum***

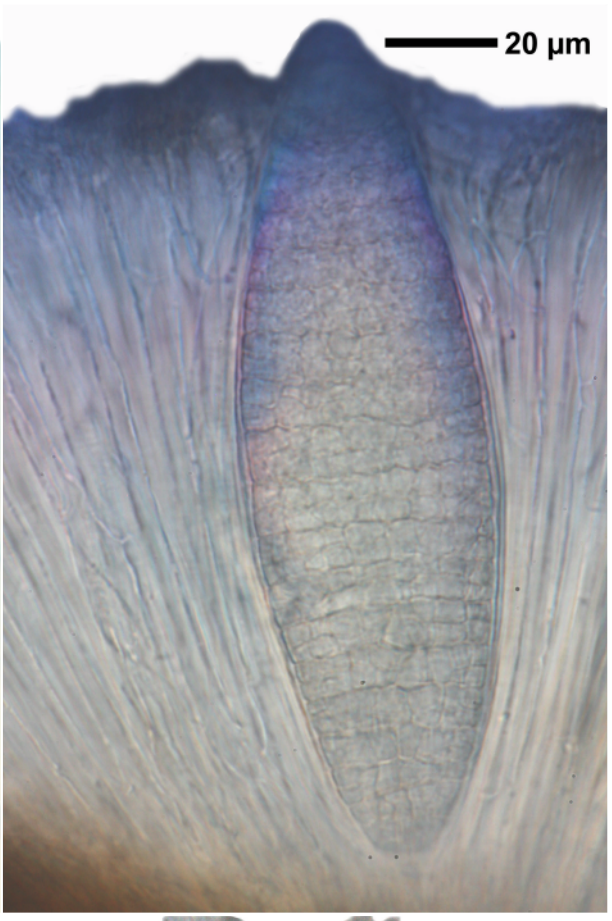



***Diorygma rufopruinosum***




*Diorygma rufopruinosum*







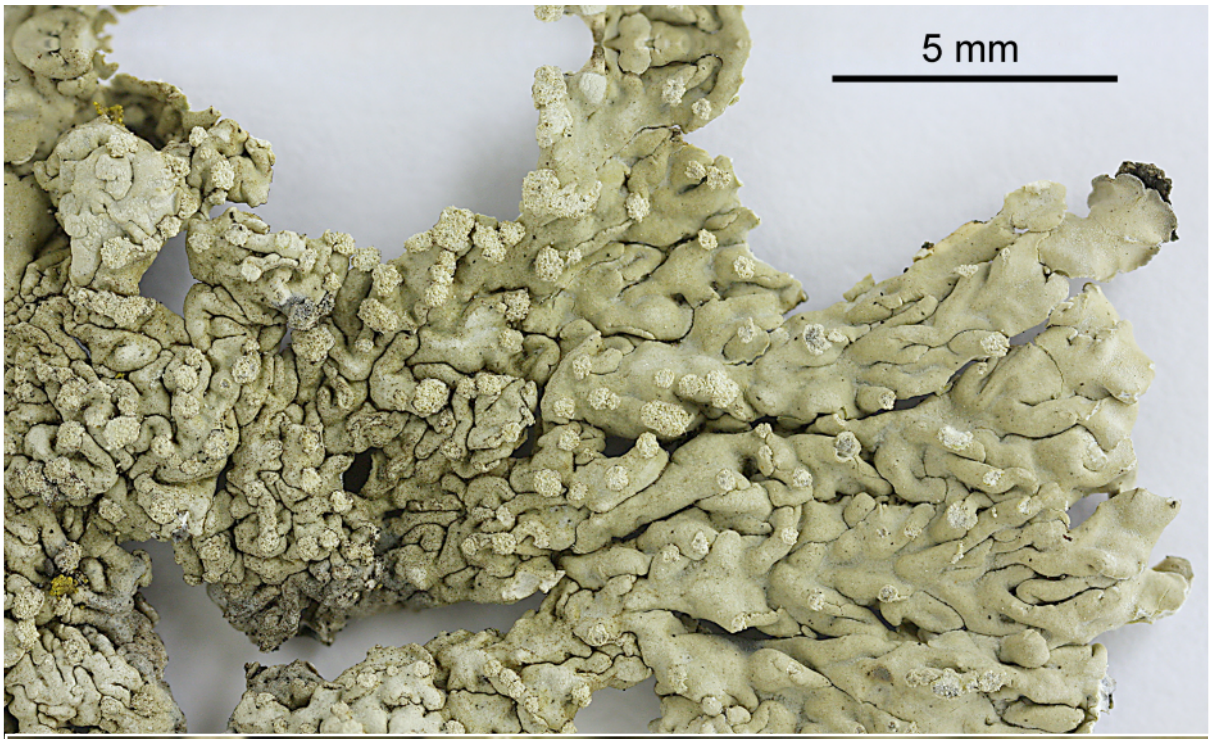


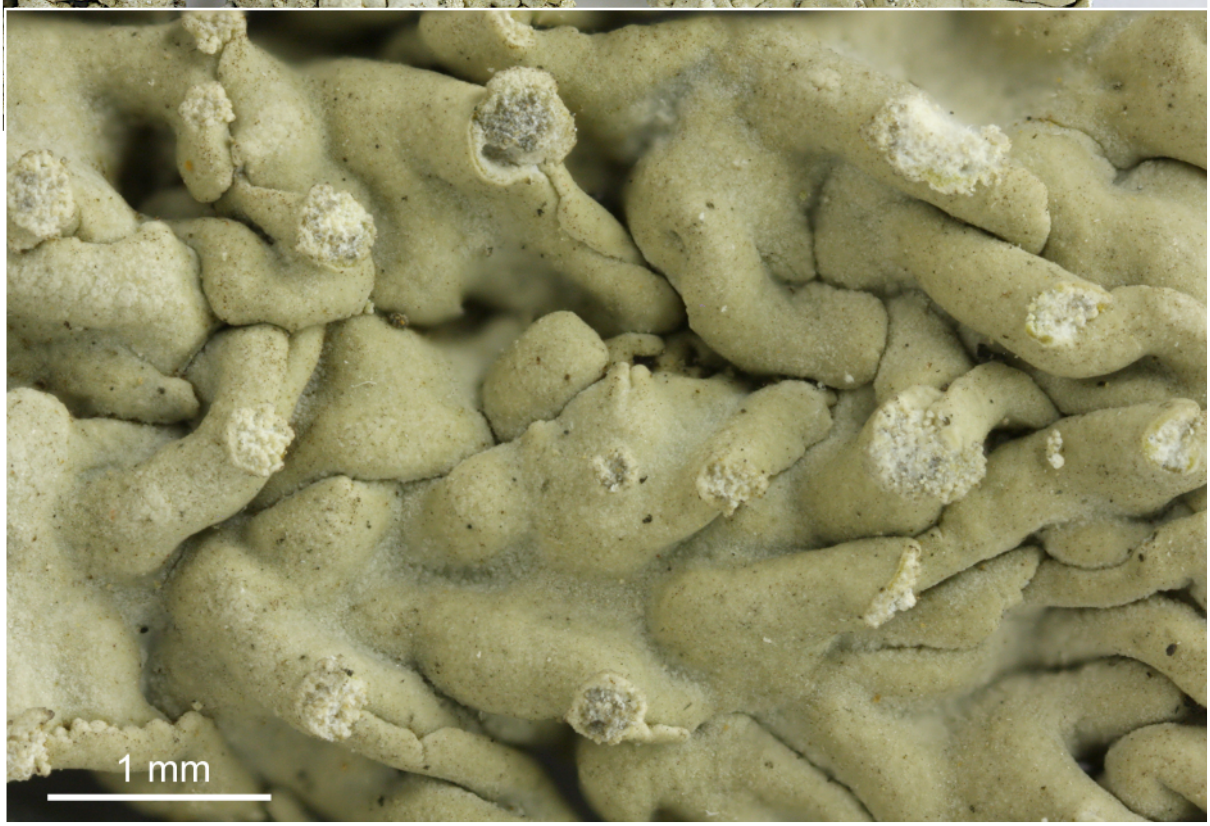

***Diorygma rufopruinosum***

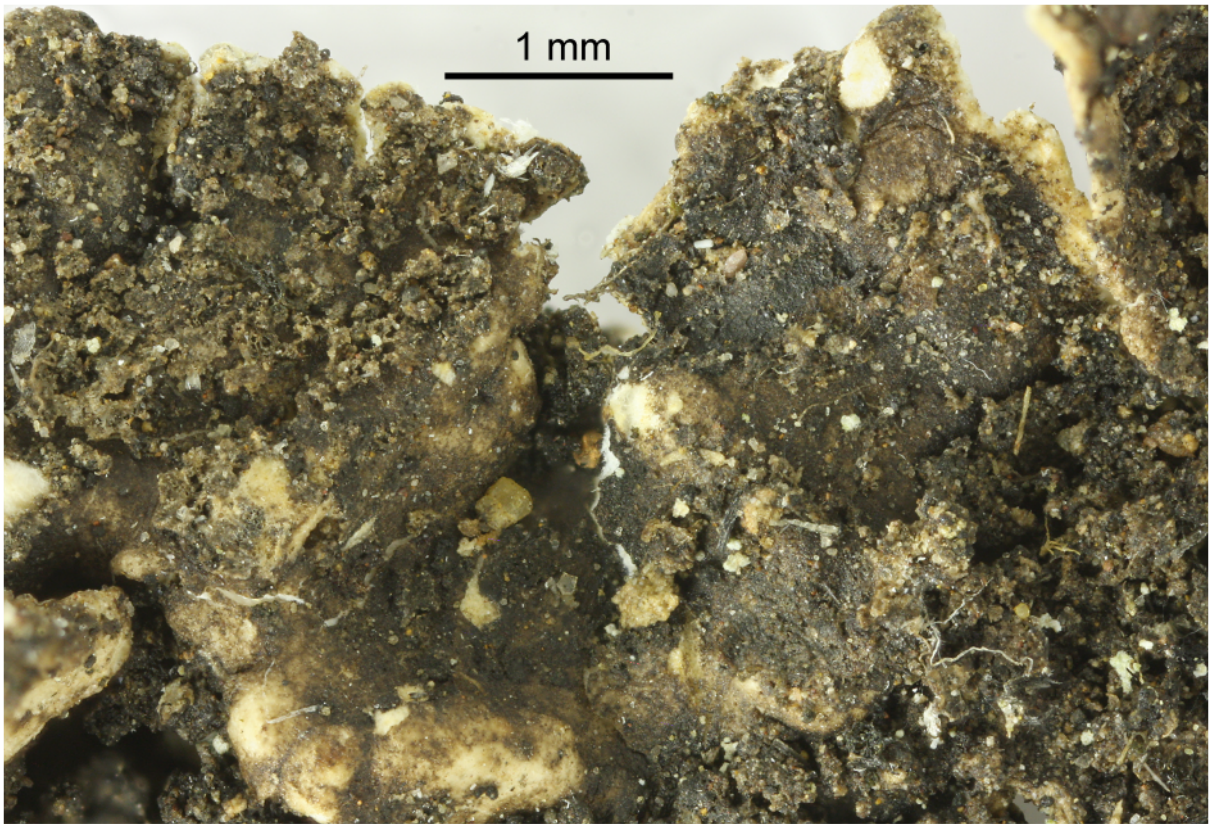
***Dirinaria applanata*** (Fée) D.D.Awasthi

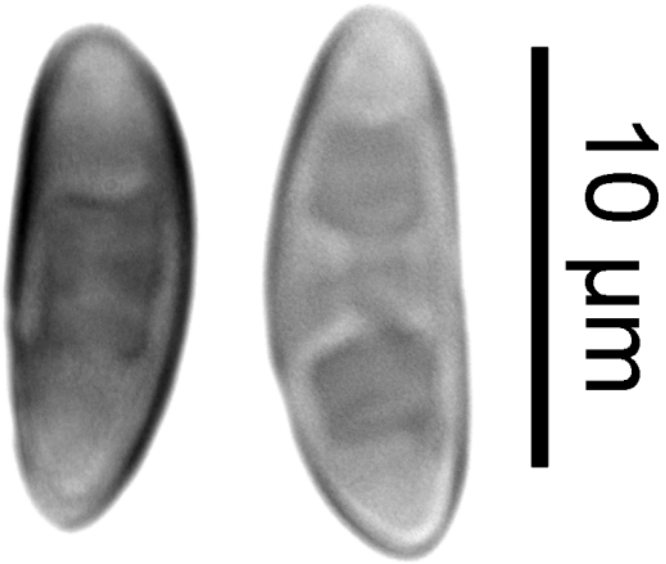
Thallus with regular soralia. Lobes confluent, longitudinally plicate, usually > 0.2 mm thick. Chemistry: cortex K+ yellow; medulla K+ yellow, C-, KC-, P-, UV+ white; atranorin, divaricatic acid, 4 terpenoids. Pantropical.

[9549], Thailand: Tempelanlage von Lampang (Wat Lampang Luang). 18°13.061' N, 99°23.316' E, 287 m. Leg. Schumm 29.03.2002, det. Aptroot 2009.





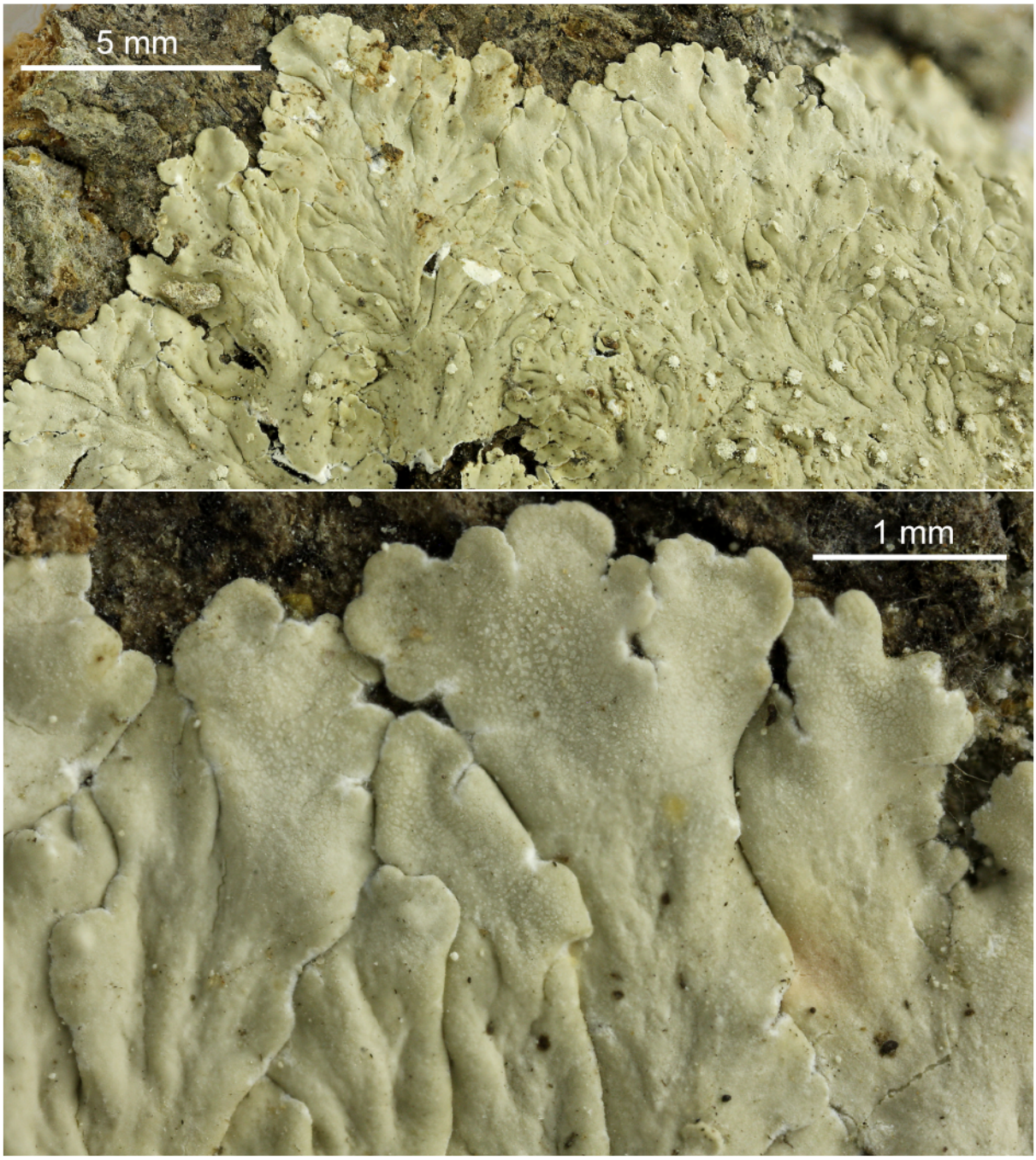



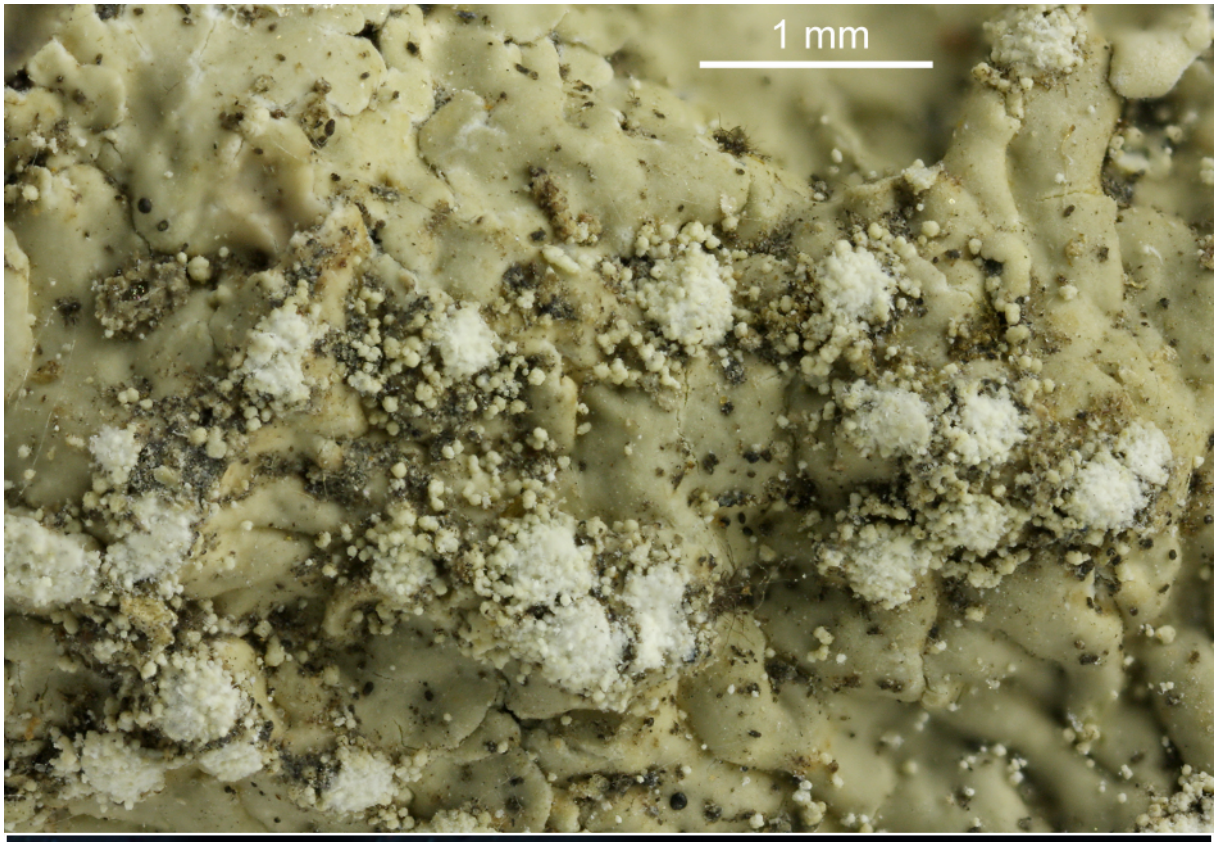

***Dirinaria applanata***

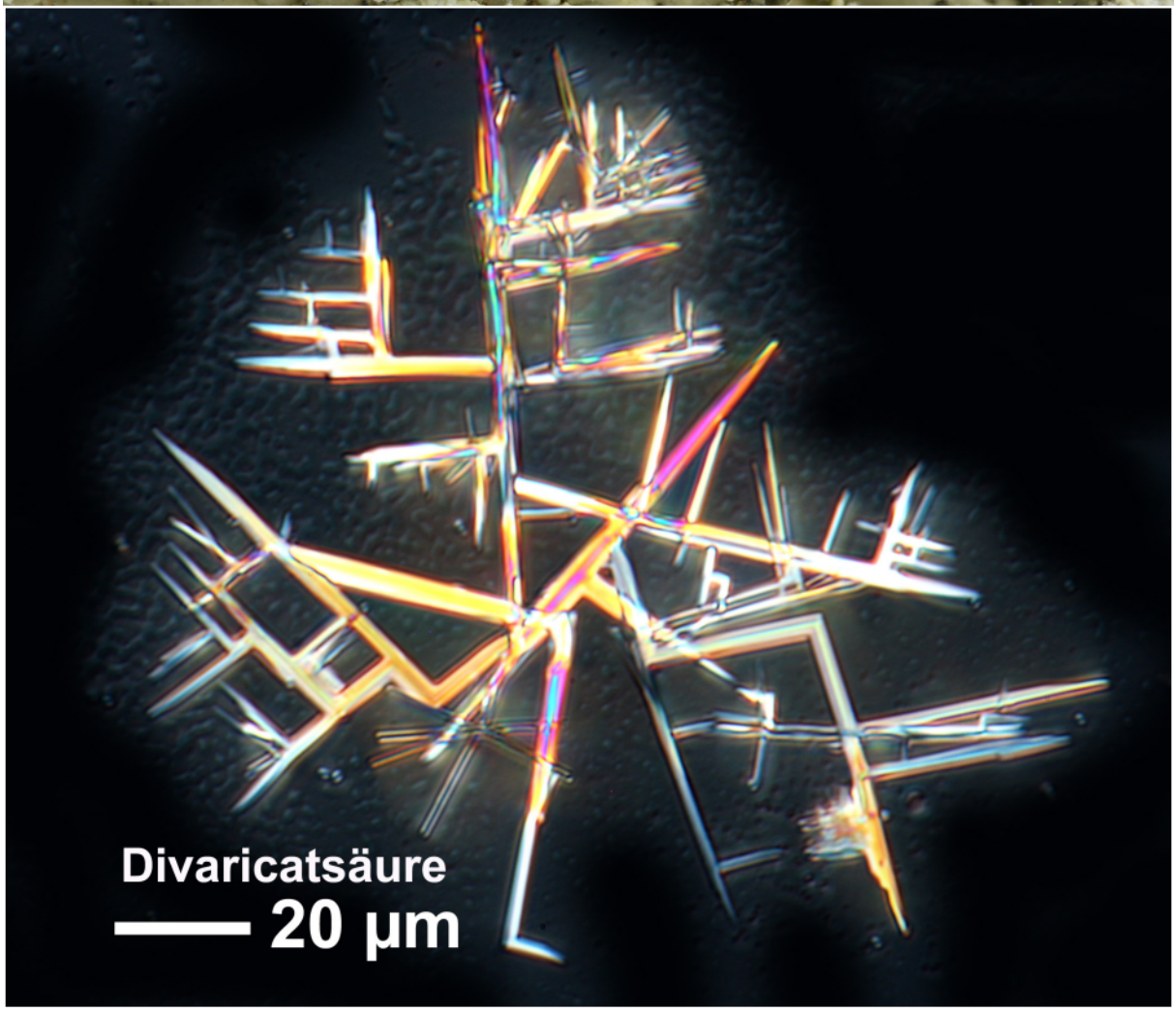
***Dirinaria picta*** (Sw.) Clem. & Shear

Thallus appressed to agglutinated up to the lobe tips. Lobes 0.5-1 mm wide, usually < 0.2 mm thin, irregularly divided, at the thallus margins discrete and not confluent. Upper surface grey to greenish, not or very faintly pruinose. Soralia laminal, globose, often greenish inside, grey outside. Medulla white. Lower surface black, erhizinate or rhizinae very short (0.3 mm). Apothecia rarely present. Chemistry: atranorin, divaricatic acid, terpenes; medula K-, C-, KC-, P-, UV+ bluish white; cortex K+ yellow, C-, KC-, P+ yellow. Pantropical. Very similar to *Dirinaria applanata* which has more confluent lobes at the margins

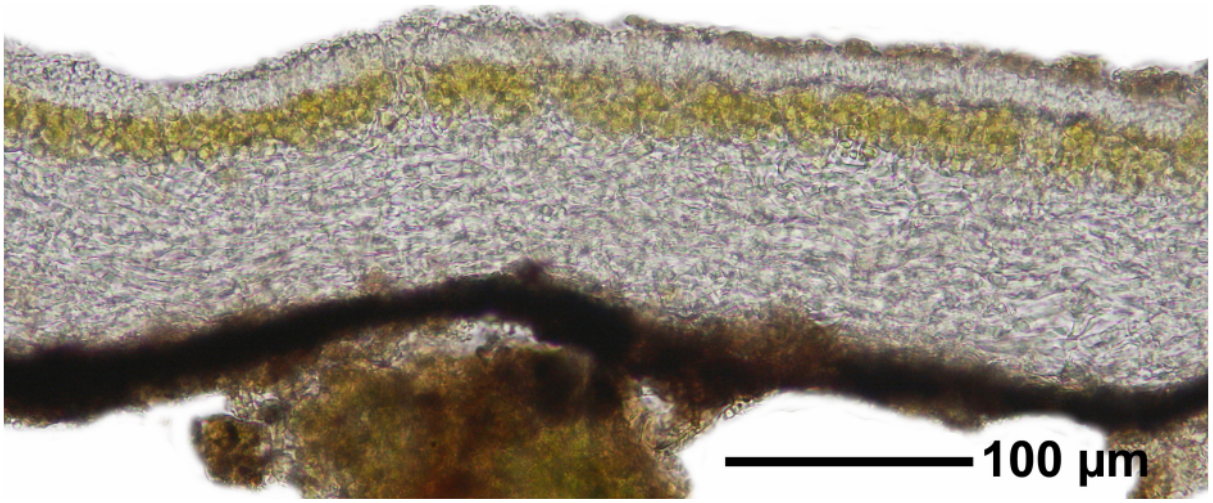
[9569], Thailand, Elefantenarbeitslager bei Chiang Mai, 19°14.859' N, 98°58.137' E, 330 m. Leg. Schumm 01.04.2002, det. Aptroot 2009.

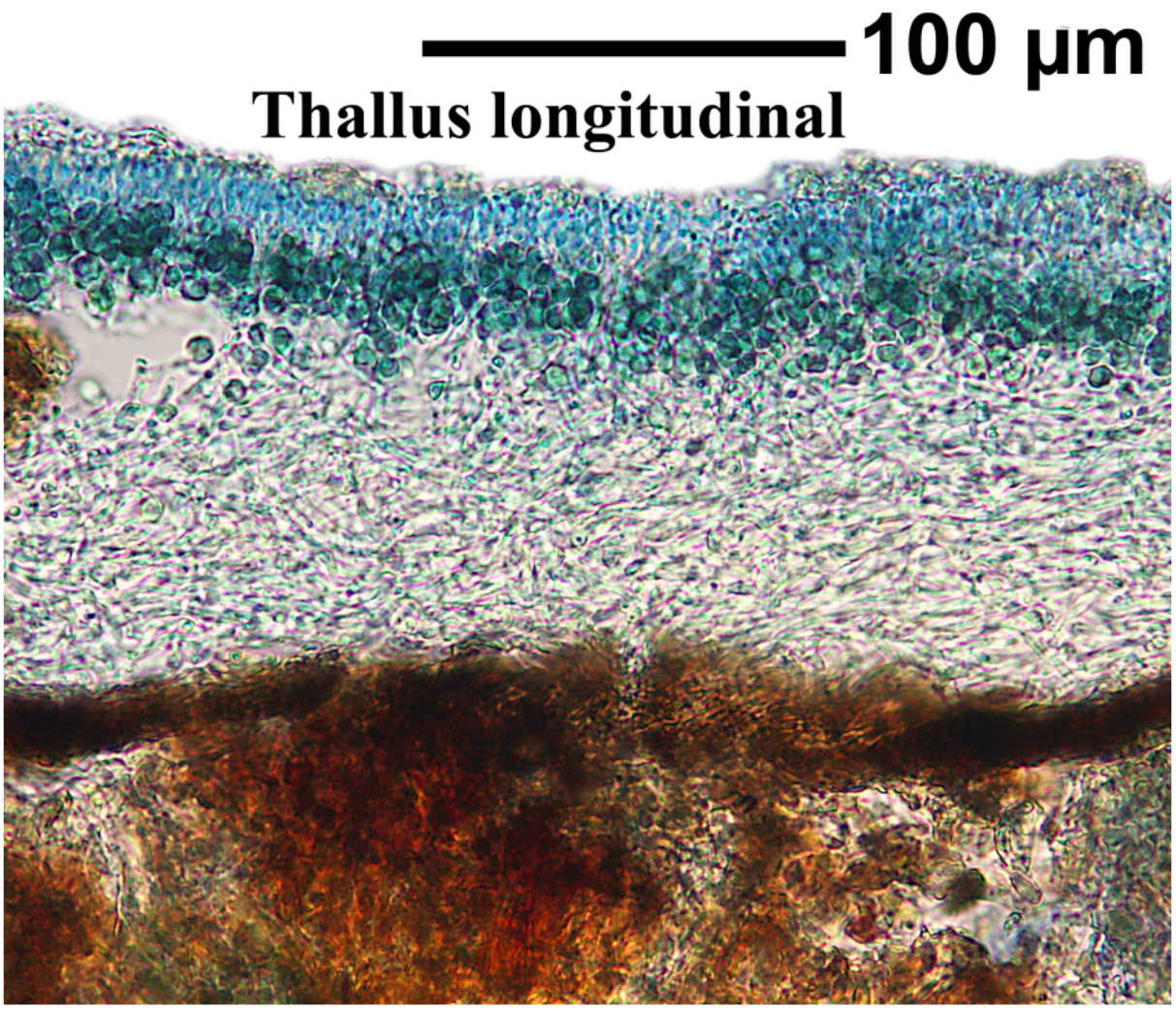




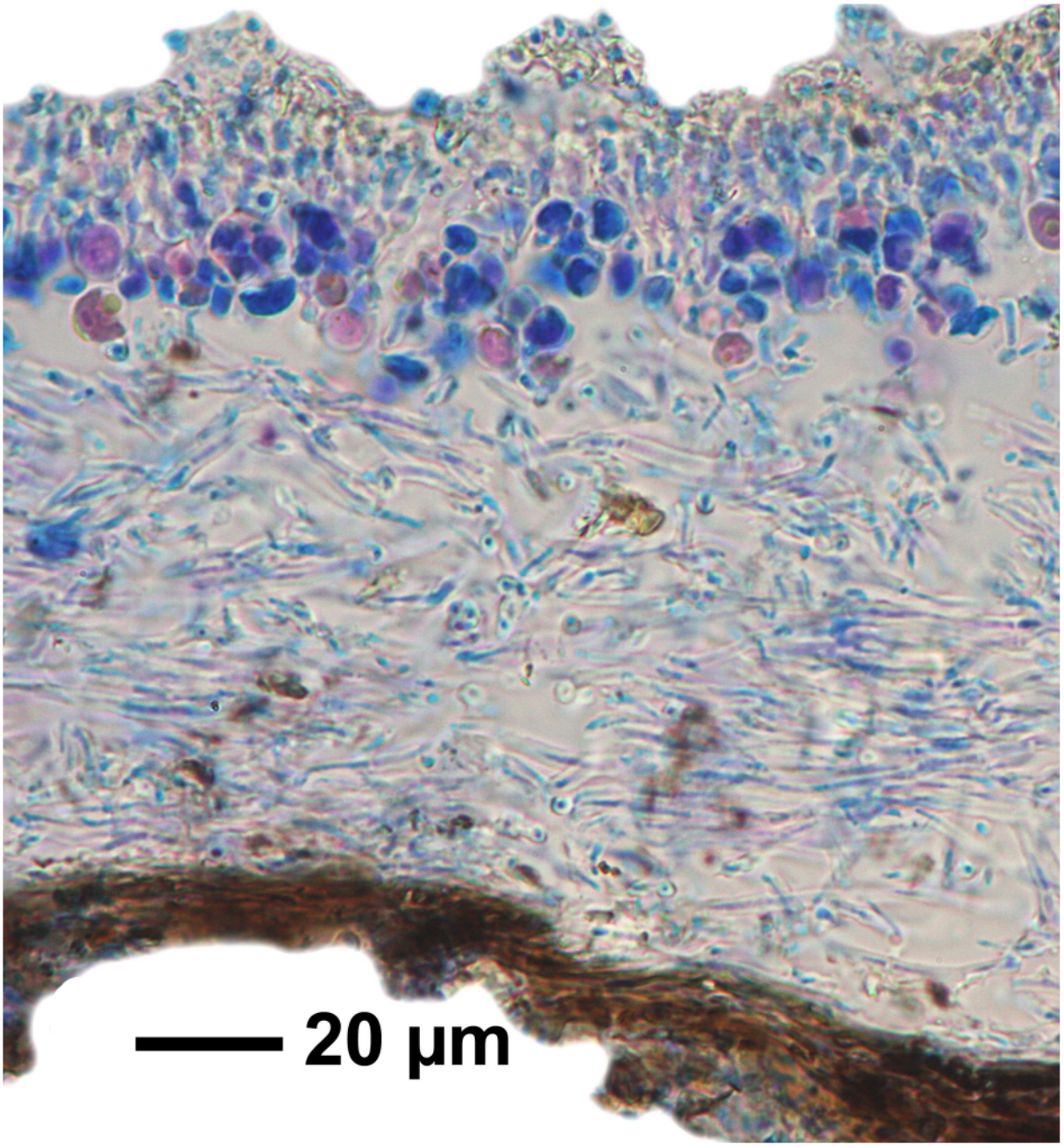



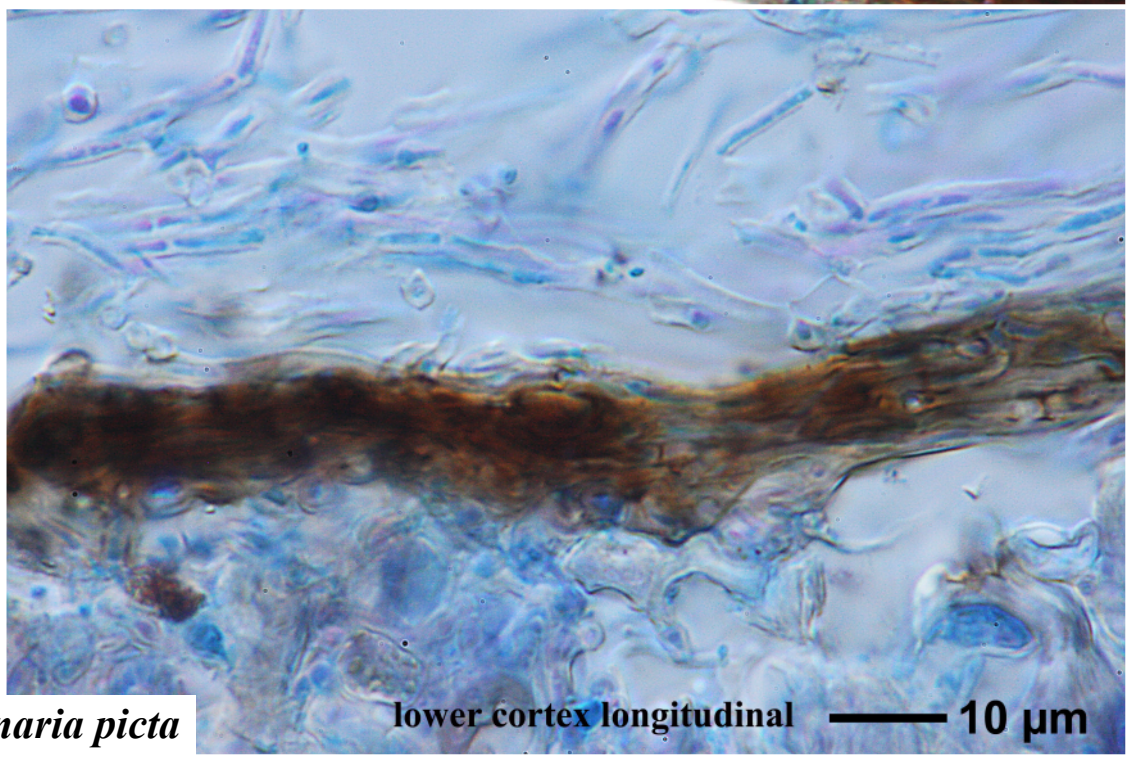

***Dirinaria picta***



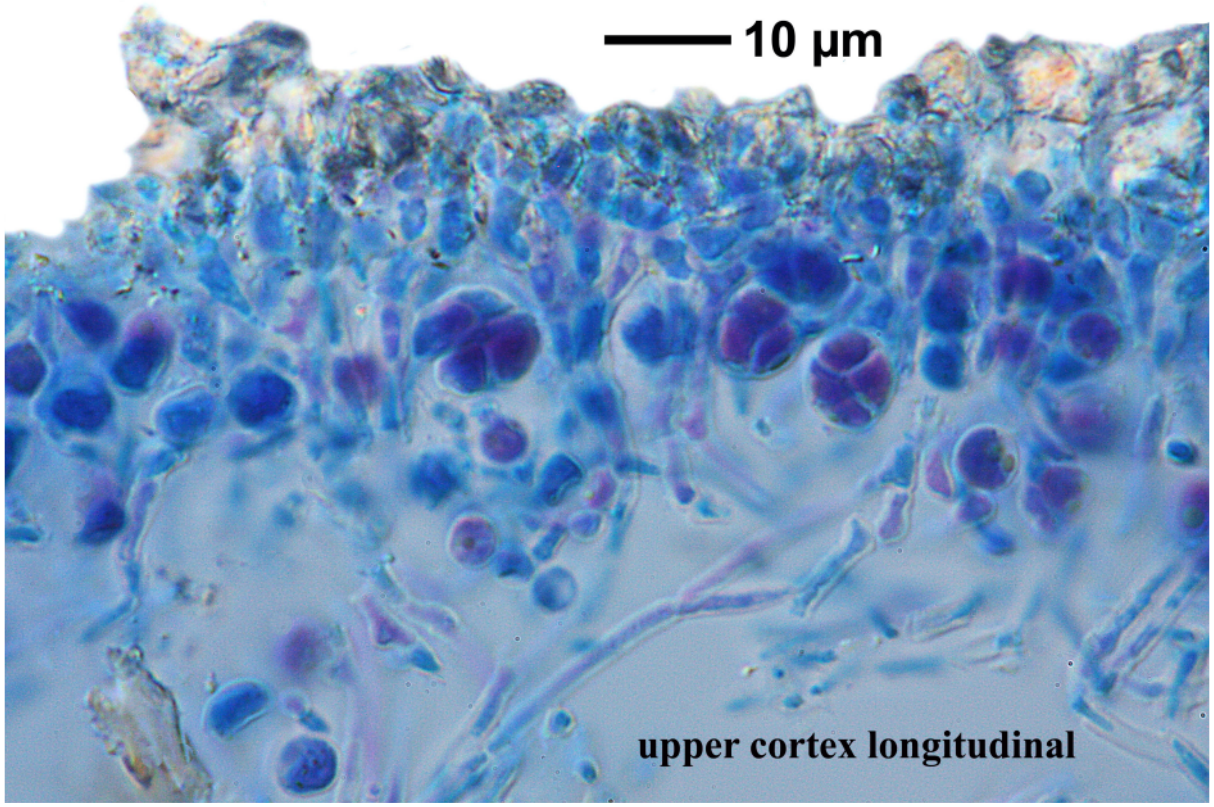



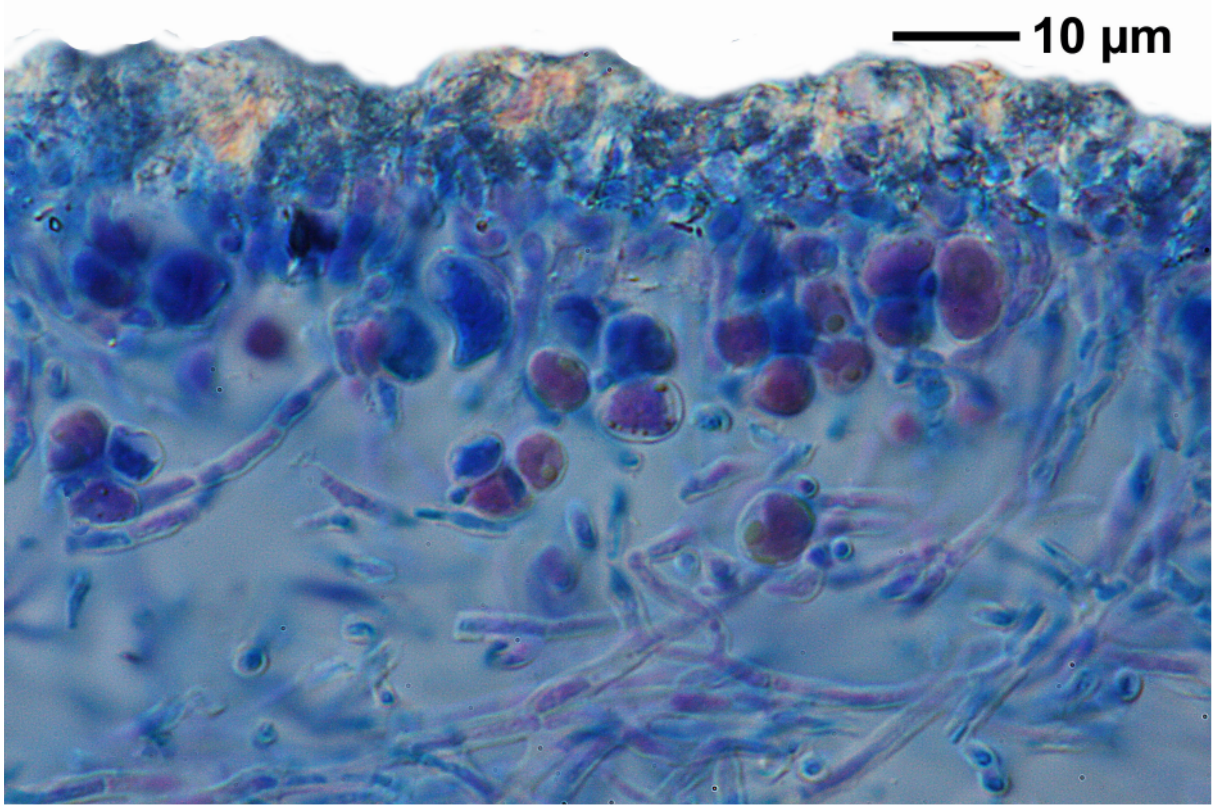

***Dirinaria picta***




***Dirinaria picta***

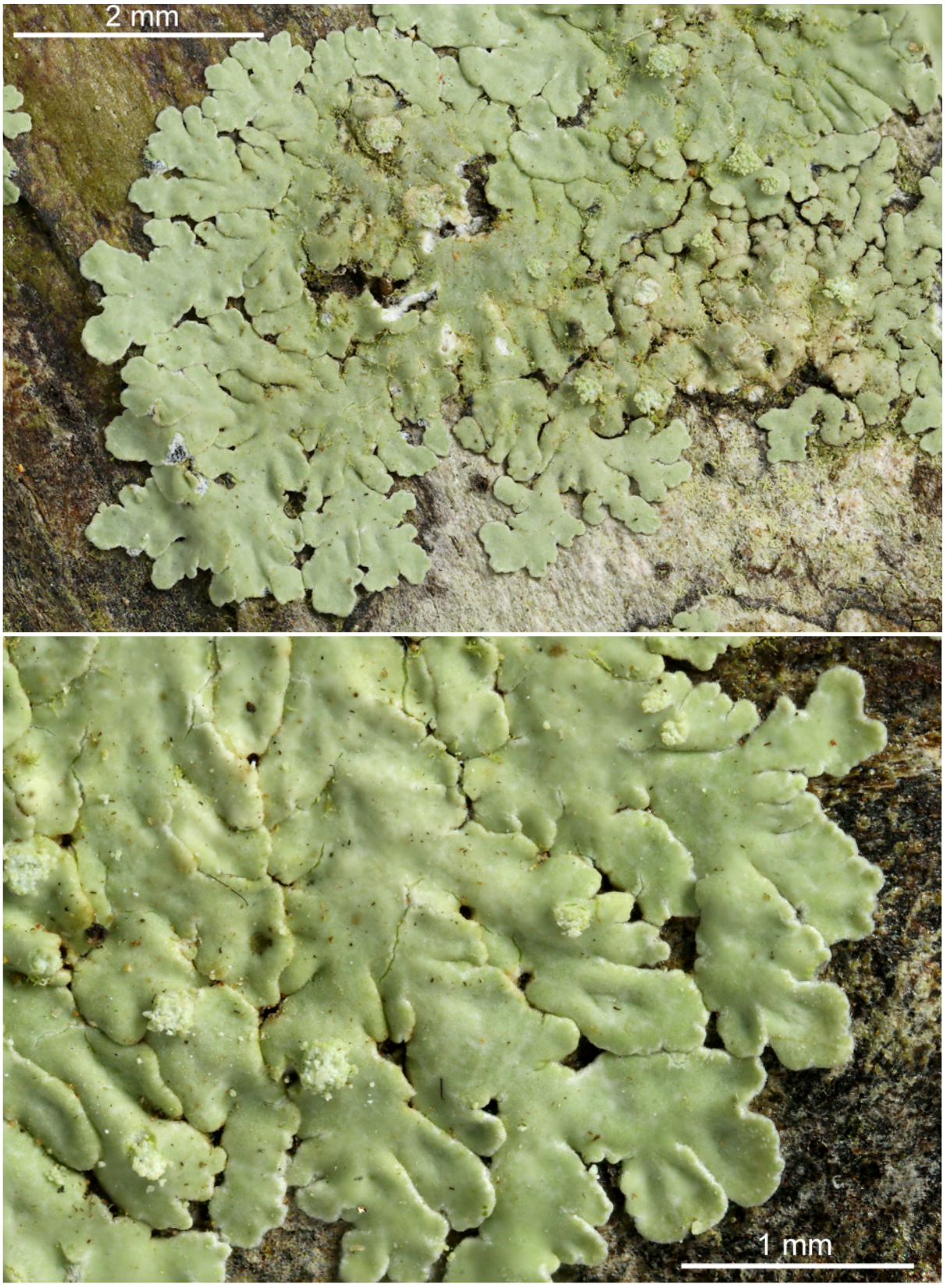



***Dirinaria picta***

***Dirinaria picta*** (Sw.) Schaer. ex Clem.

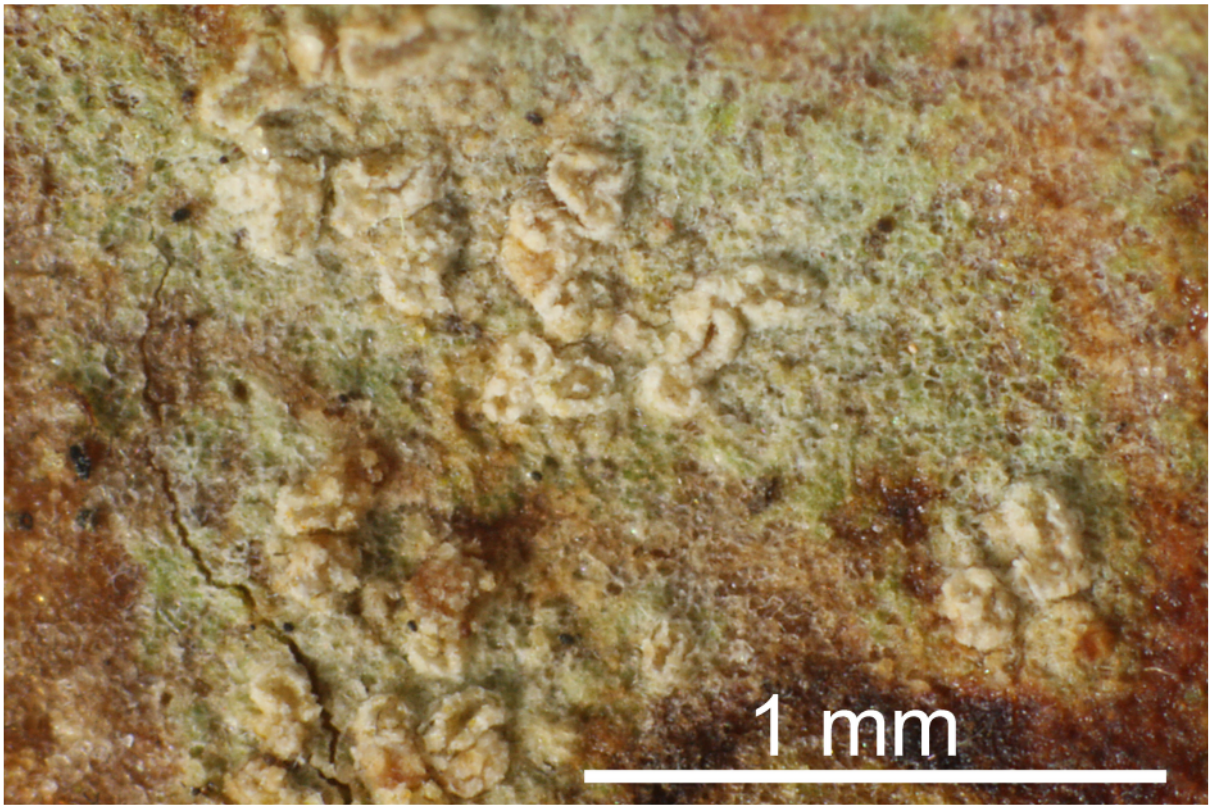
[17574], Thailand, Trat province, Had Sai Dum, Mangroven Wald, 12.17332° N, 102.40616° E, 0 m. Leg. Schumm (IAL 7) 16.01.2012, det. Kalb 06.2012.

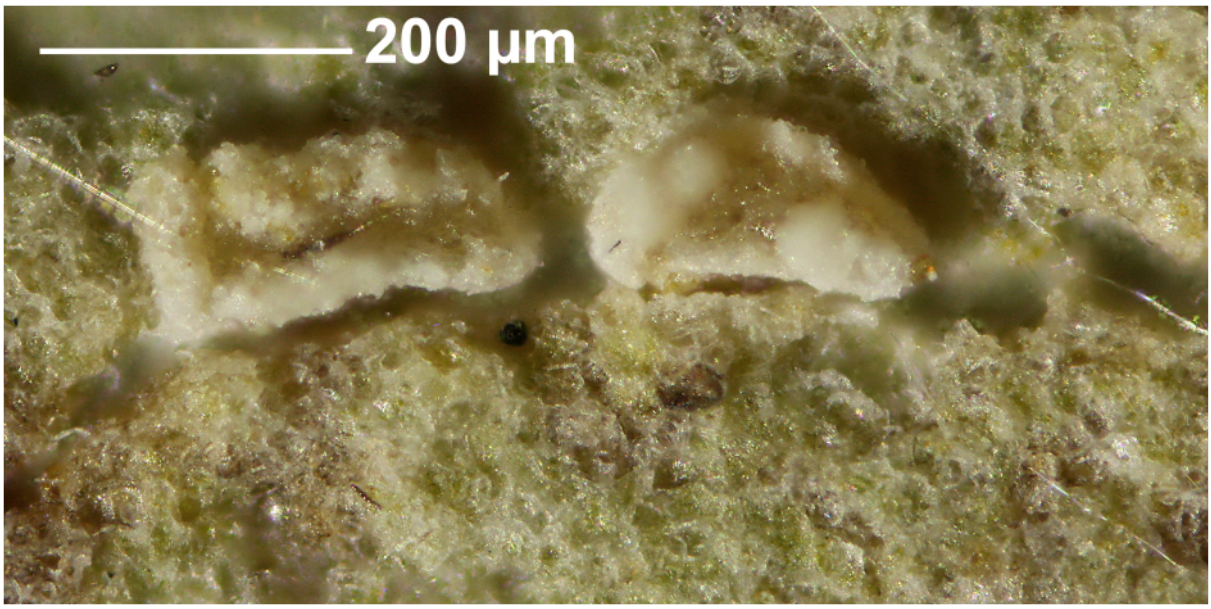


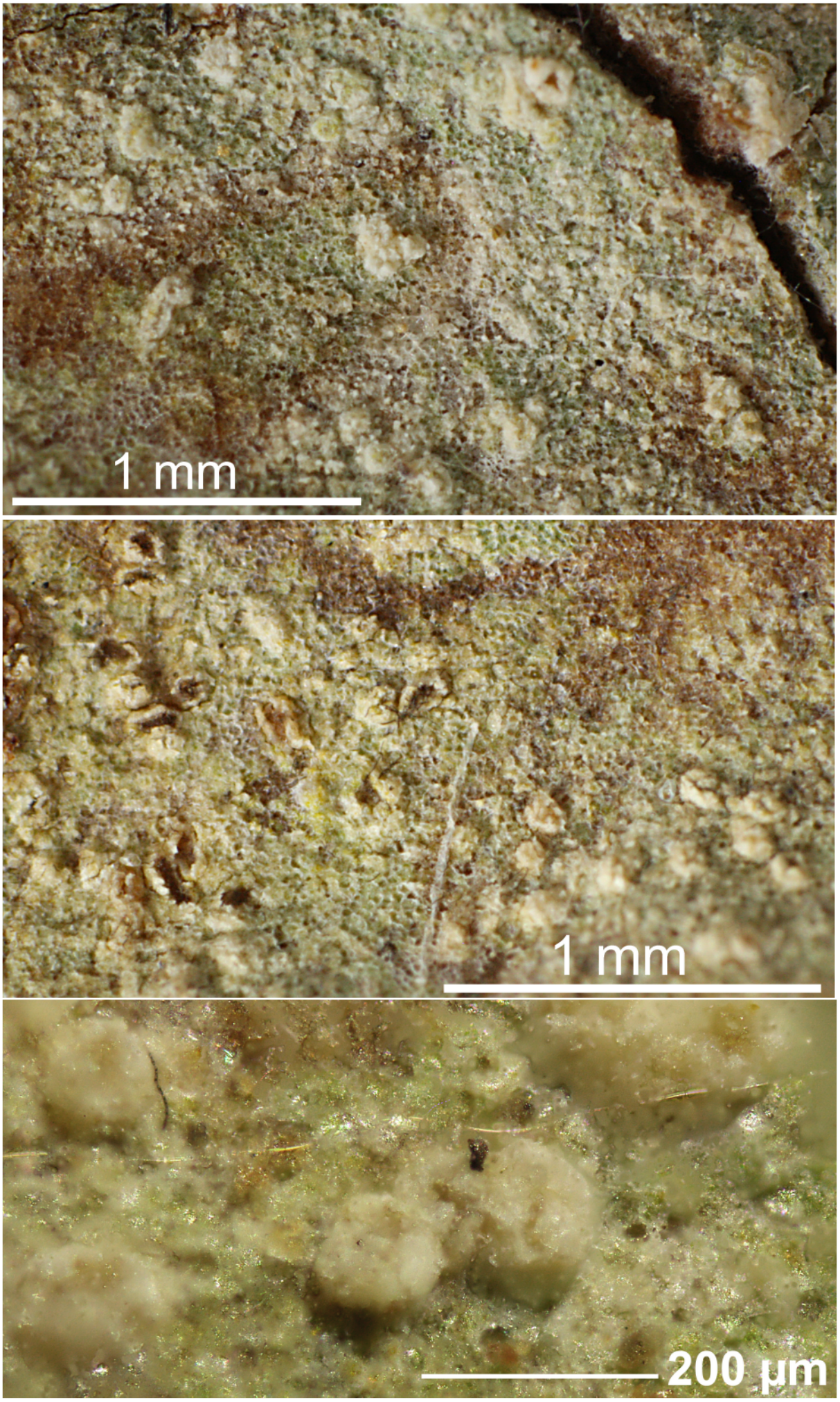
***Enterographa pallidella*** (Nyl.) Redinger

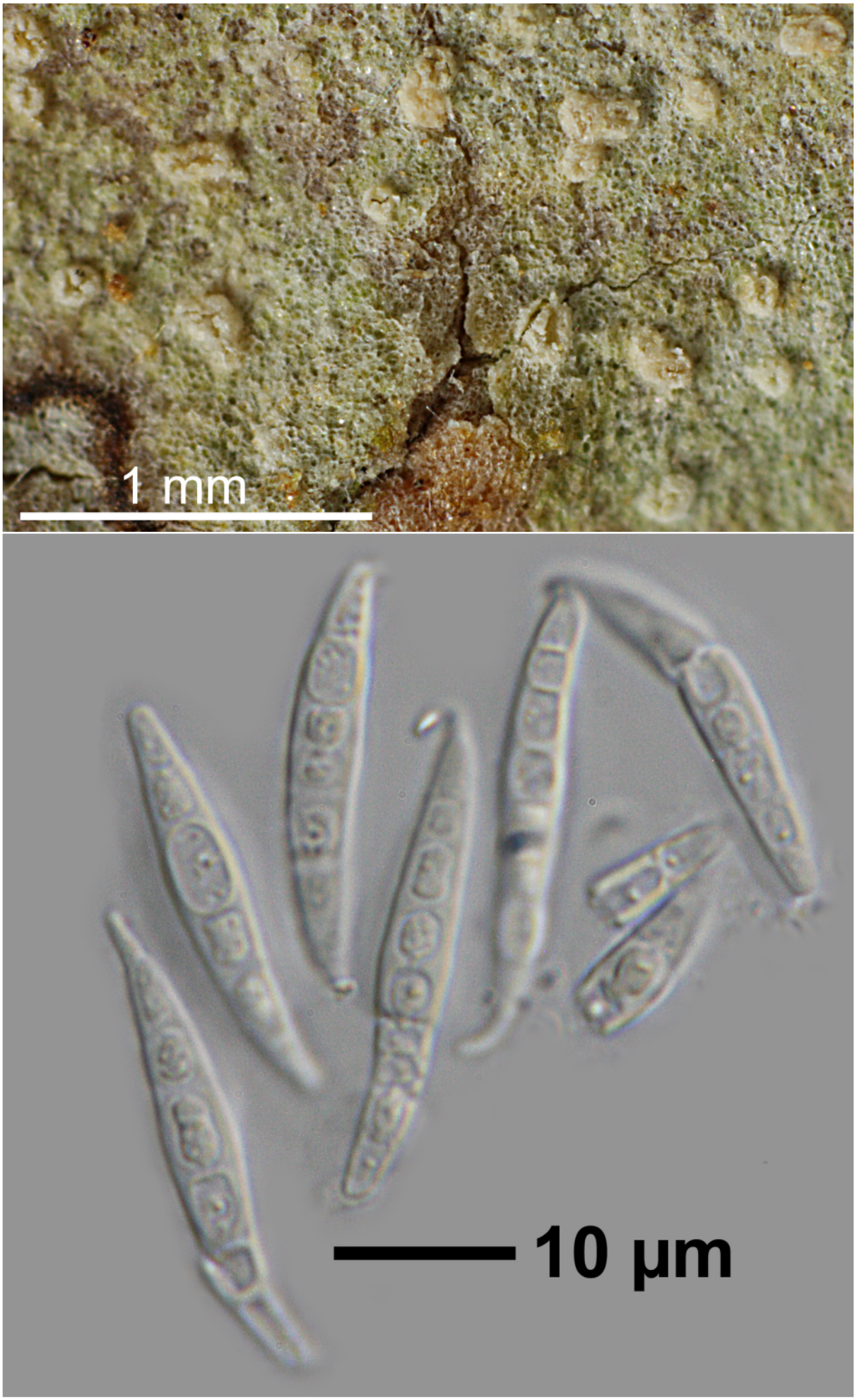
Thallus very thin, with Trentepohlia, C- (in this shaded plant, normaly C+ at least the excipulum, gyrophoric acid), K-, P-, UVK+ white. Ascocarps somewhat byssoid, not carbonized. Spores 24-31 x 3-4 µm, 6-9 septate, 8/ascus, J-. Ascus J+ redbrown.

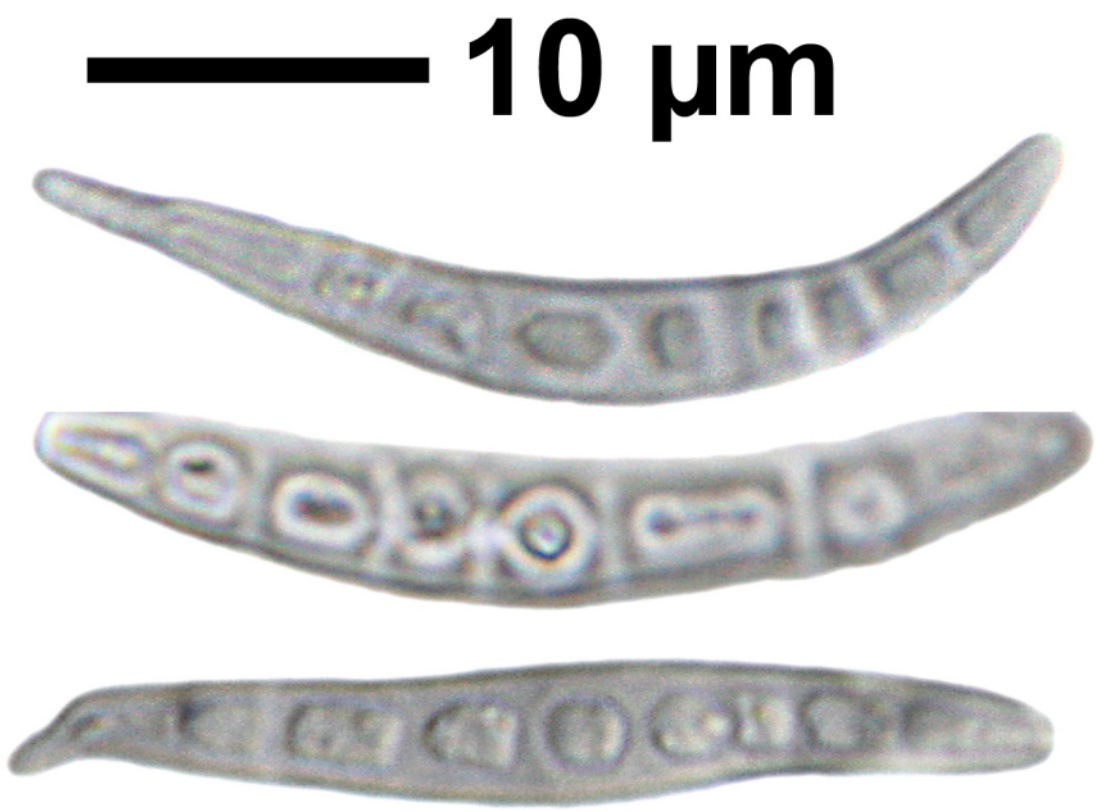
[17541], Thailand, Trat province, Ban-Dan Kao island, Mangroven Wald, 12.21359° N, 102.55290° E, 5 m. Leg. Schumm 15.01.2012 (IAL 7 meeting), det. L. Sparrius 2012.




1 mm
1 mm
200 µm

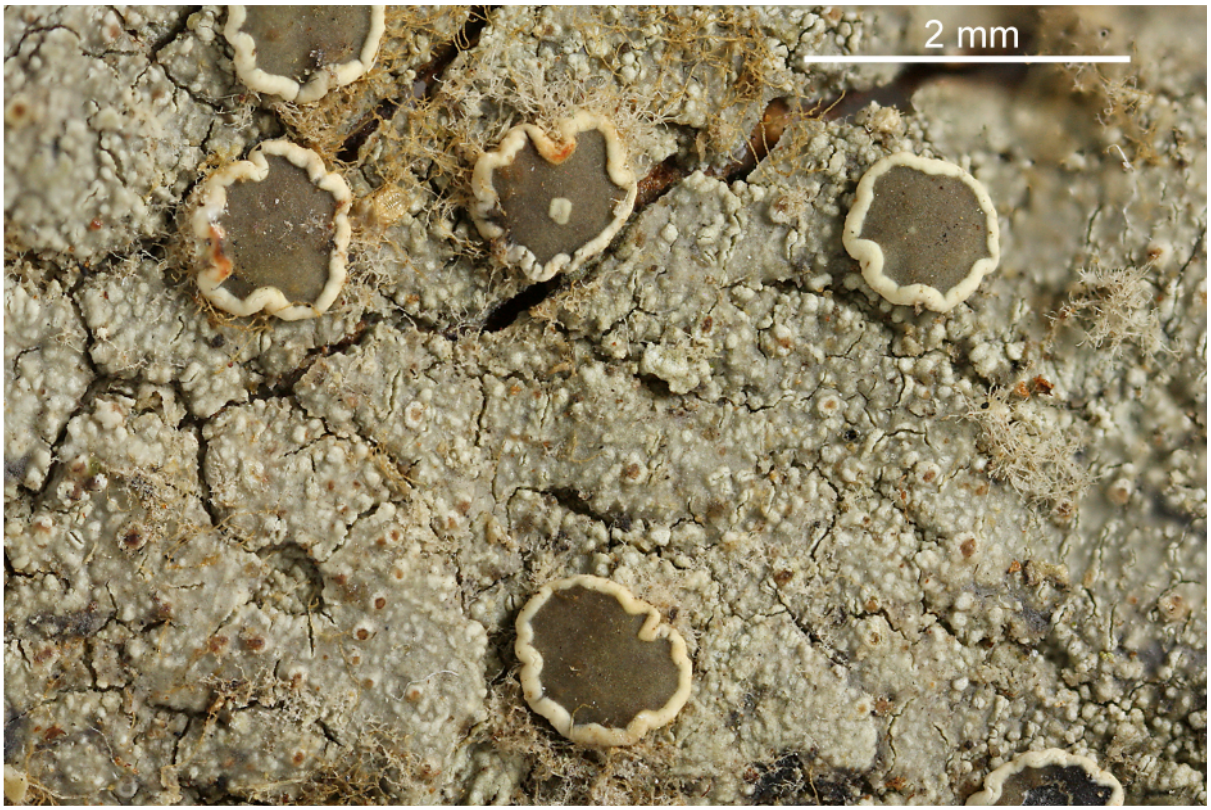

1 mm
10 µm

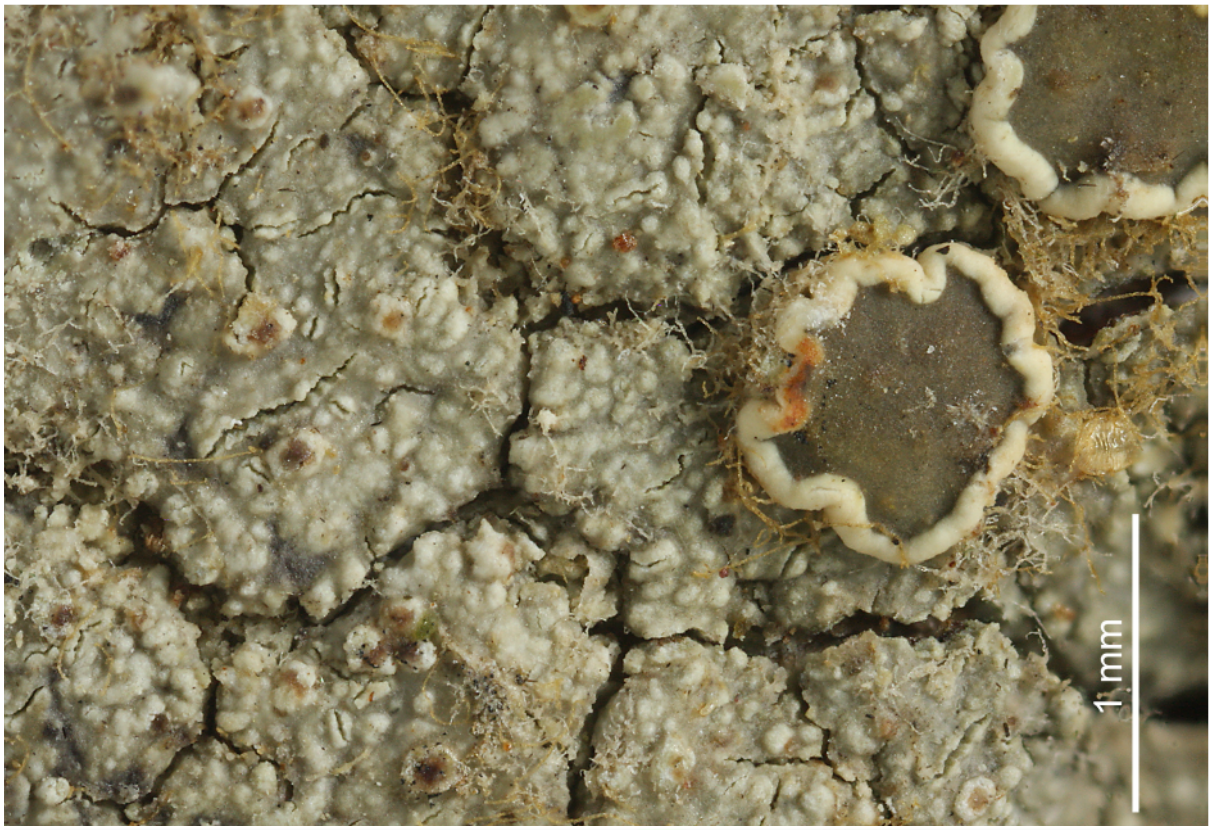

10 µm

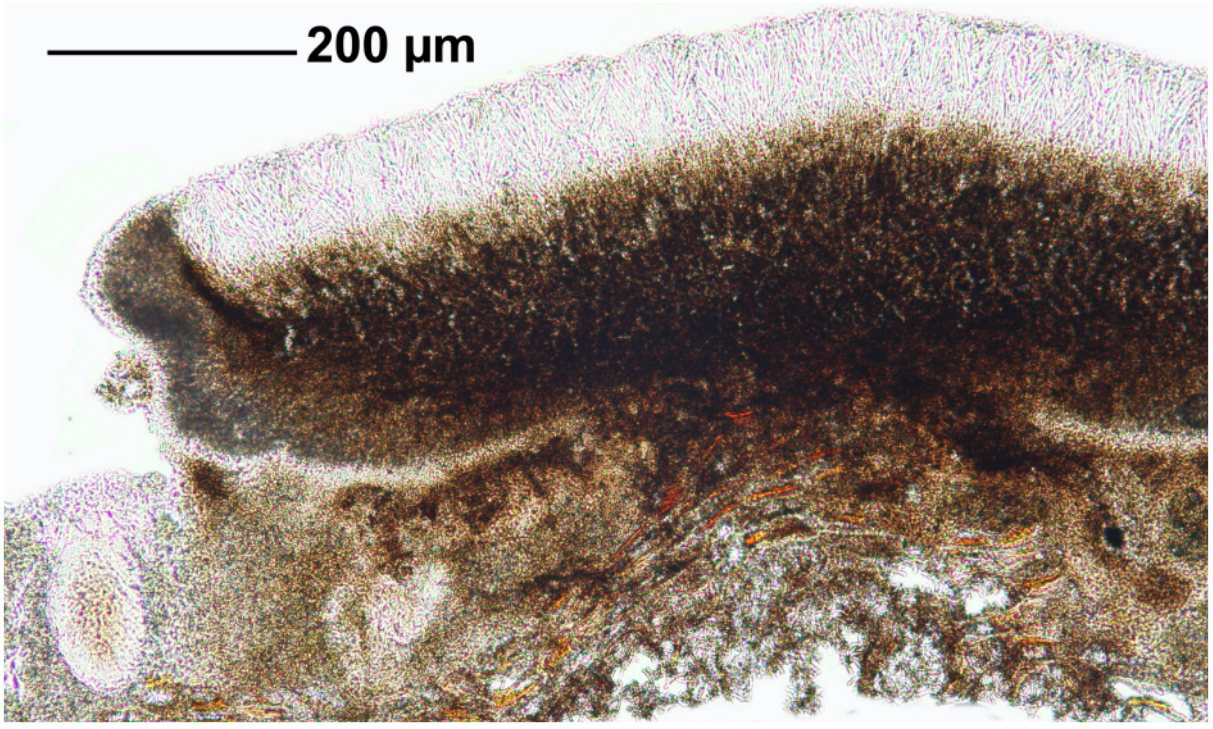
***Eugeniella sp.*** [7736]

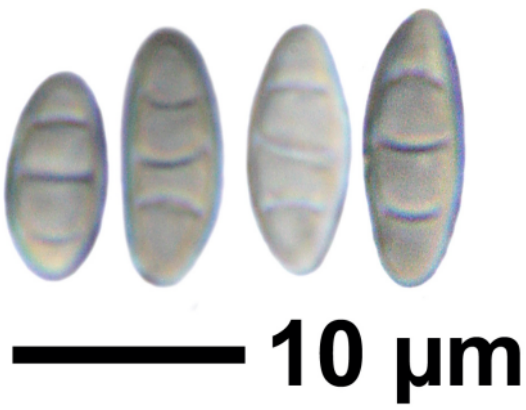
Apothecia biatorine. Margins full of fine crystals (pol. light +), which are covering and obscuring the hyphae and are solved by K with yellow colour. Epithecium pale. Hymenium pale, colourless, c. 95 µm. Hypothecium brown-black, 200-250 µm. Ascospores colourless, 3-septate, 8/ascus, 11-12 x 4 µm. Pycnidia present.

[7736], Philippinen, Leyte, Prov. Leyte, Weg zwischen Camp Pandong Bato am Lumsok River (10°43.907' N, 124°48.701' E, 340 m) und dem Gipfel des Mt. Agipo (10°46.729' N, 124°49.781' E, 885 m). Leg. Schumm 17.08.2000, det. K. Kalb 2011.

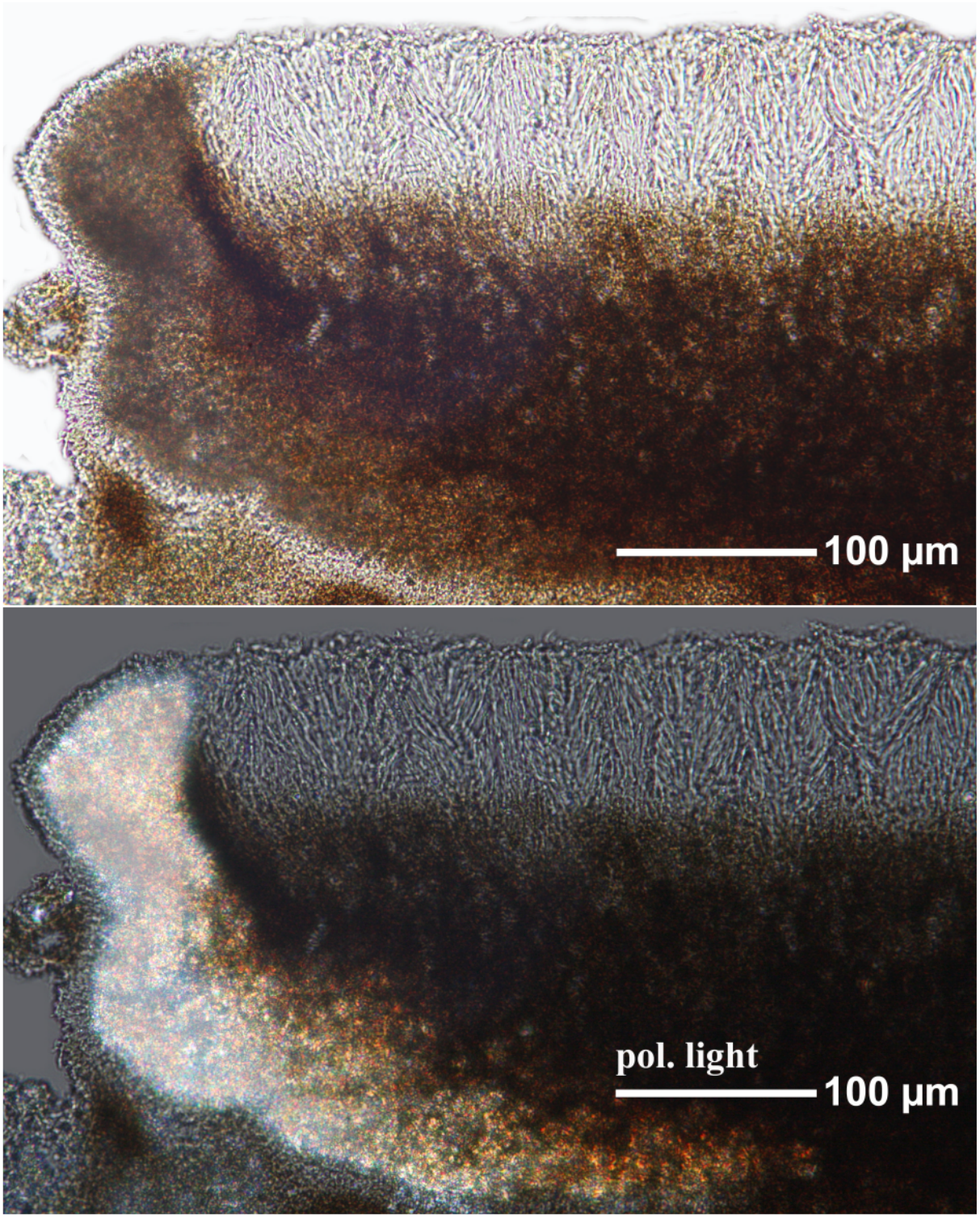




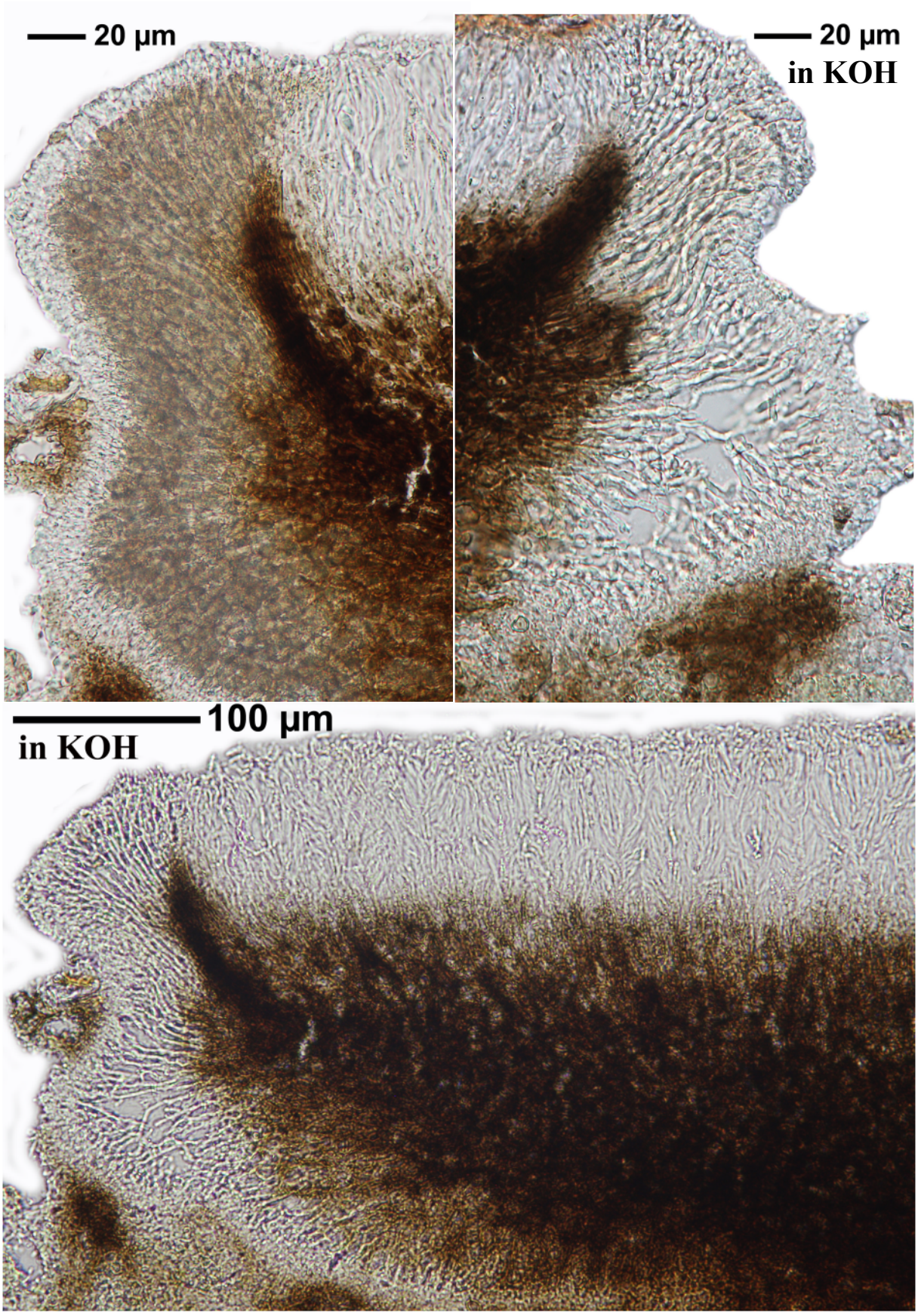



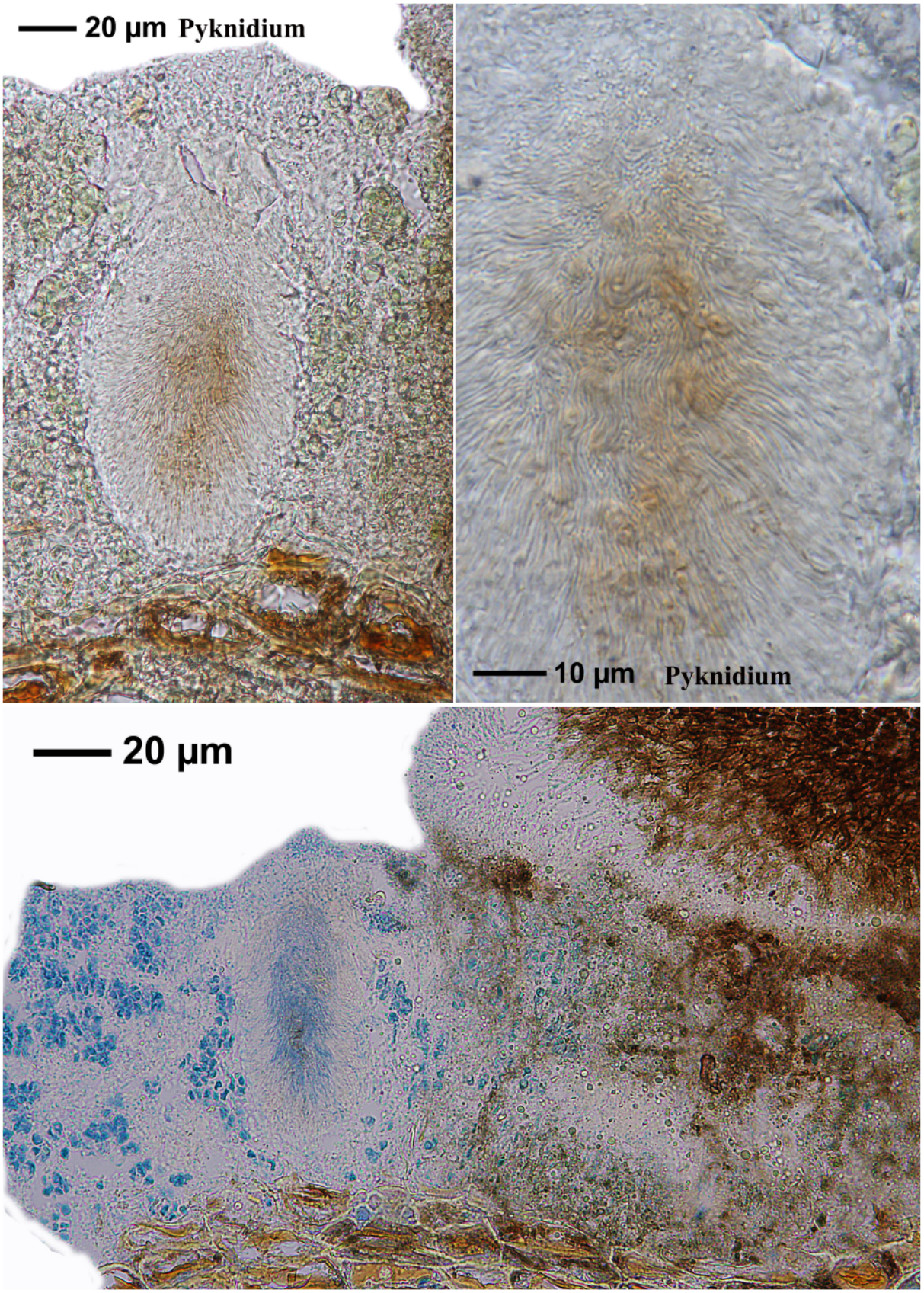

***Eugeniella sp.*** [7736]



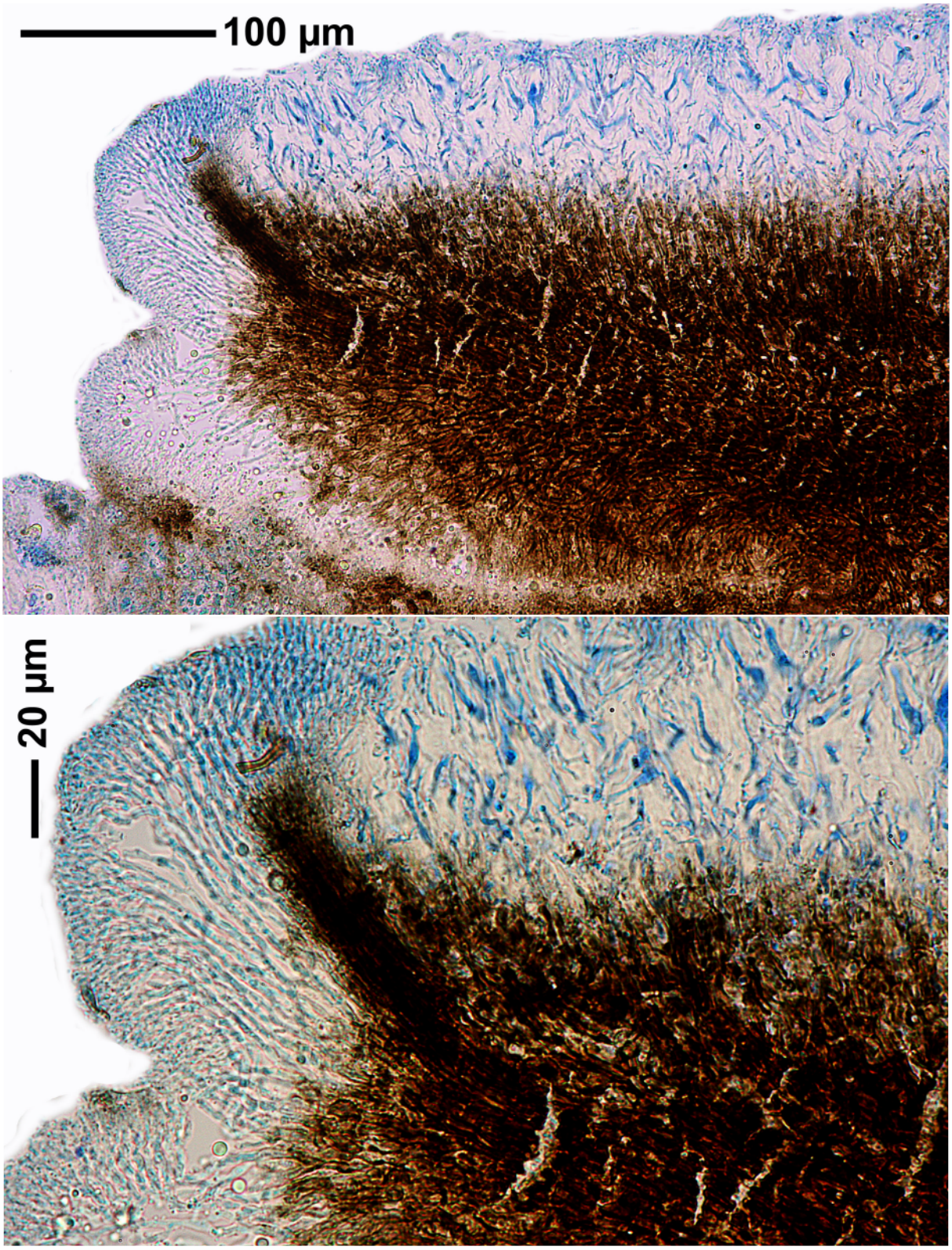

***Eugeniella sp.*** [7736]



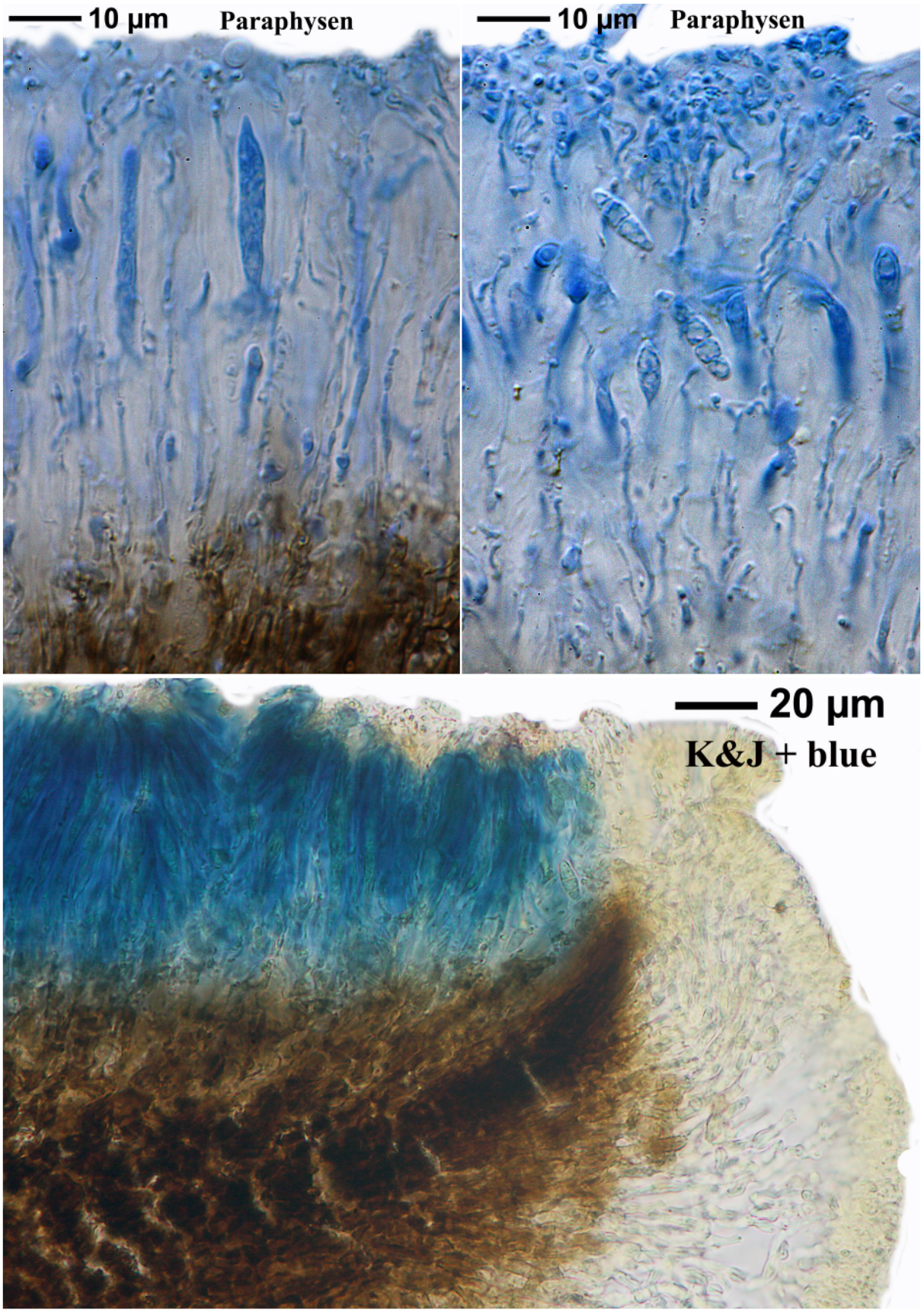

***Eugeniella sp.*** [7736]



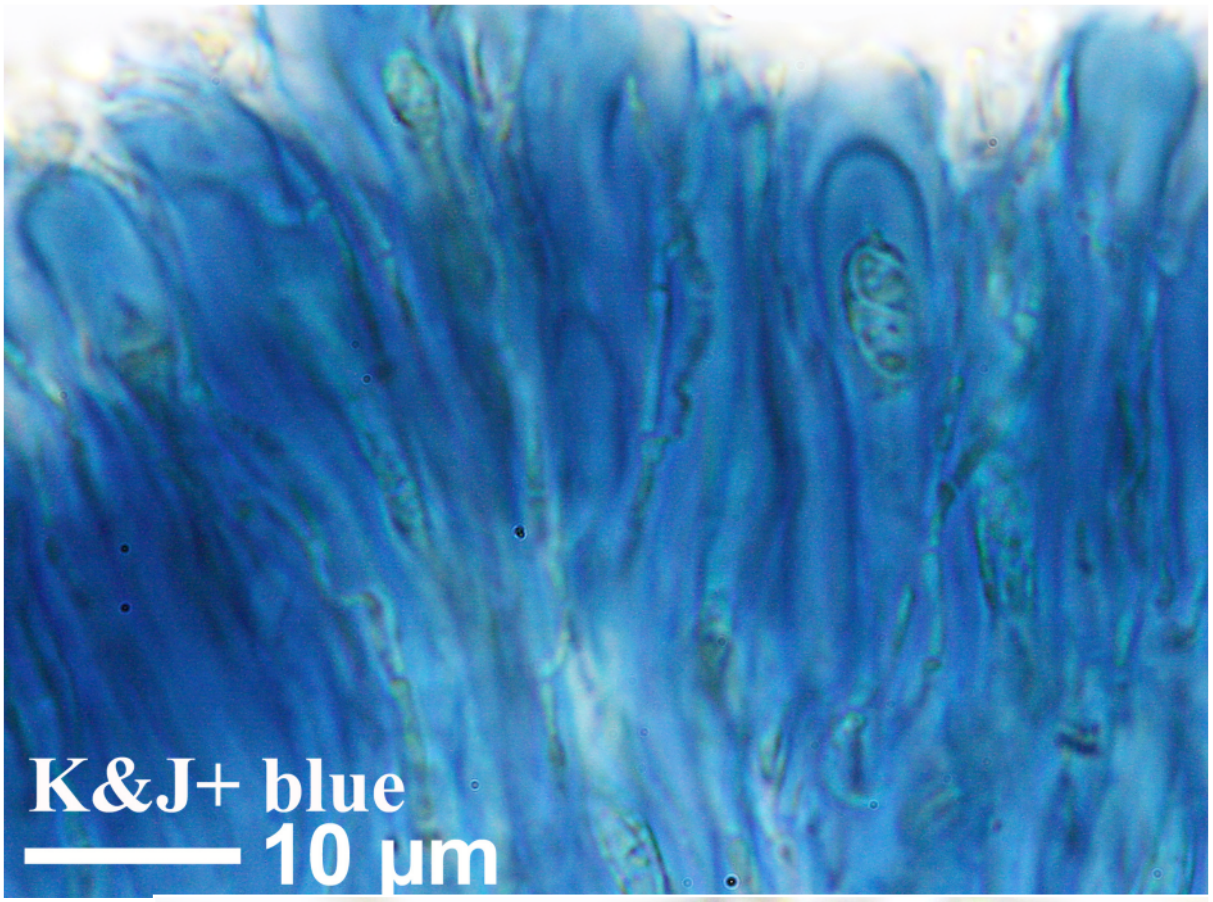

***Eugeniella sp.*** [7736]

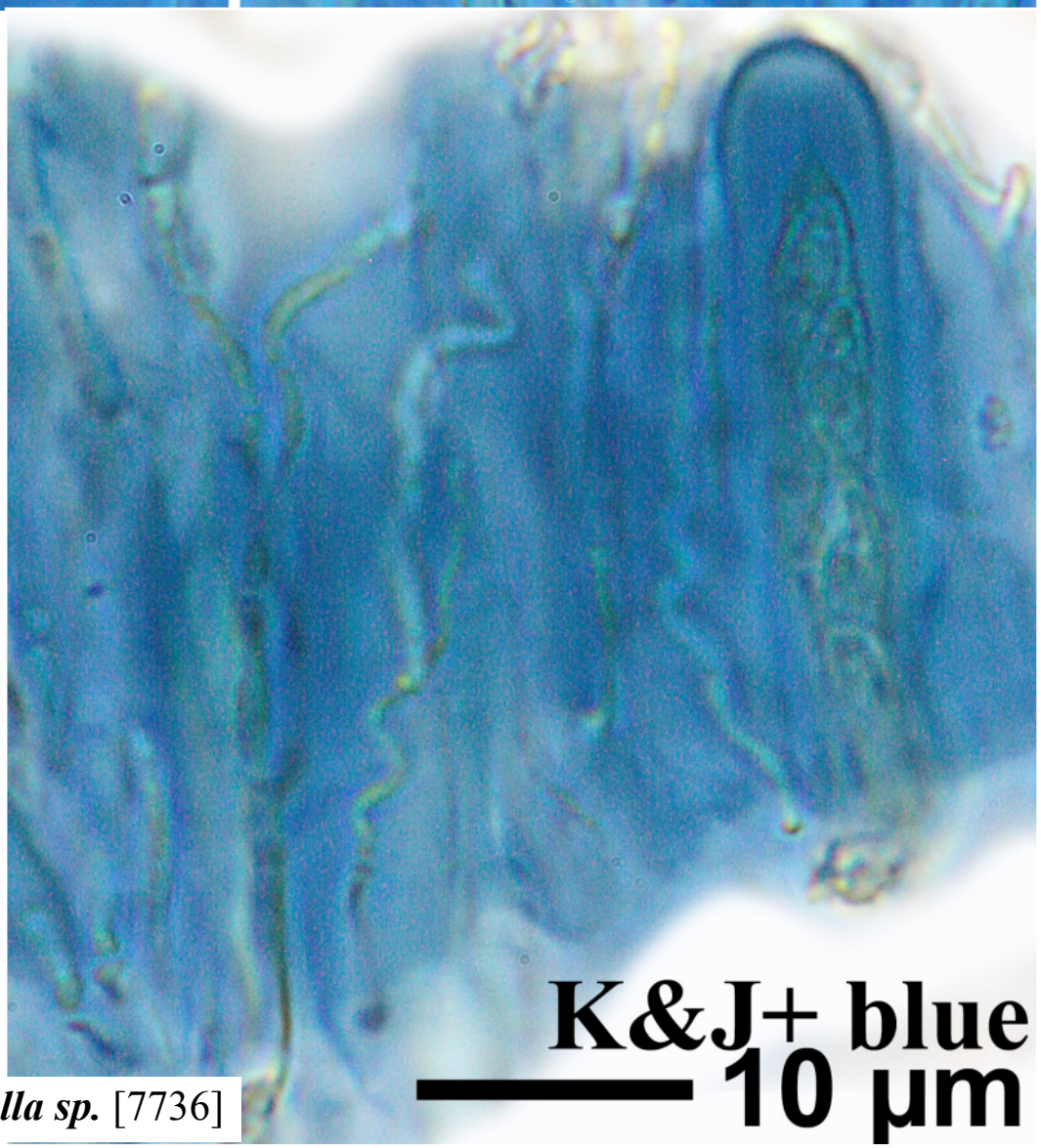



***Eugeniella sp.*** [7736]

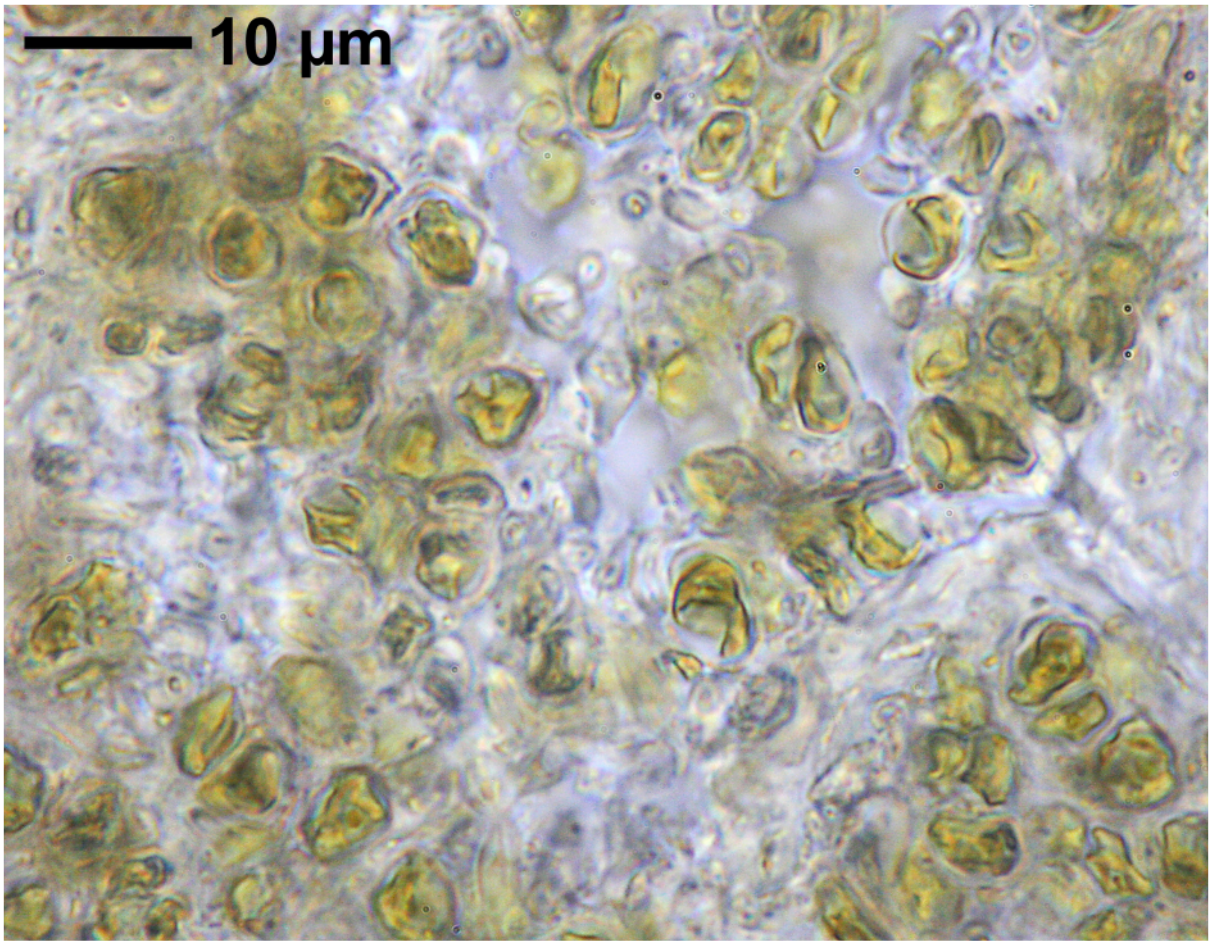



***Eugeniella sp.*** [7736]




***Eugeniella sp.*** [7736]




***Eugeniella sp.*** [7736]

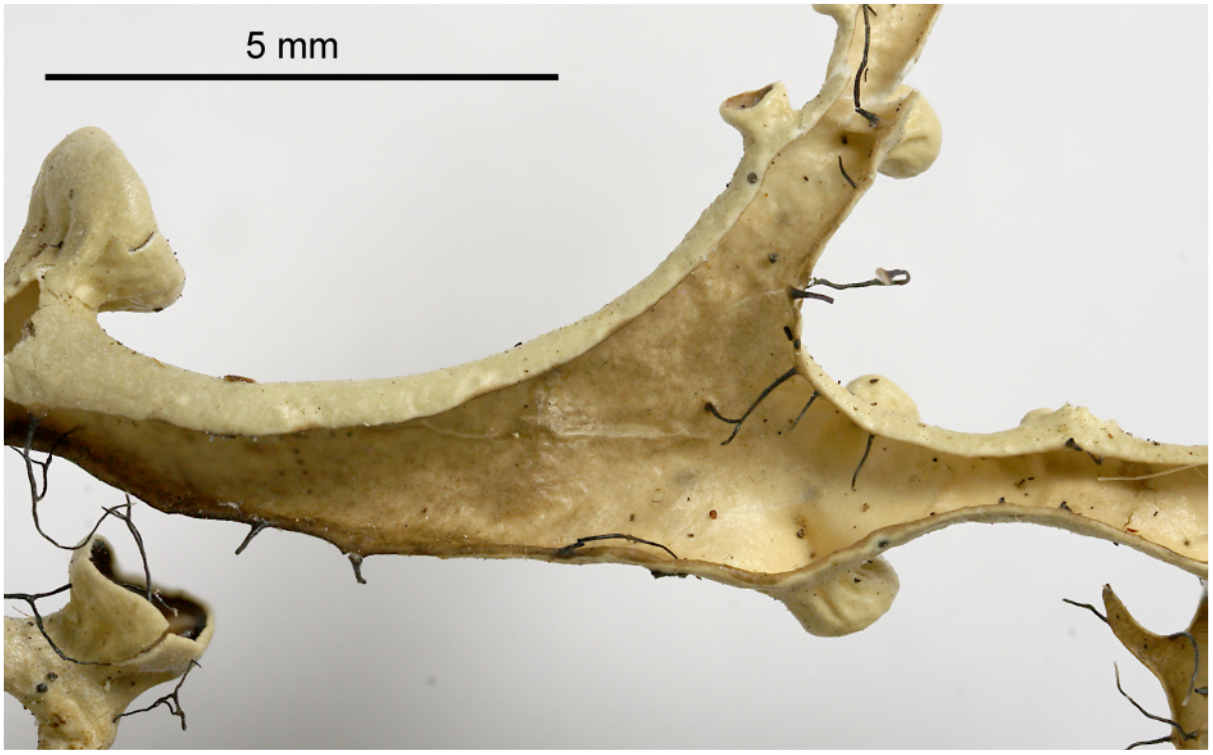
***Everniastrum cirrhatum*** (Fr.) Hale ex Sipman

Thallus grey, subcaespitose, dichotomously or subdichotomously lobate. Lobes 0.5-2(-4) mm wide, involute or flat, ciliate. Isidia and Soredia absent. Lower surface black or at the tips pale brown. Chemistry: cortex K+ yellow, C-, KC-, P+ yellow; medulla K+ yellow>red, C-, KC-, P+ yellow>orange; atranorin, salazinic acid (maj), consalazinic acid (min). Central and South America, Asia.

[11961], Ecuador, Prov. Carchi, Straße von El Angel über La Libertad nach El Moran, in kleiner Schlucht beim Steilabstieg oberhalb El Moran, 3550 m. Leg. Schäfer-Verwimp, Heinrichs, Wilson, Yandún 19.08.2004 (ex Herb. Schäfer-Verwimp Nr. 24396), det. Schumm.





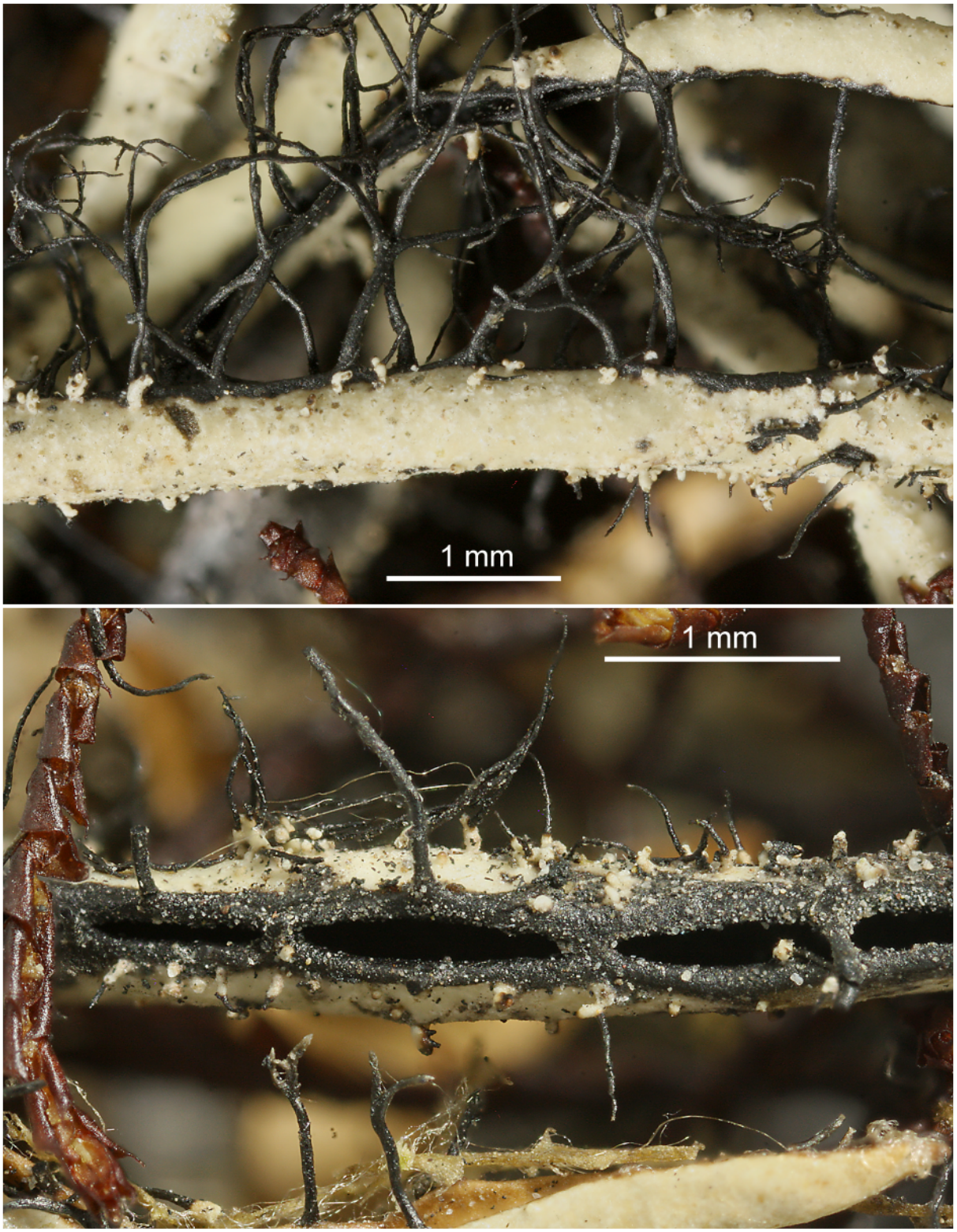

***Everniastrum cirrhatum***

***Everniastrum vexans*** (Zahlbr.) Hale ex Sipman.

Thallus subcaespitose, loosely adnate, dichotomously to subdichotomously lobate, grey. Lobes 0.5-2(-4) mm wide, involute or flat, black ciliate. Soredia absent. Isidia present. Lower surface black. Chemistry: cortex K+ yellow, C-, KC-, P+ yellowish; medulla K+ yellow>red, C-, P+ yellow>orange; atranorin, chloroatranorin, salazinic acid (maj), consalazinic acid (min).

[11958], Ecuador, Prov. Pichincha, Andenwestabhang nordwestlich von Quito, Felshänge an der Straße von Quito nach Nanegalito und Mindo, wenig oberhalb El Paluma Orchid Reserve, 1920 m. Leg. Schäfer-Verwimp, Heinrichs, Wilson, Yandún 09.08.2004 (ex Herb. Schäfer-Verwimp Nr. 24119), det. Schumm.






***Everniastrum vexans***

***Fibrillithecis confusa*** Lücking, Kalb & Rivas Plata ISOTYPUS

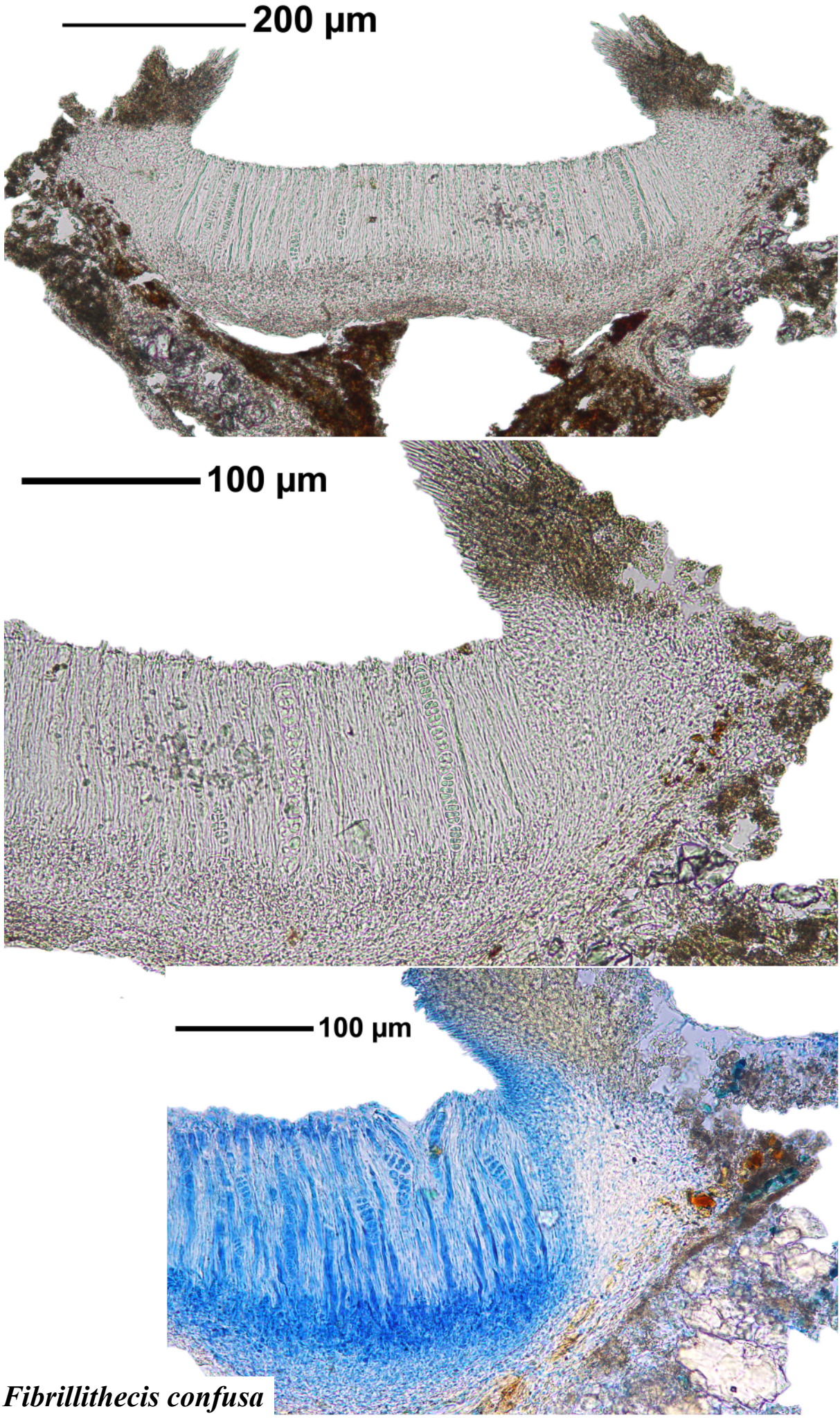
Thallus grey, with isidia. Isidia more or less erect. Apothecia erumpent to prominent, 0.7-1.3 mm wide, with a thick thaline margin and narrow, entire pore. Margin of excipulum terminating in long fibrils. Hymenium not inspersed. Ascospores submuriform, 8/ascus, 14-18(-24) x 8-10(-12) µm, mostly with 3 transversal septae, each segment 1-3 locular, J+ blue-violet. Chemistry: psoromic, subpsoromic and 2'-O-demethylpsoromic acids. Lit.: Lichenologist 42: 183 (2010)

[17240], Brazil. São Paulo. Praia de Peruibe near Itanhaém, in a dense mangrove forest on *Laguncularia racemosa*, 2 m, 24°10' S, 46°50' W. Leg. K. Kalb 24.02.1978 (Nr. 37602), det. K. Kalb. Dupl. ex Herbario Klaus Kalb.

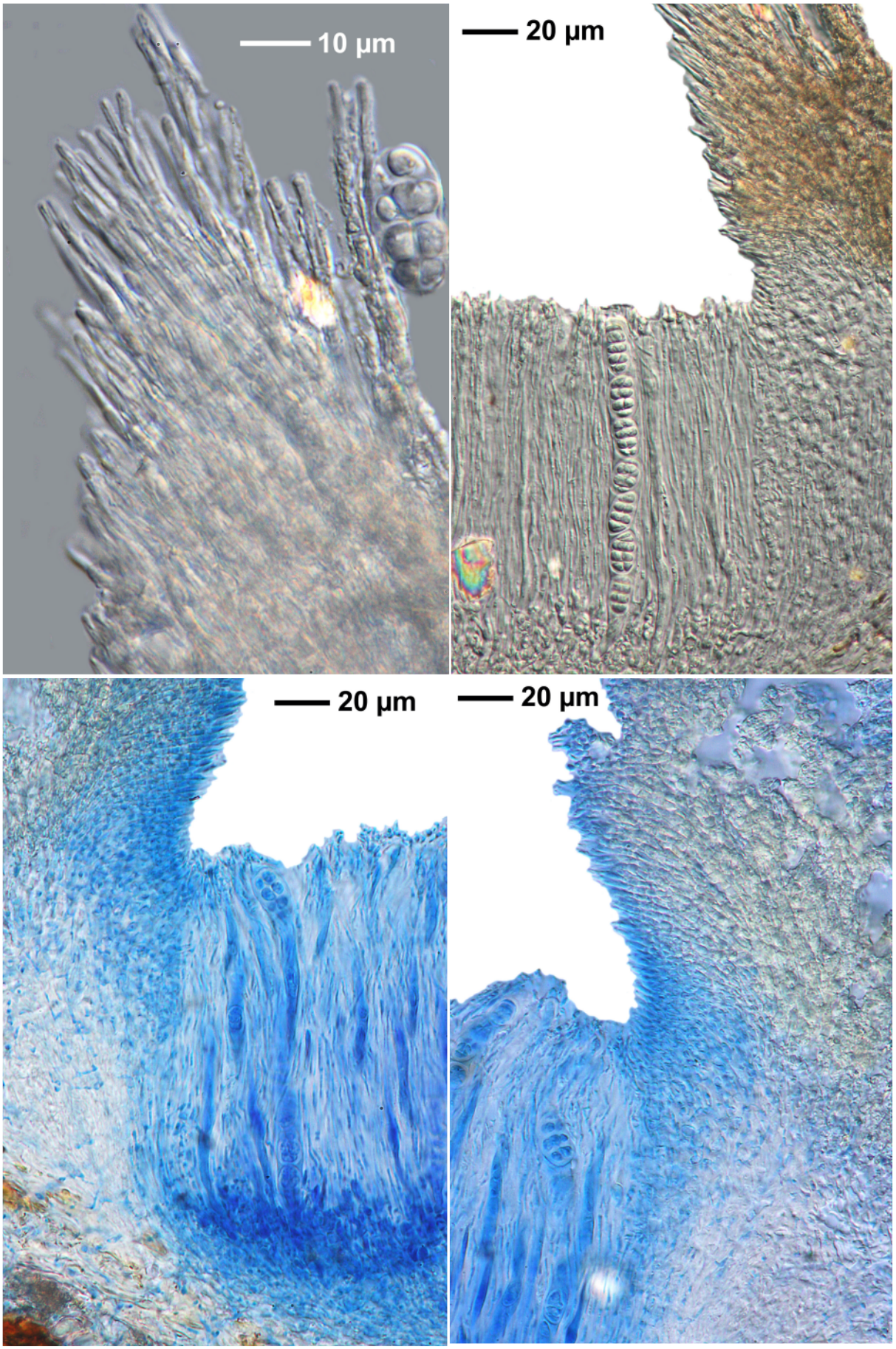




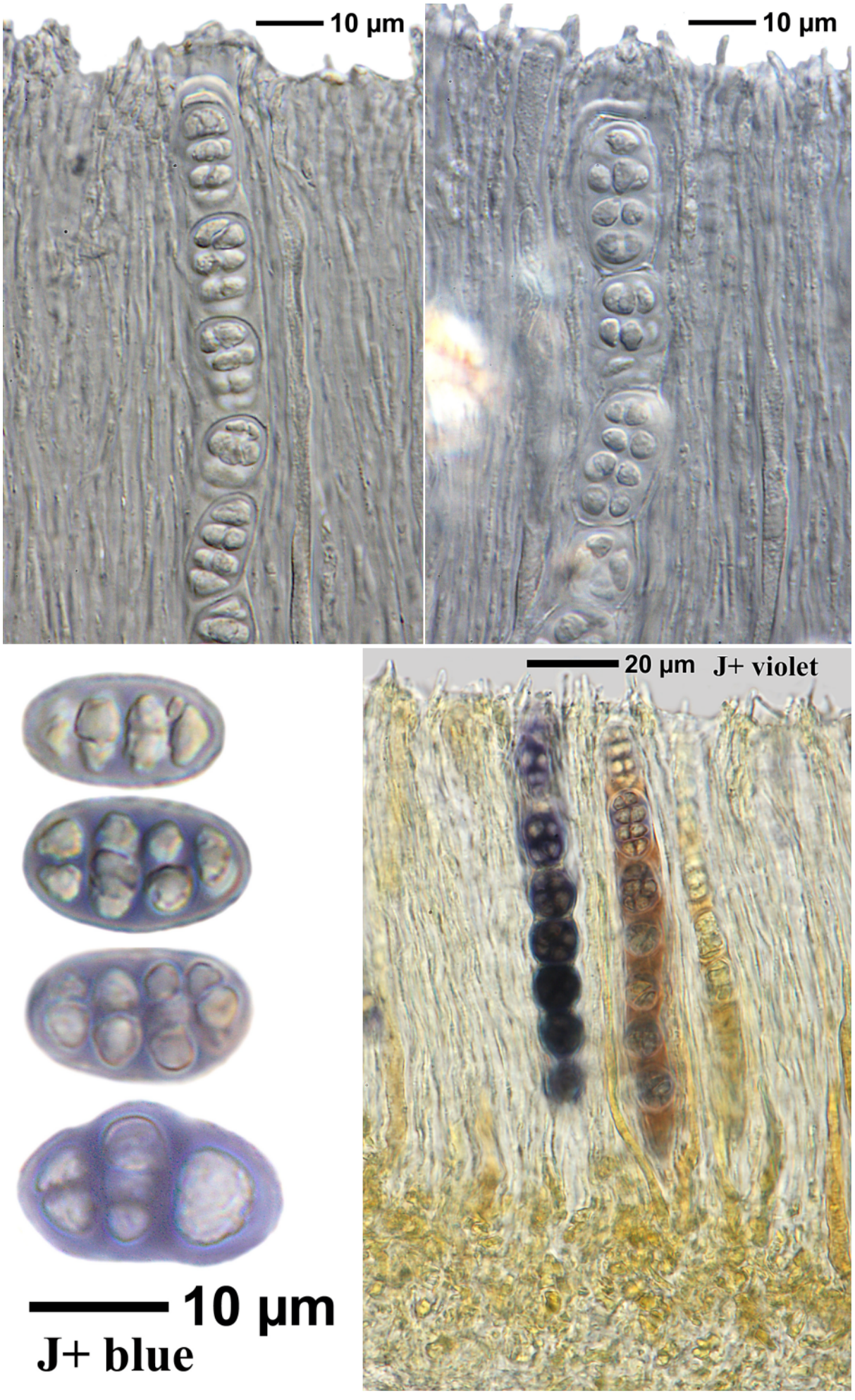

***Fibrillithecis confusa***




***Fibrillithecis confusa***




***Fibrillithecis confusa***

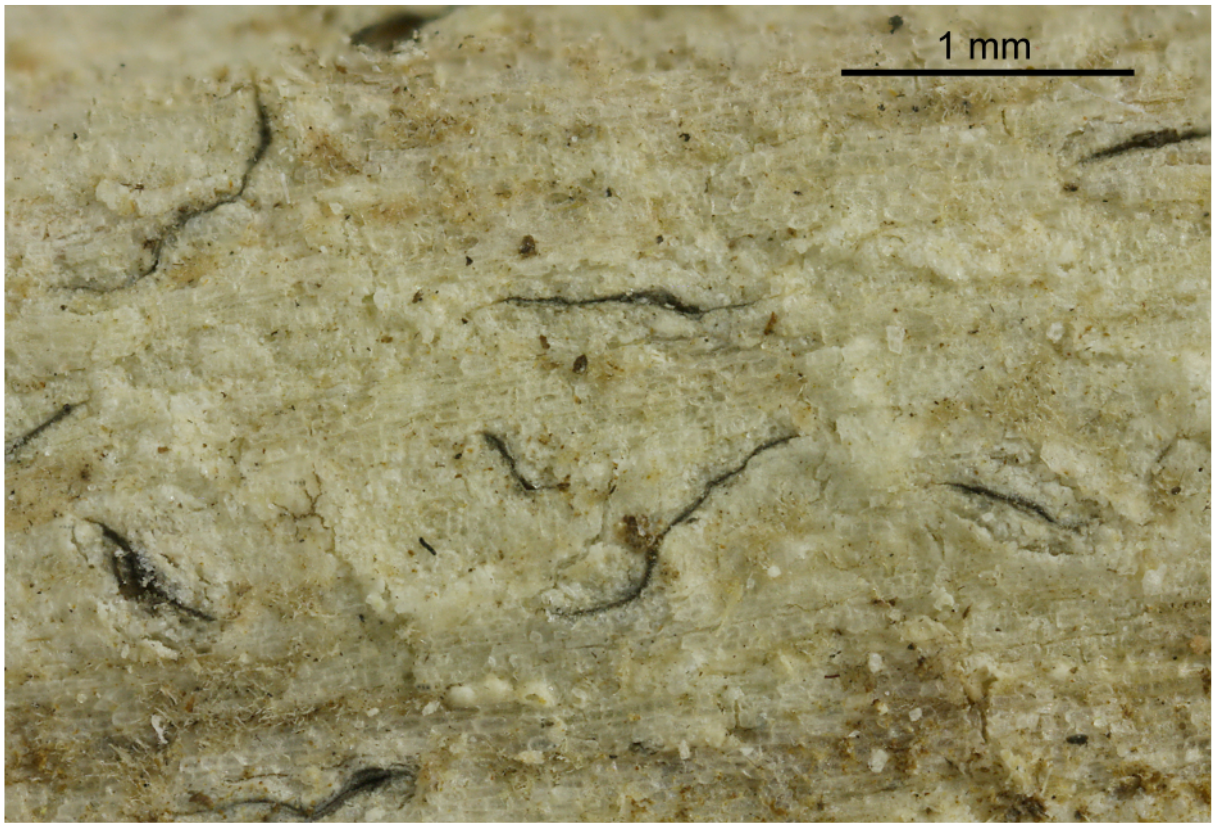



***Fibrillithecis confusa***

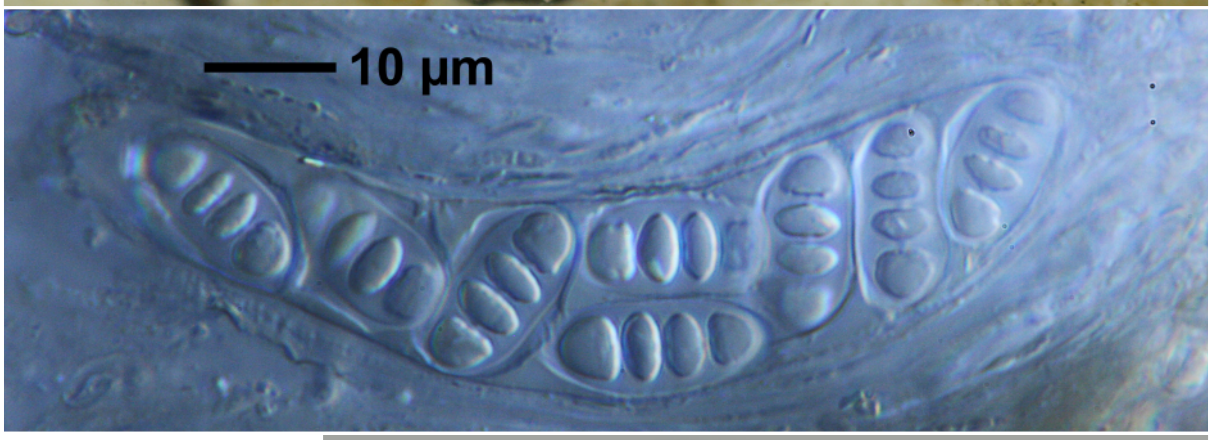
***Fissurina comparilis*** (Nyl.) Nyl.
[= ***Graphis comparilis*** Nyl.]

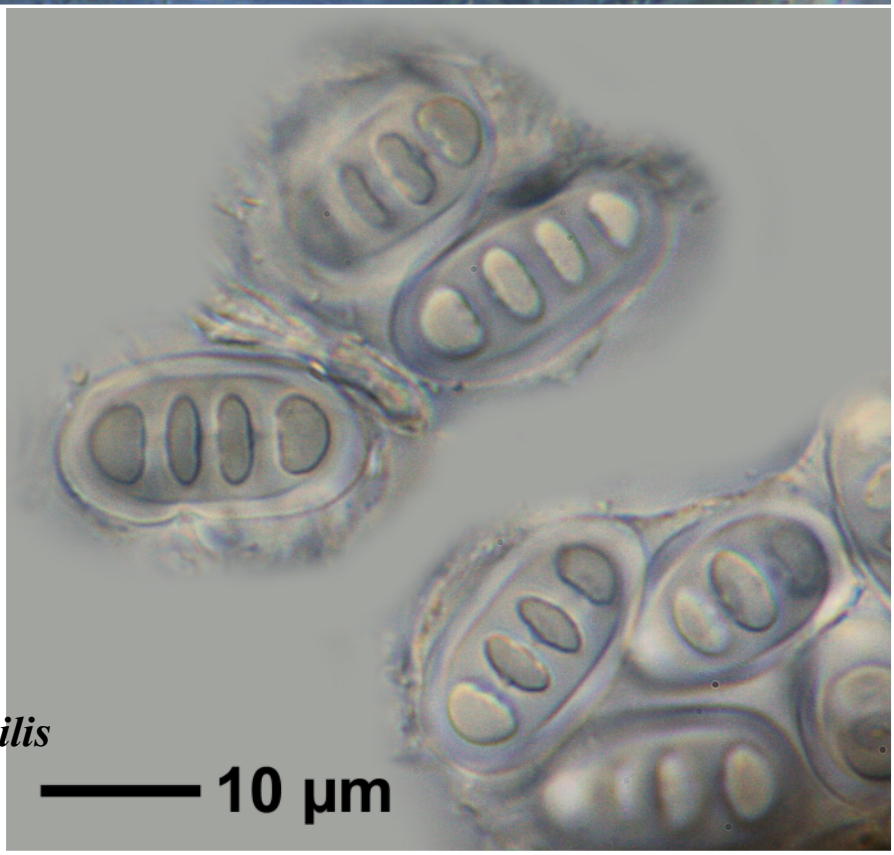
Ascospores colourless, old also faintly brownish, 4-cellular, 8/ascus, J- or faintly bluish, 16-20 x 7-10 µm. Hymenium not inspersed, J-, K&J- (only some hyphae at the wall of the excipulum pale bluish). Only the ends of the lips somewhat carbonized, other parts of the excipulum not carbonized. Chemistry: nil. Lit. Staiger (2002, S. 132).

[7623], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail, zwischen Lake Yagumyum (9°15.040' N, 123°11.172' E, 1360 m) und dem Ort Bediao-Dauin (723 m), an Rinde bei 1340 m. Leg. Schumm 12.08.2000, det. Archer 2003, test. K.Kalb 2011.

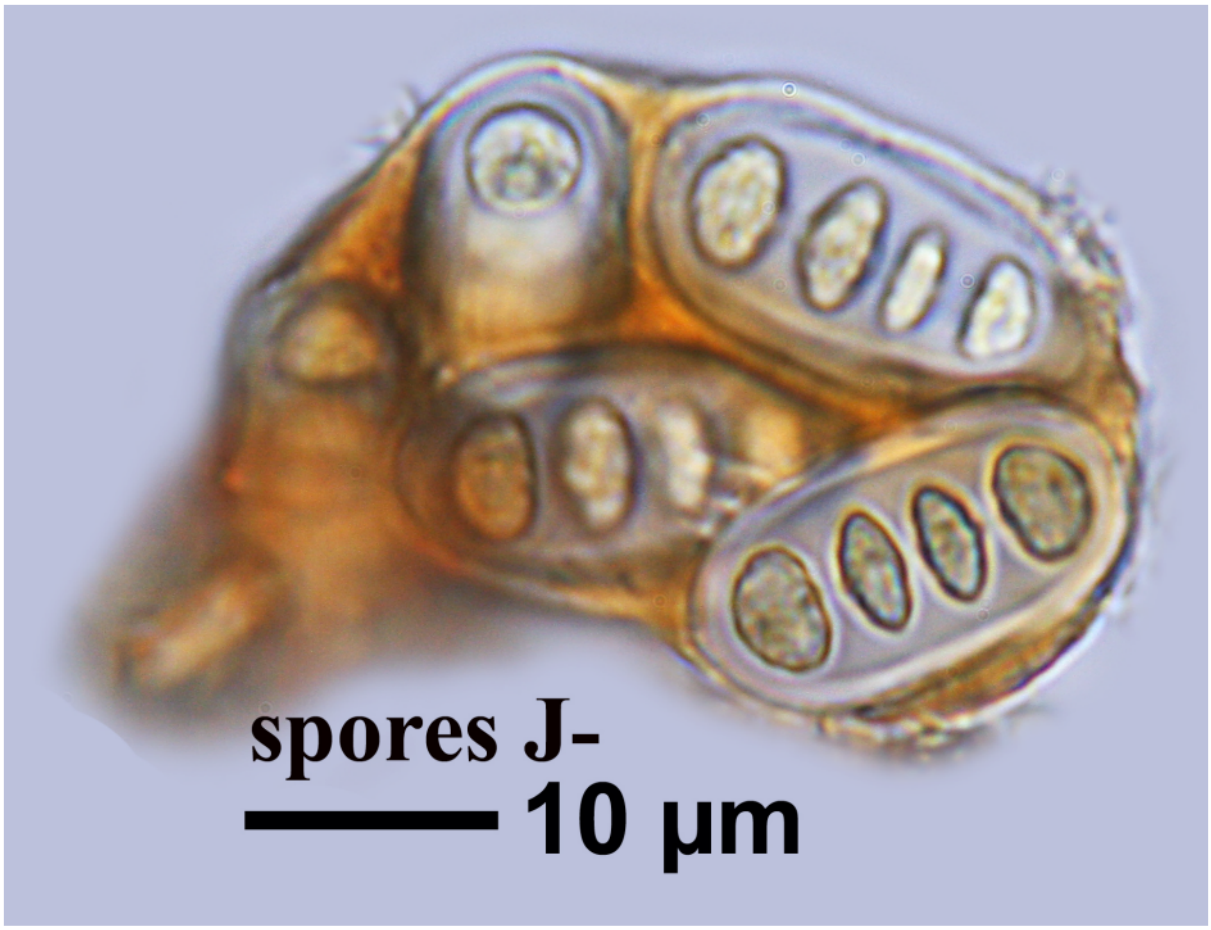




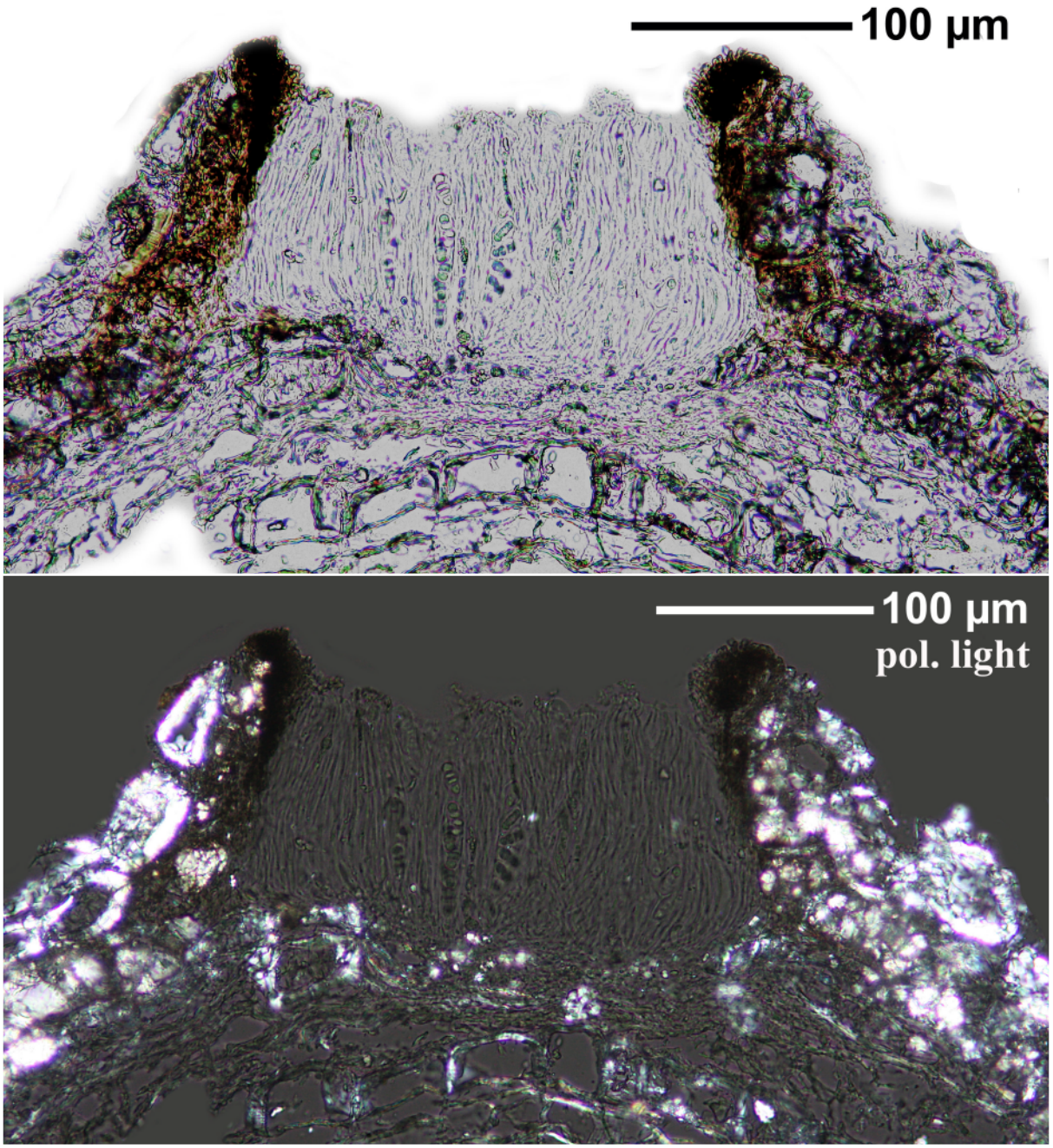

***Fissurina comparilis***



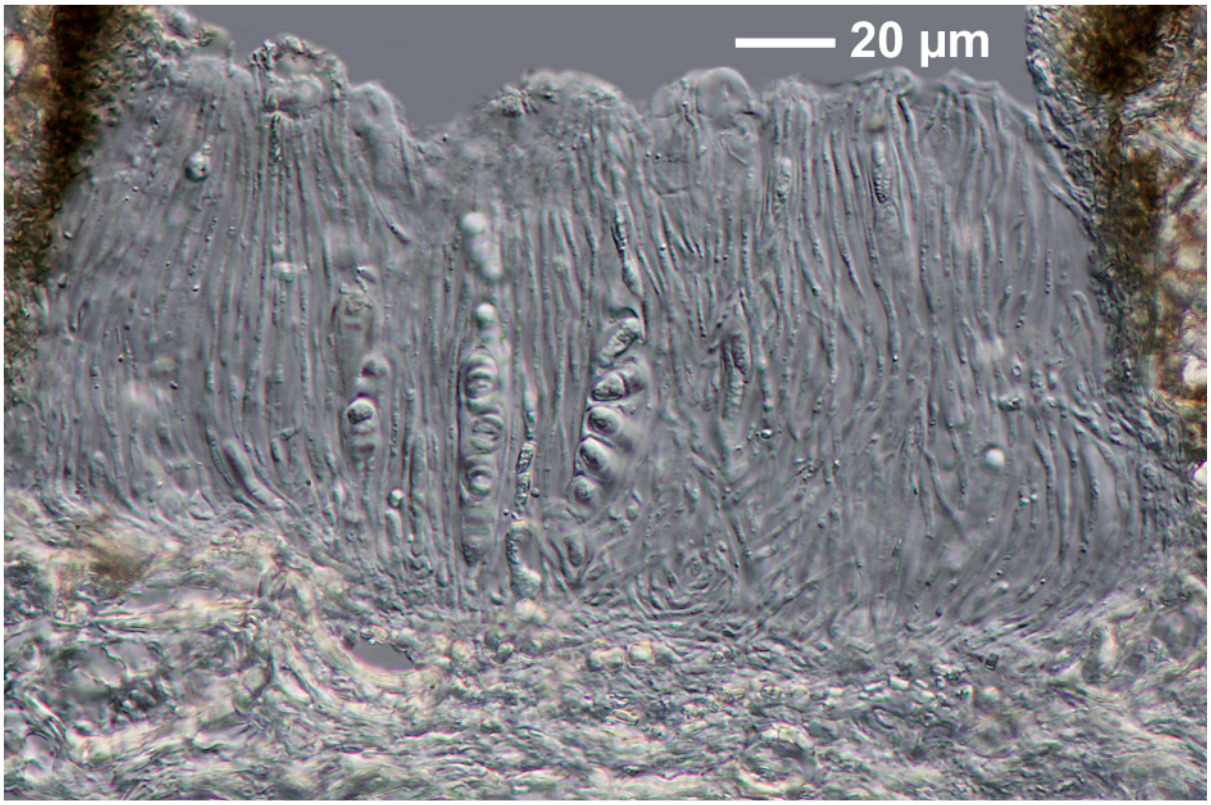


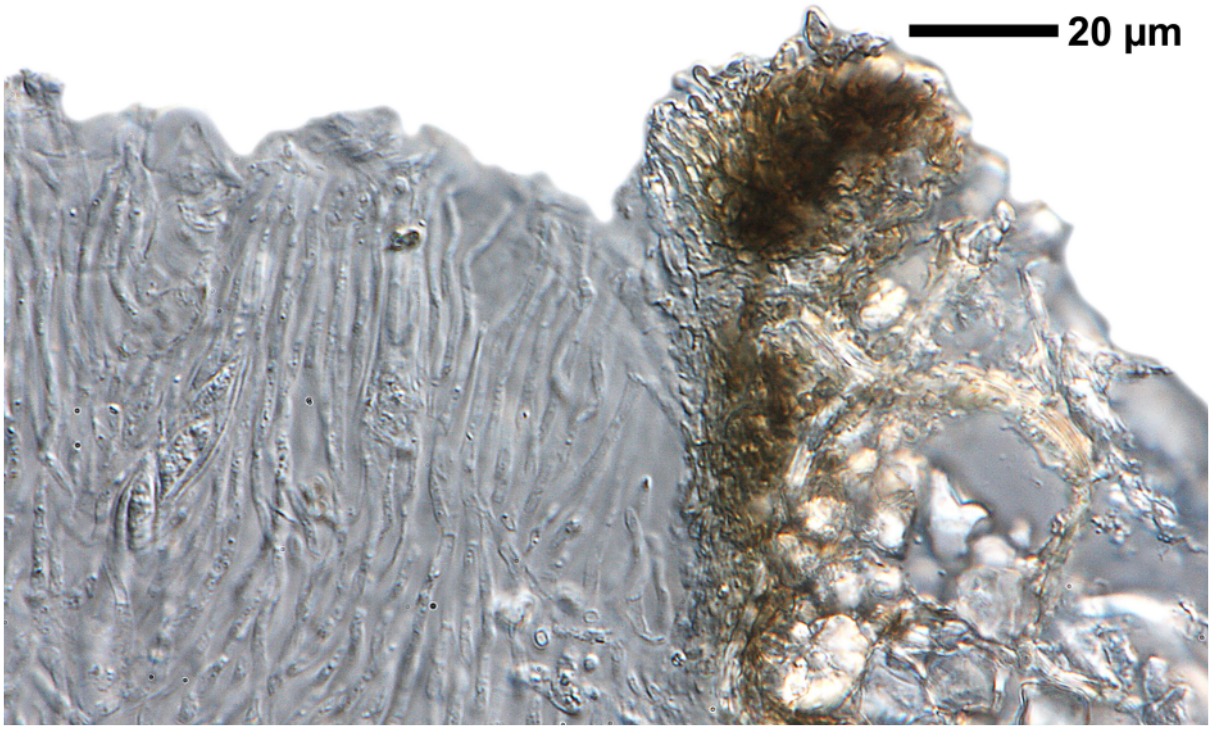


***Fissurina comparilis***

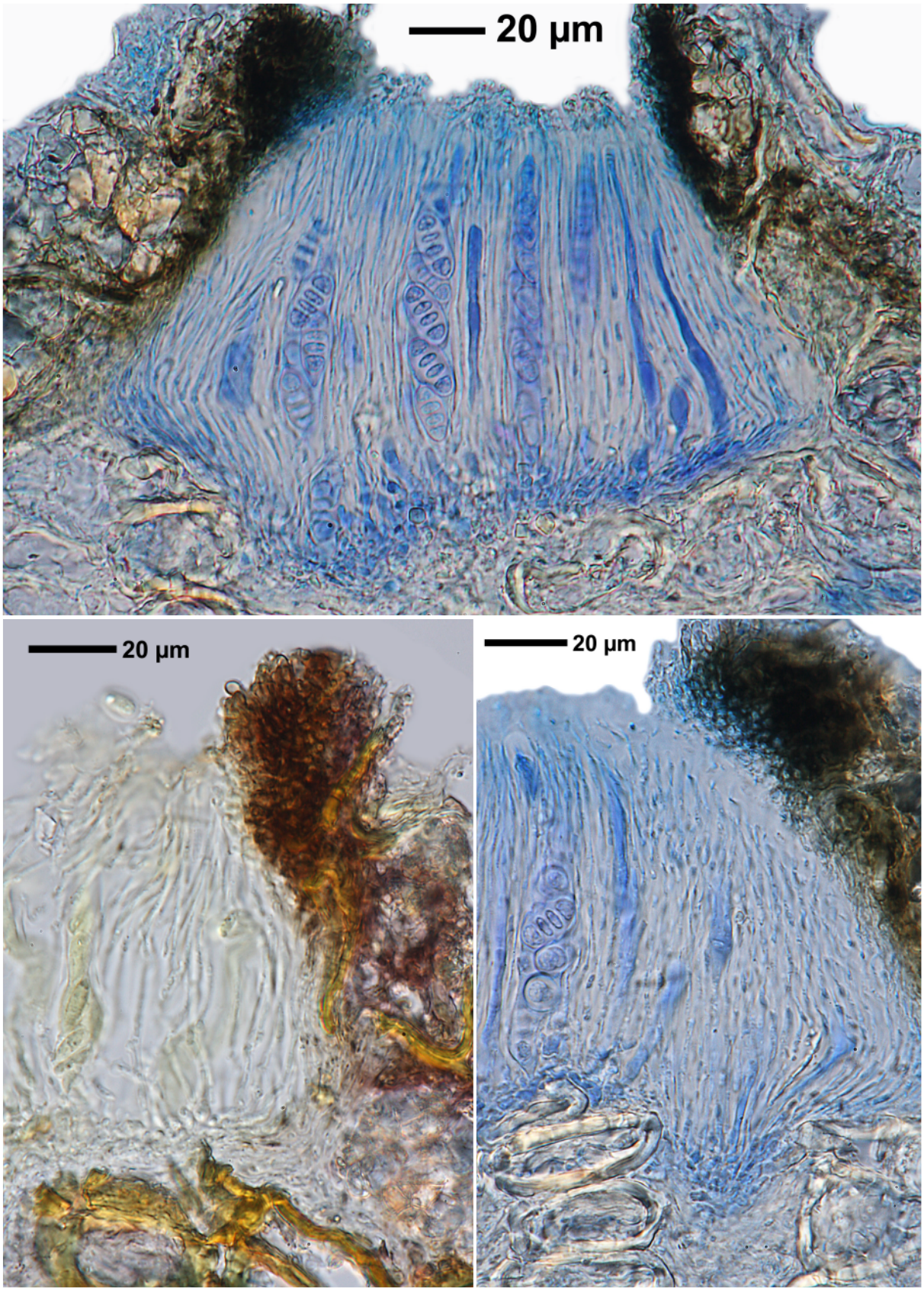



***Fissurina comparilis***




***Fissurina comparilis***



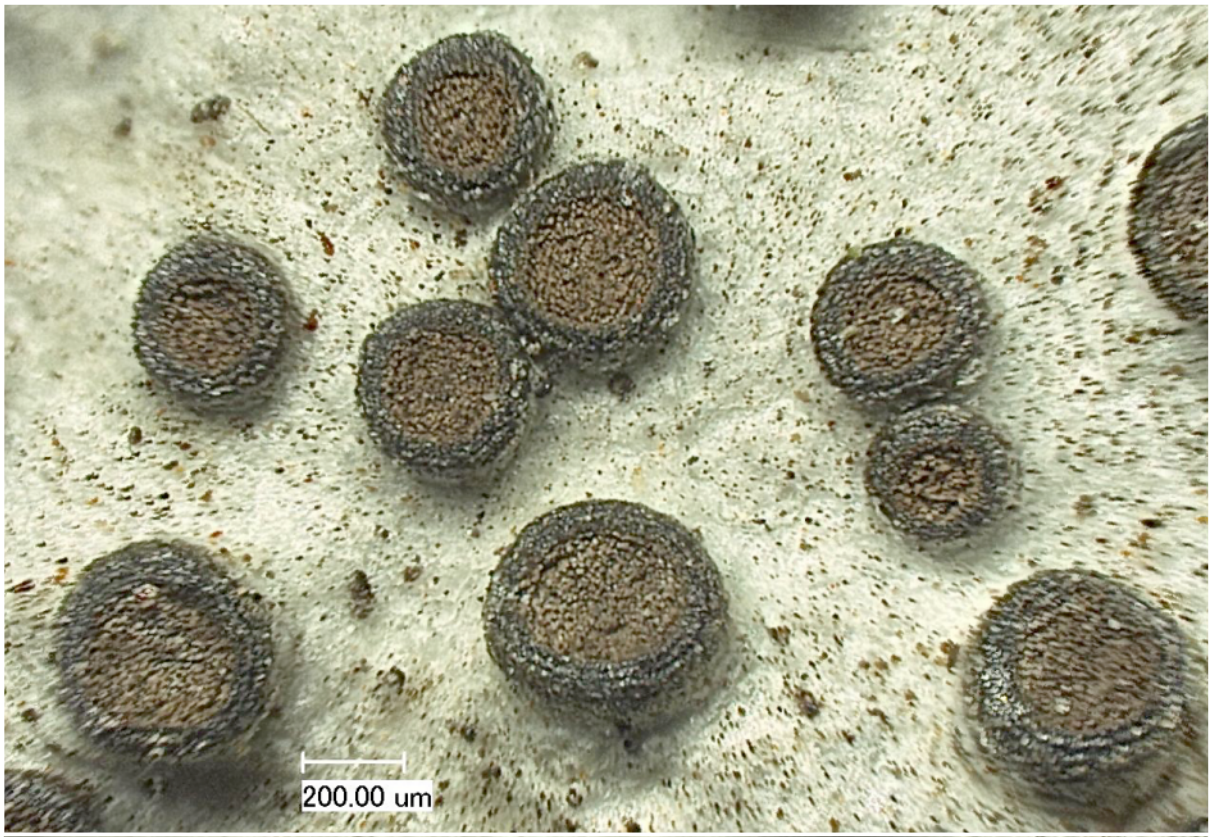

***Fissurina comparilis***

***Glyphis scyphulifera*** (Ach.) Staiger

Thallus whitish, K-, C-, KC-, P-. Ascocarps sessile, not embedded in a stroma, usually rounded, disc yellow-brown, excipulum completely carbonized, margin with crystals. Epithecium brown, J+ violet. Hymenium not inspersed. Ascospores hyaline, muriform, 8-13/3-4 locular, 30-45(-52) x 12-16 µm, 6-8/ascus, septae J+ violet.

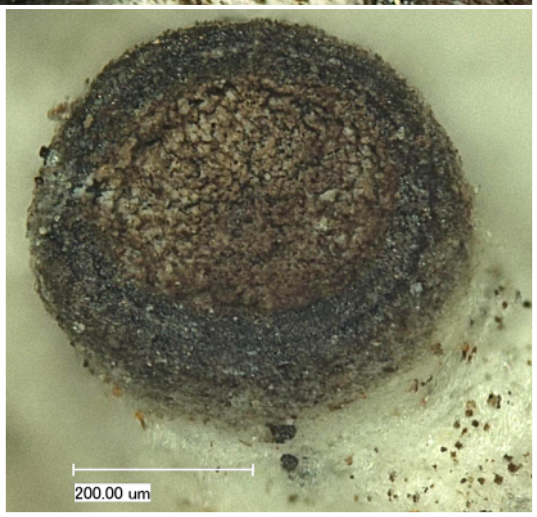
[17601], Thailand, Trat province, Ban Phu Resort, 12.16619° N, 102.56977° E, 8 m. Leg. Schumm (IAL 7) 17.01.2012, det. Schumm 2012.



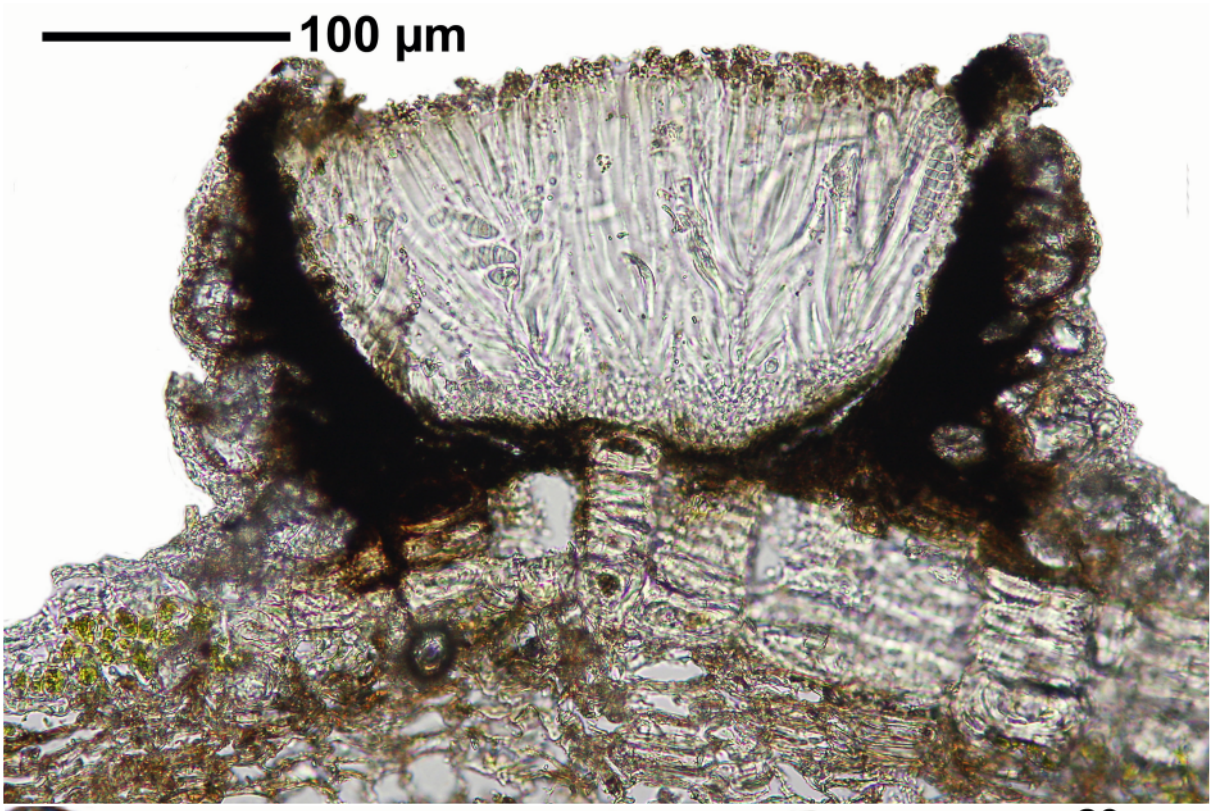






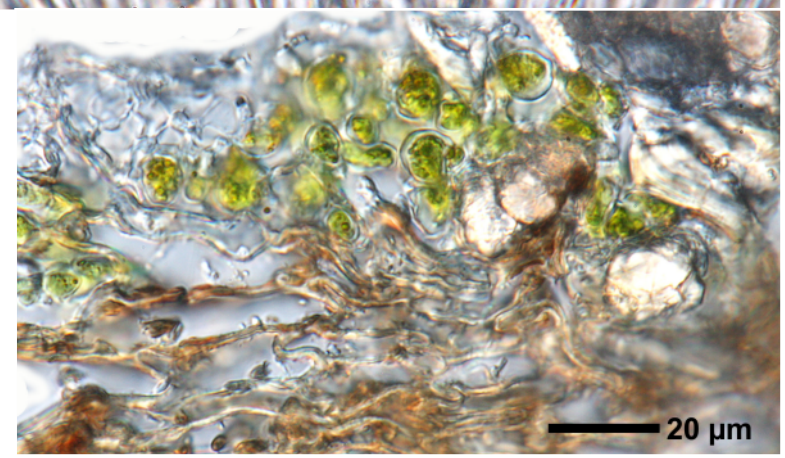



***Glyphis scyphulifera***

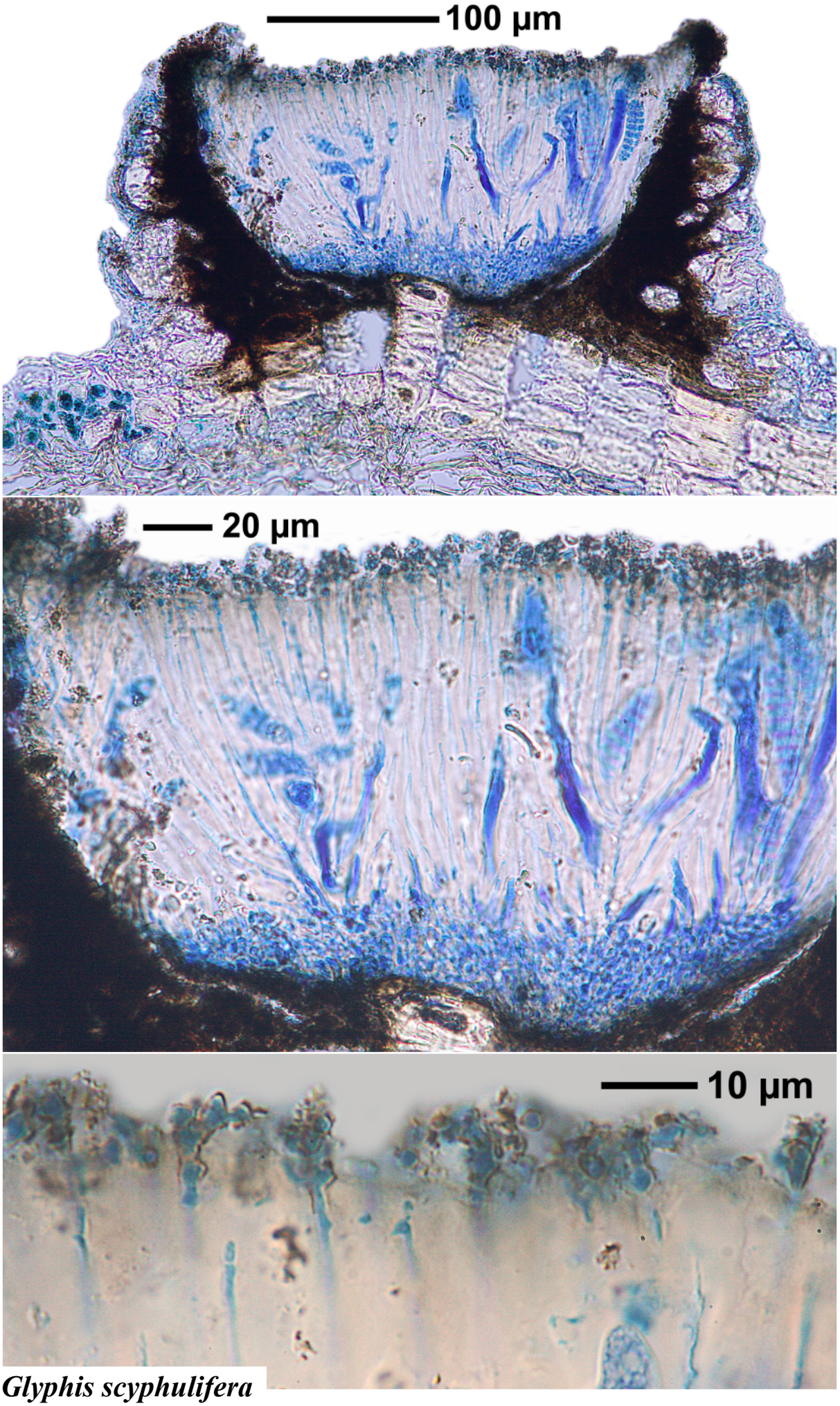




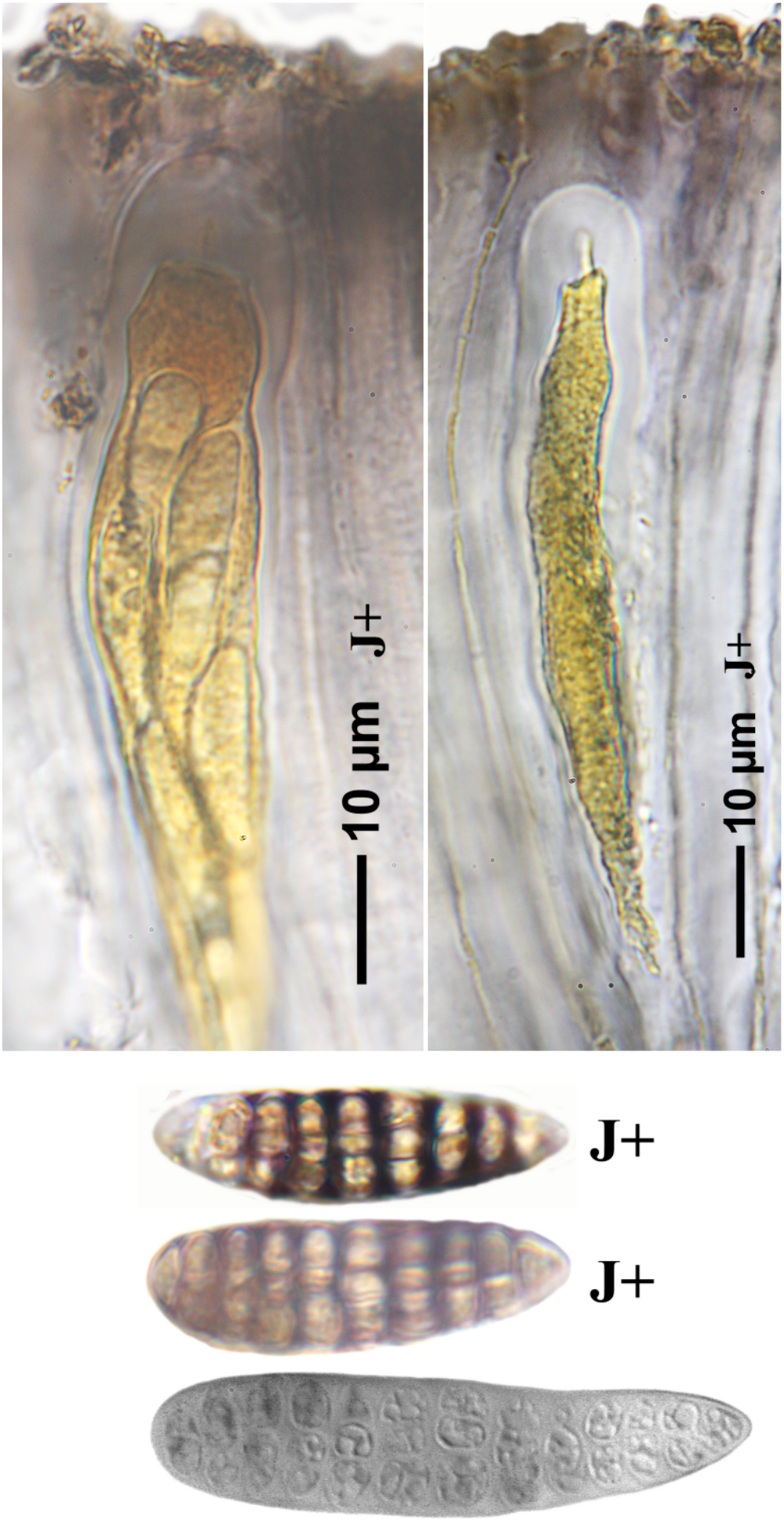





***Glyphis scyphulifera***




***Glyphis scyphulifera***



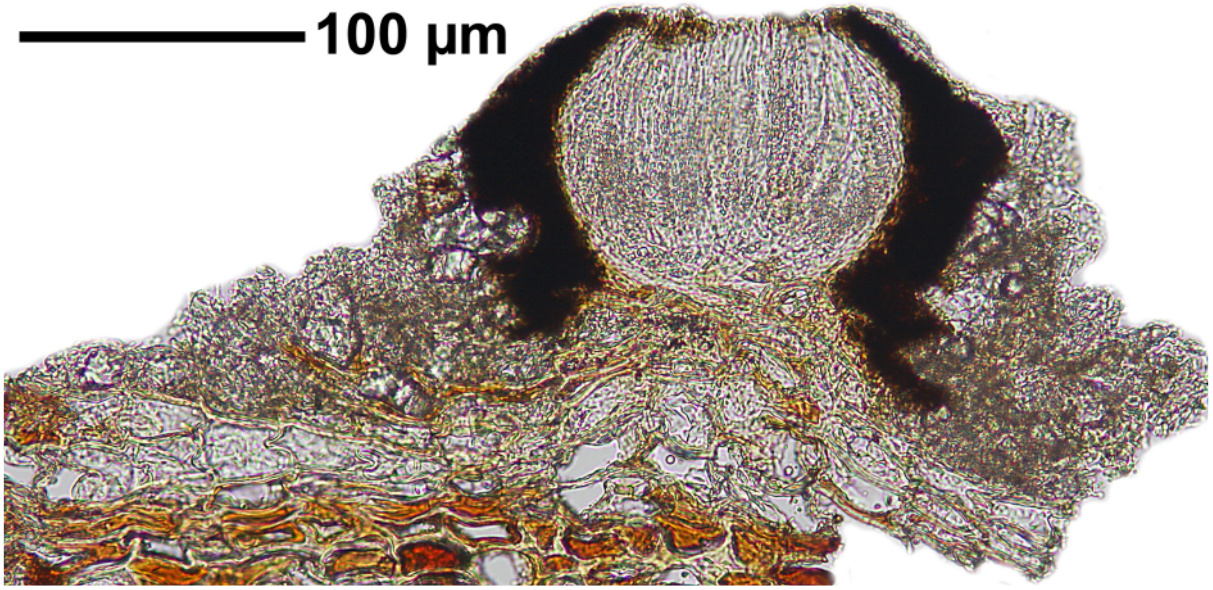

***Glyphis scyphulifera***

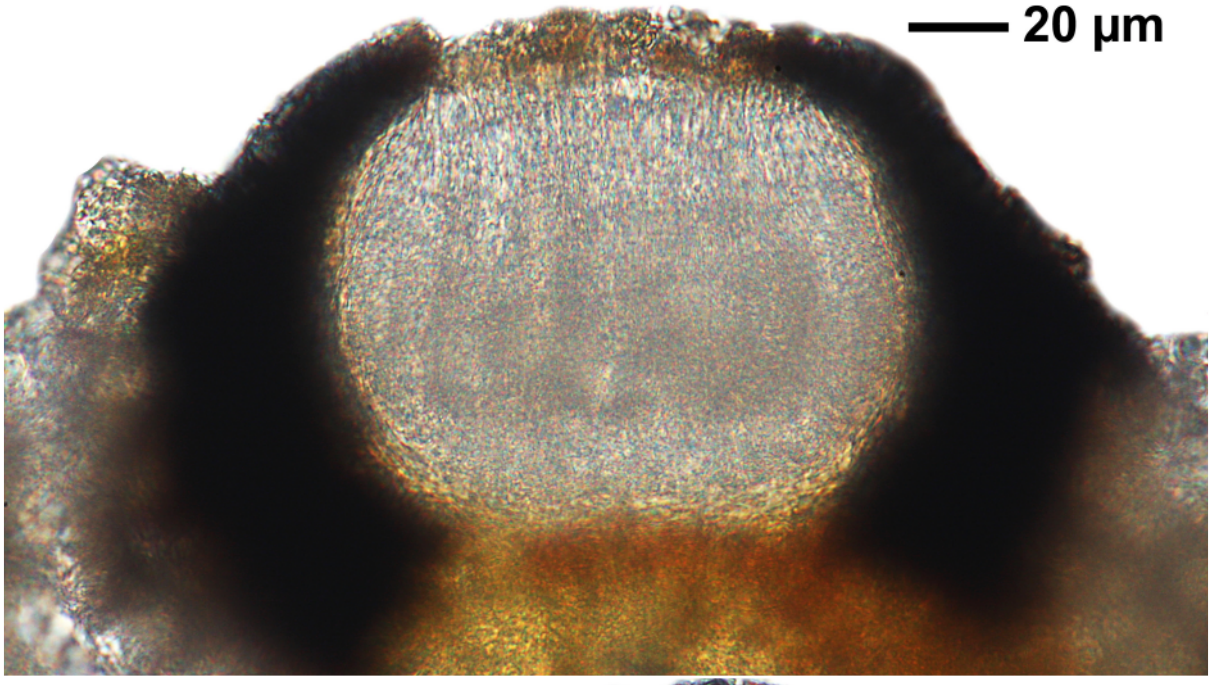
***Graphis cincta*** (Pers.) Aptroot

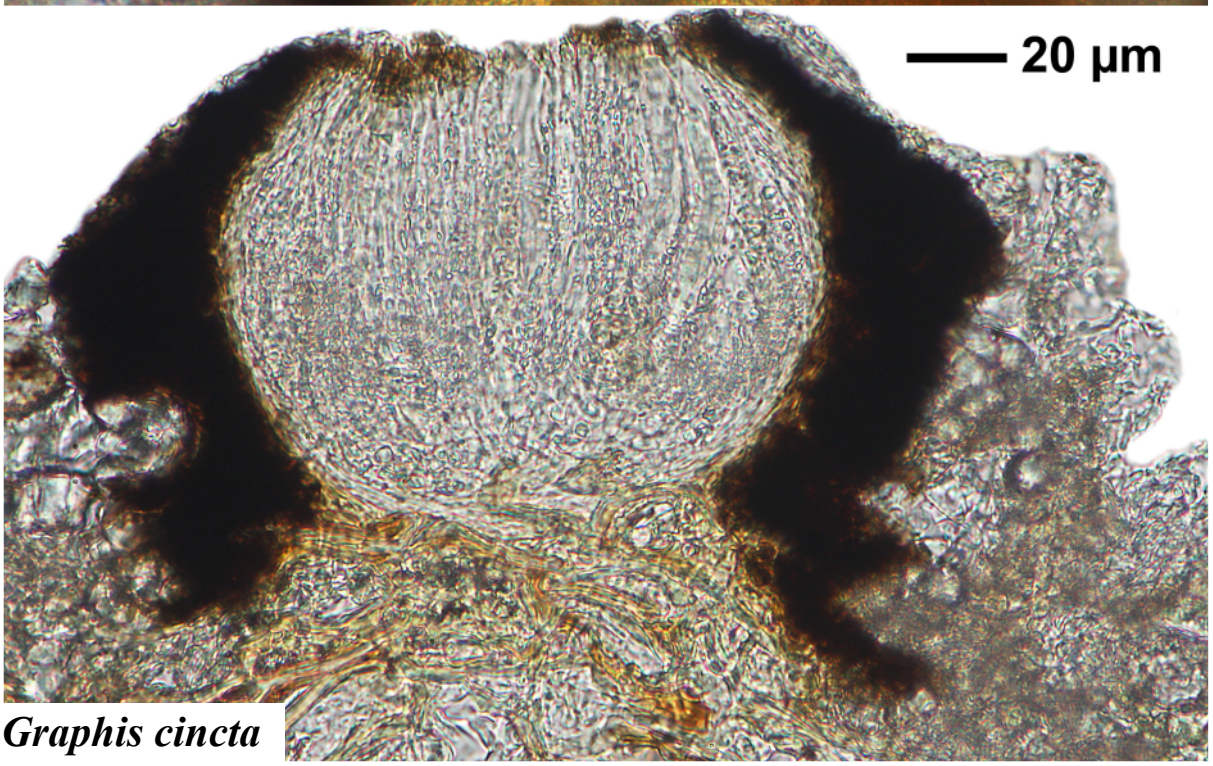
Thallus K+ red, norstictic acid (TLC), excipulum only laterally carbonized, Hymenium inspersed. Ascospores hyaline, 7-9-locular, 20-28 x 6-7 µm.

[7666], Philippinen, Cebu, Prov. Cebu, auf dem Tops ca. 7 km NW von Cebu-City, bei 650 m. Leg. Schumm 14.08.2000, det. Aptroot 2009.

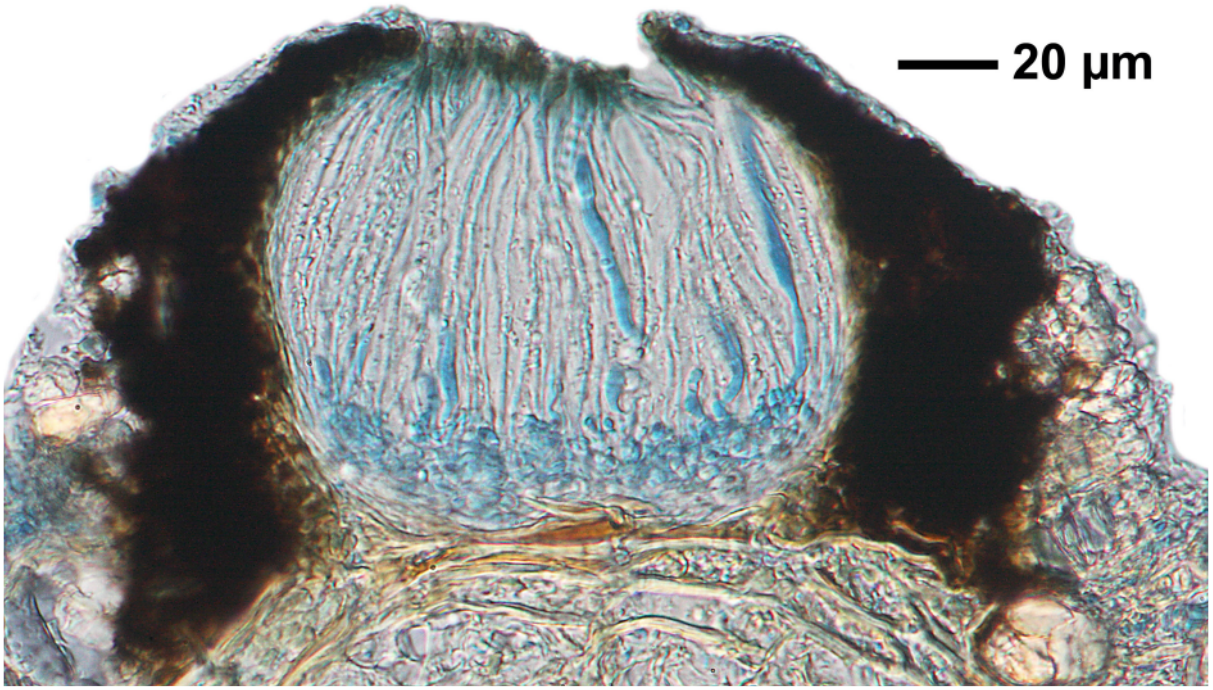


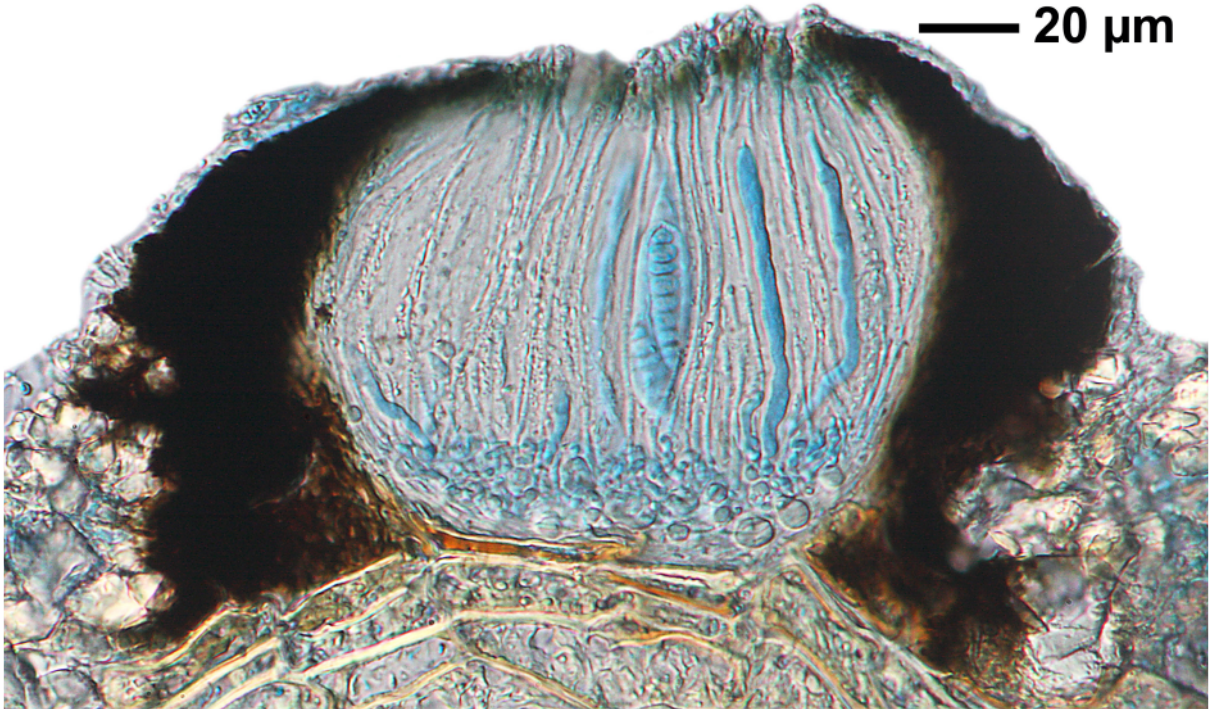


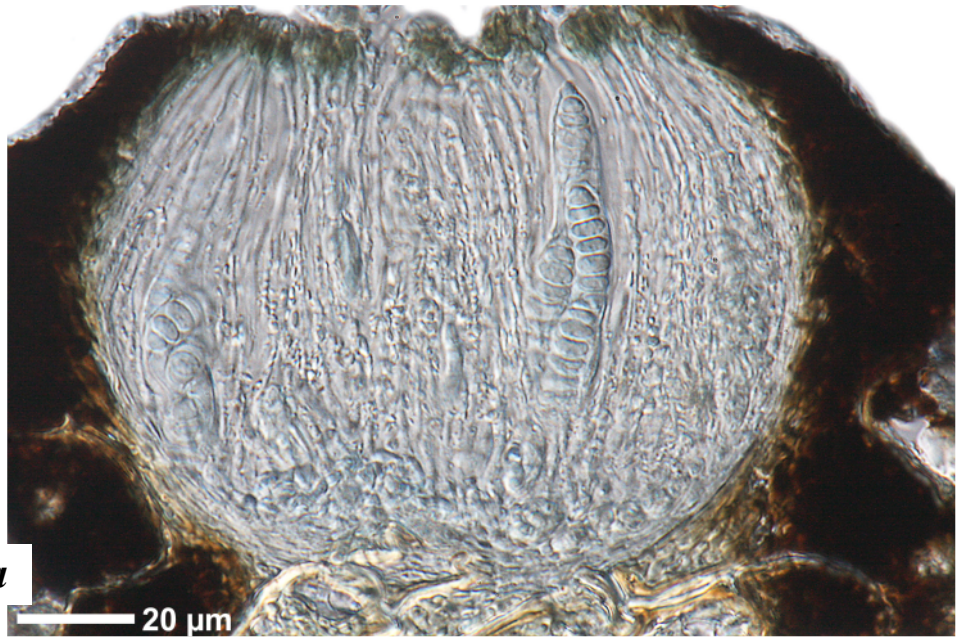




***Graphis cincta***

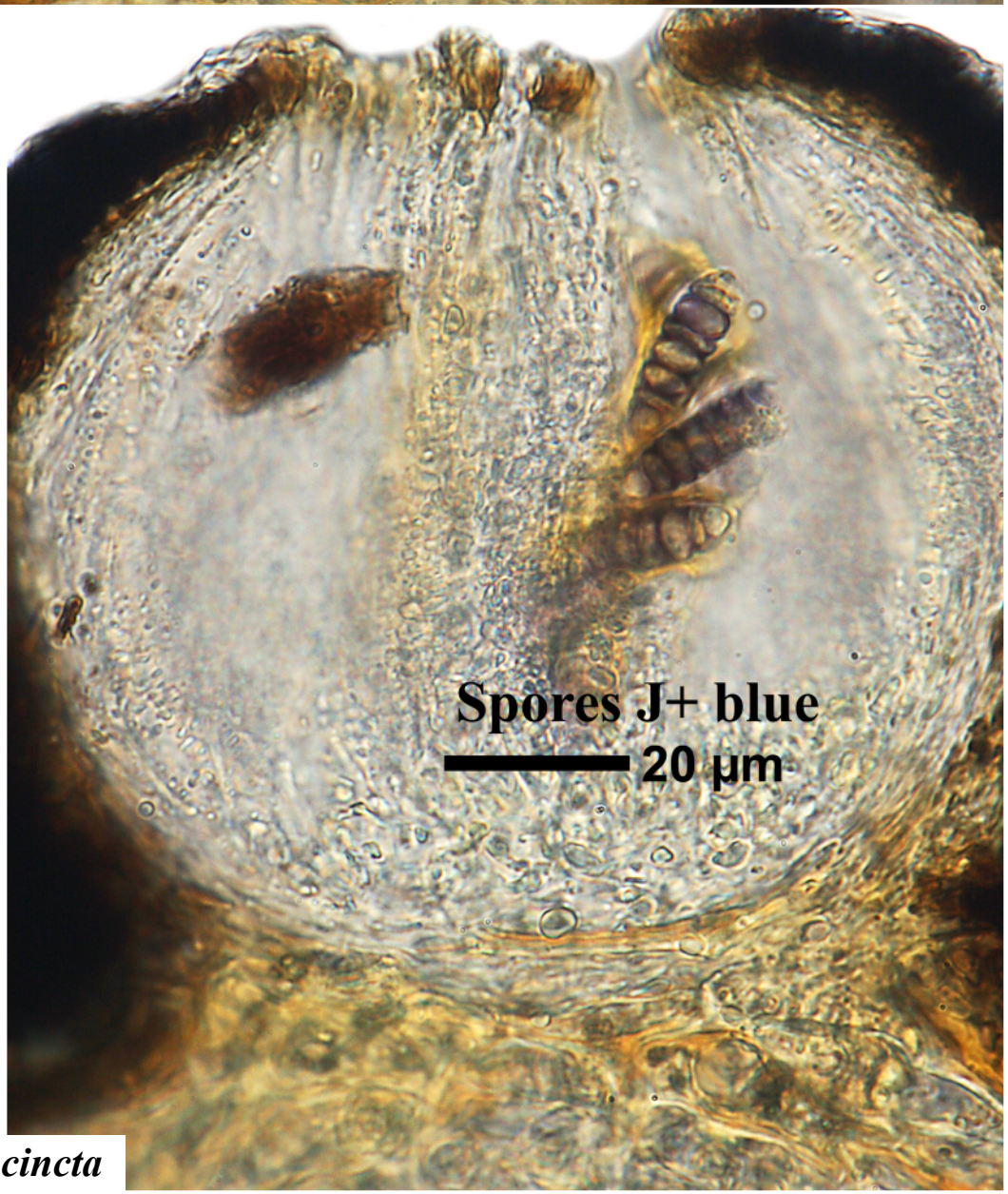


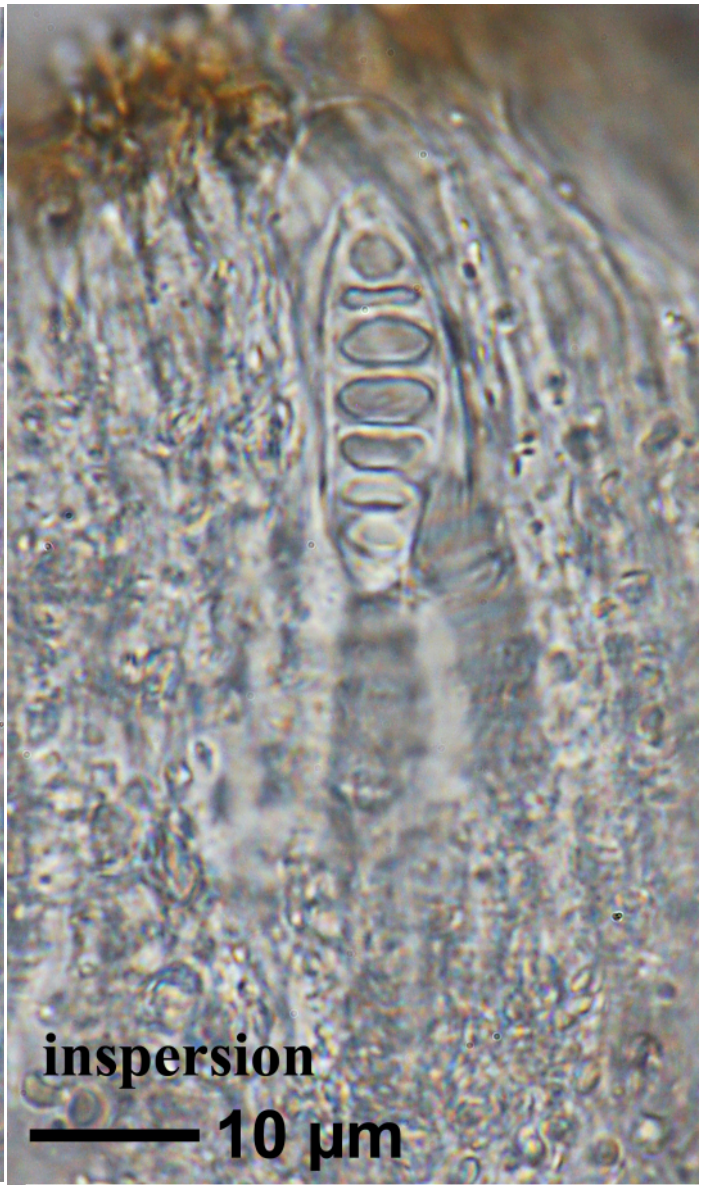

***Graphis cincta***




***Graphis cincta***







***Graphis cincta***

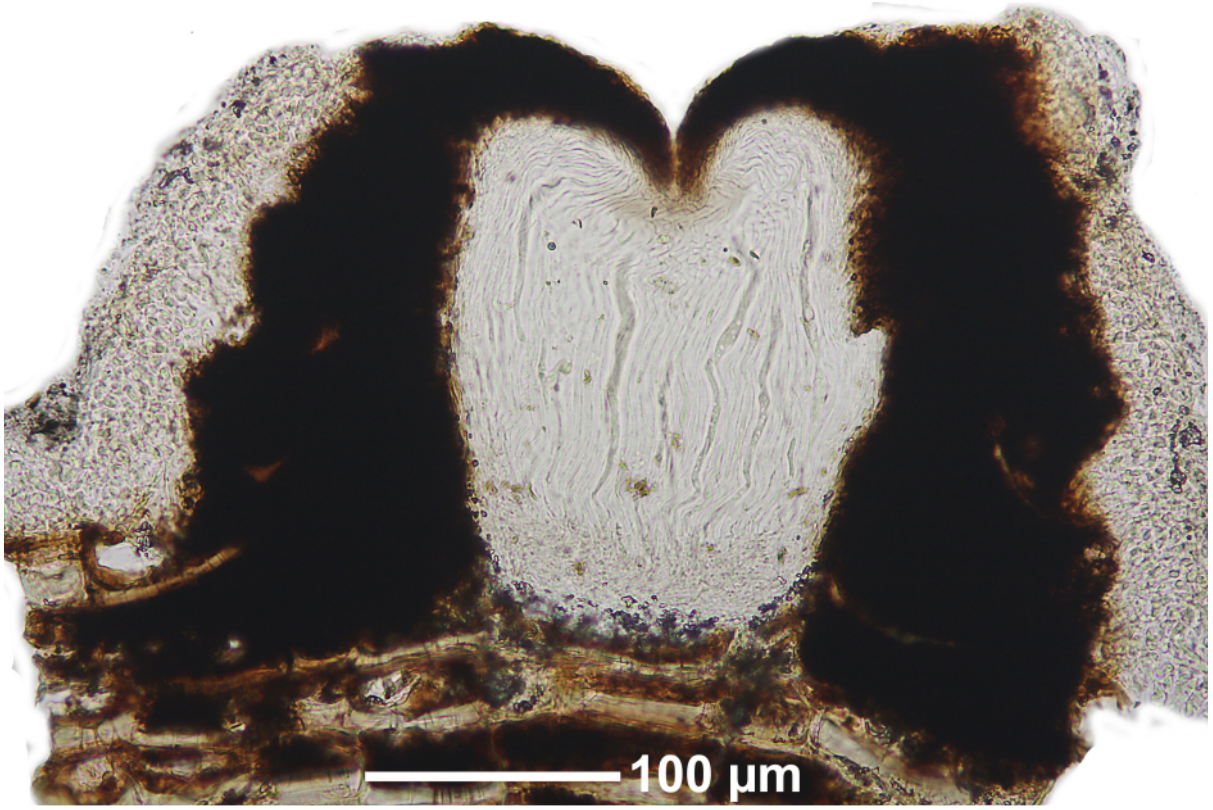
***Graphis cleistoblephara*** Nyl. (1863)
**[=** ***Graphina cleistoblephara*** (Nyl.) Zahlbr.]

Thallus grey, dull. Lirellae short, sessile, boat like, unbranched, straight, c. 1 x 0.5 mm. Excipulum laterally carbonized, at the base thin and not carbonized. Hymenium 170-180 µm, not inspersed. Ascospores (1-)2-4/ascus, hyaline, muriform, 80-130 x 13-23 µm, J+ blue-violet. Chemistry: norstictic acid. Lit. Staiger (2002, p. 222)

[2801], Hong Kong, New Territories: gesellig an glattem, lebendem oder abgestorbenem Astwerk im lichtoffenen Kronenteil kleinerer Laubbäume im *Graphidion scriptae* Ochsn., 300 m, SO, pH 6,5, schütterer Hangwald nordwestlich Pak Kong. Leg. et det. S.L. Thrower (VIII, 1978). G. Follmann: Lichenes Exsiccati Selecti A Museo Historiae Naturalis Casselensi Editi Nr. 287.

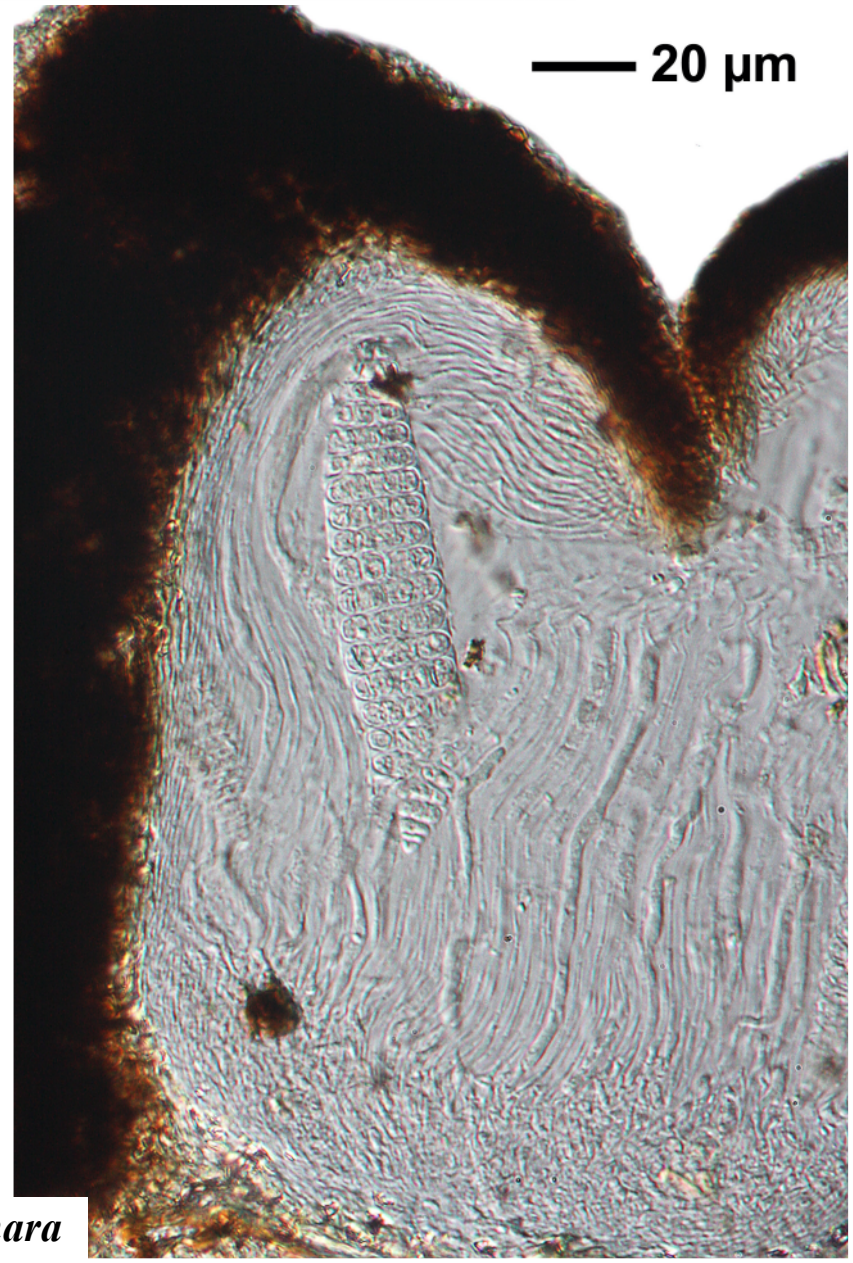




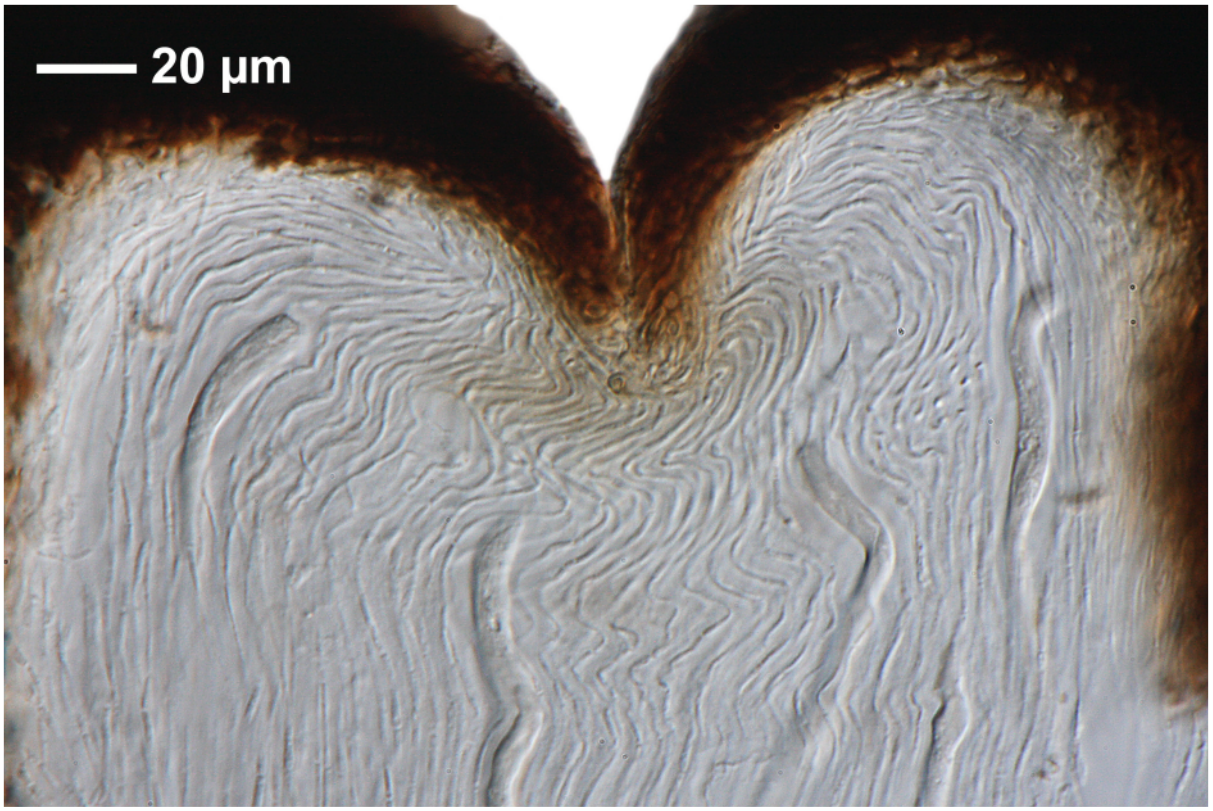



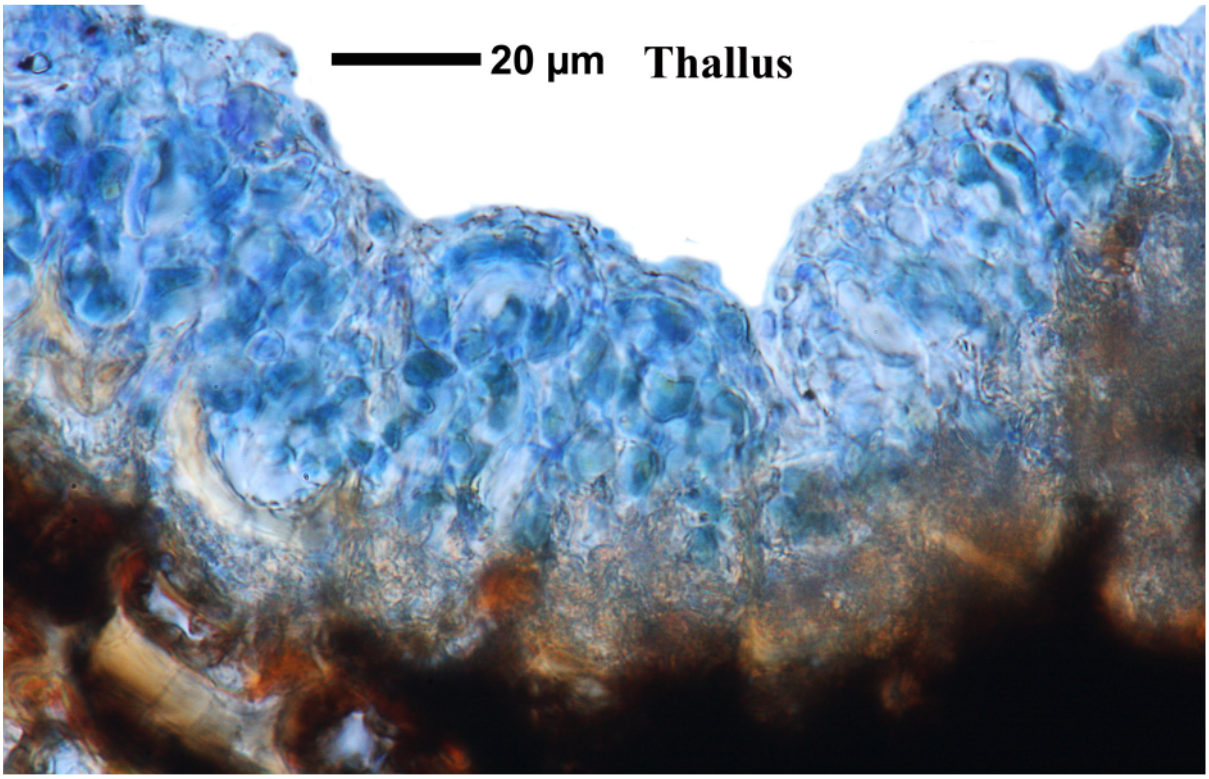

***Graphis cleistoblephara***




***Graphis cleistoblephara***







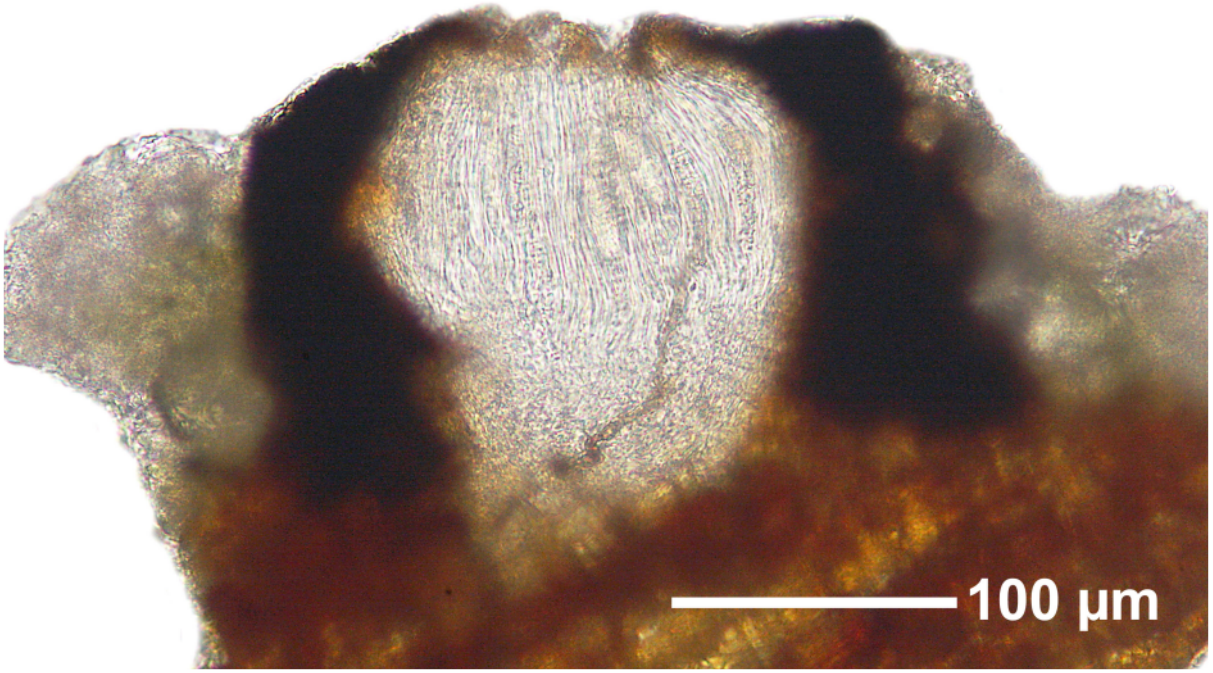
***Graphis cleistoblephara***

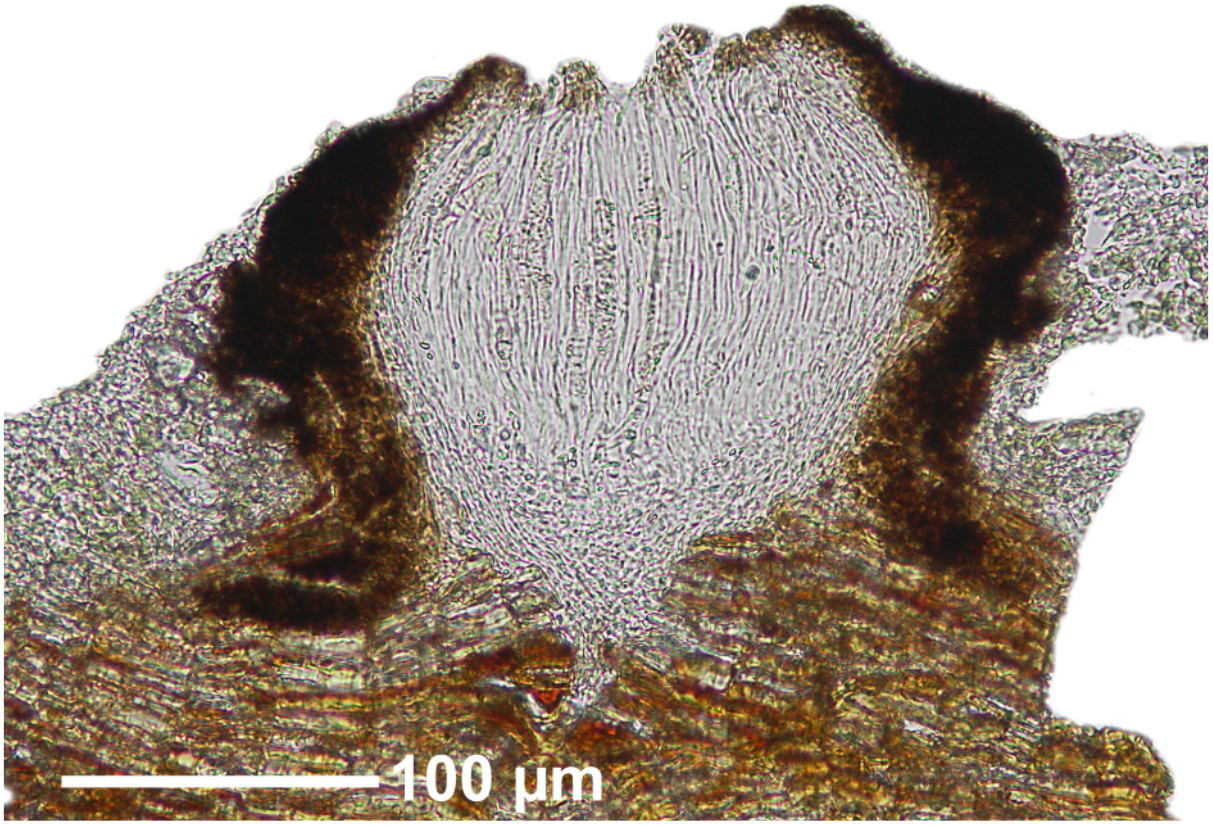
***Graphis consimilis*** Vain.

Labia only laterally carbonized. Hymenium not inspersed, J-. Paraphyses at the tips branched. Ascospores muriform, transverse 10-11-septate with 1-4 cells in each segment, 34-44 x 10-12 µm, J+ violet. Chemistry: K-, P-, TLC: nil.

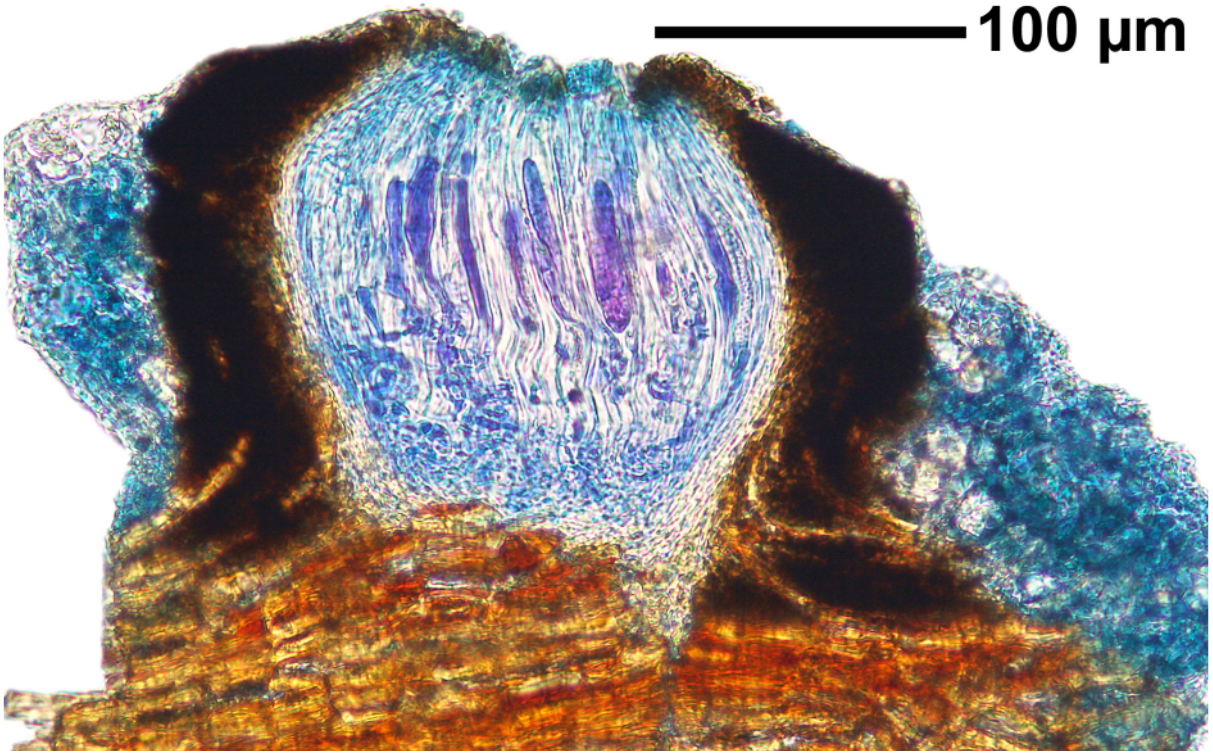
[6380], Philippinen, Povinz Camiguin, Camiguin Island, Ardent Hot Spring Resort am Fuß des Mt. Hibok Hibok, 09°13.611' N, 124°41.337' E, alt. 120 m. Leg. Schumm 22.08.1999, det. Archer 2012.

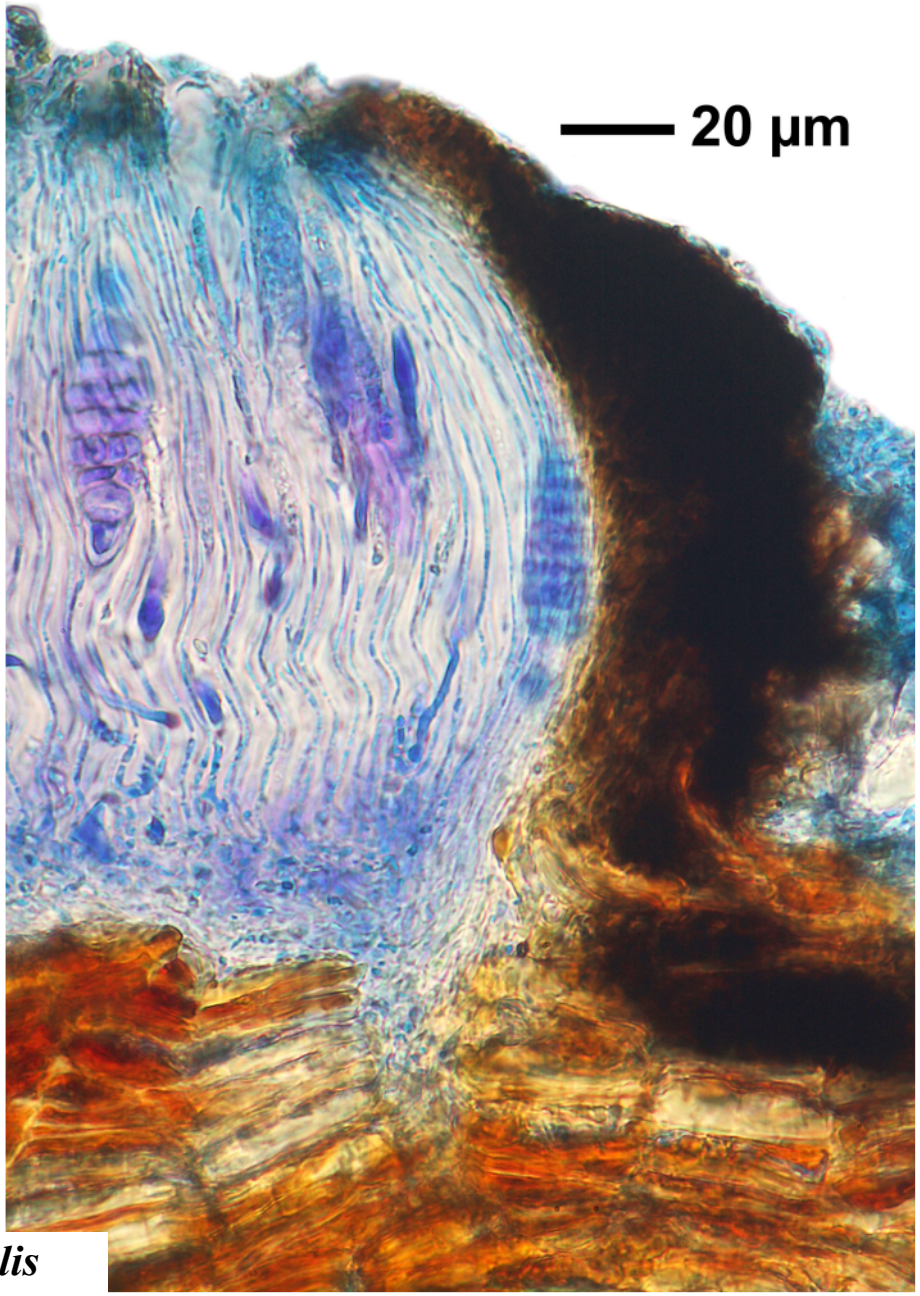




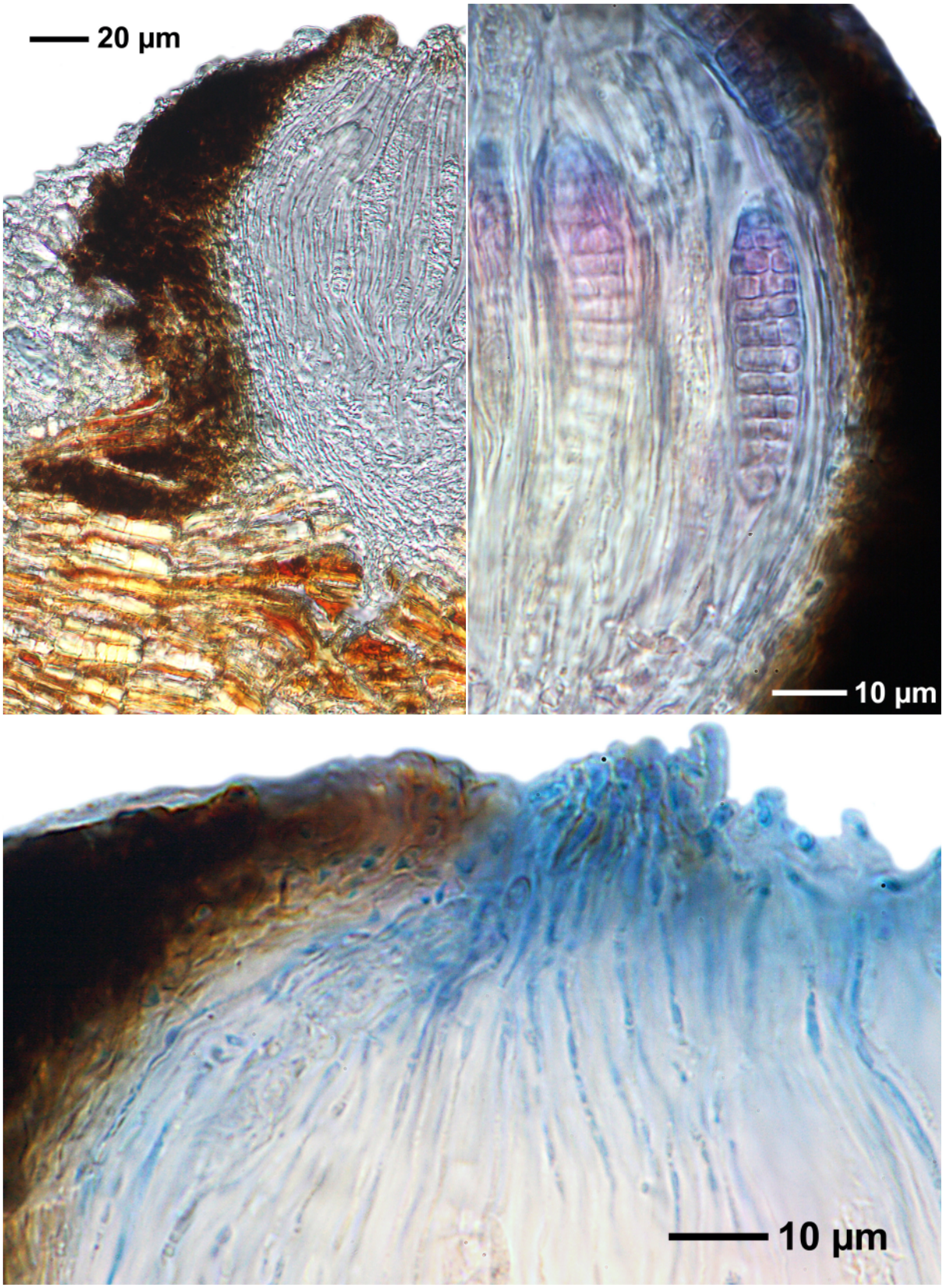




***Graphis consimilis***



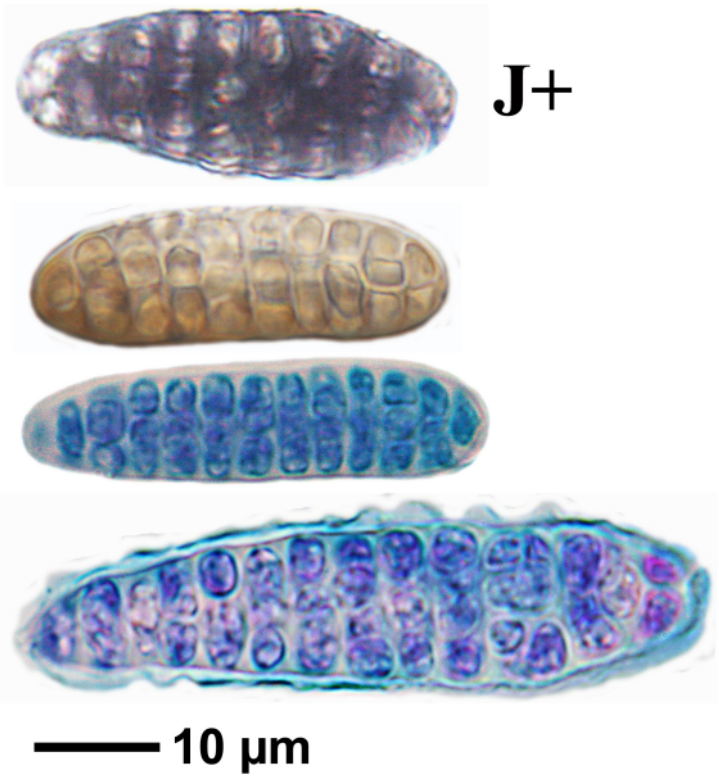



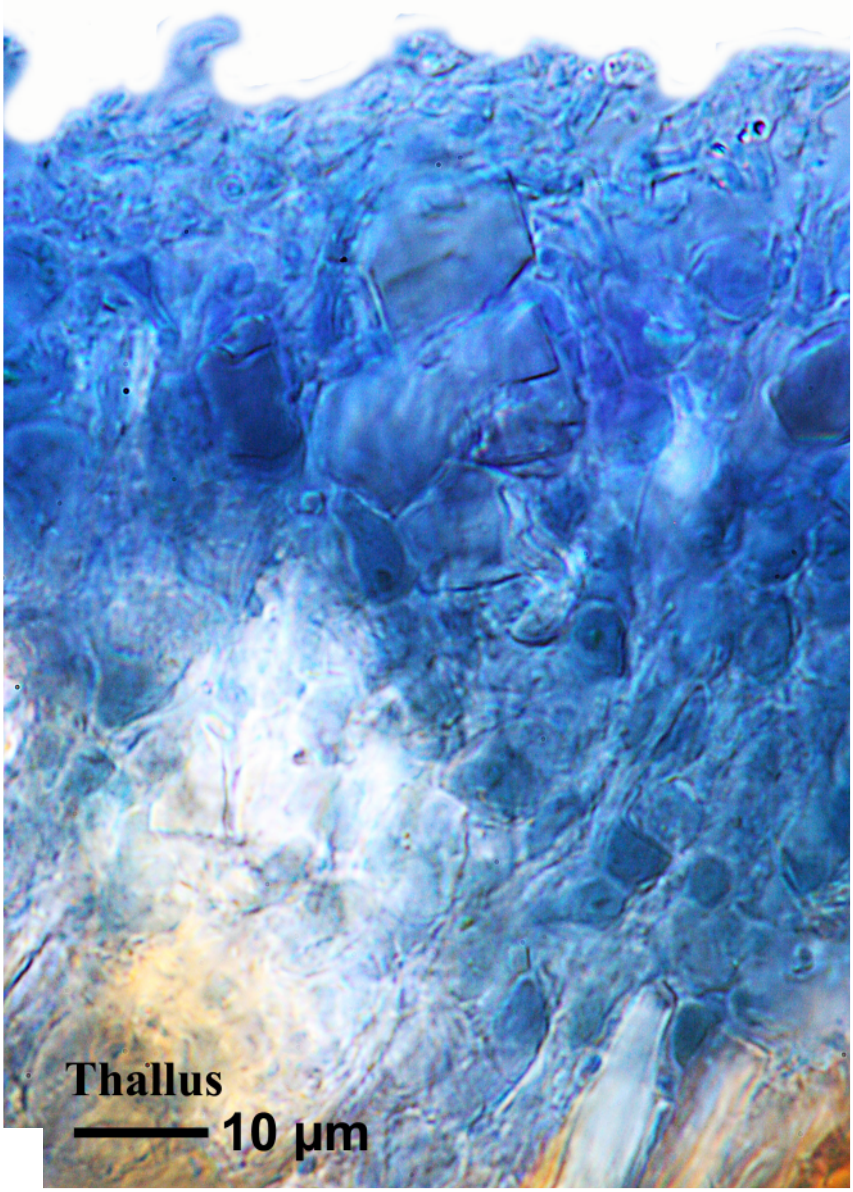

***Graphis consimilis***




***Graphis consimilis***




***Graphis consimilis***

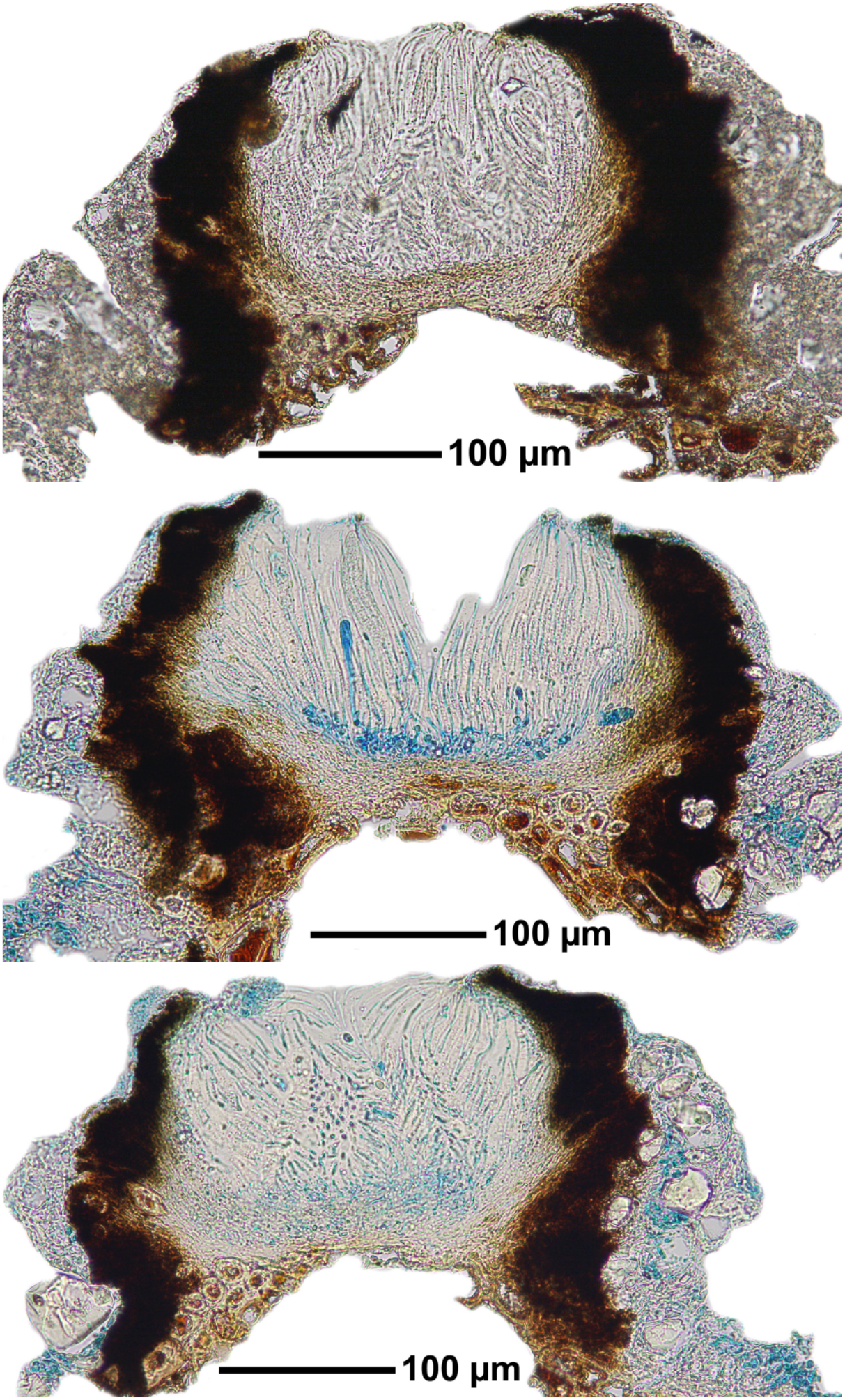
***Graphis copelandii*** Vain.

Lirellae immersed to erumpent, with lateral thalline margin. Labia entire, excipulum laterally carbonized, hymenium not inspersed. Ascospores hyaline, muriform, 1(-2)/ascus, 75-113 x 22-23 µm. Chemistry: thallus K+ yellow>red, norstictic acid (TLC).

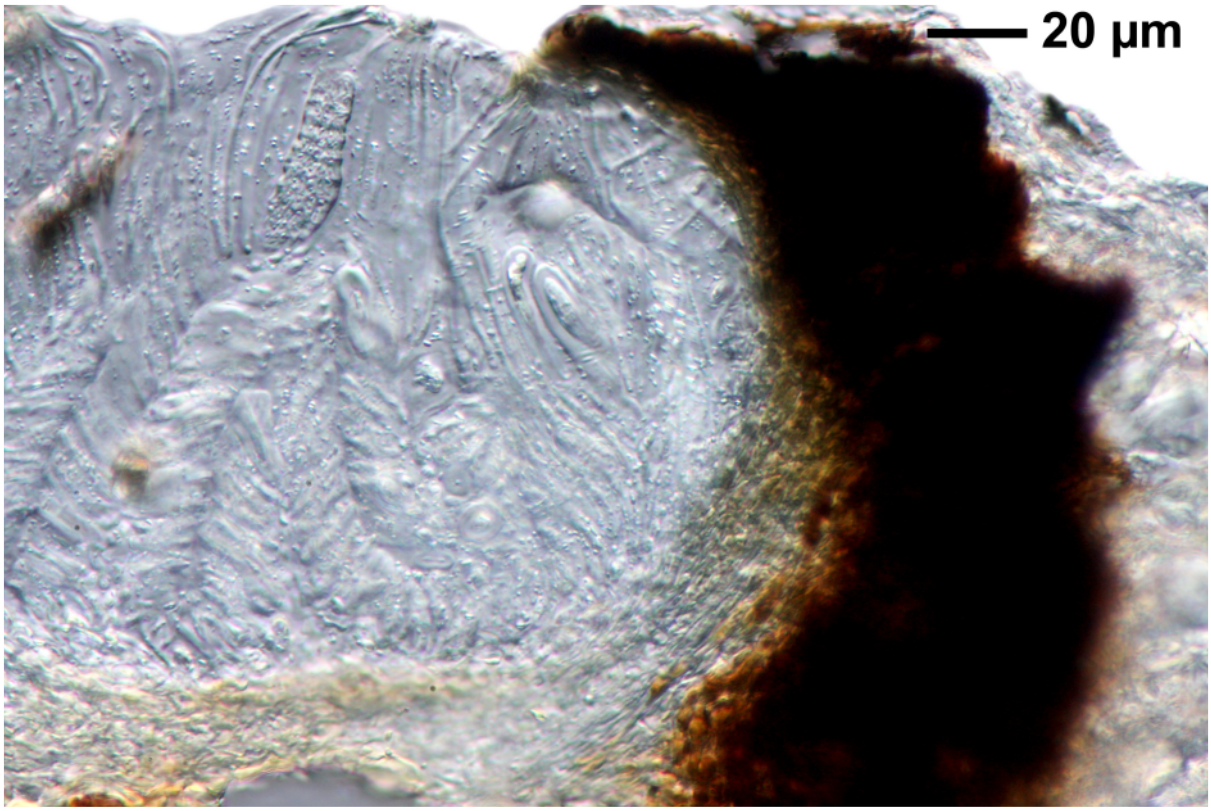
[7798], Philippinen, Leyte, Prov. Leyte, Weg von Kadwa-An (10°46.249' N, 124°48.167' E, 195 m) nach VISCA (= Visayas State College of Agriculture, 10°44.543' N, 124°47.402' E). Bei 30 m, auf Cococ nucifera. Leg. Schumm 19.08.2000, det. Aptroot 2009.

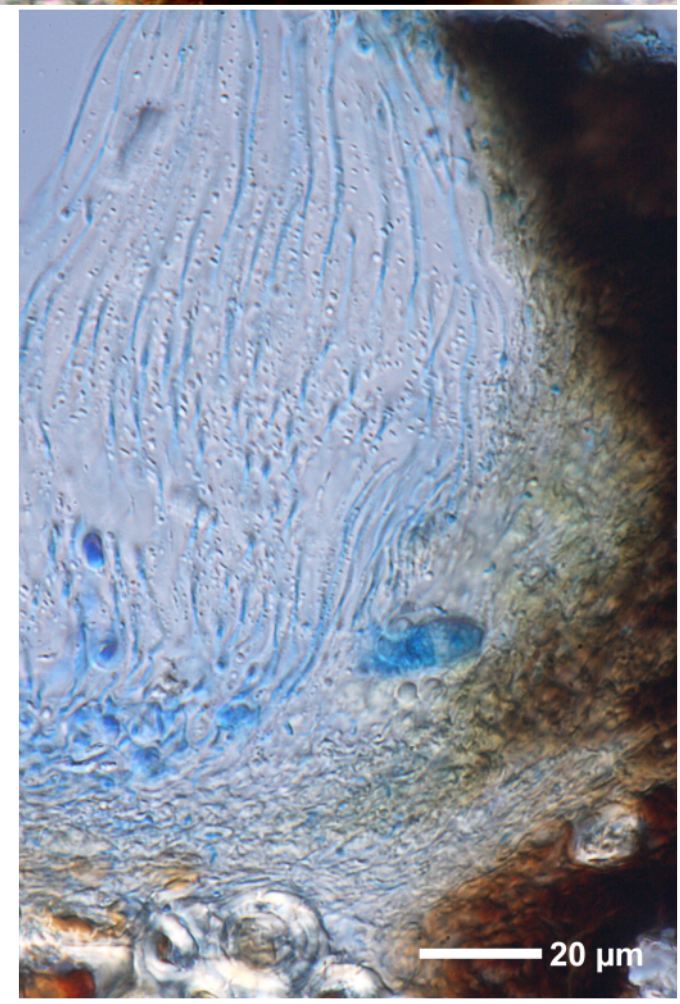




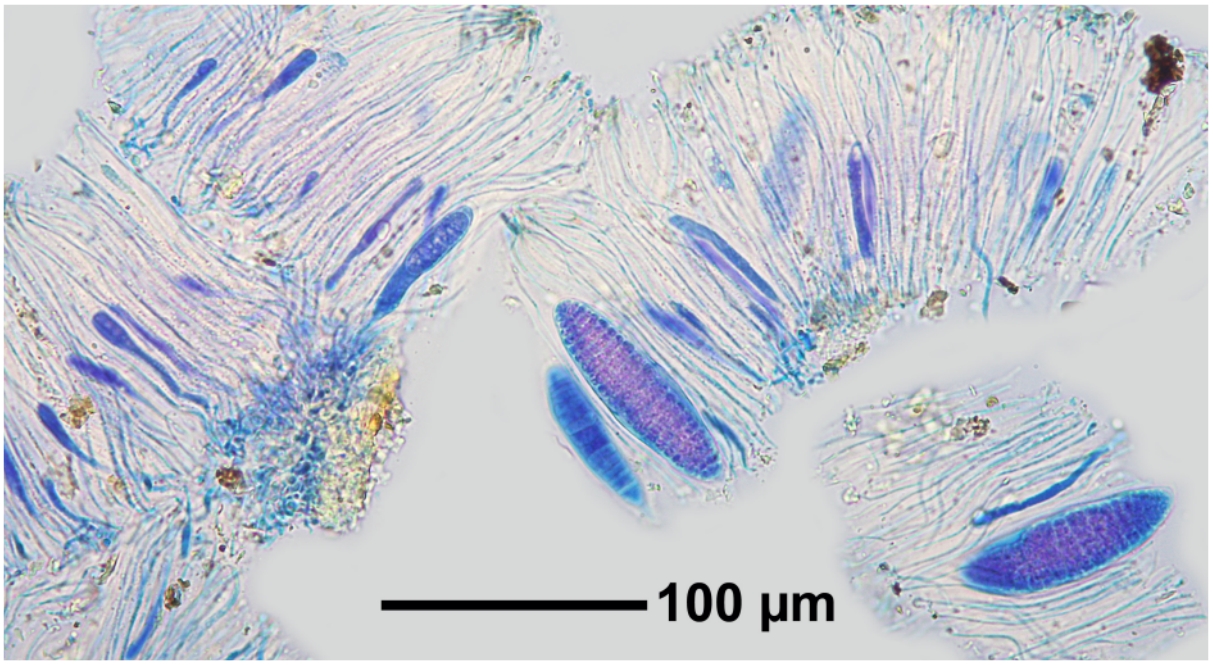



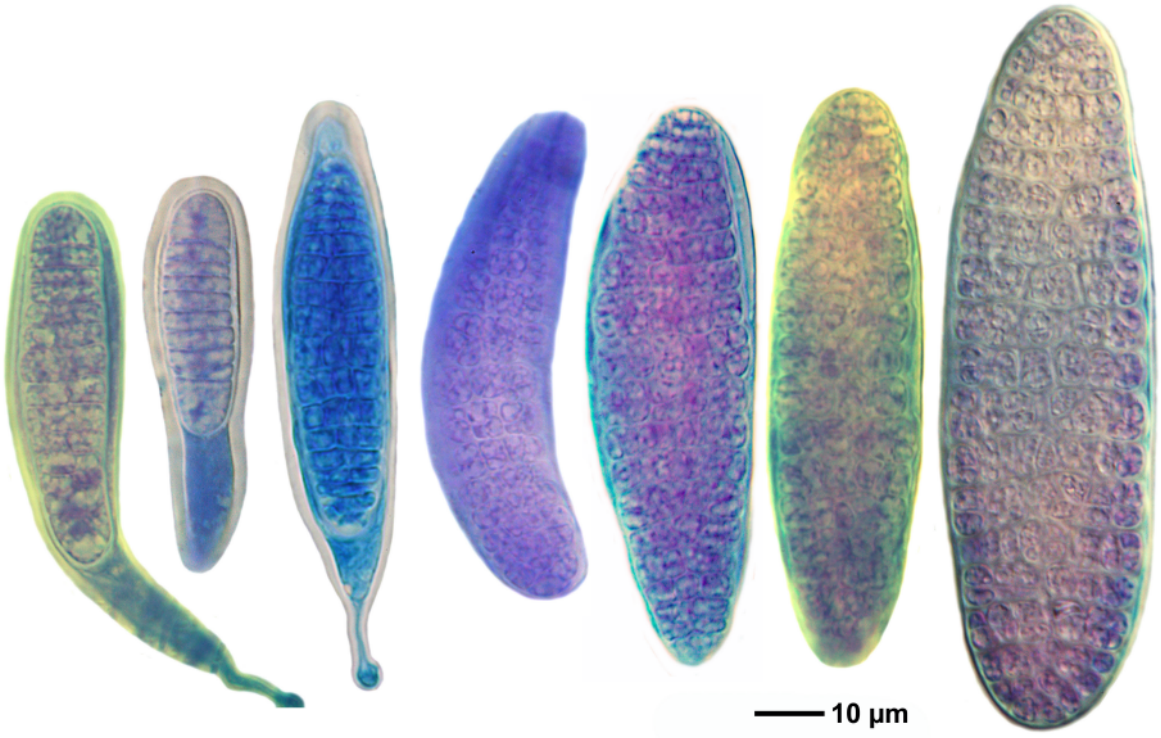

***Graphis copelandii***

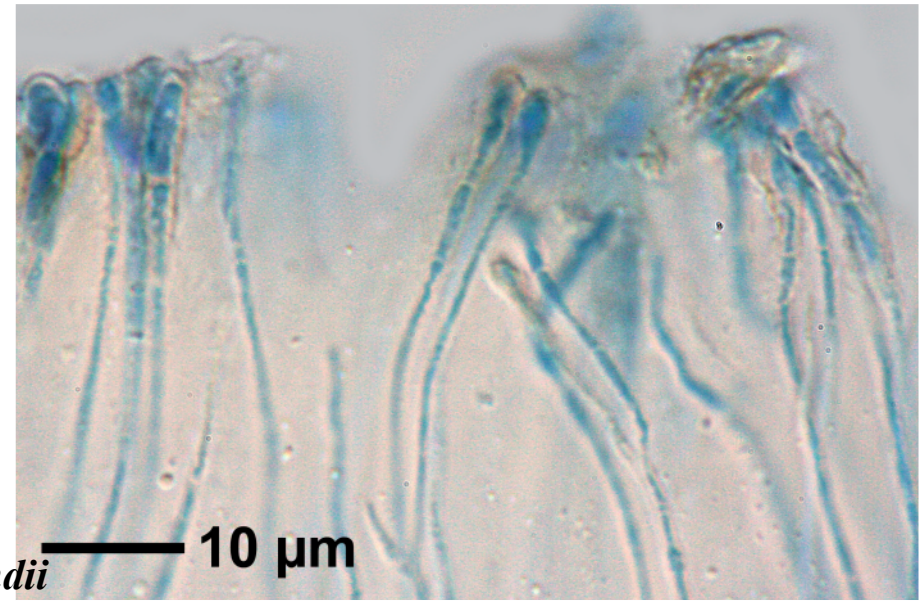



***Graphis copelandii***



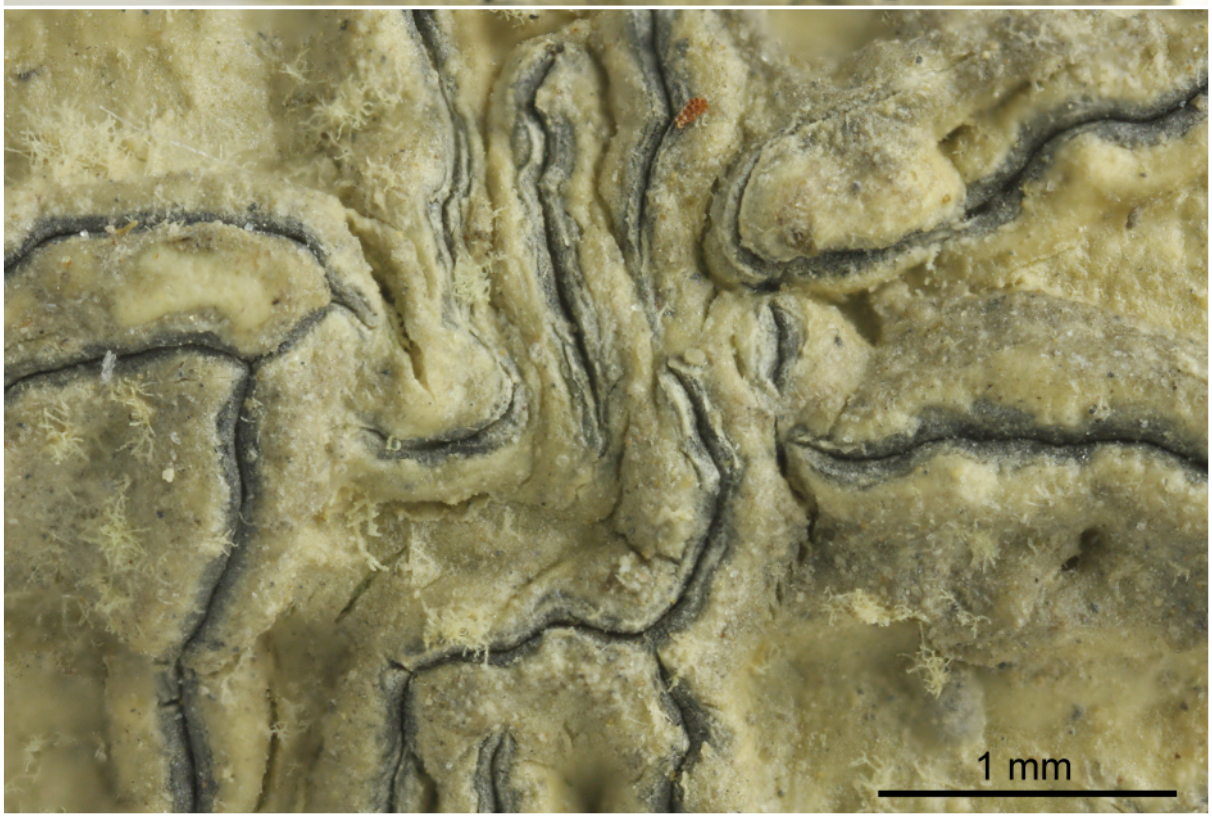

***Graphis copelandii***

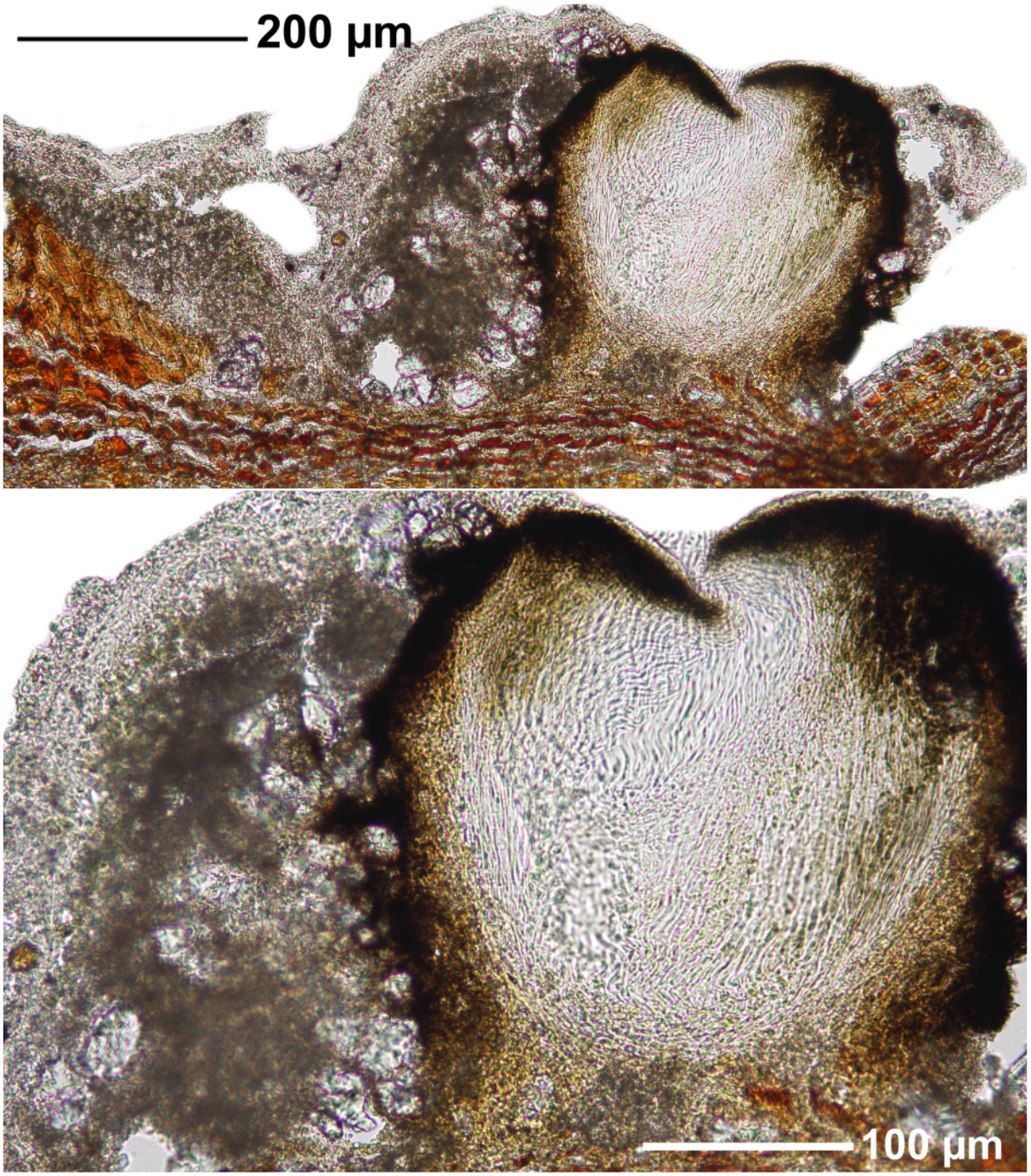
***Graphis crassilabra*** Müll.Arg.

Labia entire, excipulum laterally carbonized. Hymenium not inspersed. Medulla J+ blue-violet. Ascospores hyaline, 8/ascus, transversely septate, J+ blue, (6-)10-14(-15) locular, (28-)45-60(-86) x 7-13(-17) µm. Chemistry: stictic acid. Lit.: Lichenologist 41: 392.

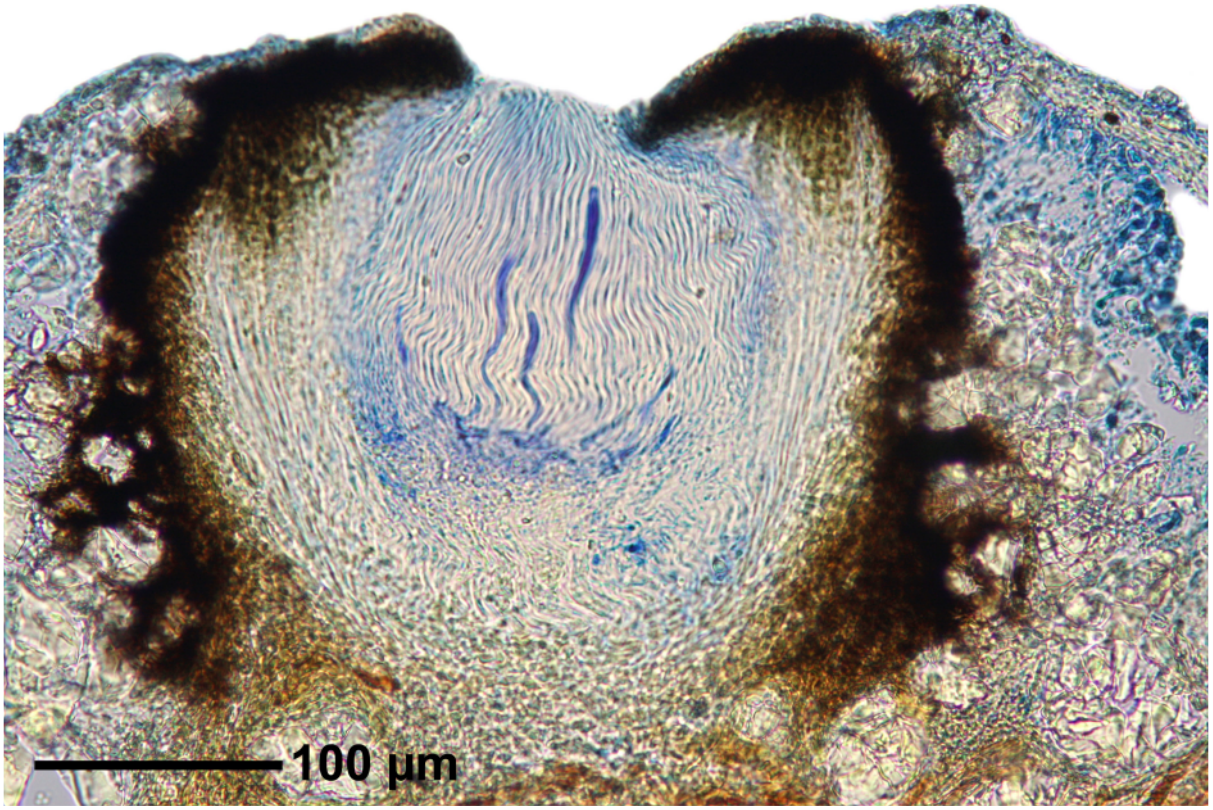
[5889], Philippinen, Mindanao, Province Cotabato, bei Ilomavis an der Straße nach Kidapawan, 07°02.069' N, 125°11.367' E, 730 m. Leg. Schumm 07.08.1999, det. Archer 22.8.2003.

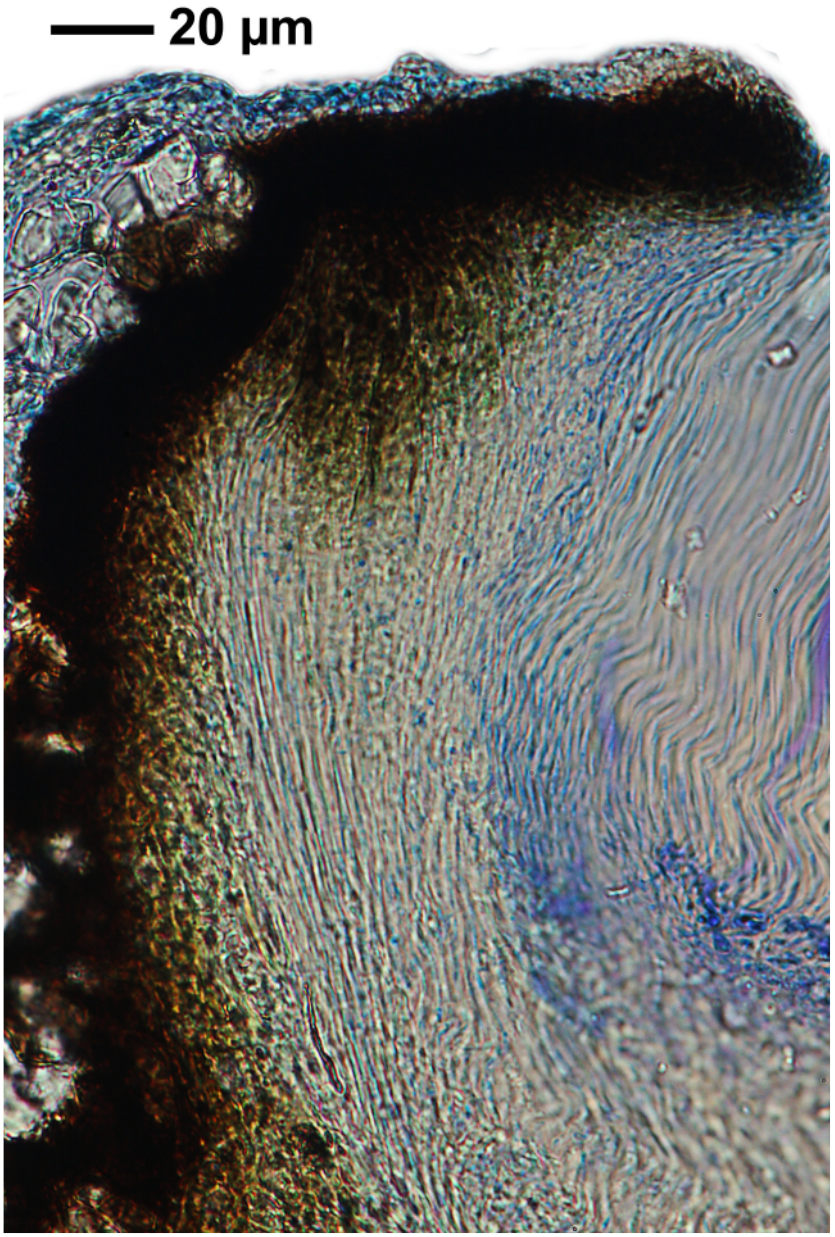


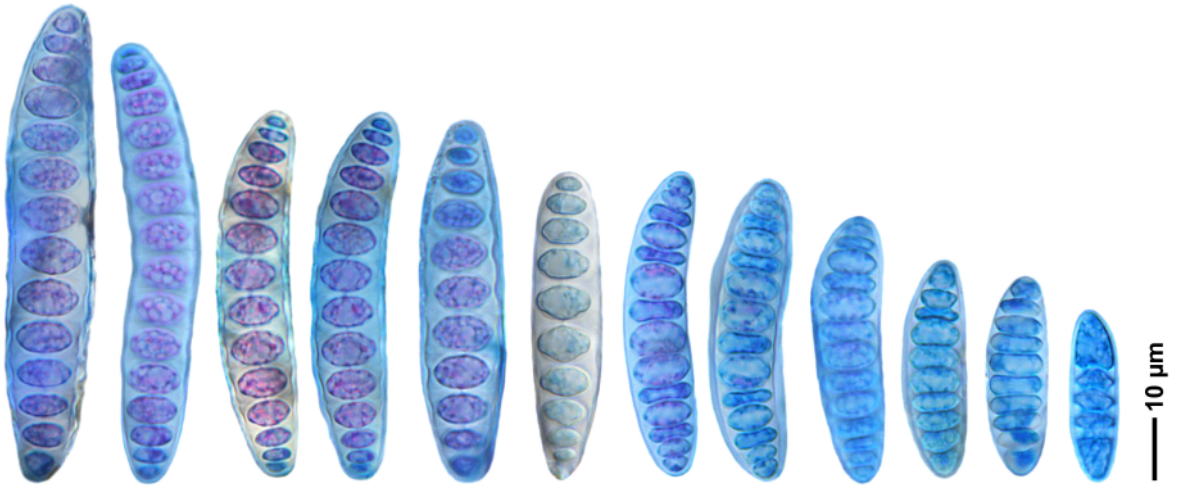


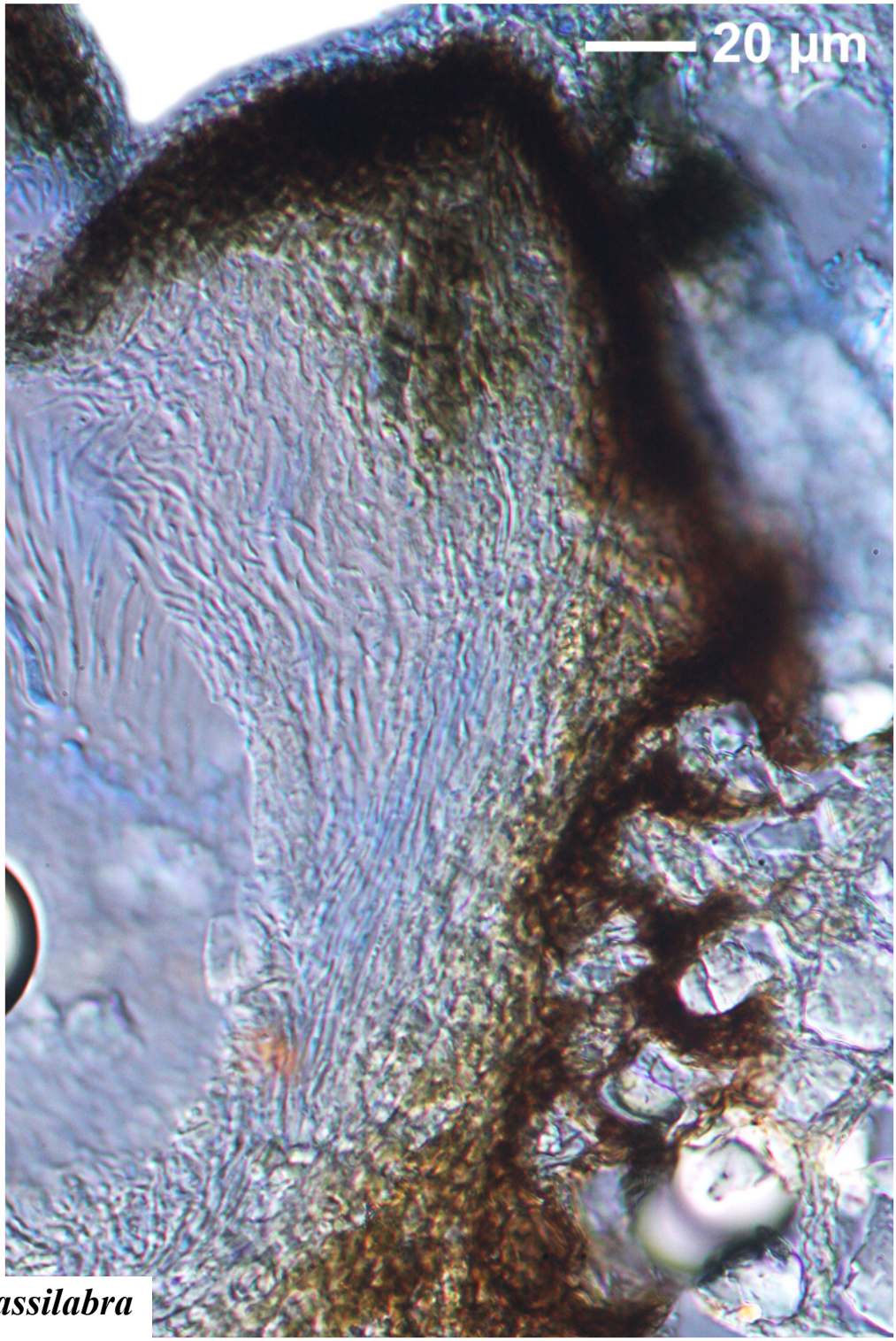

***Graphis crassilabra***




***Graphis crassilabra***



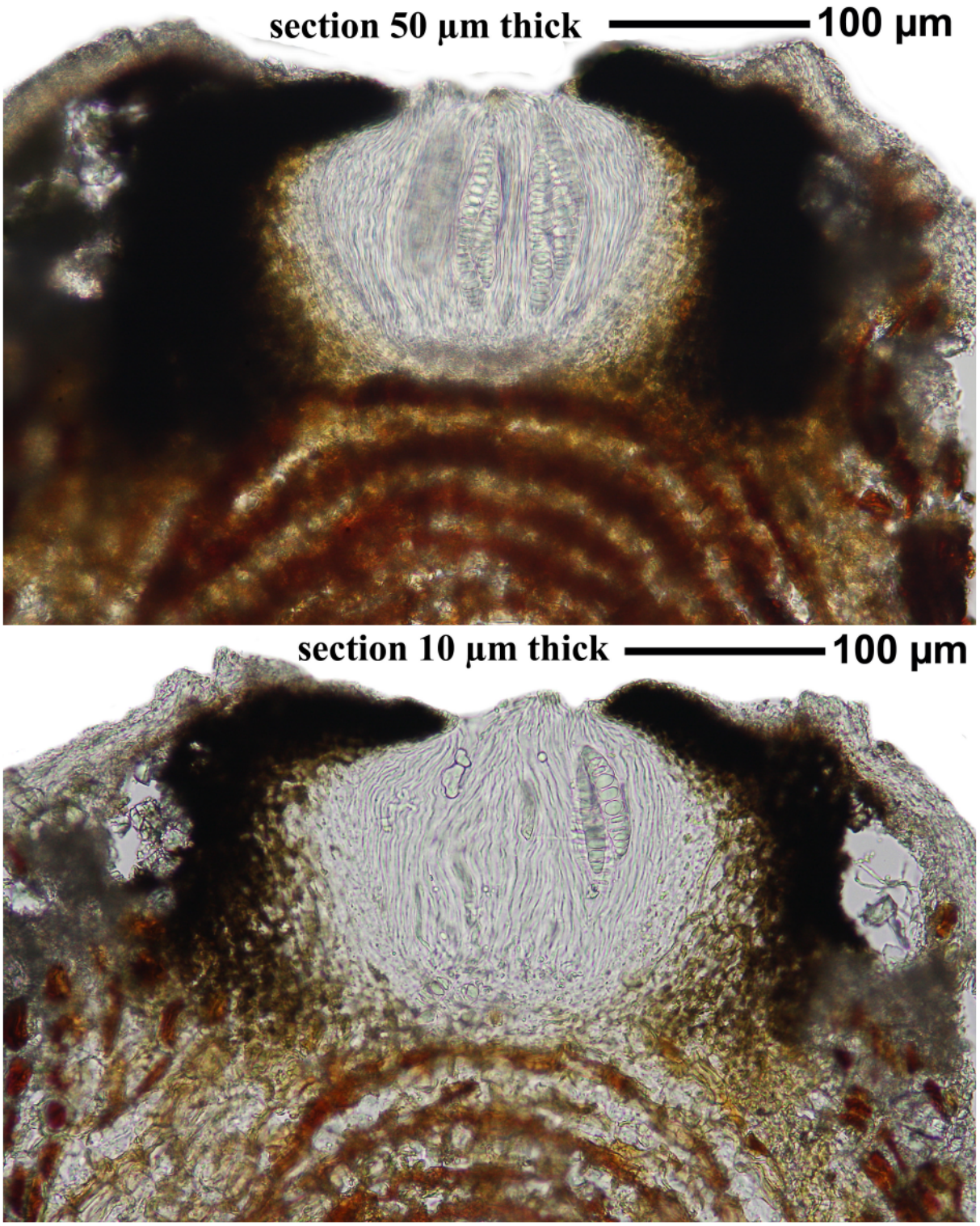

***Graphis crassilabra***

***Graphis crassilabra*** Müll.Arg.

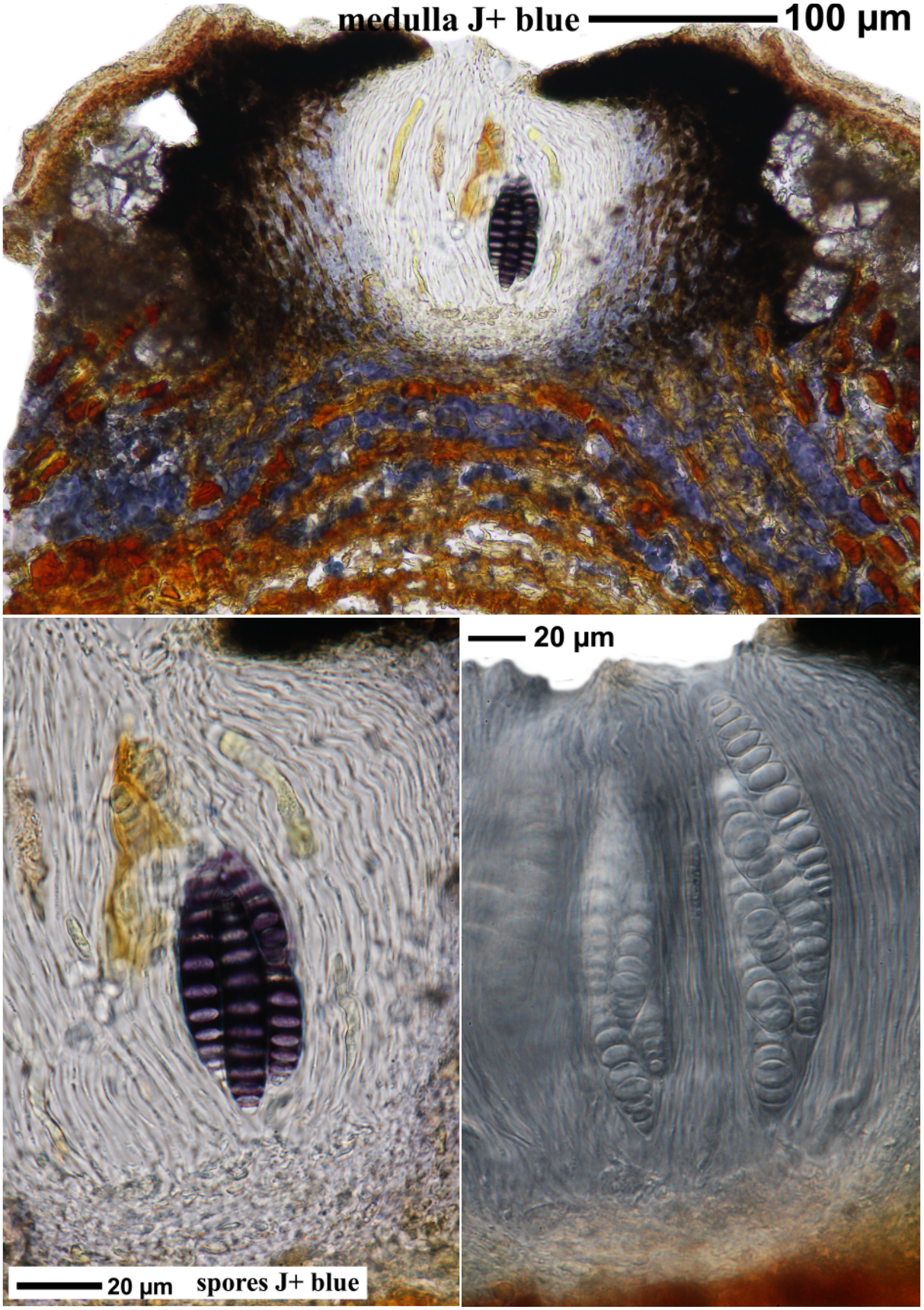
[7426], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail von Valencia Barangay Lunga (9°16.676’ N, 123°13.839’ E) bis zum Camp Vendiola (09°16.281’ N, 123°11.410’ E), bei 740 m. Leg. Schumm 09.08.2000, det. Schumm 2011.



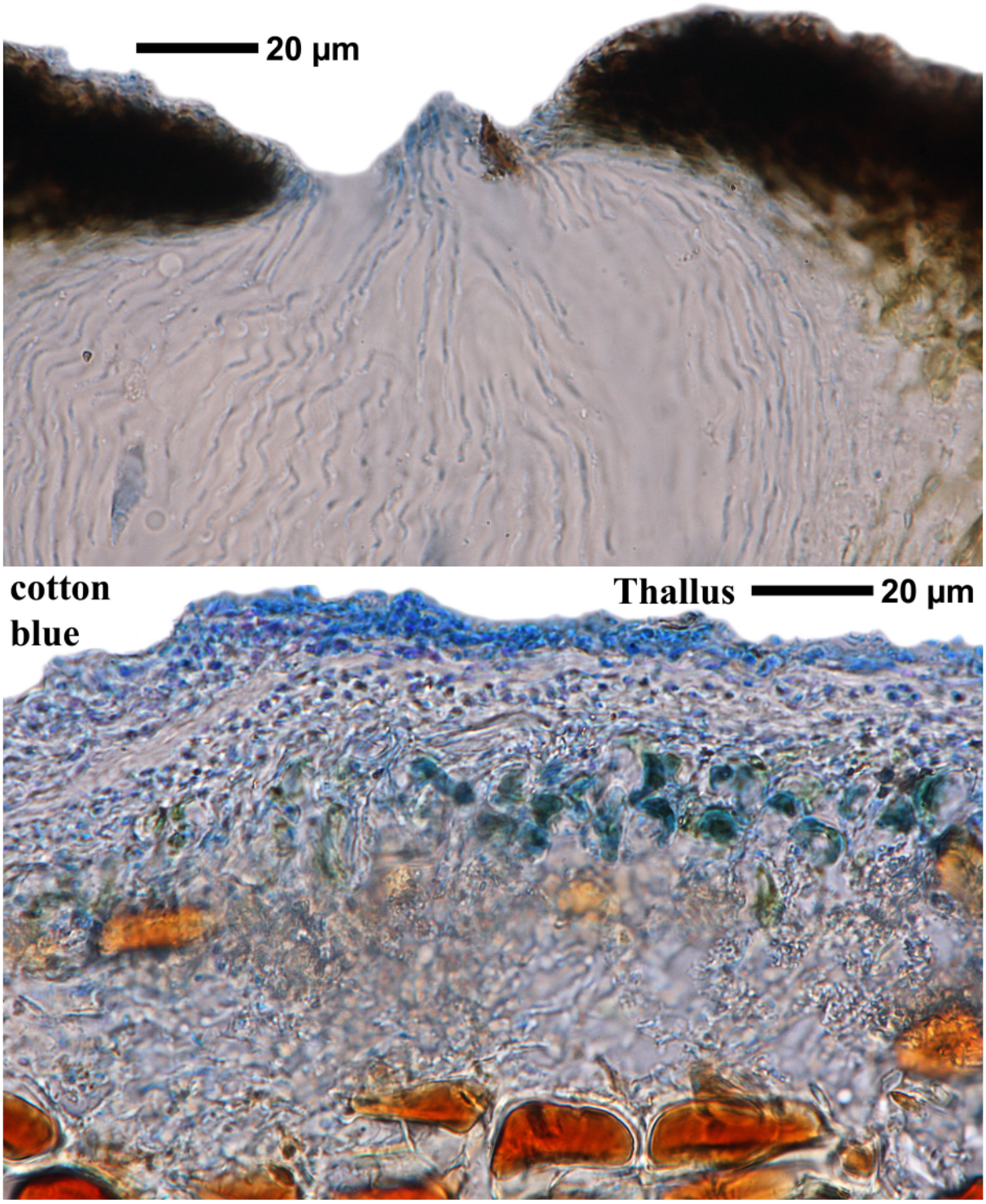



***Graphis crassilabra***




***Graphis crassilabra***



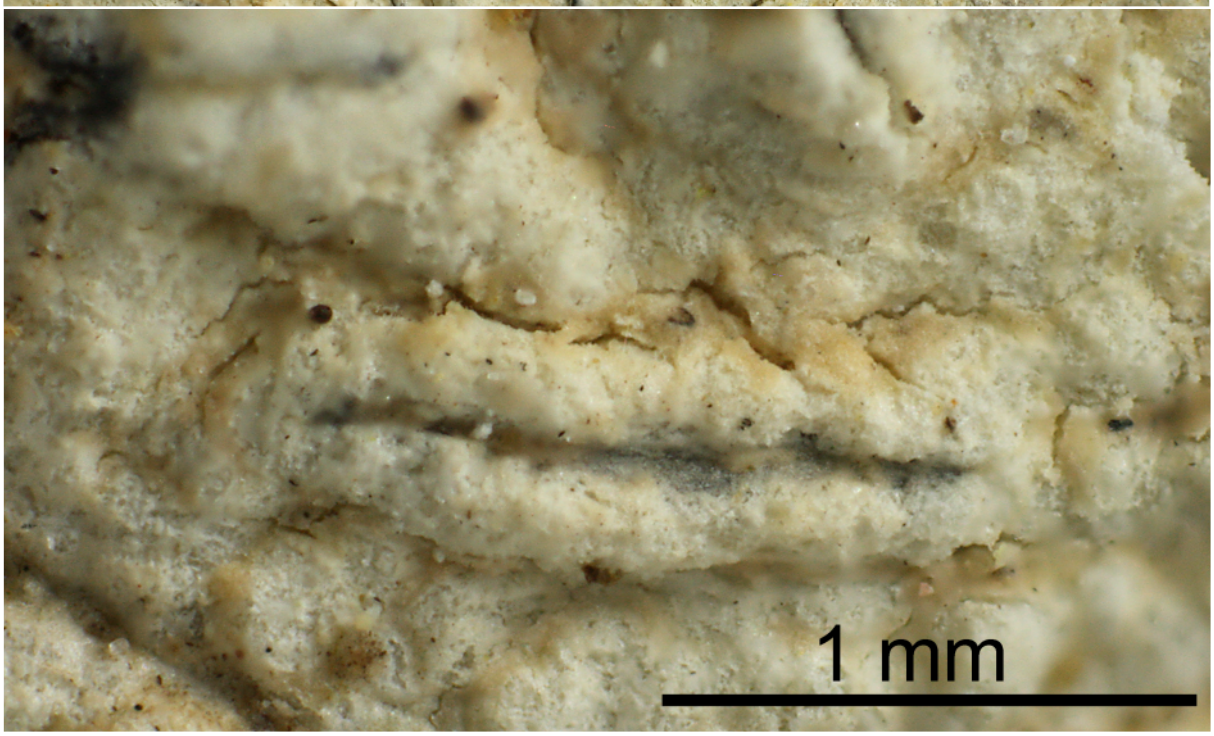

*Graphis crassilabra*

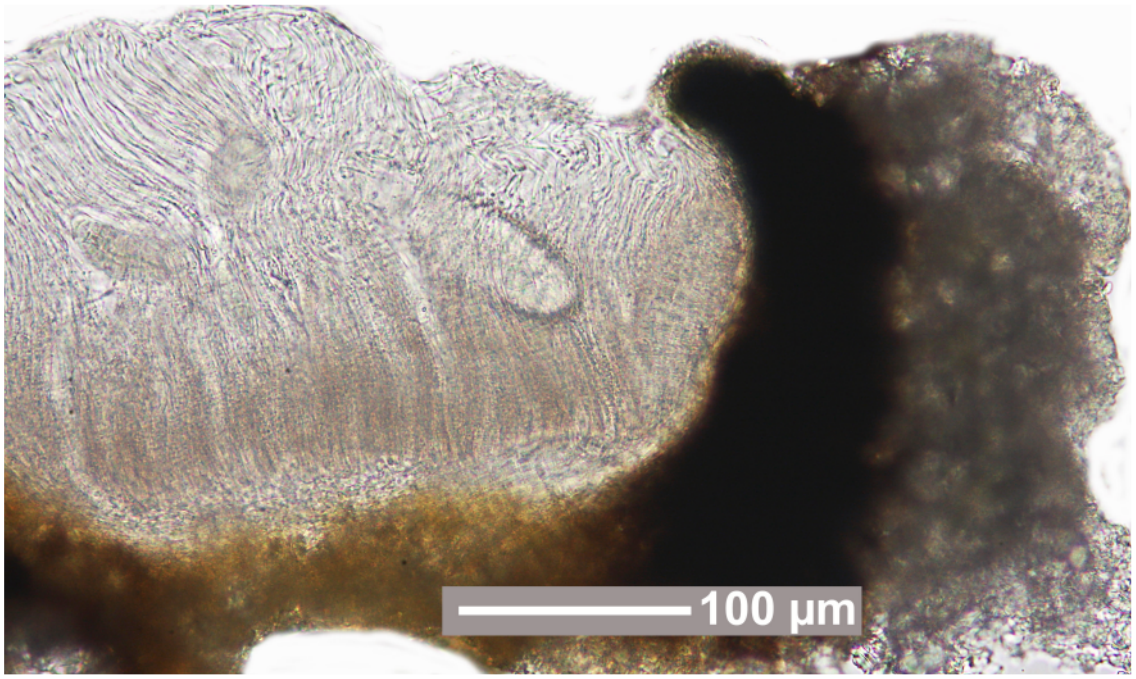
***Graphis diplocheila*** Vain.

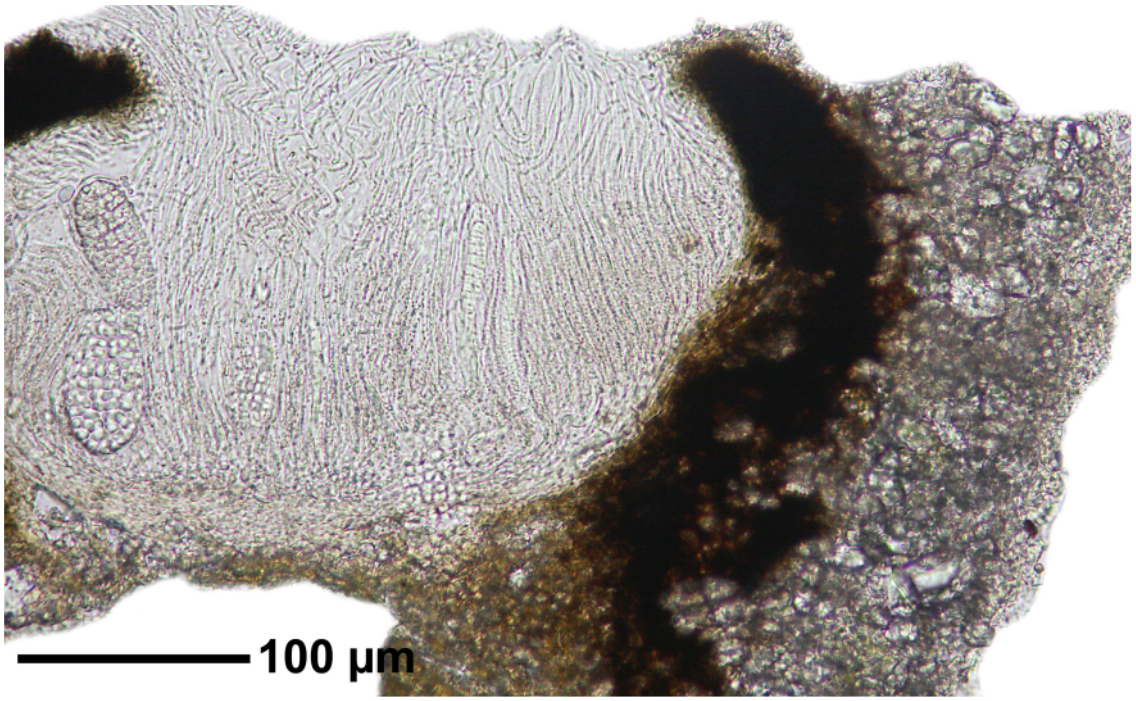
Thallus pale yellowish grey, powdery. Lirellae nearly immersed to prominent, with thick thalline margin. Excipulum only laterally carbonized. Hymenium densely inspersed. Ascospores muriform, 1/ascus, J+ blue, 50-80(-175) x 20-33(-50) µm. Chemistry: Thallus K+ orange, C-, P-, UV+ yellowish white.

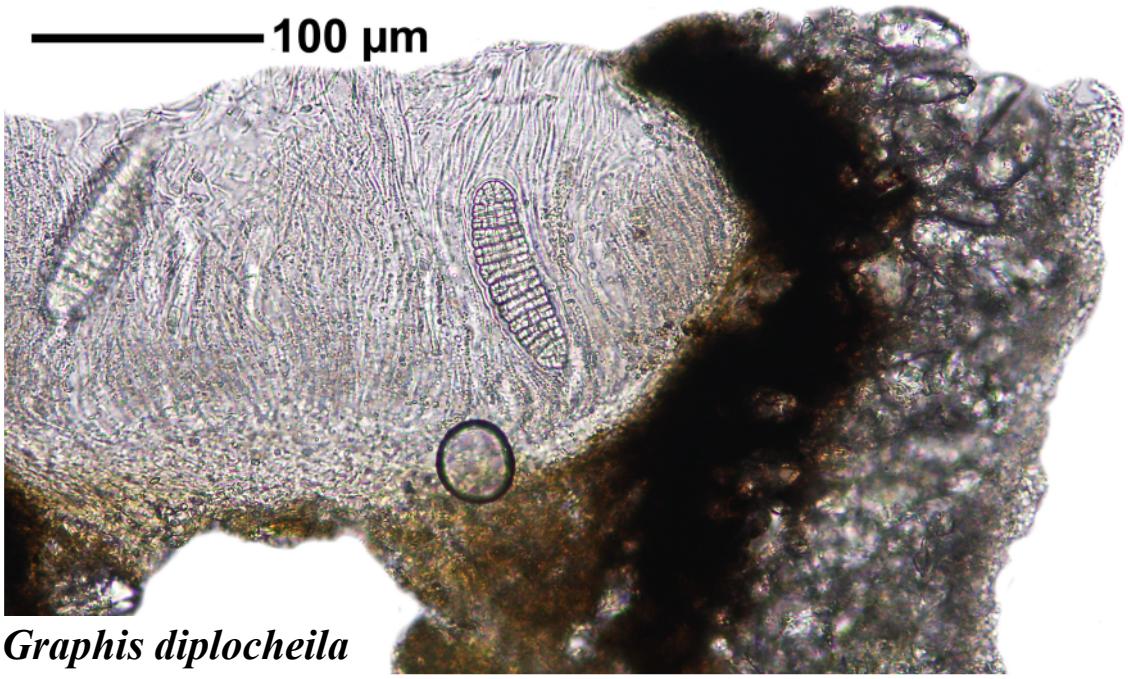
[7391], Philippinen, Negros, Prov. Negros Oriental, beim Mt. Talinis (Cuernos de Negros), Valencia Barangay Lunga, 9°16.676' N, 123°13.839' E, 540 m. Leg. Schumm 08.08.2000, det. Aptroot 2009.



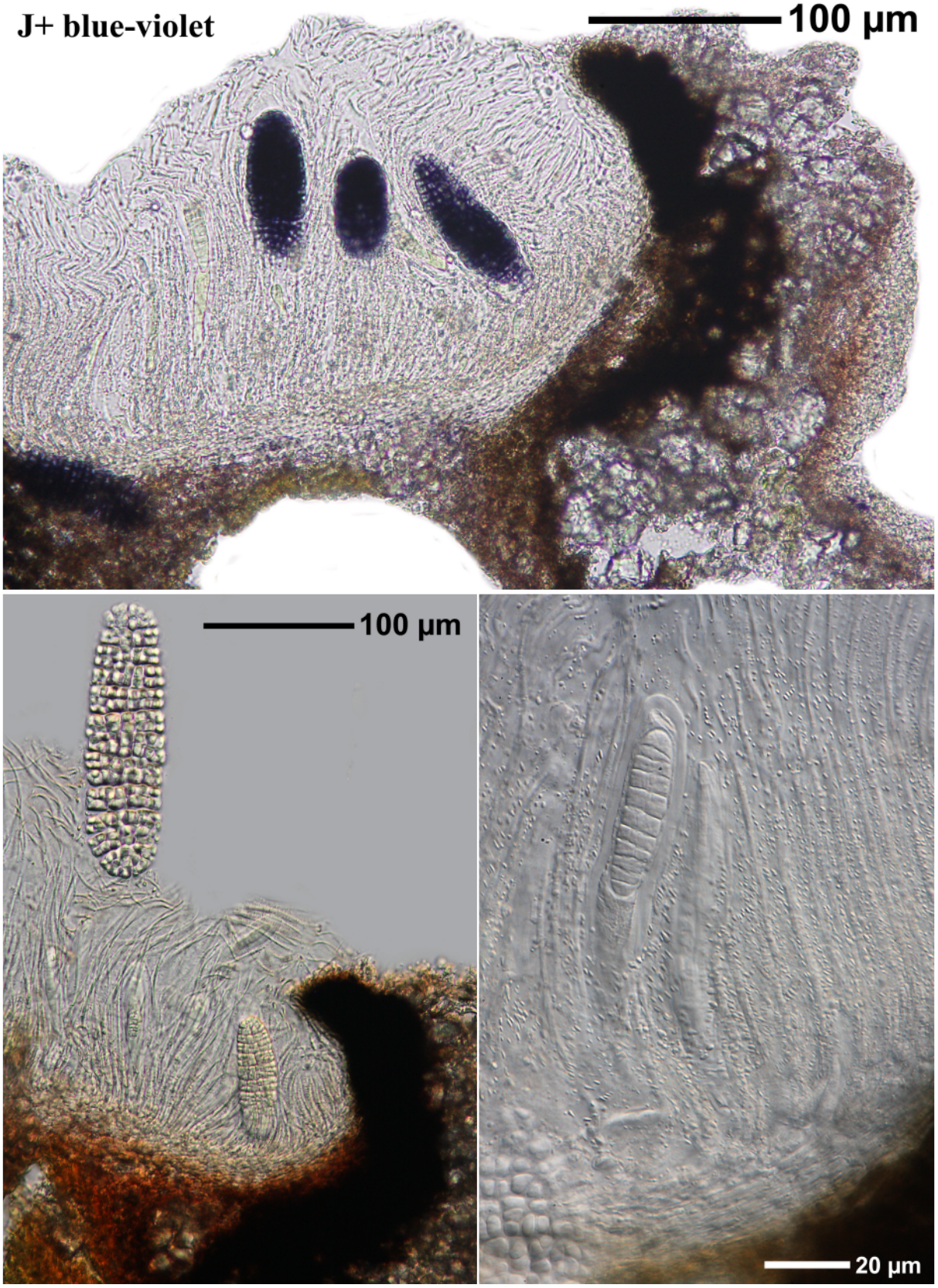





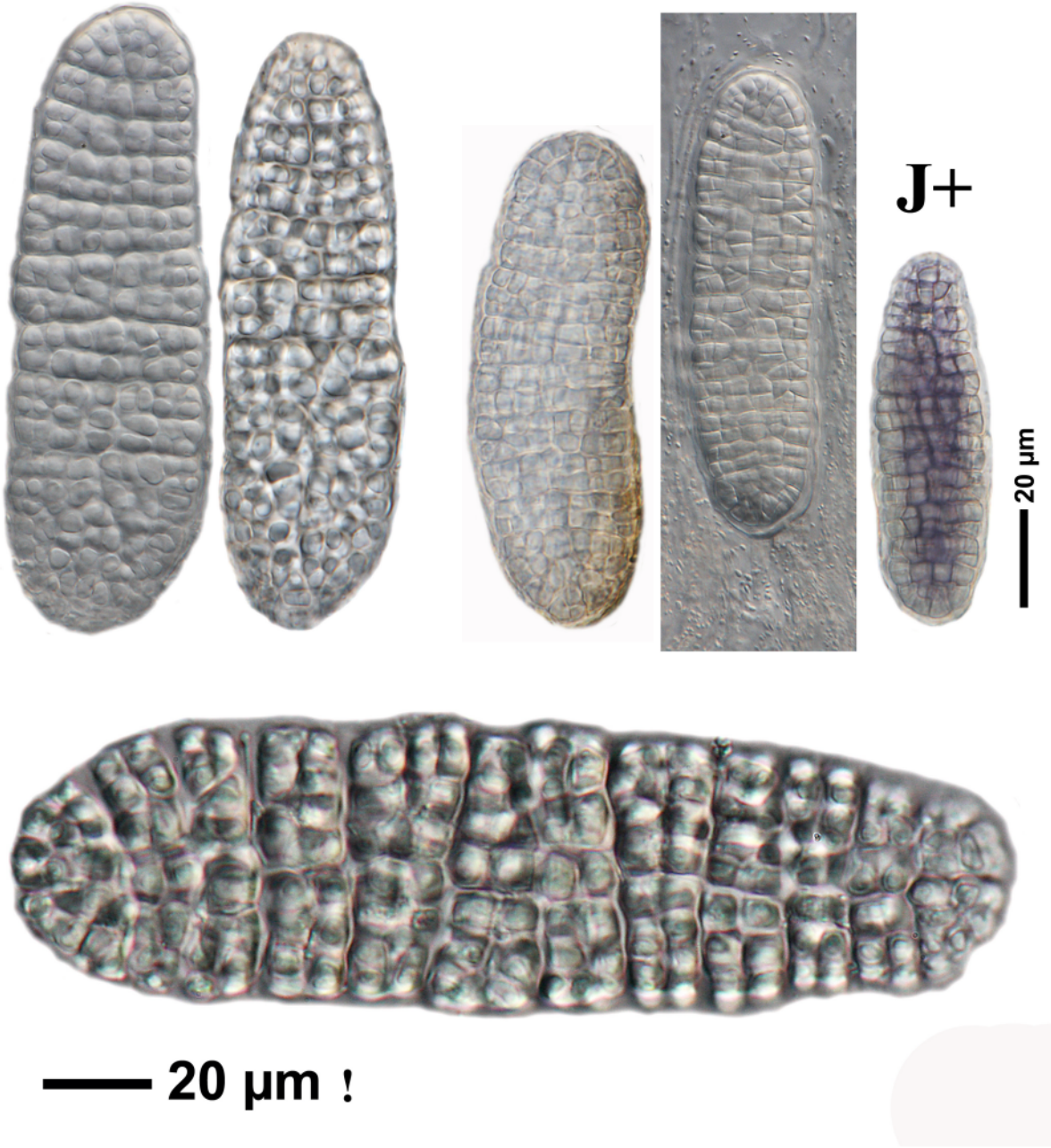




***Graphis diplocheila***




*Graphis diplocheila*




***Graphis diplocheila***

***Graphis furcata*** Fée
[= ***Graphis albissima*** Müll.Arg.]

Labia entire, only laterally carbonized, covered by thallus. Hymenium not inspersed. Ascospores 9-12-transverse-septate, with halo, J+ reddish. Chemistry: nil (TLC)

[6386], Philippinen, Povinz Camiguin, Camiguin Island, nahe dem Ardent Hot Spring Resort am unteren Teil des Mt. Hibok Hibok, 09°13.611’ N, 124°41.337’ E, ca. 420 m. Leg. Orville L. Bernabe 22.08.1999, det. Archer 23.8.2003.



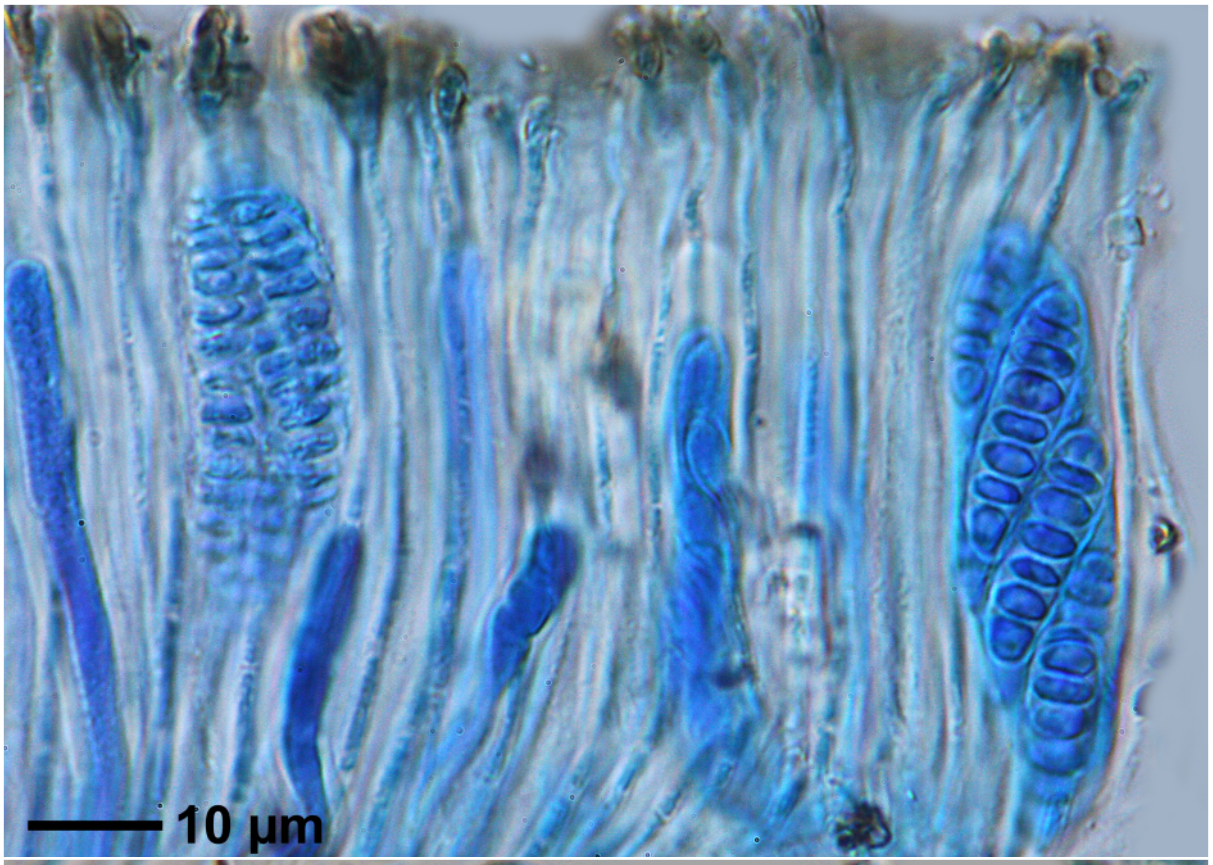


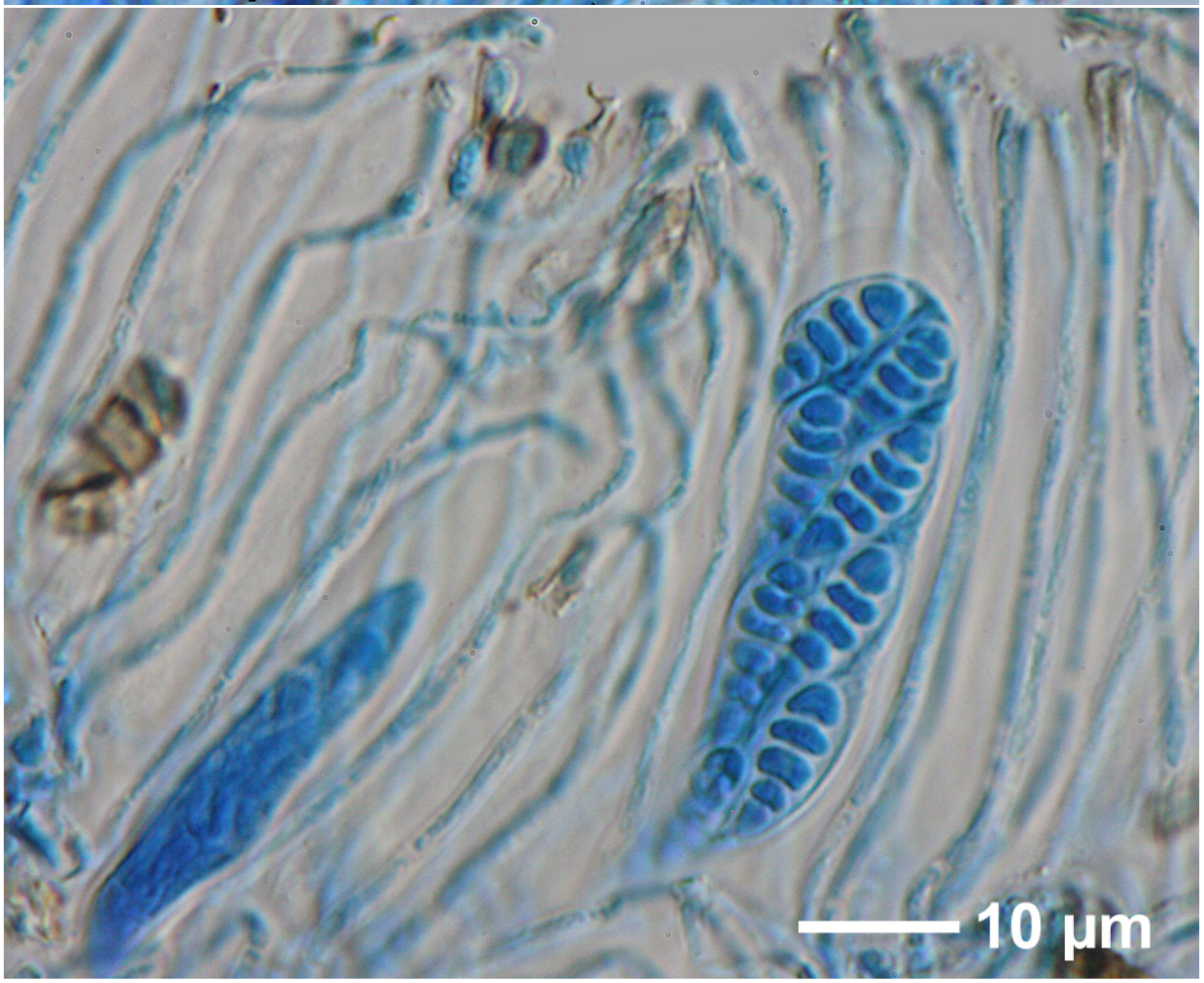







***Graphis furcata***



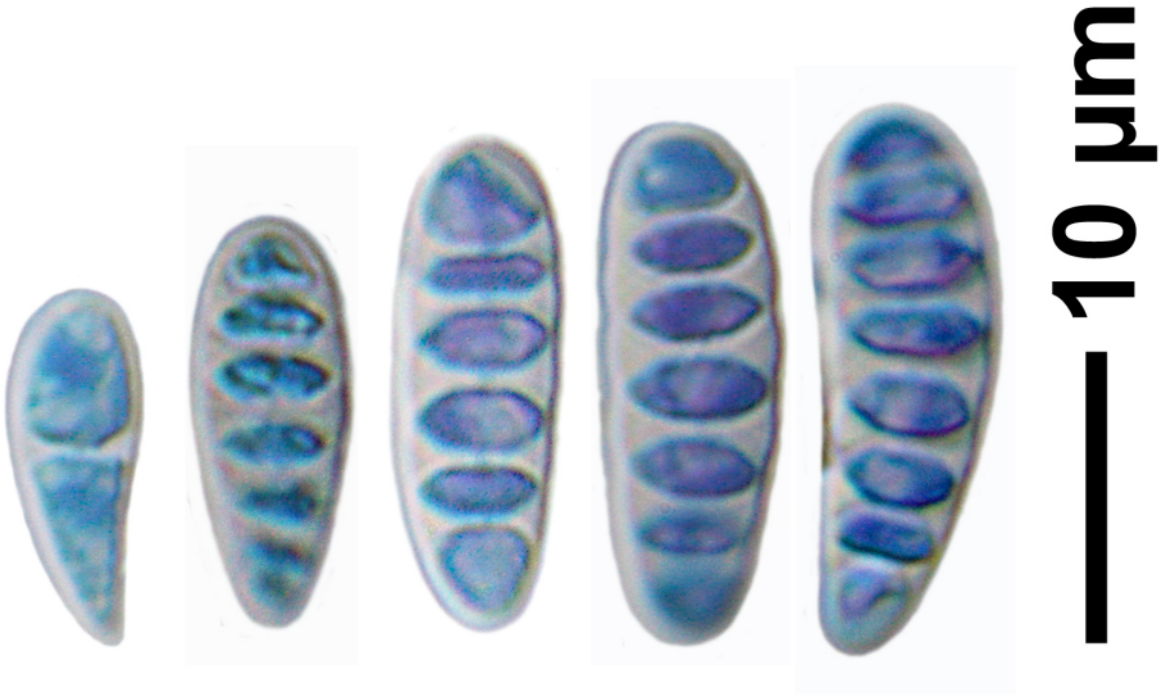

***Graphis furcata***







***Graphis furcata***



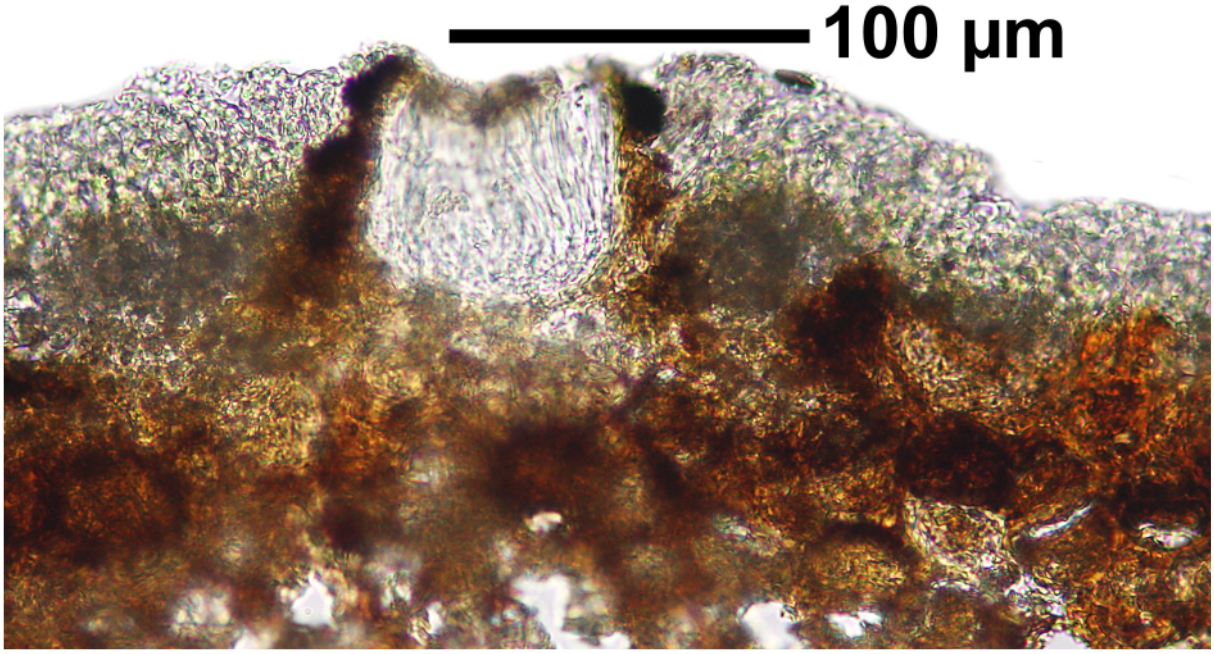

***Graphis furcata***

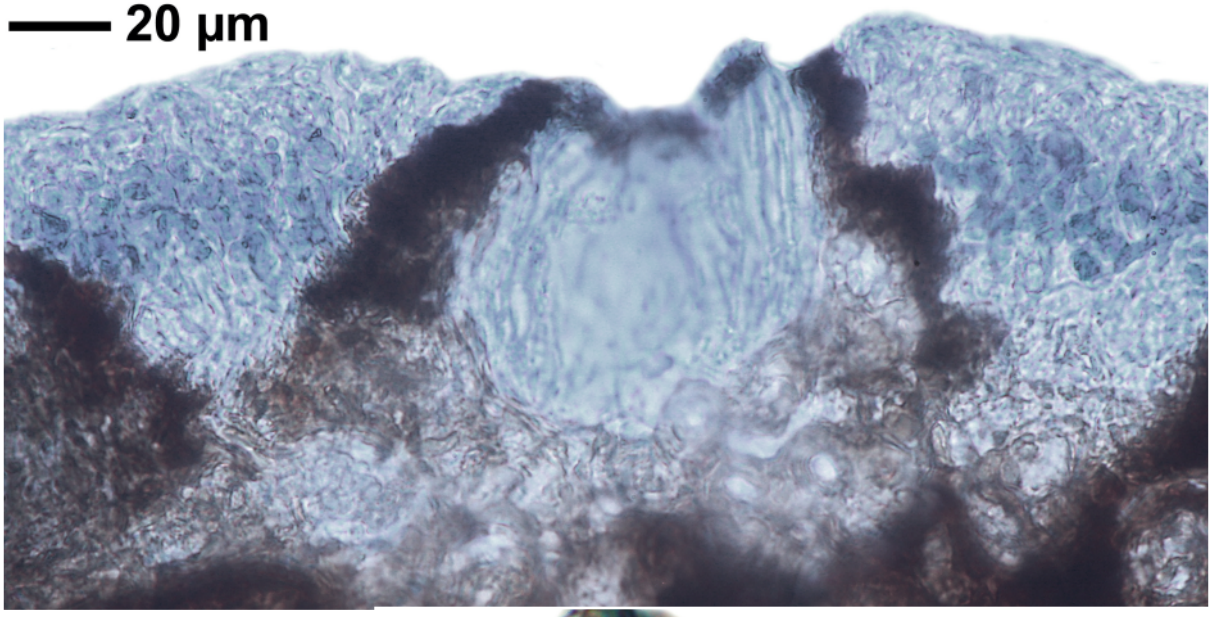
***Graphis immersella*** Müll.Arg.

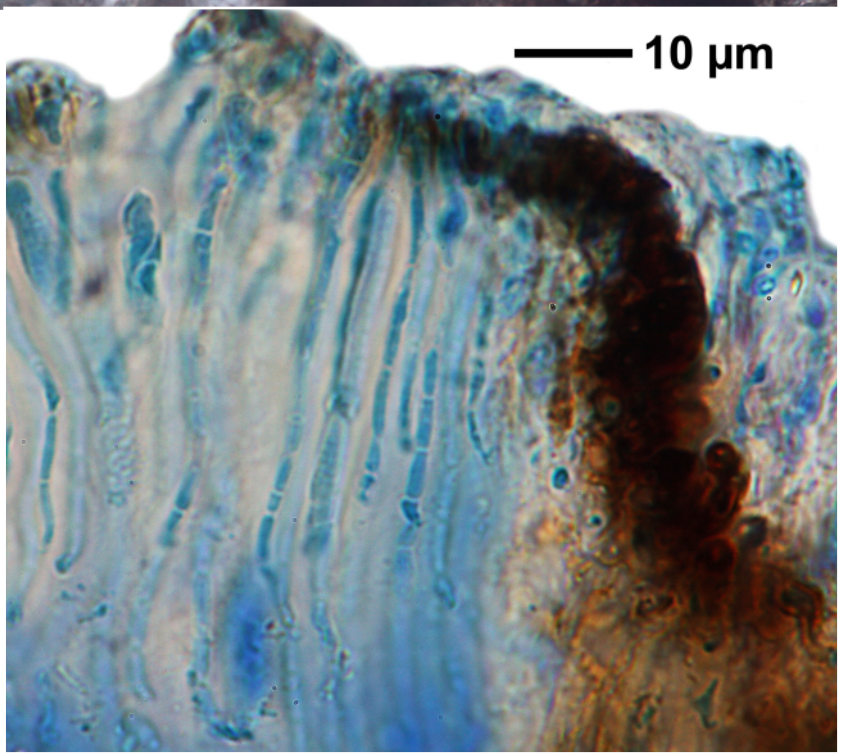
Lirellae immersed. Excipulum laterally carbonized. Ascospores 8/ascus, transversely septate, 7-8-locular, 20-24 x 5-6 µm. Chemistry: stictic acid.

[7361], Philippinen, Negros, Prov. Negros Oriental, beim Mt. Talinis (Cuernos de Negros), Valencia Barangay Lunga, 9°16.676’ N, 123°13.839’ E, 330-540 m, bei 330 m. Leg. Schumm 08.08.2000, det. Schumm 2011.

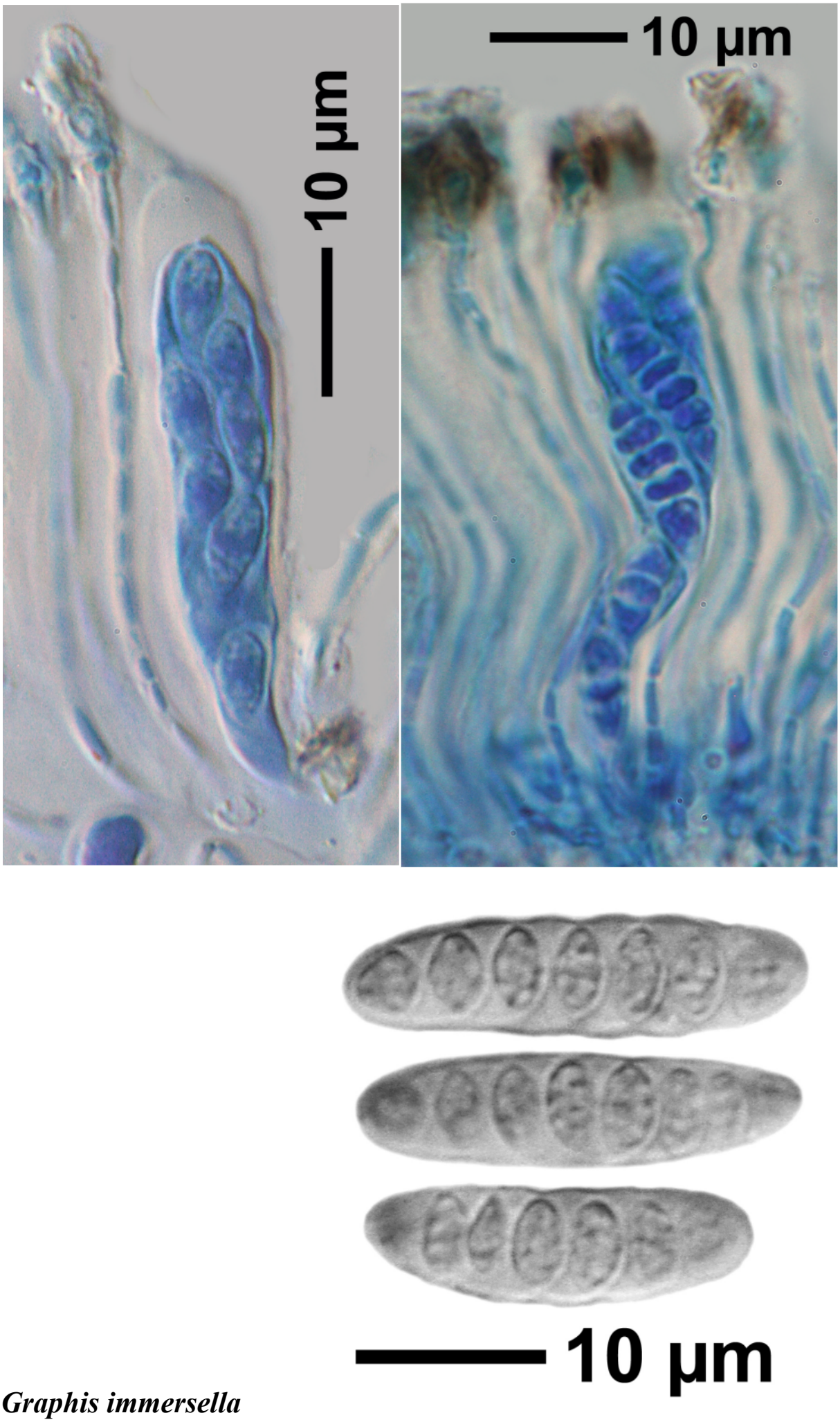





***Graphis immersella***



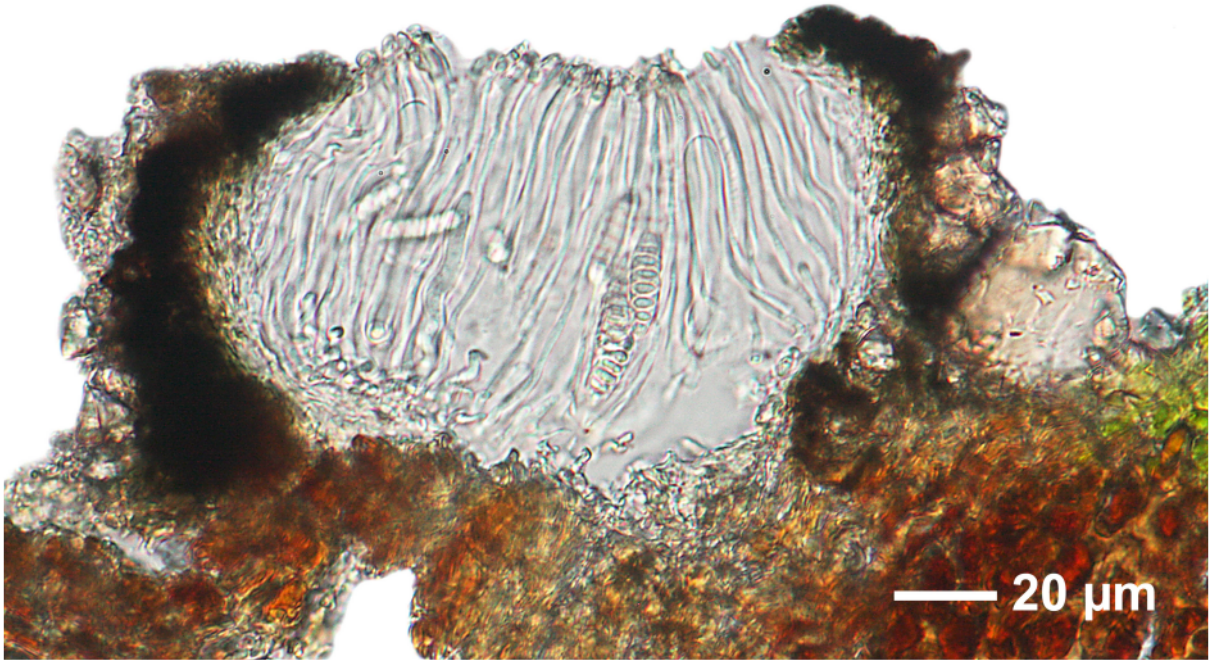

***Graphis immersella***

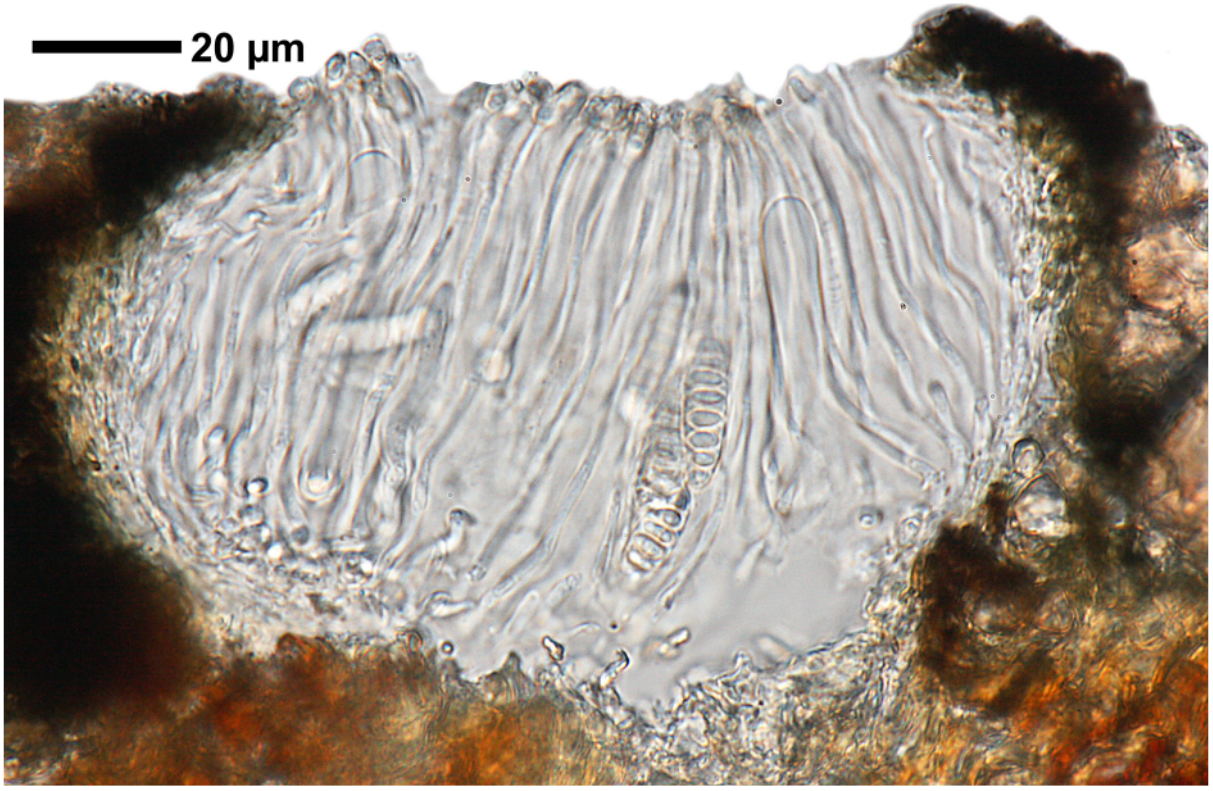
***Graphis librata*** C.Knight

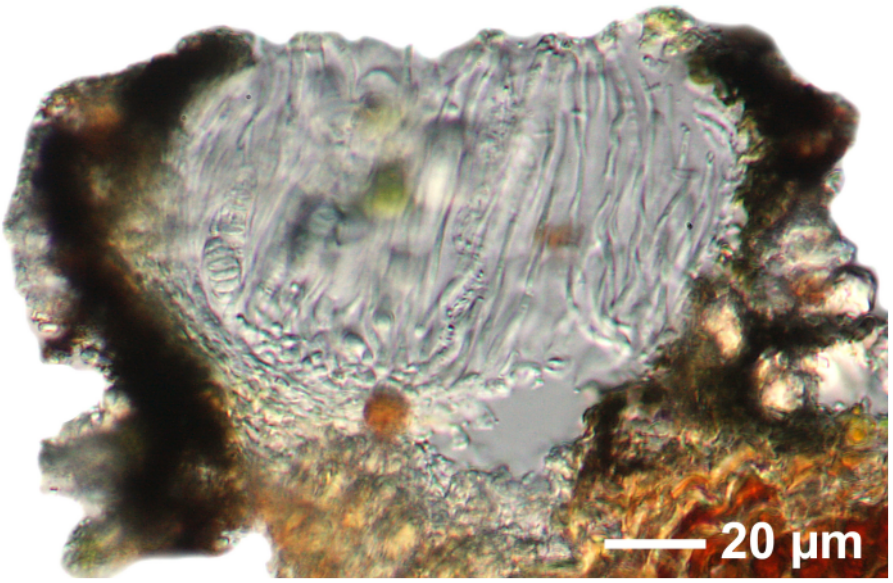
Thallus grey-white. Lirellae immersed to erumpent, with lateral thallin margin. Labia entire, laterally carbonized. Hamathecium not inspersed. Paraphyses branched only at the tips. Ascospores hyaline, 7-8-septate, septae J+ violet, 8/ascus, 22-29 x 5 µm. Pycnospores 3 x 1 µm. Cheistry: thallus K+ red, norstictic acid.

[17593], Thailand, Trat province, Ban Phu Resort, 12.16619° N, 102.56977° E, 8 m. Leg. Schumm (IAL 7) 17.01.2012, det. Schumm.

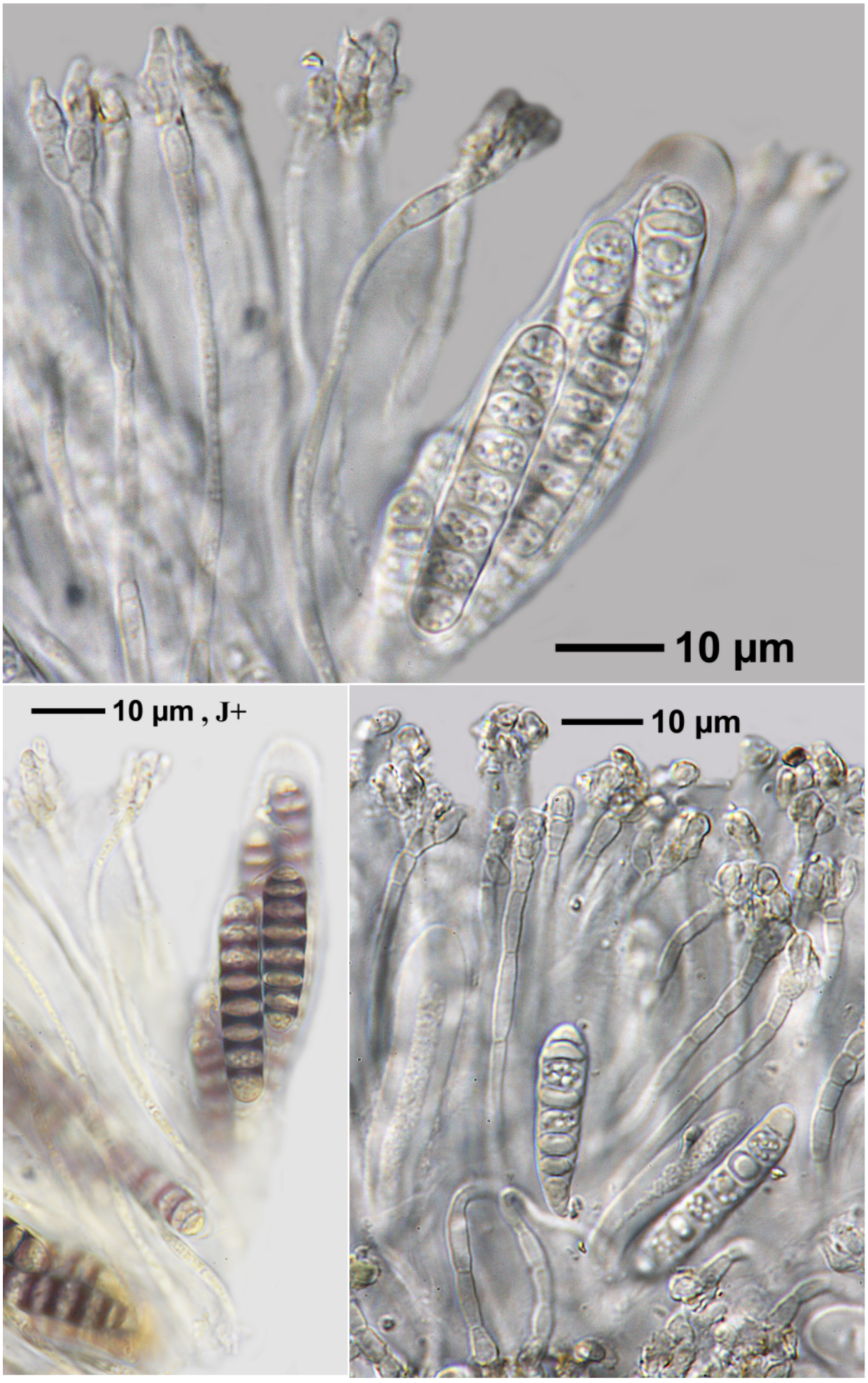





***Graphis librata***




***Graphis librata***







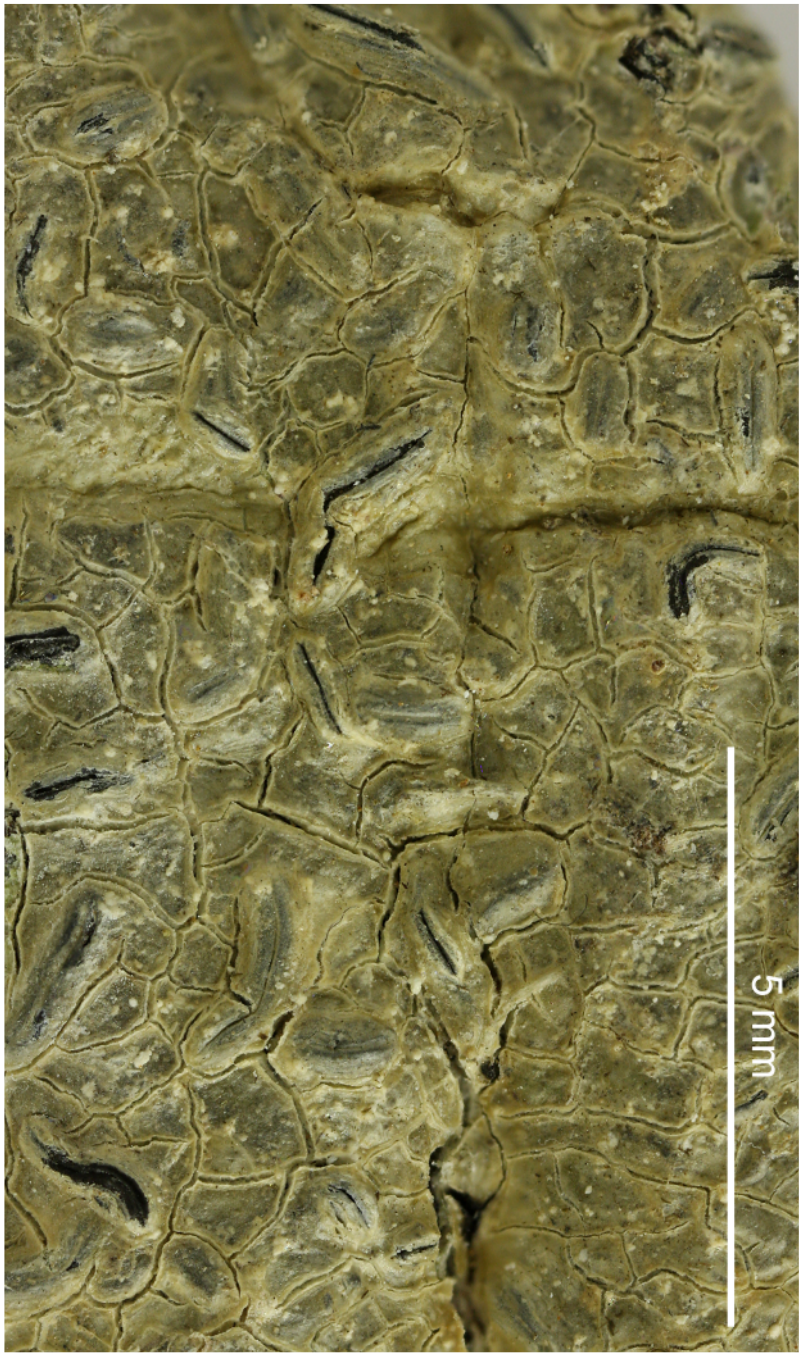


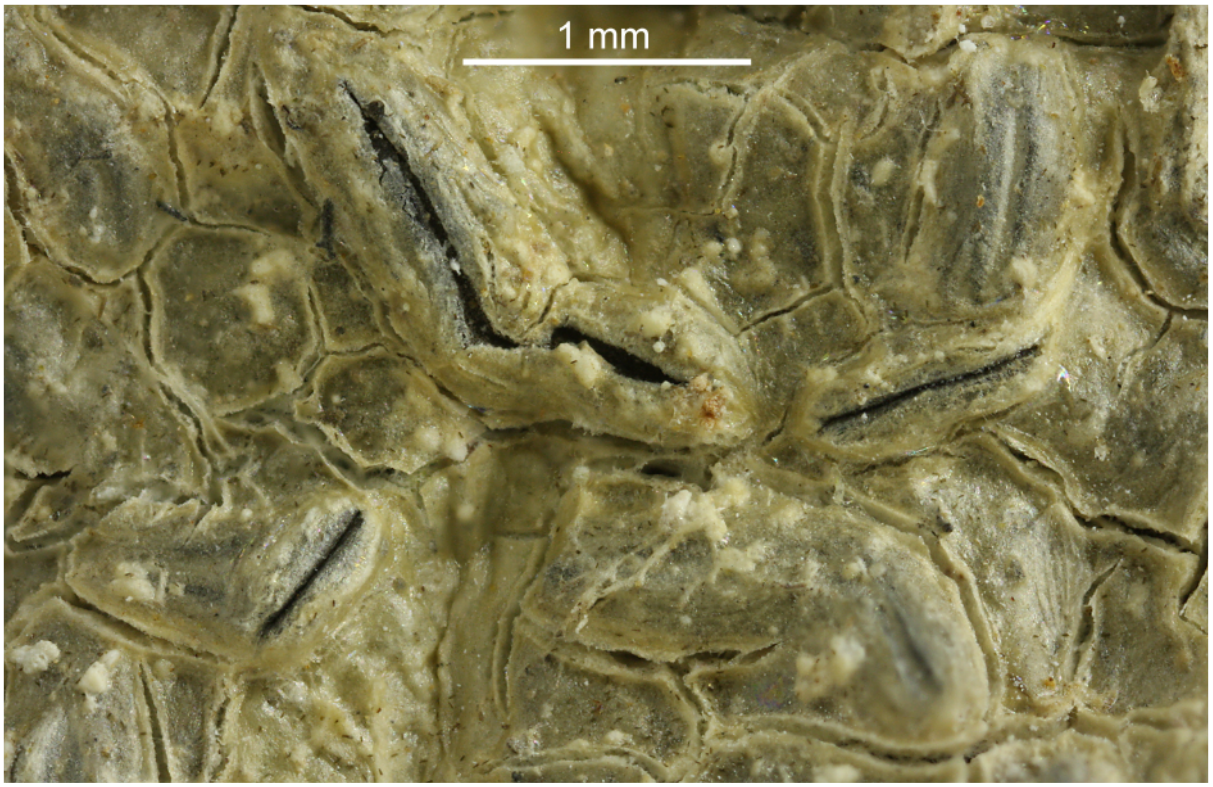

***Graphis librata***

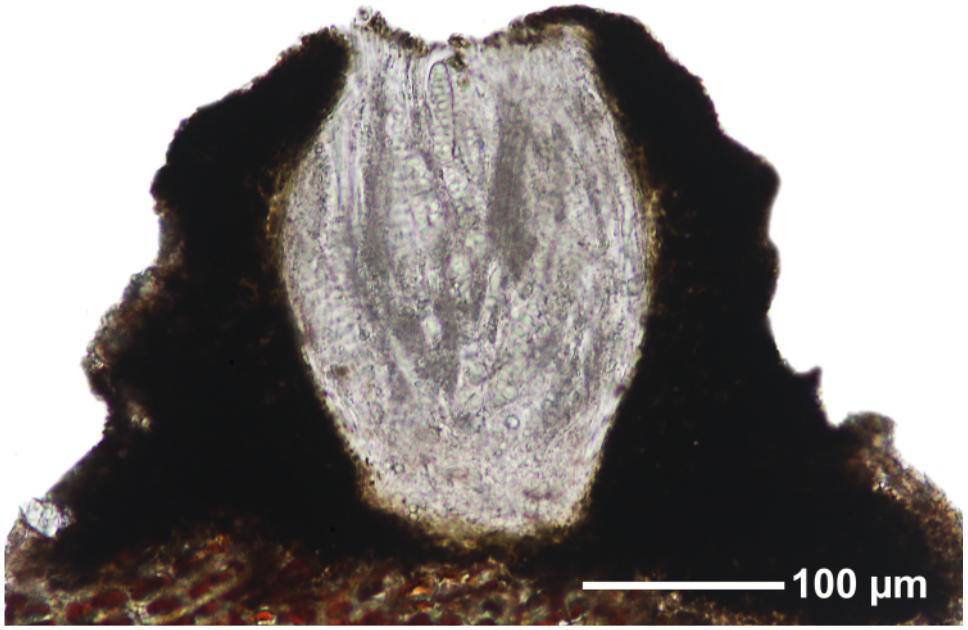
***Graphis phaeospora*** Vain.

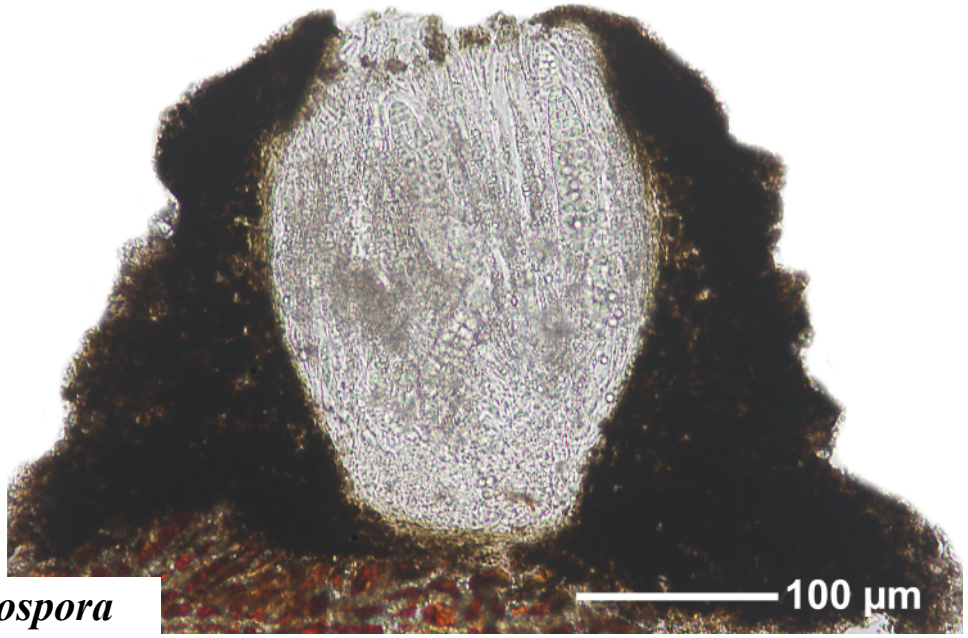
Thallus grey-green, areolate. Lirellae first immersed then prominent, and carbonized lips increasingly free. Excipulum completely carbonized (in thin 9 µm sections the base only brown). Hymenium inspersed. Ascospores colourless, muriform, 1-4/ascus, 20-22 segments with 2-4 lumina, J+ violet, 93-127 x 20-23 µm. Chemistry: cortex and medulla K-, P-, TLC: nil.

[6962], Philippinen, Mindanao, Prov. Misamis Oriental, südwestlich Gingoog City, Barangay Lunutan, 08°42.510’ N, 125°01.241’ E, 1120 m und am Weg auf den Mt. Lumot (Via Haruhay Trail) bis zum Zwischencamp im trop. Bergregenwald 08°40.713’ N, 125°01.649’ E, 1680 m. Leg. Schumm 24.08.1999 , det. K. Kalb 2011.

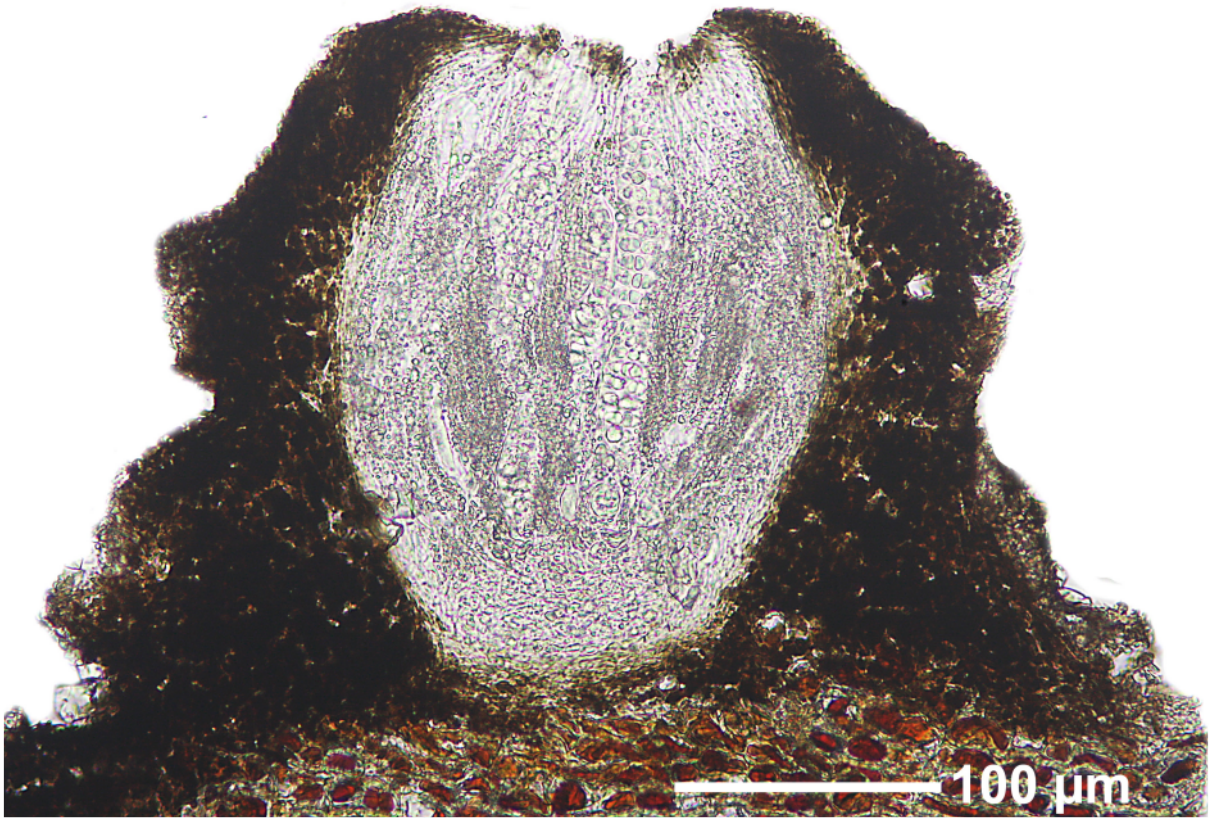


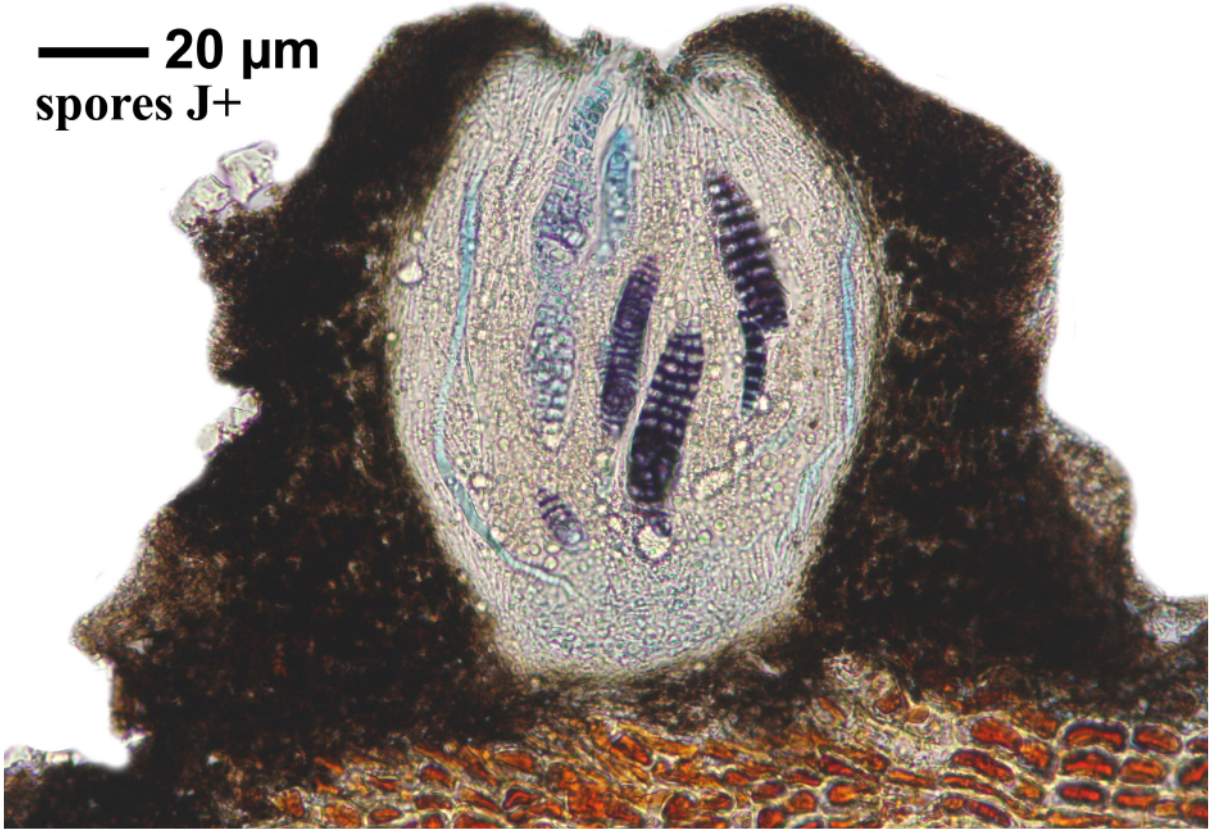


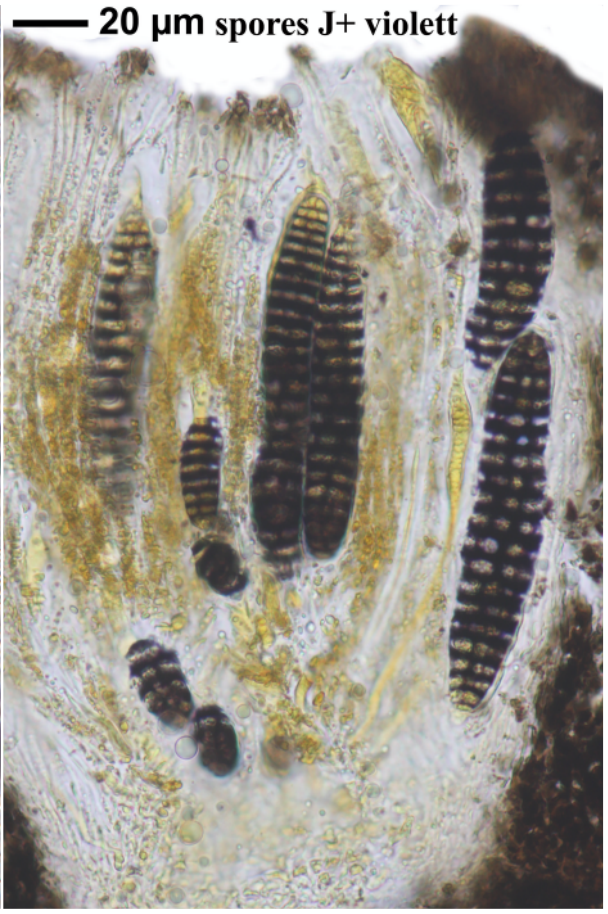

***Graphis phaeospora***

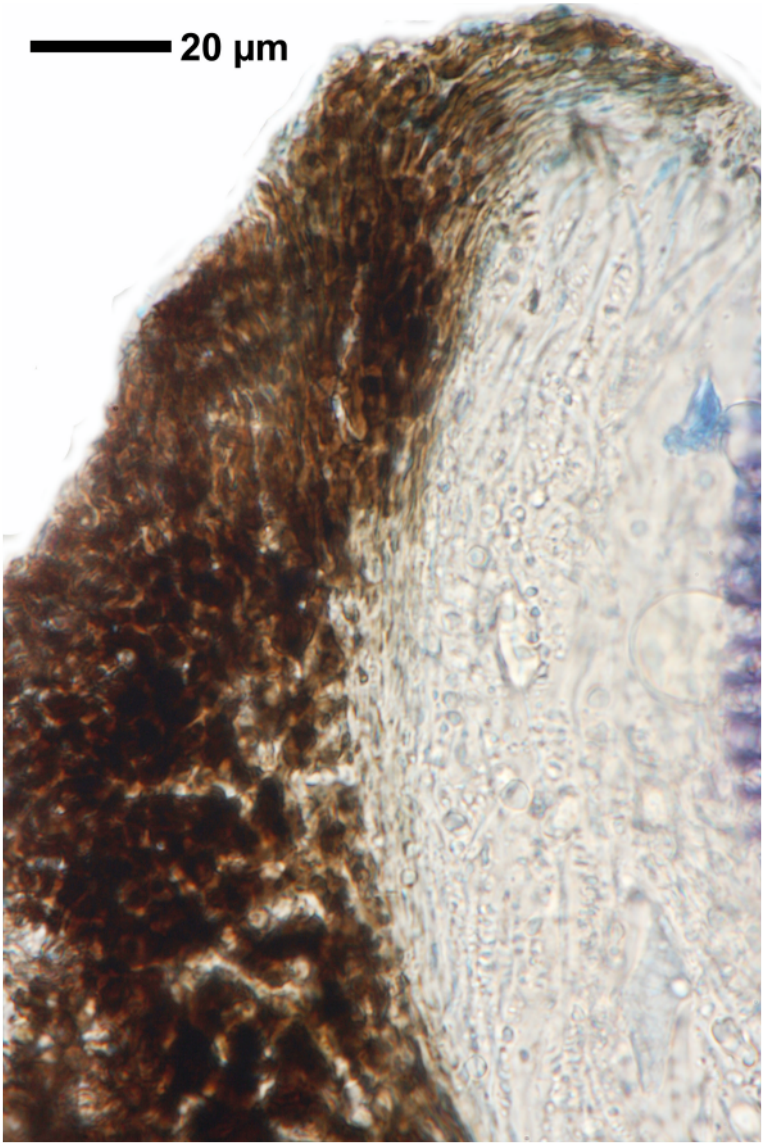


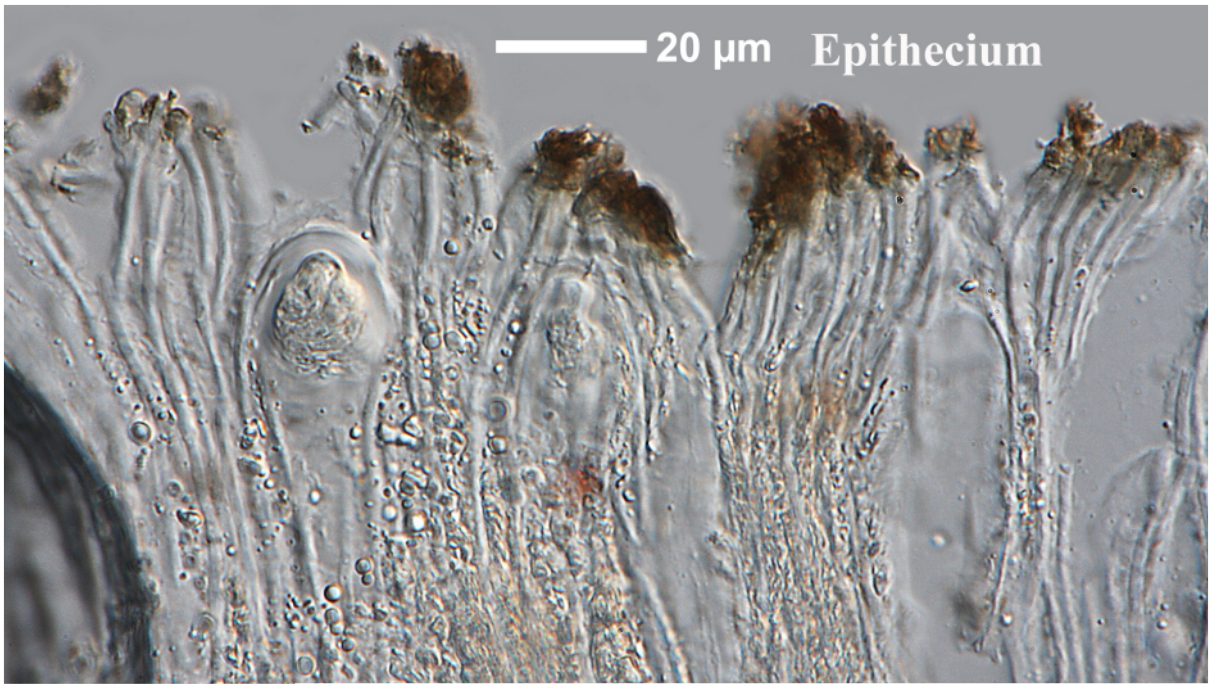

***Graphis phaeospora***

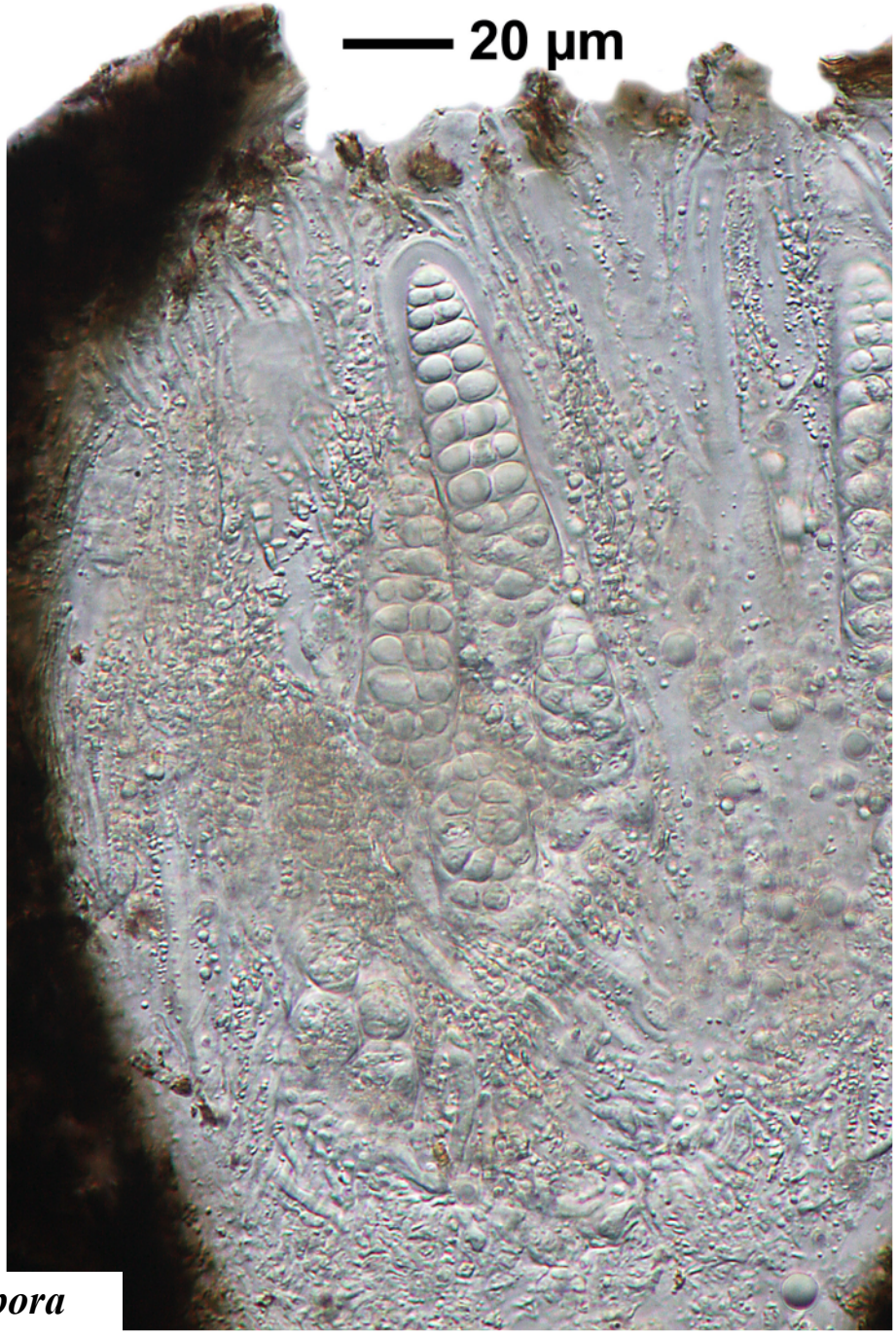



***Graphis phaeospora***




***Graphis phaeospora***

***Graphis rongklaensis*** Sutjaritturakan
[= ***Graphina vestita*** M. Nakan., Kashiw. & Moon]

Hymenium inspersed with 0.5-1 µm droplets. Ascospores hyaline, muriform, 61-100 x 22-36 µm. Chemistry: norstictic acid (TLC).

[7344], Kambodscha, Phnom Penh, am Hügel von Phnom Krom, 13°17.136' N, 103°48.816' E, 137 m. Leg. Schumm 03.08.2000, det. Archer 23.8.2003.



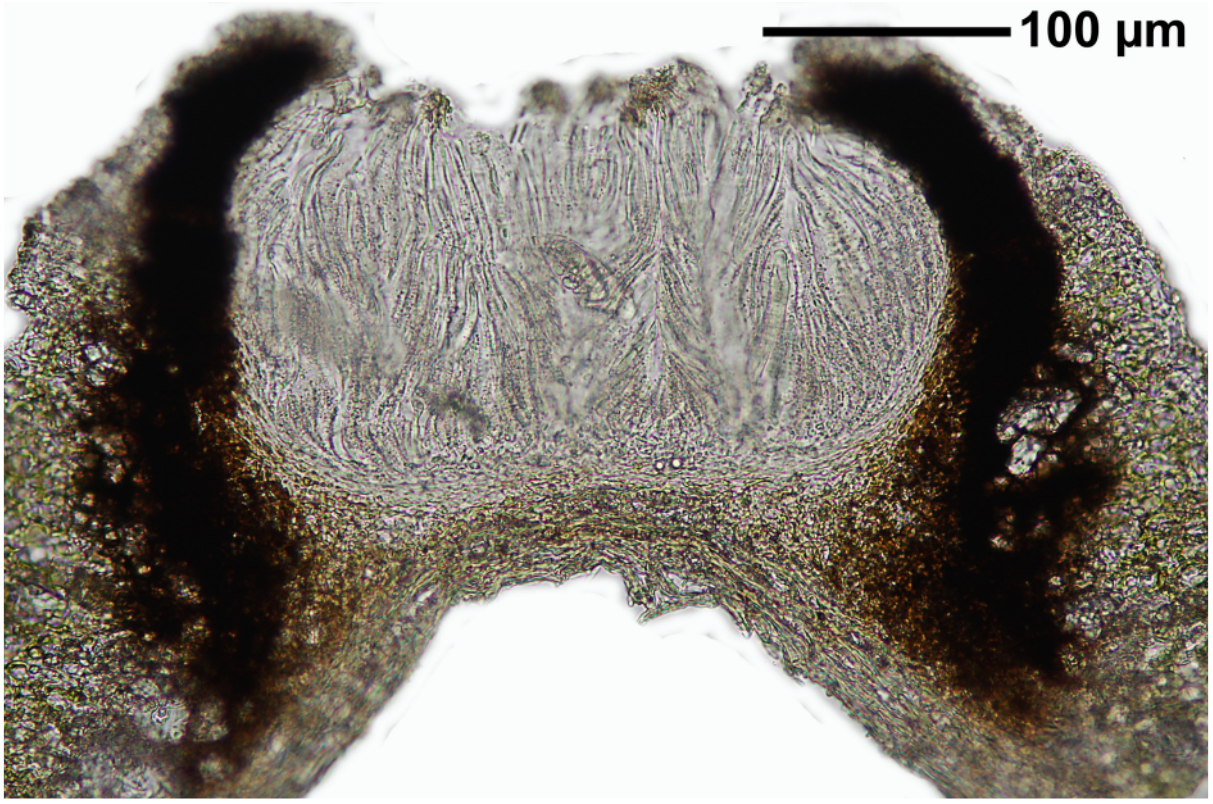




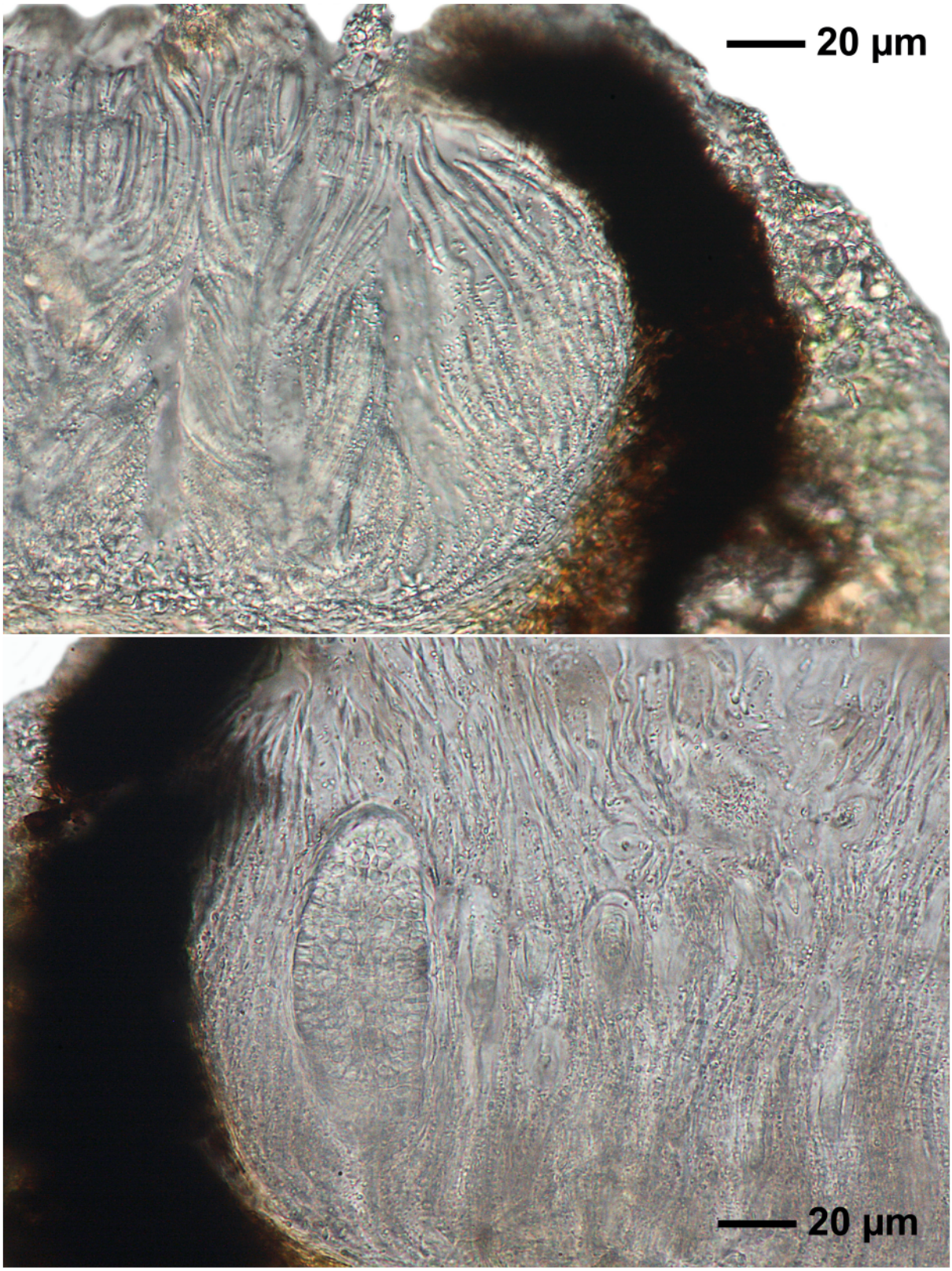


***Graphis rongklaensis***



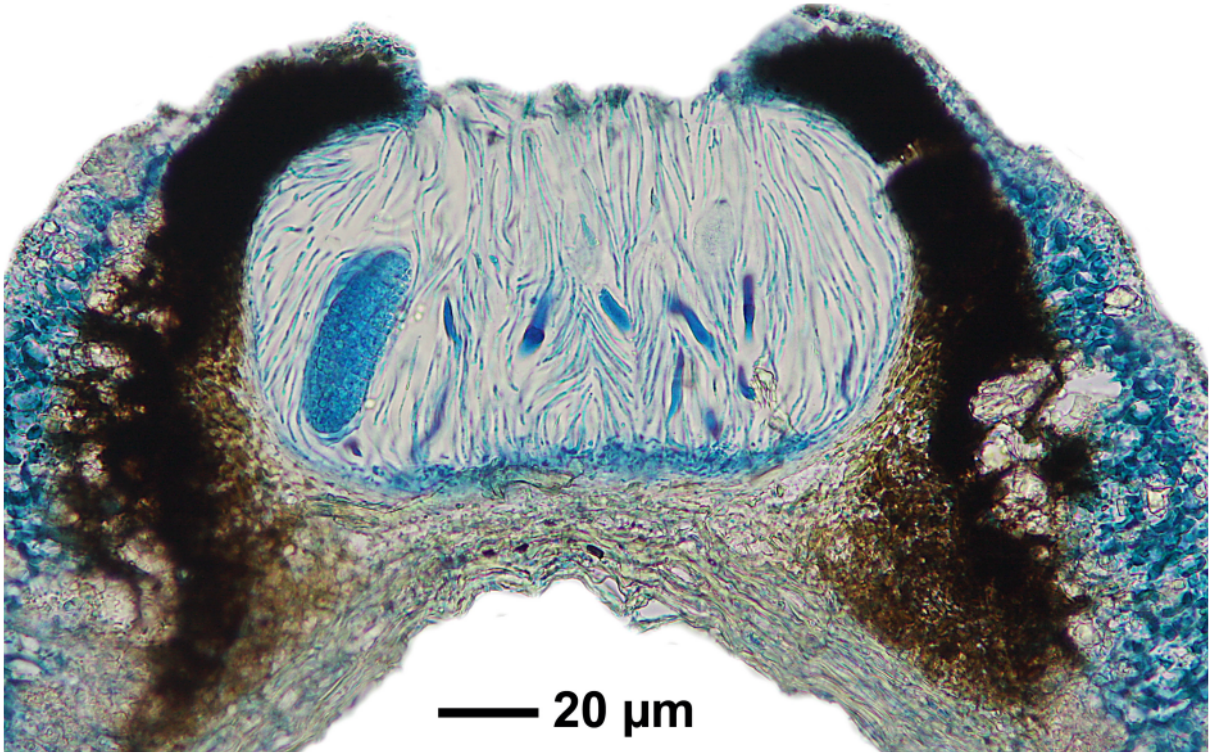



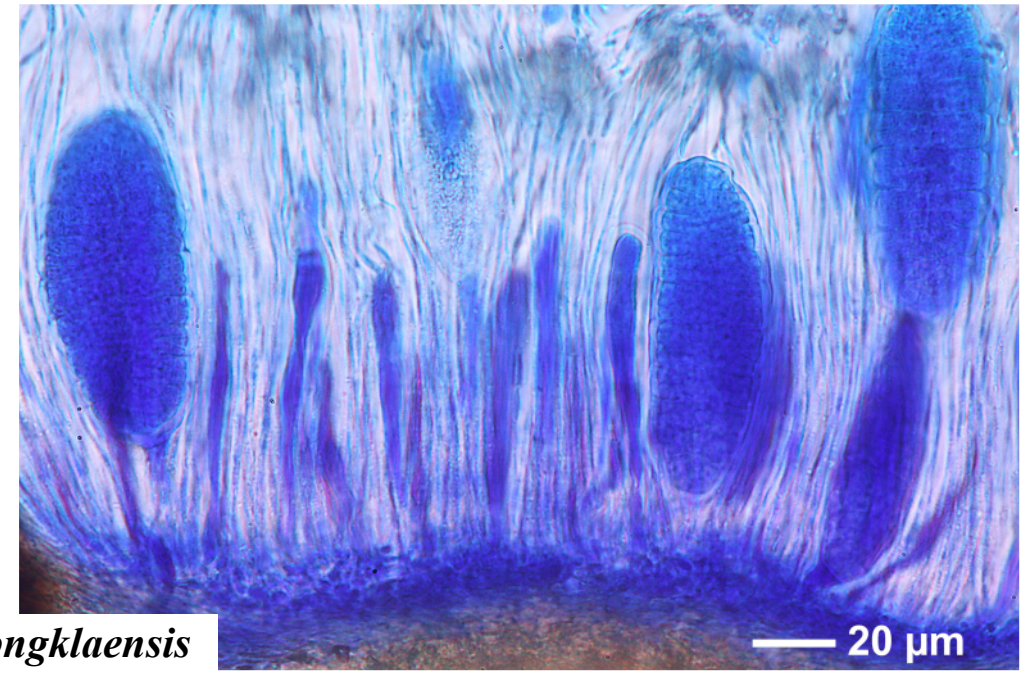

***Graphis rongklaensis***



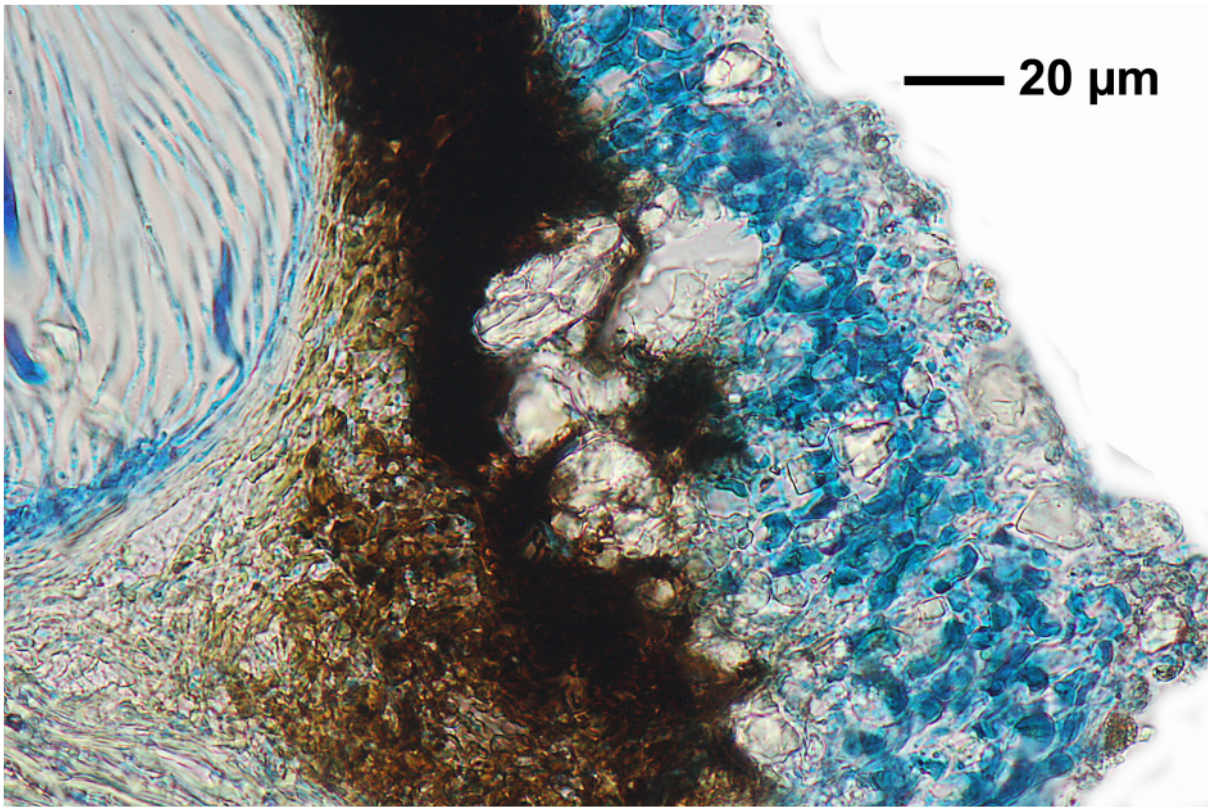

***Graphis rongklaensis***

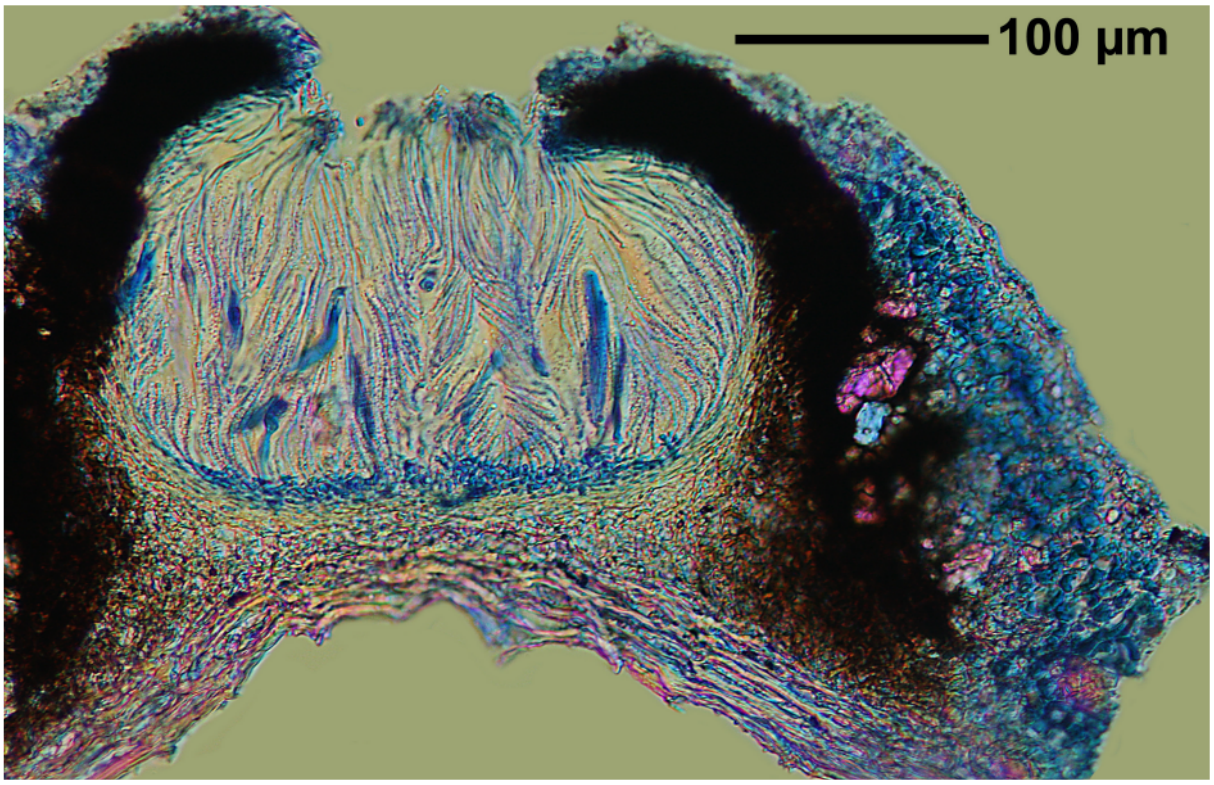



***Graphis rongklaensis***




***Graphis rongklaensis***





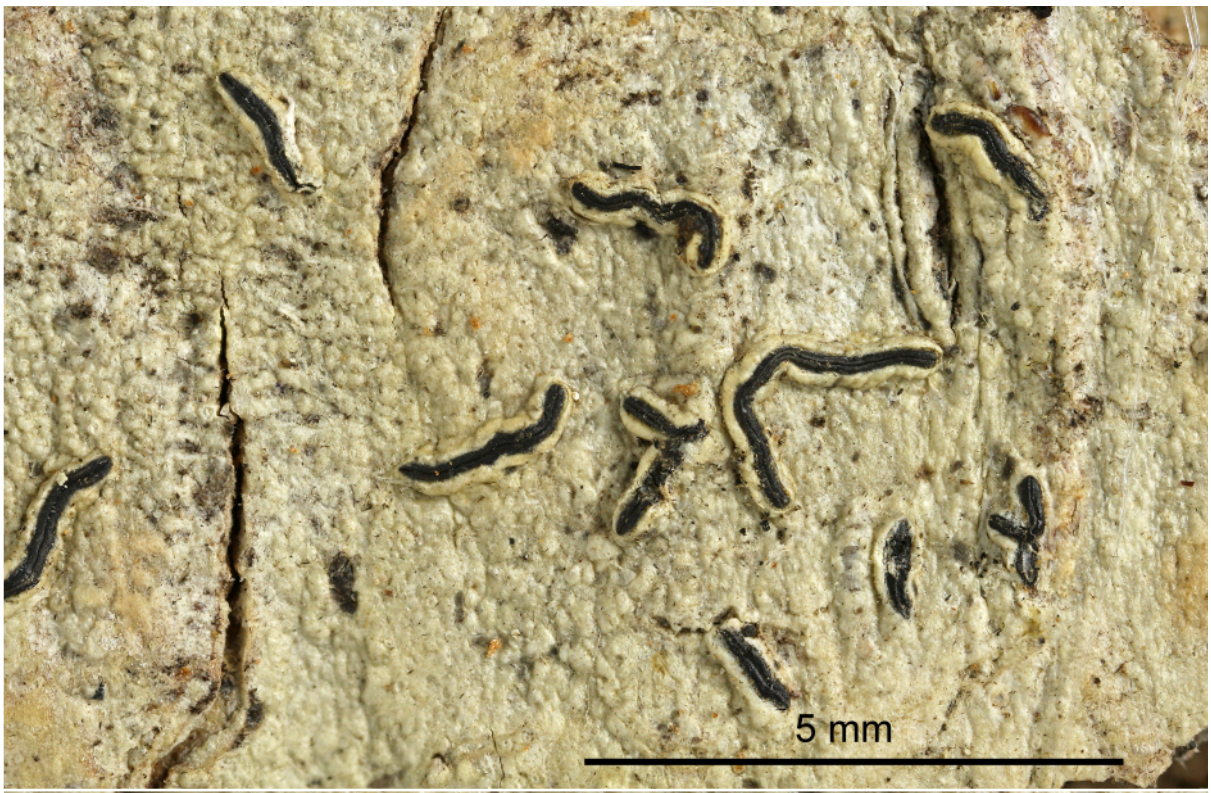


***Graphis rongklaensis***

***Graphis rustica*** Kremp.

Lirellae sessile, with thick lateral thalline margin. Labia not striate. Excipulum completely carbonized. Hymenium not inspersed. Ascospores hyaline, 8/ascus, transverse 16-18-septate, J+ blue, 65-80 x 10 µm. Chemistry: UV-, stictic acid. Pantropical. Lit. Archer (2006, Bibl. Lichenol. 94)

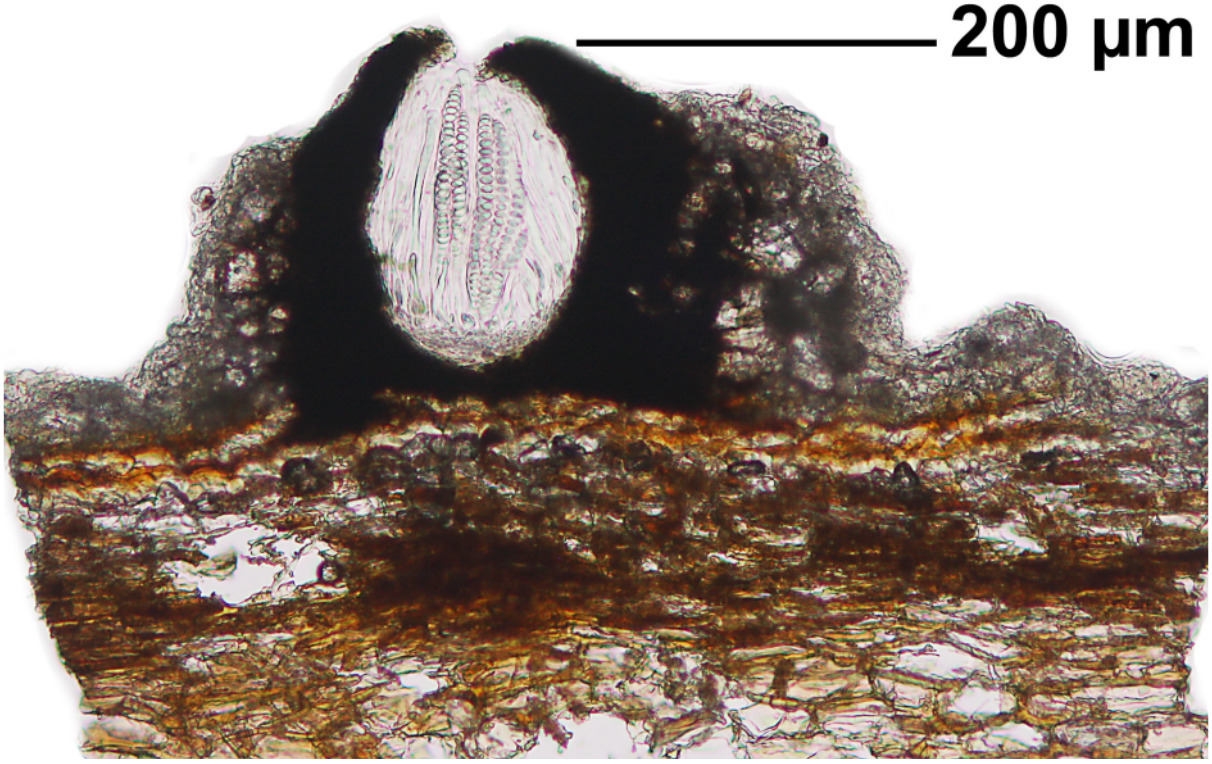
[7952], Philippinen, Leyte, Prov. Leyte, Lake Kasudsuran (11°01.539' N, 124°44.931' E, 740 m) bei Barangay Liberty (Ormoc-City). Leg. Schumm 23.08.2000, det. Schumm 2011.



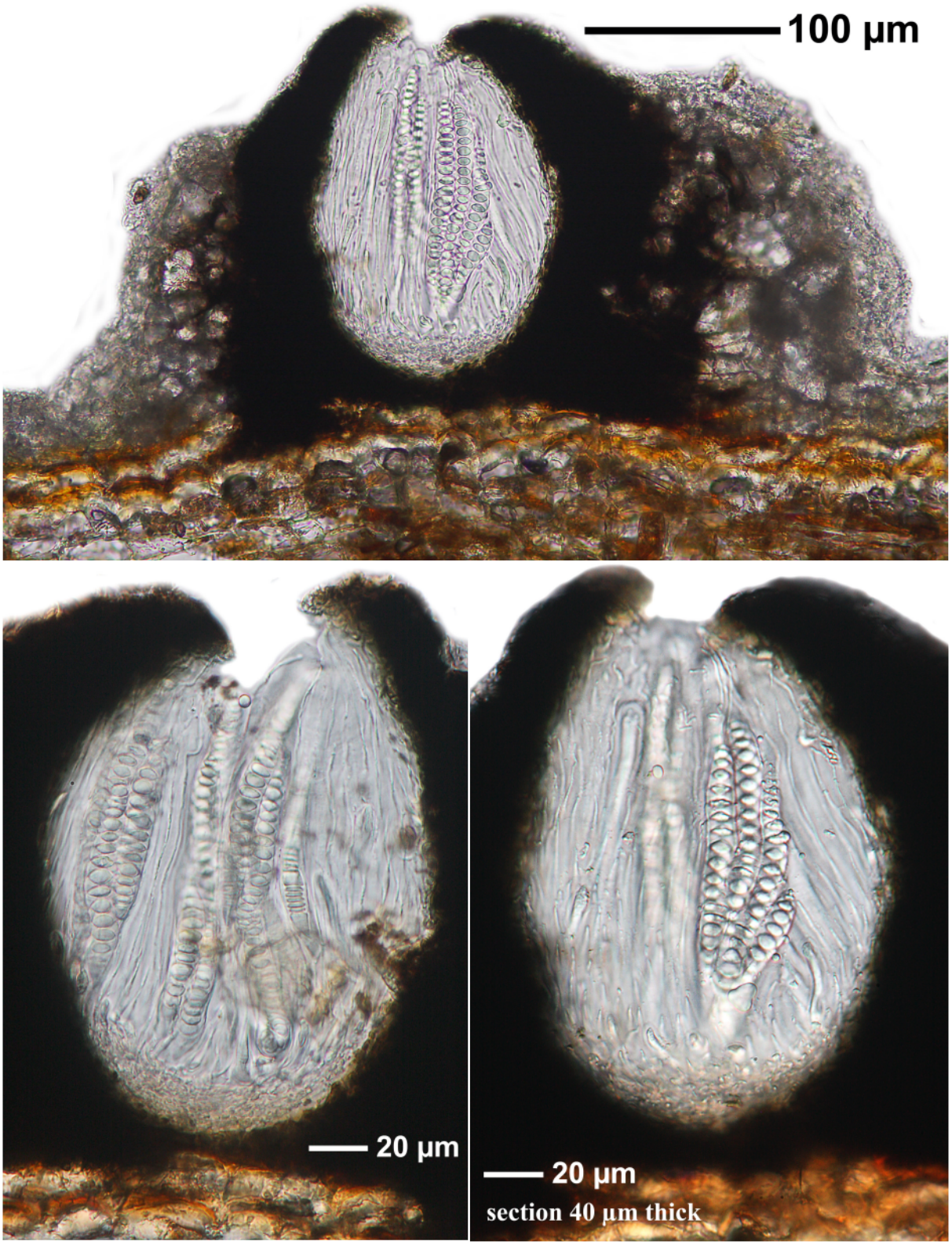




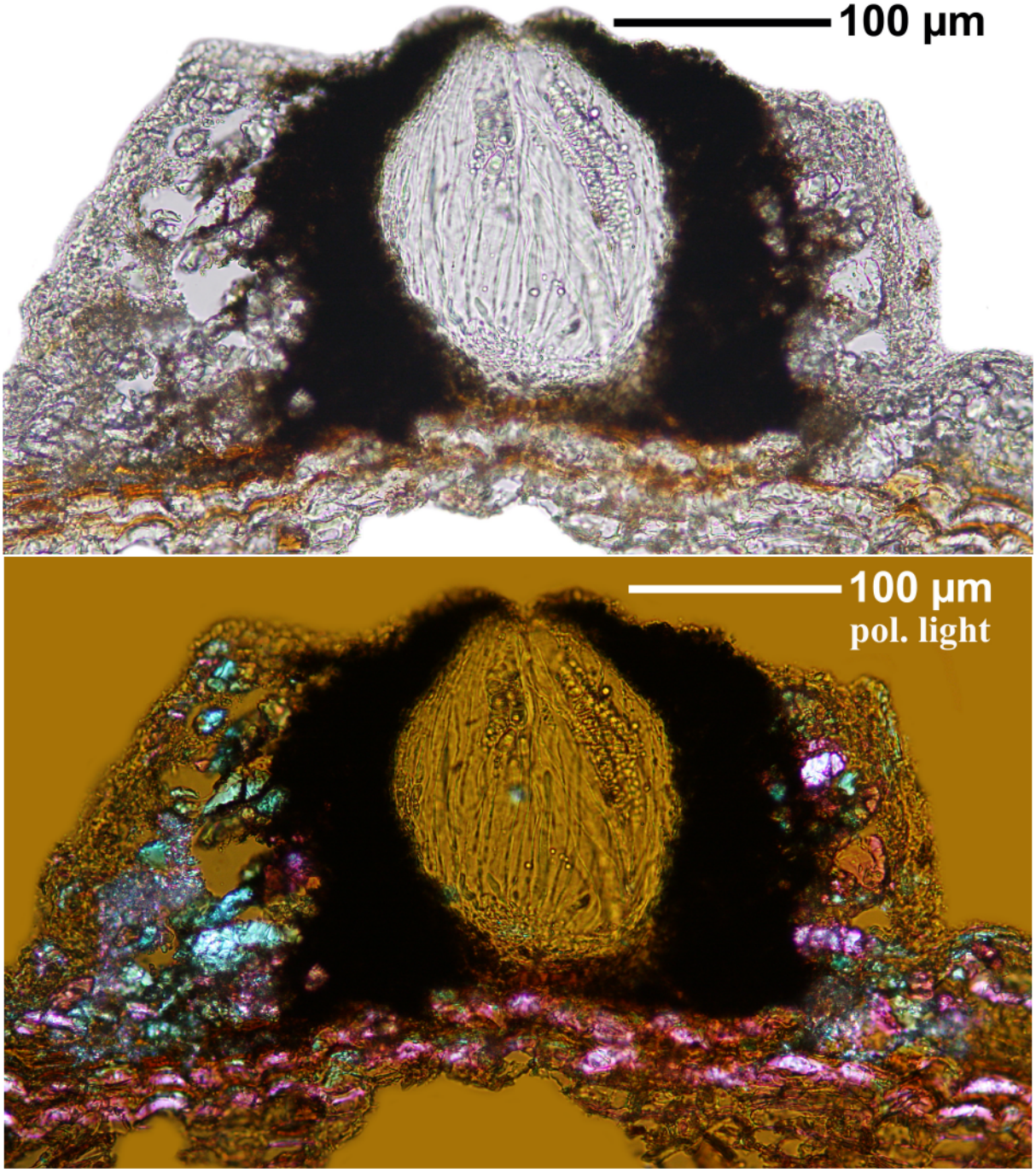





***Graphis rustica***




***Graphis rustica***

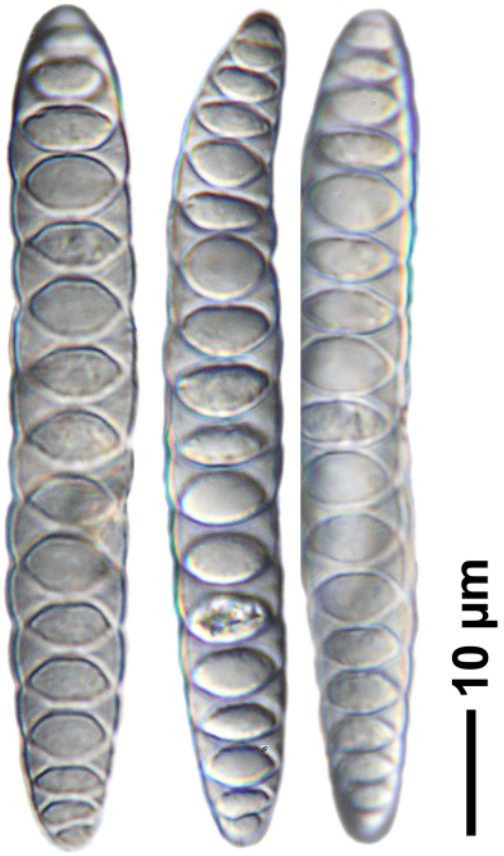



***Graphis rustica***













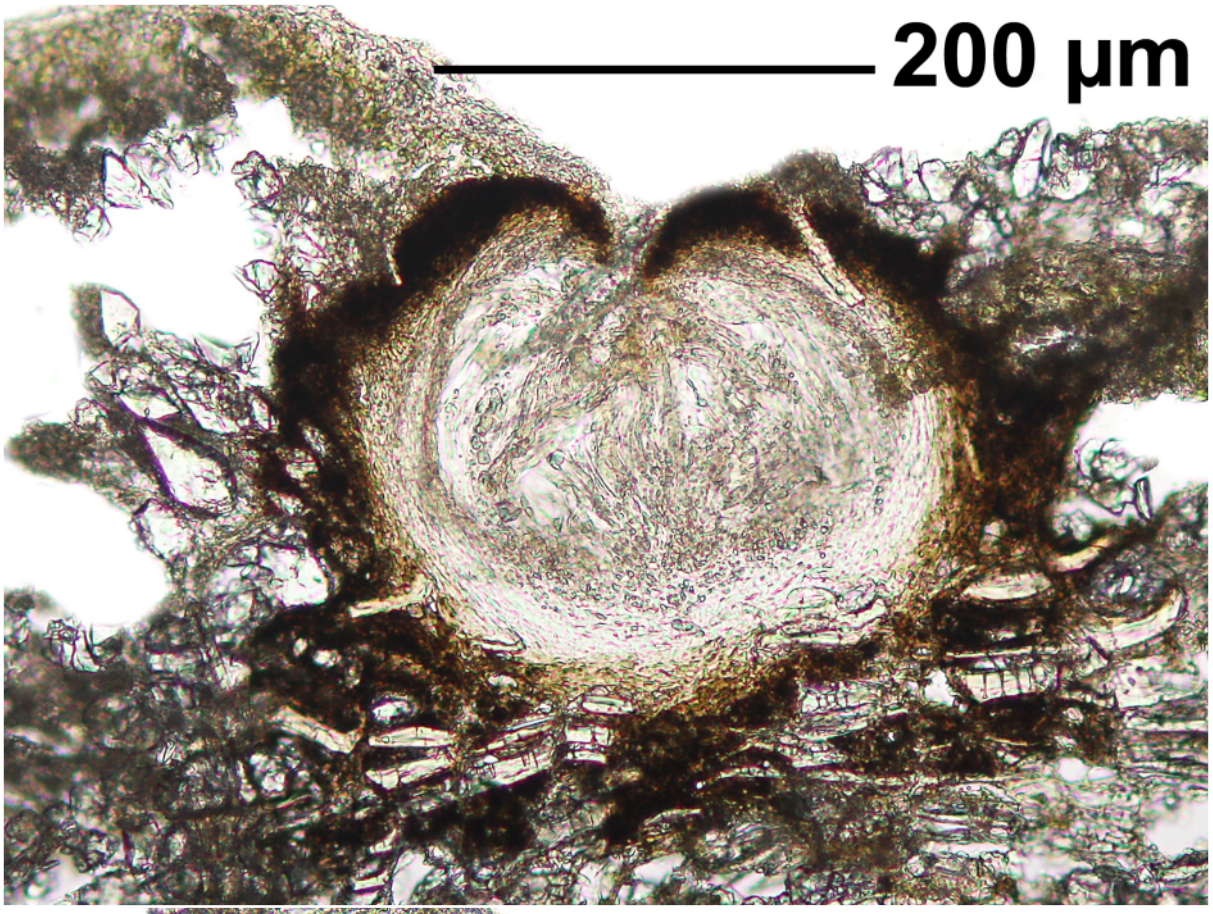
***Graphis rustica***

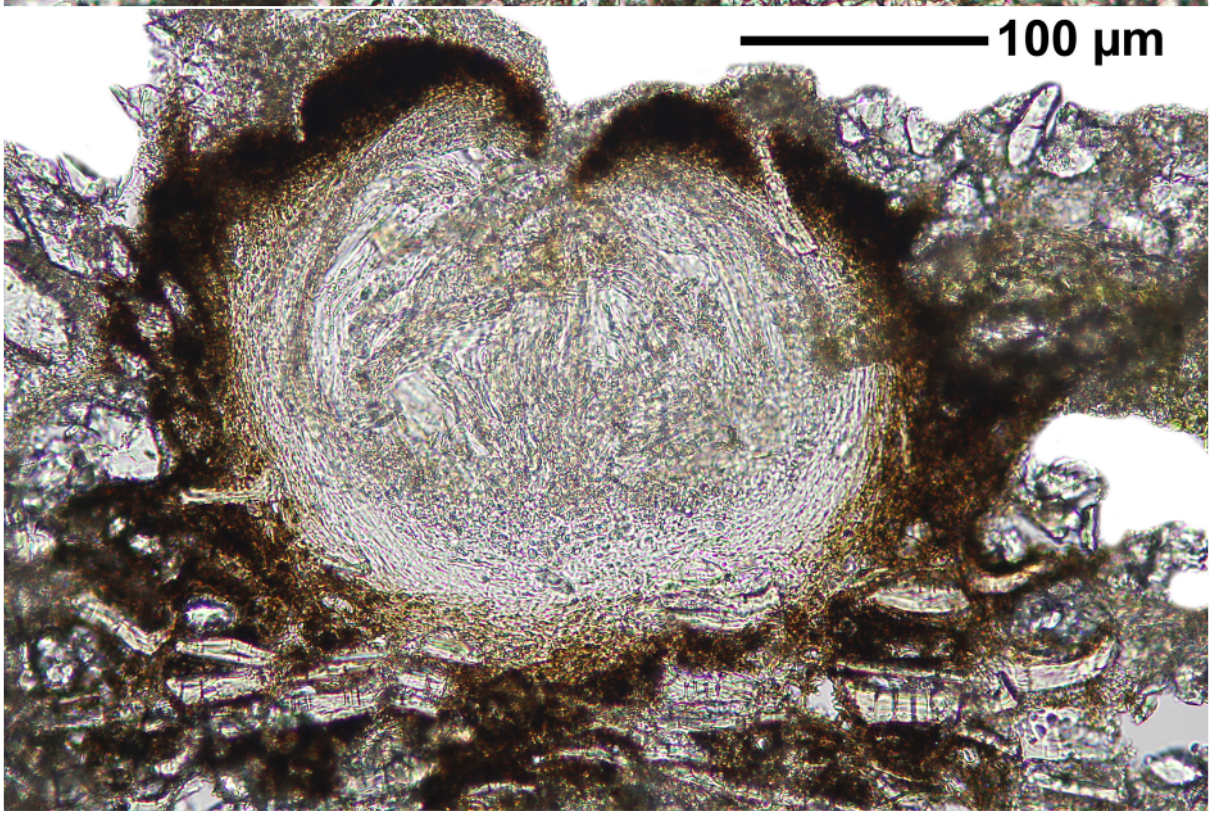
***Graphis streblocarpa*** (Bél.) Nyl.
[= ***Graphina streblocarpa*** (Bél.) Müll.Arg.]

Labia entire, completely carbonized, covered by thallus. Hymenium densely inspersed. Ascospores muriform with c. 12 transverse septae, 75-76 x 24-25 µm, colourless, without or with thin halo, J+ blue. Chemistry: K+ yellow in thallus sections, medulla P+ orange, stictic acid (TLC).

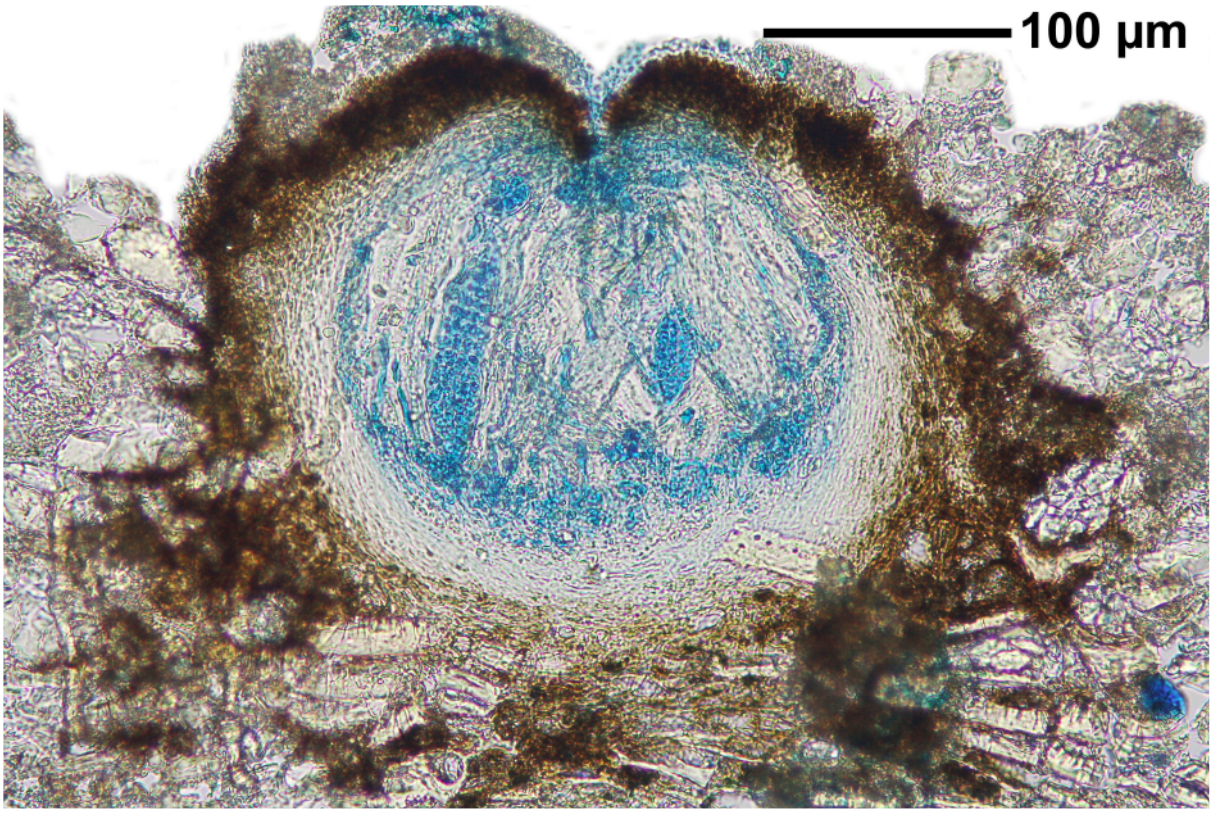
[6942], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay in Intavas am Fuß des Mt. Kitanglad, N 08°11.883’ N, E 124°56.721’ E, alt.: 1270 m. Leg. Schumm 18.08.1999, det. Archer 23.8.2003.

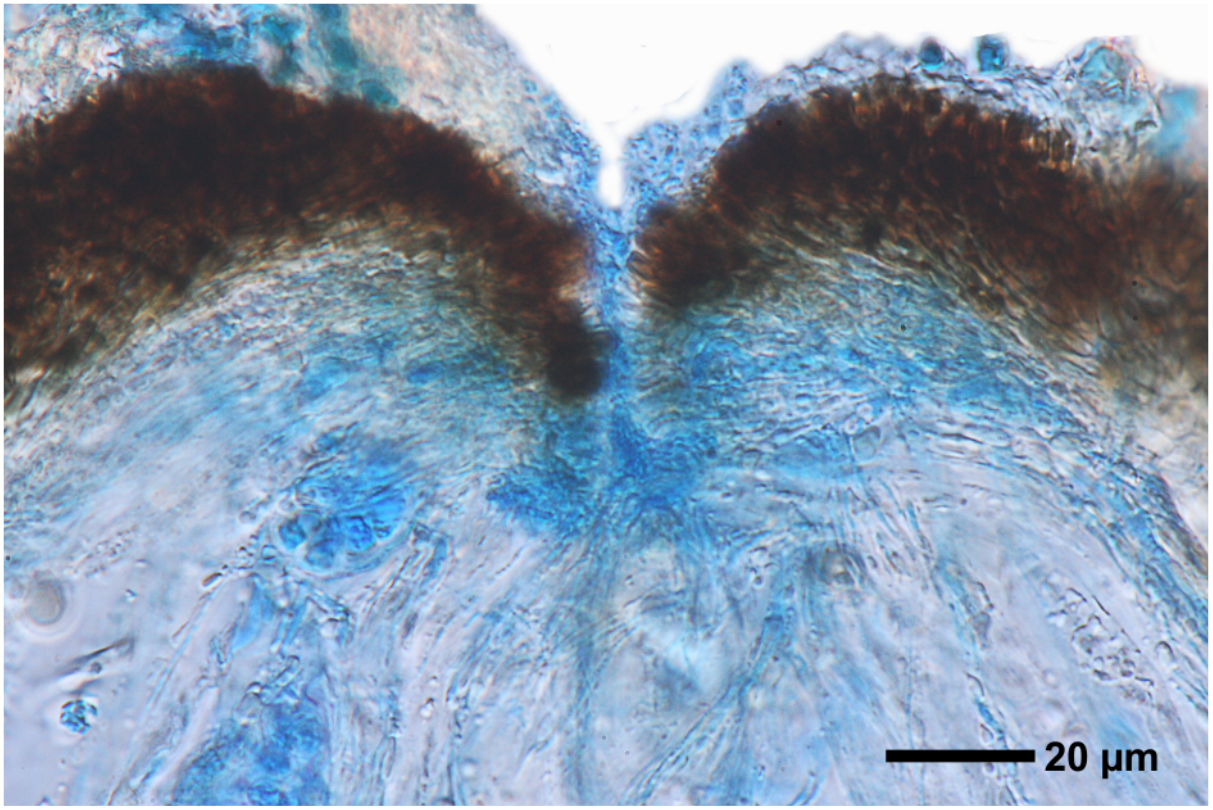


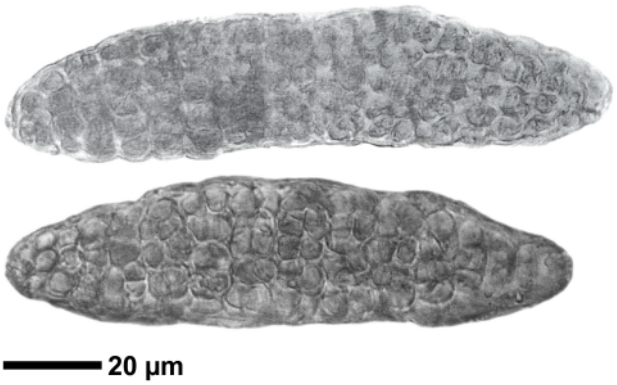


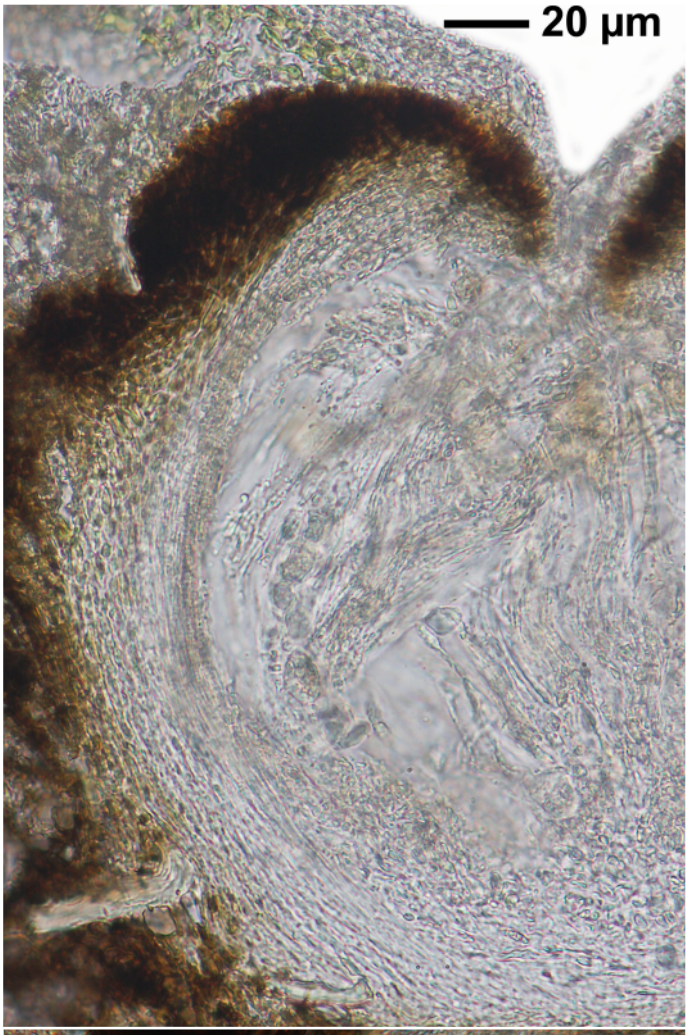

***Graphis streblocarpa***

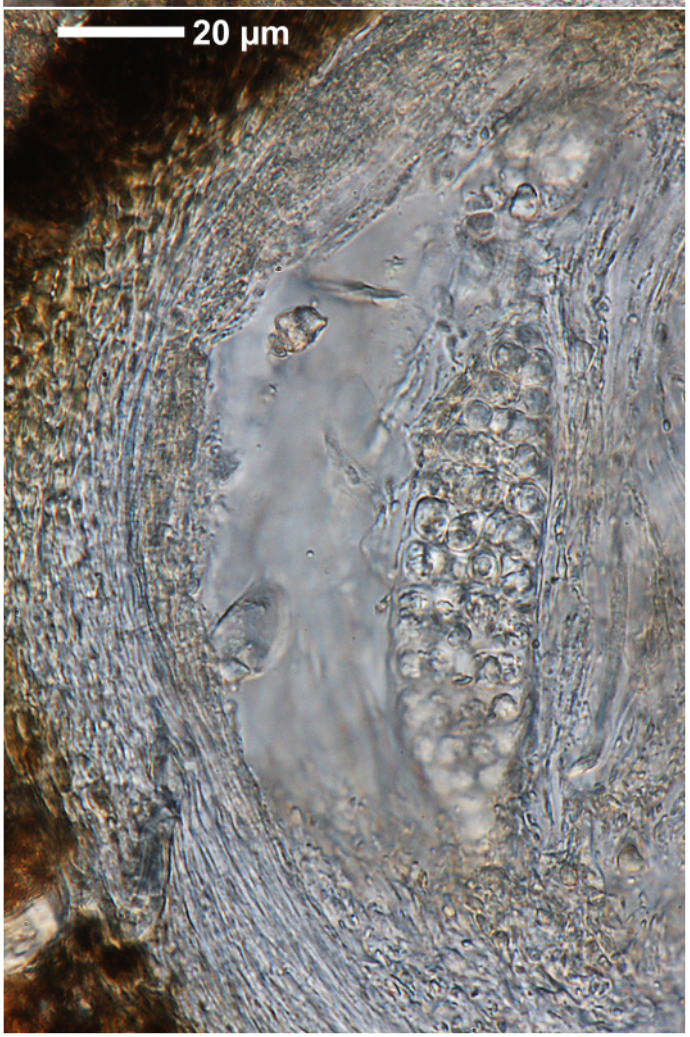



***Graphis streblocarpa***




***Graphis streblocarpa***

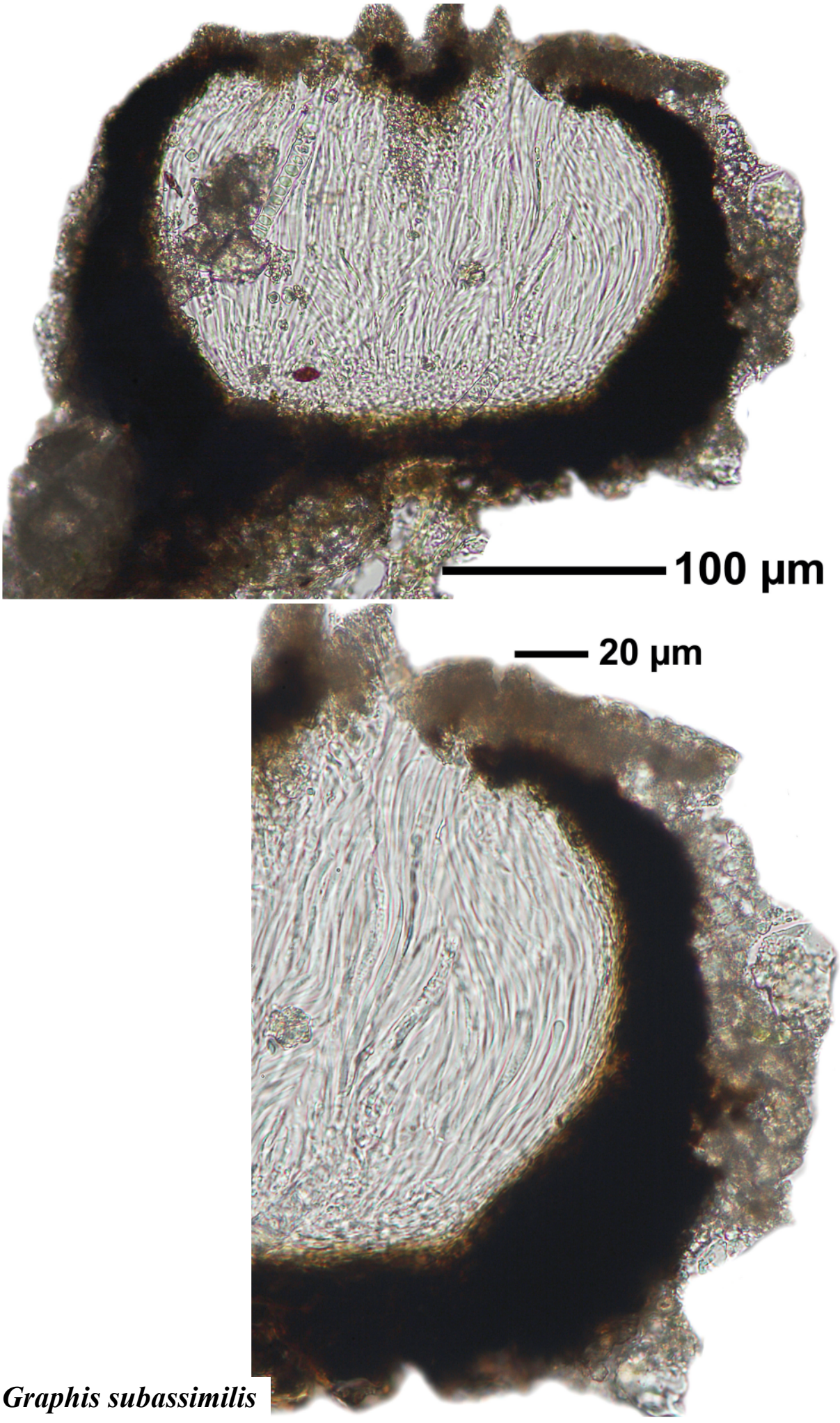
***Graphis subassimilis*** Müll.Arg.

Labia entire, excipulum completely carbonized, hymanium clear, ascospores tranversely septate, 50-70 x 7-9 µm, 10-18 locular, lirellae with lateral thalline margin, labia thinly white pruinose. Chemistry: thallus K+ yellow, UV- (somewhat grey), TLC: nil (stictic, salazinic, norstictic acids absent).

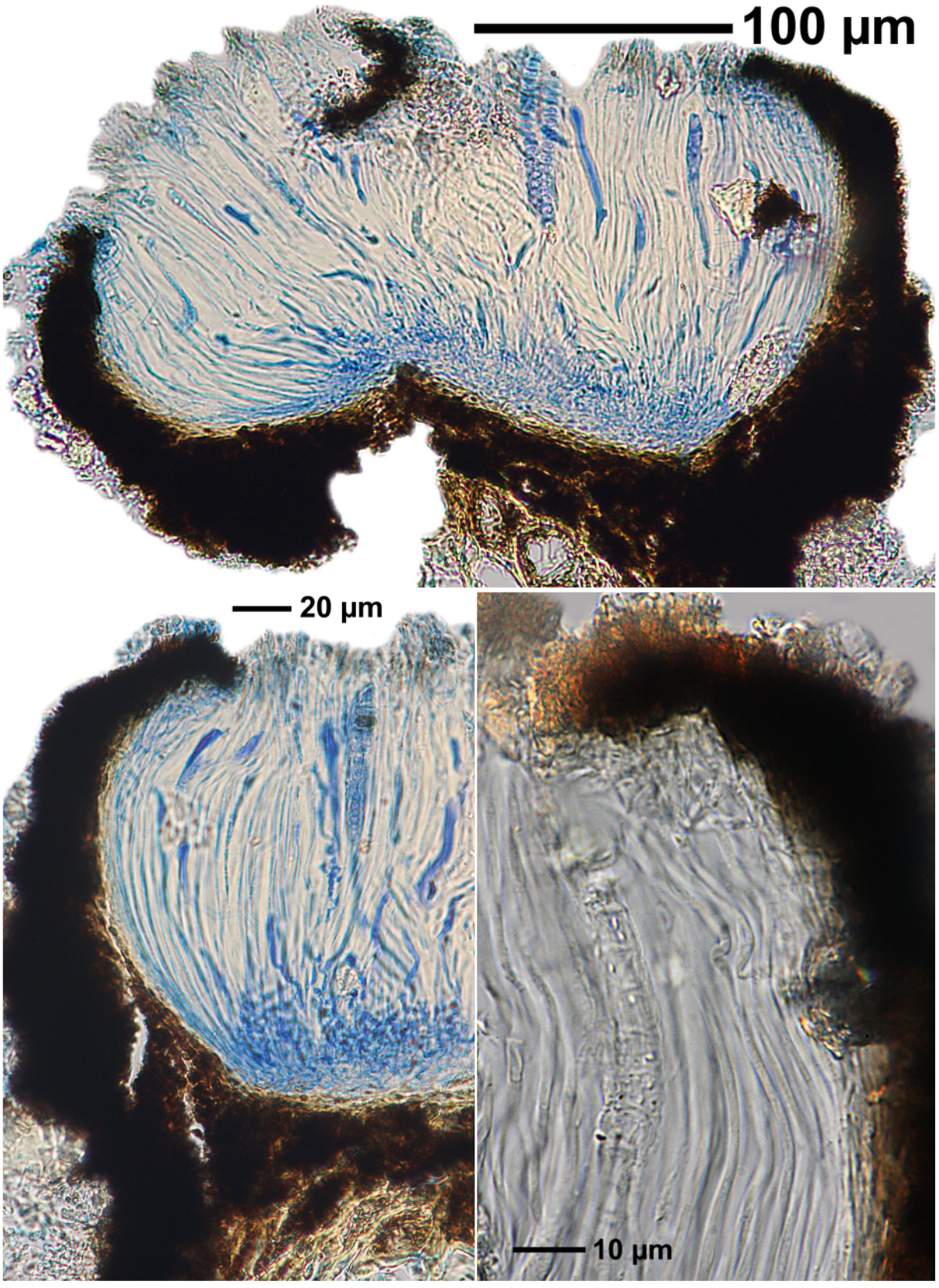
[6939], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay, tropischer Regenwald am Mt. Kitanglad ab Zwischen-Campsite, 08°09.637' N, 124°55.871' E, 1870-2800. Leg. Schumm 19.08.1999, det. Archer 23.8.2003.



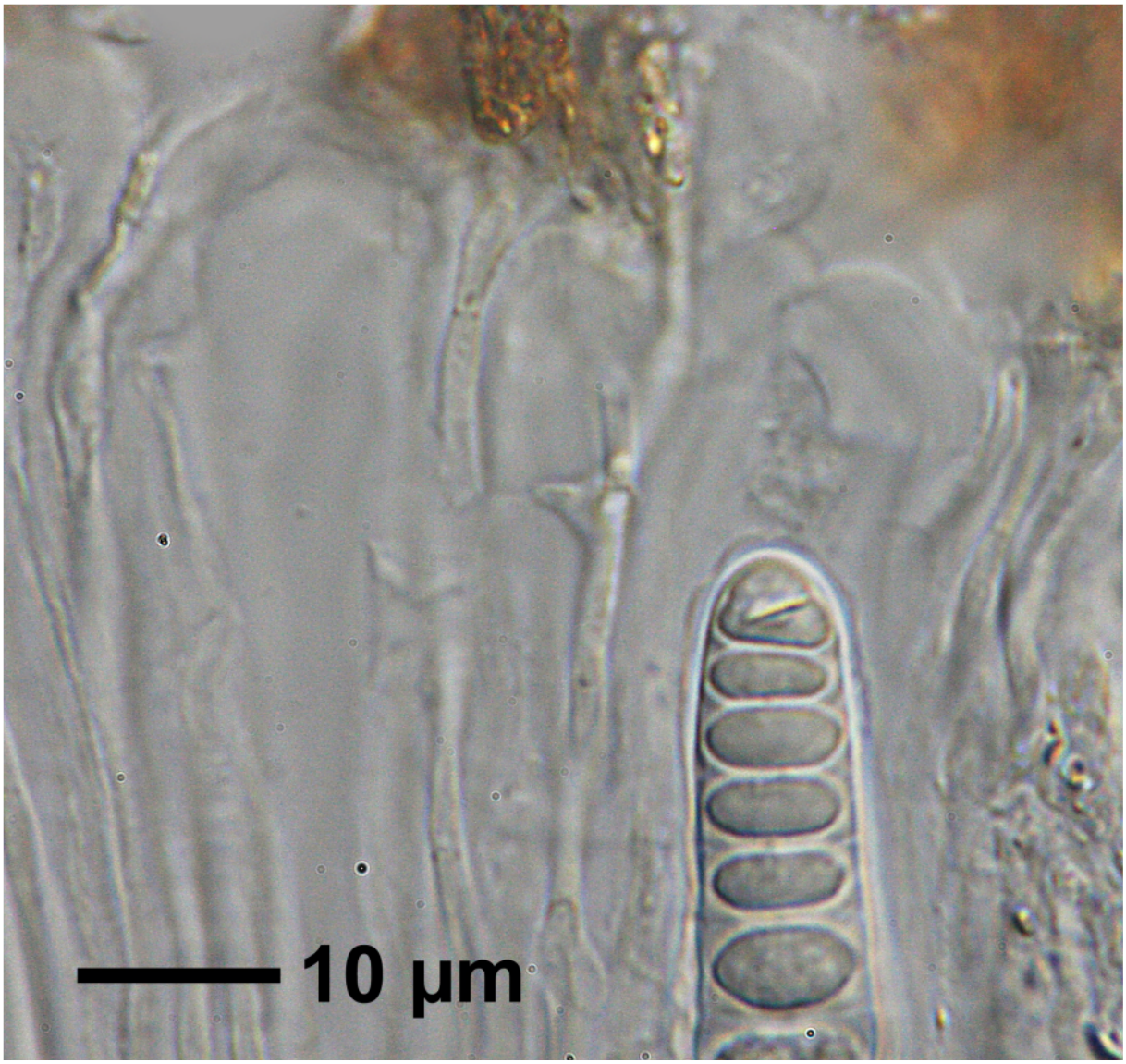


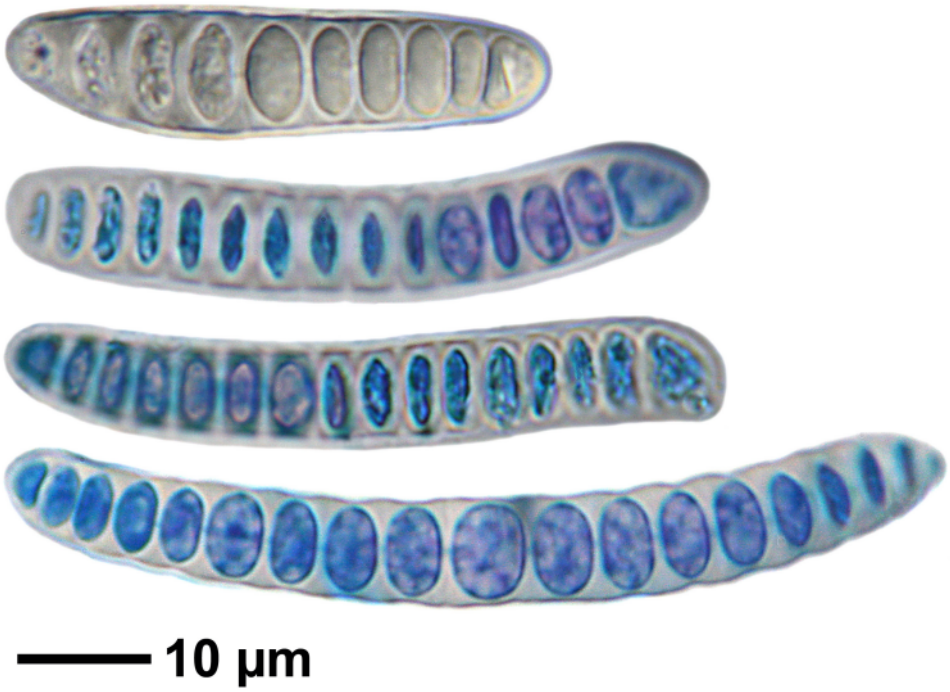




***Graphis subassimilis***




***Graphis subassimilis***



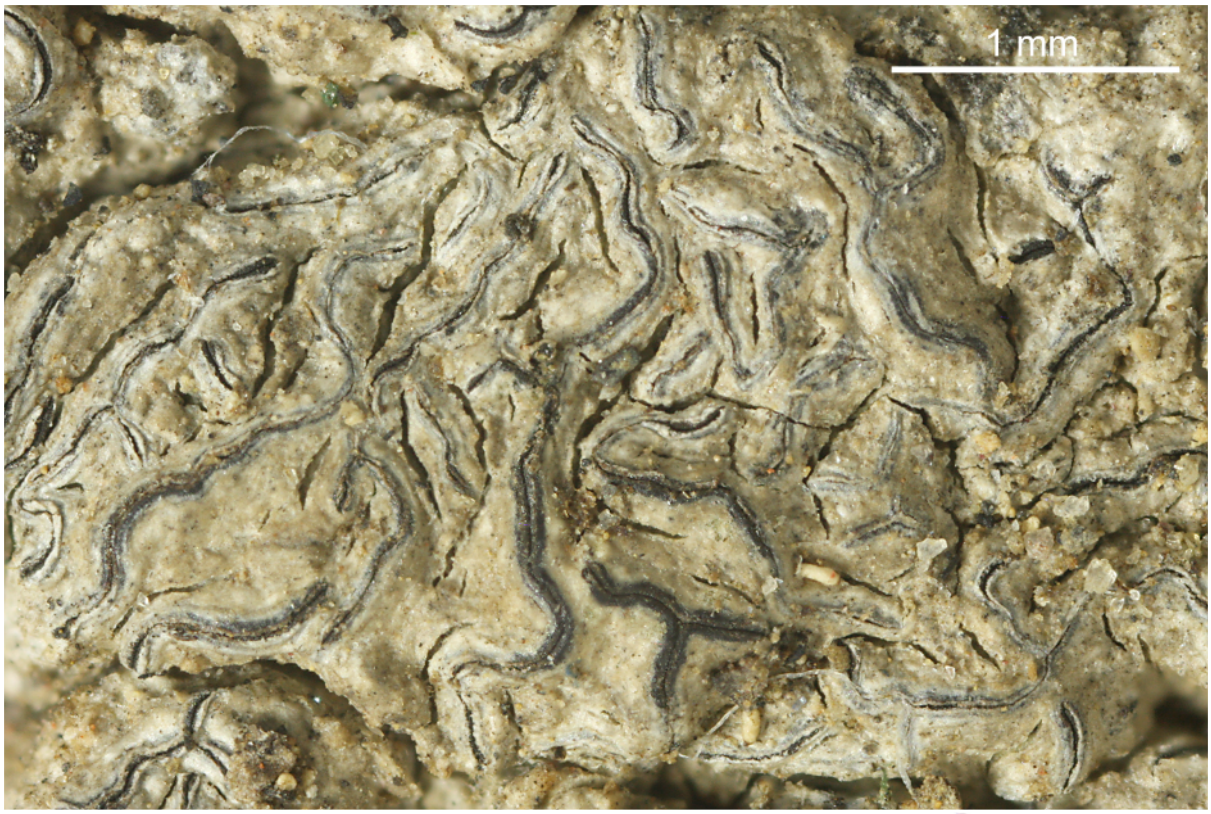

***Graphis subassimilis***

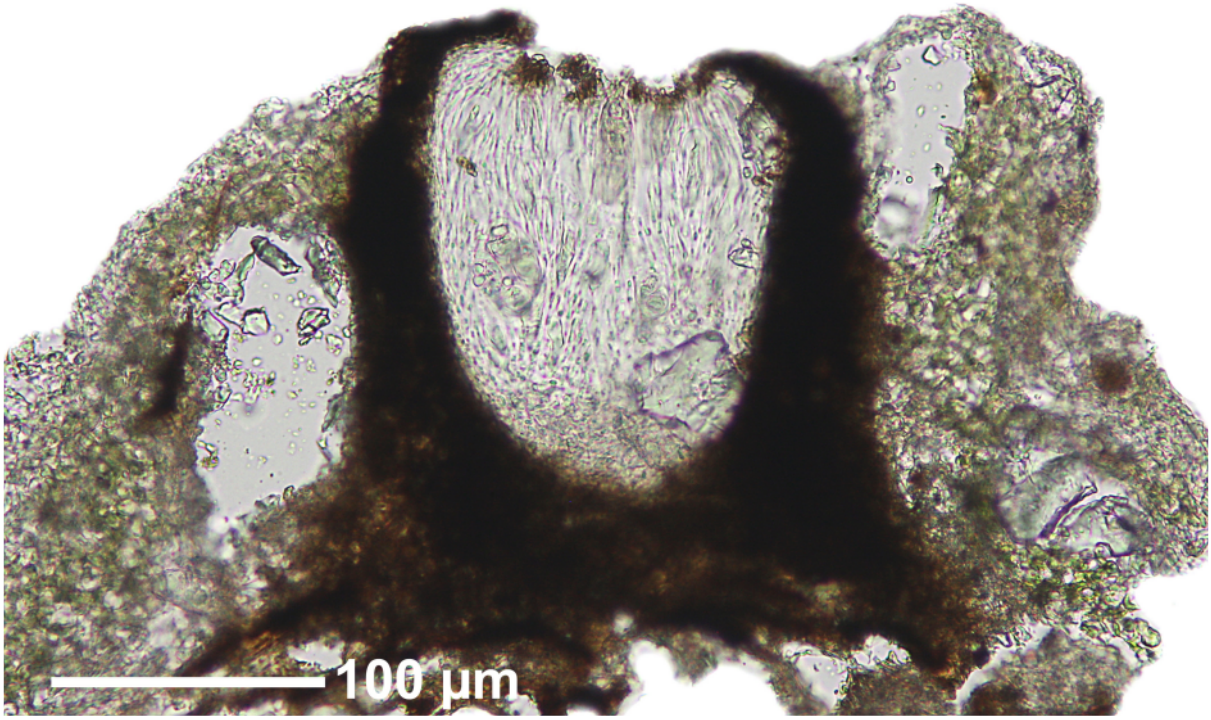
***Graphis subdisserpens*** Nyl.

Thallus sordid grey. Lirellae immersed with lateral thalline margin. Excipulum completely carbonized. Labia entire, not striate in sections. Hymenium not inspersed. Paraphyses not branched, somewhat swollen at the brown pigmented tips. Ascospores colourless, transversely septate, (12-)15-16(-20)-cellular, J+ blue, c. 6/ascus, 28-85(-95) x 7-11 µm. Chemistry: cortex and medulla K-, C-, KC-, P-, UV- (also in thick sections with K no reaction).

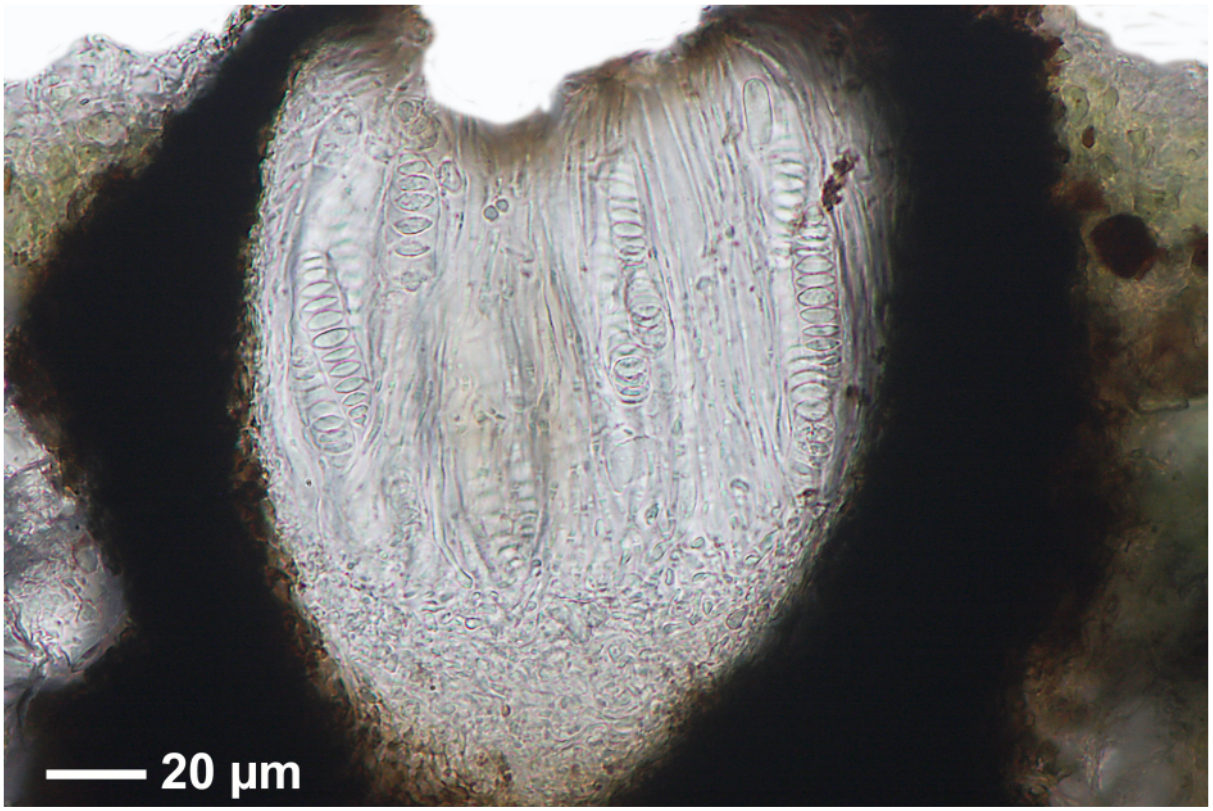
[3090], Indonesien, Bali, Tampaksiring, ca. 1000 m. Leg. D. & F. Schumm 04.01.1986, det. K. Kalb 2011.

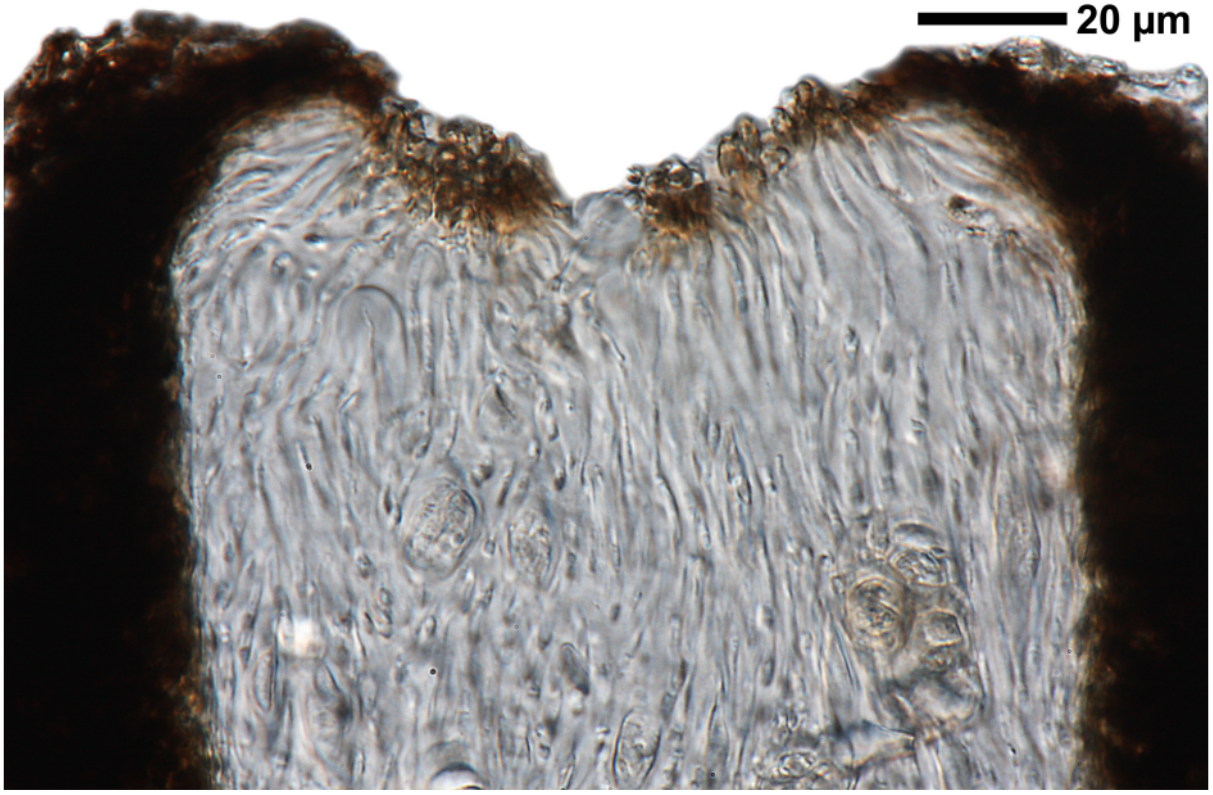




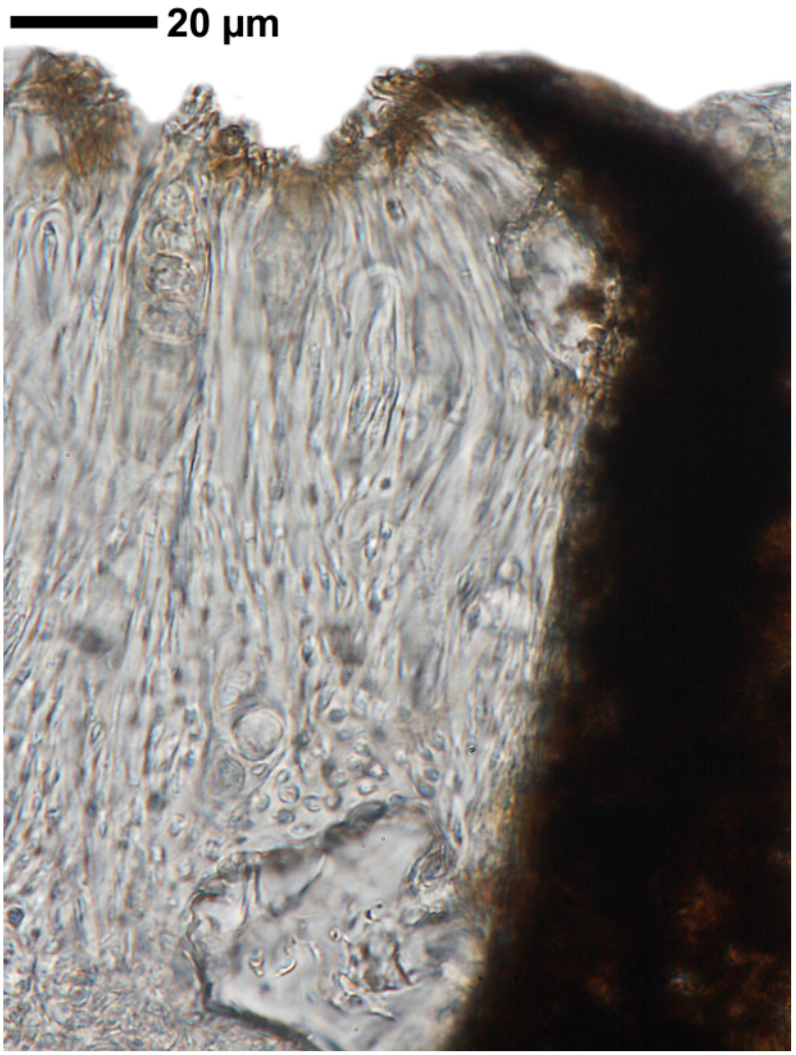

***Graphis subdisserpens***



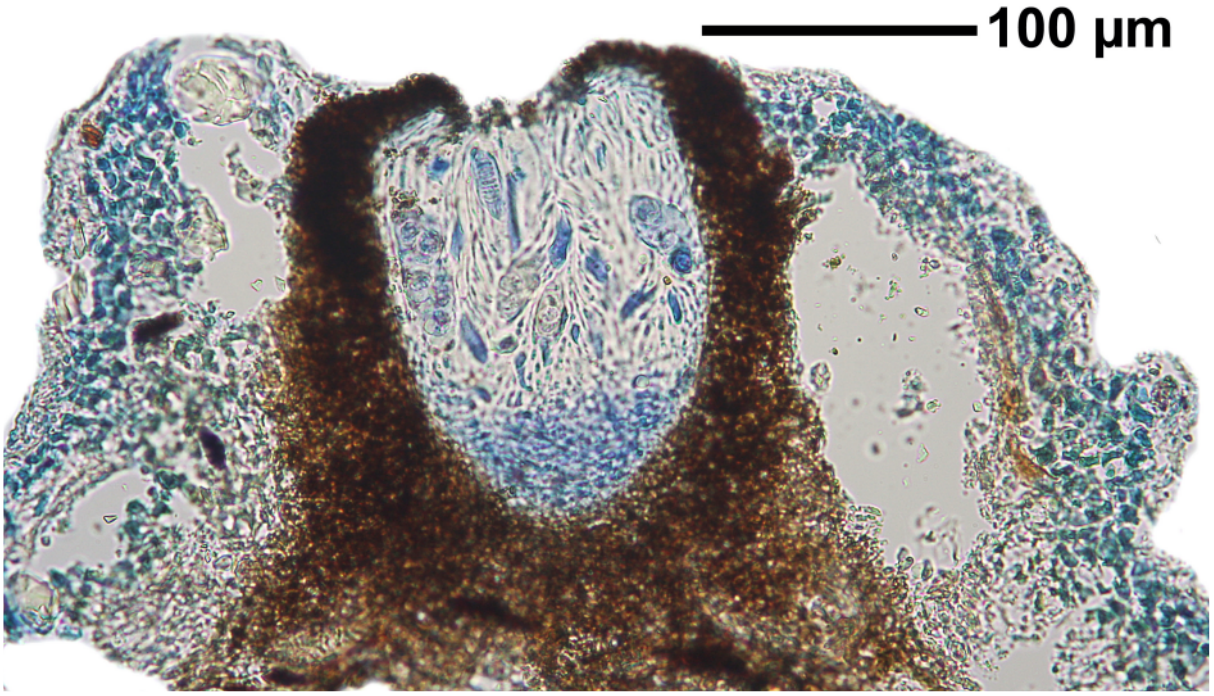



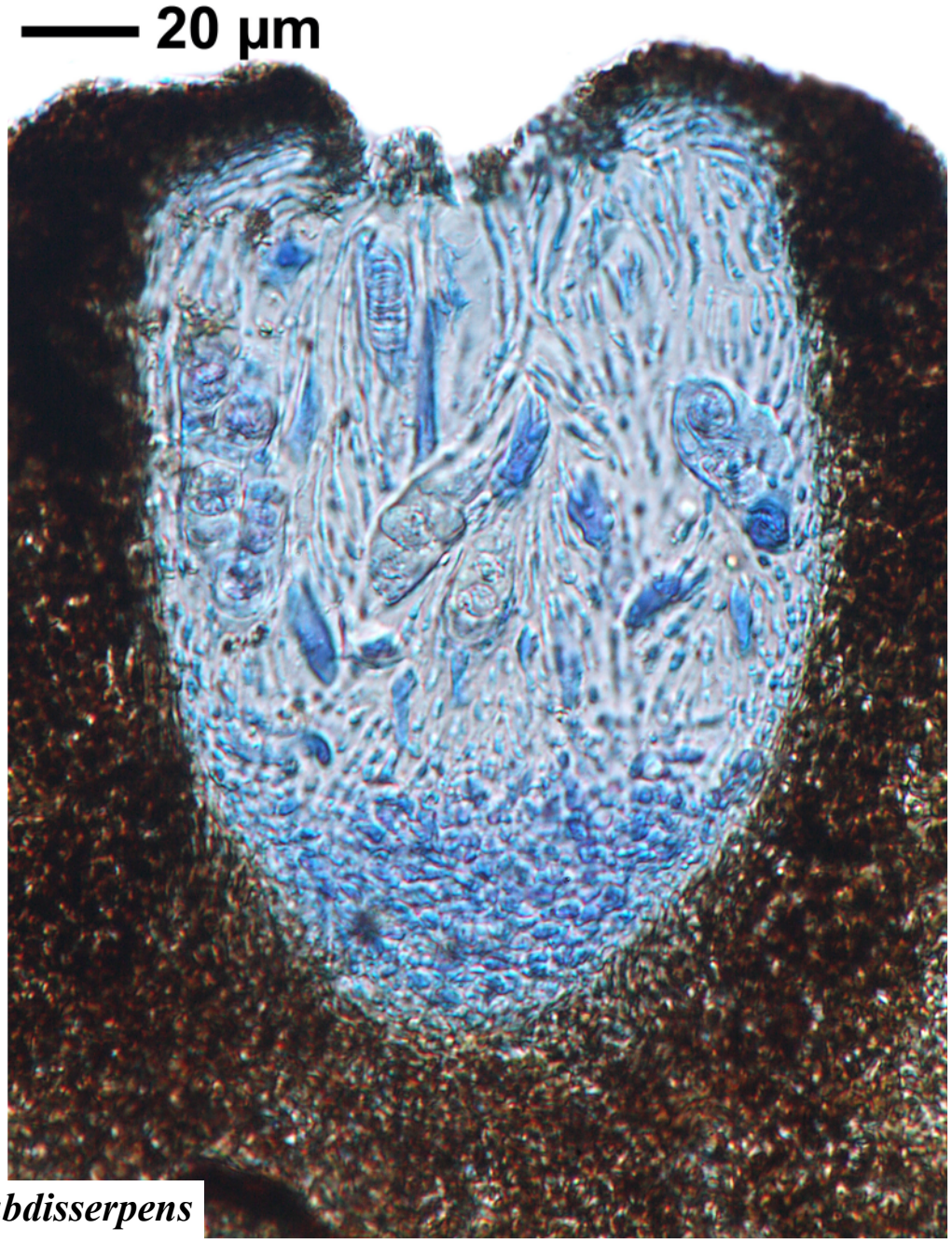

***Graphis subdisserpens***



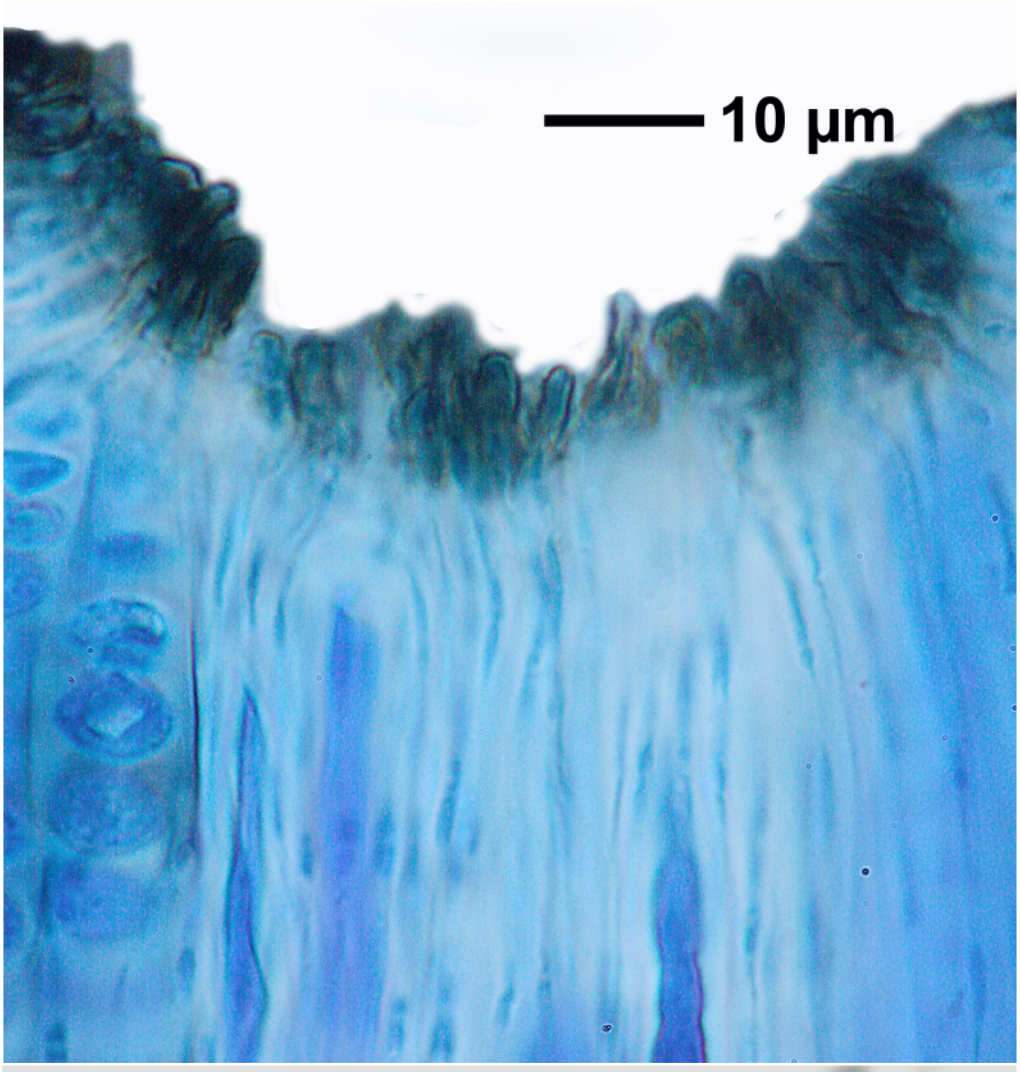



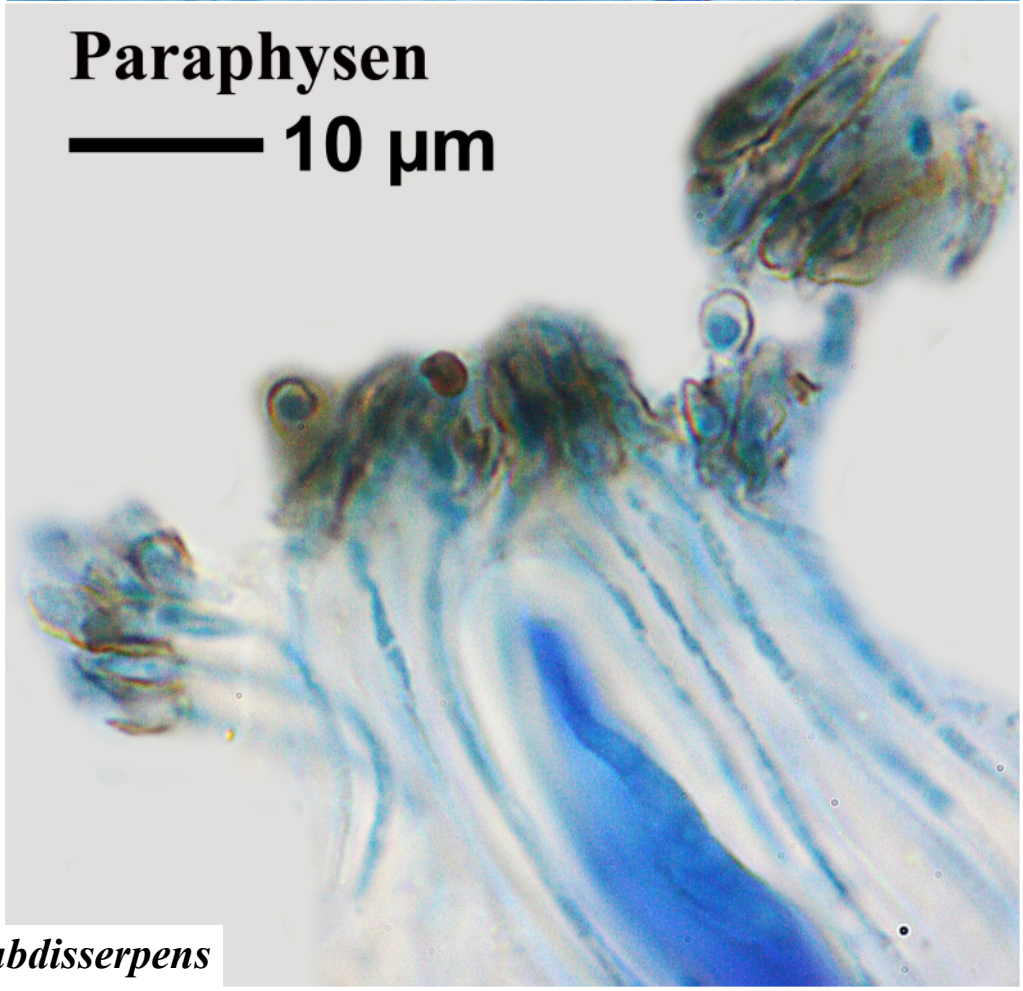

***Graphis subdisserpens***



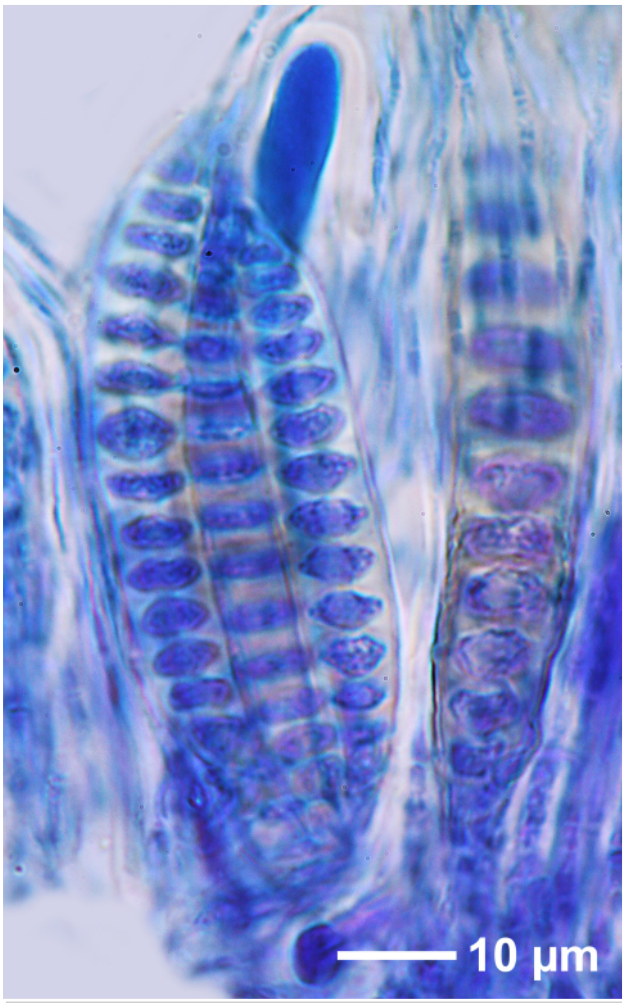



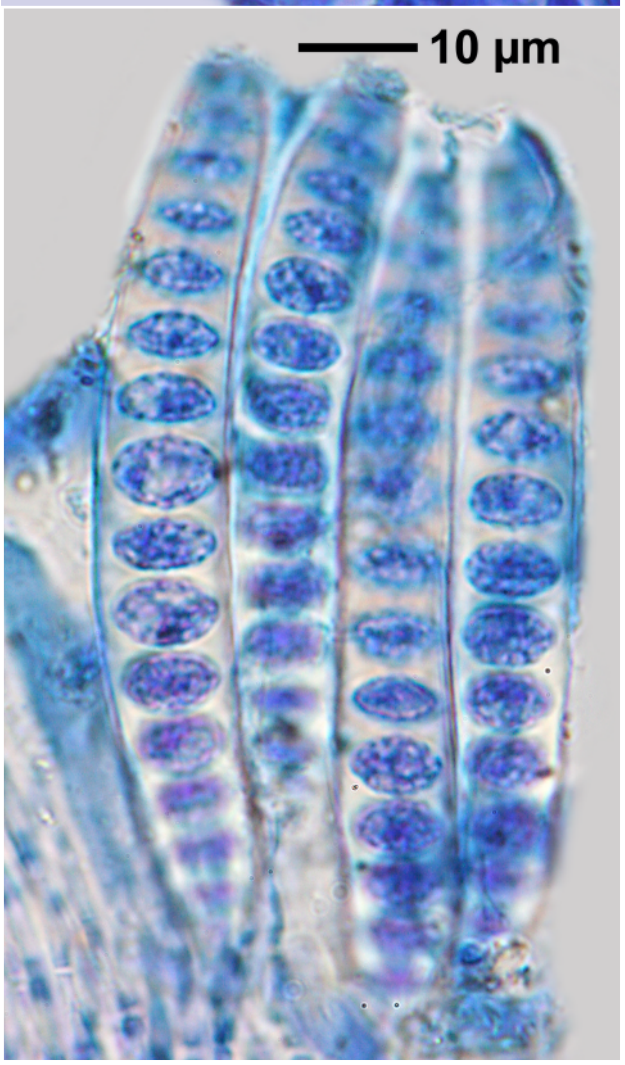

***Graphis subdisserpens***



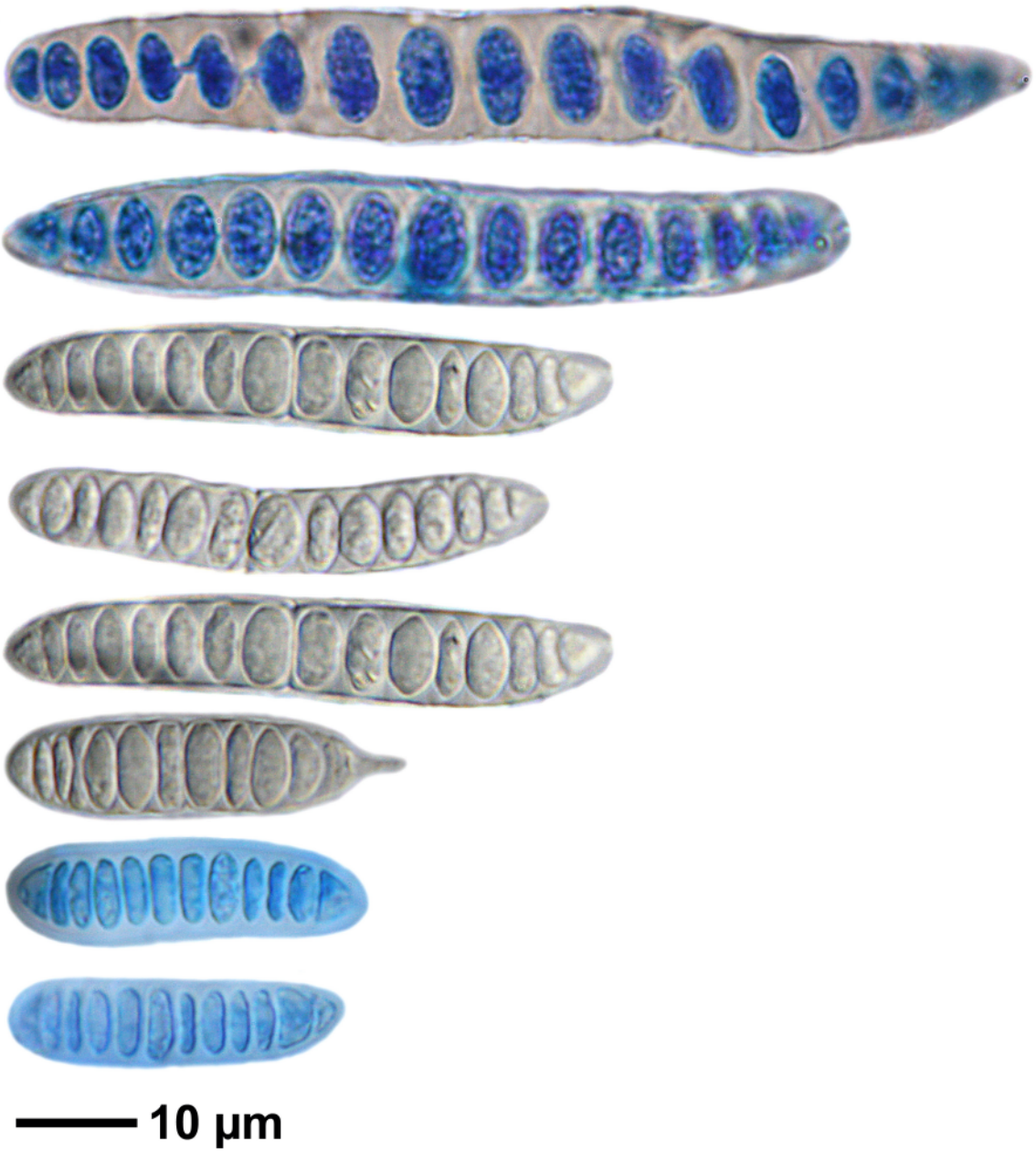




***Graphis subdisserpens***




***Graphis subdisserpens***




***Graphis subdisserpens***

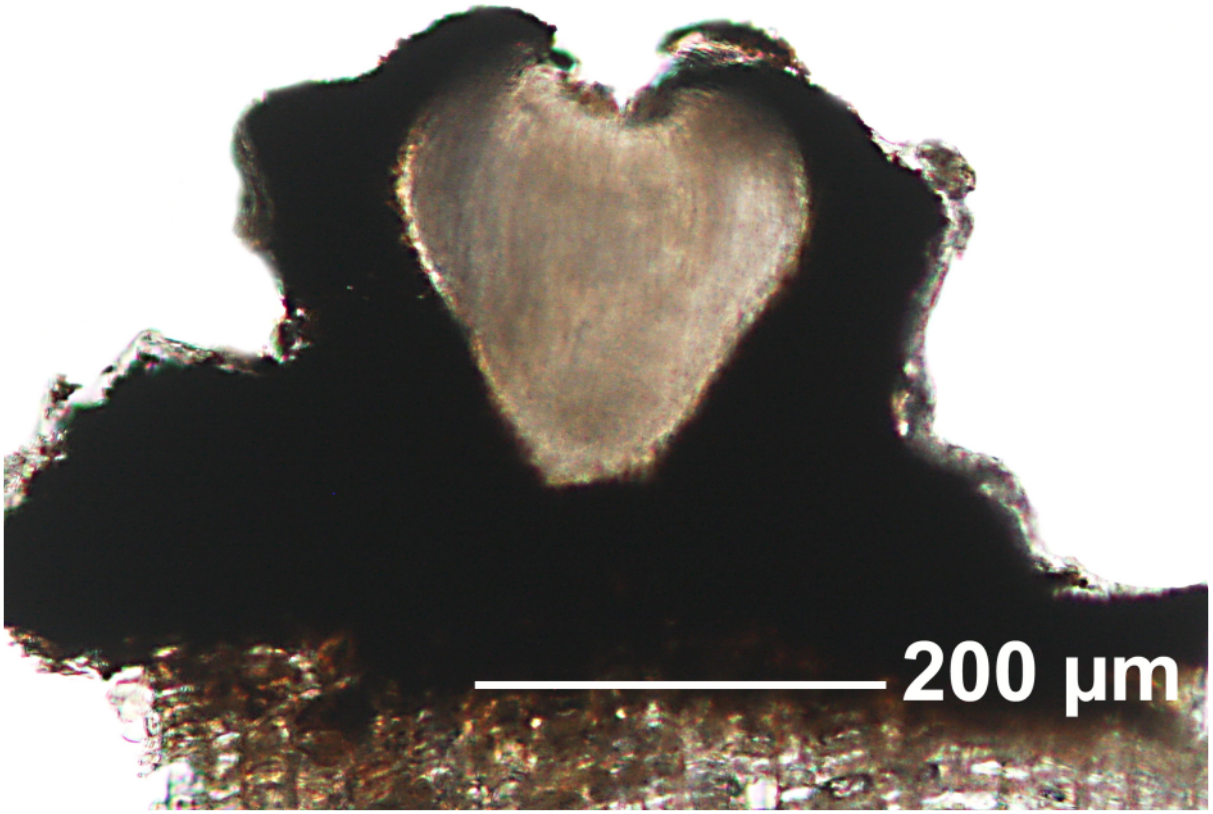
***Graphis subflexibilis*** Lücking & Chaves

Labia entire or striate. Excipulum completely carbonized, thinly covered by thallus. Hymenium densely inspersed (the difference to *G. vestitoides*). Ascospores 21-23-transverse-septate, but end cells with some longitudinal septa, 90-110 x 20-23 µm, J+ violet. Chemistry: K+ weakly yellowish, P- or weakly yellowish; TLC: nil. Lit. Lücking et al. (2008, Fieldiana)

[6956], Philippinen, Mindanao, Prov. Misamis Oriental, südwestlich Gingoog City, Barangay Lunutan 08°42.510’ N, 125°01.241’ E, 1120 m und am Weg auf den Mt. Lumot (Via Haruhay Trail) bis zum Zwischencamp im trop. Bergregenwald bei 08°40.713’ N, 125°01.649’ E, 1680 m. Leg. Schumm 24.08.1999, det. Schumm 2011.



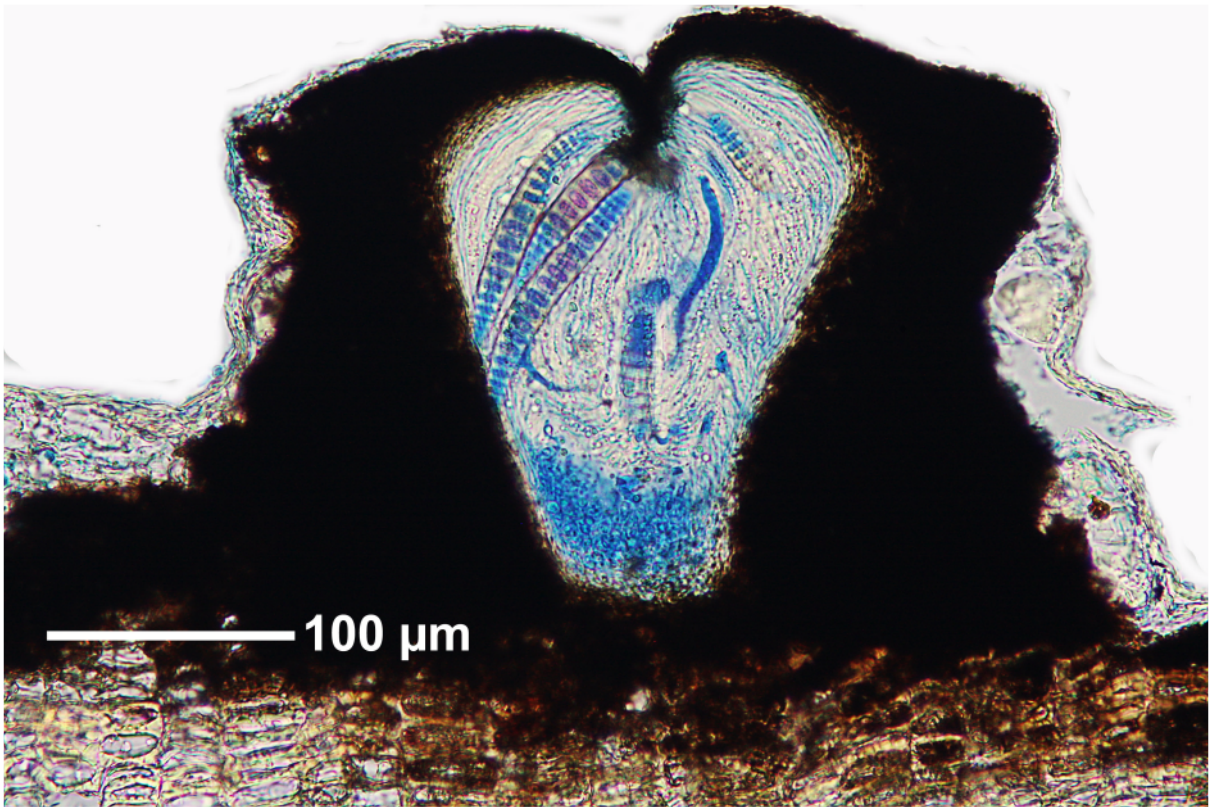


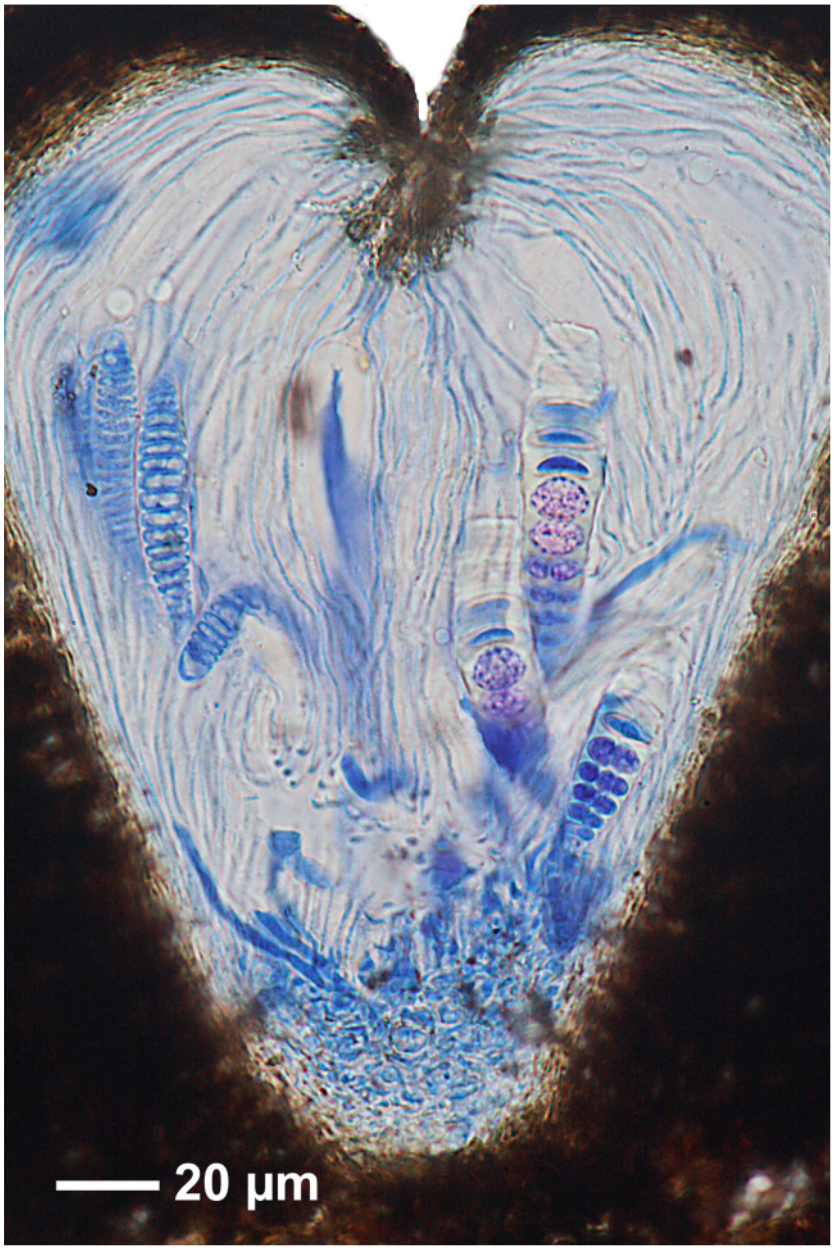





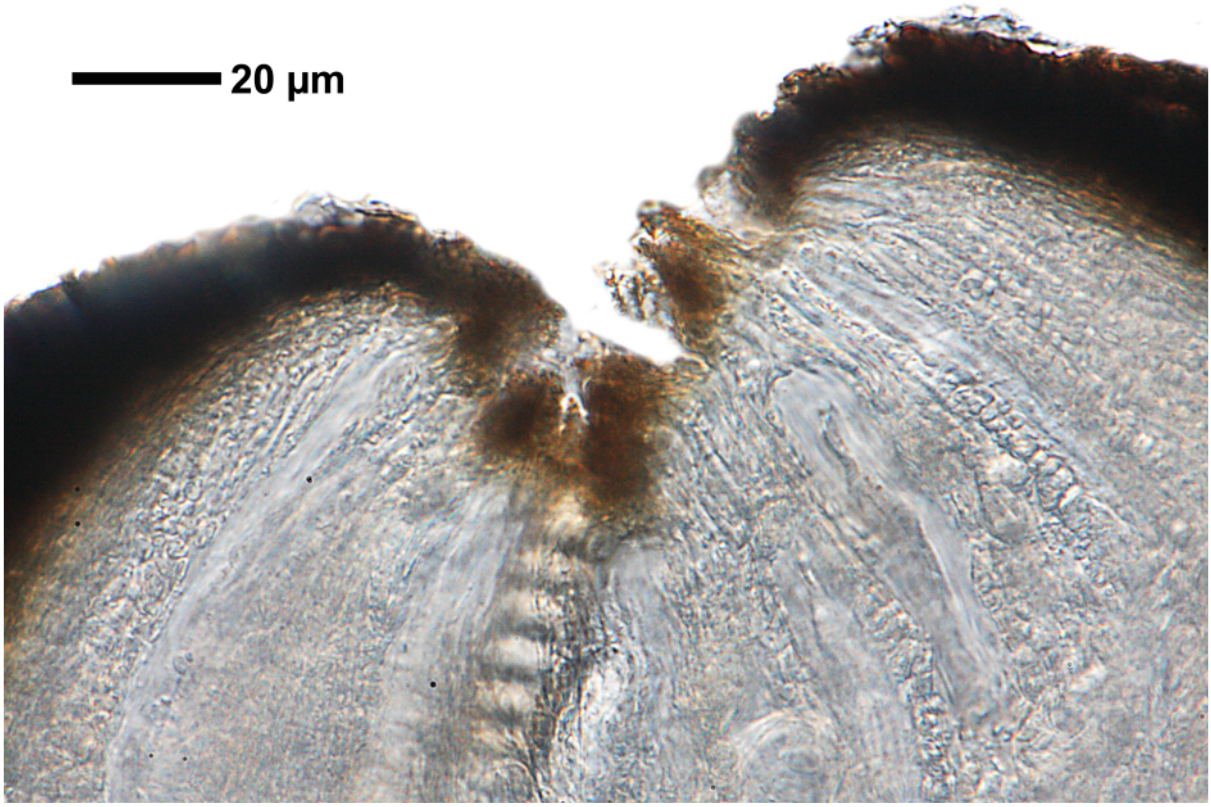


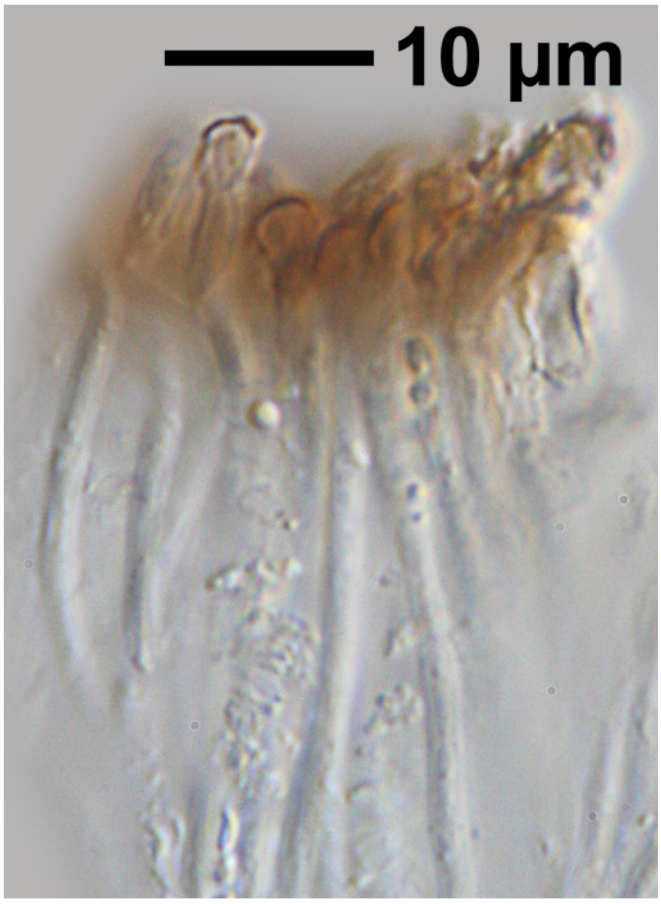
***Graphis subflexibilis***



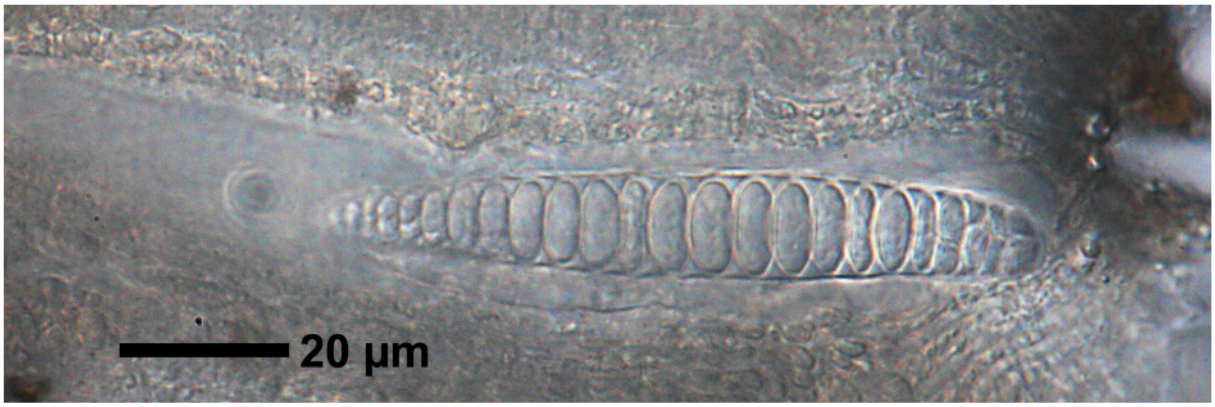




***Graphis subflexibilis***




***Graphis subflexibilis***





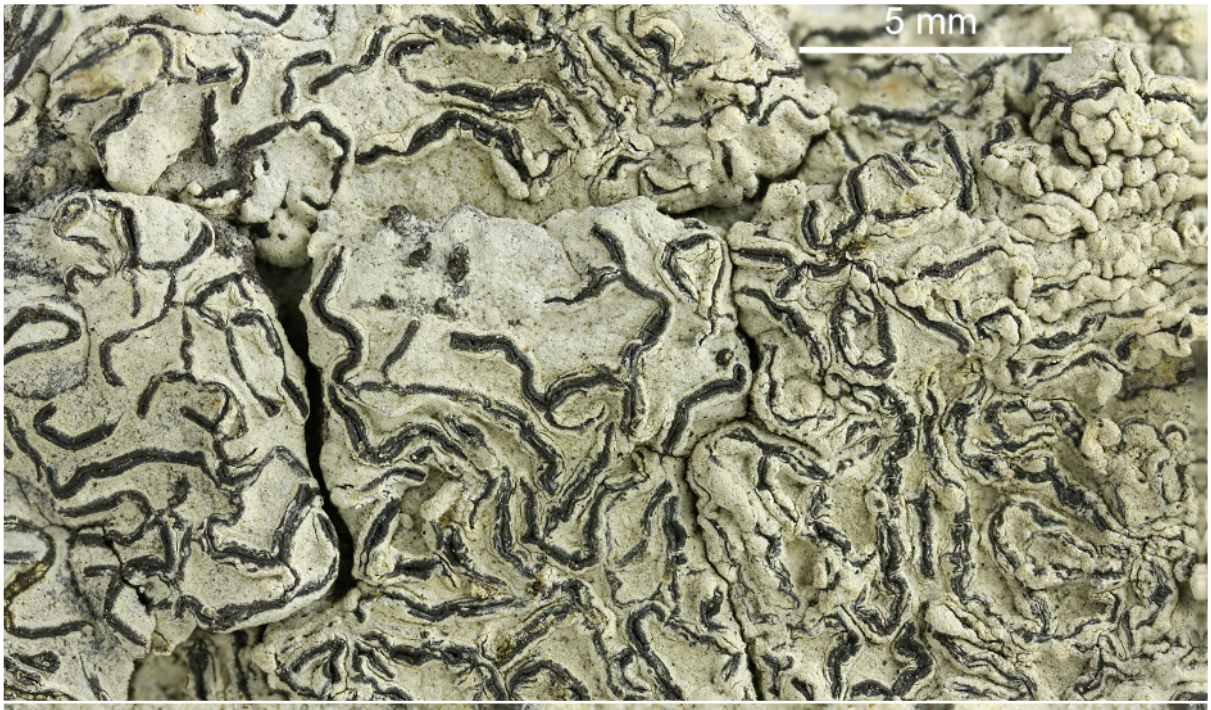


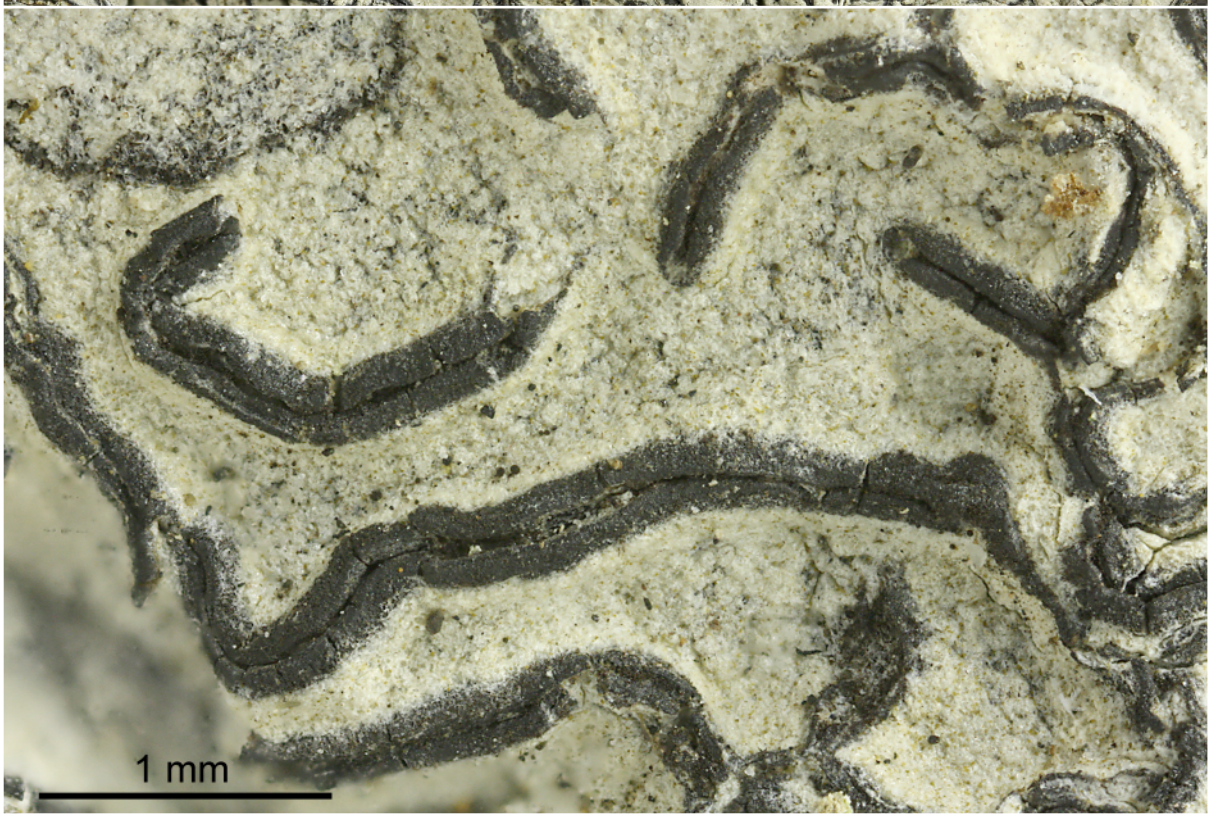
***Graphis subflexibilis***

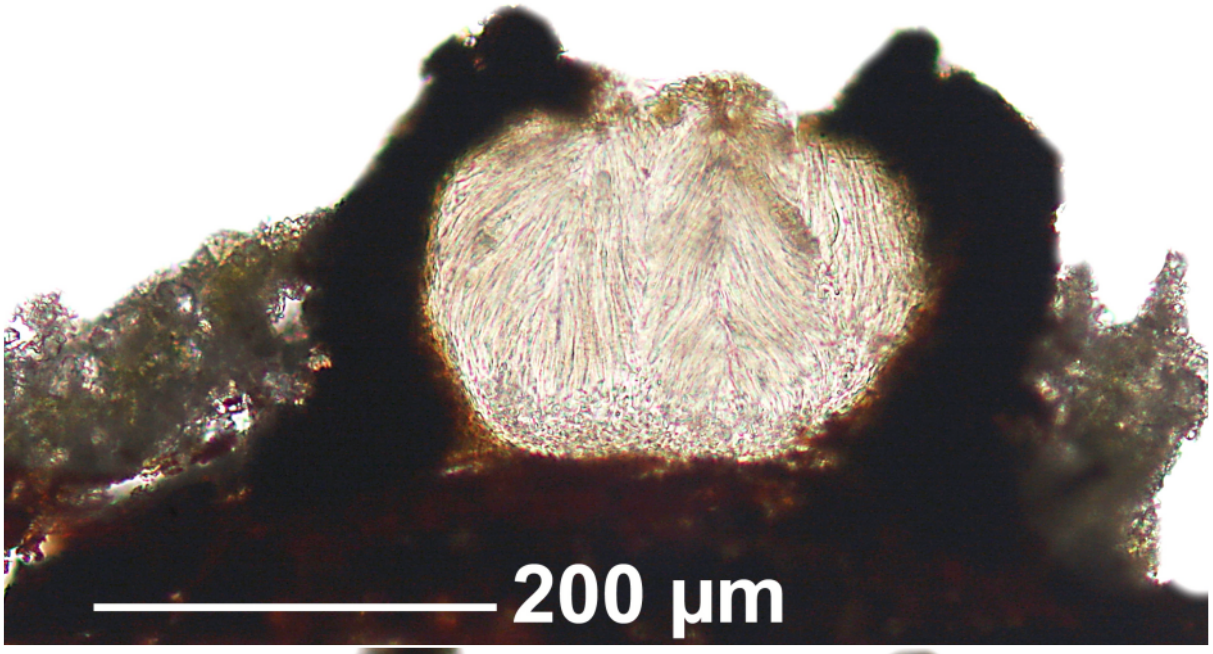
***Graphis subserpentina*** Nyl.
[= ***Graphina subserpentina*** (Nyl.) Müll.Arg.]

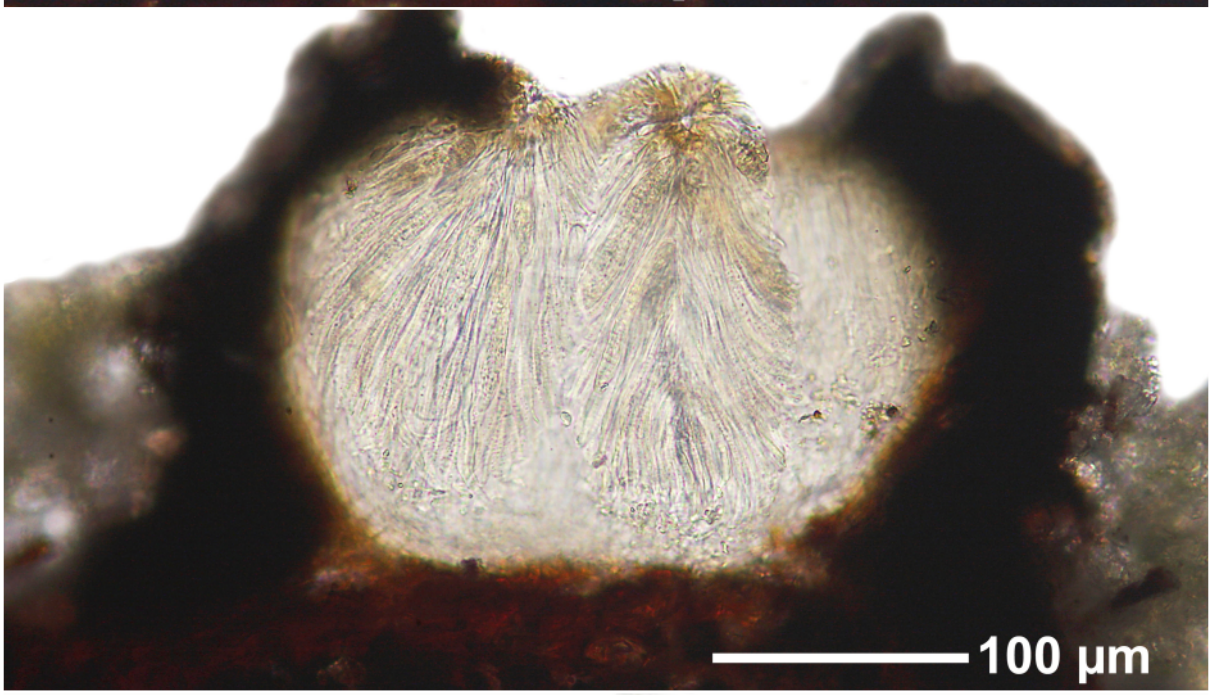
Labia entire. Excipulum only laterally carbonized. Hymenium somewhat inspersed, 100-133 µm high, J-. Paraphyses not branched. Ascospores muriform, 43-76 x 11-17 µm, without halo, J+ violet. Chemistry: K+ yellow>red, P+ yellow, norstictic acid (TLC).

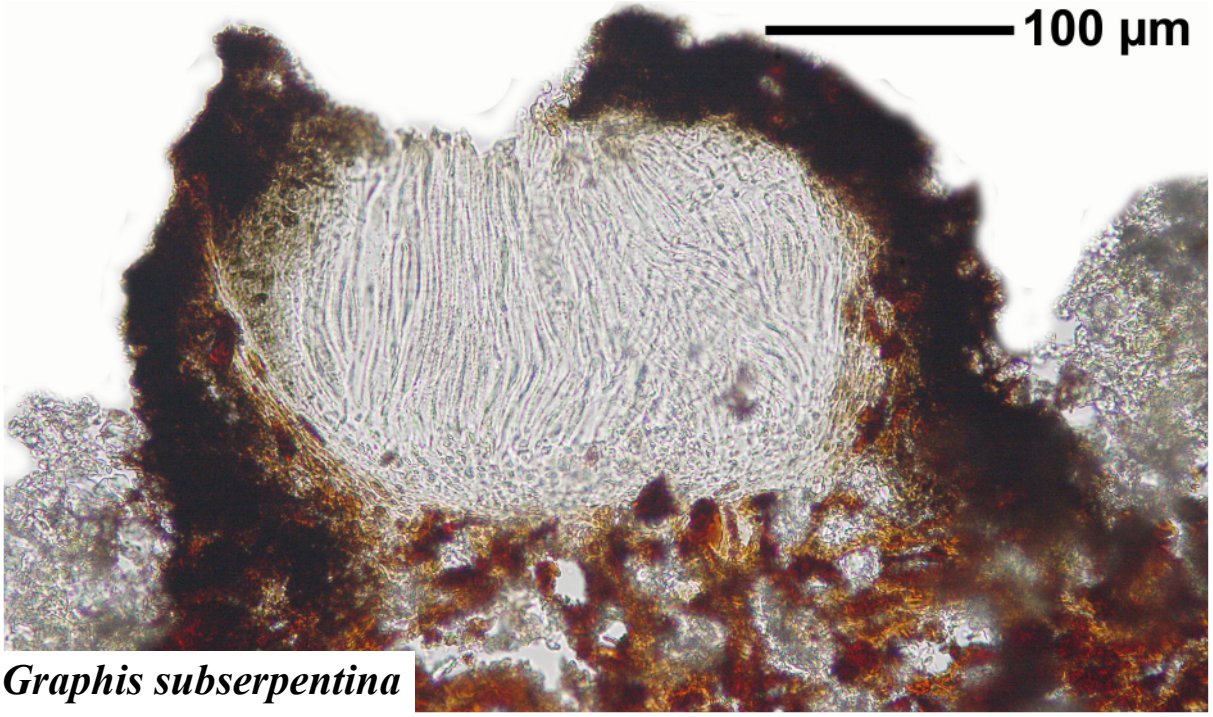
[5849], Singapore, nahe der Philippinischen Botschaft. Leg. Schumm 03.08.1999, det. Archer 22.8.2003.



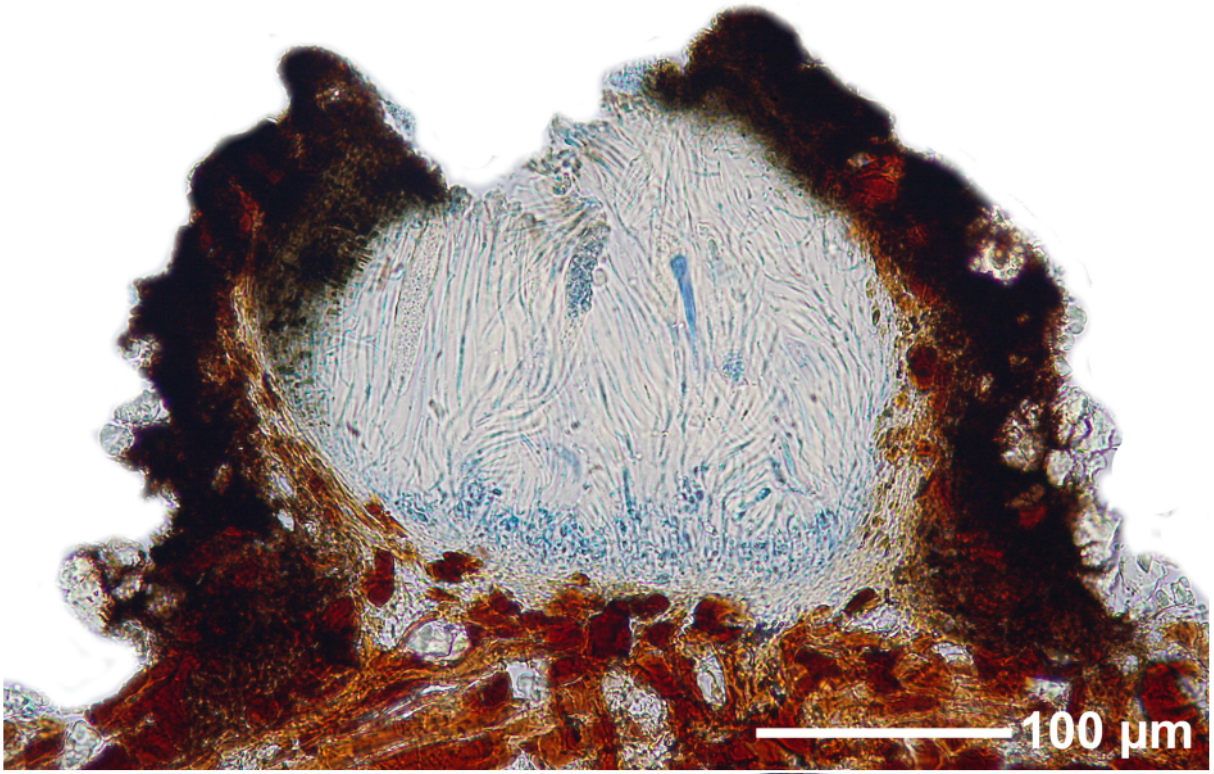



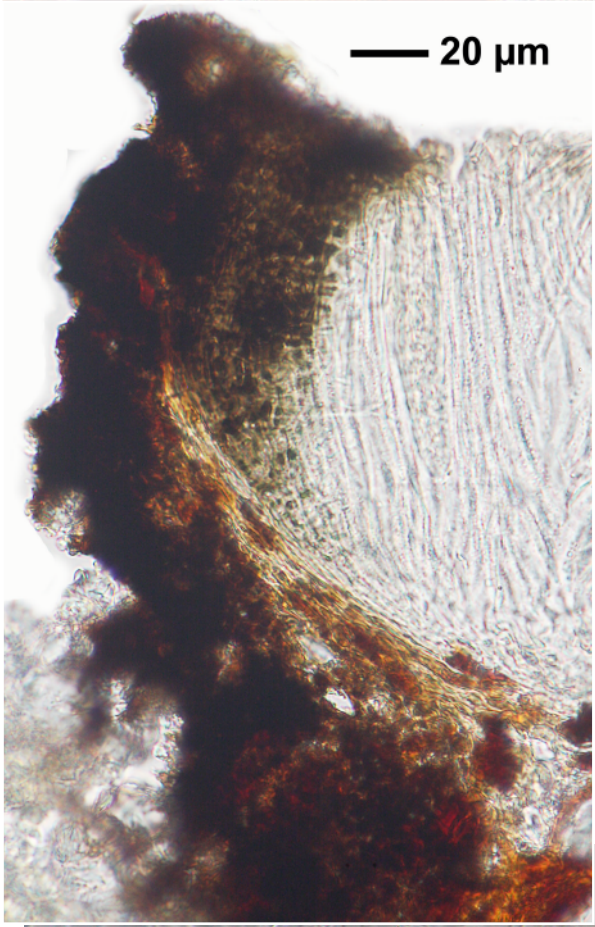


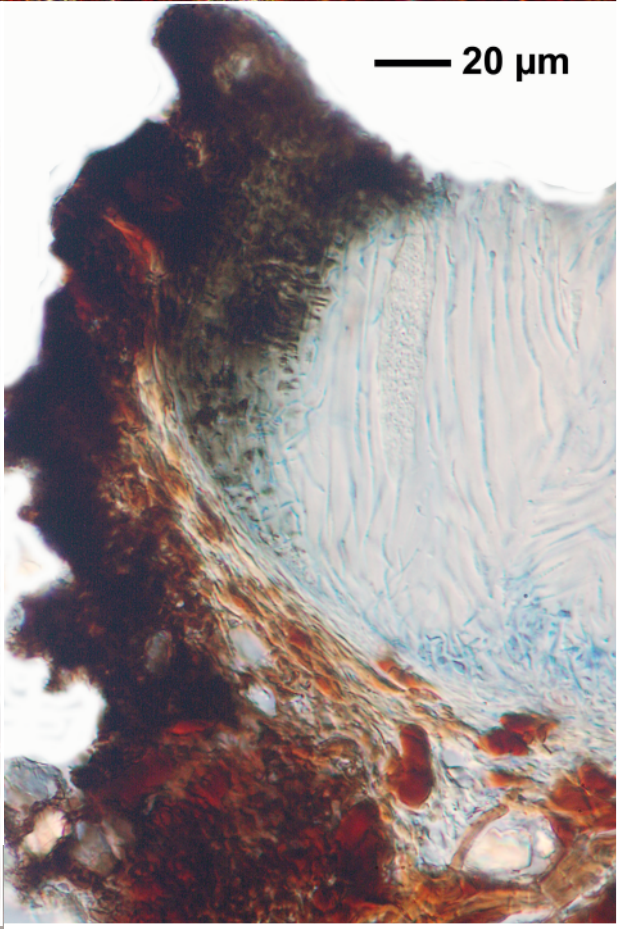



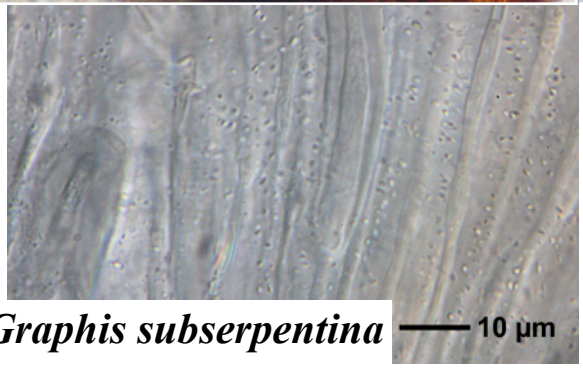




***Graphis subserpentina***







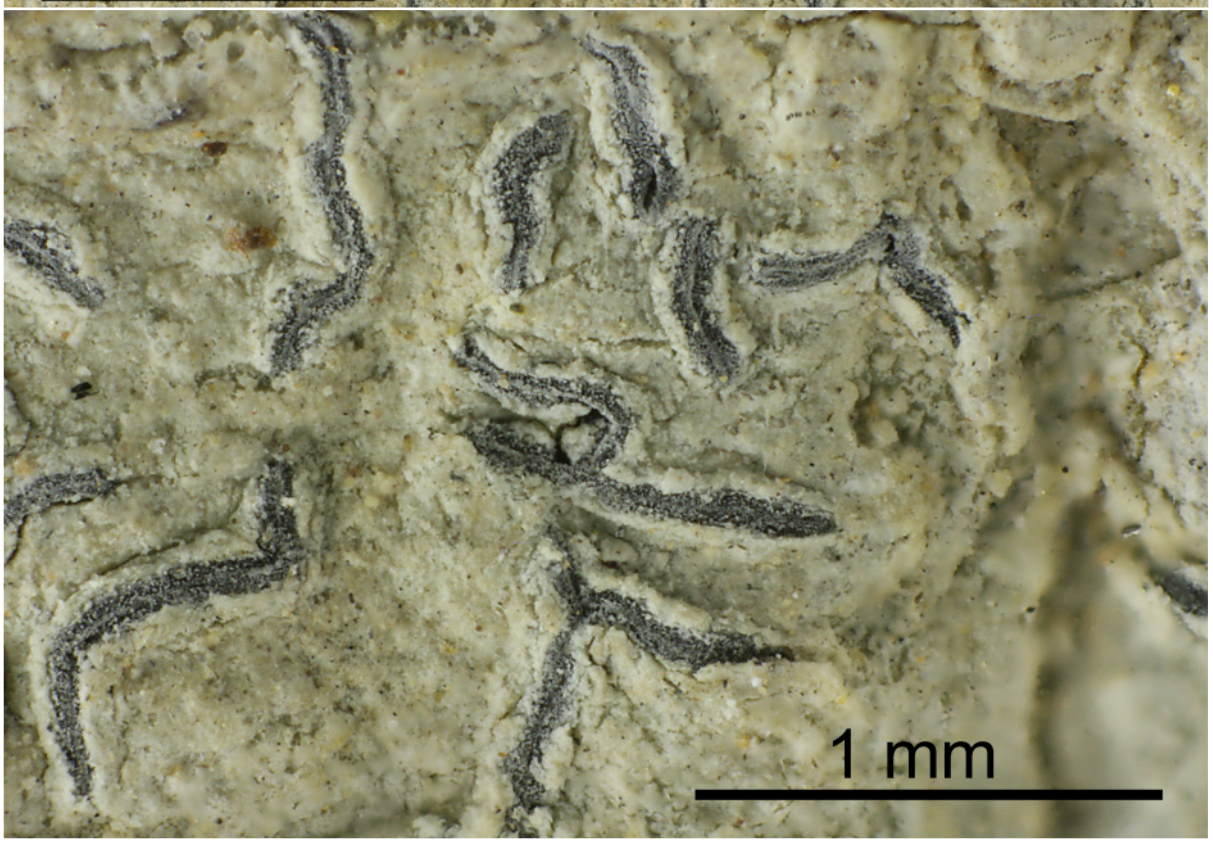
***Graphis subserpentina***

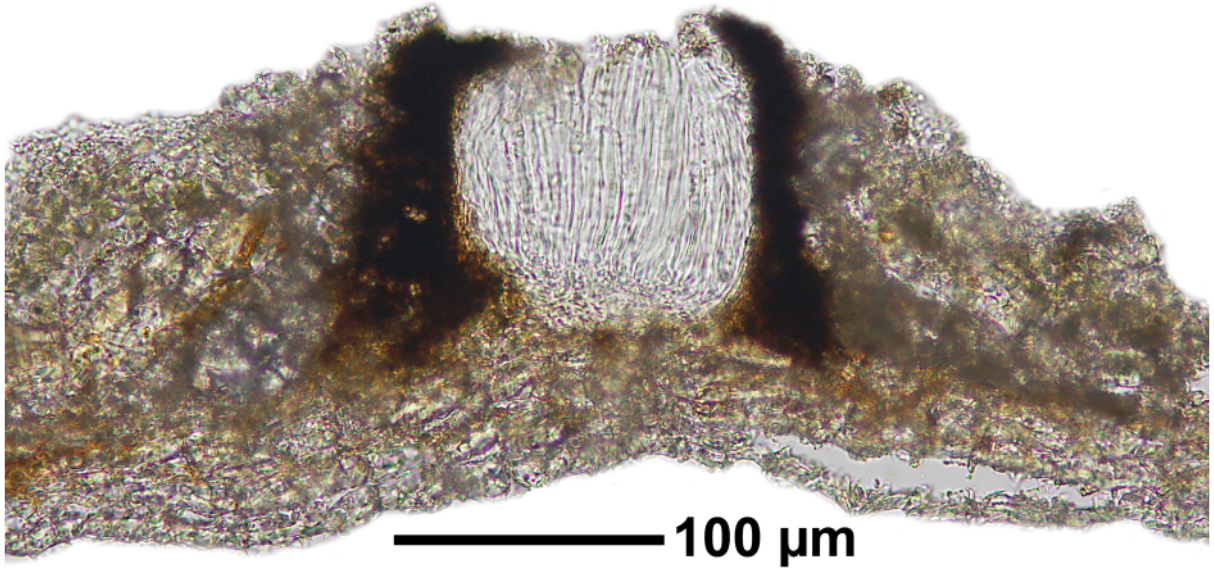
***Graphis supracola*** A.W.Archer

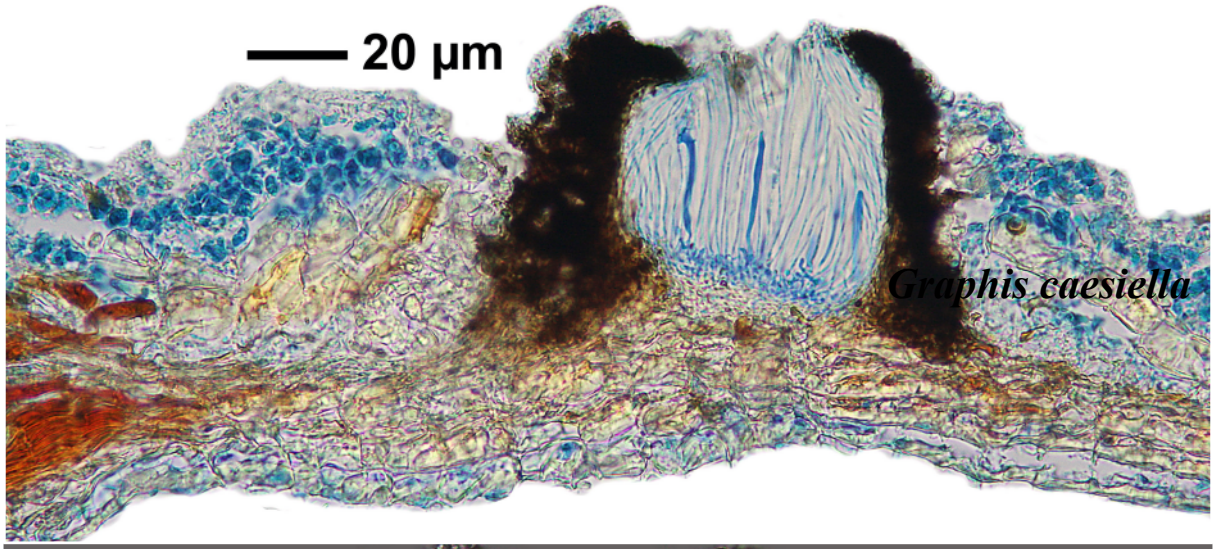
Exciple laterally carbonized, not sulcate. Hymenium not inspersed. Ascospores hyaline, 22-41 x 7 µm, transverely 5-9-septate.
Chemistry: protocetraric acid (TLC), thallus UV-.

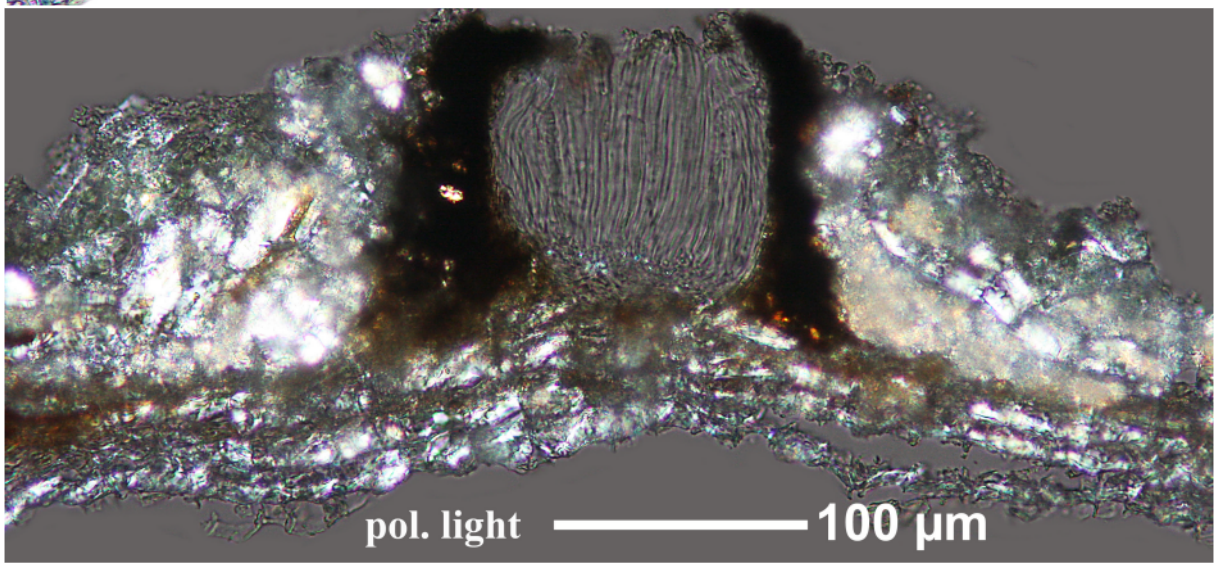
[9550], Thailand, am Mekhong Fluß bei Chiang Saen (Goldenes Dreieck Thailand, Laos, Burma), 20°21.196' N, 100°04.836' E, 450 m. Leg. Schumm 30.03.2002, det. Schumm 2011.



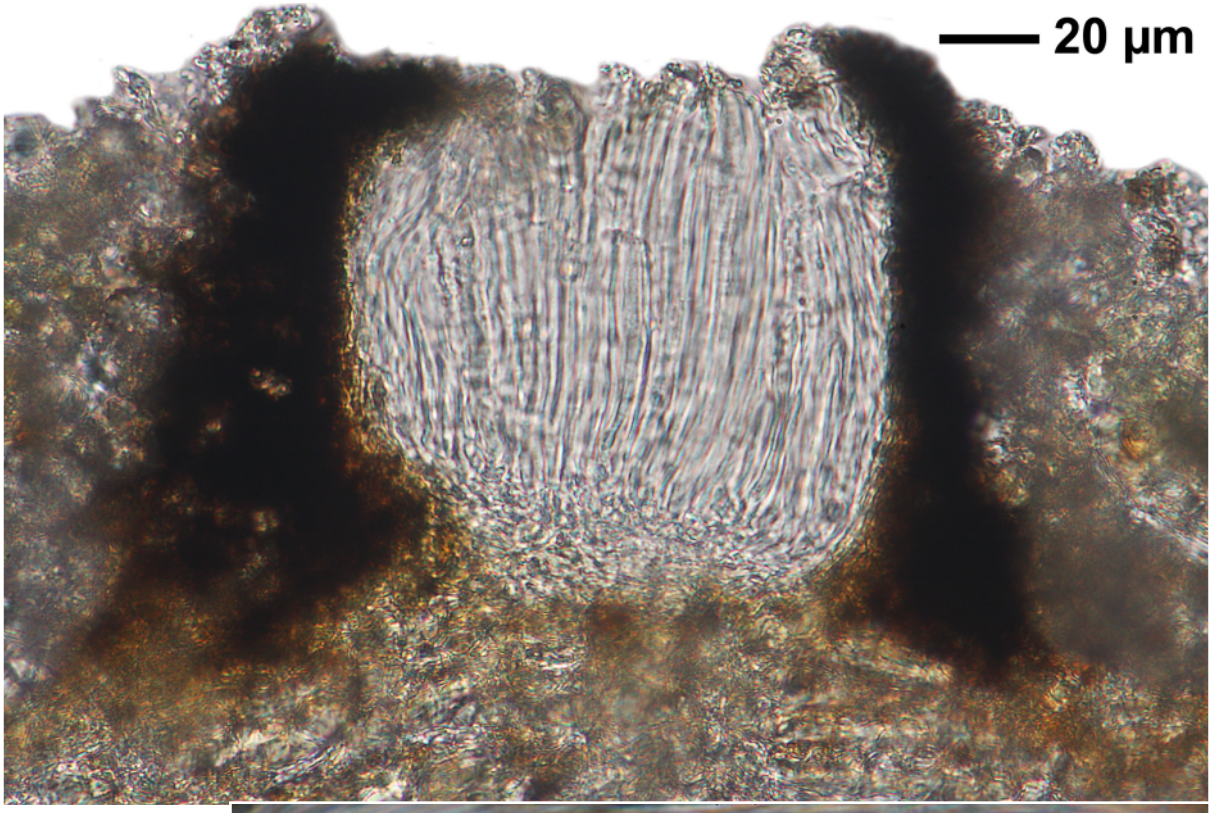



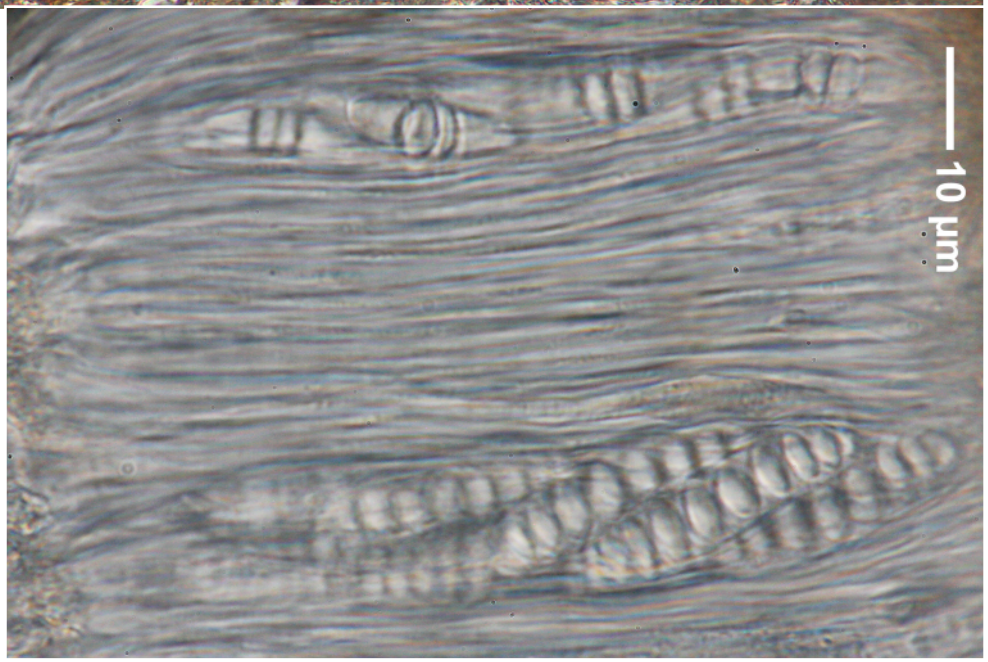


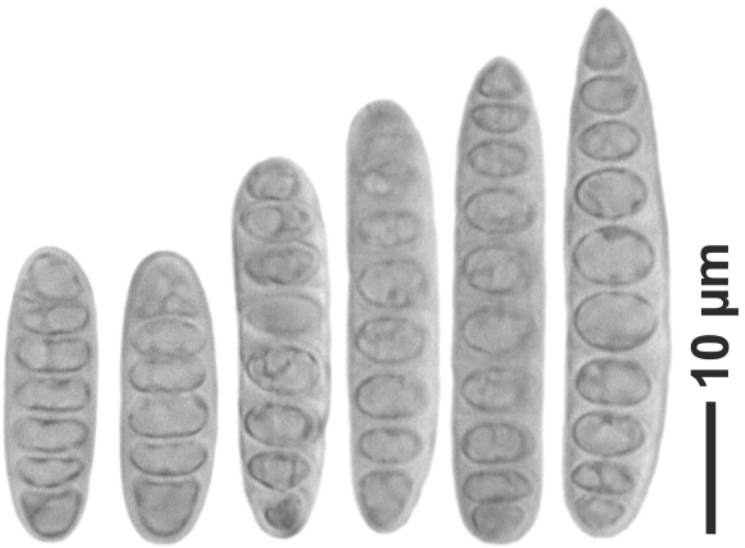



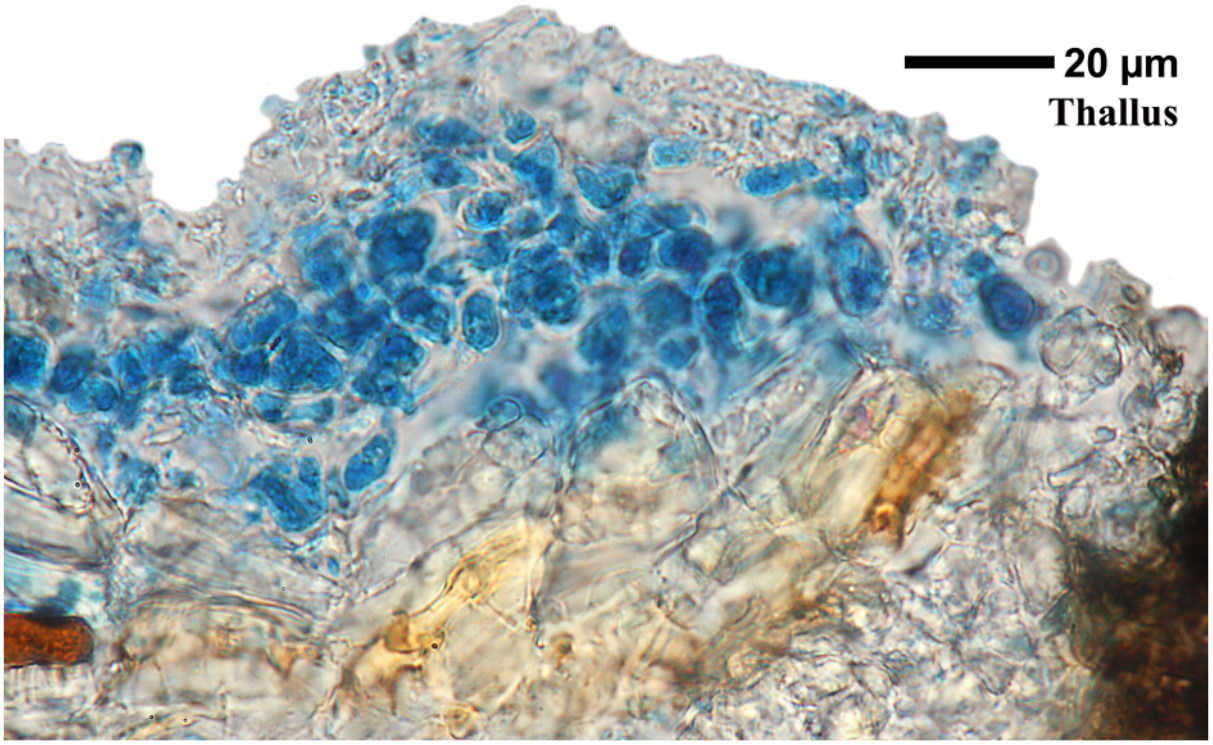

***Graphis supracola***




***Graphis supracola***

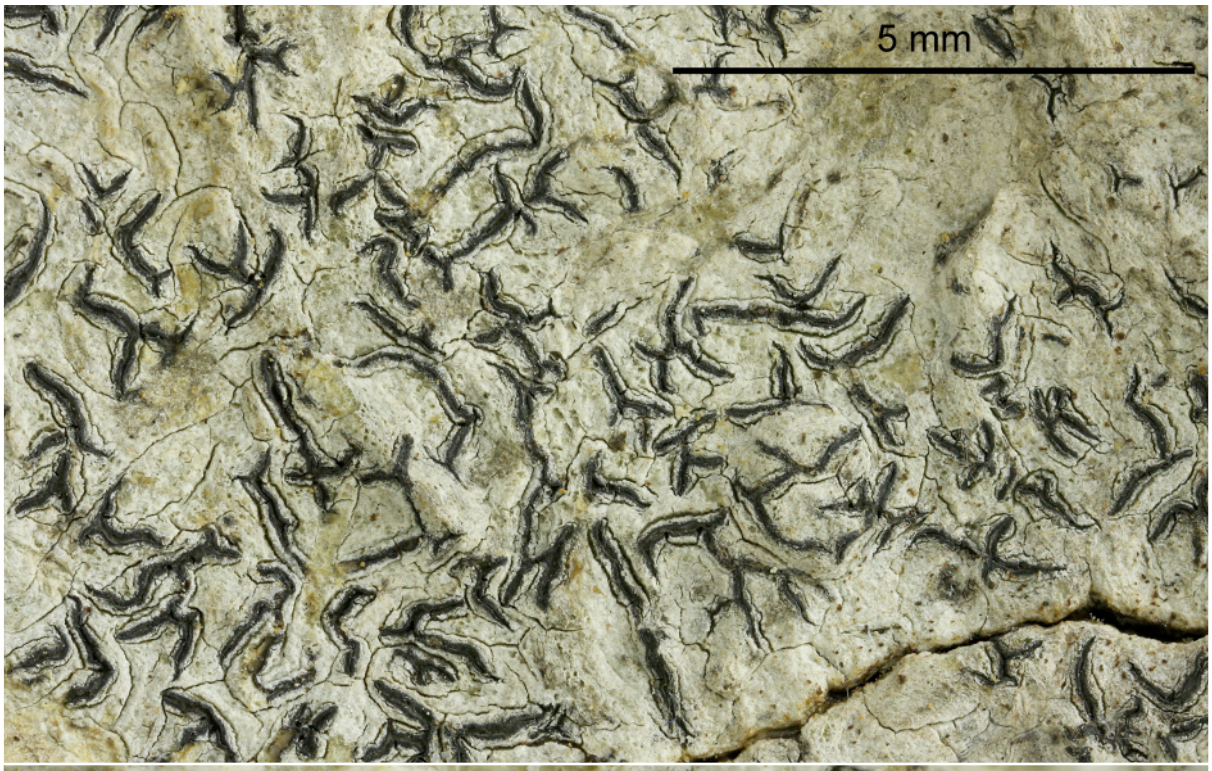


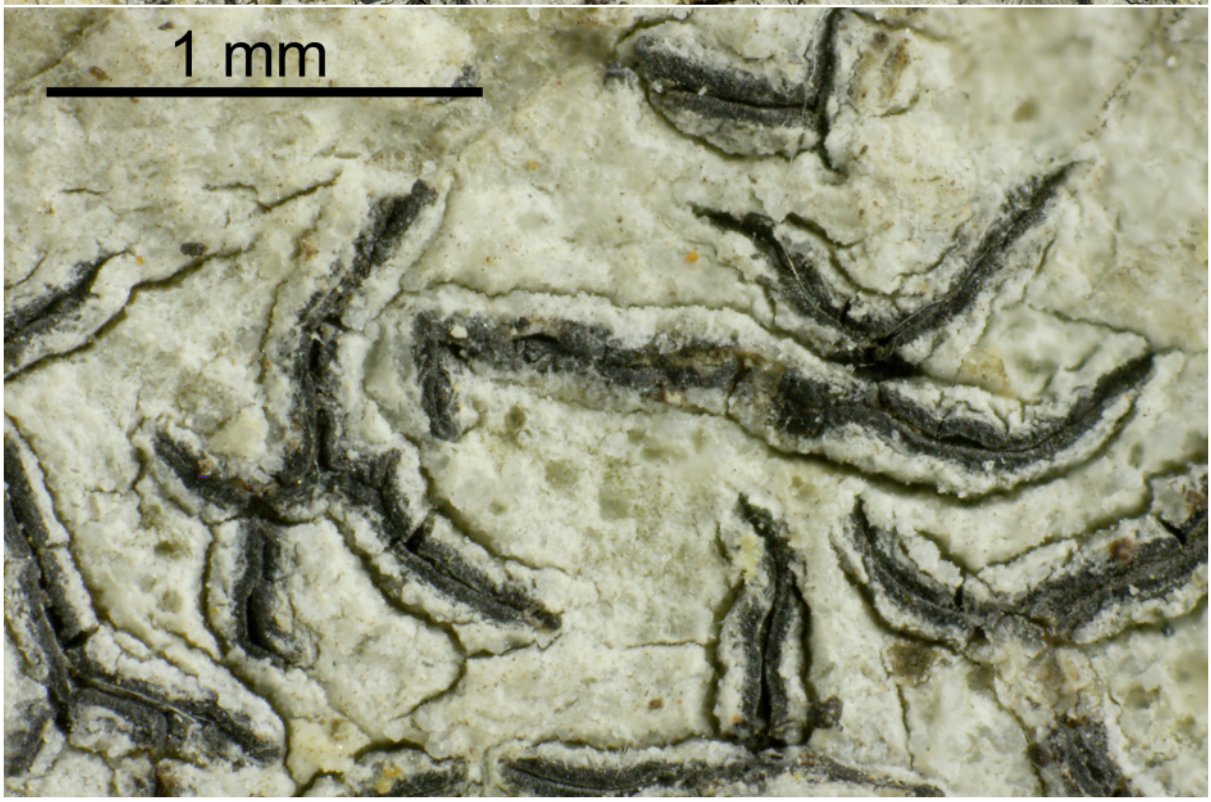

***Graphis supracola***

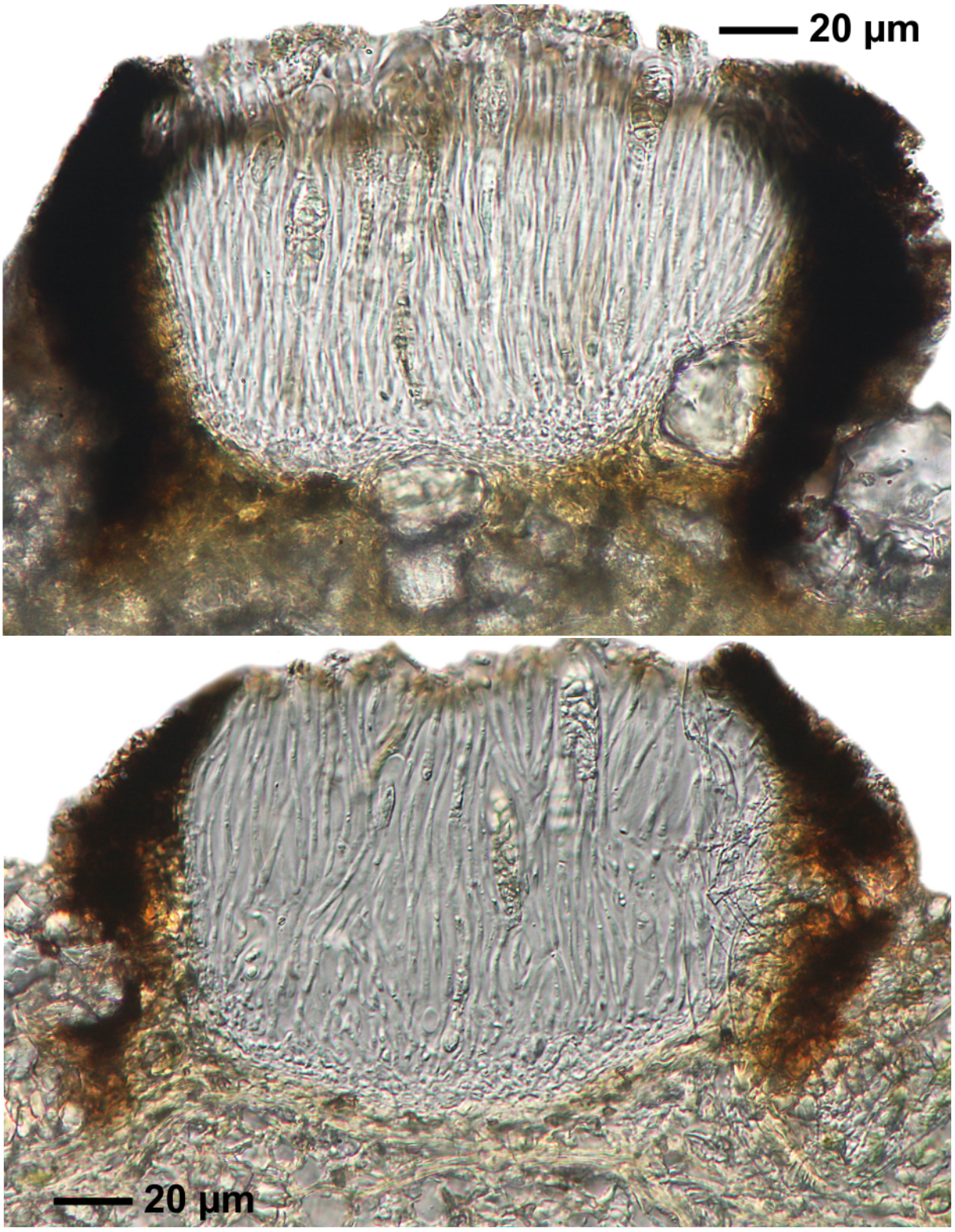
***Graphis tenuirima*** (Shirley) A.W.Archer
[= ***Graphina tenuirima*** Shirley]

Excipulum laterally carbonized. Ascospores hyaline, submuriform, 24-30 x 8-9 µm, with 7-8 transverse and with 0-1 longitudinal septa. Chemistry: nil (TLC).

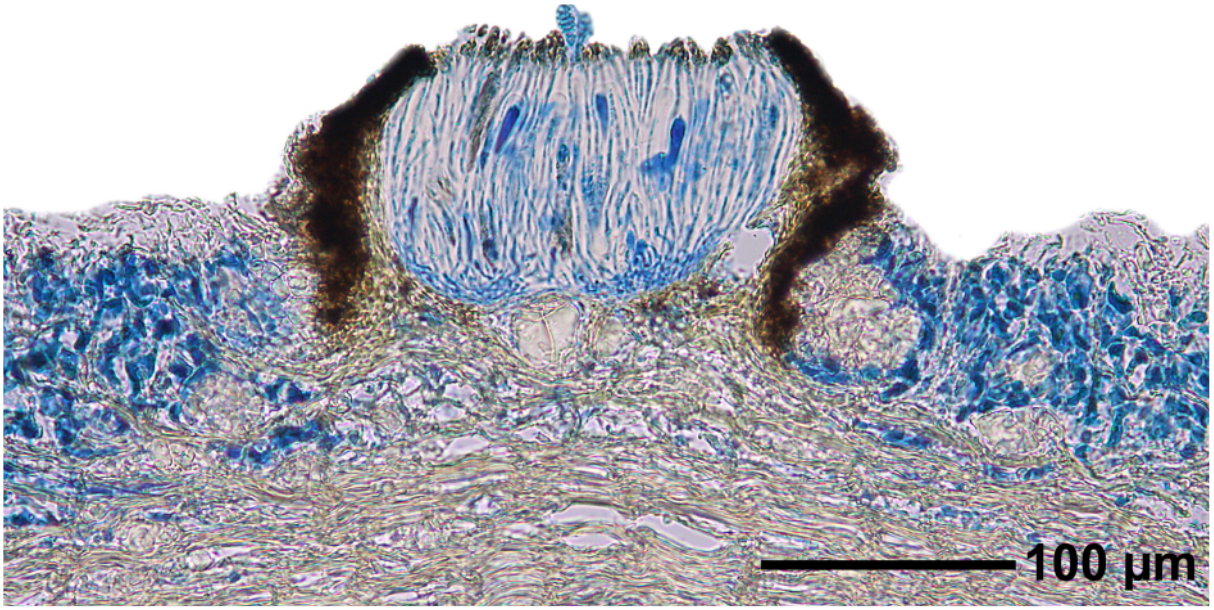
[7342], Kambodscha, Phnom Penh, am Hügel von Phnom Krom, 13°17.136' N, 103°48.816' E, 137 m. Leg. Schumm 03.08.2000, det. A.W.Archer 25.8.2003.

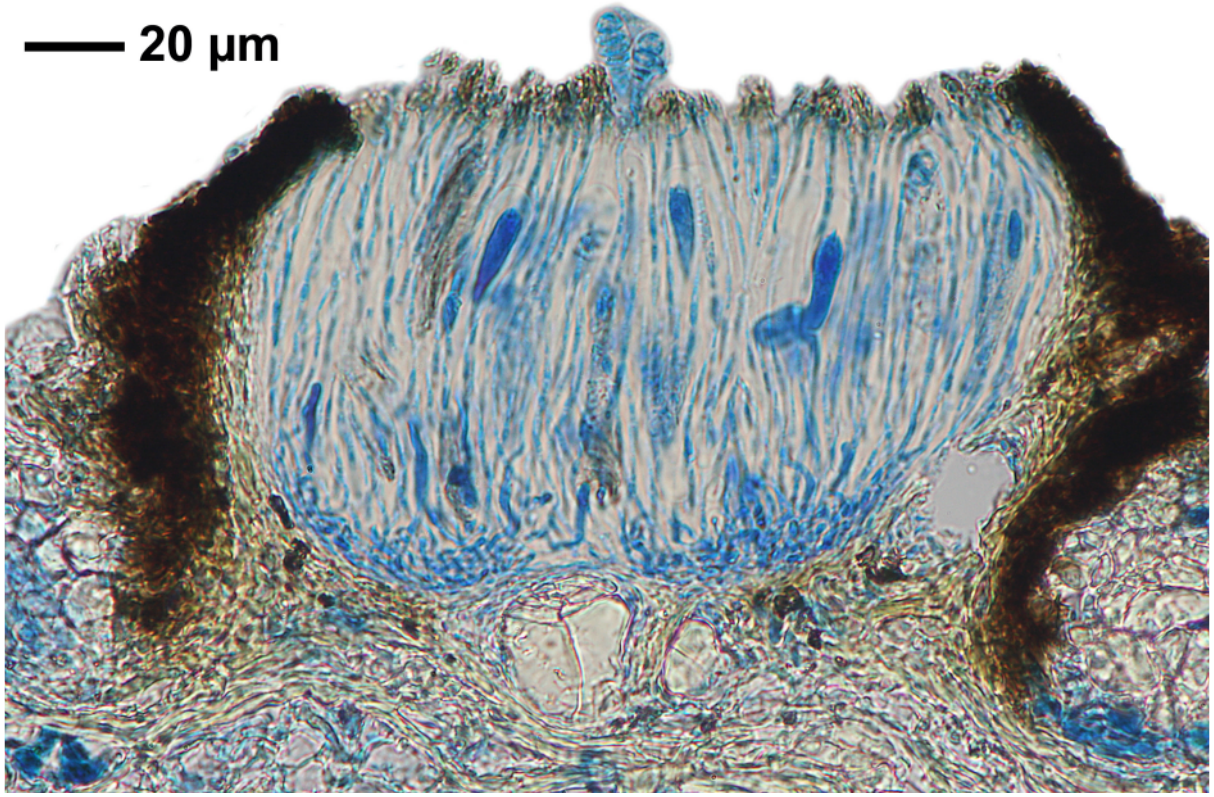


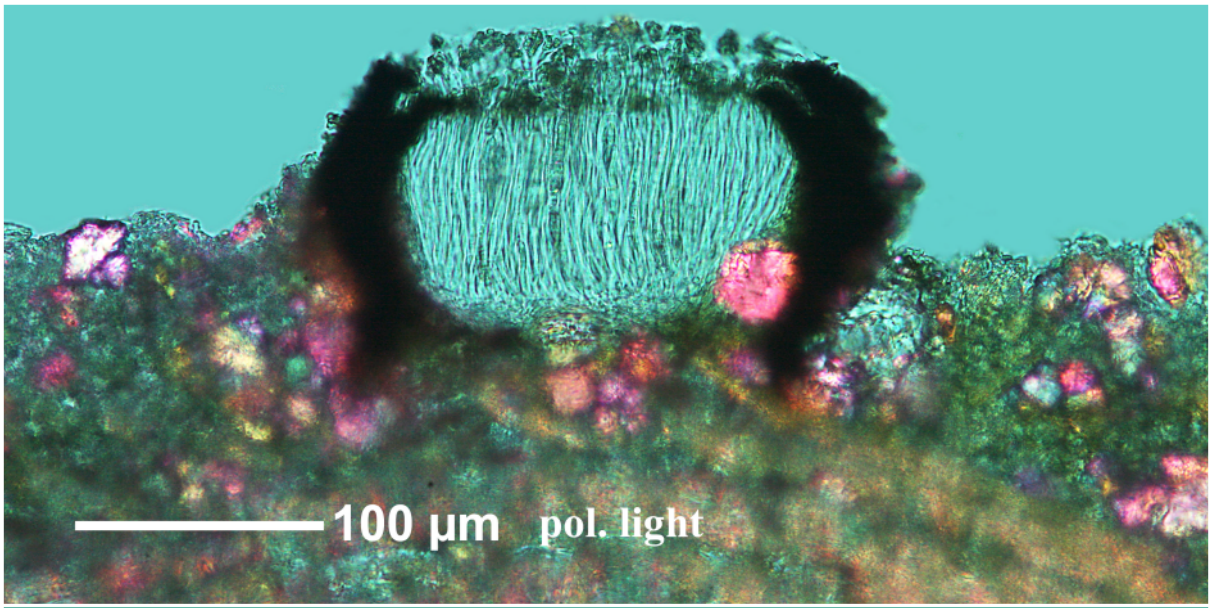


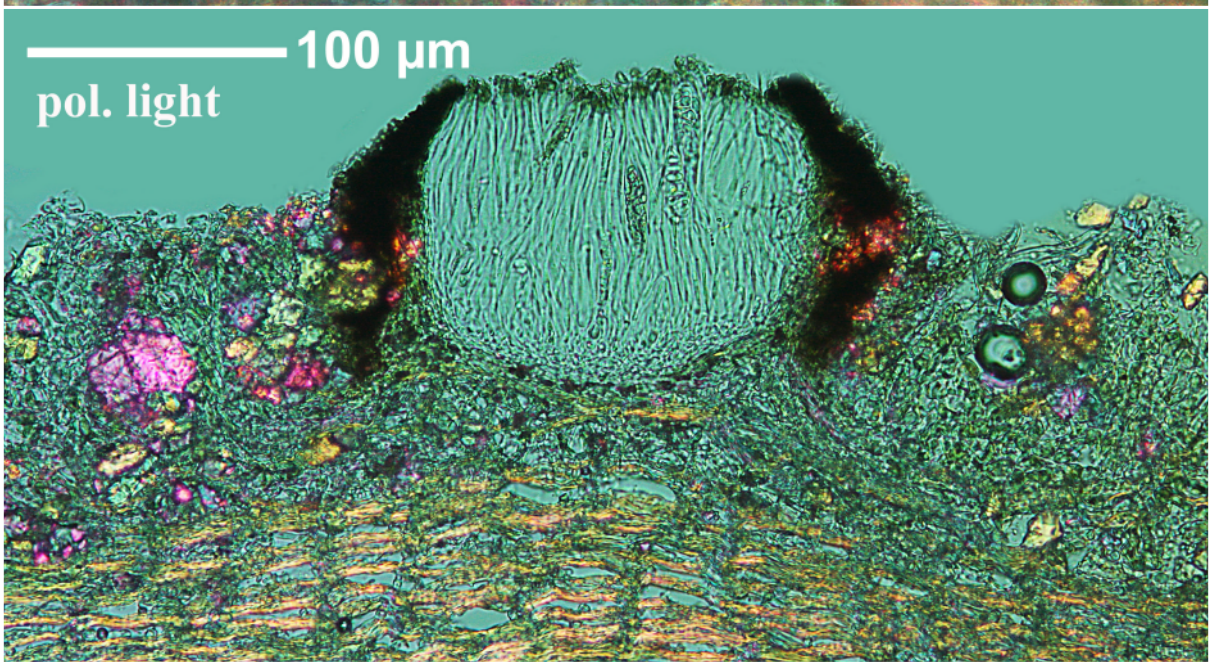

***Graphis tenuirima***



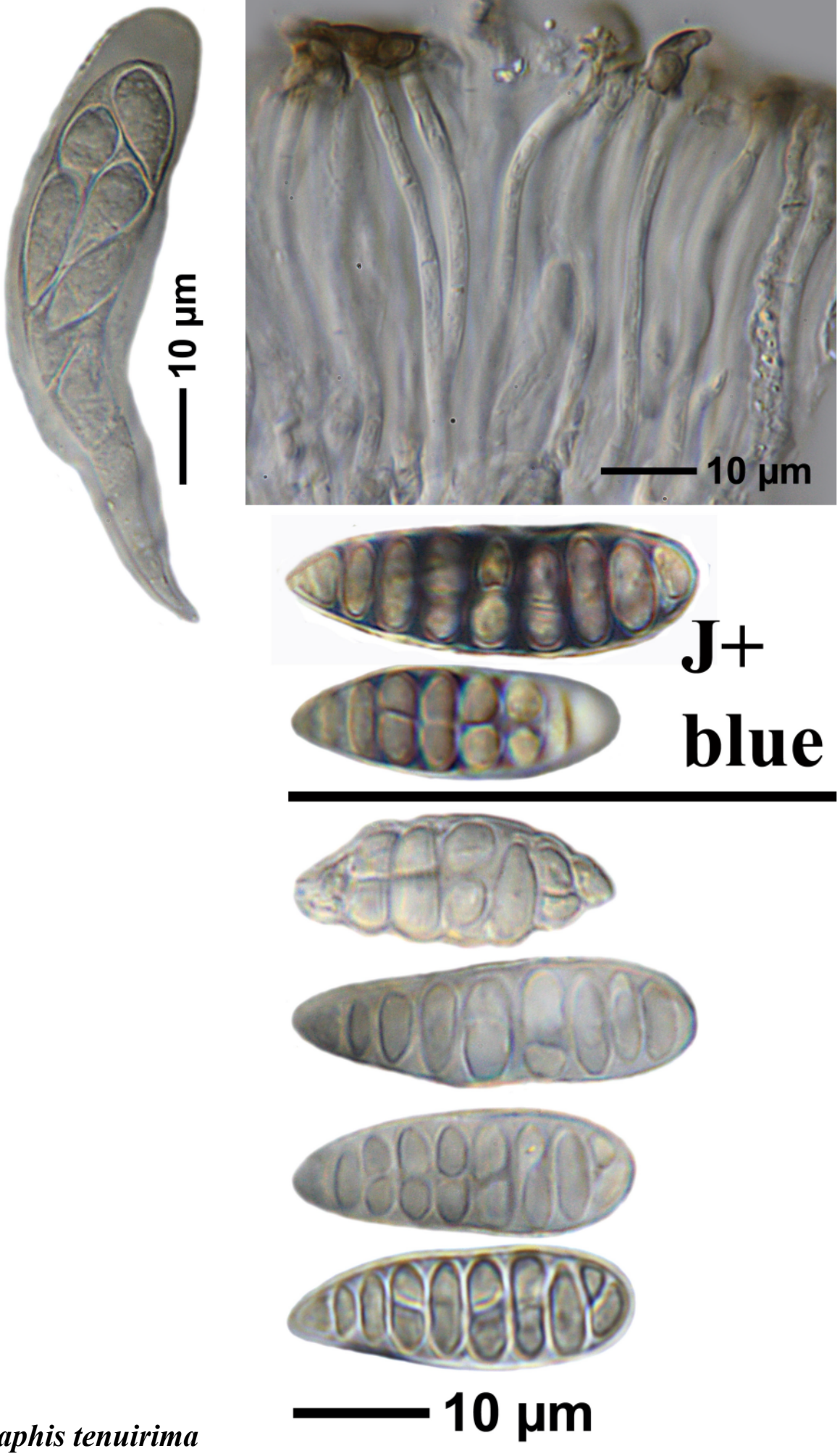




***Graphis tenuirima***




***Graphis tenuirima***




*Graphis tenuirima*

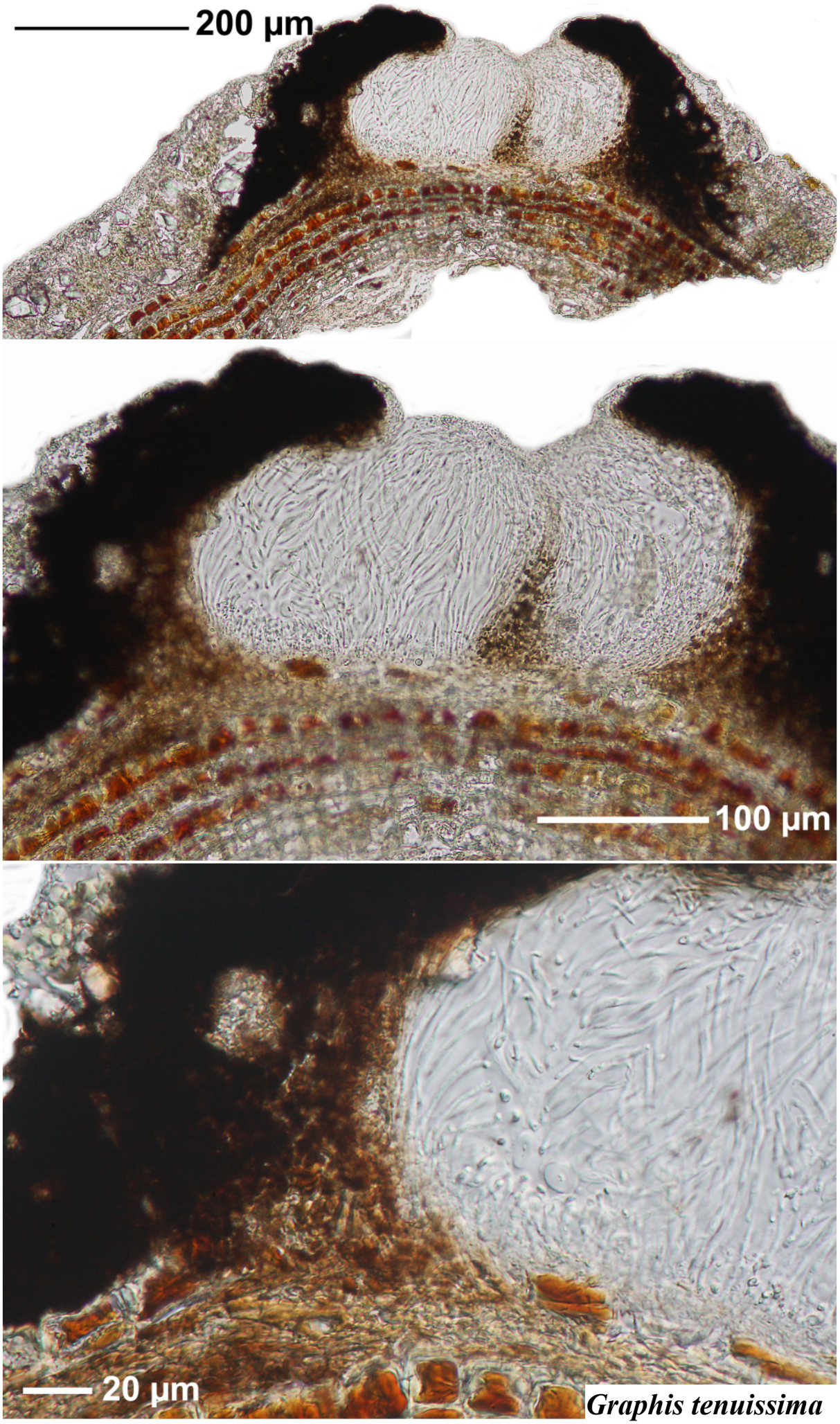
***Graphis tenuissima*** Fée

Exciple laterally carbonized. Hymenium not inspersed. Ascospores muriform, hyaline, 1/ascus, 40-50(-70) x 11-14 µm. Thallus K-

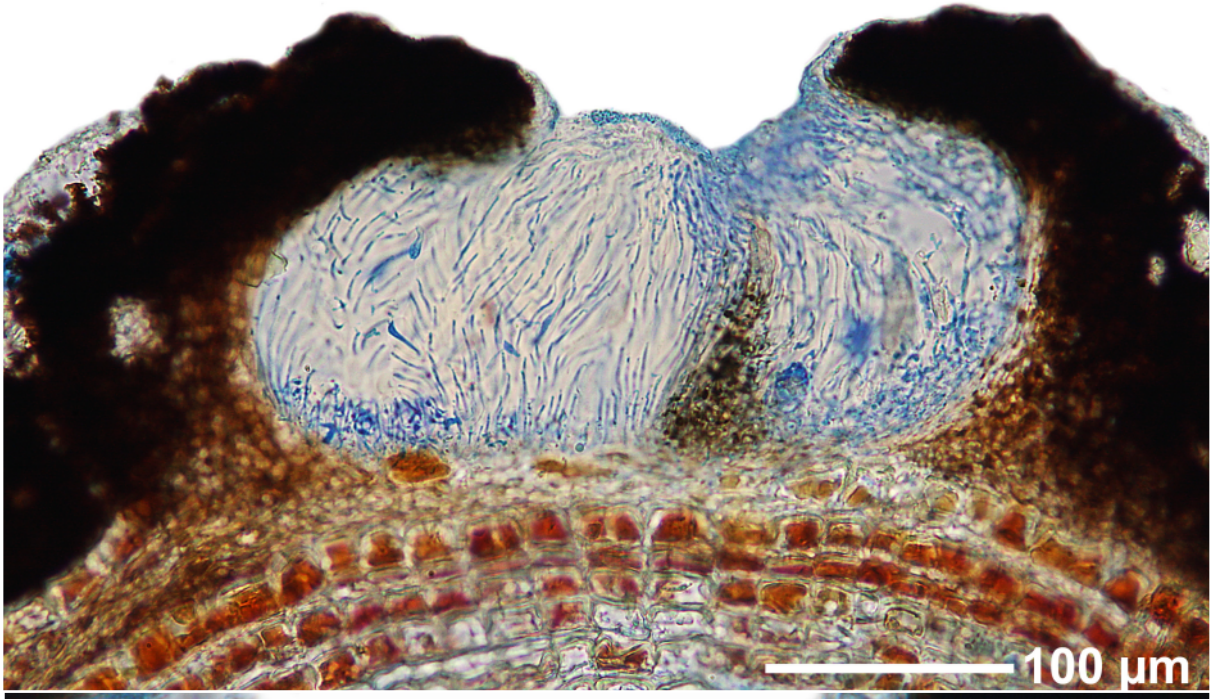
[14747], Kambodscha, Provinz Siem Reap, 10,6 km N Siem Reap, Tep Pranan, auf Rinde, 13°23'05" N, 101°33'01" E, ca. 100 m. Leg. U. Schwarz 14.02.1998 (Nr. 3030), det. Aptroot 2009.

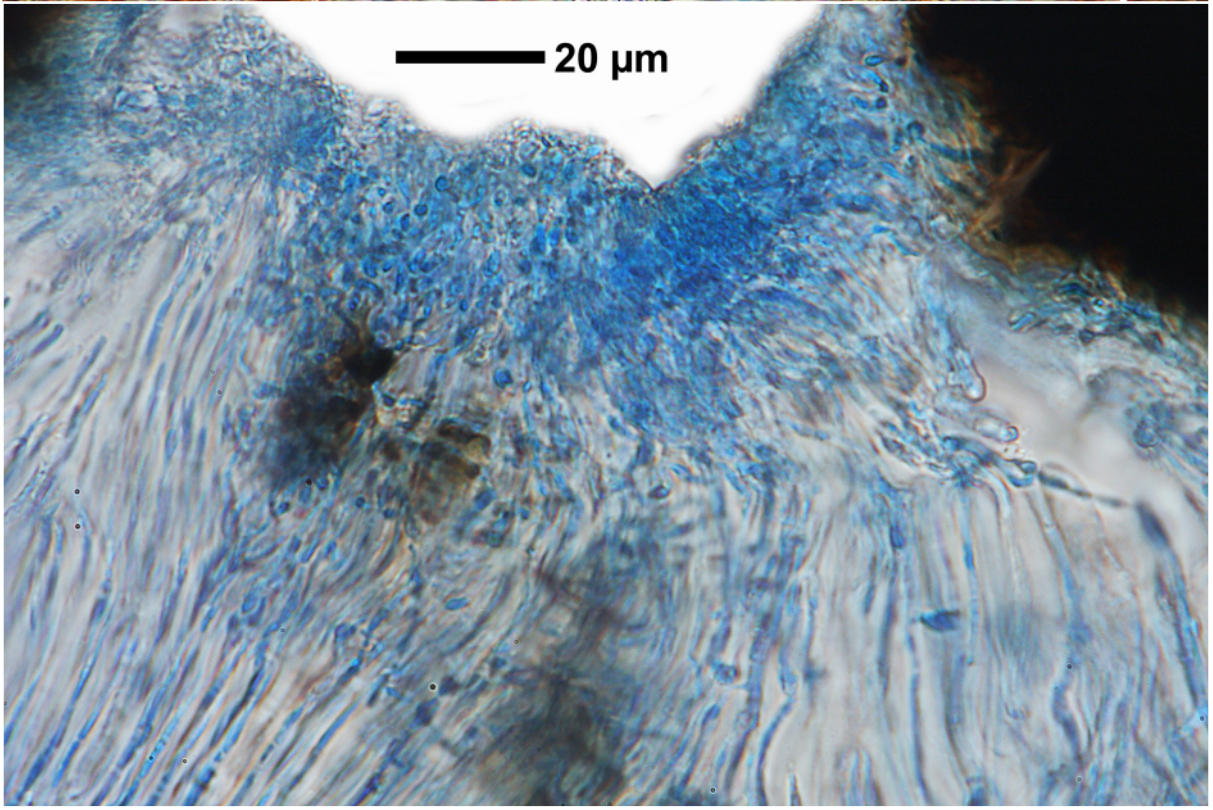




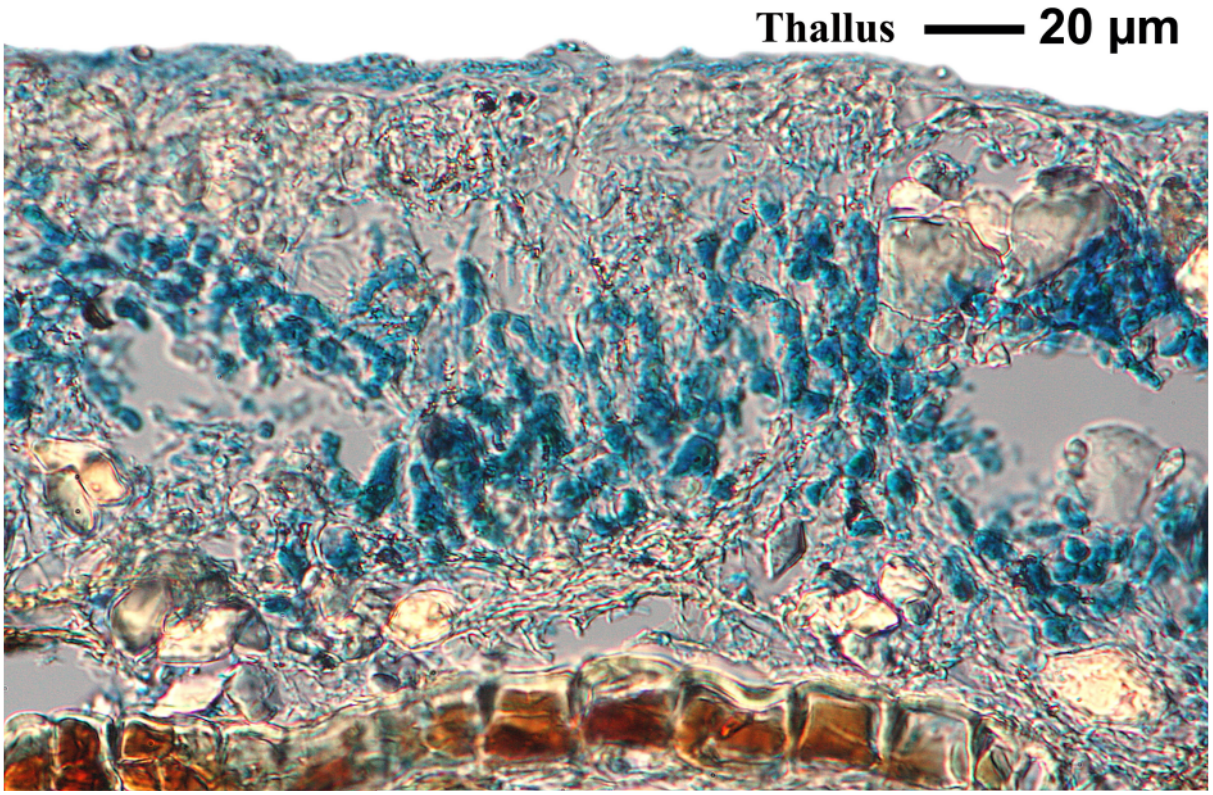



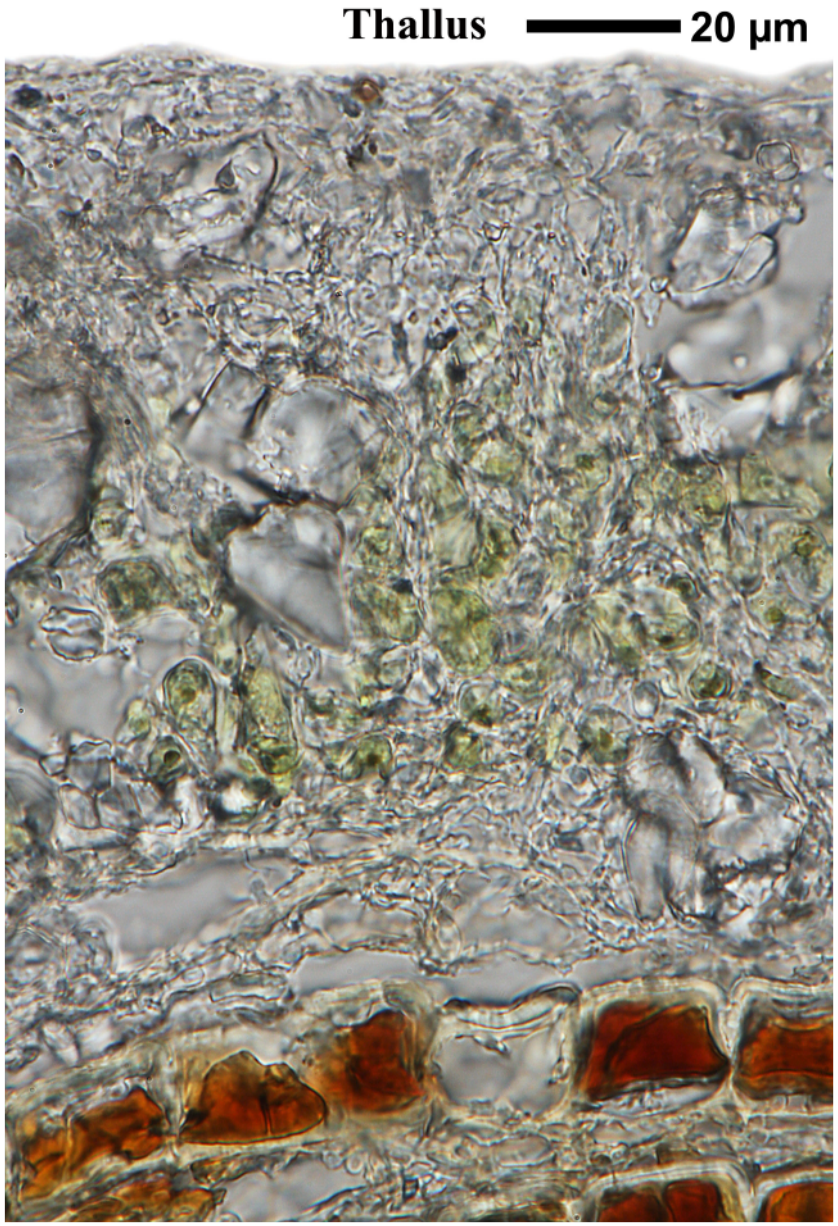

***Graphis tenuissima***



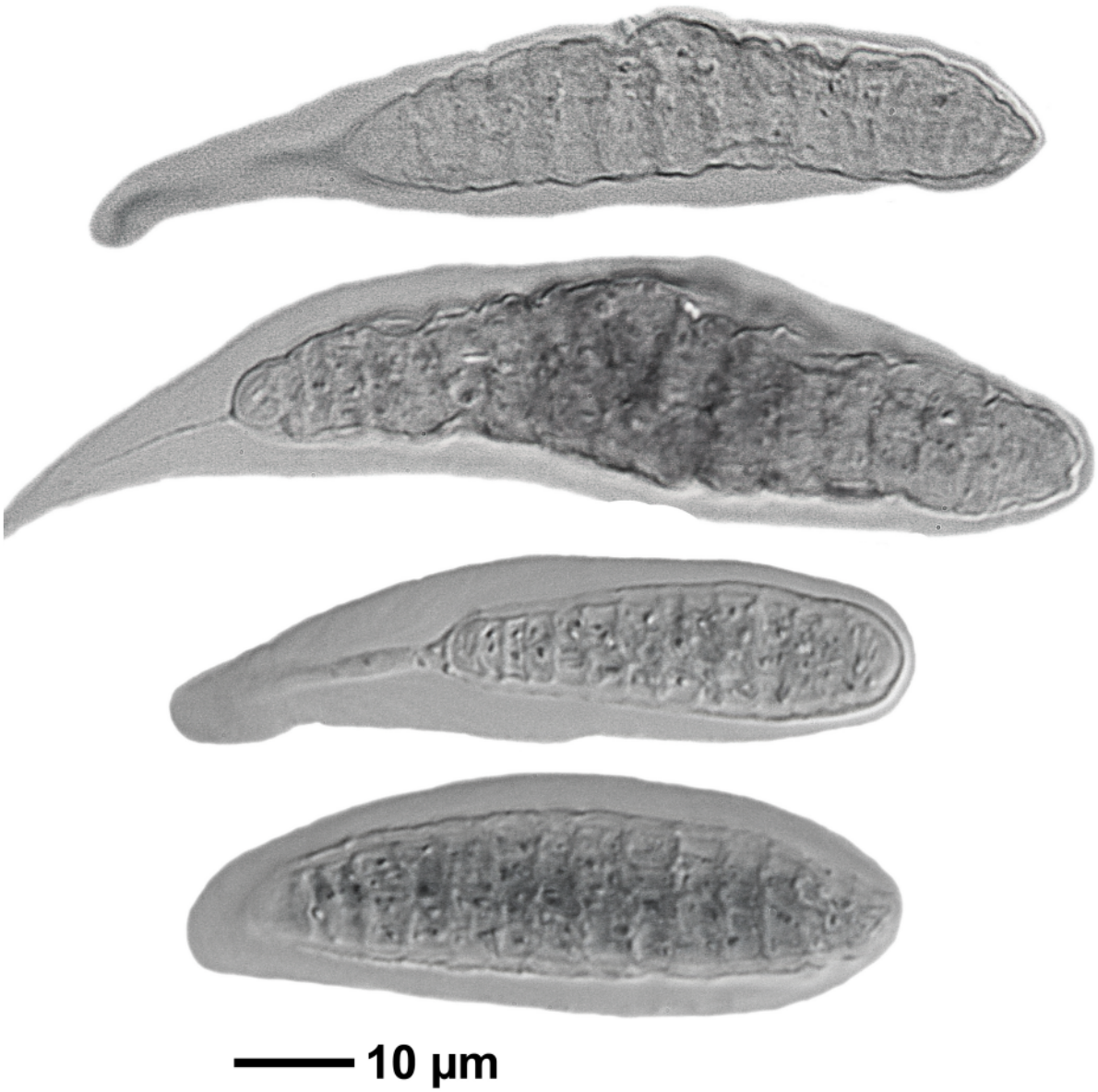




***Graphis tenuissima***




***Graphis tenuissima***



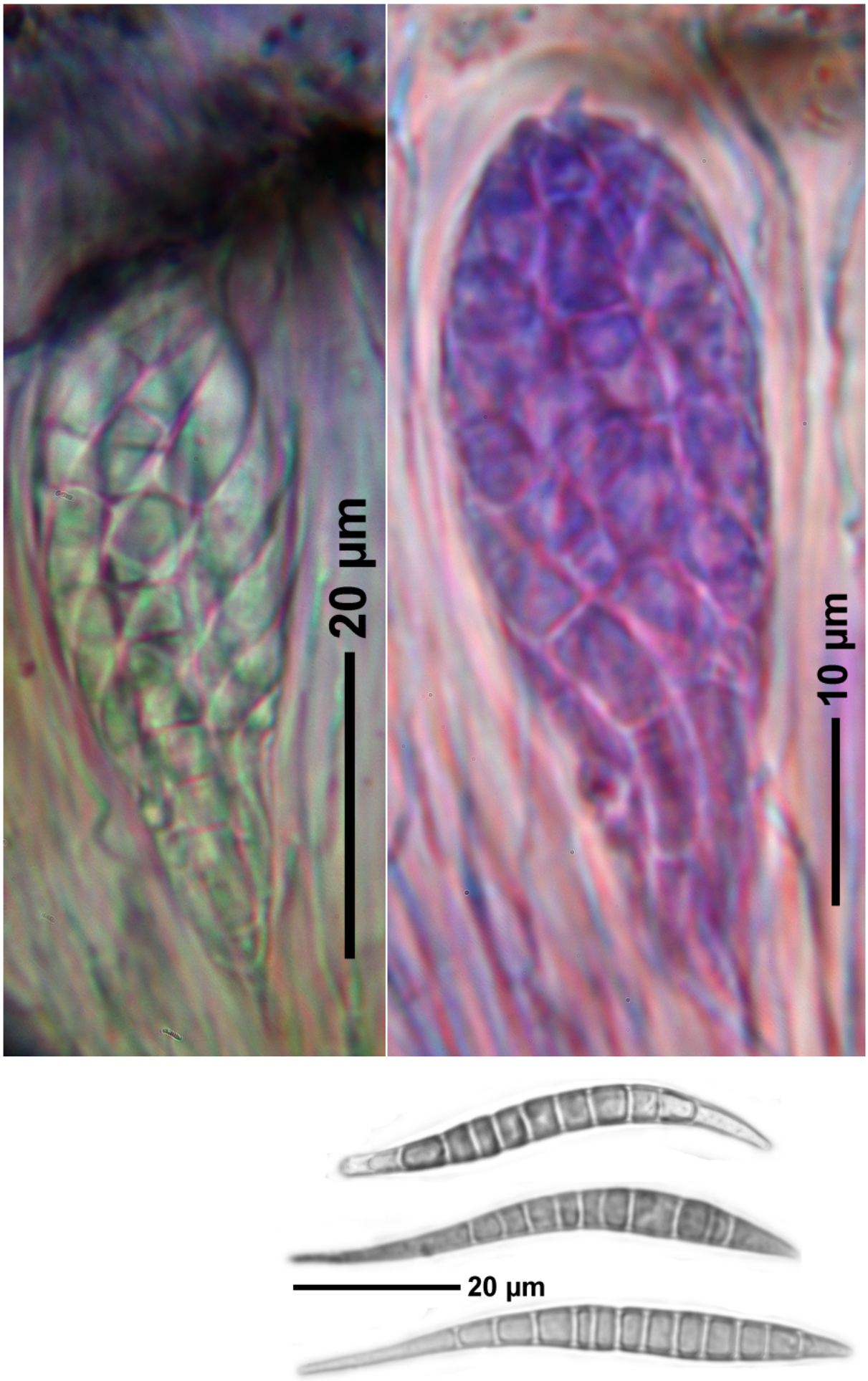

***Graphis tenuissima***

***Haematomma africanum*** (Steiner) C.W.Dodge

Thallus whitish to greenish grey, even or warty. Soredia and isidia absent. Apothecia sessile, cinnabar red, sometimes yellowish pruinose, 0.5-2 mm wide. Epithecium with dark red pigment, K+ blue-violet, but after short time becoming colourless. Ascospores hyaline, 8/ascus, 11-13(-20)-cellular, 45-80 x 4-5.5 µm, straight or „S“-curved. Chemistry: atranorin, haematommone, placodiolic acid. Pantropical. Lit. Staiger & Kalb (1995).

[7424], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail von Valencia Barangay Lunga (9°16.676’ N, 123°13.839’ E) bis zum Camp Vendiola (09°16.281’ N, 123°11.410’ E), appr. 740 m. Leg. Schumm 09.08.2000, det. Schumm 2008.





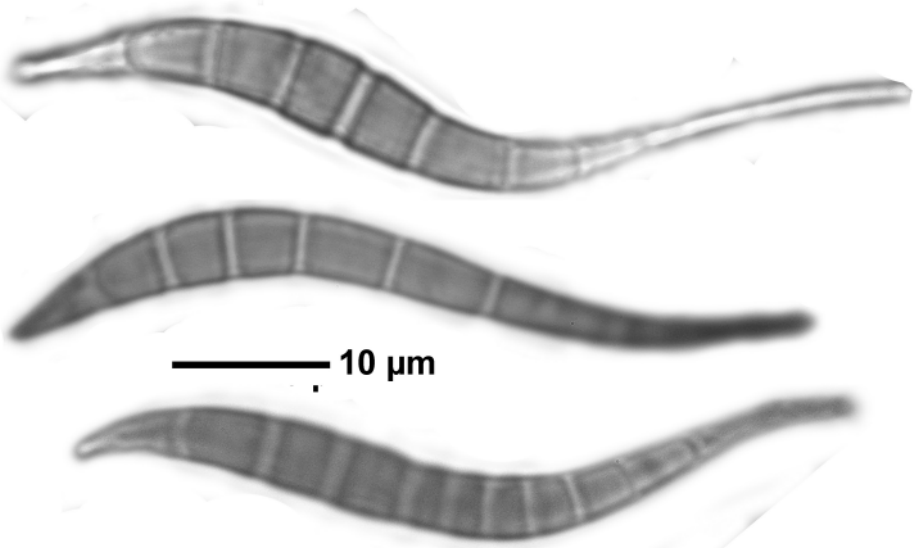

***Haematomma africanum***

***Haematomma collatum*** (Stirt.) C.W.Dodge

Thallus pale to yellowish grey, small warty. Isidia and Soredia absent. Apothecia sessile, 1-1.5 mm wide. Disc red, not pruinose. Thallin margin strongly crenate. Epithecium and upper hymenium with red pigment, K+ durable red-violet (russulone). Ascospores hyaline, 8/ascus, „S“-shaped, 9-11-cellular, 50-70 x 4-4.5 µm. Chemistry atranorin, sphaerophorine, russulone. Corticolous, pantropical.

[7651], Philippinen, Cebu, Prov. Cebu, auf dem Tops ca. 7 km NW von Cebu-City, bei 660 m. Leg. Schumm 14.08.2000, det. Schumm 2008.



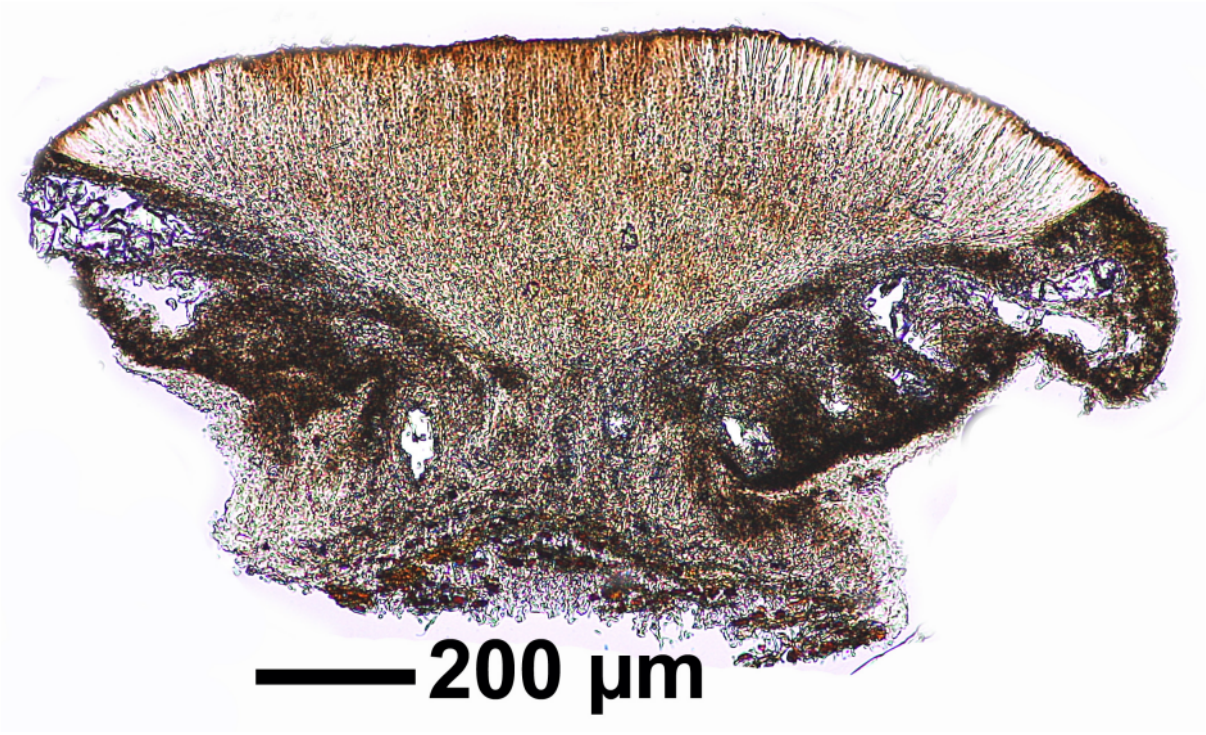



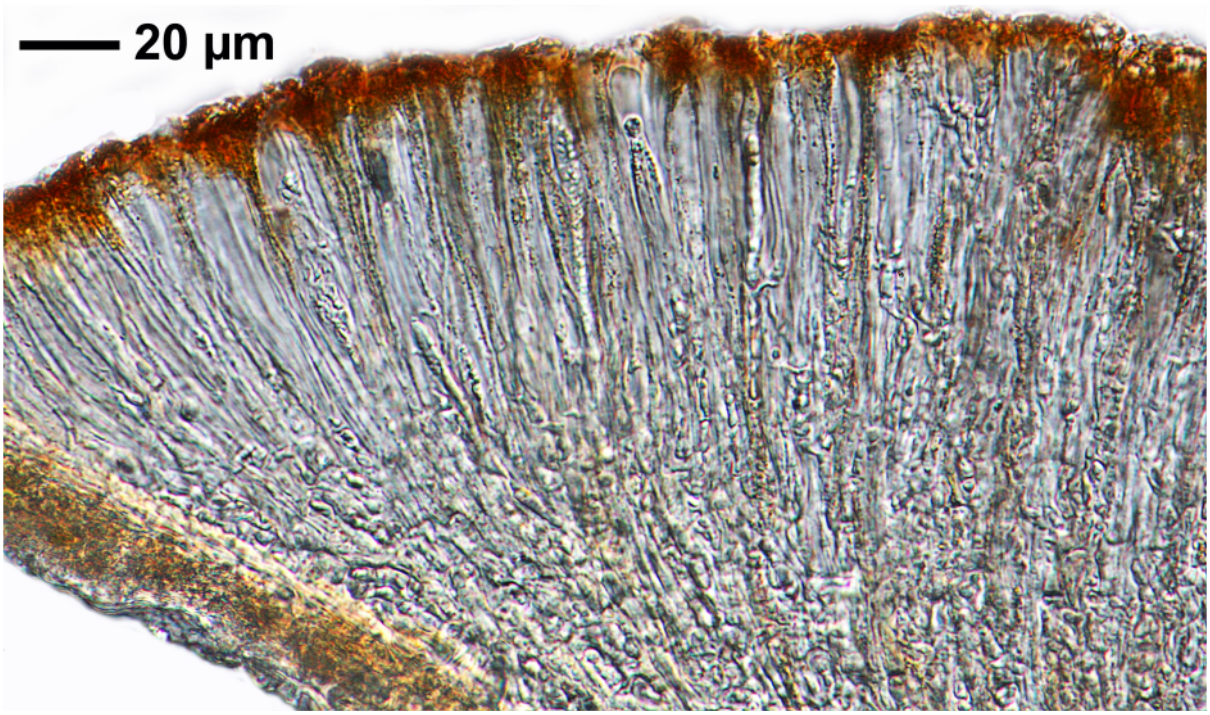
***Haematomma collatum*** (Stirt.) C.W.Dodge

Thallus warty granulose. Soredia and isidia absent. Apothecia red. Epithecium with russulone (K+ durable red solution with tiny red crystals). Ascospores 52-53 x 5-6 µm, appr. (5-)7(-8)-septate, curved. Chemistry: thallus UV-, atranorin (min), russulone sphaerophorin, isosphaeric acid.

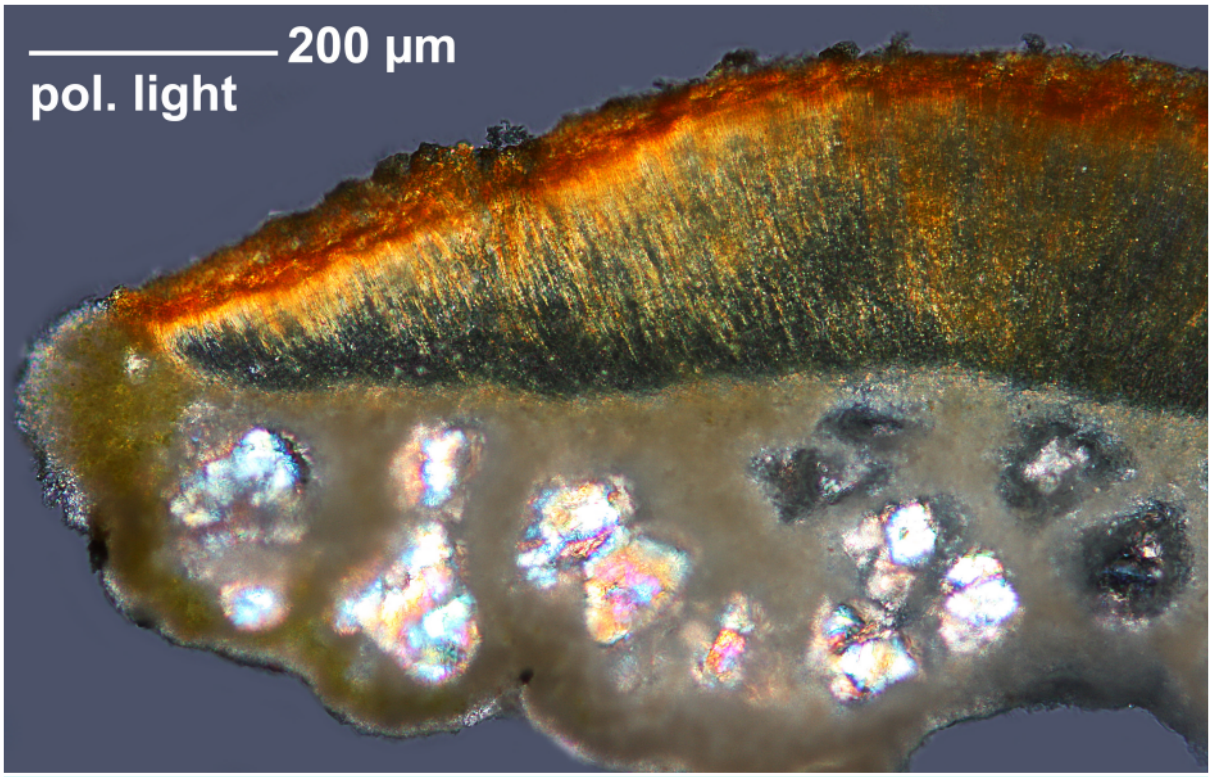
[15525], La Reunion, Anse des Cascades, meist auf Cocos-Palmen; 21,18511° S, 55,82711° E, 0 m. Leg. Schumm & Frahm 14.09.2009, det. Schumm 02.2010.

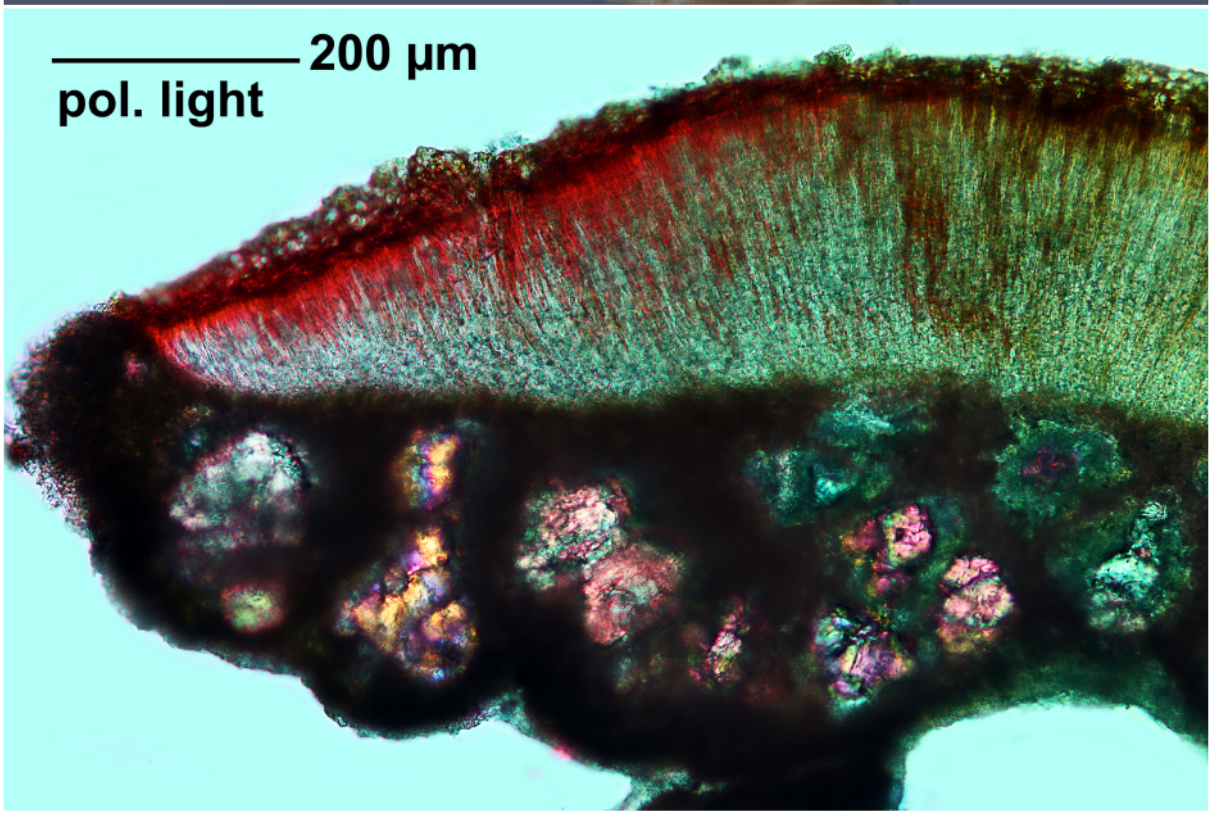




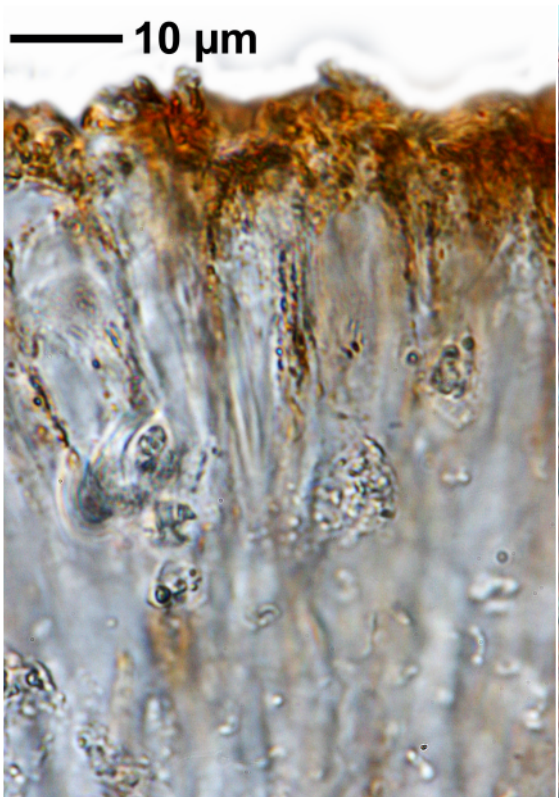




***Haematomma collatum***



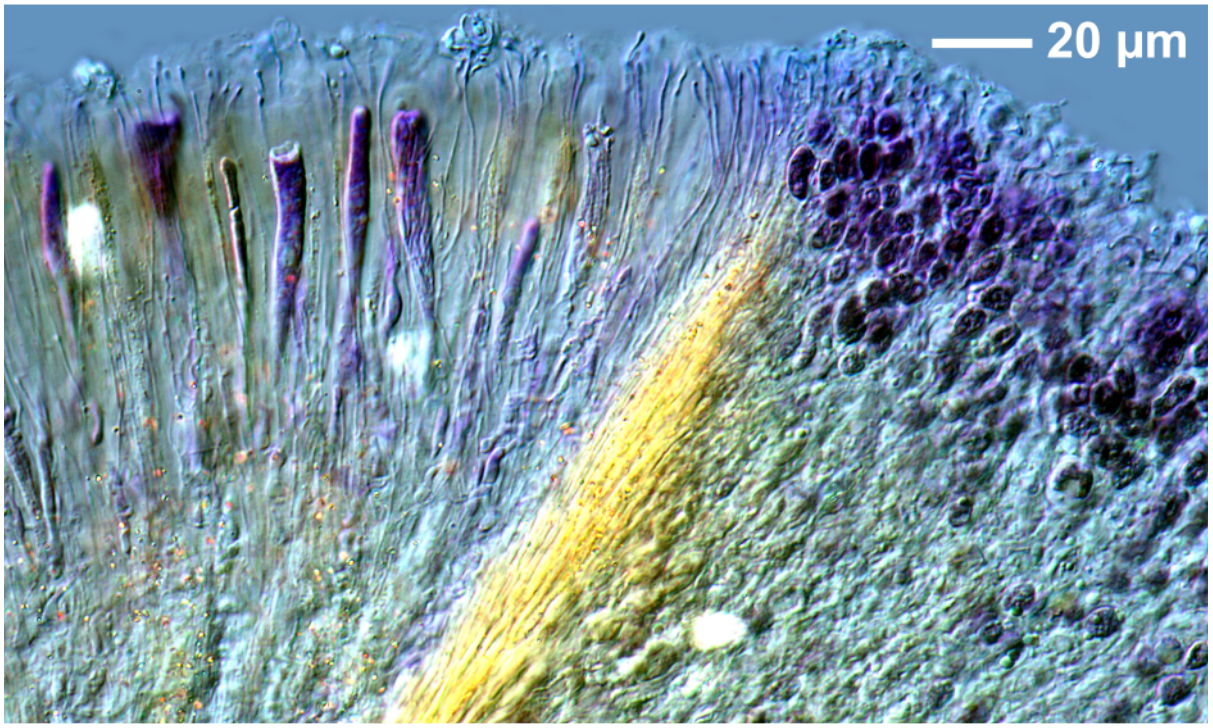




***Haematomma collatum***

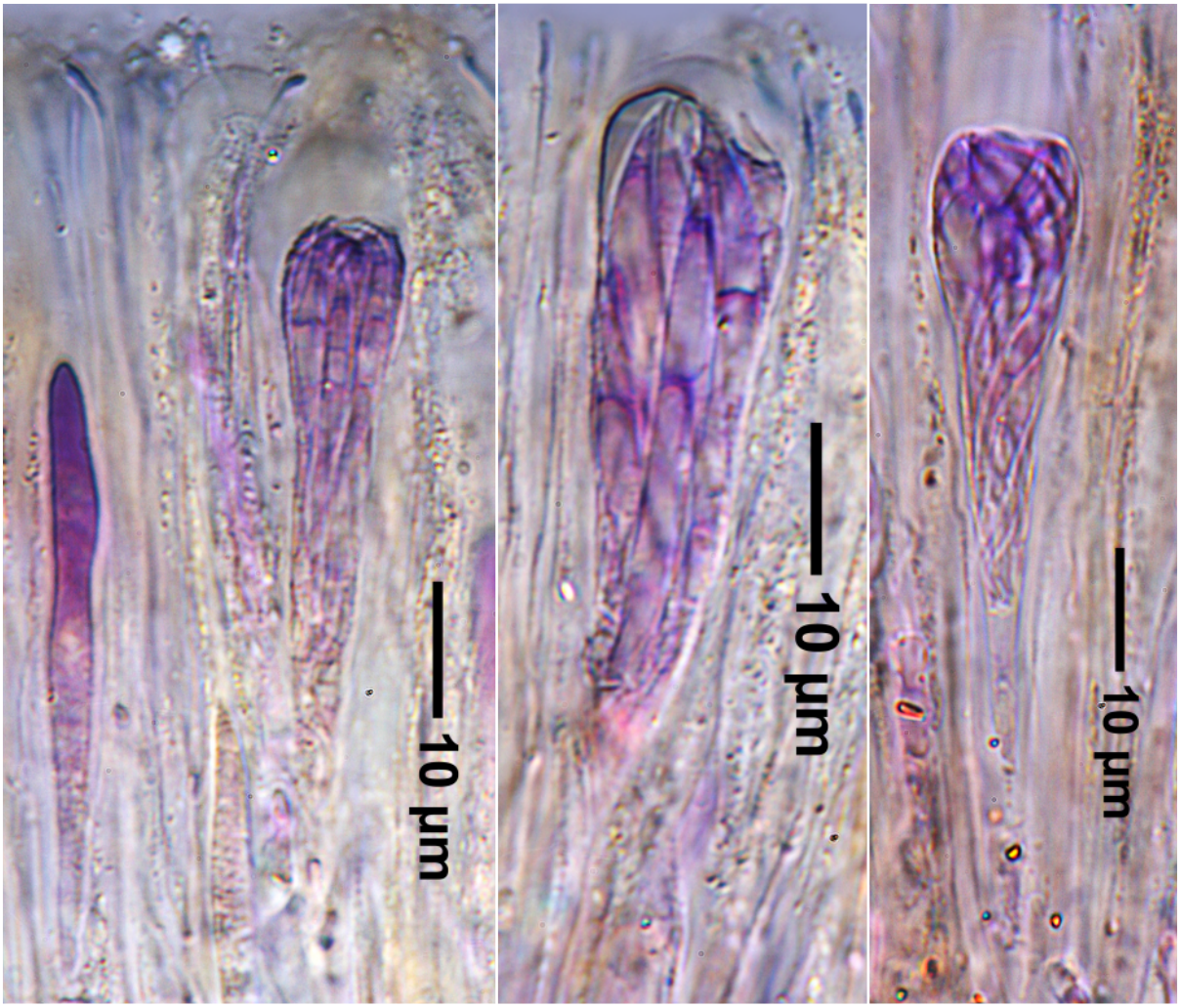


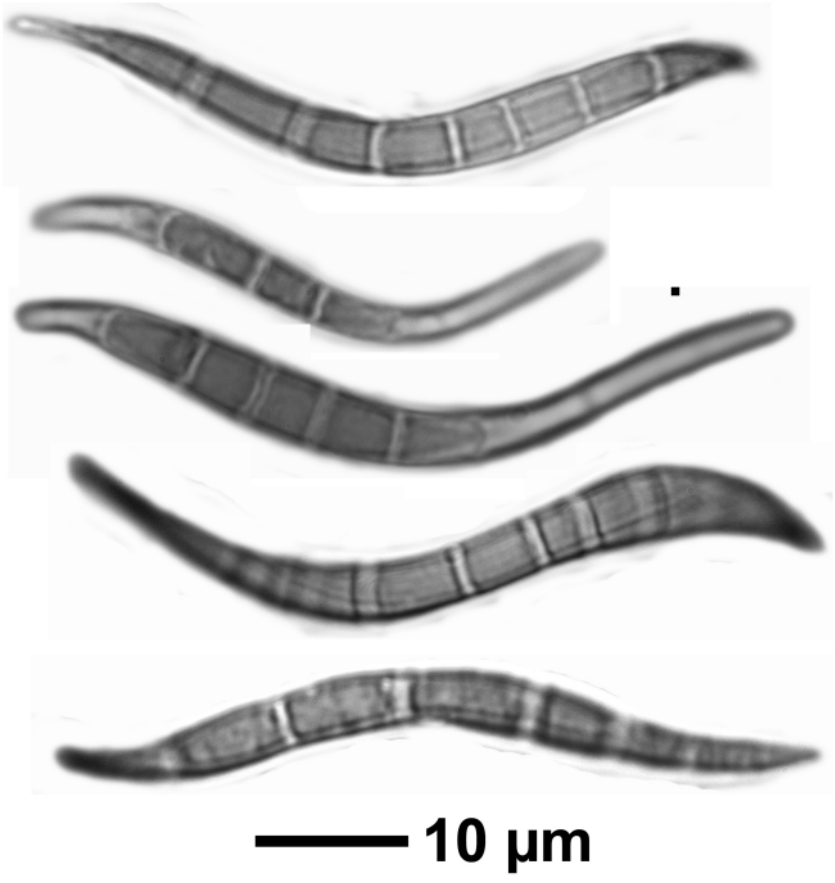







*Haematomma collatum*



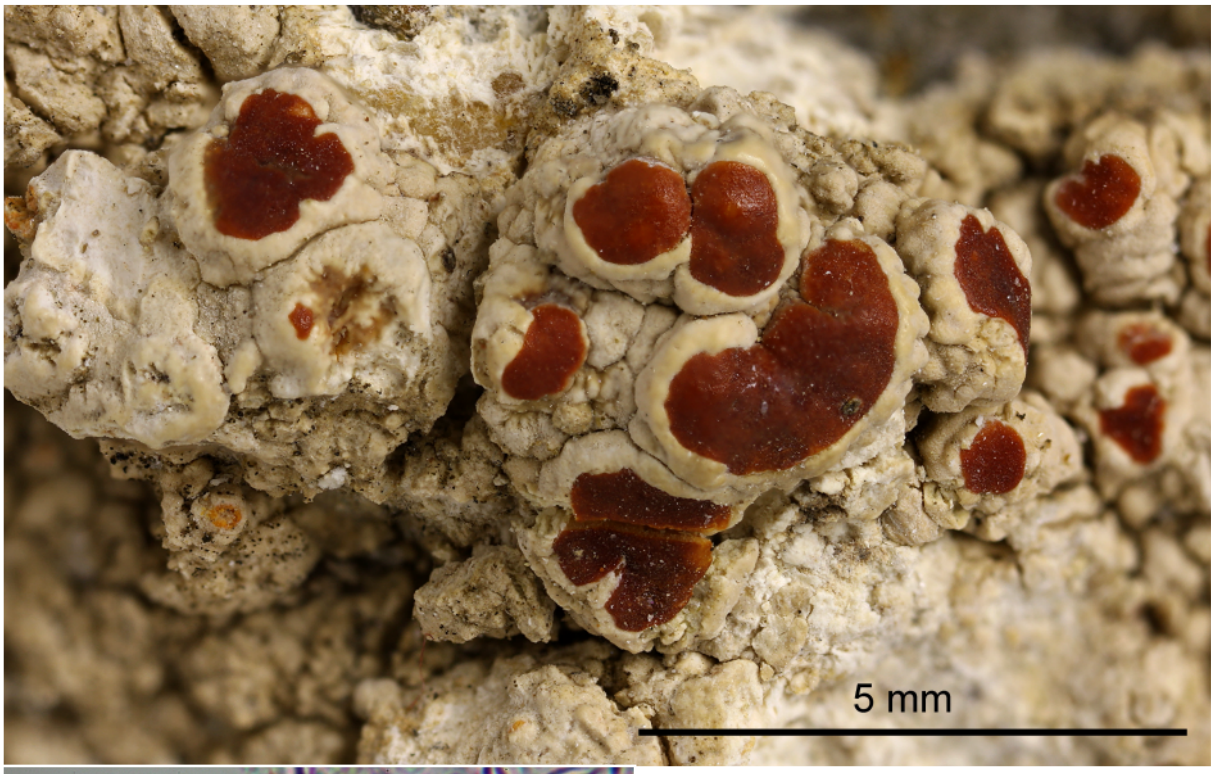




***Haematomma collatum***

***Haematomma nemetzii*** J.Steiner

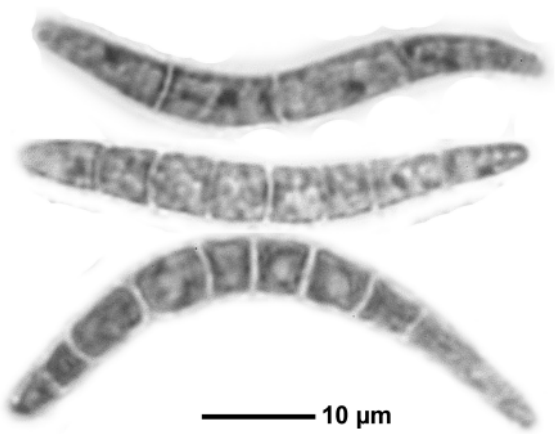
Thallus grey, greenish grey, warty, deeply cracked. Soredia and isidia absent. Apothecia red, not pruinose, bulging, 0.5-3 mm, somewhat immersed. Epithecium K+ durable red (russulone). Ascospores hyaline, 8/ascus, 3-7-septate, straight or curved, 25-50 x 4.5-8 µm. Saxicolous. Chemistry: atranorin, psoromic acid, russulone, roccelic acid (tr), 2'-O-demethylpsoromic acid (± tr). Lit.: Staiger & Kalb (1995)

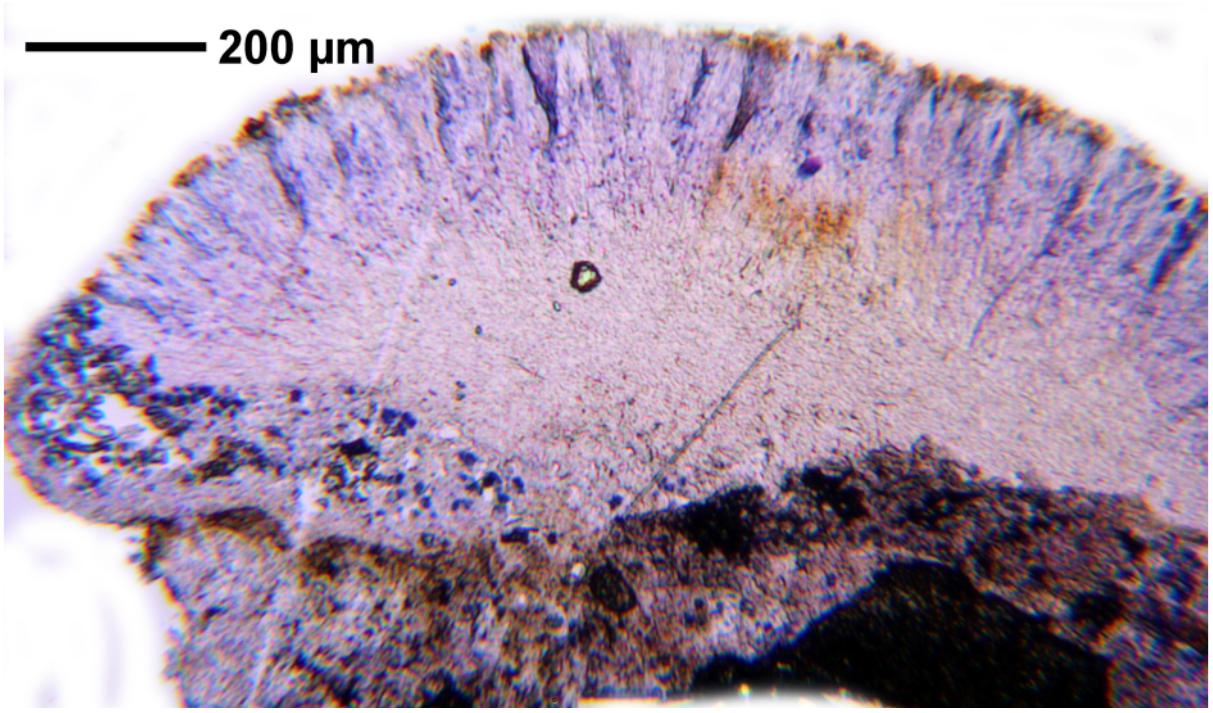
[11974], Türkei, Southwest Anatolia, Province of Mugla, Pinus nigra dominated pinewood in the fog-belt around Kosantepe Pass at Bespar-mak Dag between Narhisar and Cukurköy, covering larger rain-protected, overhanging gneissose rocks, 850 m. Leg. V. John 03.1983, det. V. John. Ex Follmann: Nr. 547 Lichenes Exsciccati Selecti Ab Instituto Botanico Universitatis Coloniensis Editi. (test TLC Schumm).

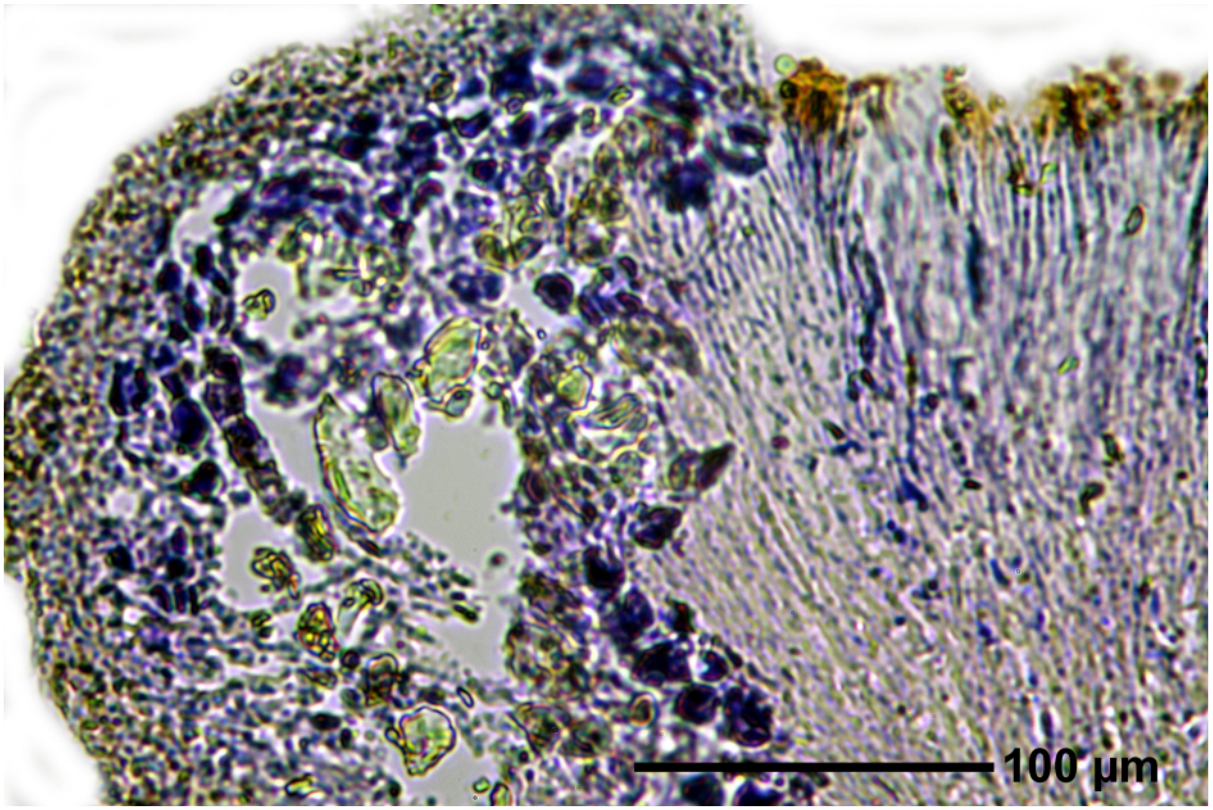


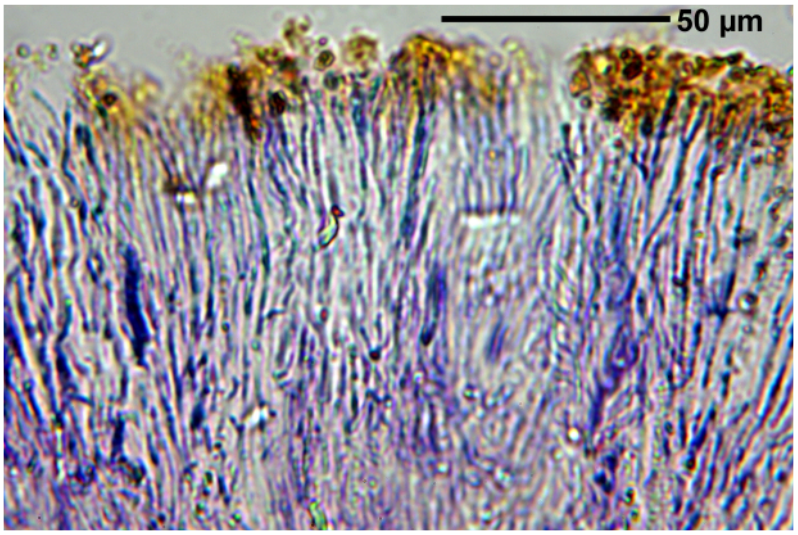








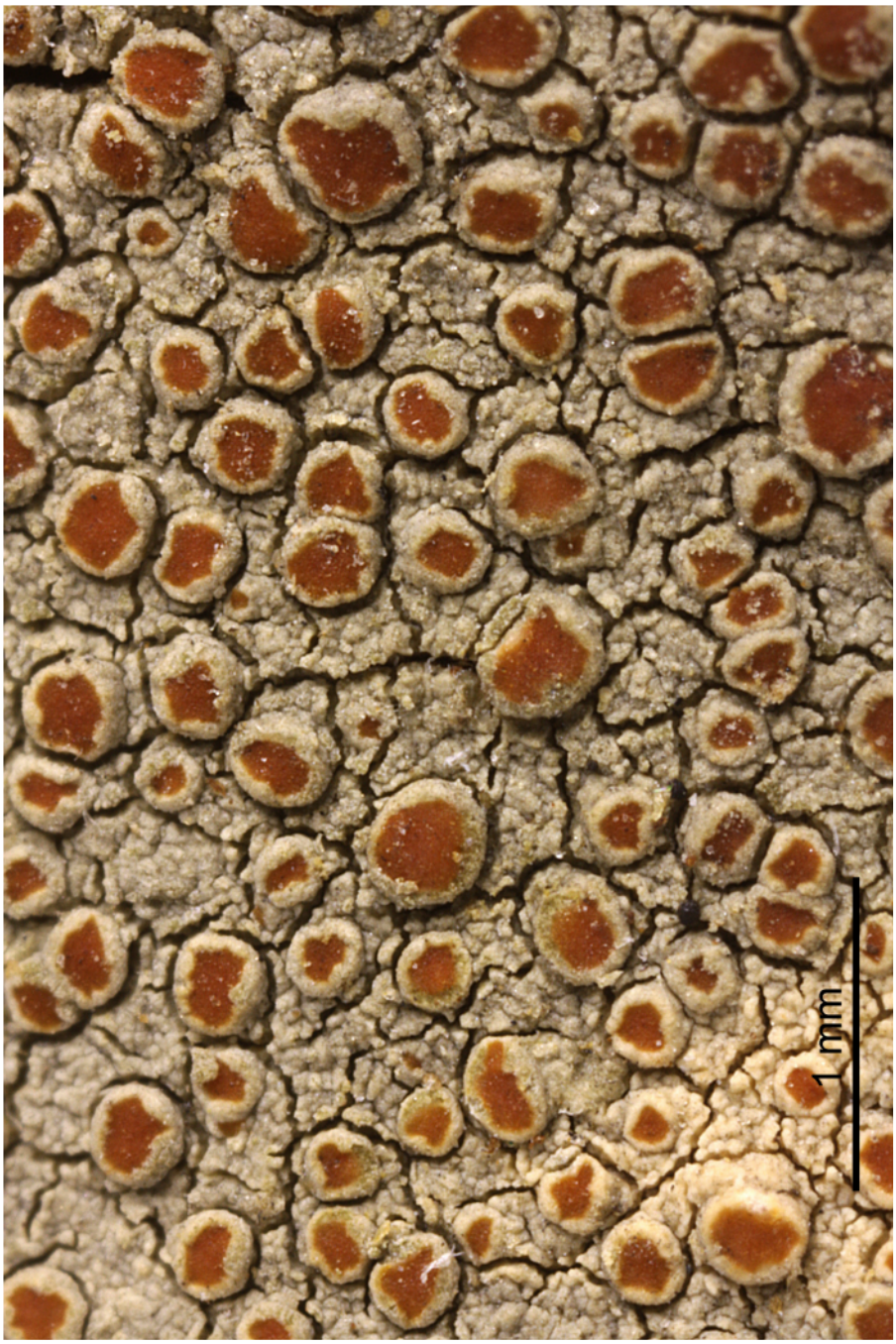



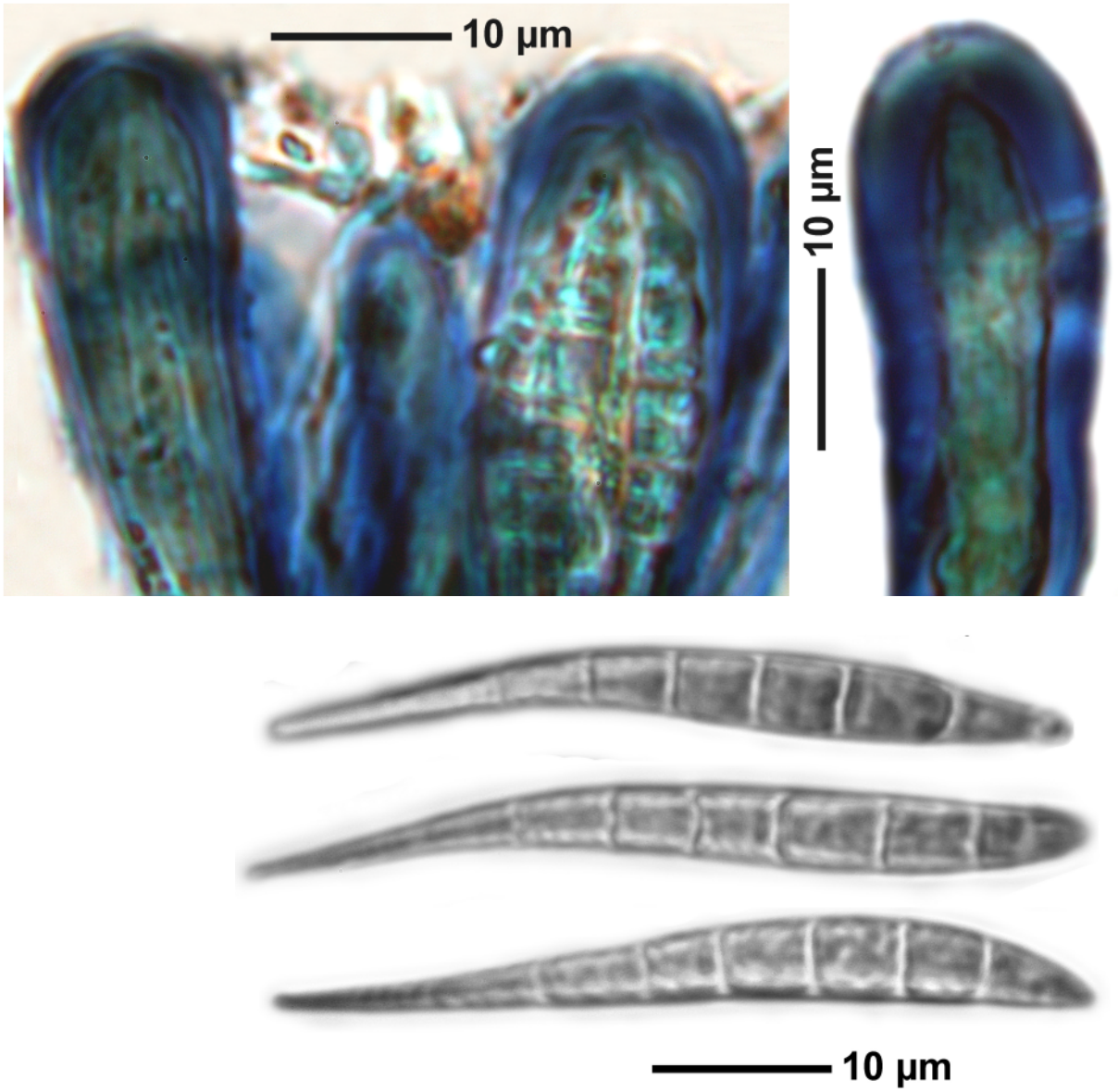

***Haematomma nemetzii***

***Haematomma persoonii*** (Fée) A.Massal.

Thallus whitish to greenish grey, even to warty, ± cracked, 0,3-0,5 mm thick. Soredia and isidia absent. Apothecia broad sessile to immersed, 0.3-1.5 mm wide. Disc red, not pruinose. Thalline margin simple to somewhat crenulate. Epithecium K+ durable red (russulone). Ascospores hyaline, 8/ascus, 7-8-cellular, straight or somewhat „S“-curved, 30-50 x 3.5-5 µm. Chemistry: atranorin, russulone, sphaerophorin (±), isosphaeric acid (±). Thallus K+ gelb, UV-, apothecium margin UVL+ bluish white. Corticolous, pantropical. Lit. Staiger & Kalb (1995)

[2313], USA, Louisiana, East Baton Rouge, Parish: Grey-green crust & rim, rust-red disk. Common on branches of hickory and oak. Leg. Shirley C. Tucker 20.11.1966, as # 6678), test. Schumm (TLC) 2009.






***Haematomma persoonii***

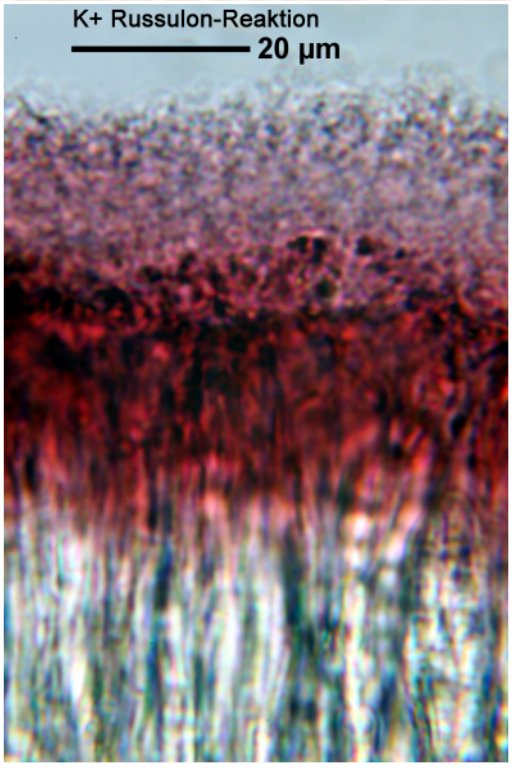
***Haematomma persoonii*** (Fée) A.Massal.

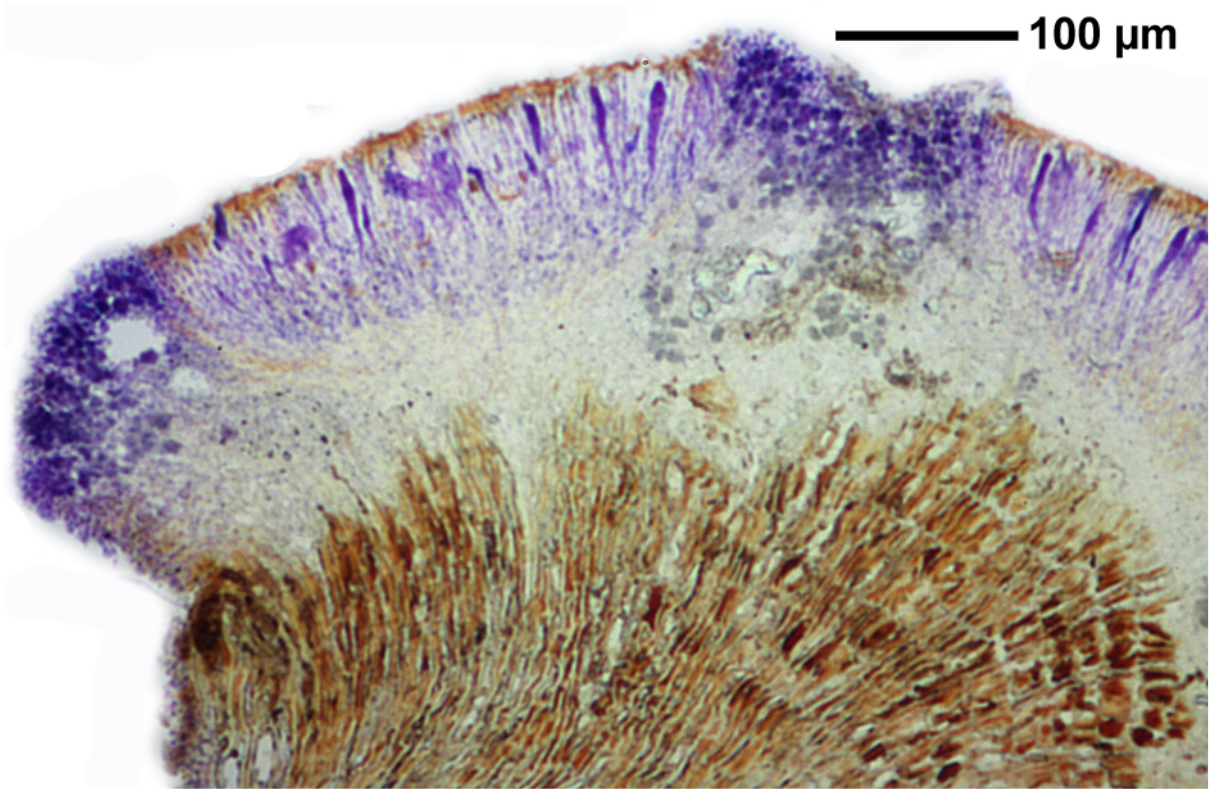
[2891], Nordargentinien, Prov. Corrientes: kleinflächig an verhältnismäßig glatten Borkenschollen halbschattiger Mittelstämme älterer Laubbäume im offenen Regenwald im Ochrolechietum austroamericanae, 300 m, pH 6,5, Tabay im Departamento Conceptión. Leg. M.M. Arbo 09.1980. Follmann: Nr. 346 Lichenes Exsiccati Selecti A Instituto Museo Historiae Naturalis Casselensi Editi, distributed as *Haematomma puniceum* (already corr. by Staiger & Kalb, 1995, p. 157).

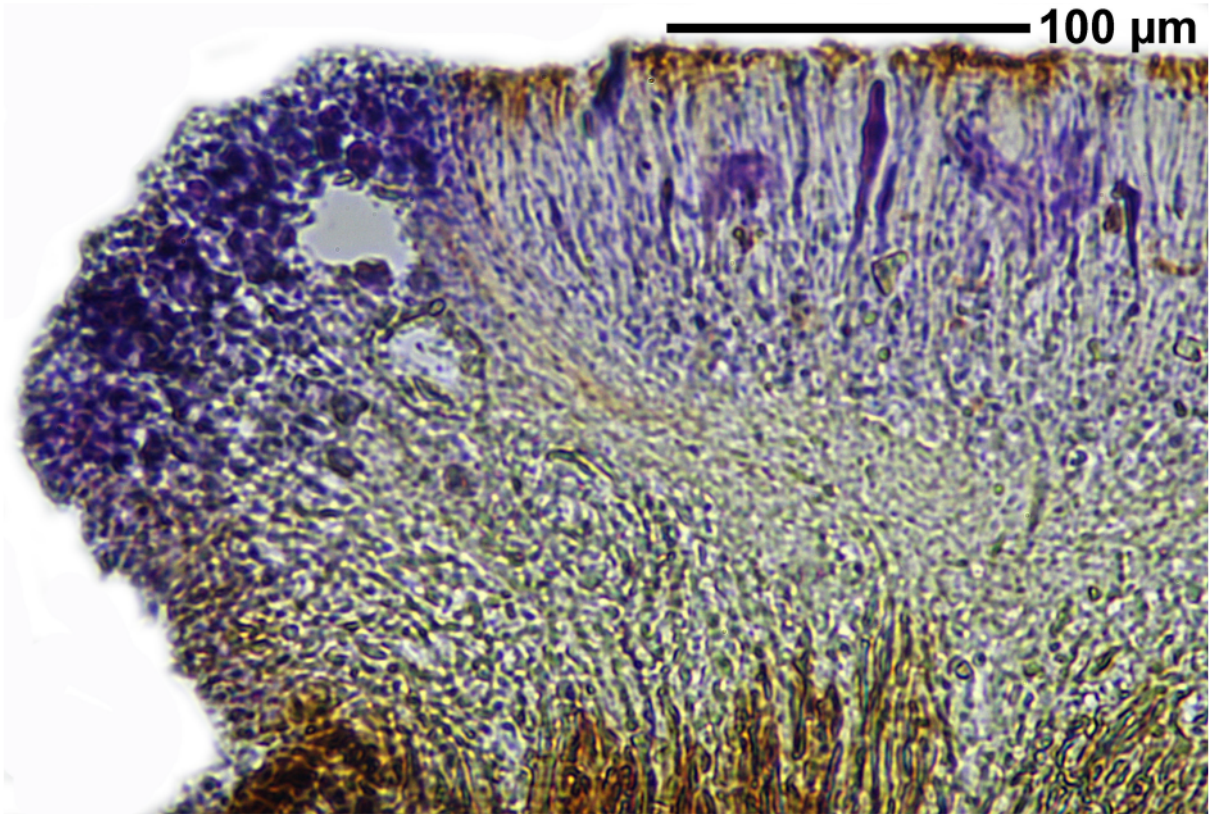










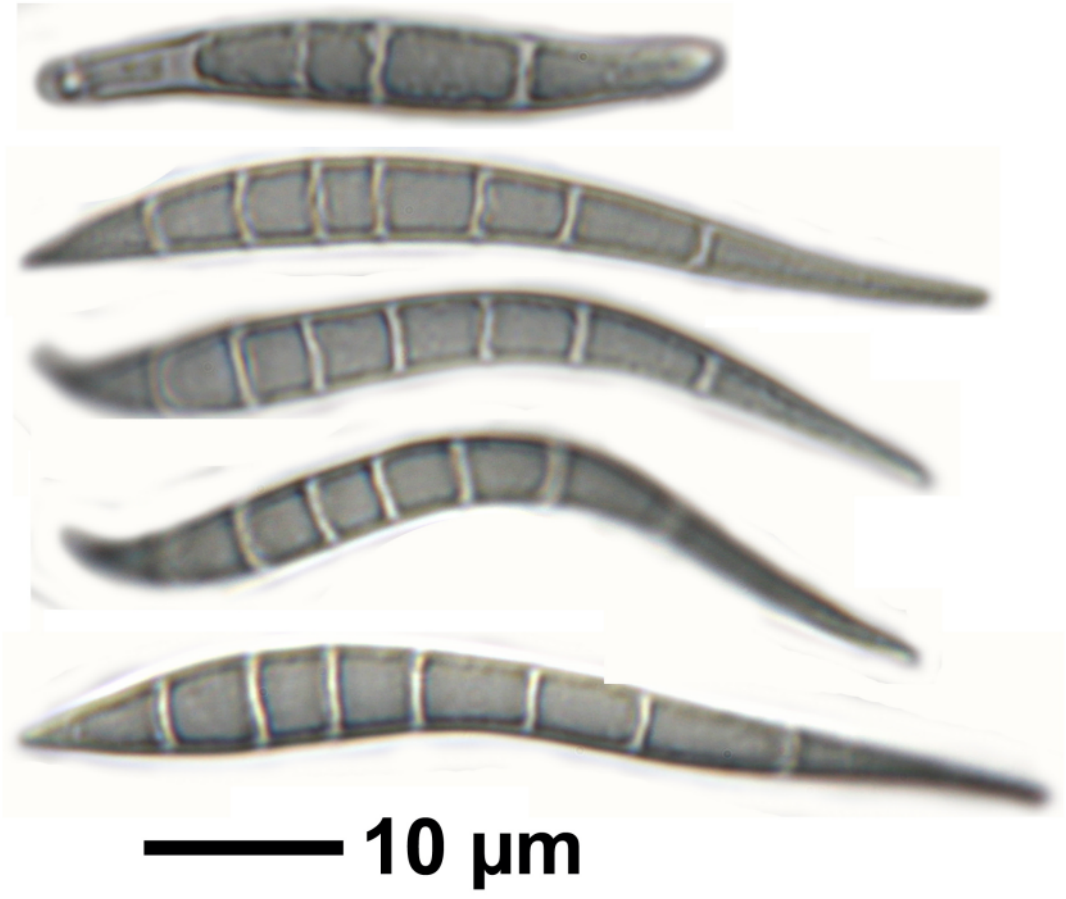



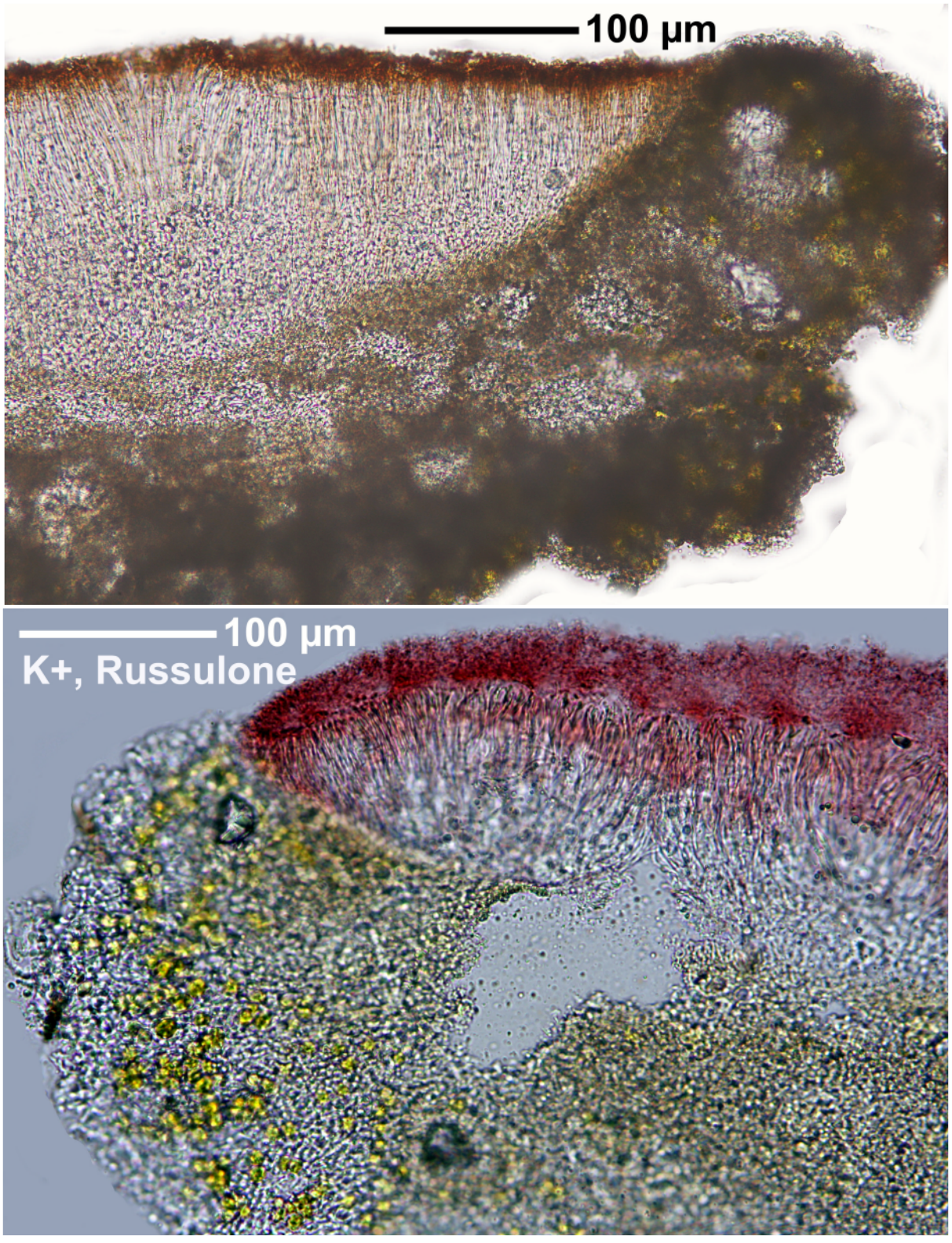

***Haematomma persoonii***

***Haematomma persoonii*** (Fée) A.Massal.

[15516], La Reunion, Anse des Cascades, meist auf Cocos-Palmen; 21,18511°S, 55,82711°E, 0 m. Leg. Schumm & Frahm 14.09.2009, det. Schumm 2009.



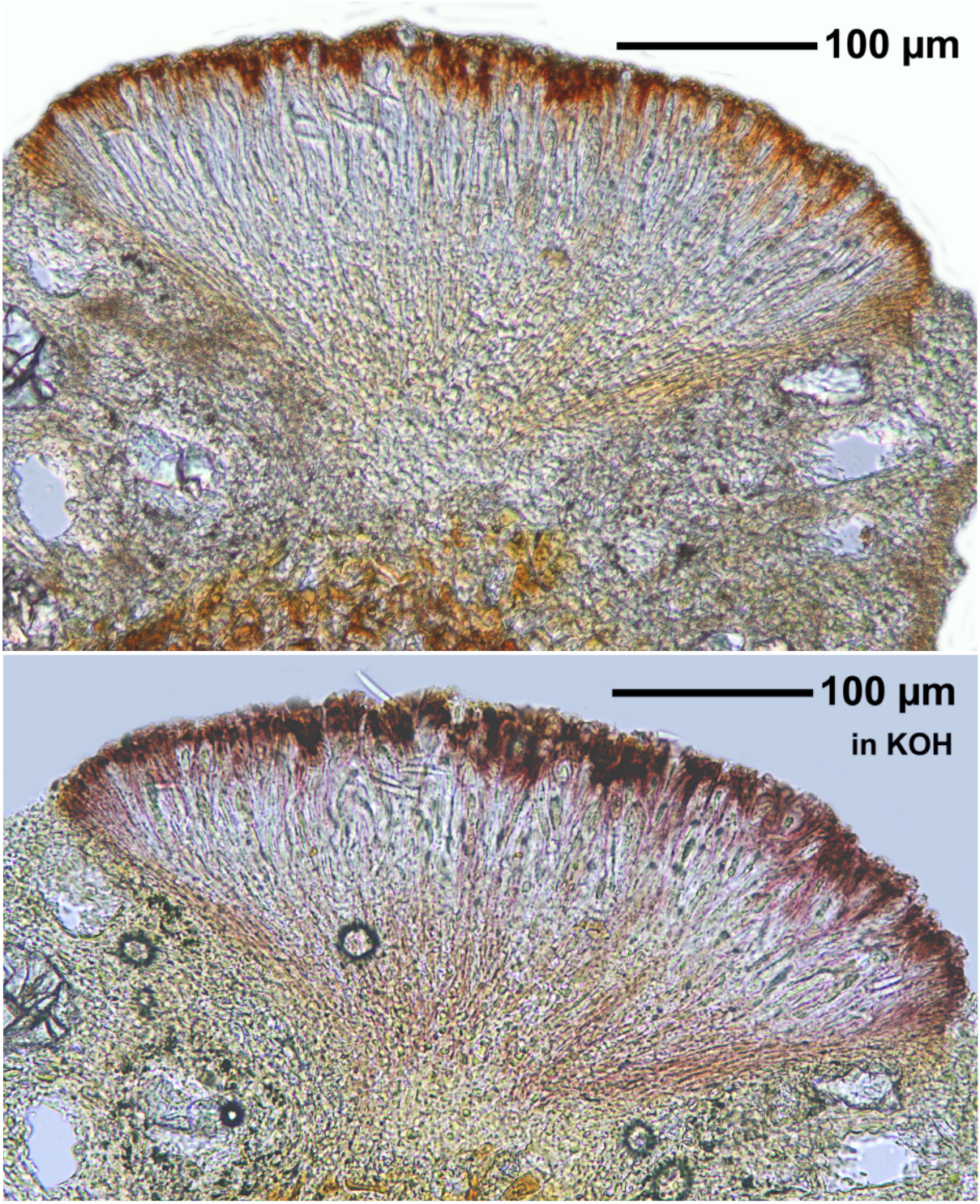



***Haematomma persoonii***

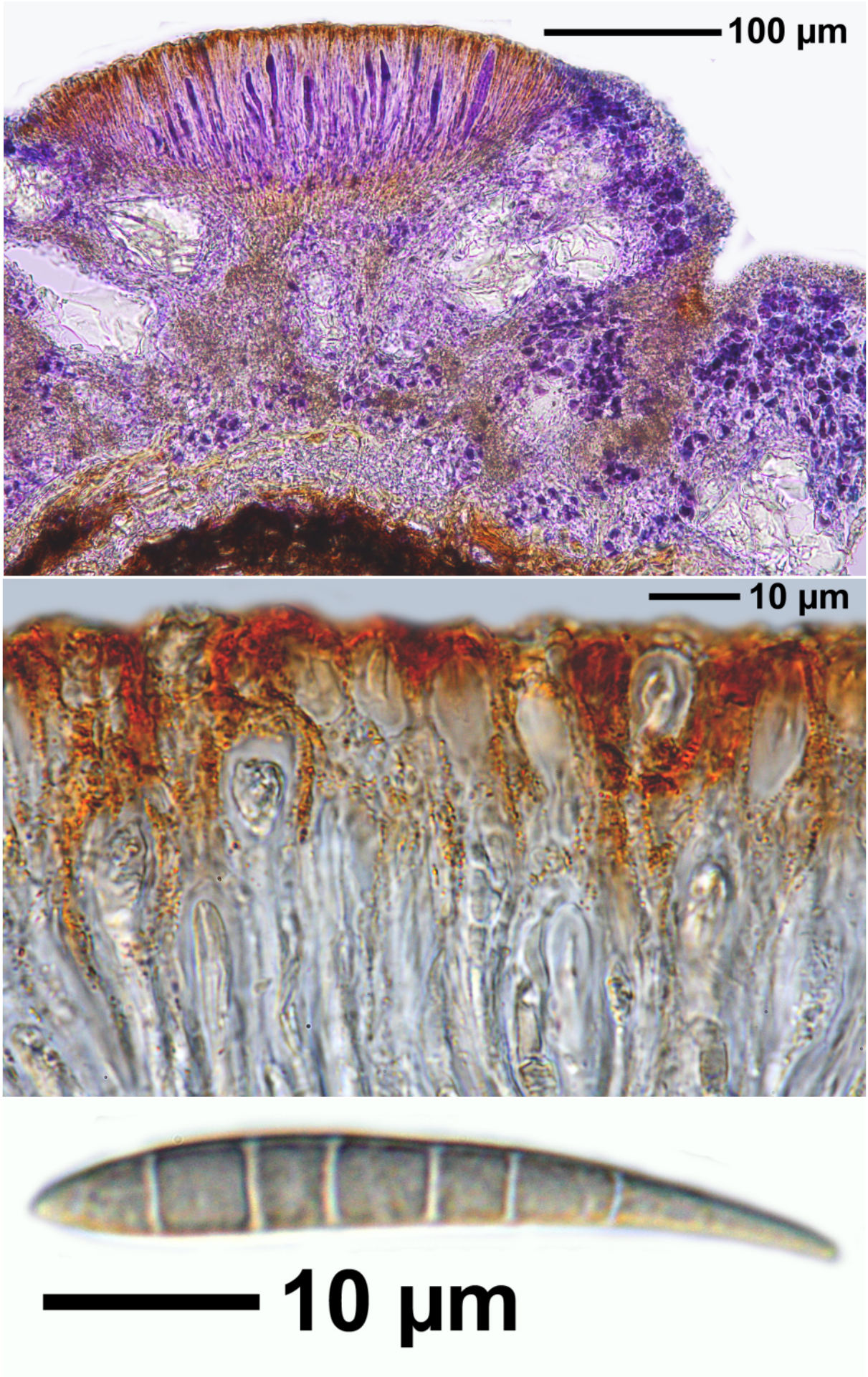
***Haematomma persoonii*** (Fée) A.Massal.

[5801], Madagaskar, Süd-Madagaskar, Berenti Park, an Eucalyptus, ca. 100 m alt, together with *Glyphis cicatricosa* and *Glyphis scyphulifera*. Leg. Schumm 28.12.1992, det. Schumm 2010.






***Haematomma persoonii***



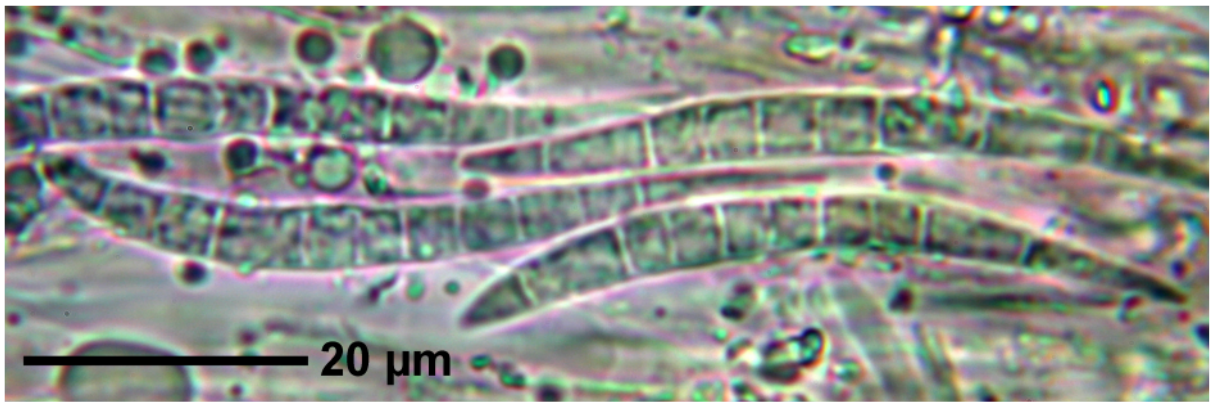

***Haematomma persoonii***

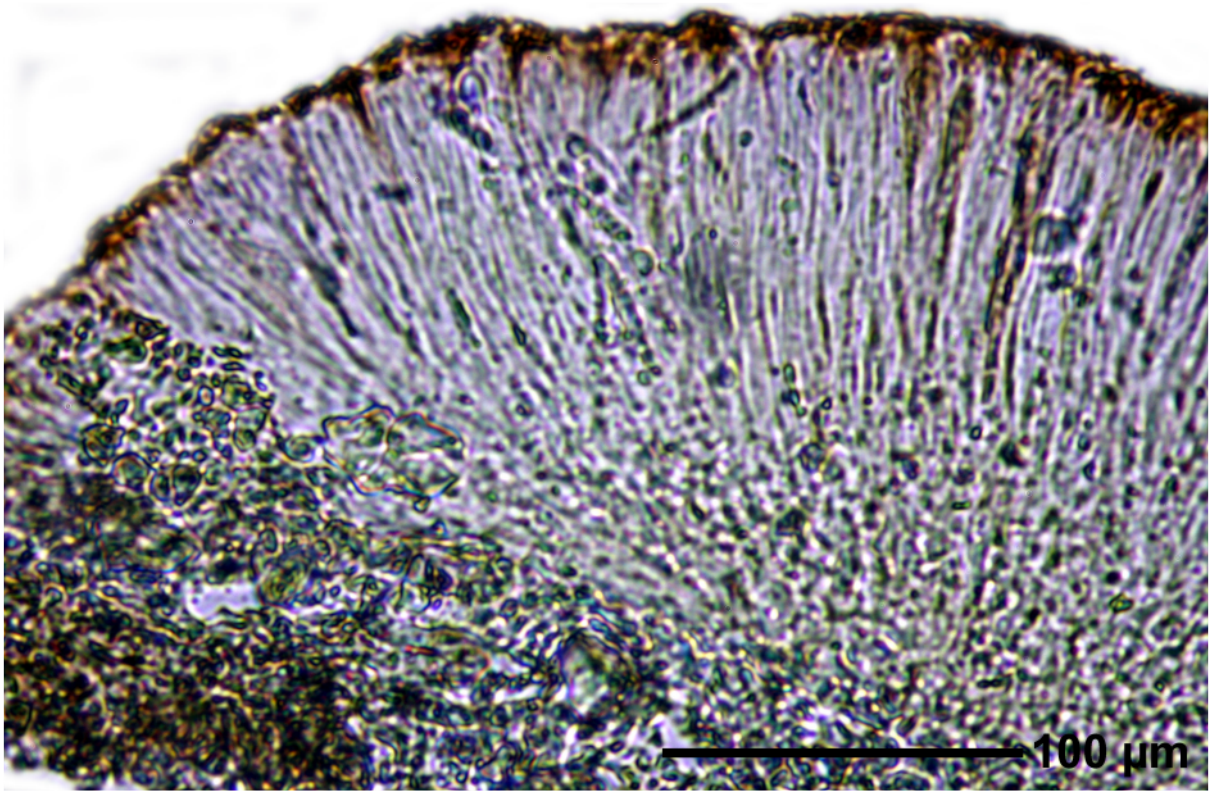
***Haematomma rufidulum*** (Fée) A.Massal.

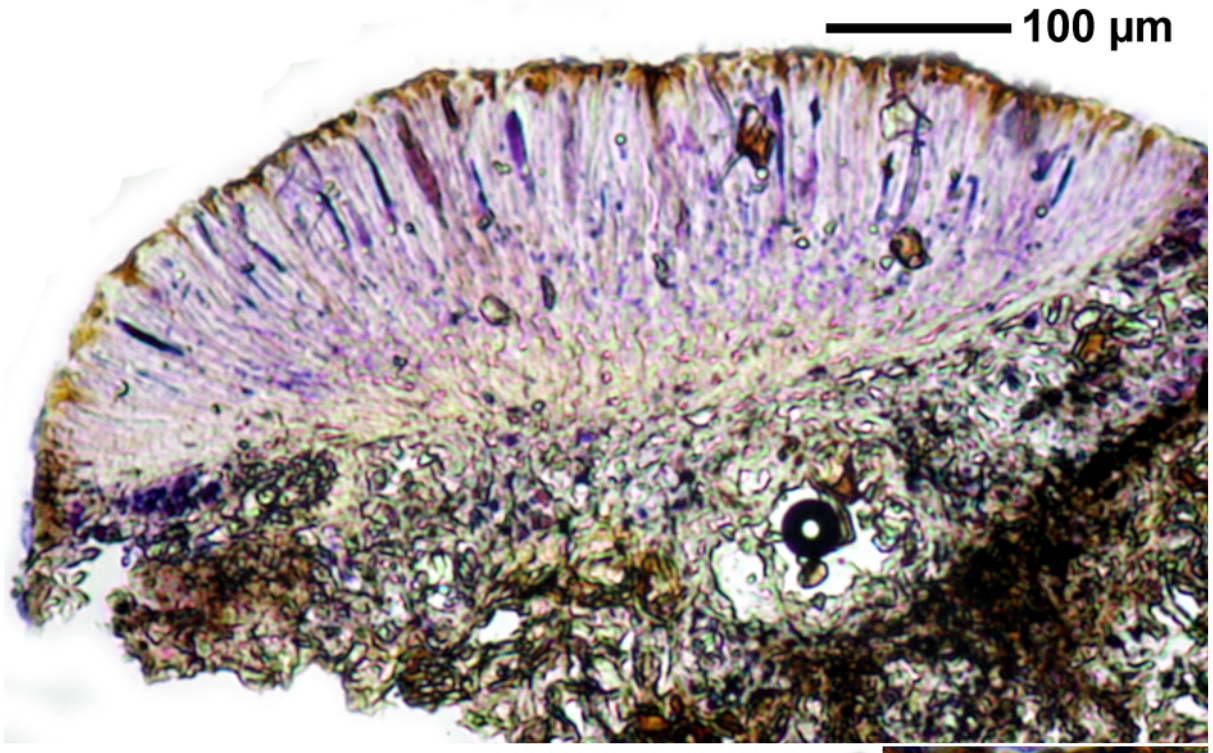
Thallus pale to greenish grey, uneven, warty, cracked. Soredia and isidia absent. Apothecia sessile, 1-2 mm, discs red, thalline margin wavy or crenulate. Epithecium K+ durable violet-red (russulone). Ascospores hyaline, 8/ascus, 10-11(-20)-cellular, straight or somewhat „s“-curved, 51-54(-63) x 4.5-5.5 µm. Corticolous. Chemistry: Thallus UV-, atranorin, placodiolic acid, russulone (TLC).

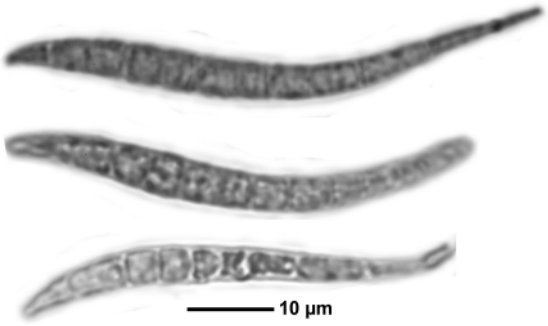
[6221], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay in Intavas am Fuß des Mt. Kitanglad, 08°11.883’ N, 124°56.721’ E, 1270 m. Leg. Schumm 18.08.1999, det. Schumm 2008.









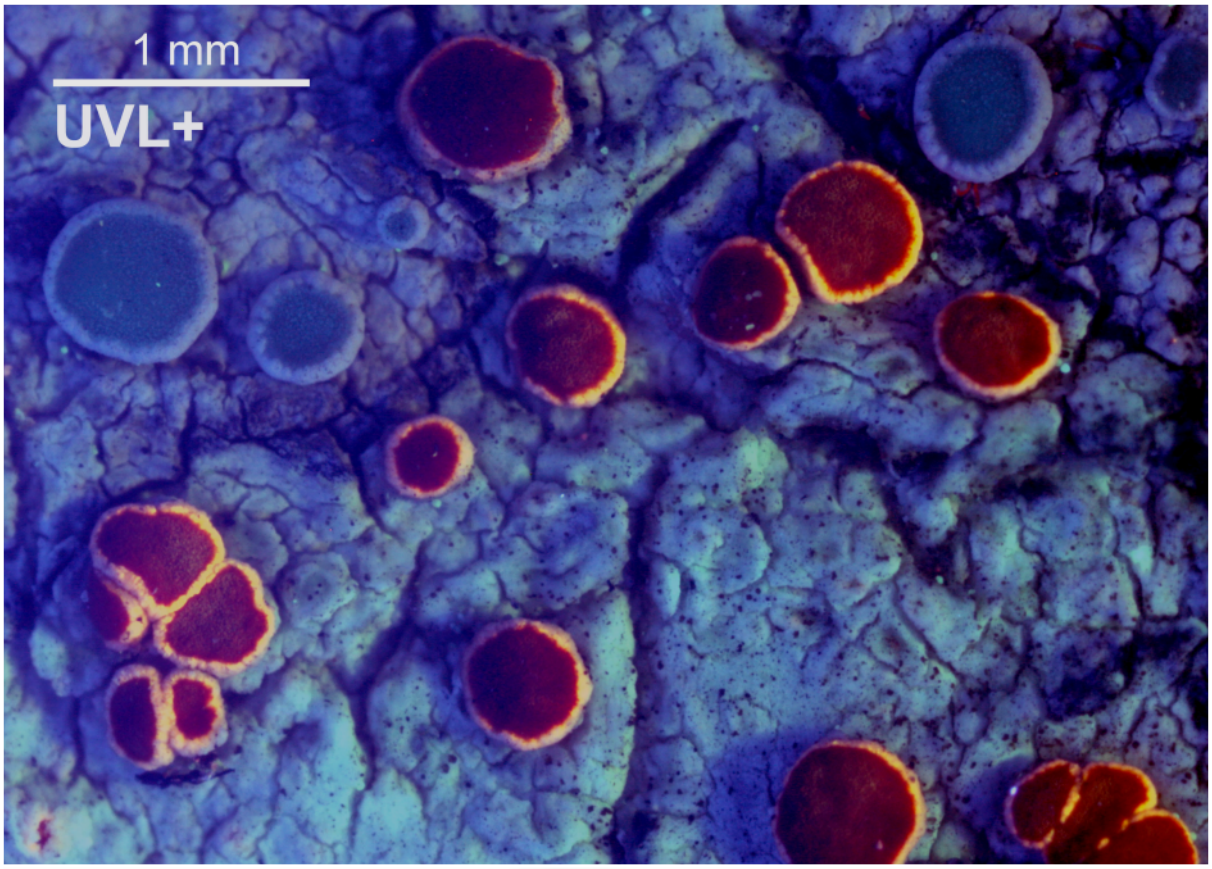
***Haematomma rufidulum***

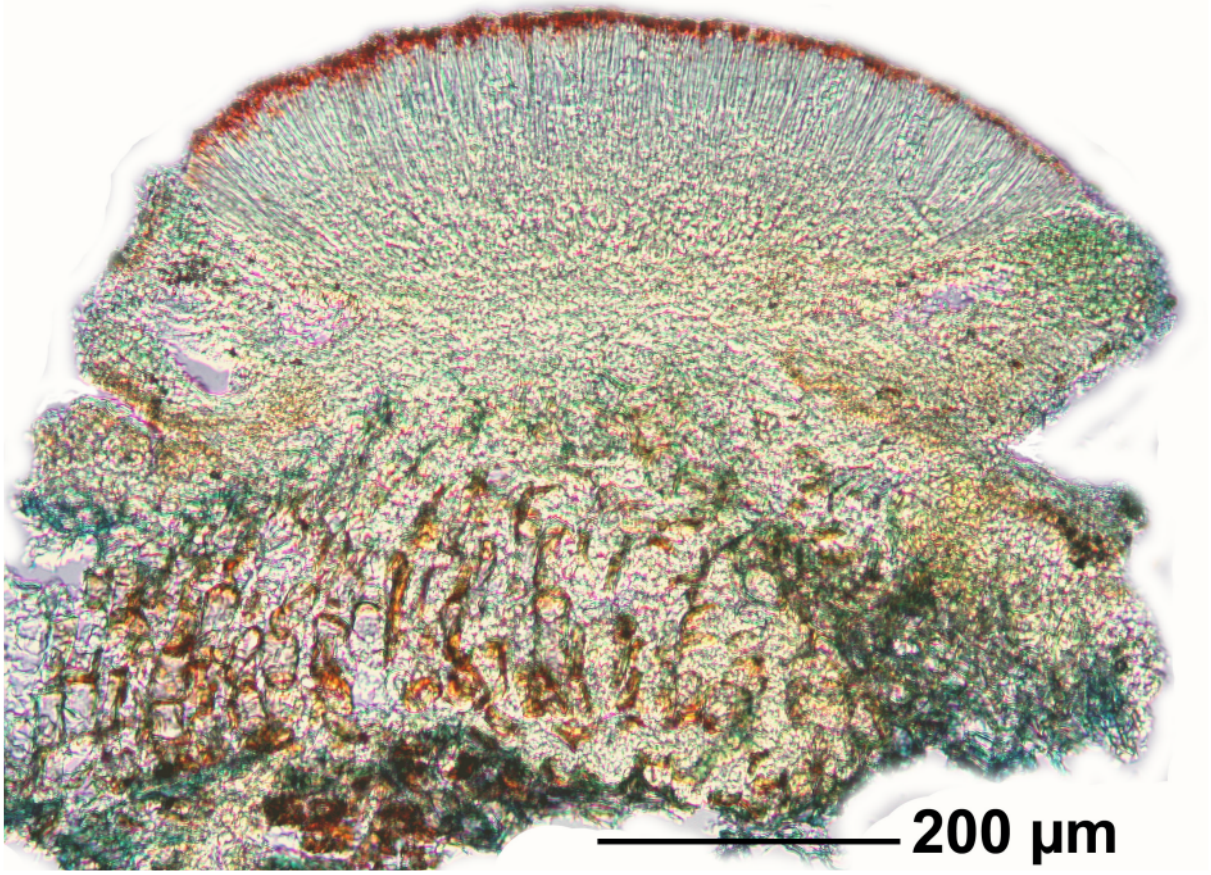
***Haematomma sulphureum*** (Müll.Arg.) Kalb & Staiger

Thallus smooth to uneven. Soredia and isidia absent. Apothecia red (haematommone, K+ violet, quickly bleaching), thalline margin UVL+ bright yellow, but thallus UVL-. Ascospores appr. 11-14-septate, 65 x 5 µm. Chemistry: atranorin (min), haematommone, lichexanthone (TLC).

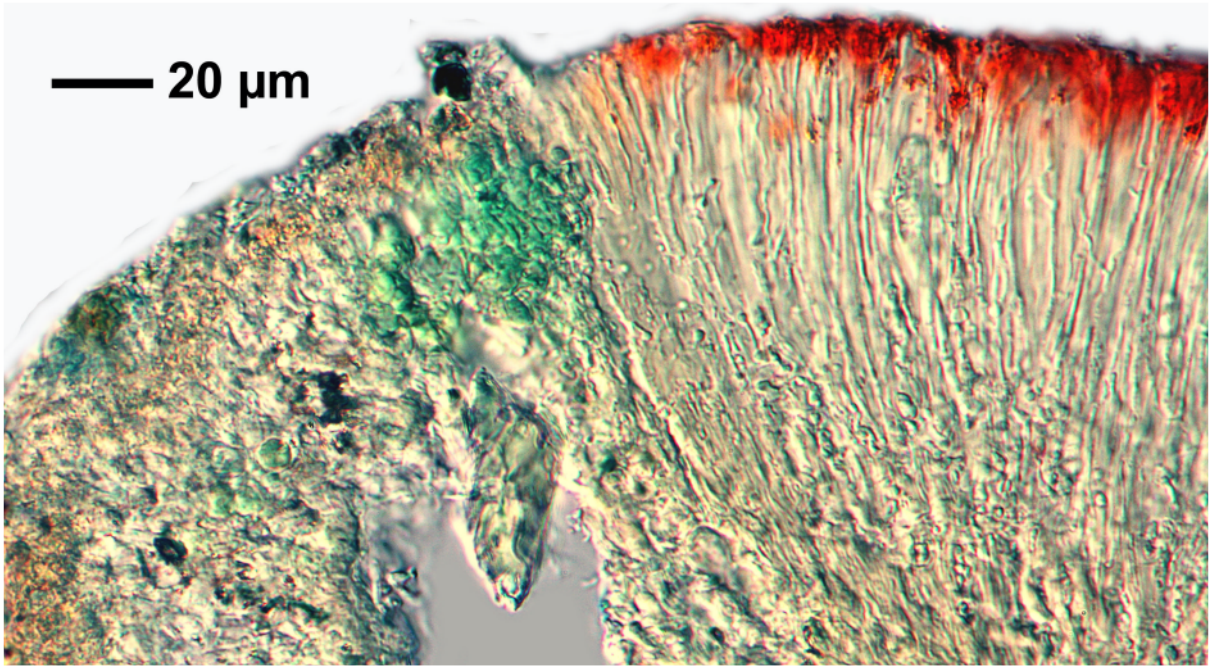
[15059], La Reunion, an der Straße von La Petite France zum Piton Maido bei Caverne du Maido; 21,06201° S, 55,37890° E, 1950 m. Leg. Schumm & Frahm 07.09.2009, det. Schumm 02.2010

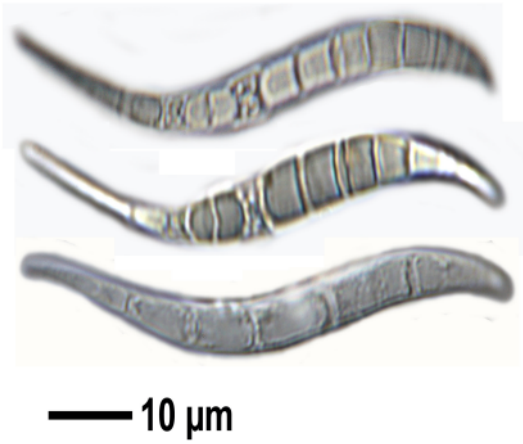


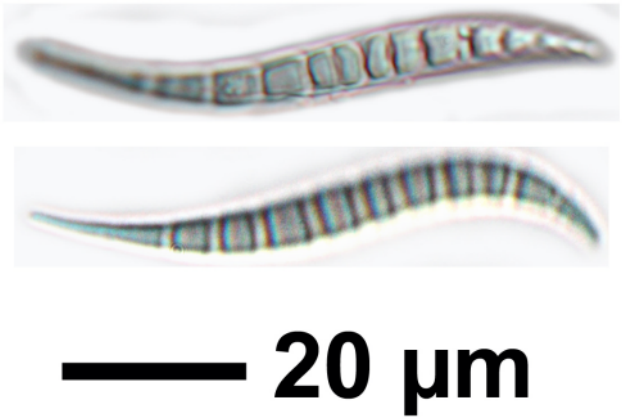


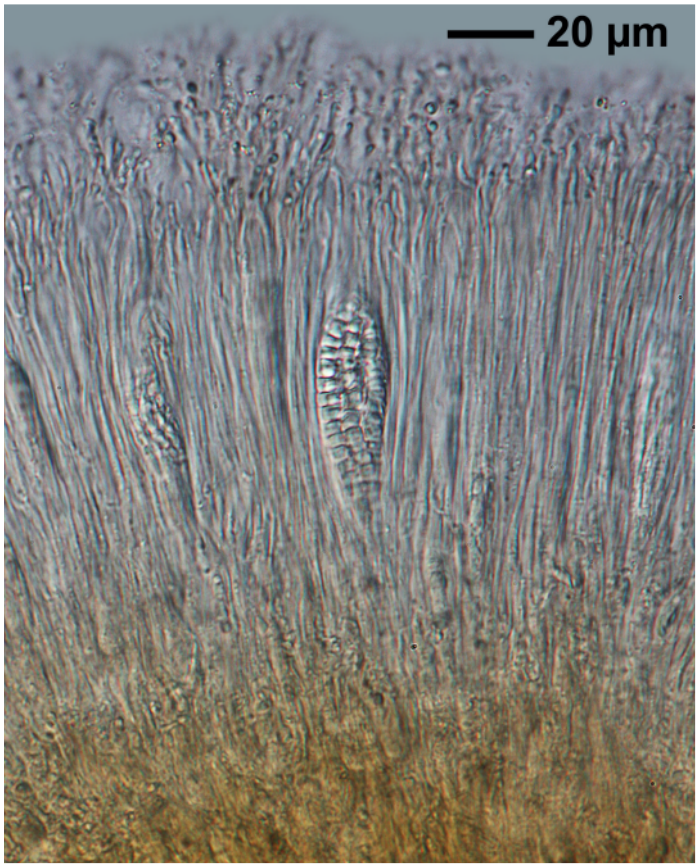




***Haematomma sulphureum***



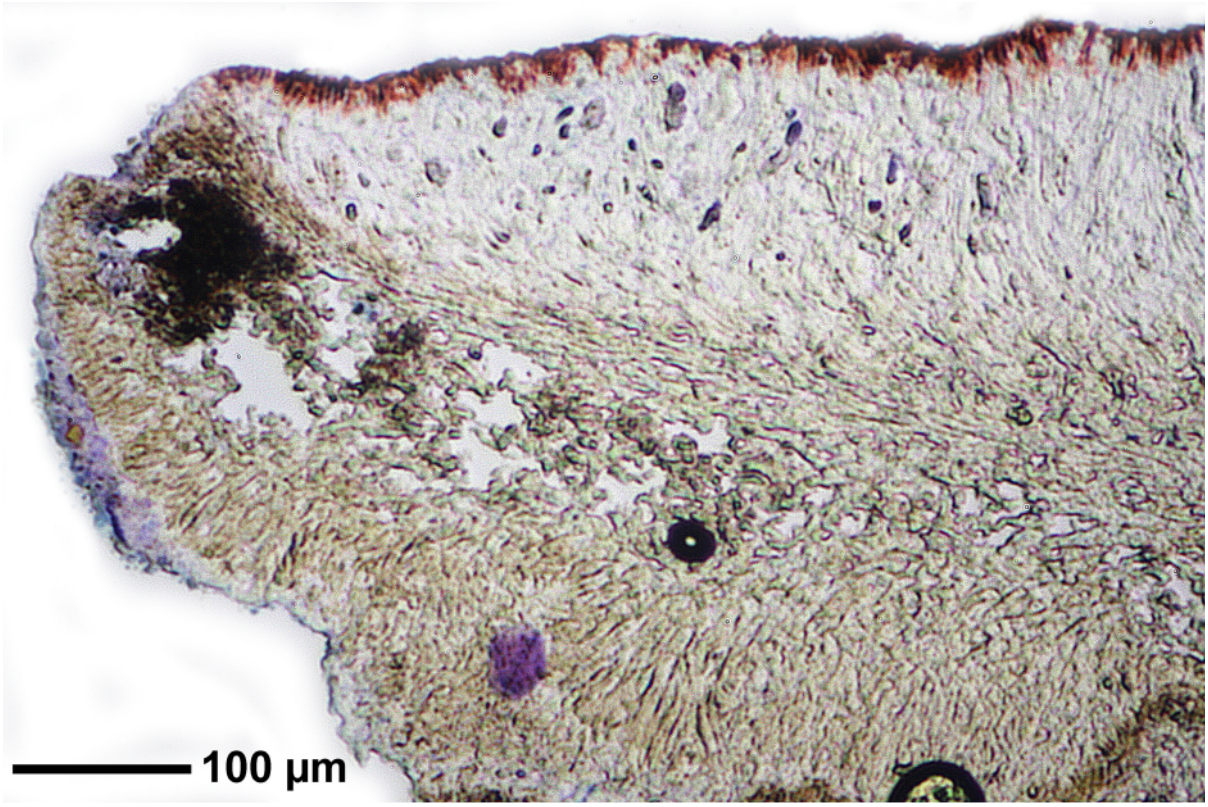

***Haematomma sulphureum***

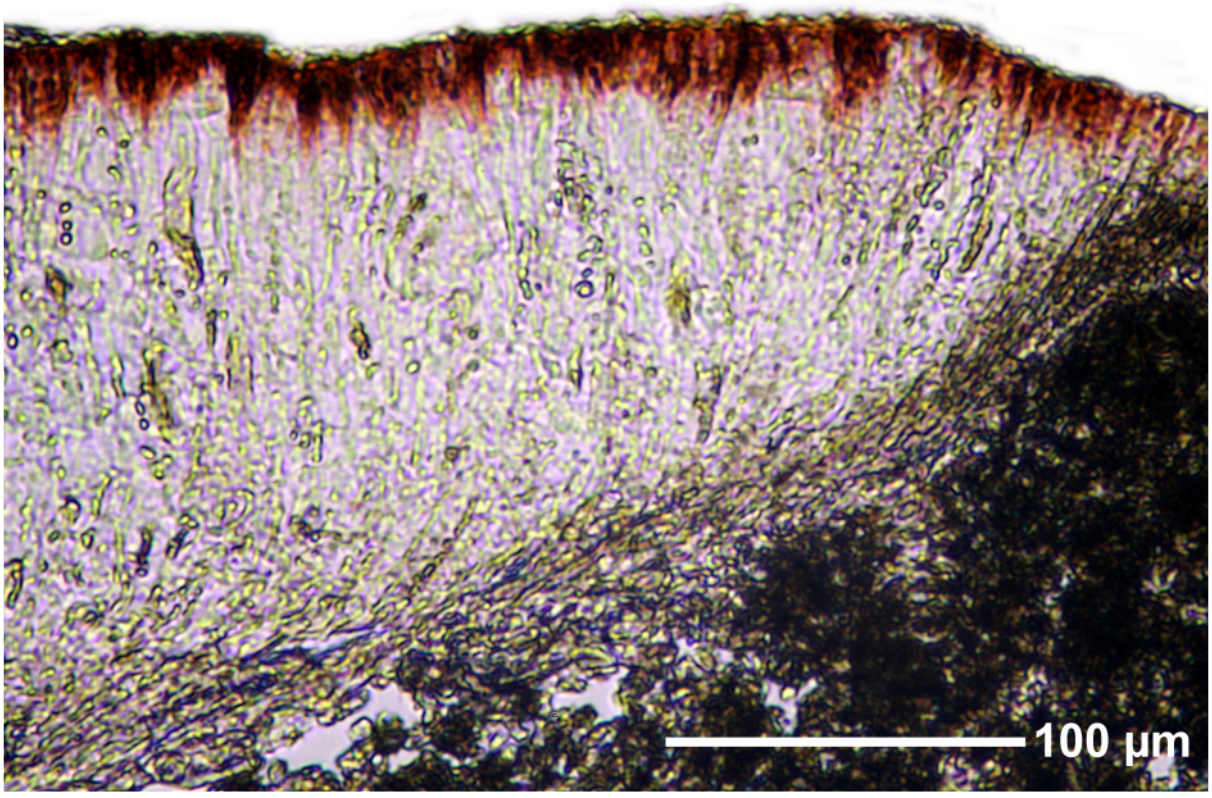
***Haematomma wattii*** (Stirt.) Zahlbr.

Thallus pale to greenish grey, smooth or uneven to warty cracked. Isidia and soredia absent. Apothecia sessile, 0.5-2 mm, disc red, thalline margin mostly simple but also crenulate. Epithecium with red pigment, K+ violet, quickly fading (haematommone). Ascospores finaly muriform, transverse 18-septate (variable!), segments with 1-3 longitudinal septae, 50-95 x 6.5-10 µm, mostly 4/ascus. Corticolous. Chemistry: thallus and margin of Apothecia UV+ yellow, atranorin, placodiolic acid, haematommone. Lit. Staiger & Kalb (1995)

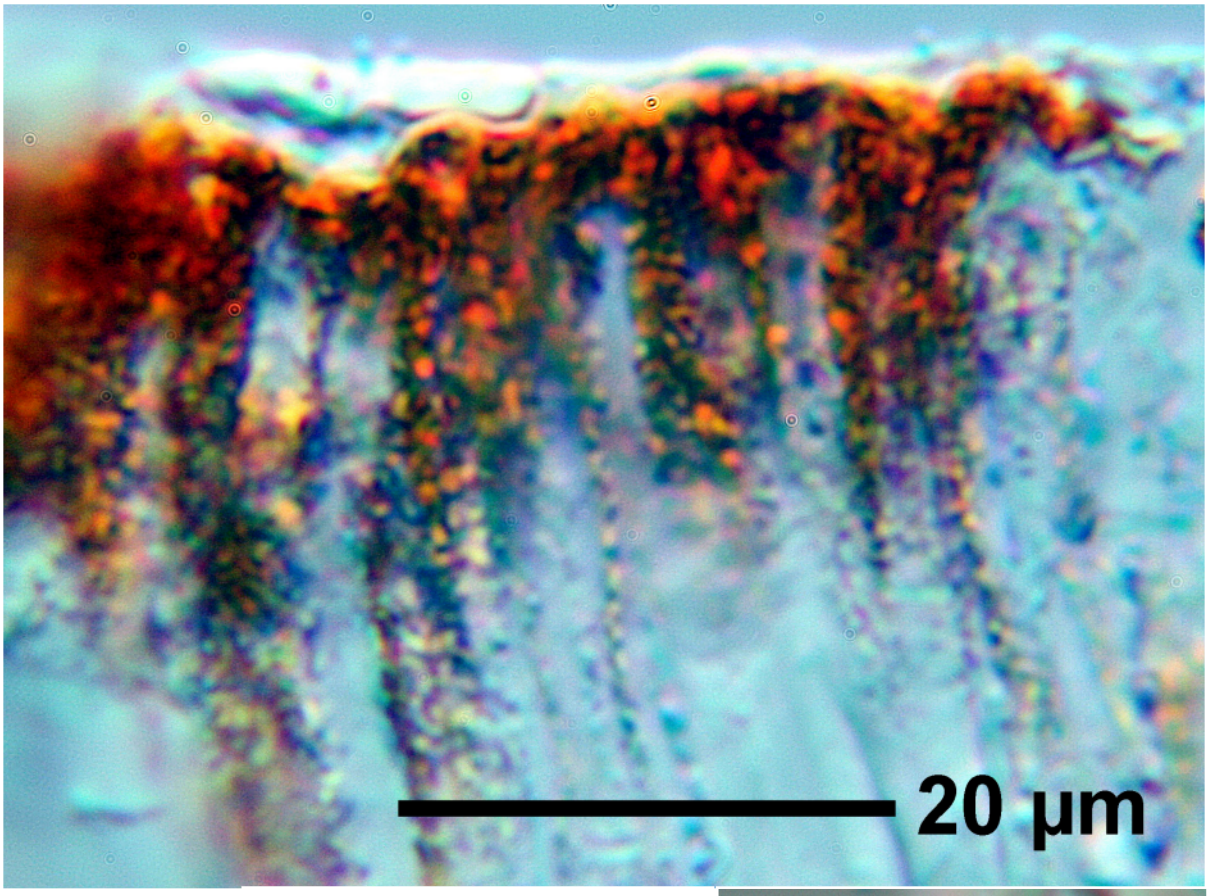
[6275], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay, tropischer Regenwald am Mt. Kitanglad ab Zwischen-Campsite, 08°09.637' N, 124°55.871' E, 1870-2800 m. Leg. Schumm 19.08.1999, Staiger 08.04.2000.






***Haematomma wattii***







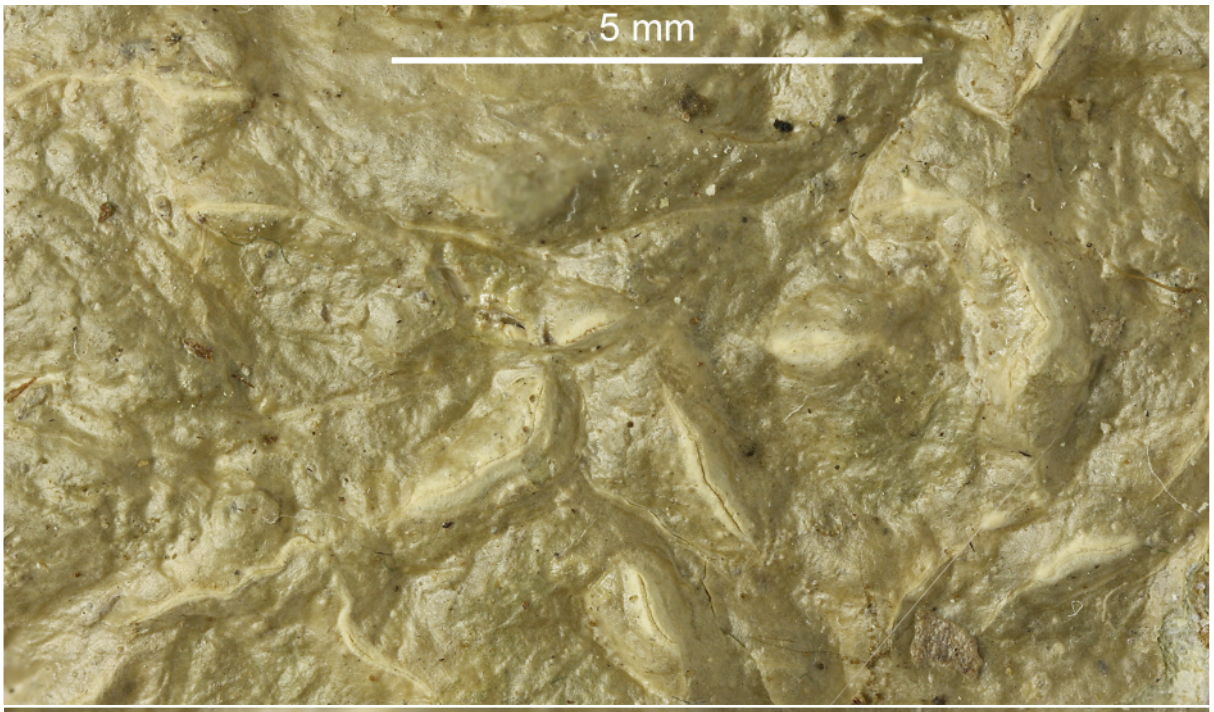


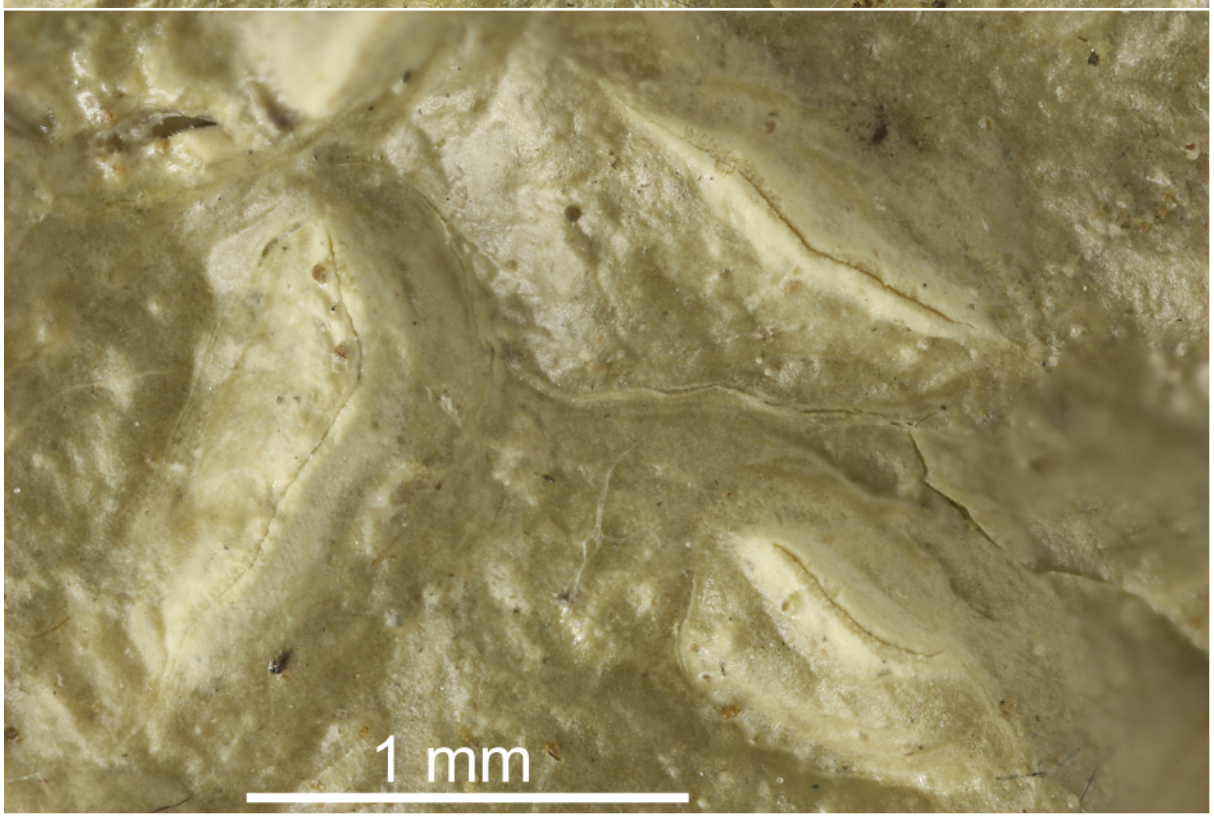

***Haematomma wattii***

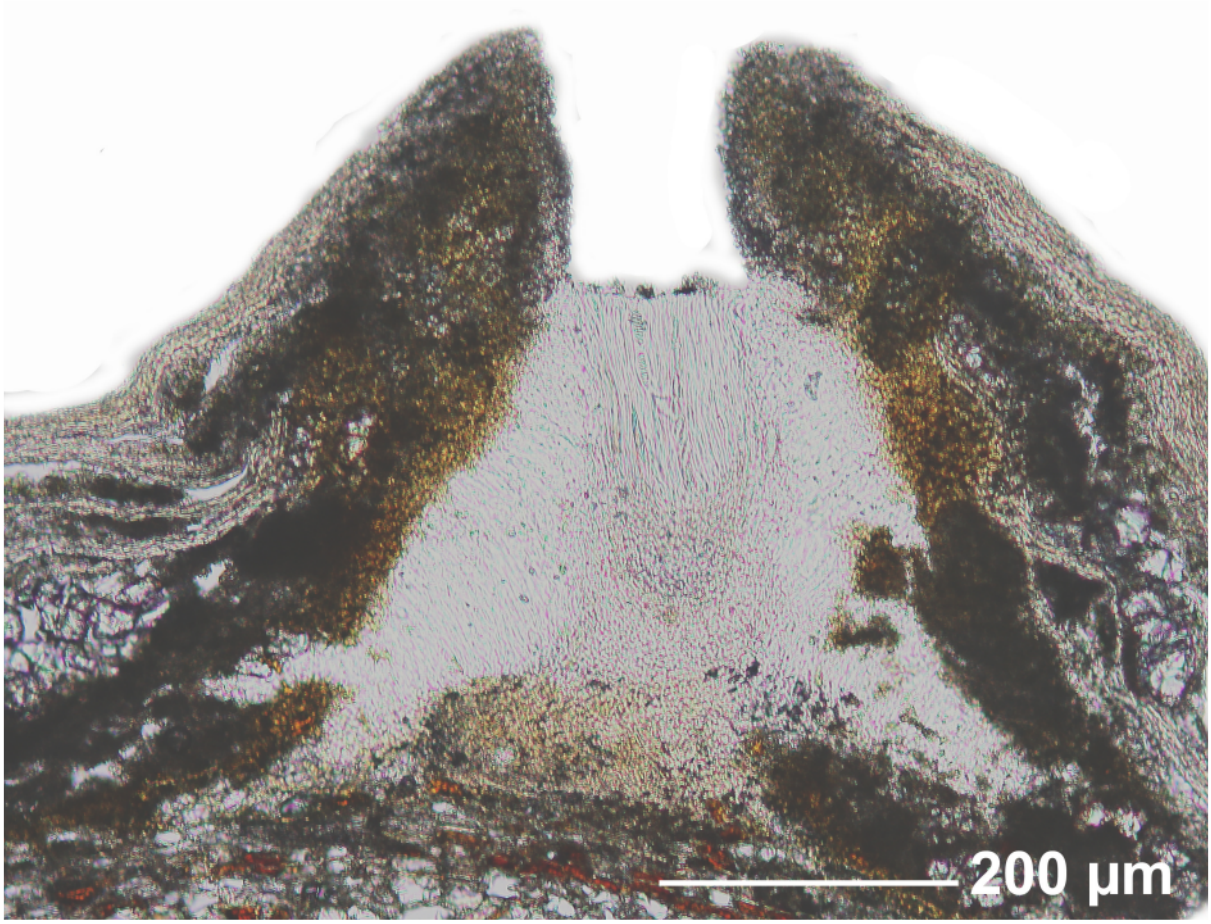
***Hemithecium canlaonensis*** (Vain.) A.W.Archer
[= ***Fissurina canlaonensis*** (Vain.) Staiger]
[= ***Graphis canlaonensis*** Vain.]

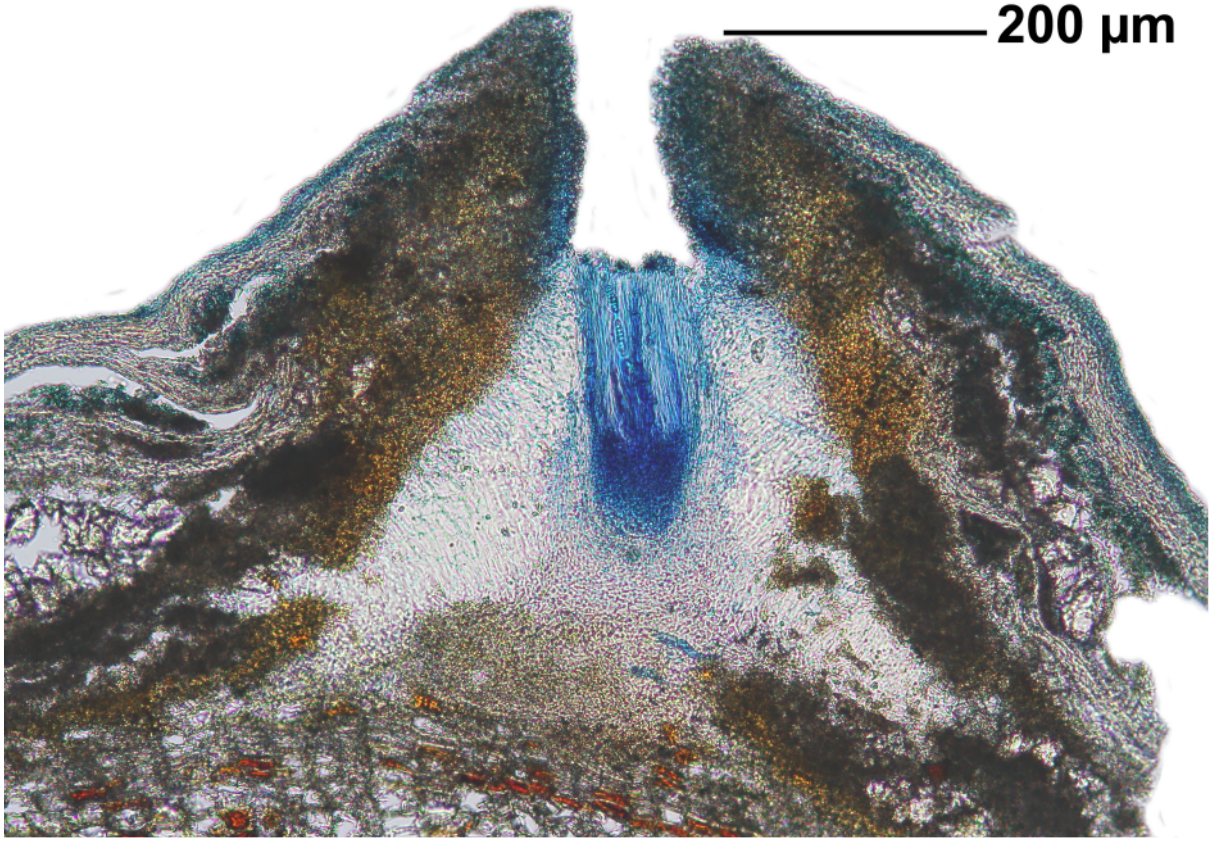
Excipulum not carbonized. Hymenium surrounded with reticulate plectenchyma. Ascospores hyaline, 6(-7) locular, 20-24 x 10-11 µm, J- (or only very faintly bluish). Chemistry: stictic acid (TLC).

[7916], Philippinen, Leyte, Prov. Leyte, Lake Kasudsuran, 11°01.539' N, 124°44.931' E, 740 m,bei Barangay Liberty (Ormoc-City). Leg. Schumm 23.08.2000, det. Archer 25.8.2003.

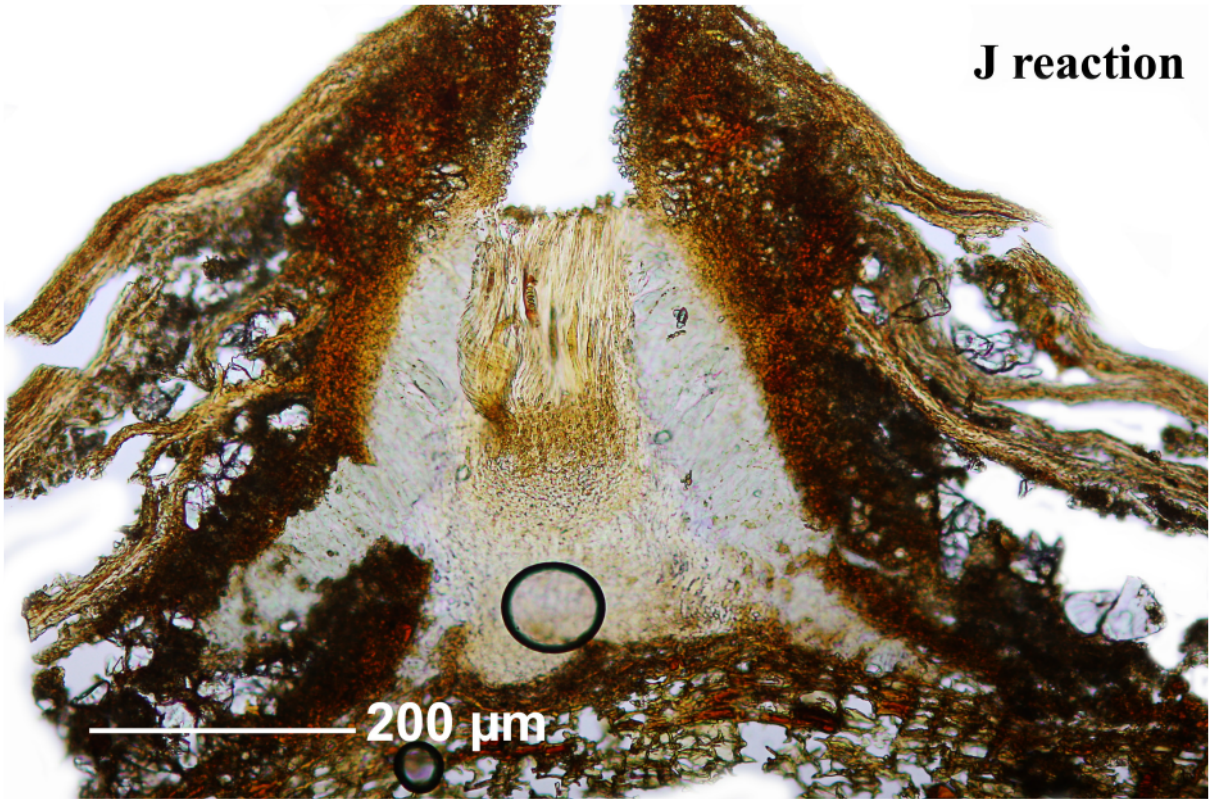


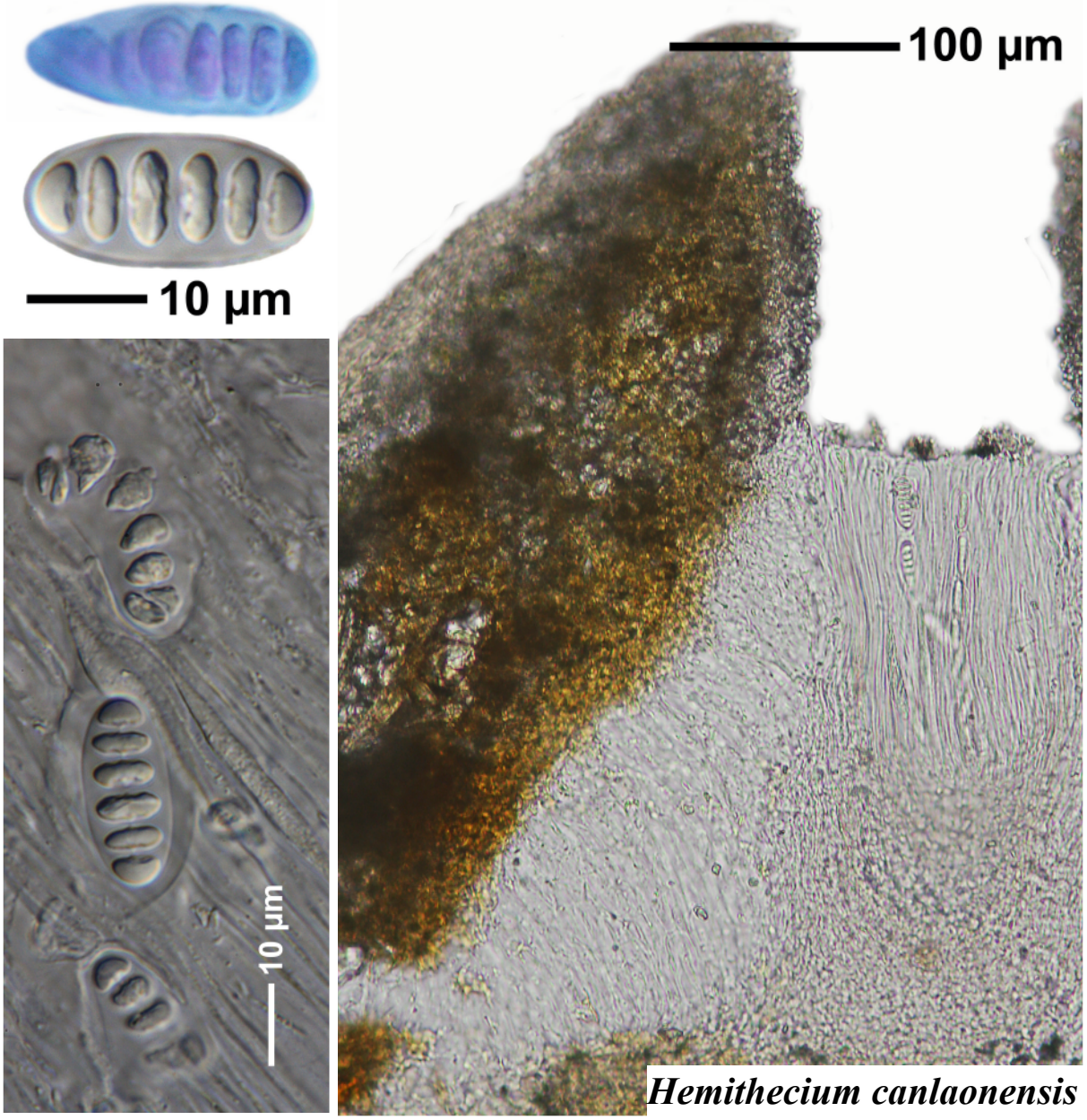





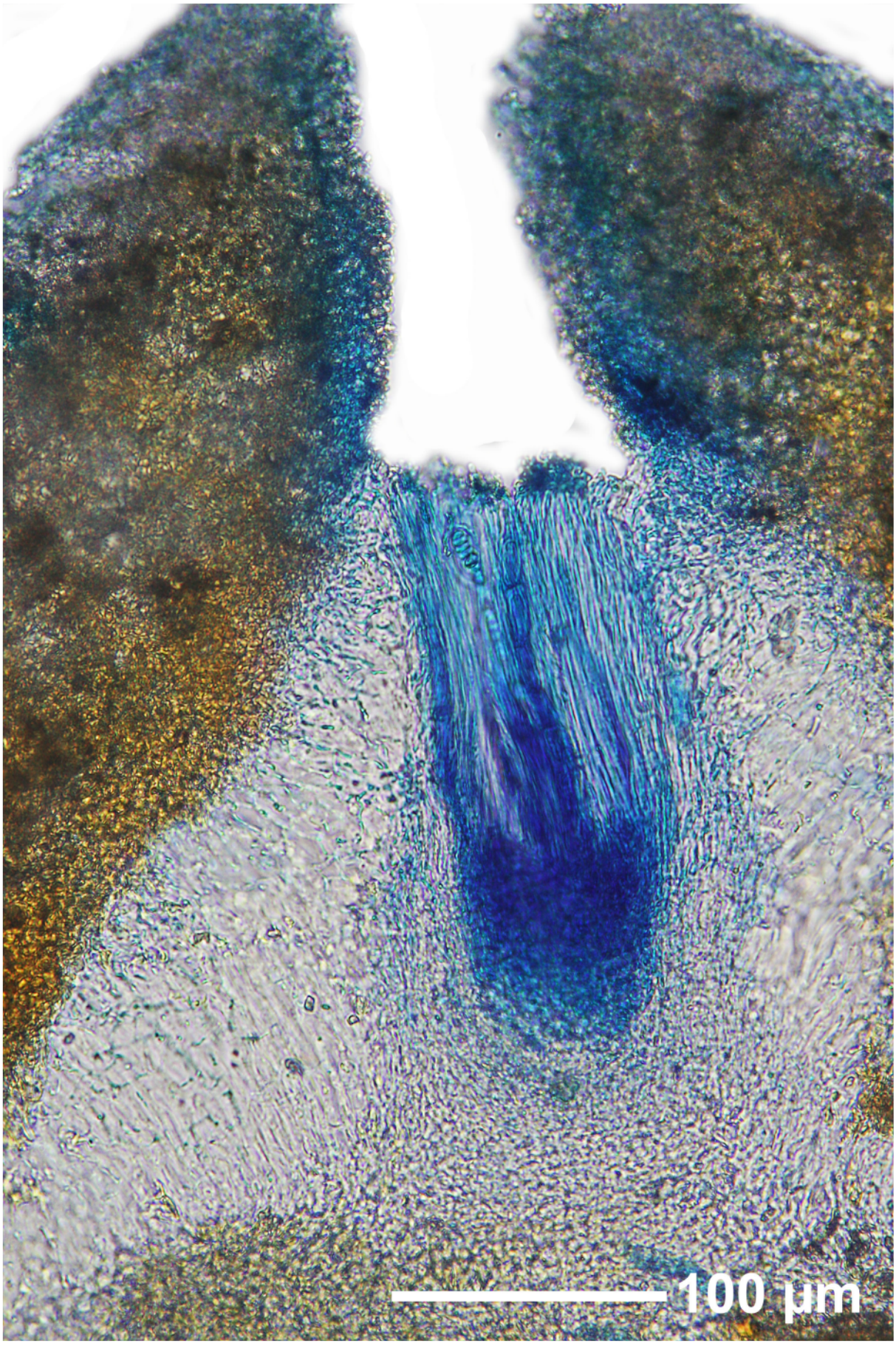




***Hemithecium canlaonensis***

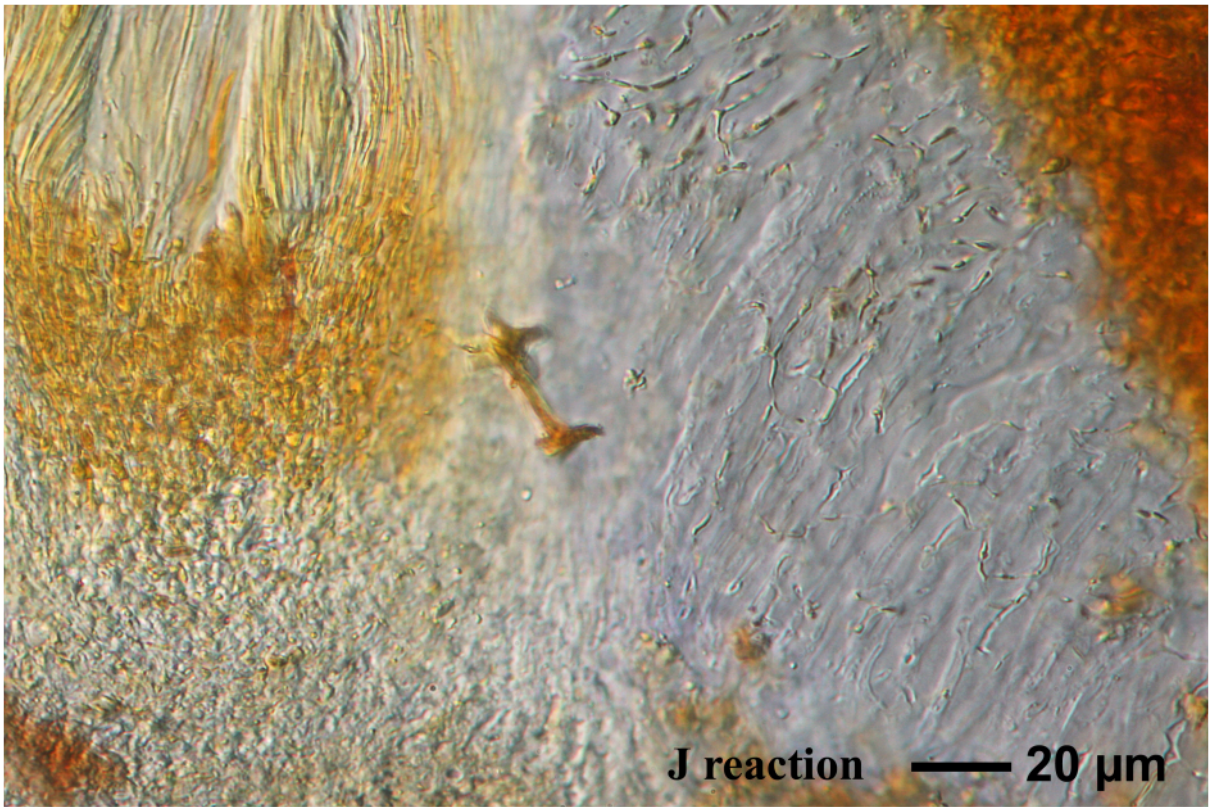


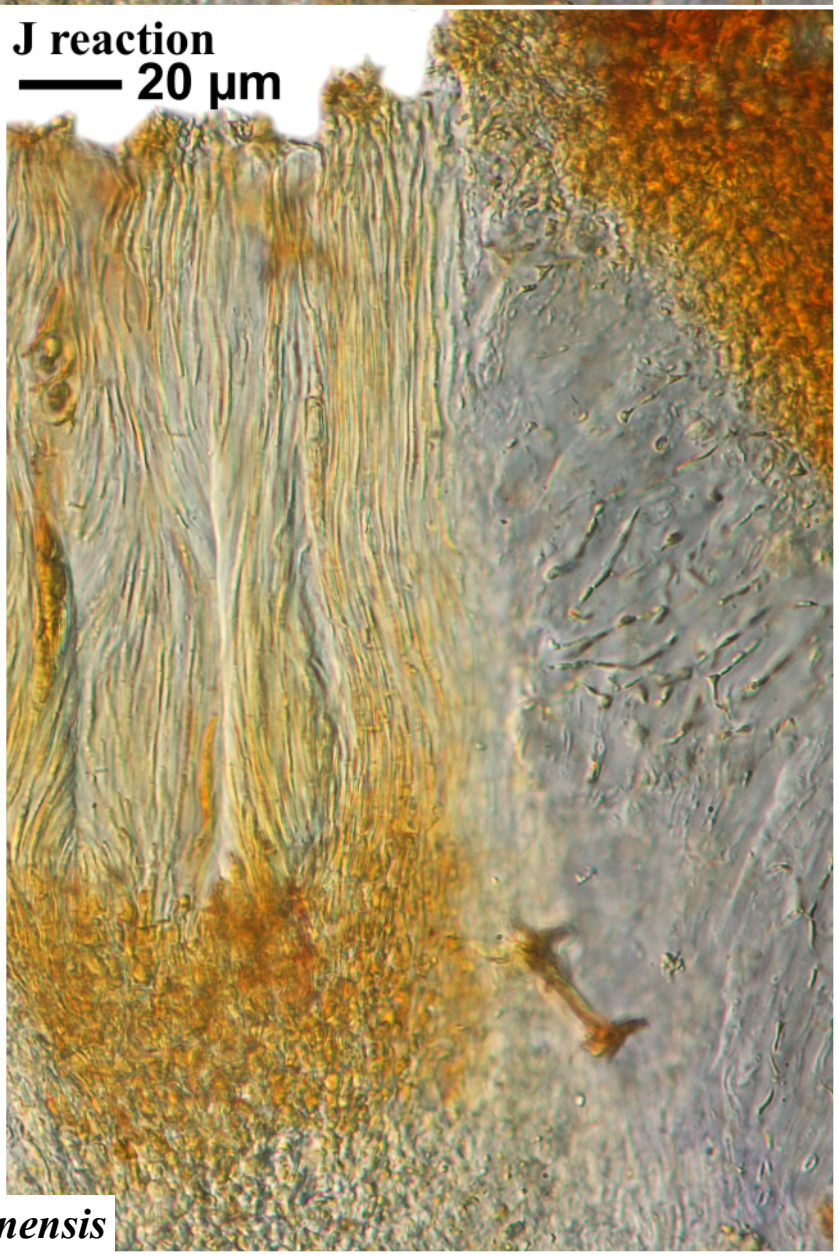




*Hemithecium canlaonensis*

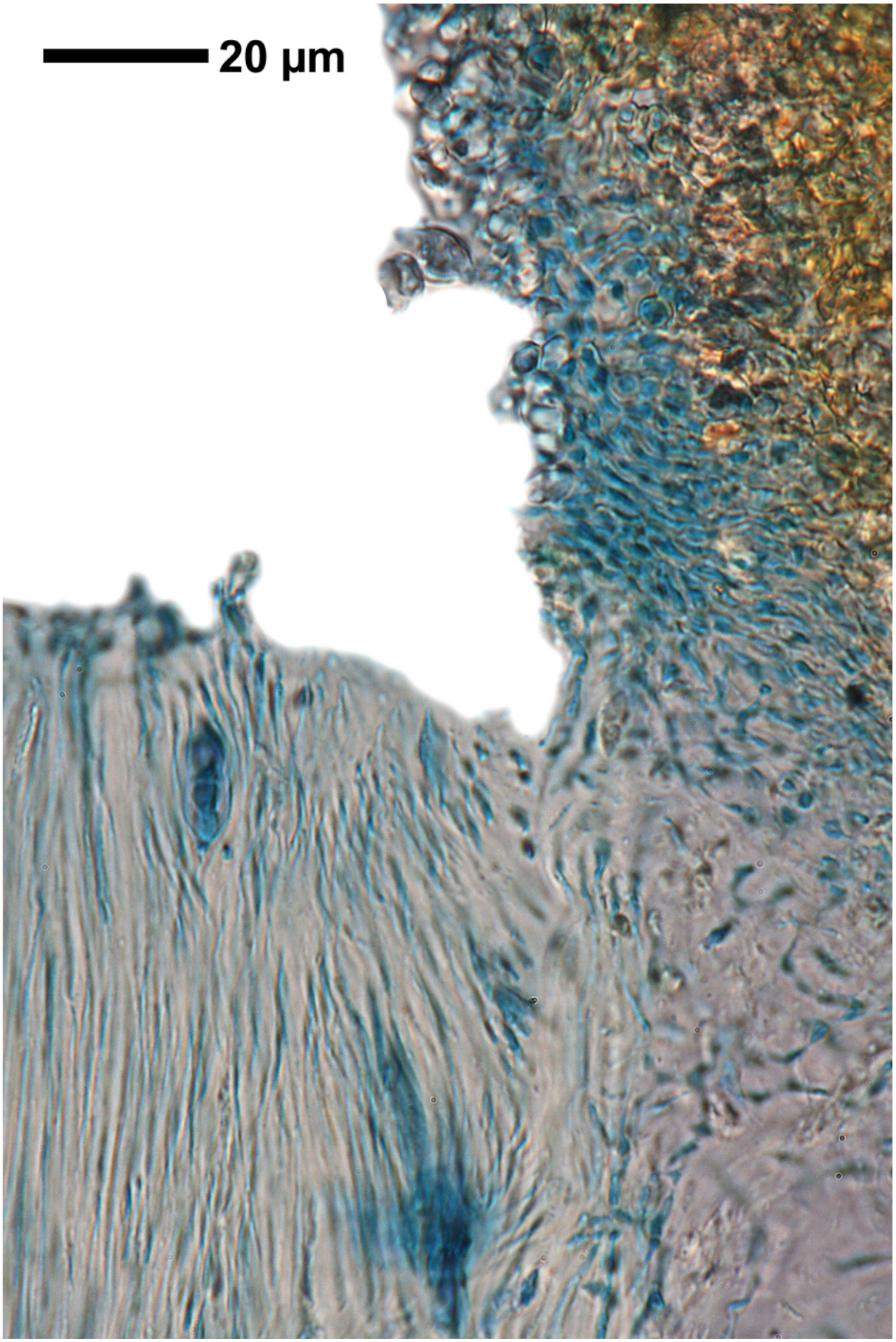



***Hemithecium canlaonensis***

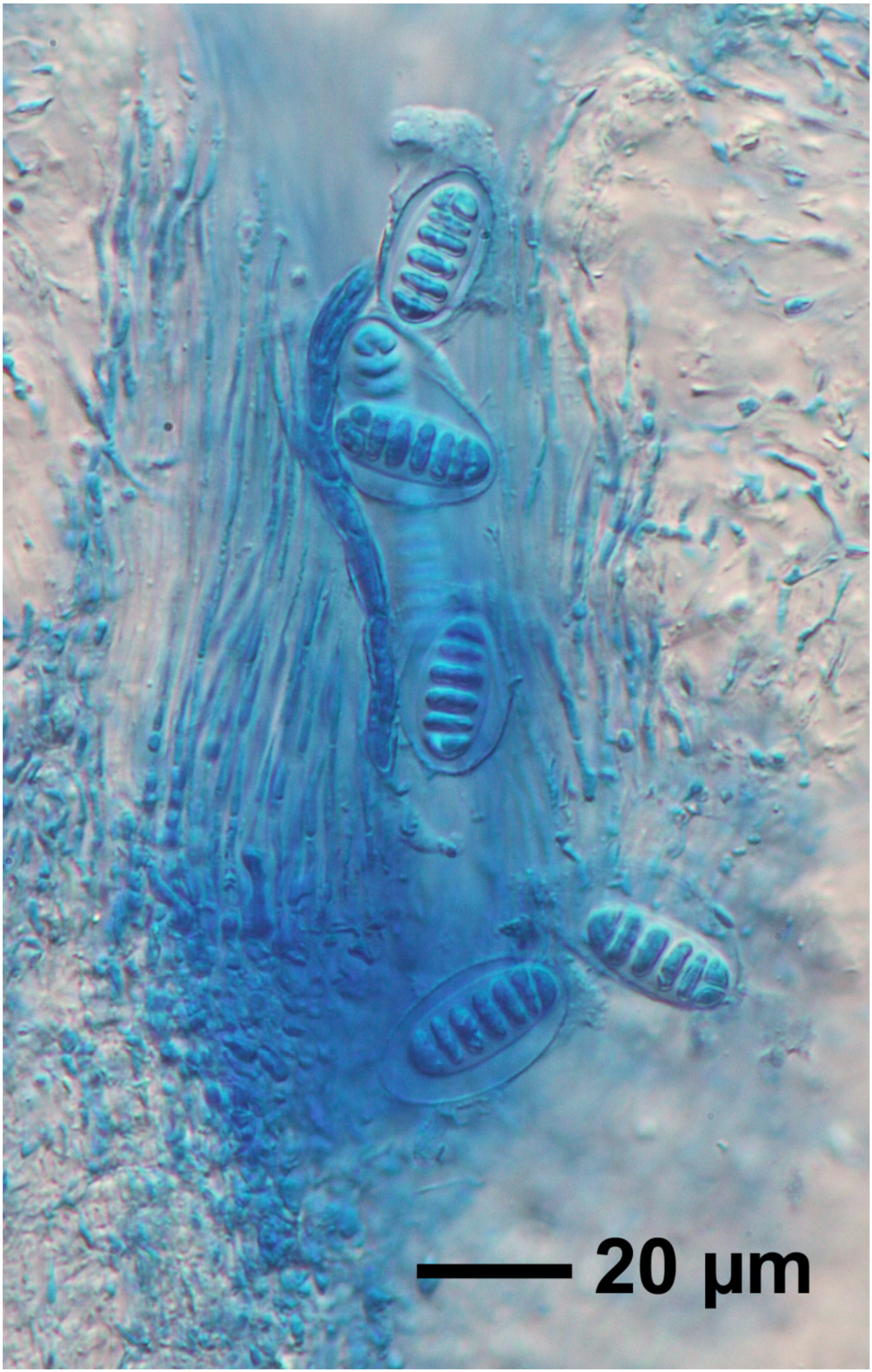


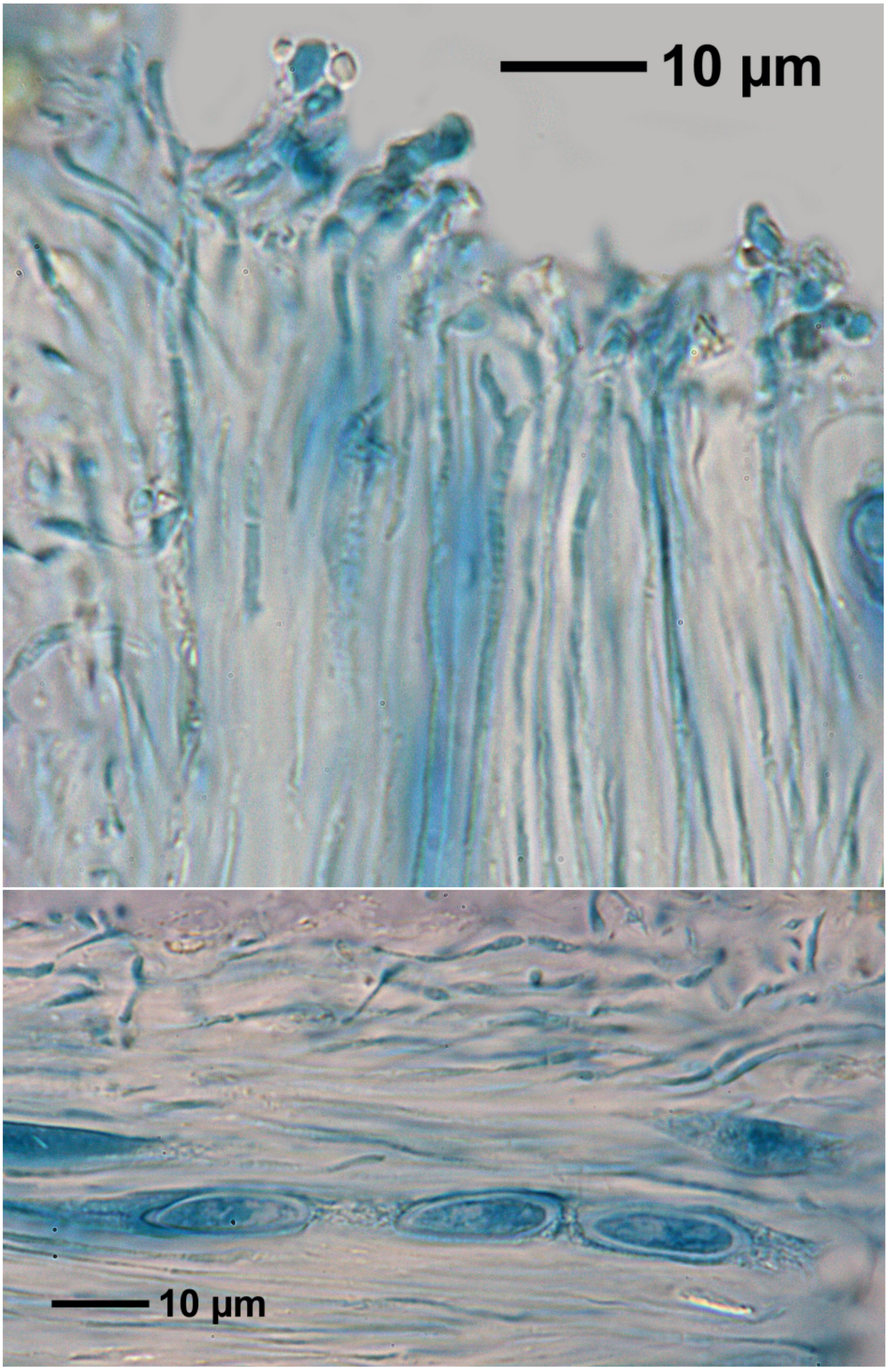

***Hemithecium canlaonensis***




***Hemithecium canlaonensis***




***Hemithecium canlaonensis***

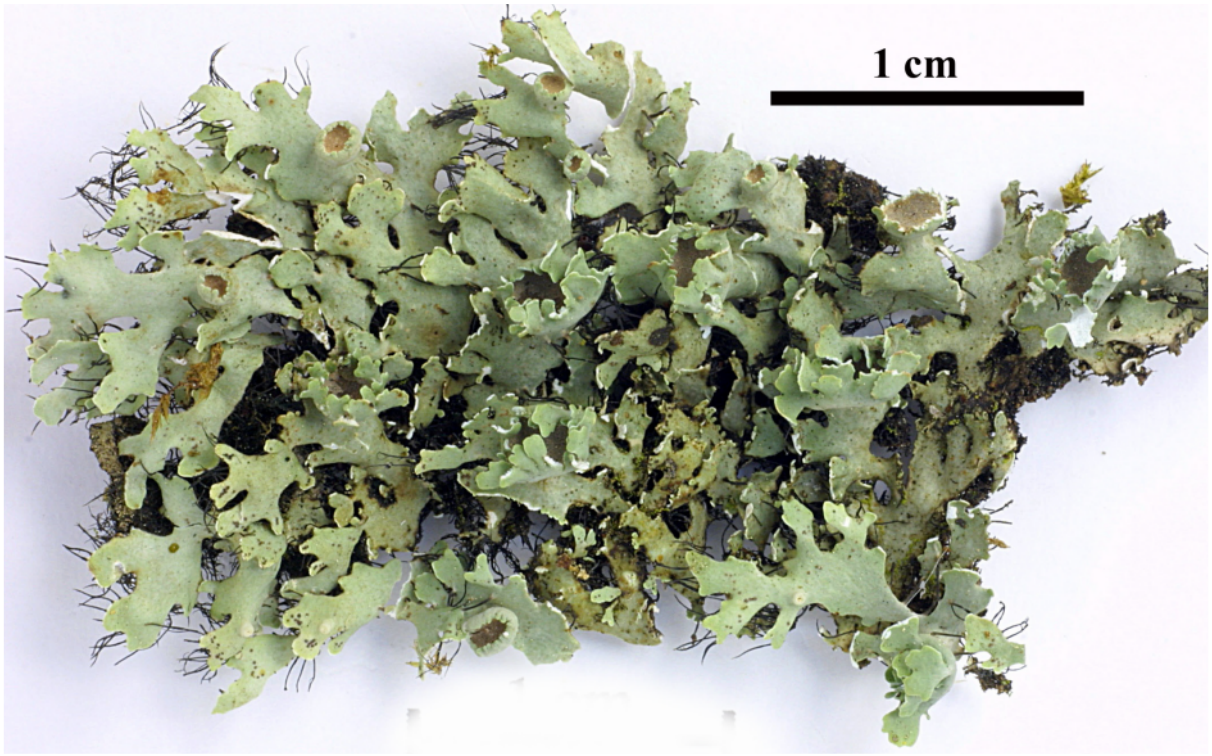


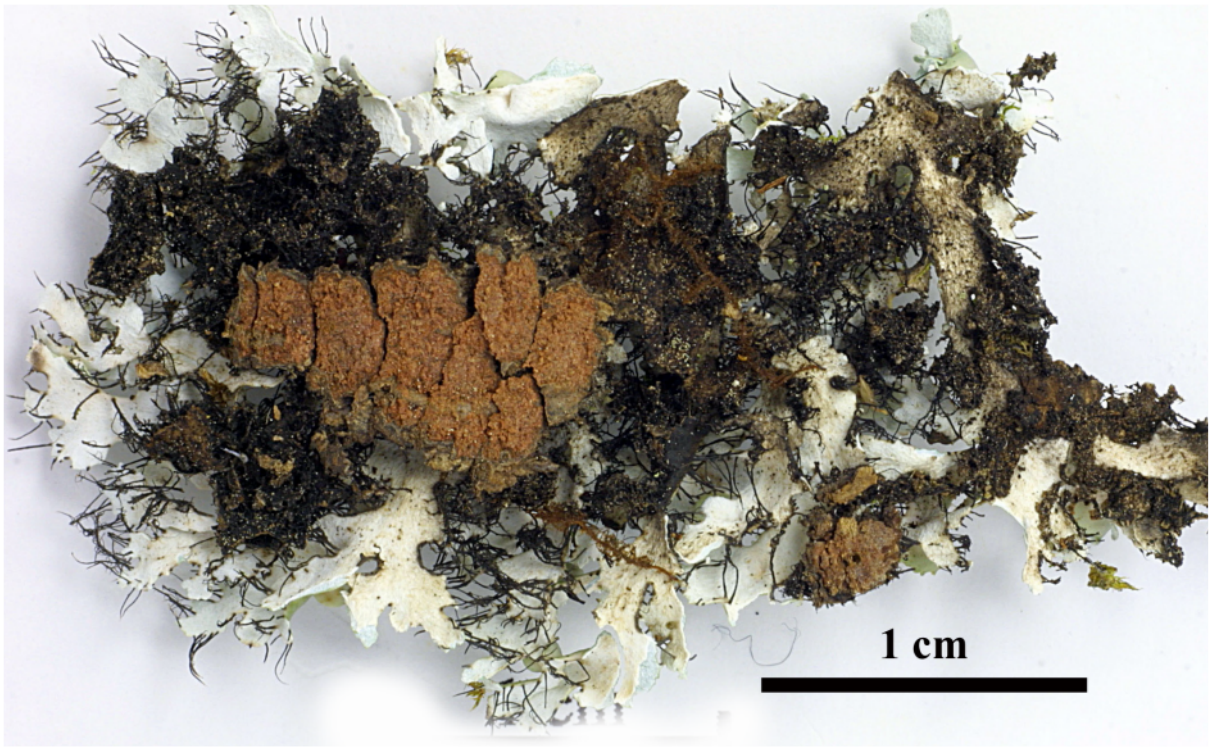

***Hemithecium canlaonensis***

***Heterodermia palpebrata*** (Taylor) Trass

Thallus lobes ascending (Podocarpa-group), up to 2.2 mm wide. Cilia marginal, abundant, not branched, black, c. 1.5 mm long. Soredia and isidia absent. Lower surface arachnoid, without cortex, white to ochre-coloured, K+ yellow not red. Rhizinae black, simple, not densely squarrose. Apothecia laminal, up to 3.7 mm wide, margins without cilia but with small, c. 0.8 mm long squamulae. Ascospores brown, 2-cellular, with many additional tiny lumina (sporoblastidia), 40-48 x 16-17 µm. Chemistry: atranorin (maj), zeorin (maj), c. 4 further triterpens (1 maj, 3 minor) (TLC).
Note: It is not clear whether *Anaptychia congoensis* Kurok. is a synonym; *H. palpeprata* is said to differ from this species by warty thallus and veins on the lower surface.

[11758], Nord-Thailand, Prov. Mae Hong Son, Hangwald an der Straße 1095 bei km 125 am Pass zwischen Soppong und Pai, westl. der Passhöhe, an heruntergebrochener Baumkrone, 1380 m. Leg. Schäfer Verwimp 11. April 2004 Nr. 23914-a, det. Schumm 2004.








***Heterodermia palpebrata***





***Heterodermia palpebrata***





***Heterodermia palpebrata***




***Heterodermia palpebrata***

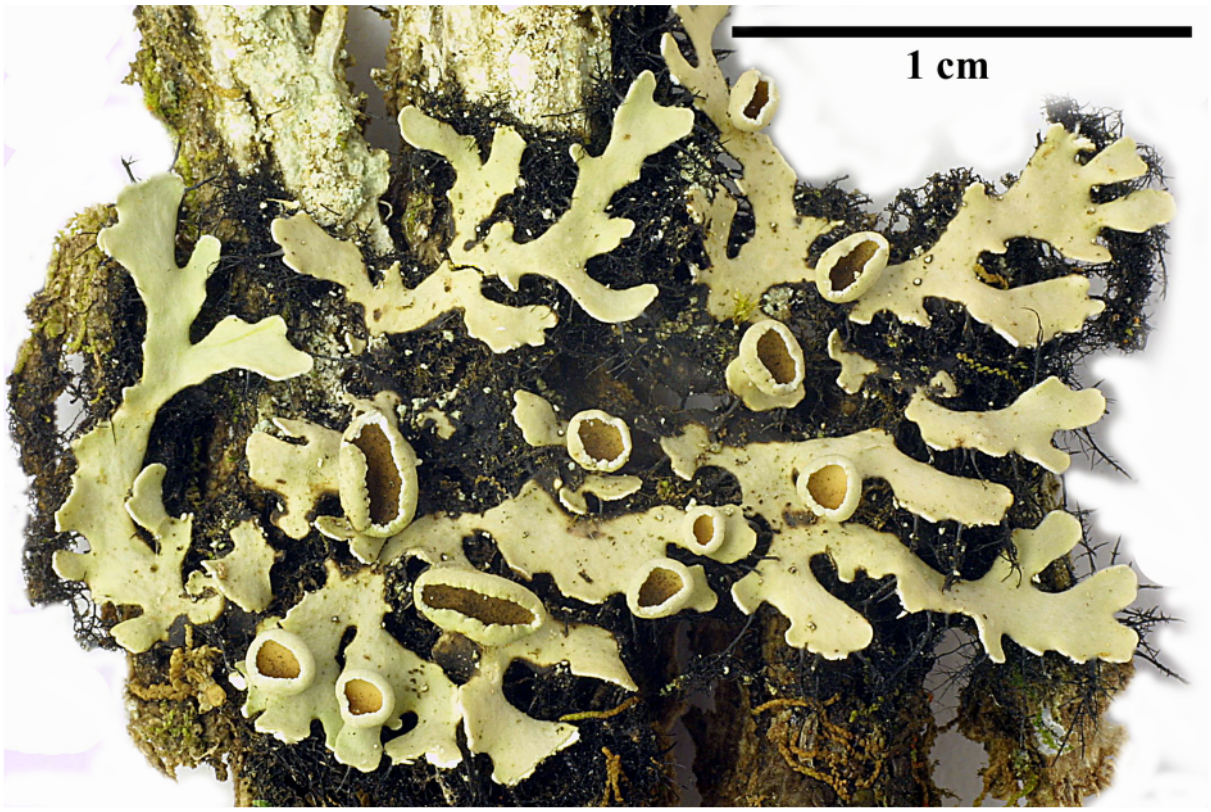
***Heterodermia paradoxa*** Schumm & Schäfer-Verwimp (2006)

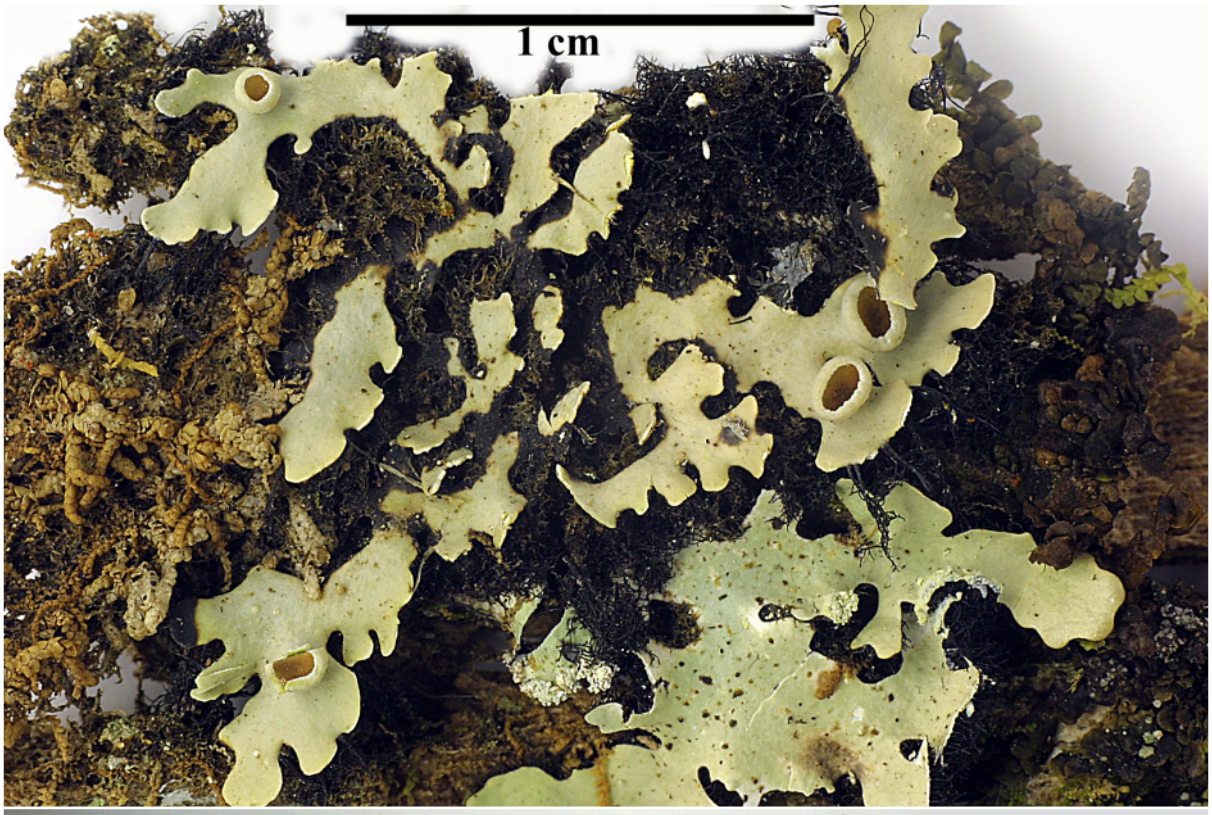
Thallus lobes adnate to somewhat ascending. Soredia and isidia absent. Lower surface not corticate but arachnoid, with brown-yellow (K+ red) hyphae similar to *Heterodermia flabellata*. Apothecia laminal, margins without cilia. Ascospores 26-28 x 11-16 µm, brown, 2-locular, without tiny additional lumina (sporoblastidia). Chemistry: atranorin, zeorin (TLC).

Note: Key to the species of *Heterodermia* without isidia or soredia, without lower cortex and with yellow to orange pigments on the lower surface

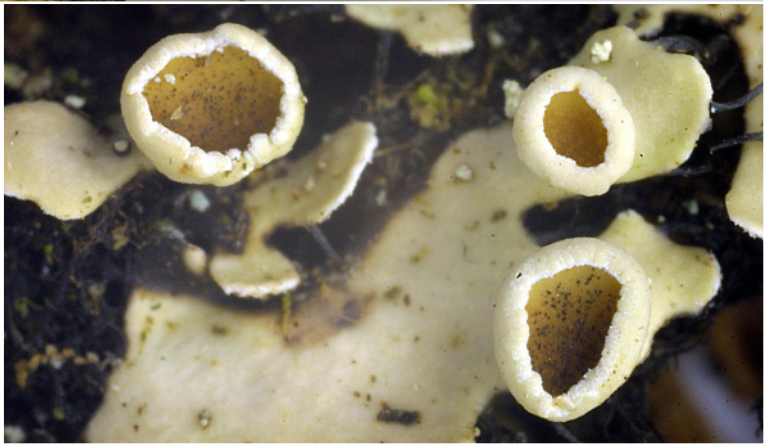
1a ascospores without additional tiny lumina (sporoblastidia) .....
.....***H. paradoxa*** Schumm & Schaefer-Verwimp
1b ascospores with additional sporoblastidia
2a yellow pigment K-..... ***H. lamelligera*** (Taylor) Follmann & Rédon
2b yellow pigment K+ red or purple
3a without norstictic acid (lobe tips K-)..***H. flabellata*** (Fée) D.D.Awasthi
3b with norstictic acid (lobe tips yellow>red)
4a pigment extensive.....***H. dendritica*** (Pers.) Poelt
4b pigment spotted.....***H. dendritica*** var. ***corcovadensis*** Kurok.

[11757], Thailand, Prov. Chiang Mai, Doi Inthanon, am Rande des immergrünen Regenwaldes nördlich des Checkpoints (gegenüber der Abzweigung nach Mae Chaem), an freistehendem Baum; 1720m. Leg. Schäfer-Verwimp 8. April 2004 (Nr. 23854/B-b), det. Schumm 2004.

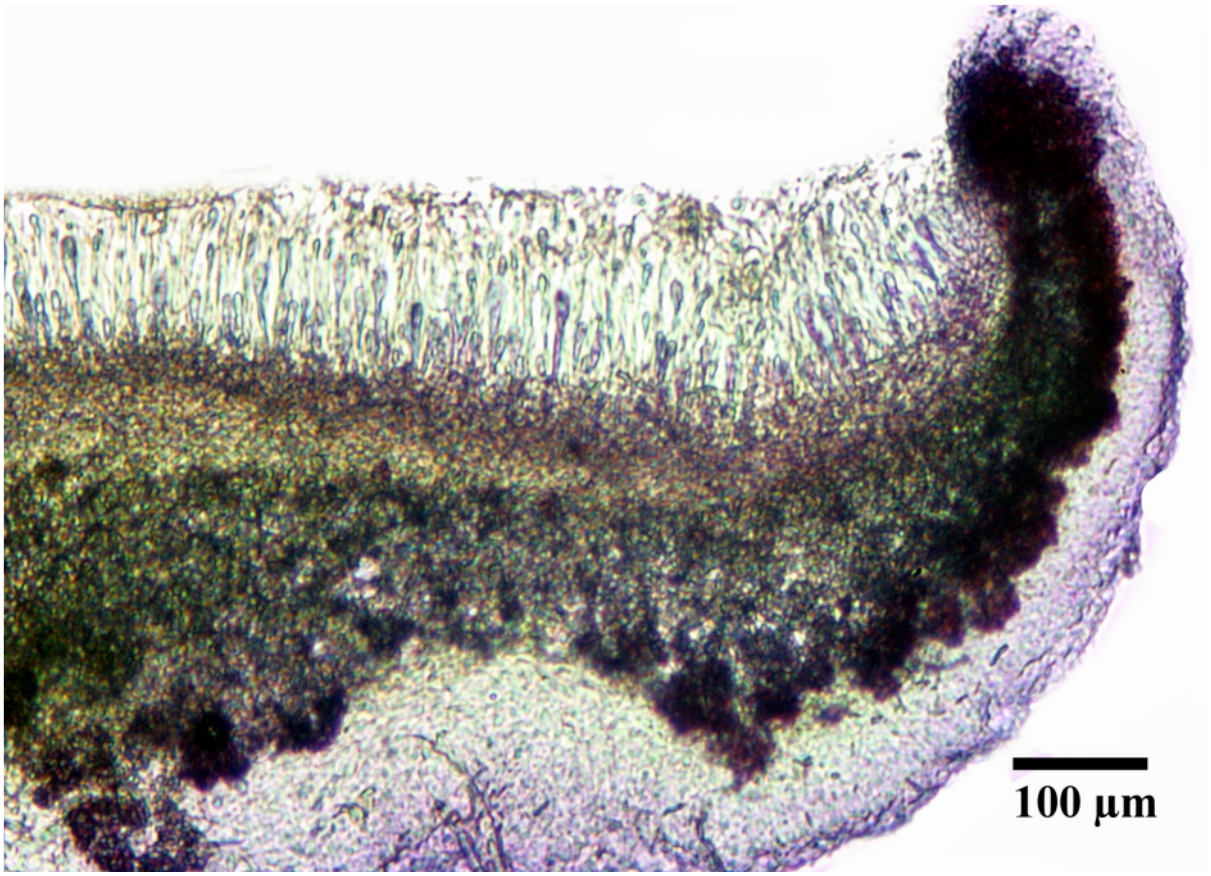


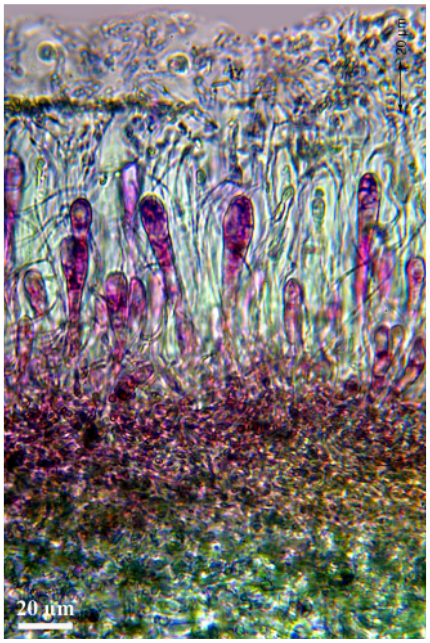


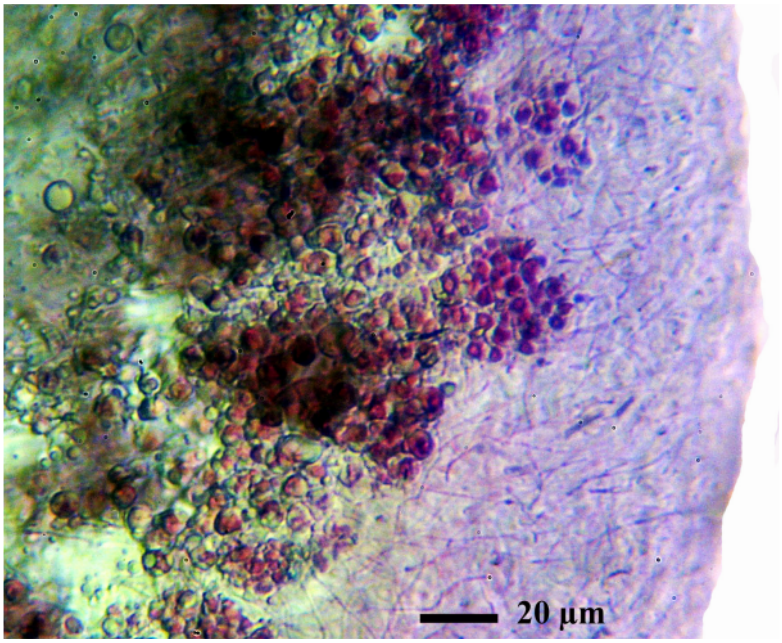


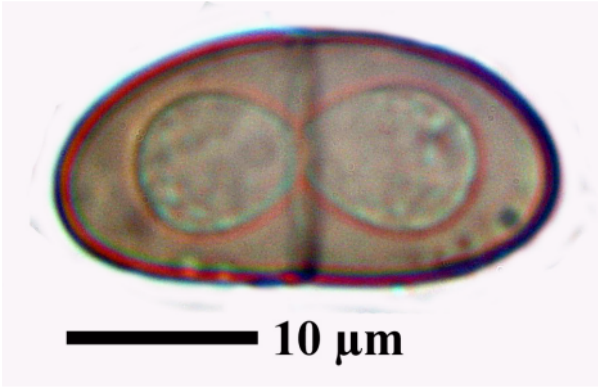



***Heterodermia paradoxa***







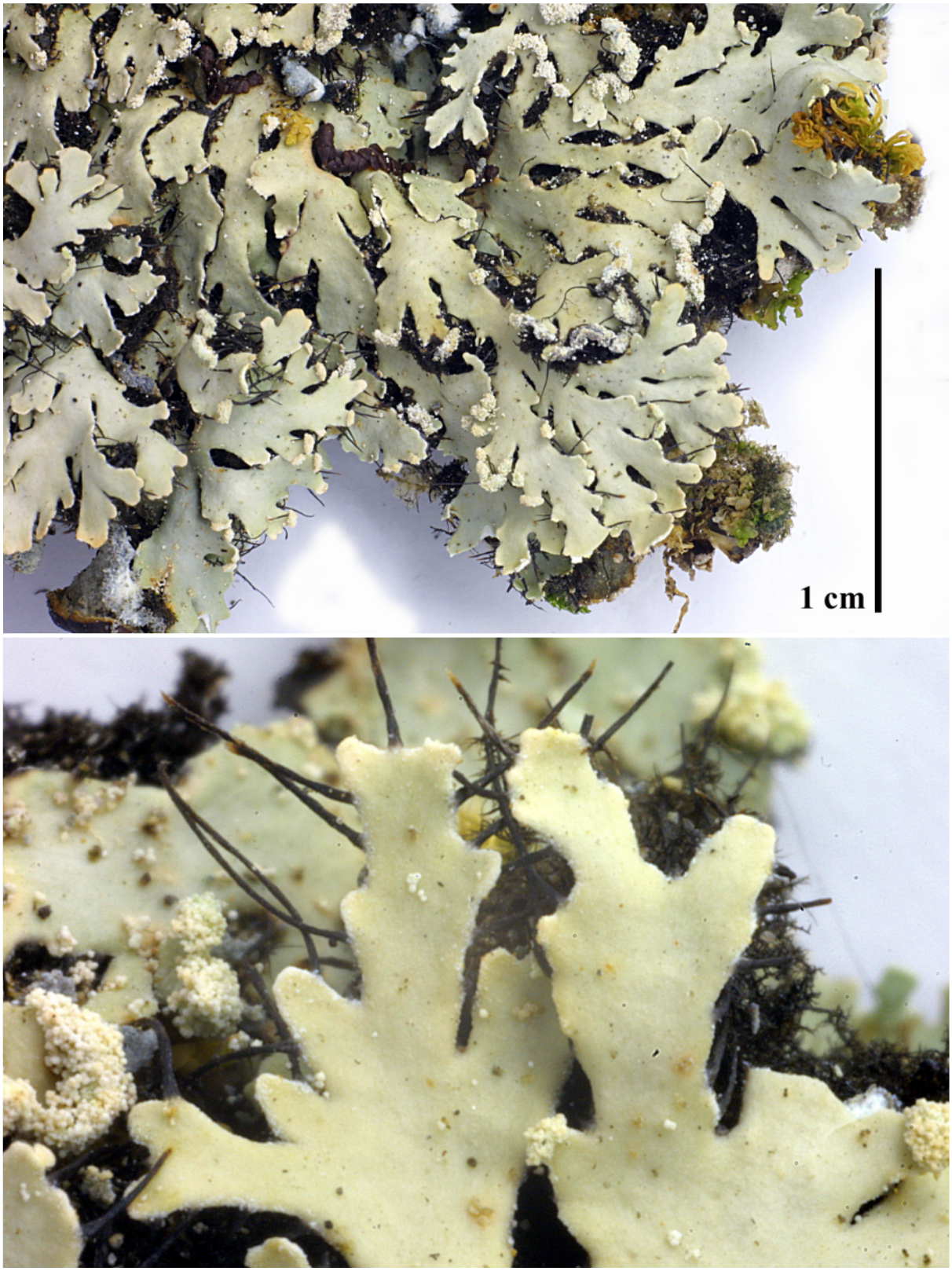
***Heterodermia paradoxa***

***Heterodermia propagulifera*** (Vain.) Dey

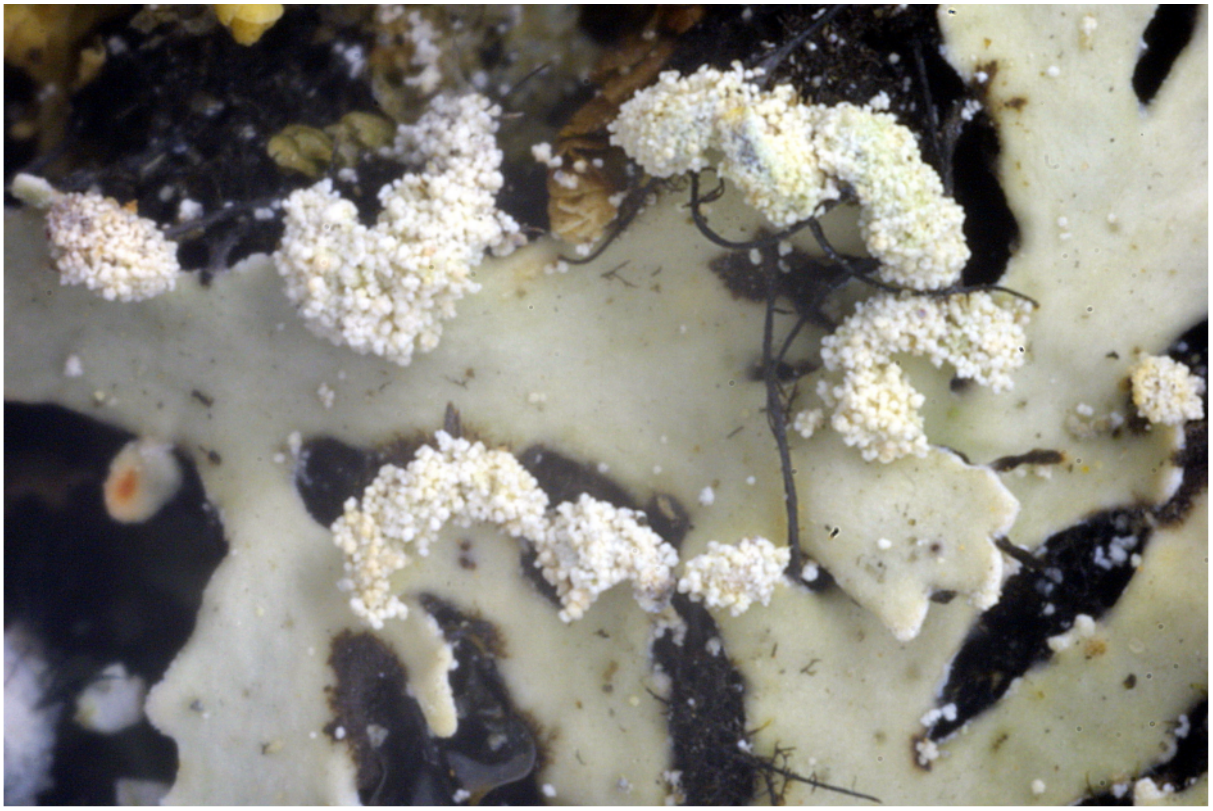
Thallus lobes adnate to somewhat ascending at the margins, 0.75-1.1 mm wide. Soredia present, mainly on the tips of tiny secondary lobes. Cilia black, mostly simple, up to 1.7 mm long. Rhizinae black, simple or squarrose. Lower surface not corticated, white, toward the centre blackish, toward the lobe tips with unstructured, diffuse, yellowish K- pigment and additional partly spotted with tiny yellow to orange granules (K+ red to purple). Chemistry: atranorin (maj), zeorin (maj), salazinic acid (maj), norstictic acid (trace), pigments. Note: the very similar *H japonica* has no yellow pigments on the lower side

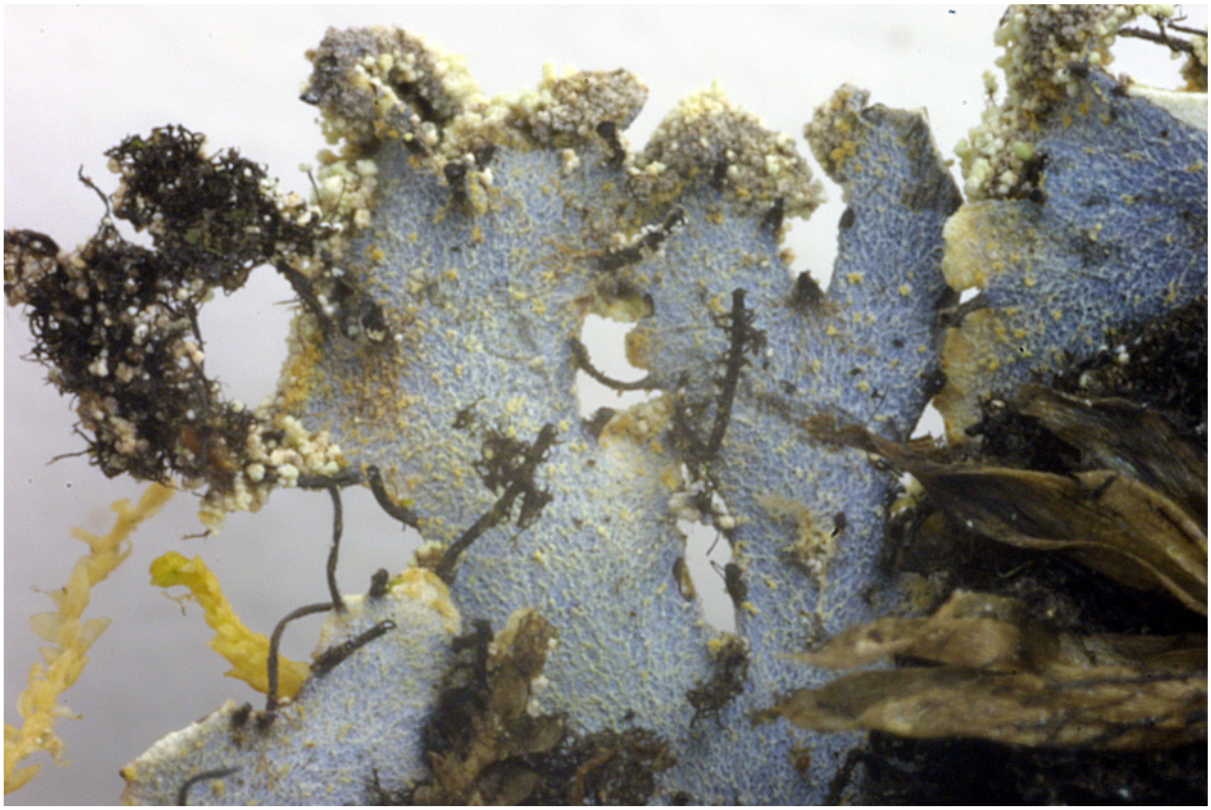
[11761], Nord-Thailand, Prov. Chiang Mai, „Antennenberg“ an der Straße 1095 bei km 33,2 (10,8 km lange Stichstraße westlich Pa Pae), epiphytisch; 1480 m. Leg. Schäfer Verwimp 12. April 2004 (Nr. SV 24004), det. Schumm 20.8.2004.



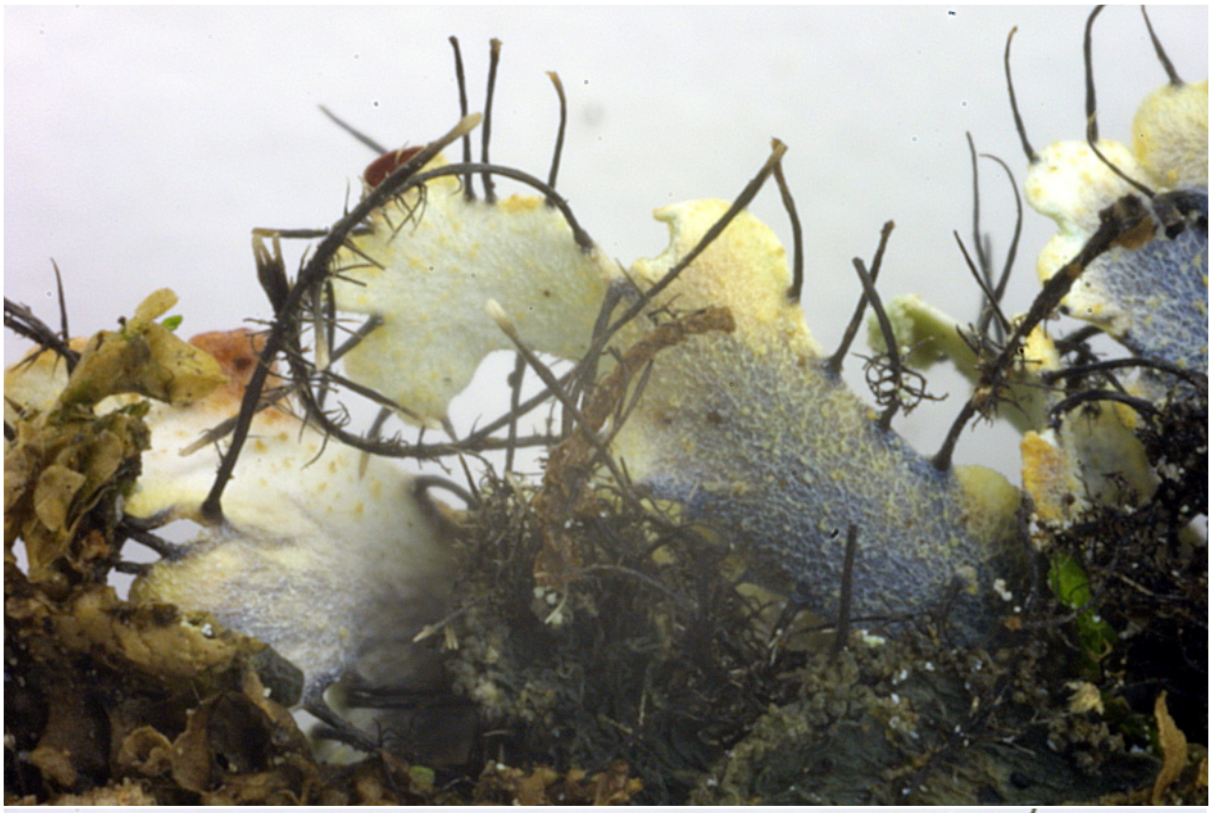


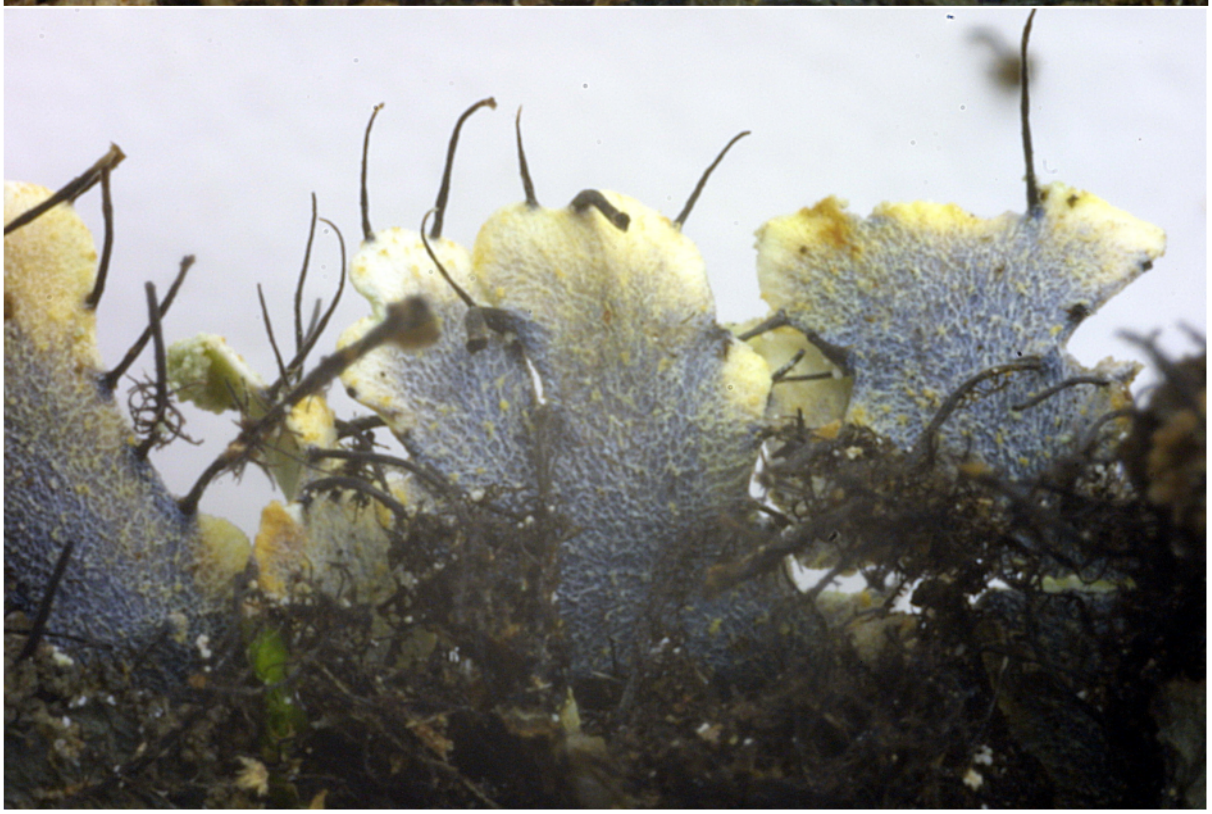

***Heterodermia propagulifera***



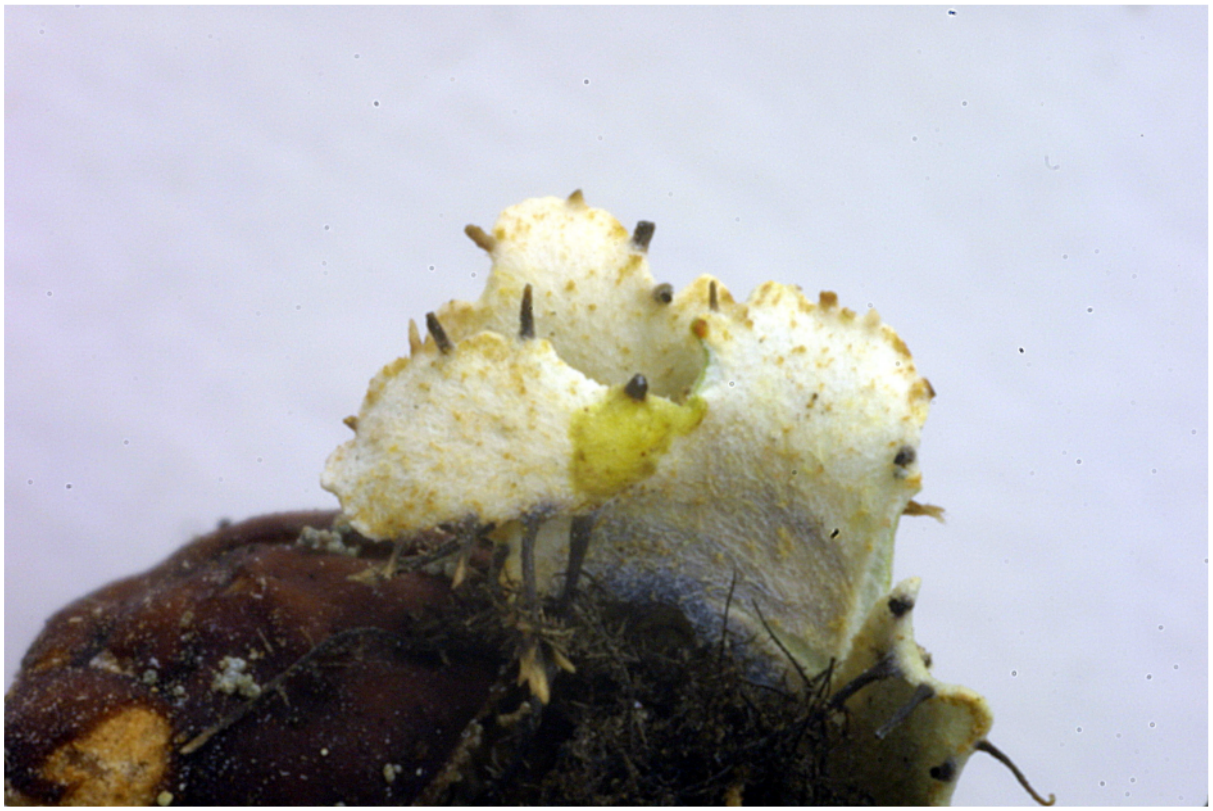


***Heterodermia propagulifera***





***Heterodermia propagulifera***

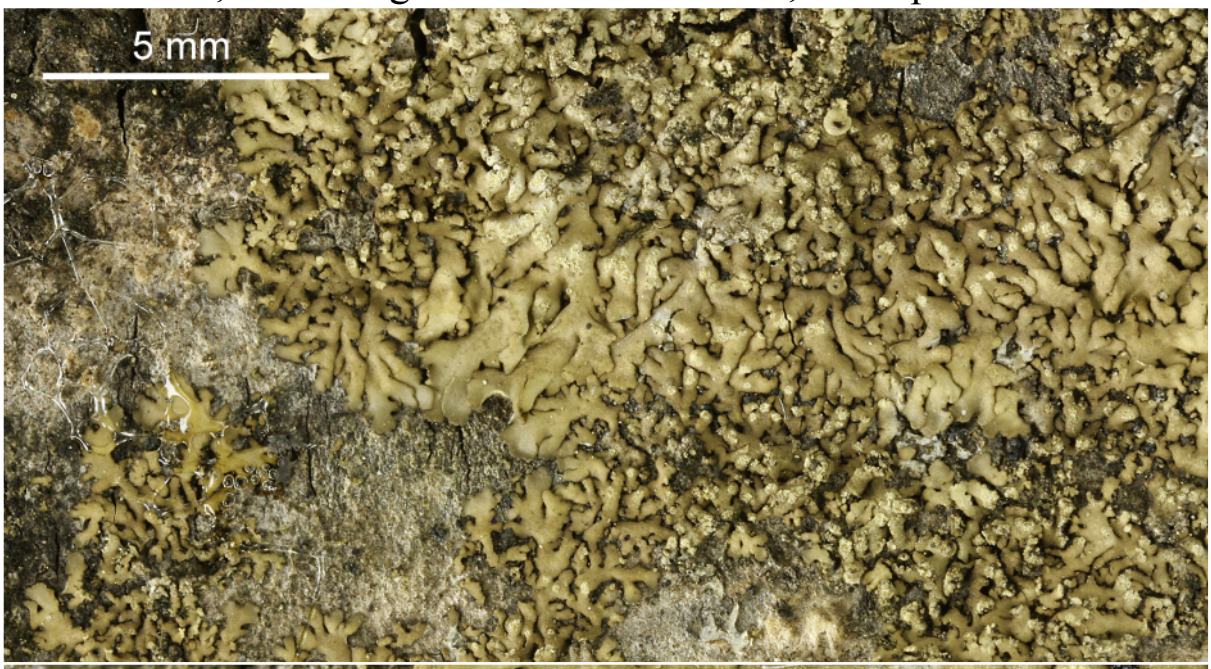


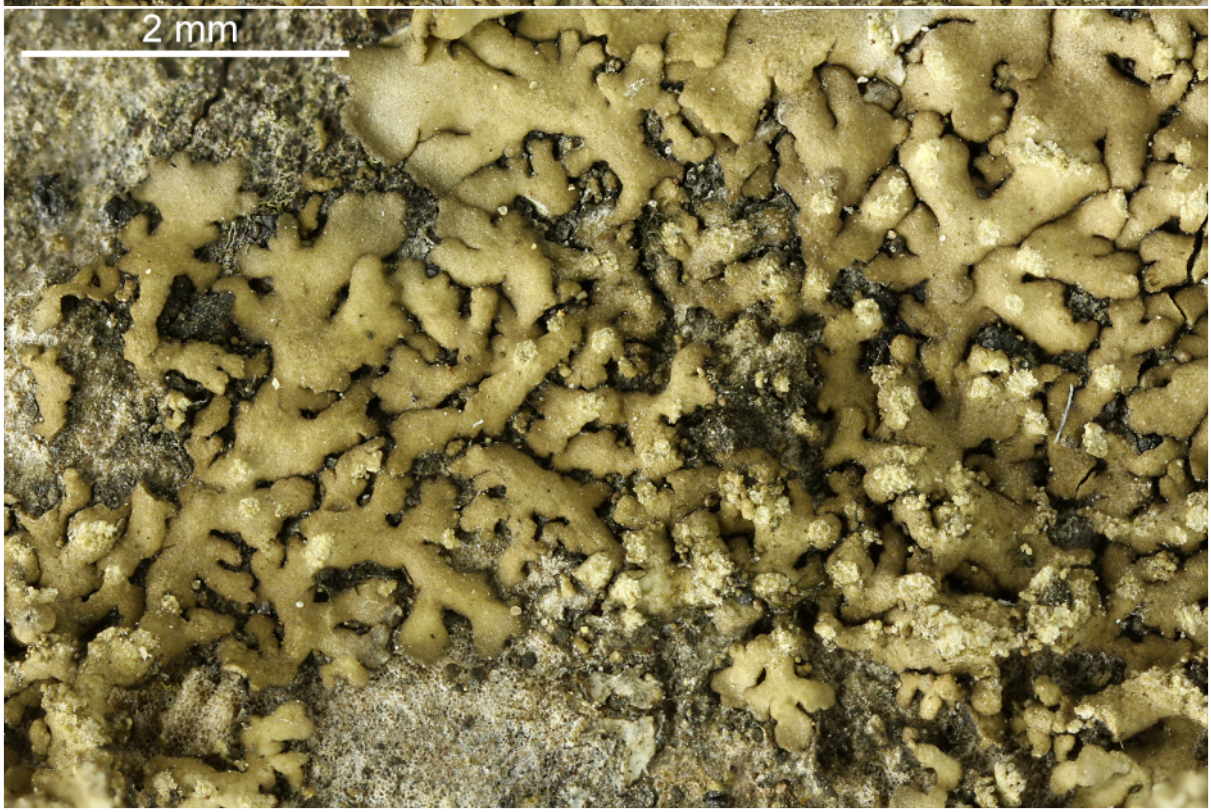
***Heterodermia propagulifera***

***Hyperphyscia adglutinata*** (Flörke) H.Mayrhofer & Poelt

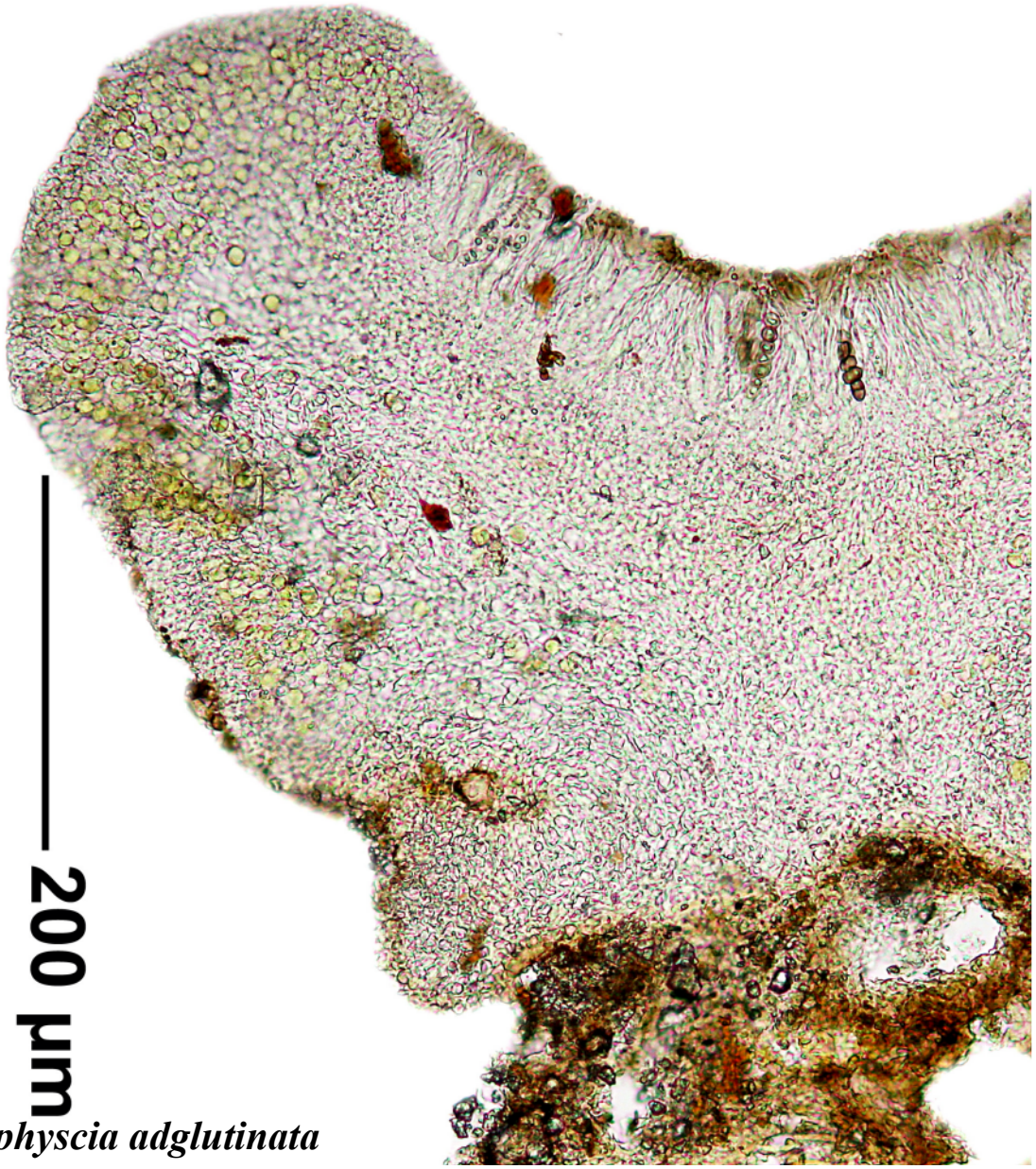
Thallus grey to brown, strongly appressed, microfoliose to squamulose or nearly crustose. Lobes up to 0.5 mm wide, spot-like sorediate. Upper surface paraplectenchymatic, lower surface prosopectenchymatic, with a few thick rhizines. Apothecia often present, laminal. Paraphyses at the tips brown and branched. Ascospores brown, 1-septate, walls uneven thickened, 12-18 x 6-10 µm. Pycnospores 10-20 x 1 µm. Chemistry: nil (TLC)

[9547], Thailand, Tempelanlage von Sukhothai. 17°01.019' N, 99°42.273 E, 78 m. Leg. Schumm 29.03.2002, det. Aptroot 2009.

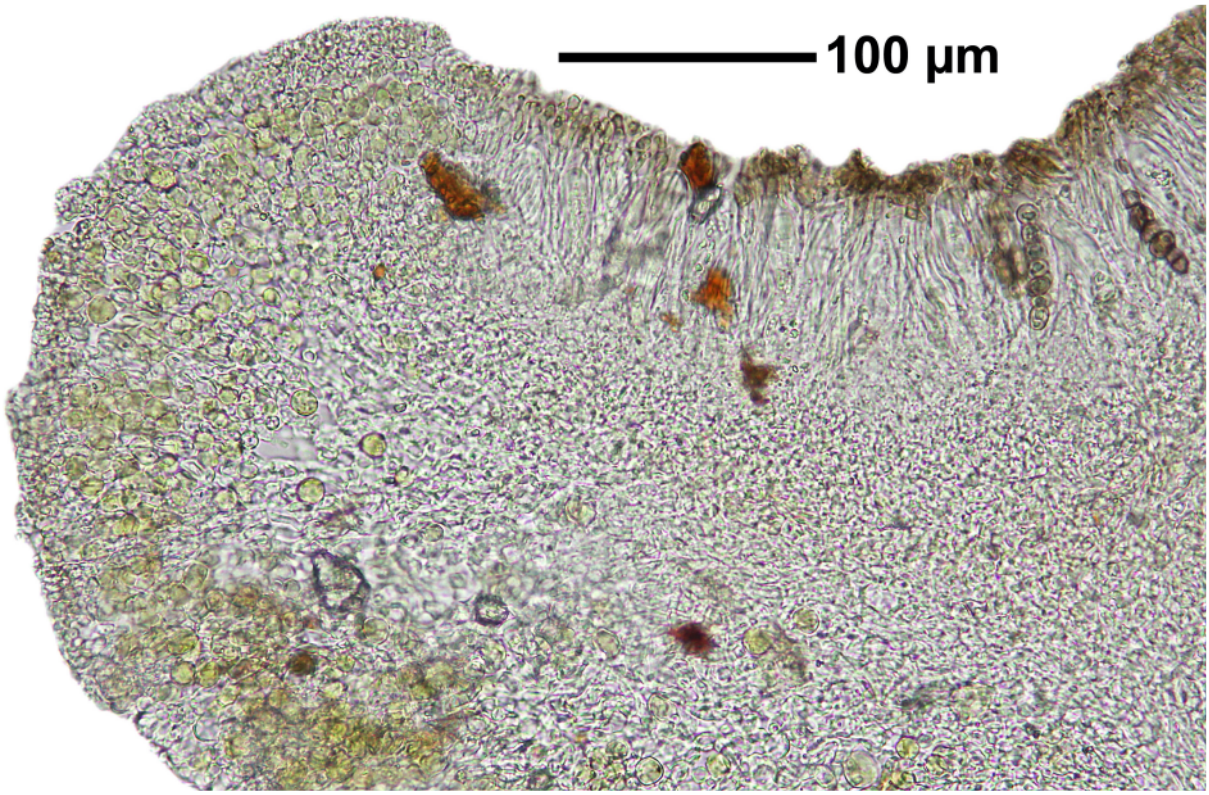


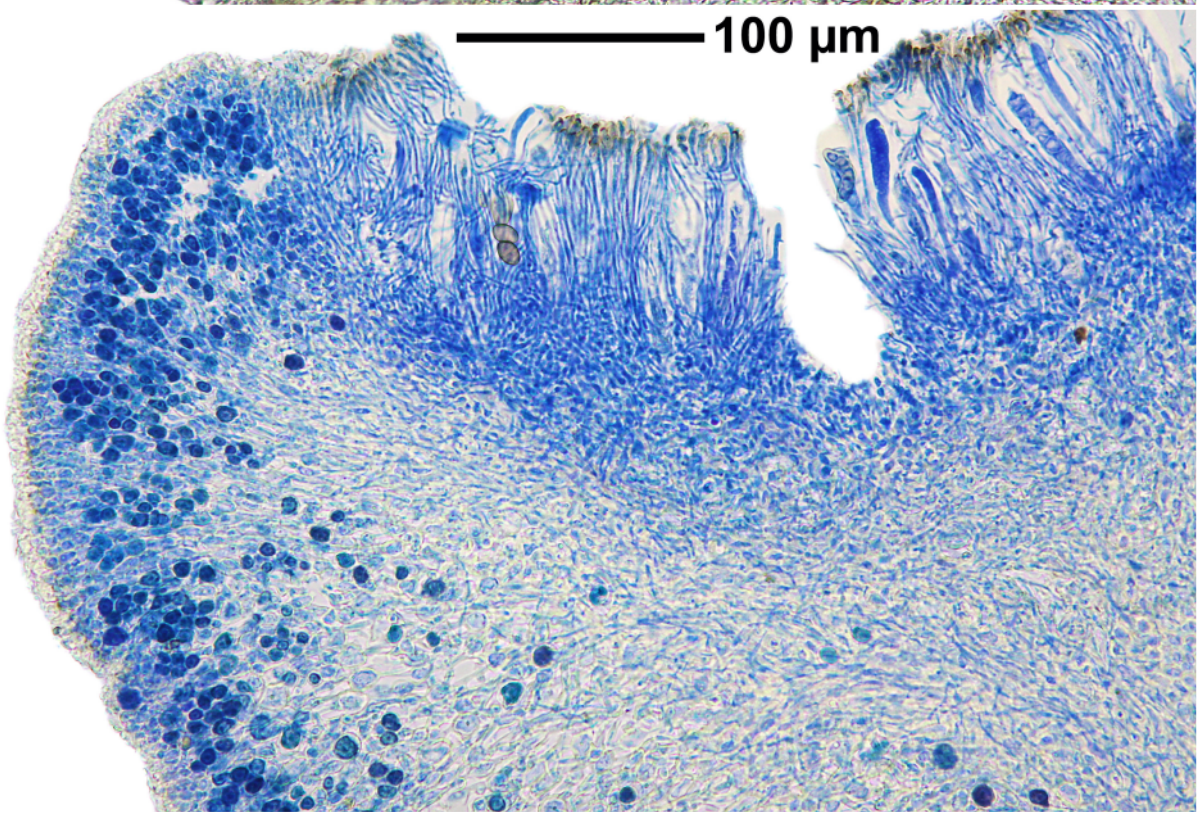





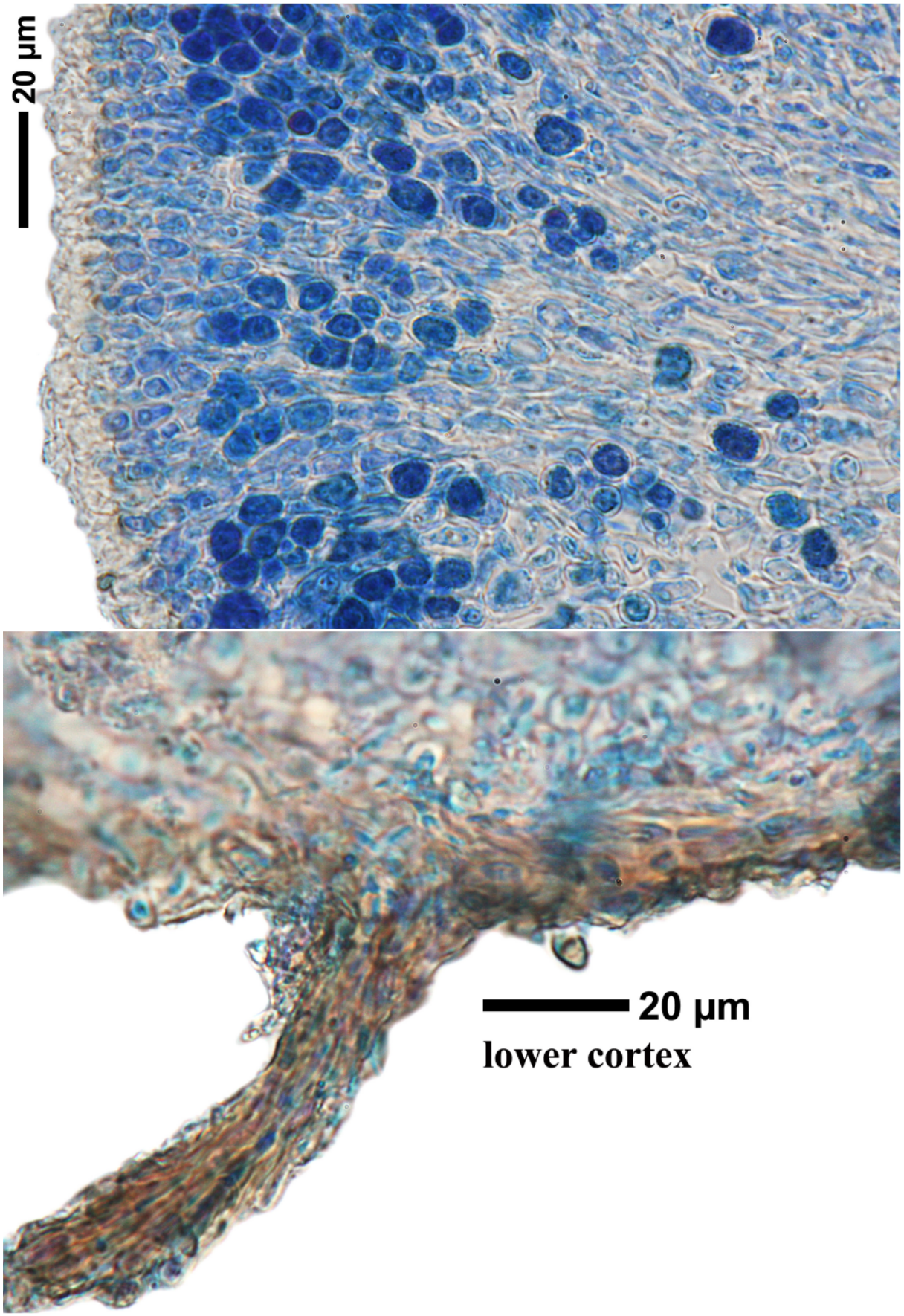




***Hyperphyscia adglutinata***

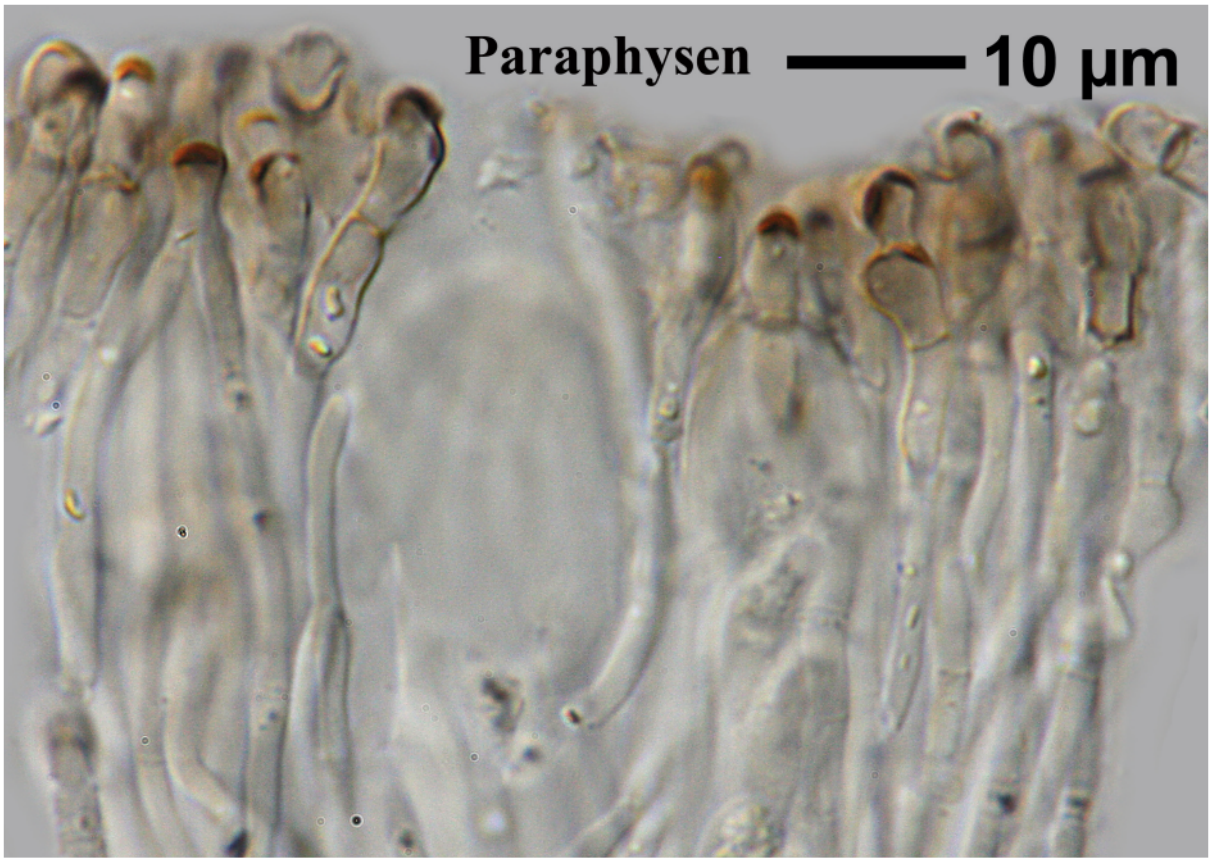



***Hyperphyscia adglutinata***




***Hyperphyscia adglutinata***







***Hyperphyscia adglutinata***

***Hypotrachyna corneola*** Kurok. & K.H.Moon

Thallus corticolous, mineral grey, turning into ochre-buff in the herbarium. Lobes sublinear-elongate, 1.5-5 mm wide. Upper surface plane, more or less glossy, emaculate, lacking soredia, isidia and pustules. Medulla white. Lower surface black, densely rhizinate. Apothecia 1-2 mm in diameter. Spores 6-7.5 x 5 µm, hyaline. Chemistry: atranorin (minor), salazinic acid (major), consalazinic acid (minor) [Elix, solvent C]. Lit. Kurokawa, S. & Moon, K.H. (2000, Bull Bot. Gard. Toyama 5:9-24).

[8031], Philippinen, Mindanao, Provinz Cotabato, Mt. Apo, tropischer Bergregenwald, Marbel-River-Campsite, ca. N 07°00.165, E 125°14.767, alt.: 1490 m. Leg. Schumm 09.08.1999, det. J.A. Elix 11.10.2000.

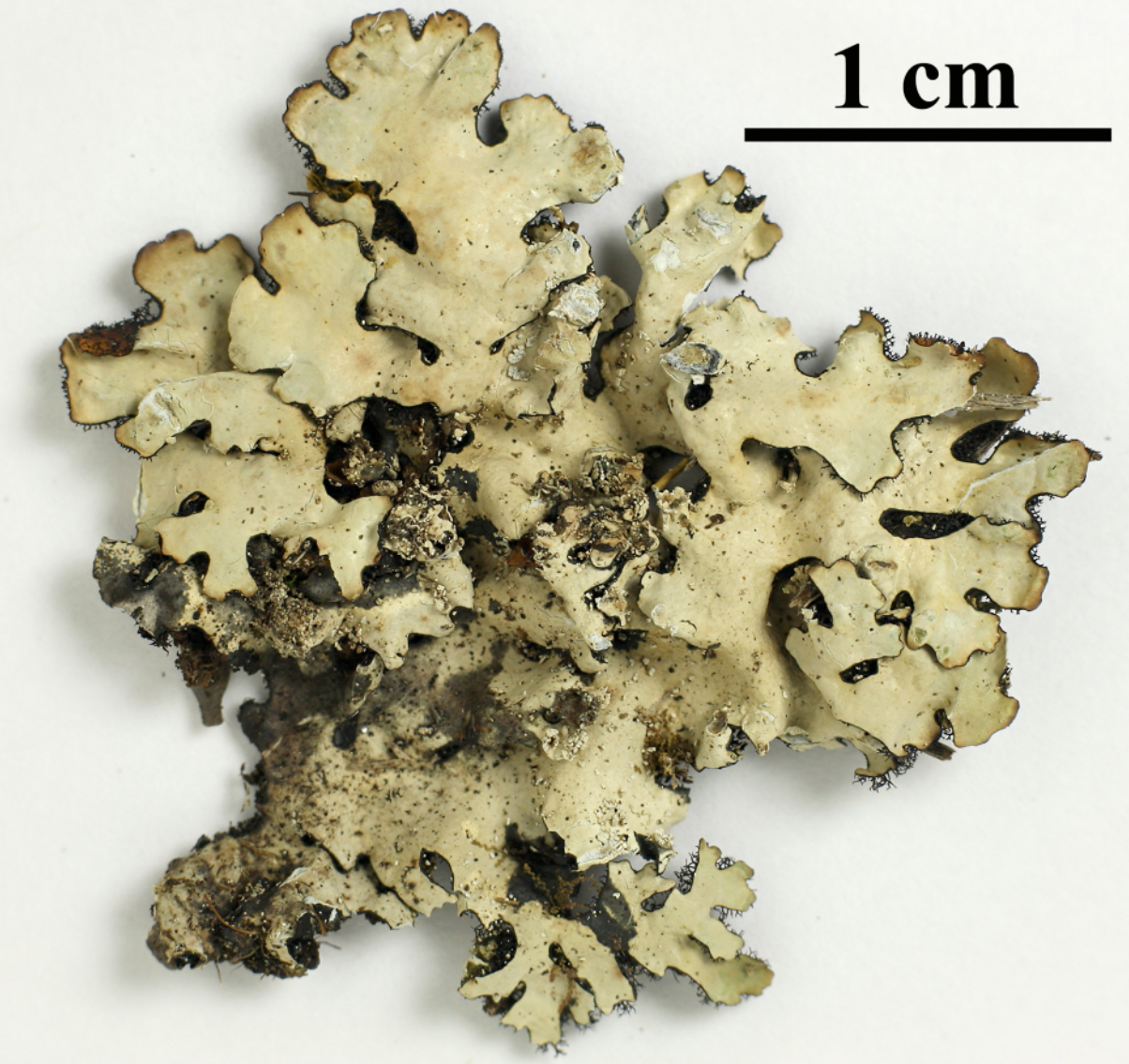




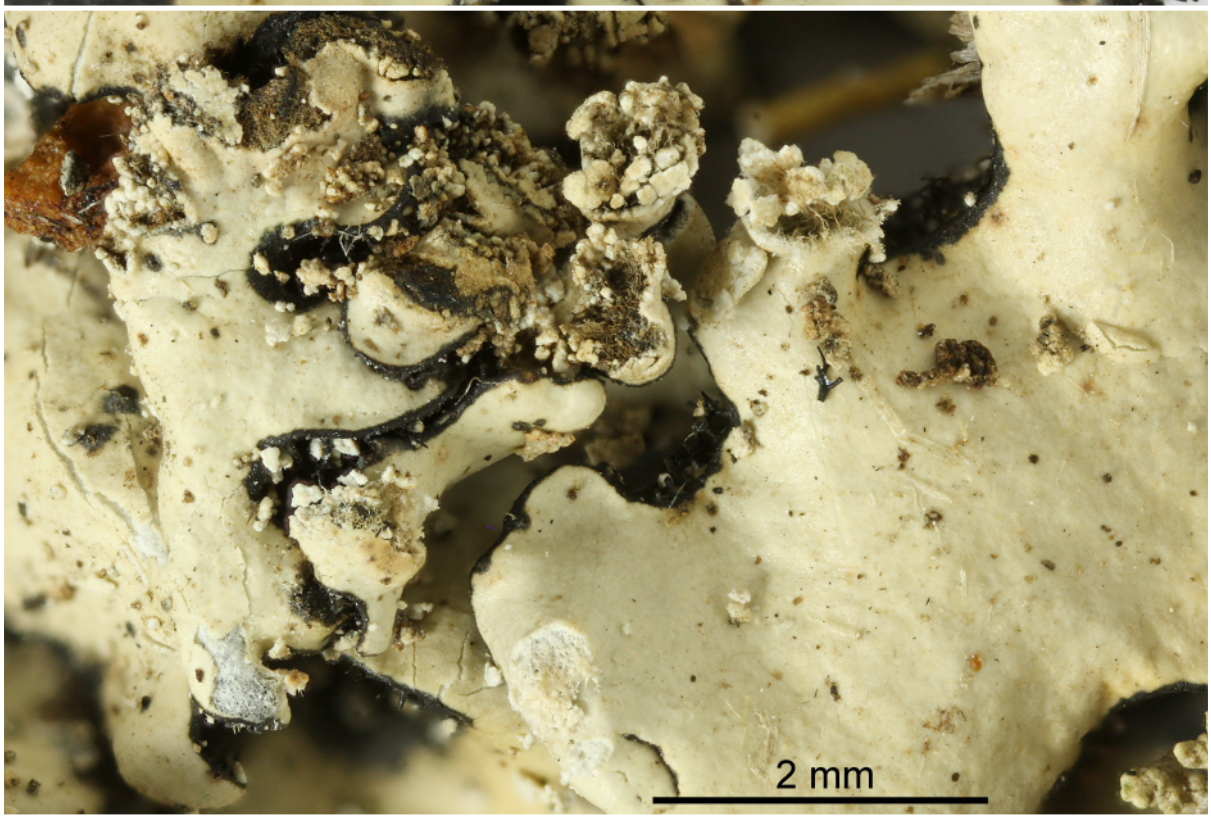

***Hypotrachyna exsecta*** (Taylor) Hale

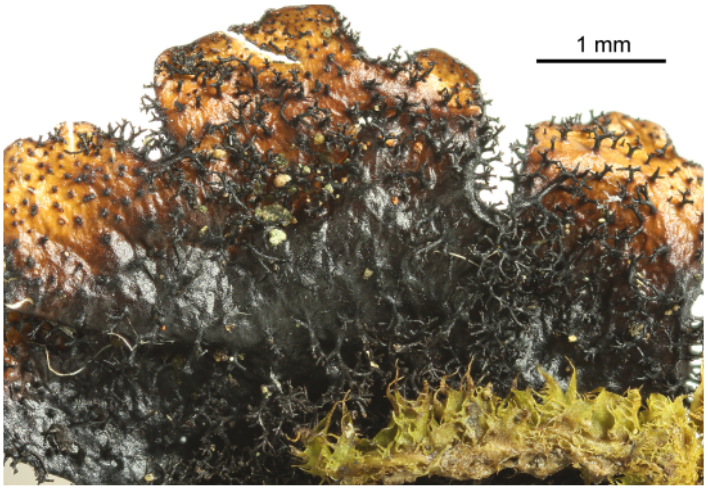
Thallus whitish grey. Lobes 1-3 mm wide. Upper surface emaculate, without isidia but pustulate. Pustules subapical, erumpent, eroding and becoming coarsely granular-sorediate and exposing black lower cortex. Medulla white. Rhizines richly dichotomously branched. Apothecia rare, 2-7 mm wide, Ascospores 9-11 x 5-9 µm. Chemistry: cortex K+ yellow, UV-; medulla K-, C-, KC+ orange, P-; atranorin (minor), barbatic acid (major), 4-O-demethylbarbatic acid (minor) .

[6211], Philippinen, Mindanao, Provinz Cotabato, Gipfelregion des Mt. Apo, 06°59.272' N, 125°16.195' E, 2900 m. Leg. Orville L. Bernabe 12.08.1999, det. J.A. Elix 12.05.2000.





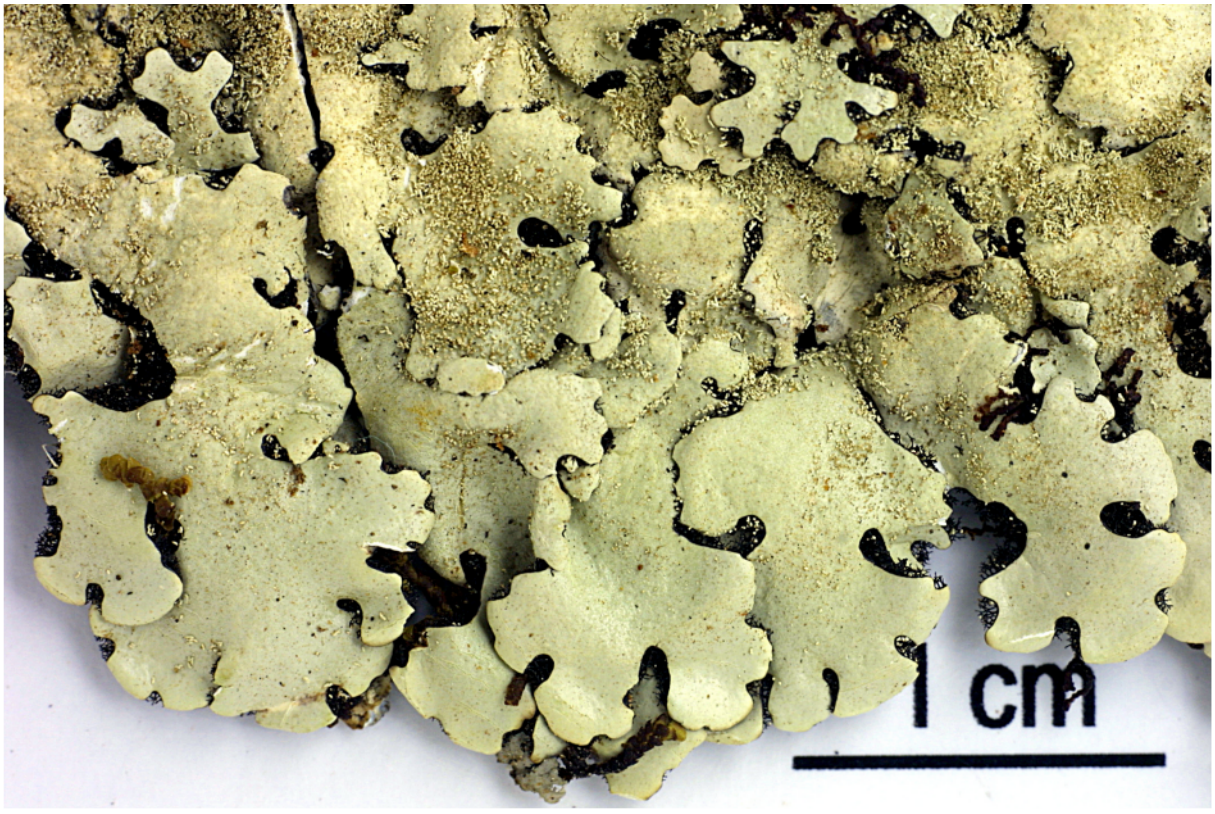



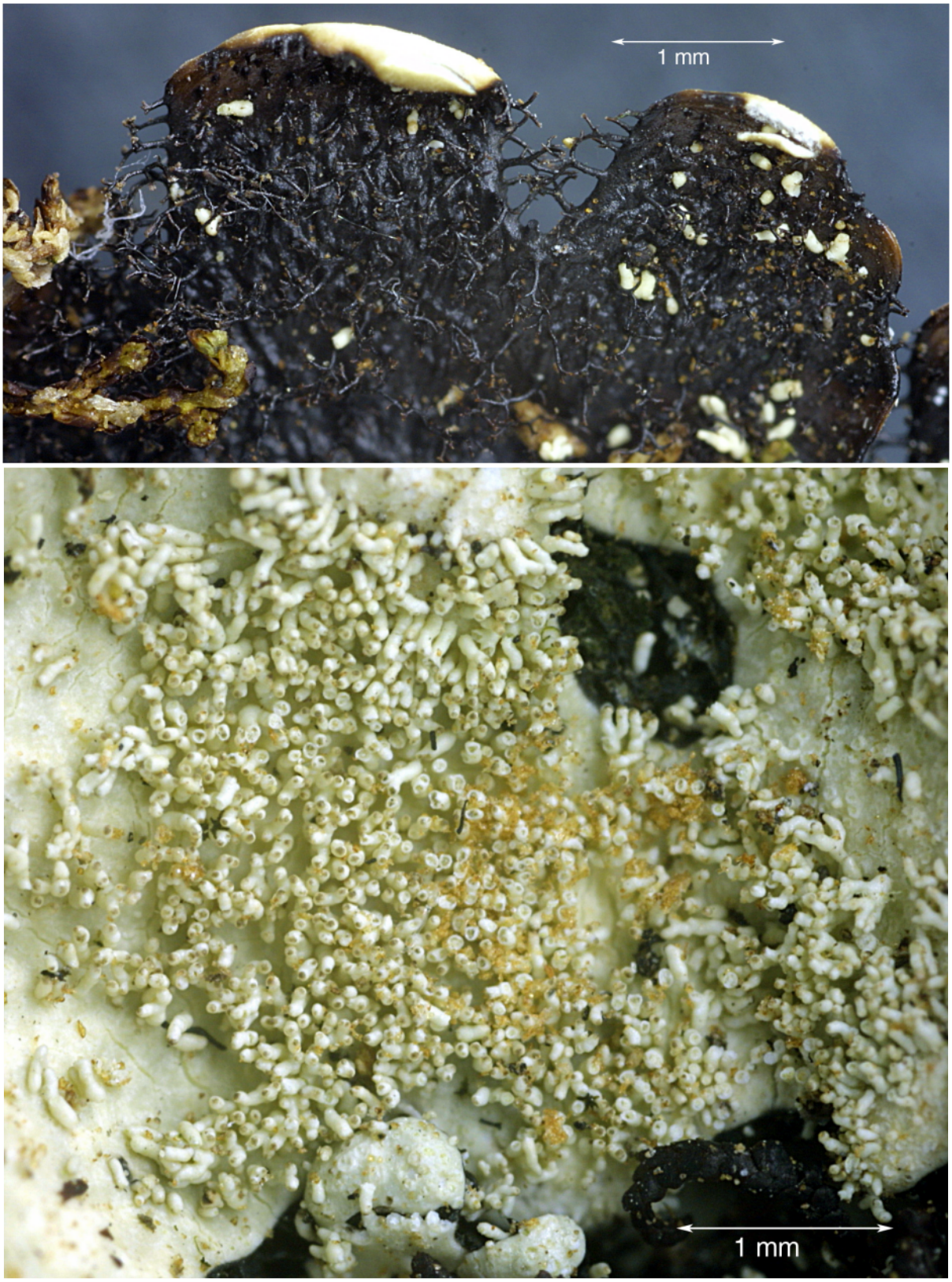

***Hypotrachyna exsecta***

***Hypotrachyna imbricatula*** (Zahlbr.) Hale

Thallus corticolous, 3-15 cm wide, subdichotomously lobate, whitish gray, white maculate, isidiate, without soredia. Isidia laminal to marginal, dense, cylindrical or branched. Medulla white. Apothecia rare, 2-10 mm wide. Ascospores 11-16 x 7-10 µm. Chemistry: upper cortex K+ yellow, C-, KC-, P+ yellow, UV-; medulla K-, C+ yellow-orange, KC+ yellow orange, P-; atranorin, chloroatranorin, barbatic acid (major), 4-O-demethylbarbatic acid (major), obtusatic acid (minor), norobtusatic acid (minor/trace). Widespread throughout the Neotropics, known also from the Azores, India, China,Thailand, Philippines, Papua New Guinea, Australia, and Hawaii.

[6246], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay in Intavas am Fuß des Mt. Kitanglad, 08°11.883’ N, 124°56.721’ E, 1270 m. Leg. Schumm 18.08.1999, det. J.A.Elix 2000. Dupl. in CANB.





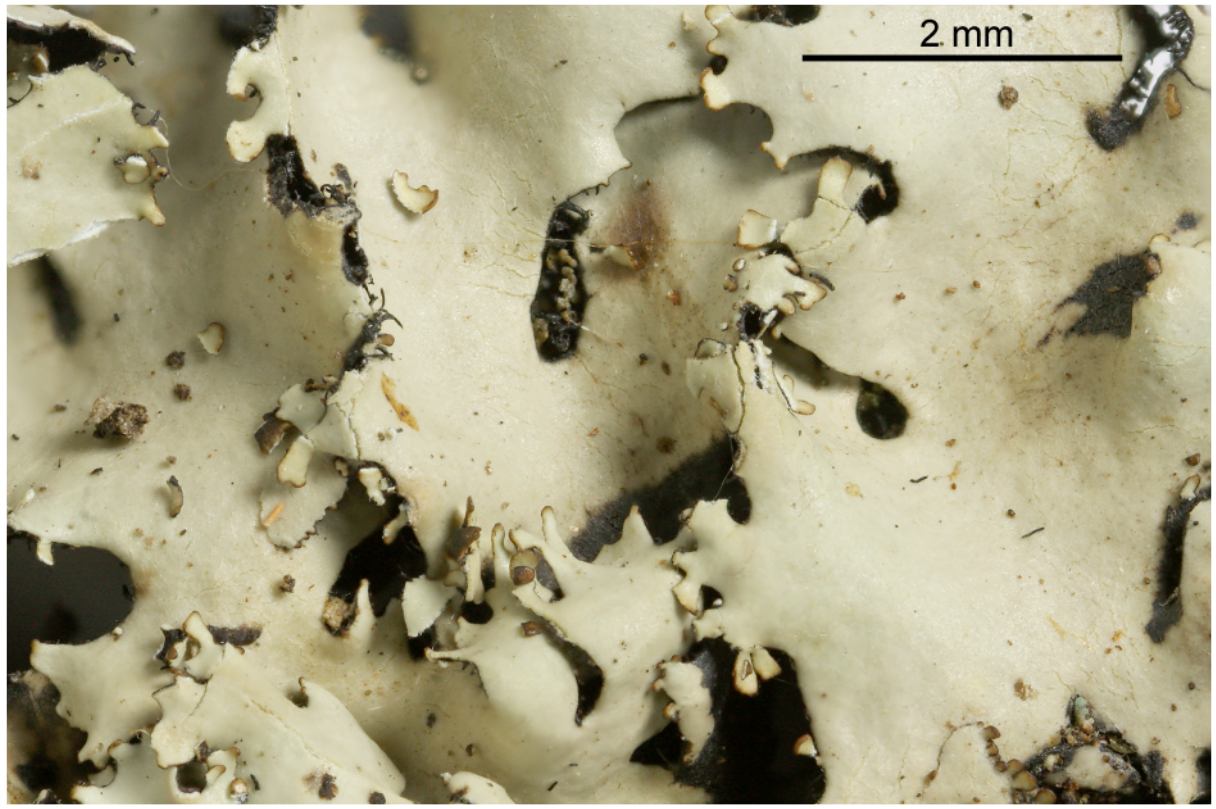

***Hypotrachyna imbricatula***

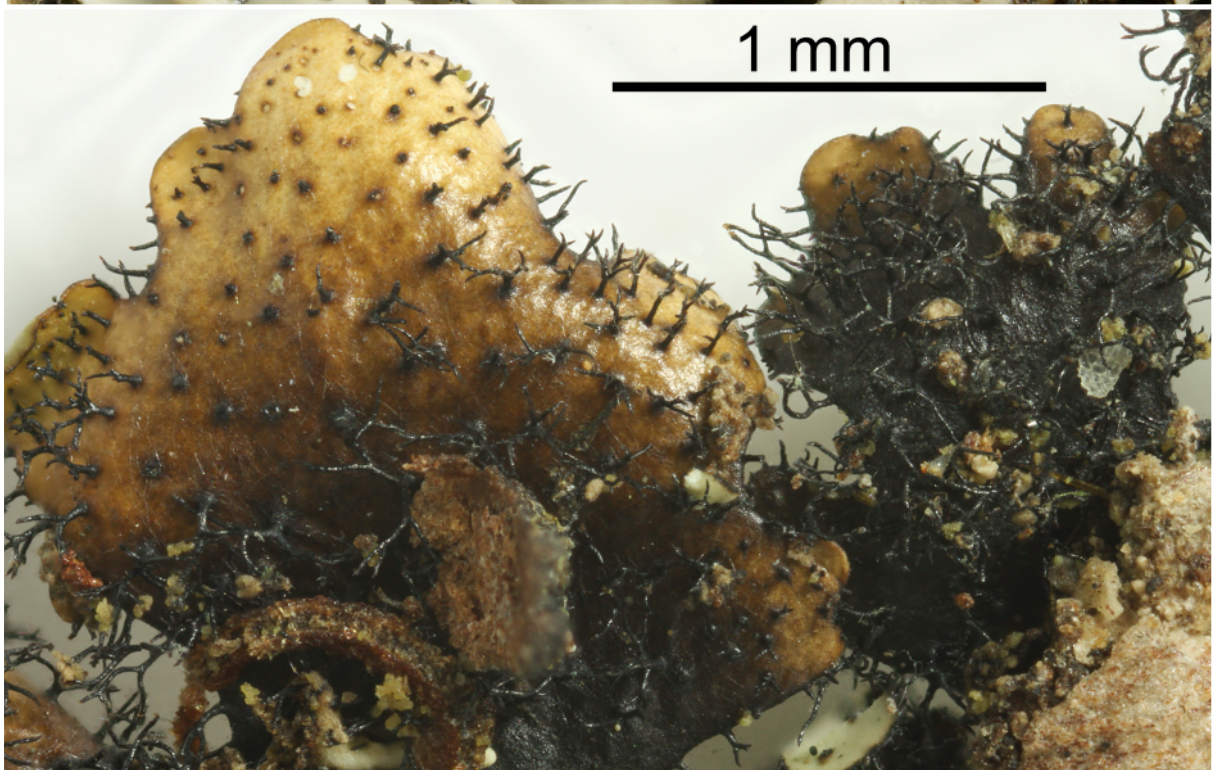
***Hypotrachyna neodigitata*** Kurok. & K.H.Moon

Thallus corticolous, mineral grey, more or less glossy, emaculate, 2.5-5 cm wide. Lobes sublinear, subirregularly divided, 1-3 mm wide, becoming densely lobulate along the margin and surface. Soredia and Isidia absent. Medulla white. Lower surface densely rhizinate. Chemistry: atranorin (minor), barbatic acid (major), 4-O-demethylbarbatic acid (minor), norobtusatic acid (trace). Lit. Kurokawa & Moon 2000.

[6271], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay, tropischer Regenwald am Mt. Kitanglad ab Zwischen-Campsite , 08°09.637' N, 124°55.871' E, 1870-2800 m. Leg. Schumm 19.08.1999, det. J.A. Elix 07.07.2000.






***Hypotrachyna neodigitata***

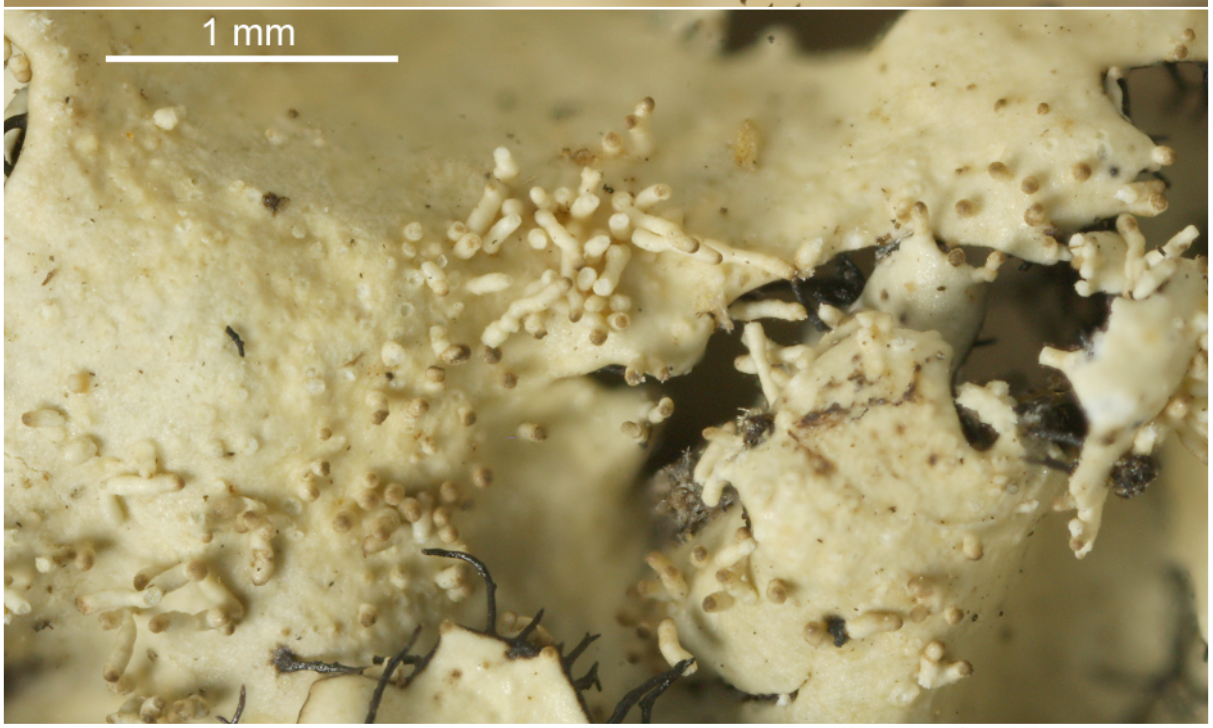
***Hypotrachyna orientalis*** (Hale) Hale

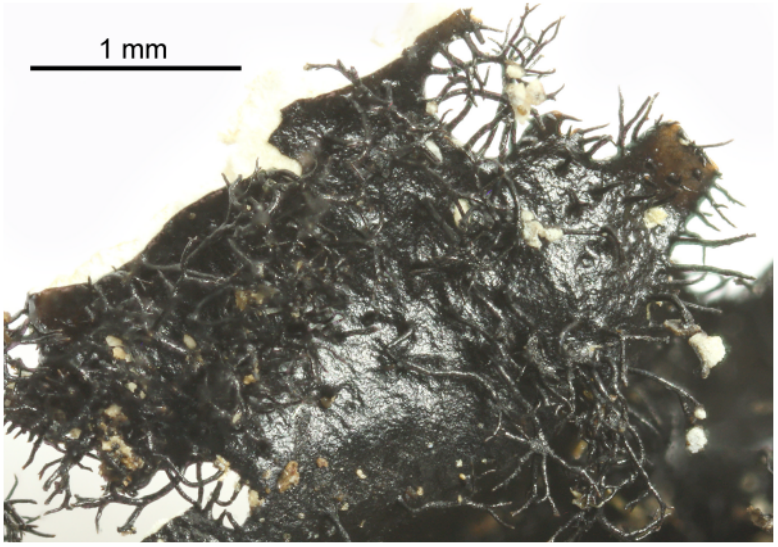
Very similar to *Hypotrachyna imbricatula*, but more fragile, more membranaceous, with emaculate surface and without obtusatic and norobtusatic acids which are present in *Hypotrachyna imbricatula*. Chemistry: atranorin (minor), barbatic acid (major), 4-O-demethylbarbatic acid (major). Some lichenologists synonymized *H. orientalis* with *H. imbricatula*, Kurokawa (1986), Divakar & Upreti (2004).

[7585], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail beim Lake Yagumyum, 9°15.040' N, 123°11.172' E, 1360 m. Leg. Schumm 11.08.2000, det. JA Elix 06.11.2000.






***Hypotrachyna orientalis***

***Hypotrachyna physcioides*** (Nyl.) Hale

Thallus grey smooth to rugulose, often white maculate, 5-15 cm wide, corticolous, lacking soredia, isidia, pustules, and dactyls. Lobes 2-6 mm wide. Lower surface black. Medulla white. Apothecia common, 2-10 mm wide. Ascospores 12-16 x 6-9 µm. Chemistry: upper cortex K+ yellow, C-, KC-, P+ yellow, UV-; medulla K-, C+ yellow-orange, KC+ yellow-orange, P-; atranorin (minor), chloroatranorin (minor), barbatic acid (major), 4-O-demethylbarbatic acid (major/minor), and of no taxonomic importance additional obtusatic acid (trace), ± norobtusatic acid (trace), ± evernic acid (trace/minor), ± gyrophoric acid (trace/minor), ± pigmentosin A (trace/minor)), ± pigmentosin D(trace/minor). Widespread in the Neotropics and SE Asia. *Hypotrachyna physcioides* is the fertile counterpart of *Hypotrachyna laevigata* (sorediate) and *Hypotrachyna imbricatula* (isidiate)

[6194], Philippinen, Mindanao, Provinz Cotabato, Gipfelregion des Mt. Apo, 06°59.272’ N, 125°16.195’ E, 2900 m. Leg. Orville L. Bernabe 12.08.1999, det. J.A. Elix 11.05.2000.



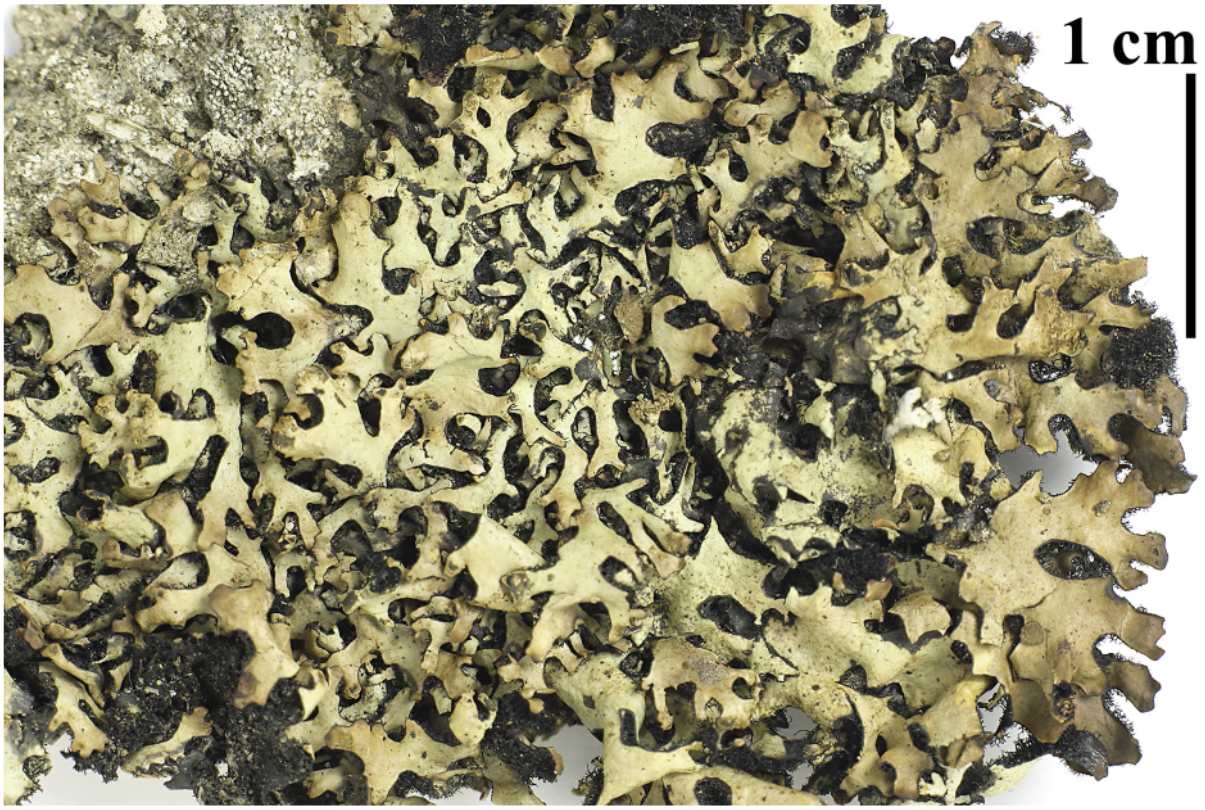


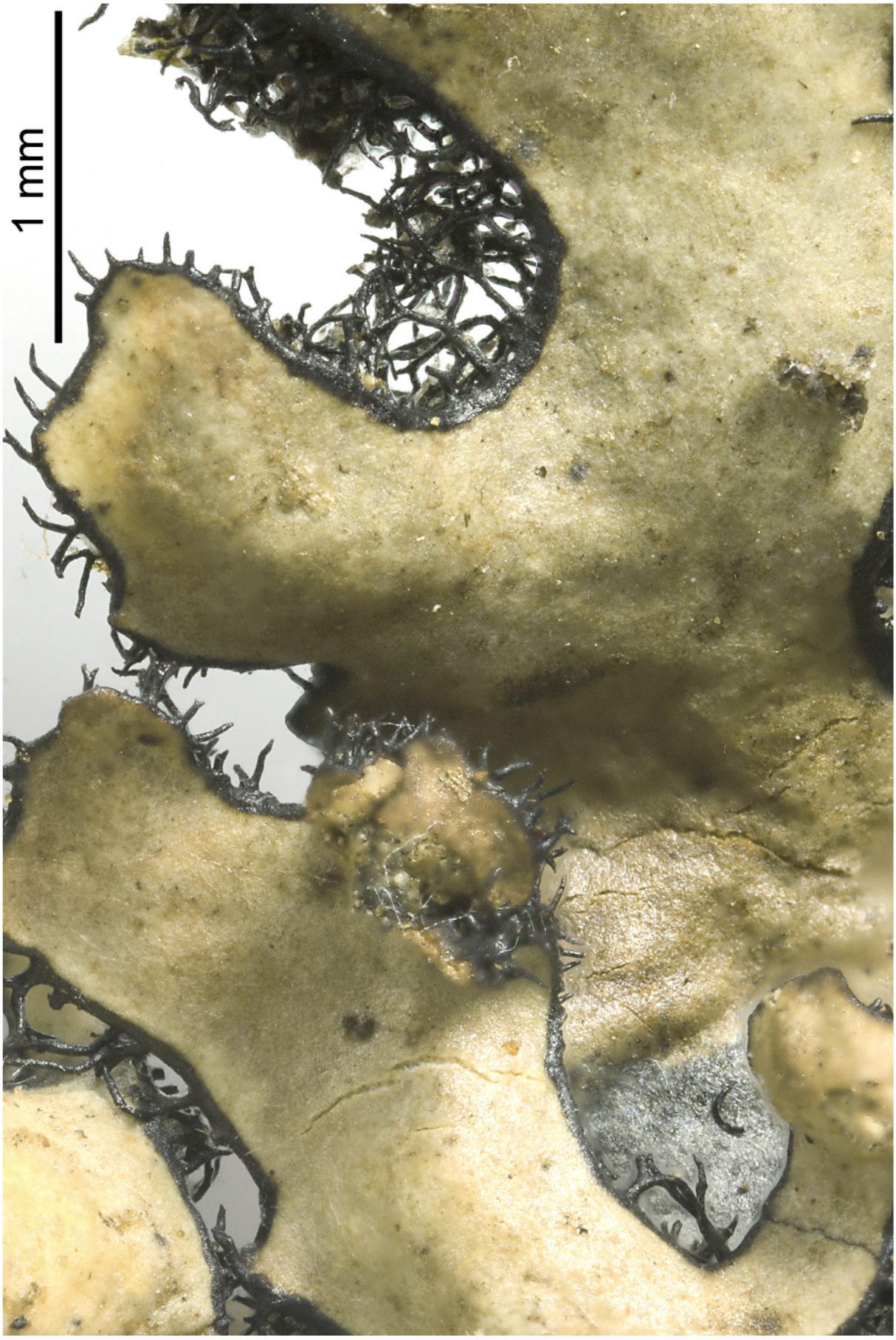

***Hypotrachyna physcioides***

***Hypotrachyna reducens*** (Nyl.) Hale

Thallus yellow-green, faintly maculate or not, lacking soredia, isidia, and pustules, mostly corticolous, 2-5 cm wide. Lobes 1-3 mm wide, with black margins. Medulla white. Lower surface black with narrow brown marginal zone. Rhizines squarrose to richly dichotomously branched. Apothecia common, 1-10 mm wide. Ascospores 10-14 x 6-9 µm. Chemistry: upper cortex K-, C-, KC yellow, P-, UV-; medulla K+ yellow then red, C- or C+ pink, KC- or KC+ red, P+ orange; usnic acid (major/minor), ± atranorin (trace), norstictic acid (major), connorstictic acid (minor/trace), ± gyrophoric acid (major/minor).

[6273], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay, tropischer Regenwald am Mt. Kitanglad ab Zwischen-Campsite , 08°09.637' N, 124°55.871' E, 1870-2800 m. Leg. Schumm 19.08.1999, det. Elix 2000, Dupl. in CANB.





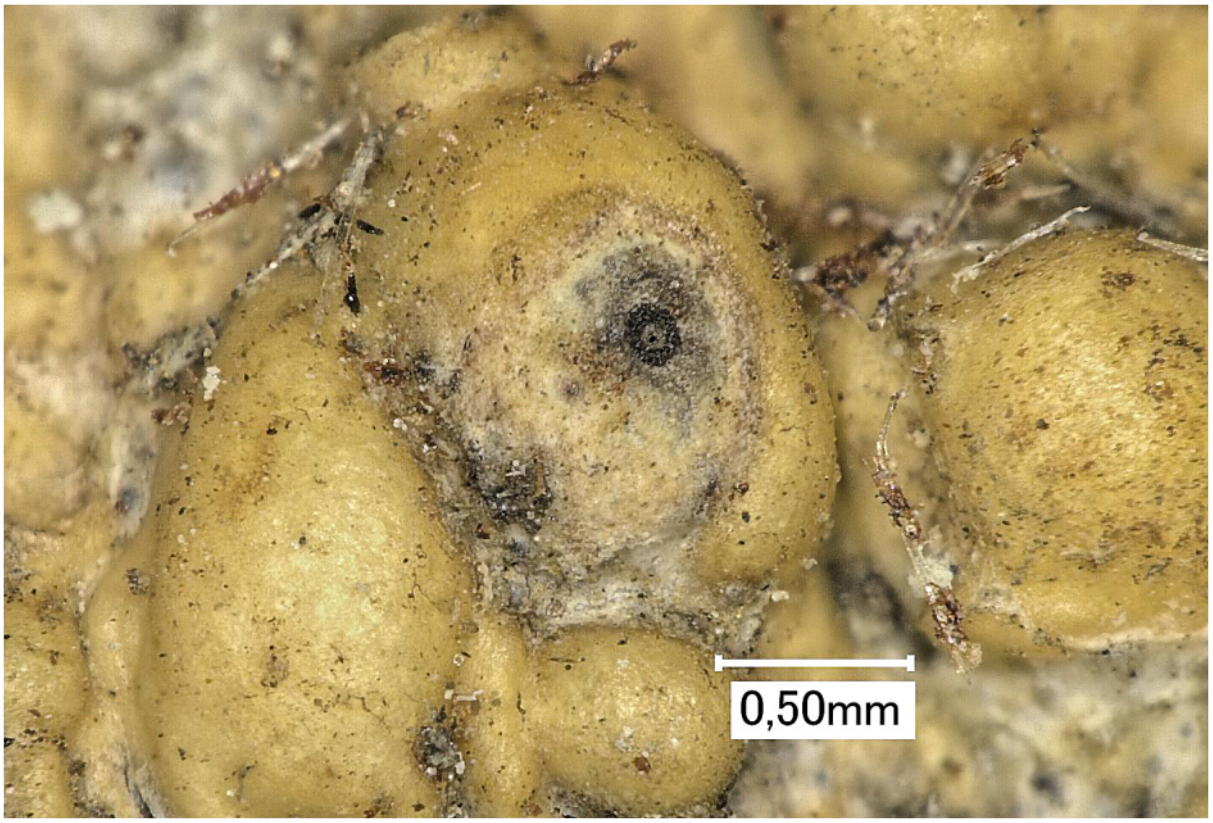

***Hypotrachyna reducens***

***Laurera megasperma*** (Mont.) Riddle

Thallus yellowish brownish. Excipulum carbonized, closed. Hamathecium strongly inspersed with oil droplets, J-, filaments thin and anastomosing, without periphyses. Ascospores hyaline, muriform, 126-153 x 36-45 µm. Chemistry: medulla K± yellowish, C-, KC-, P+ orange; cortex: K-, C-, KC-, P-, UV+ yellow.

[6491], Philippinen, Mindanao, Prov. Misamis Oriental, südwestl. Gingoog City, Barangay Lunutan, 08°42.510’ N, 125°01.241’ E, 1120 m und am Weg auf den Mt. Lumot (Via Haruhay Trail) bis zum Zwischencamp im trop. Bergregenwald, 08°40.713’ N, 125°01.649’ E, 1680 m. Leg. Schumm 24.08.1999, det. Schumm.

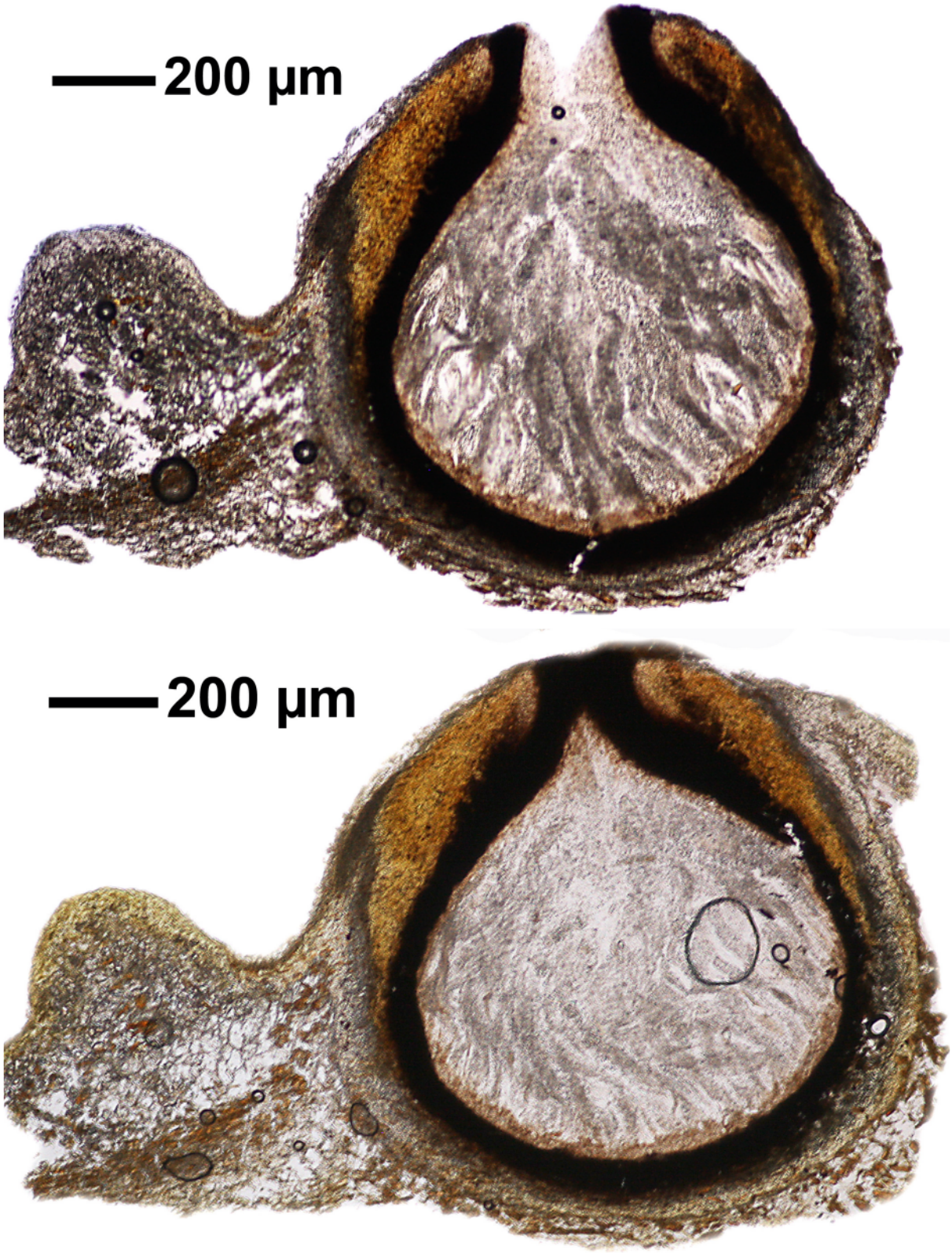




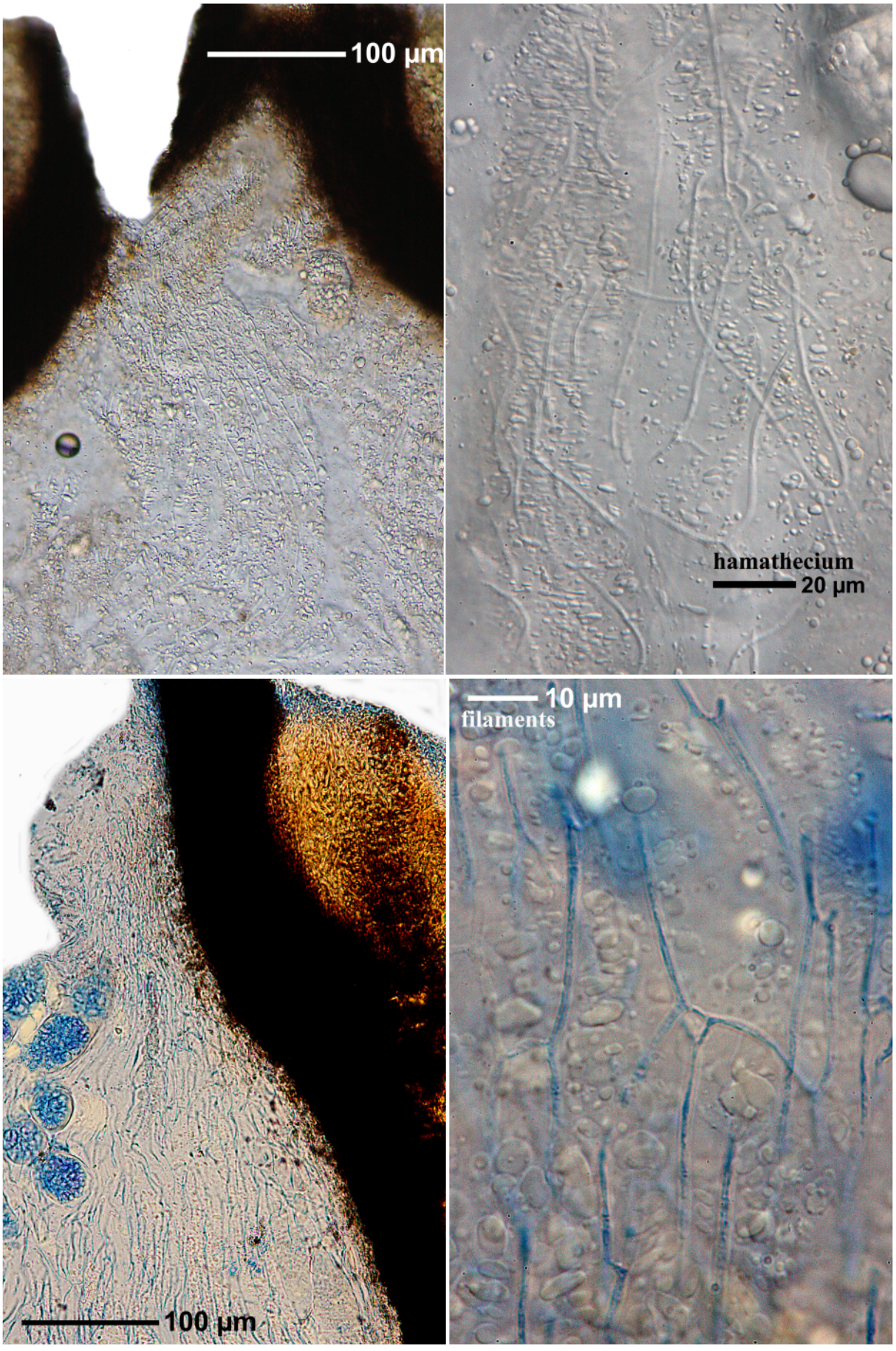




***Laurera megasperma***



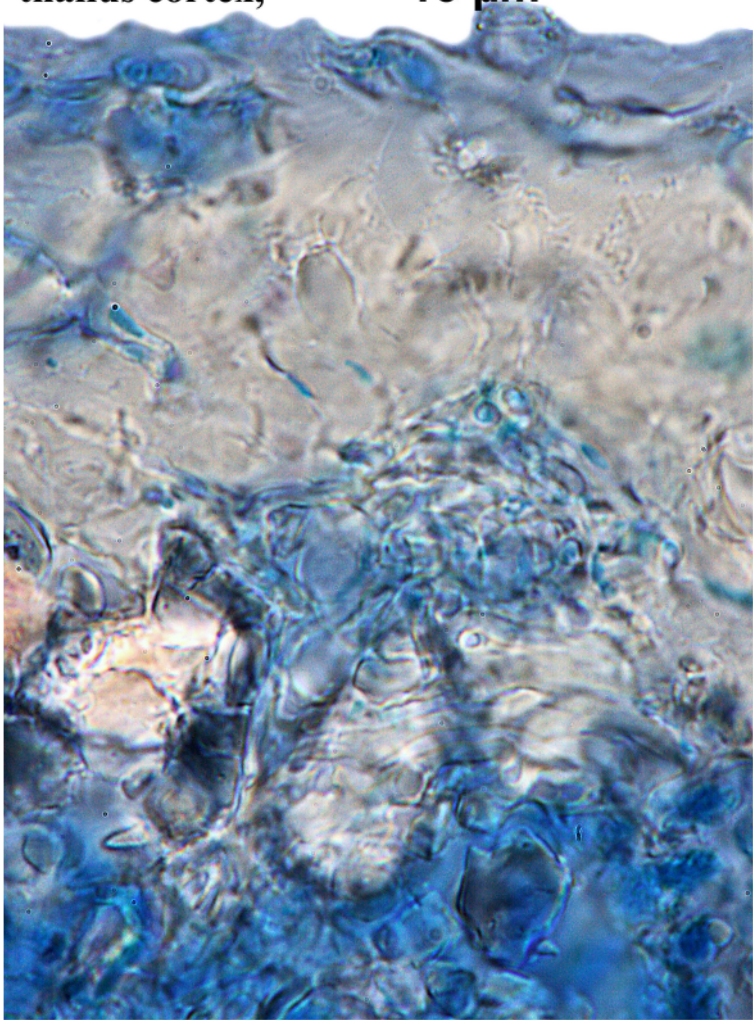

***Laurera megasperma***




***Laurera megasperma***




thallus cortex, —— 10 µm

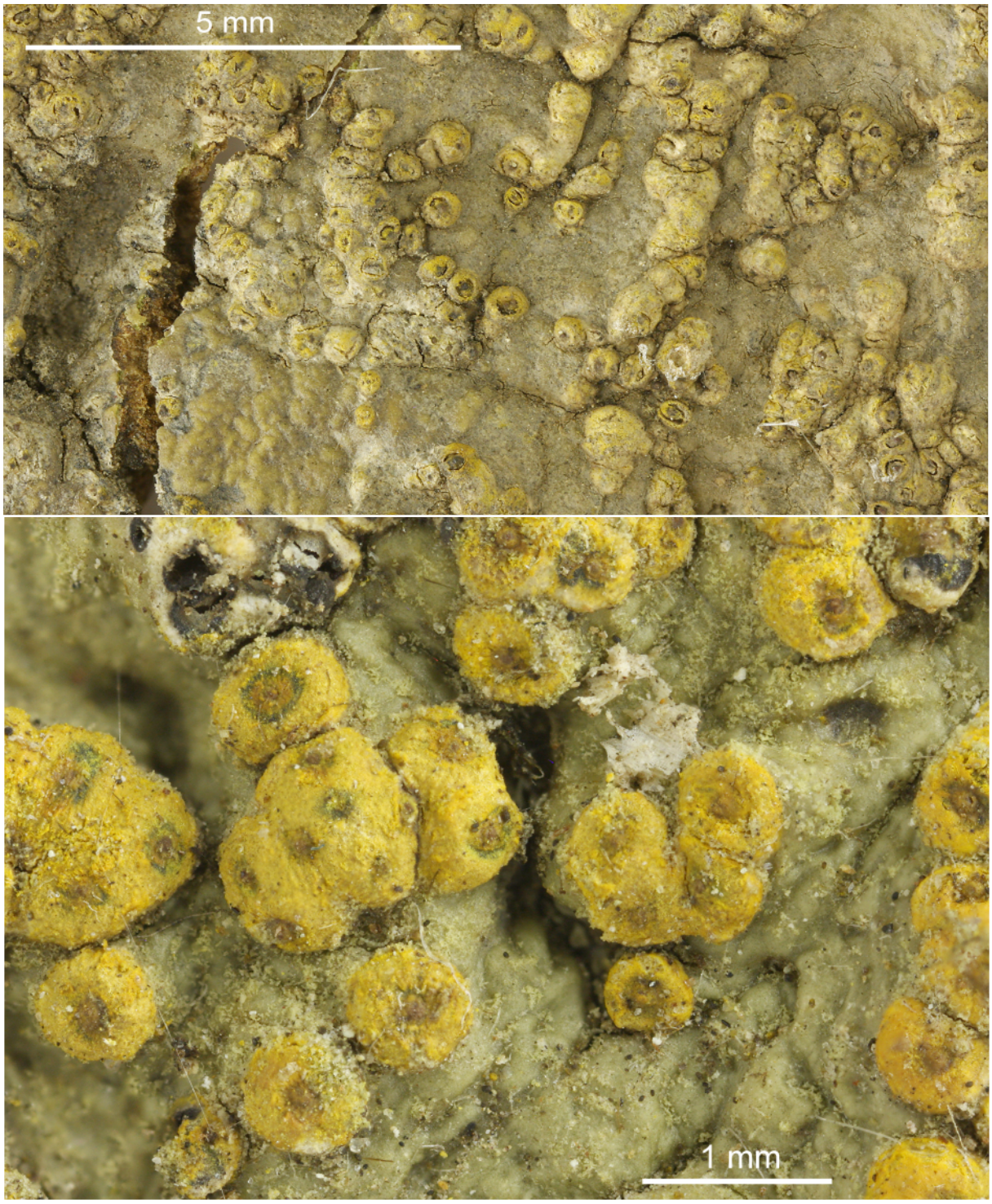


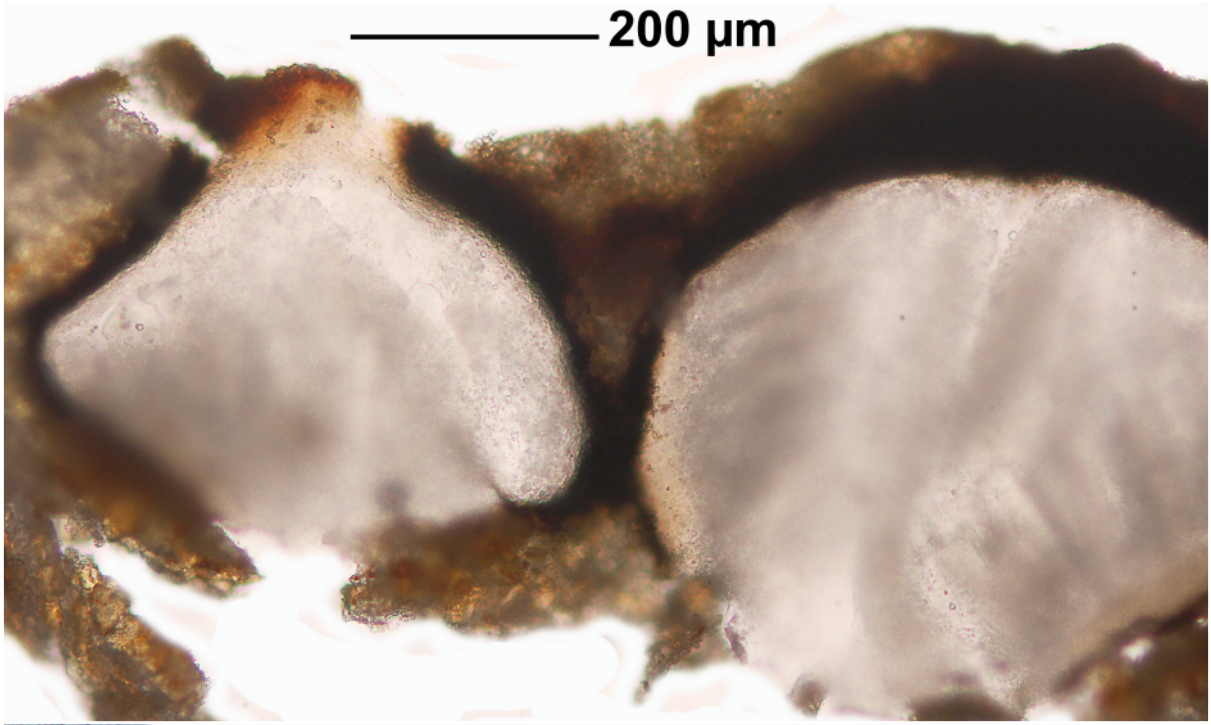
*Laurera megasperma*

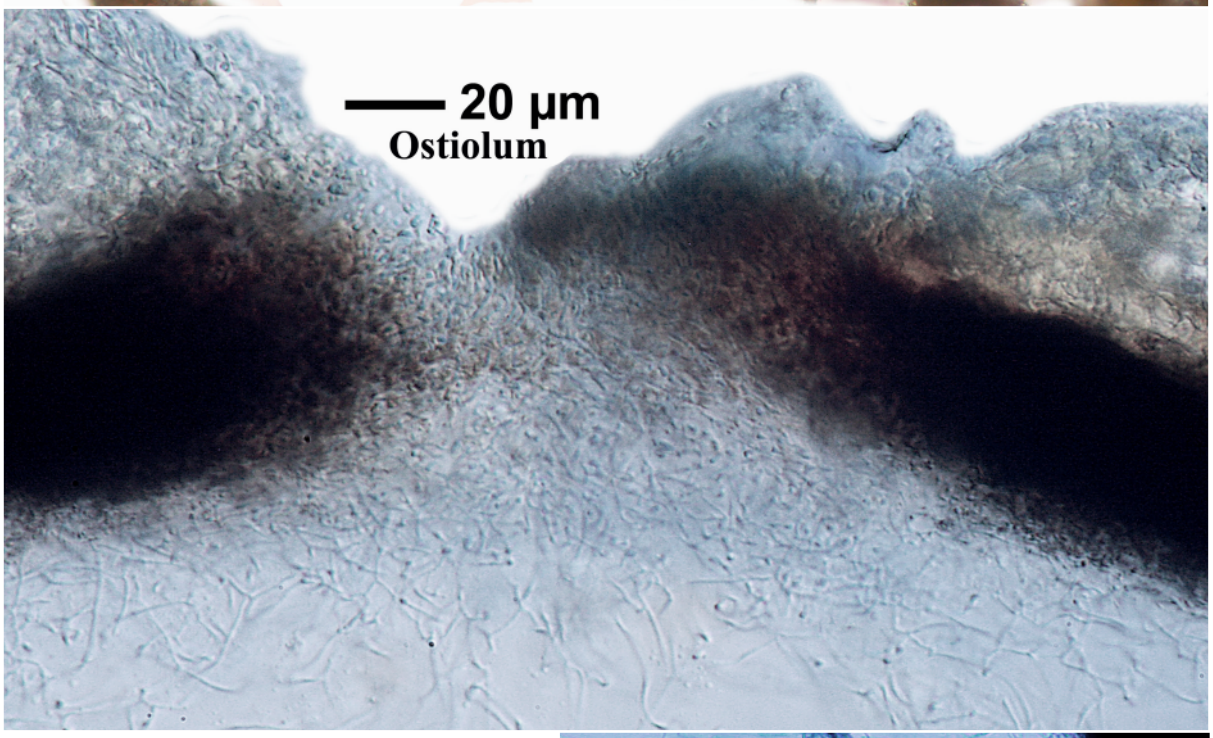
***Laurera subbenguelensis*** Upreti & A.Singh

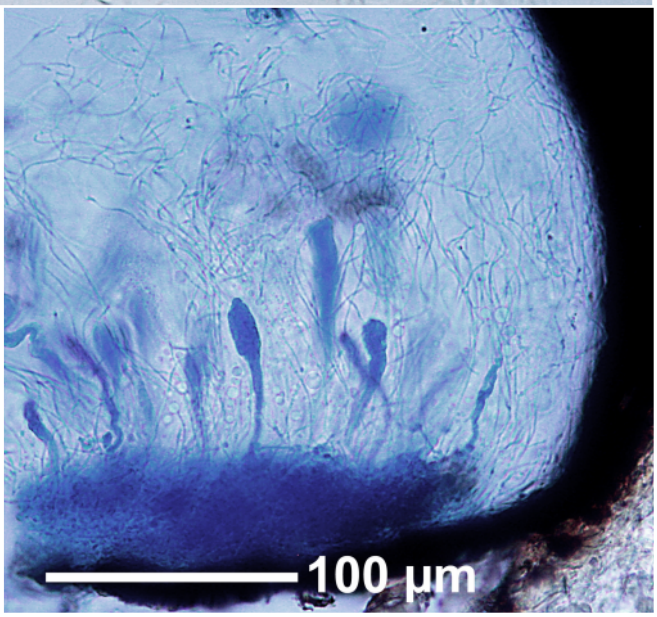
Hamathecium very inspersed. Paraphysoids branched, anastomosing. Asci J red-brown. Ascospores hyaline, size variable, first 2-cellular, then transversely 13-14-septate with thick halo, finaly muriform with c. 3 longitudinal septa at each segment, 28-71 x 6-17 µm. Pycnospores bacillar, 5 x 0.5 µm. Yellow pigment K+ blood-red.

[9566], Thailand, Elefantenarbeitslager bei Chiang Mai. 19°14.859' N, 98°58.137' E, 330 m. Leg. Schumm 01.04.2002, det. Aptroot & Schumm 2011.

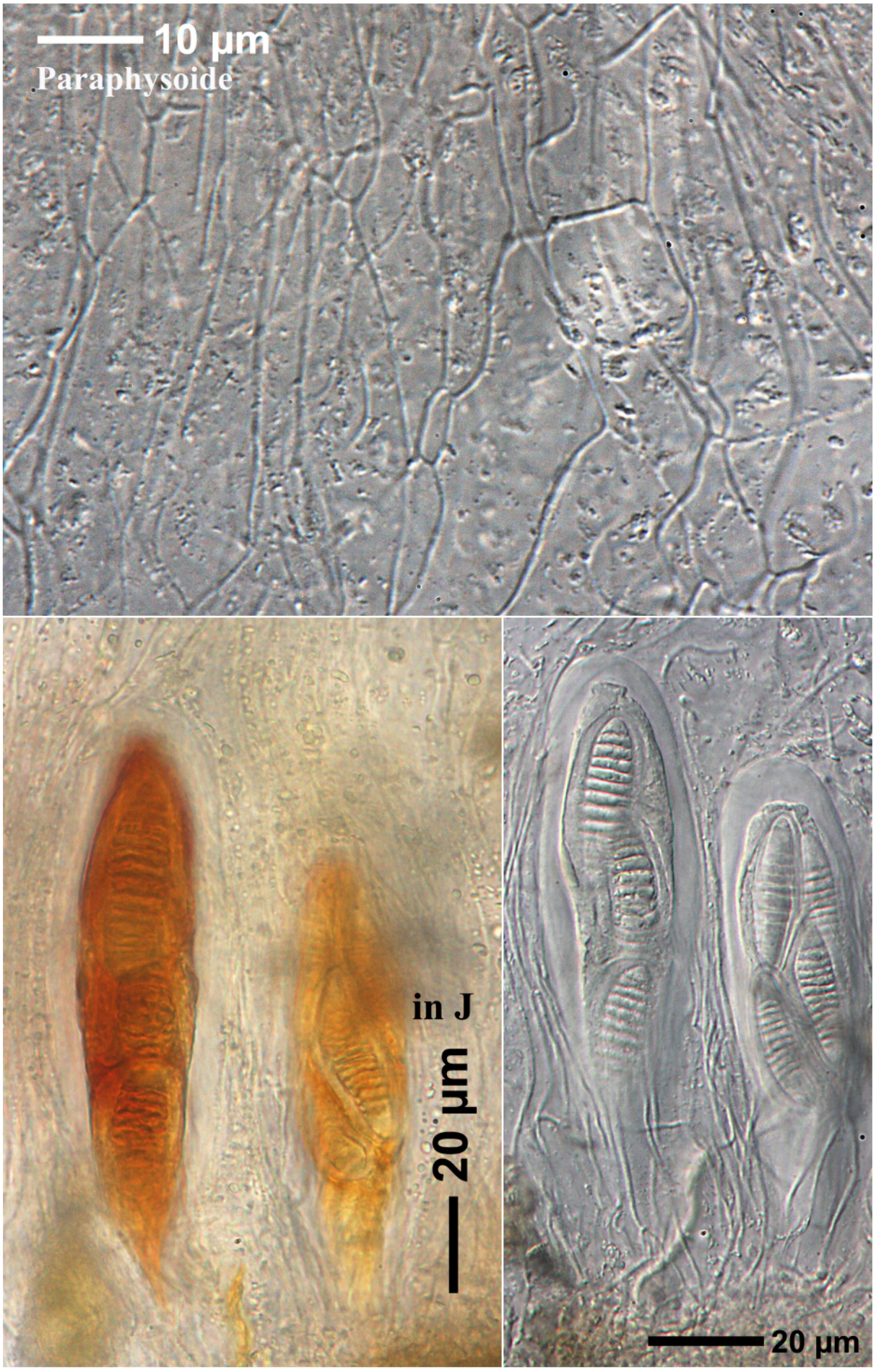




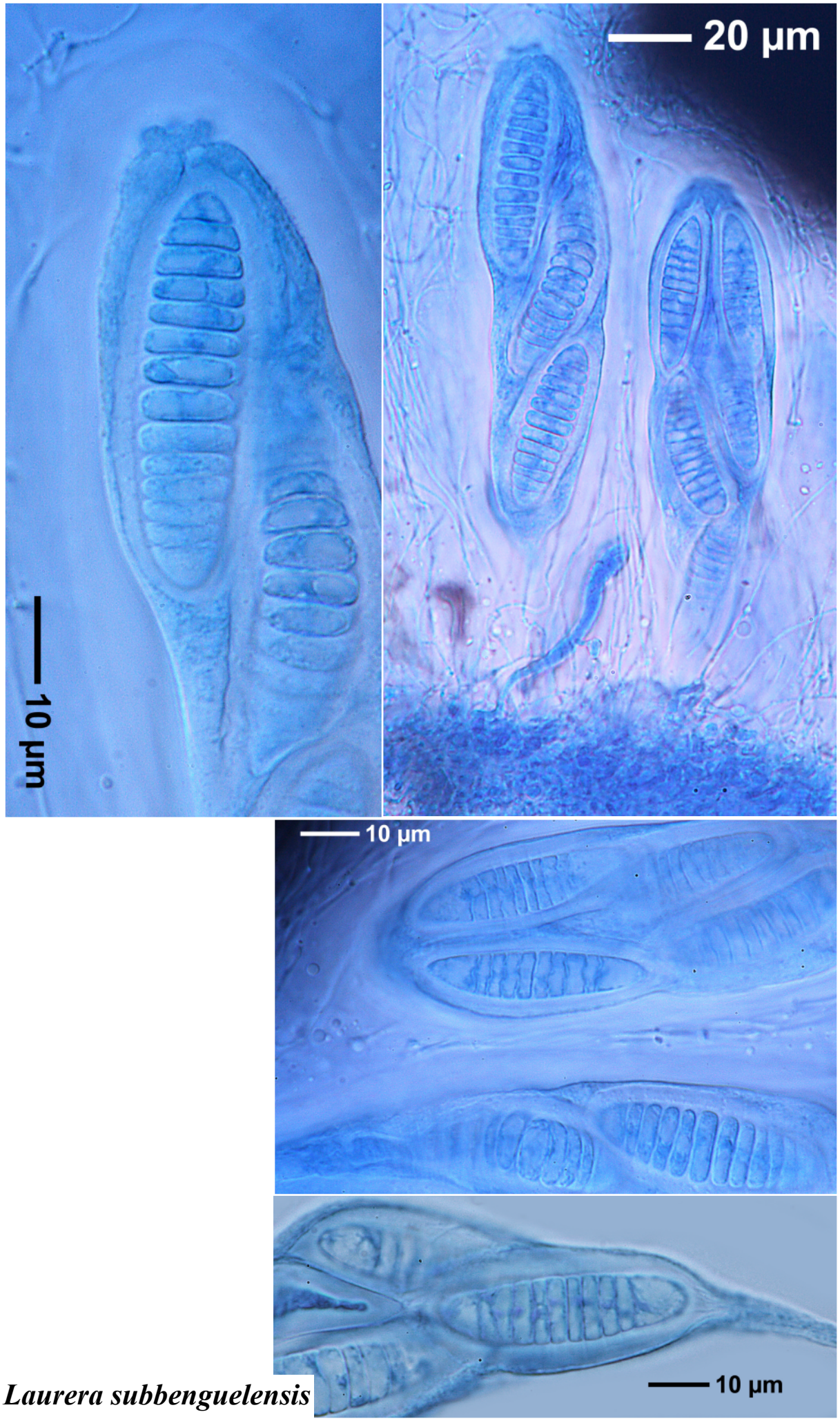




***Laurera subbenguelensis***

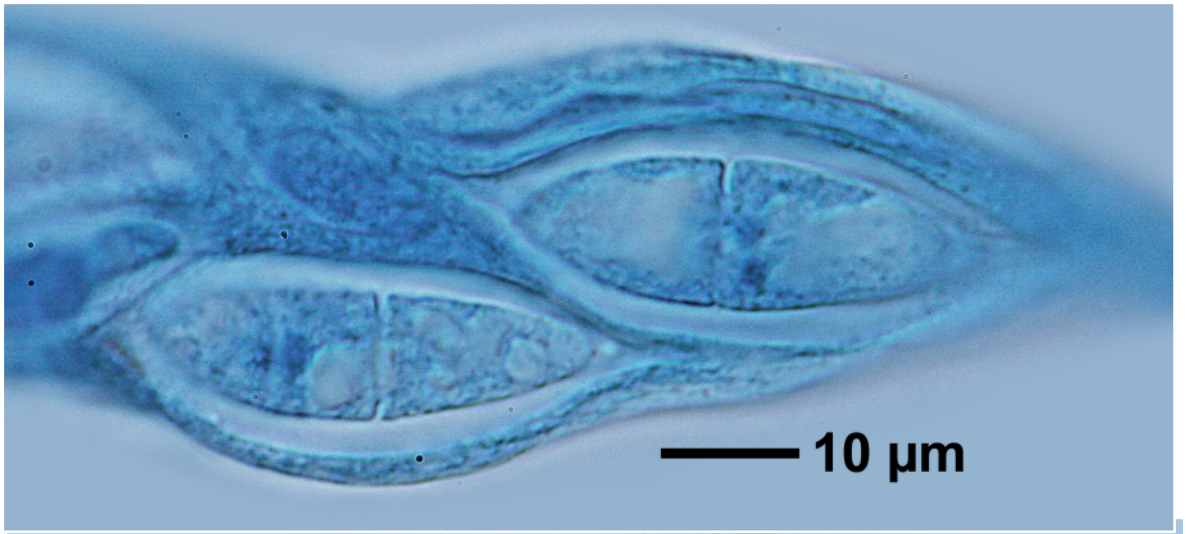


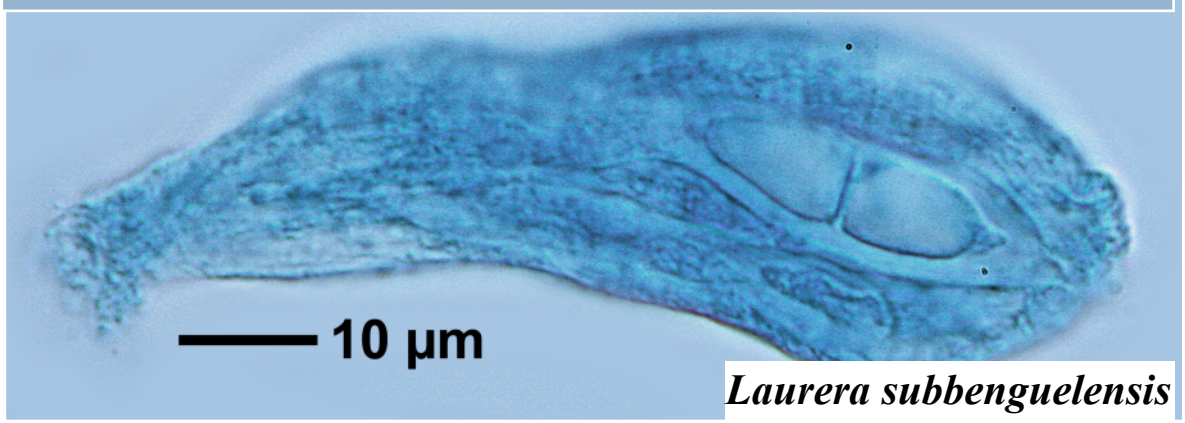

***Laurera subbenguelensis***




***Laurera subbenguelensis***

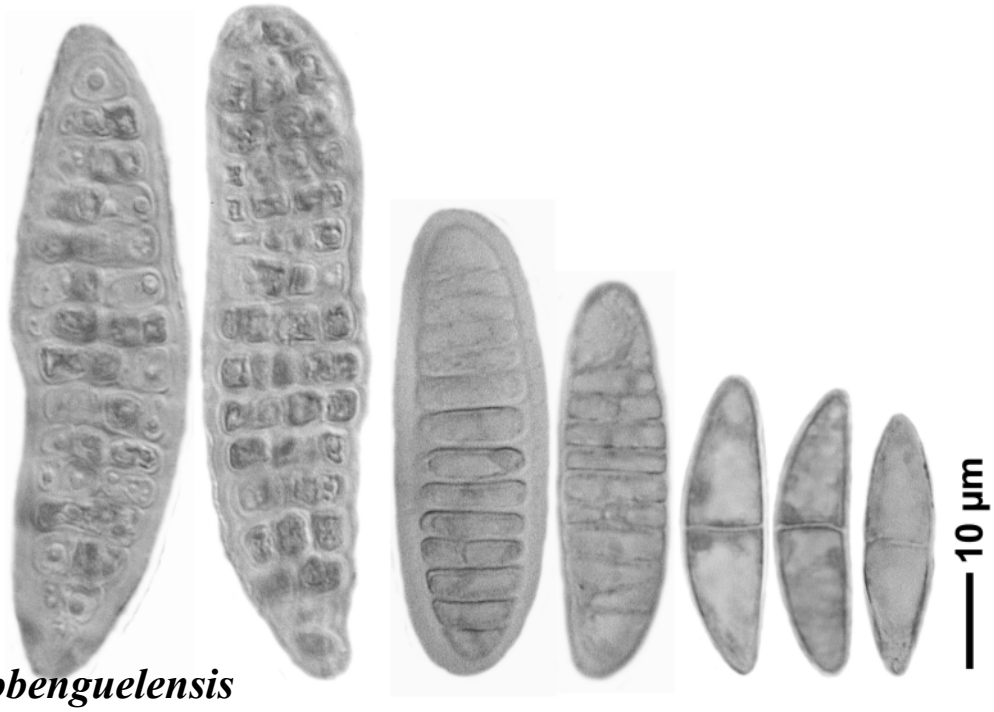


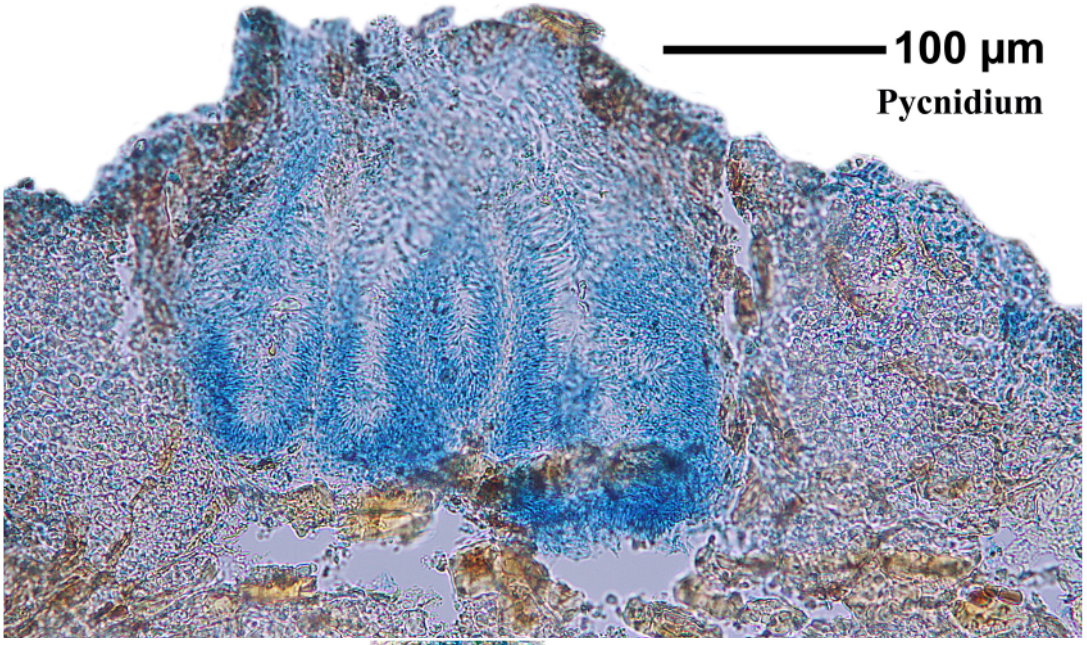



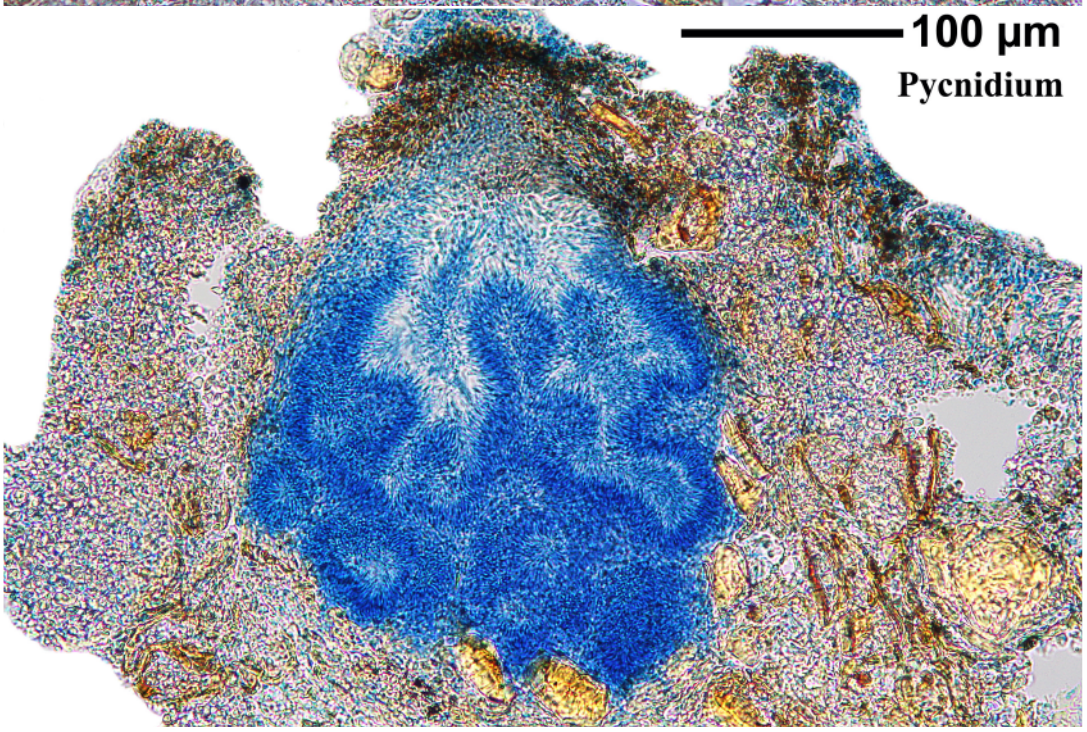

***Laurera subbenguelensis***

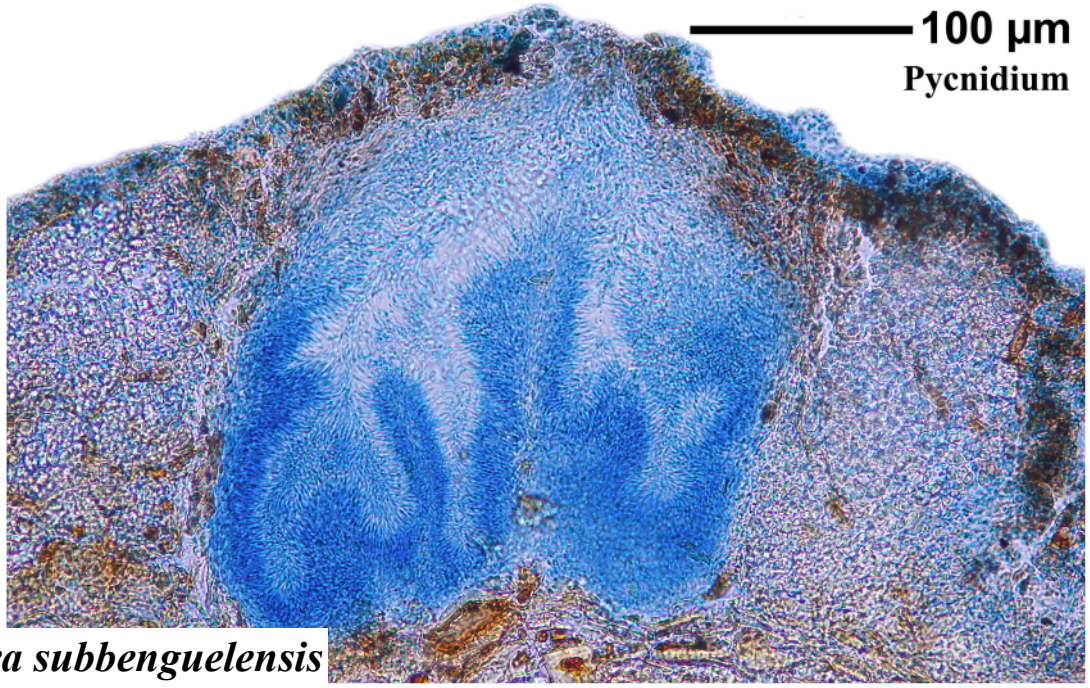


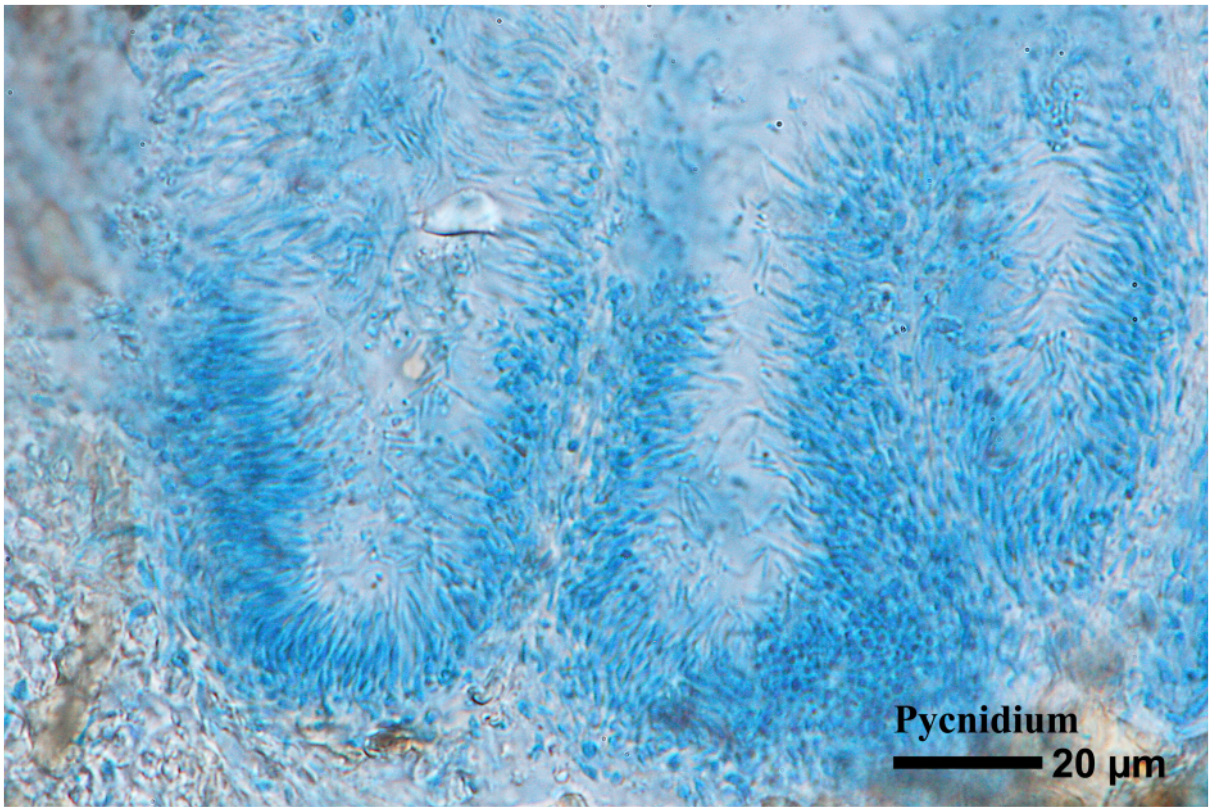

***Laurera subbenguelensis***

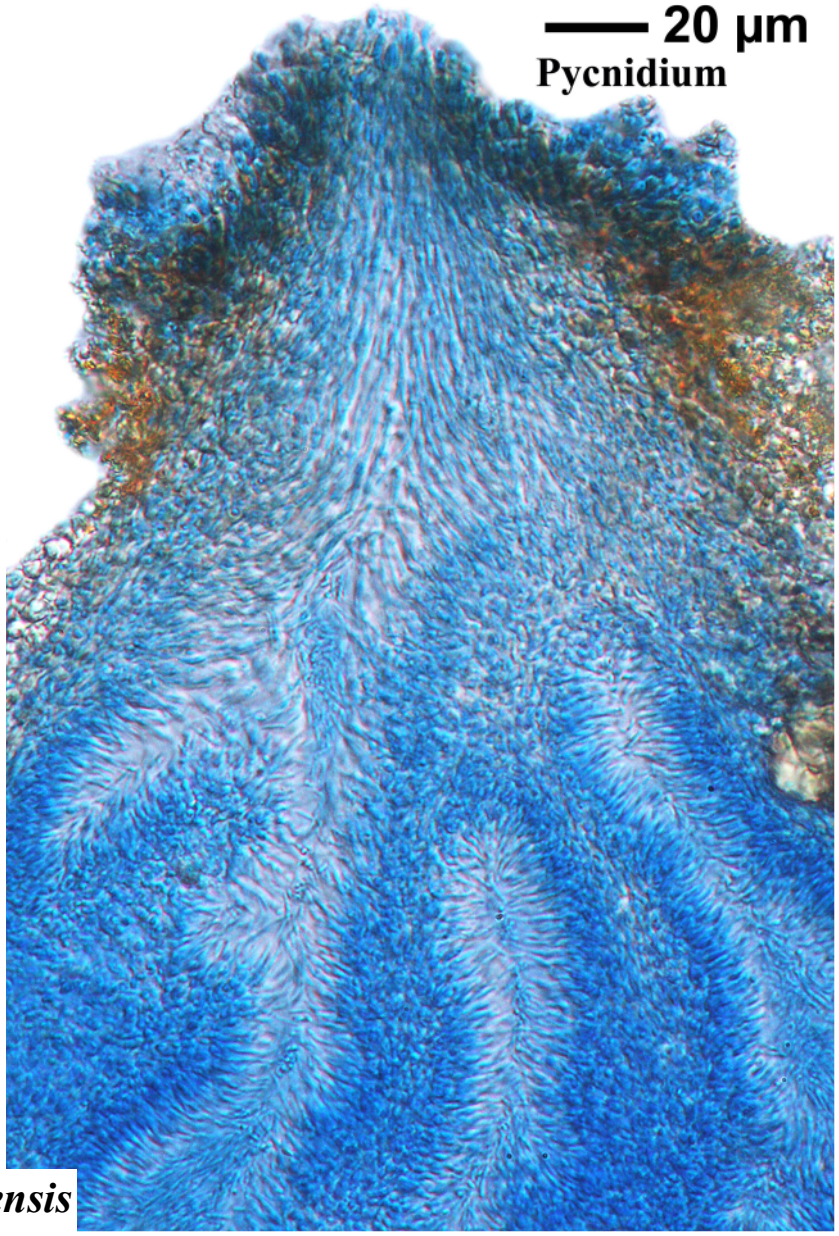


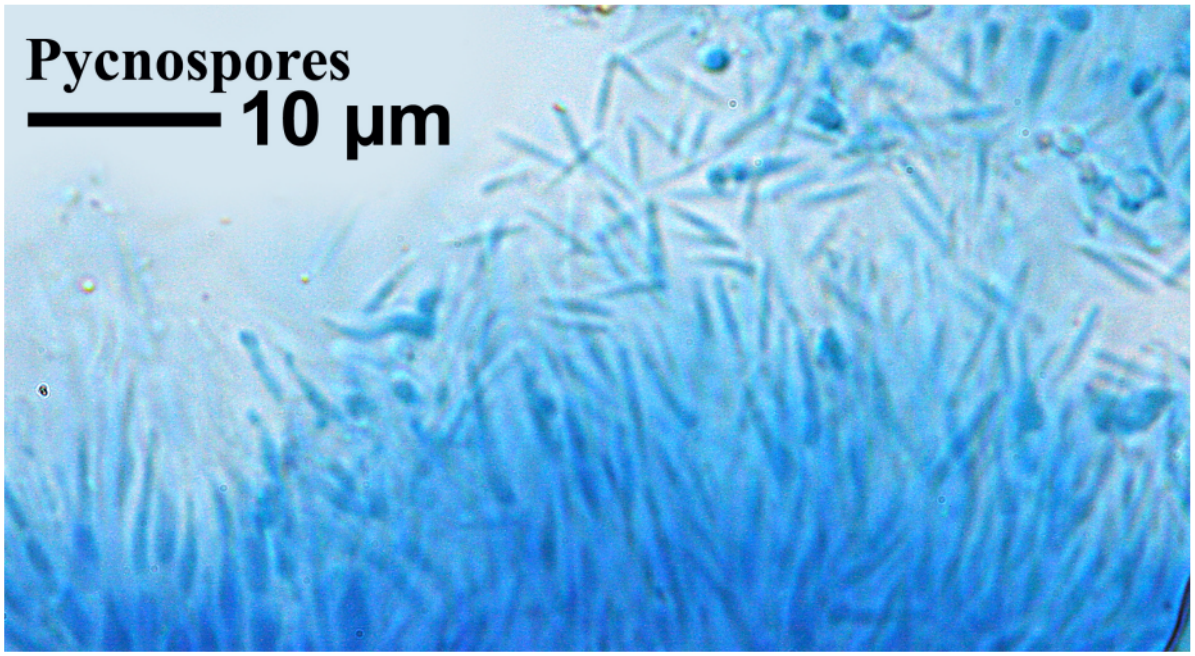



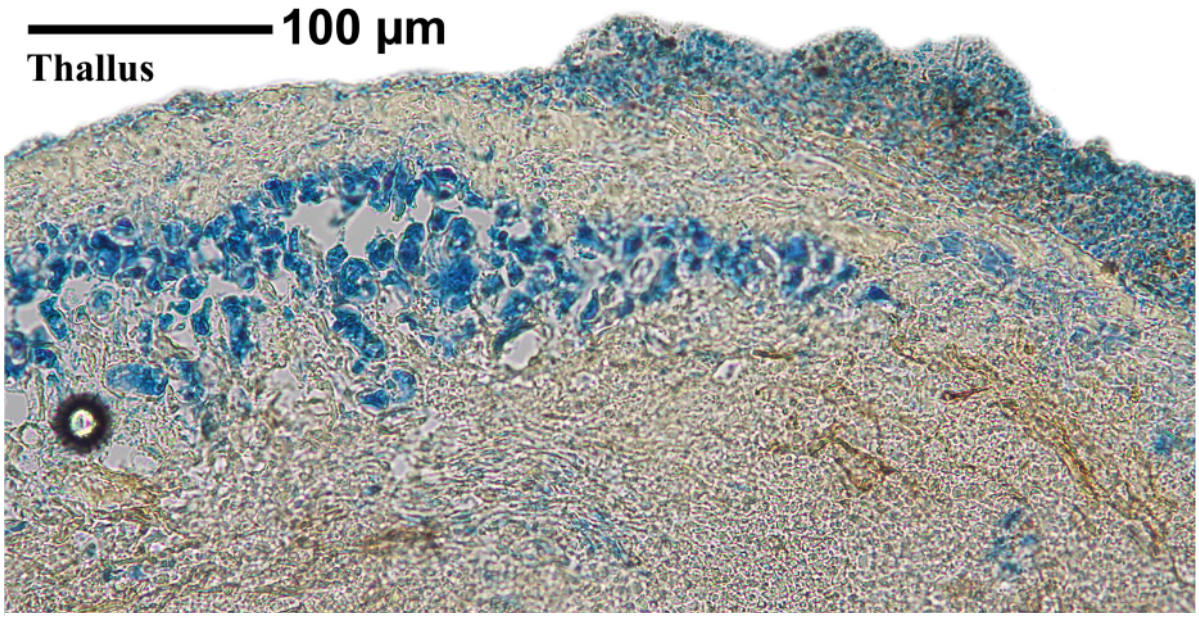

***Laurera subbenguelensis***

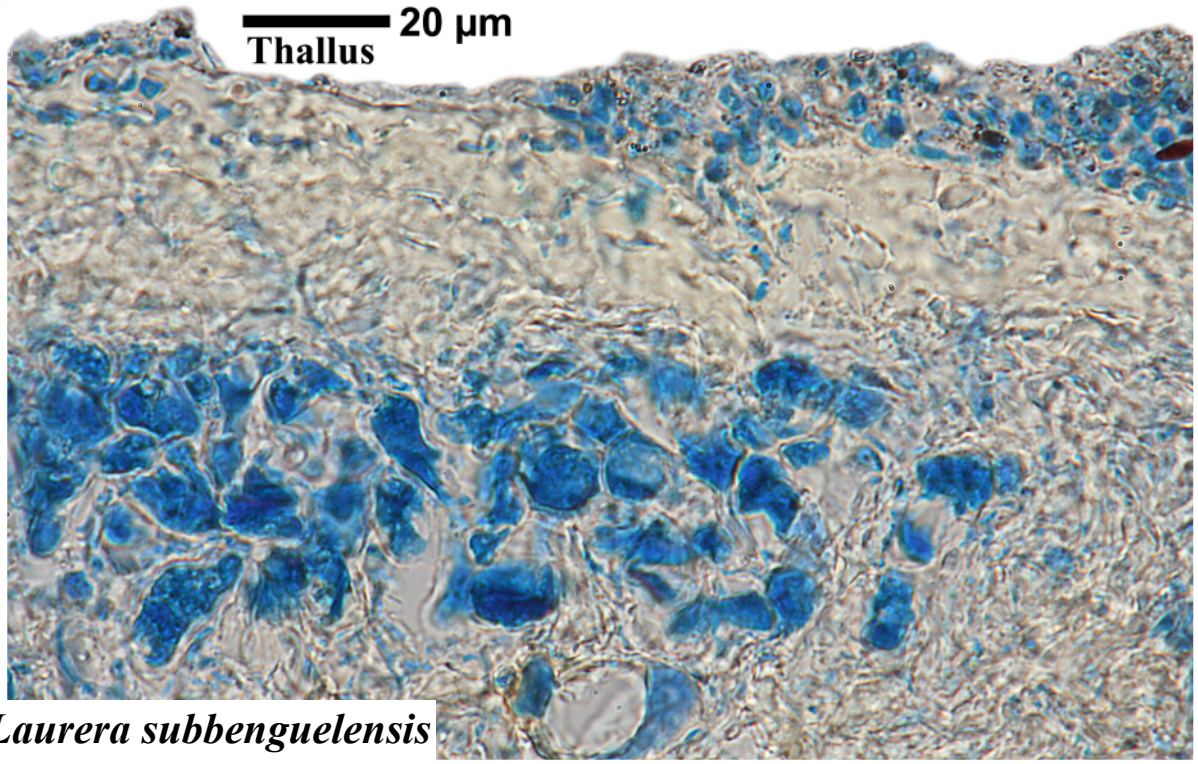


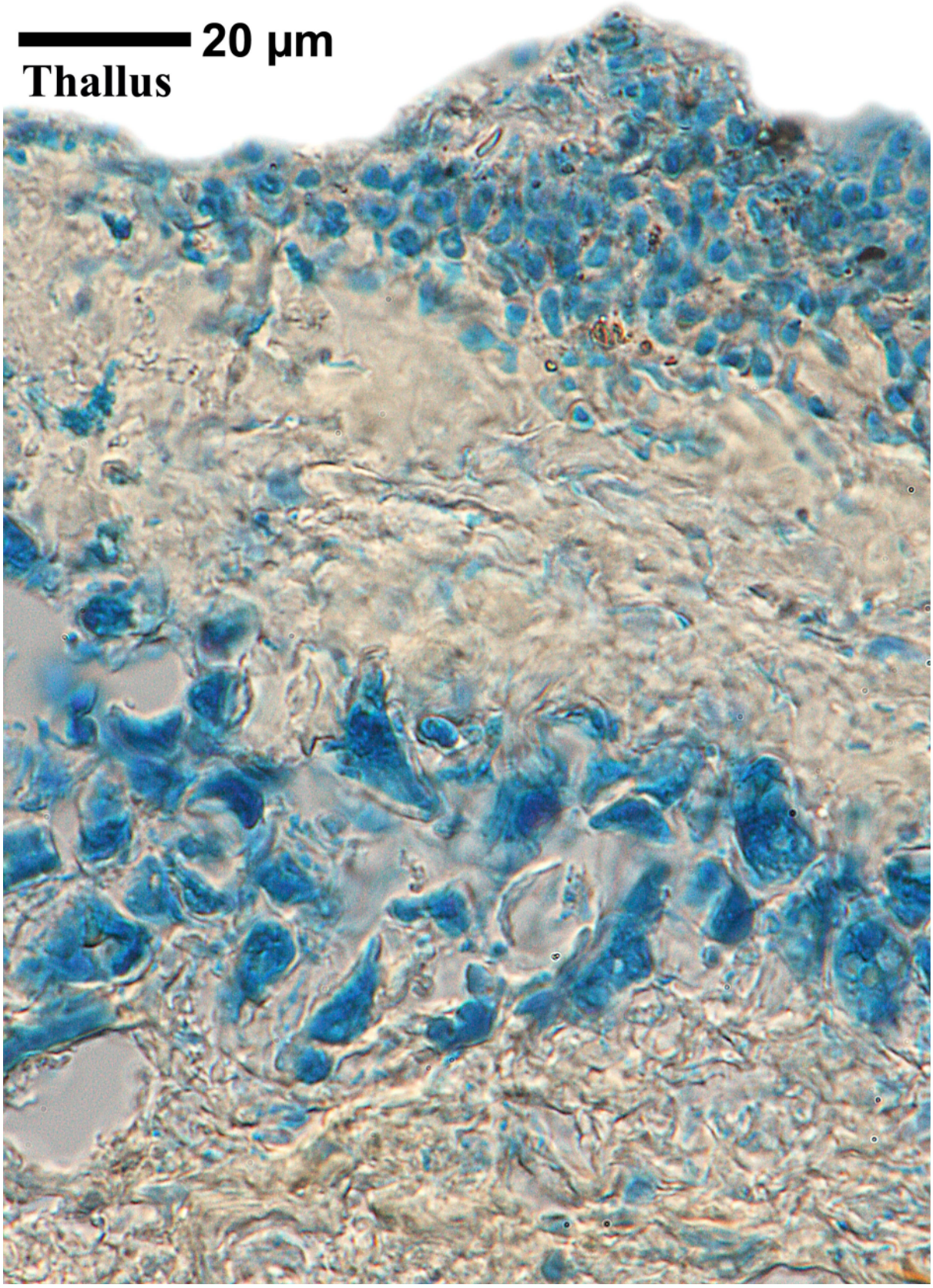

***Laurera subbenguelensis***




***Laurera subbenguelensis***



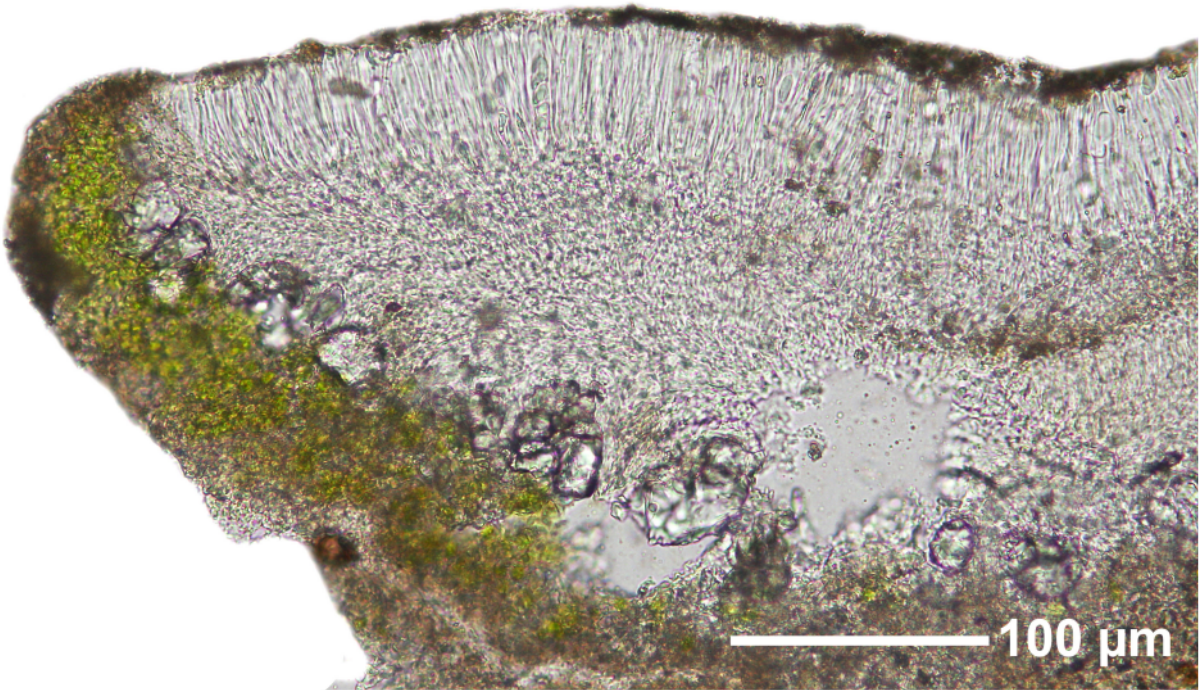

***Laurera subbenguelensis***

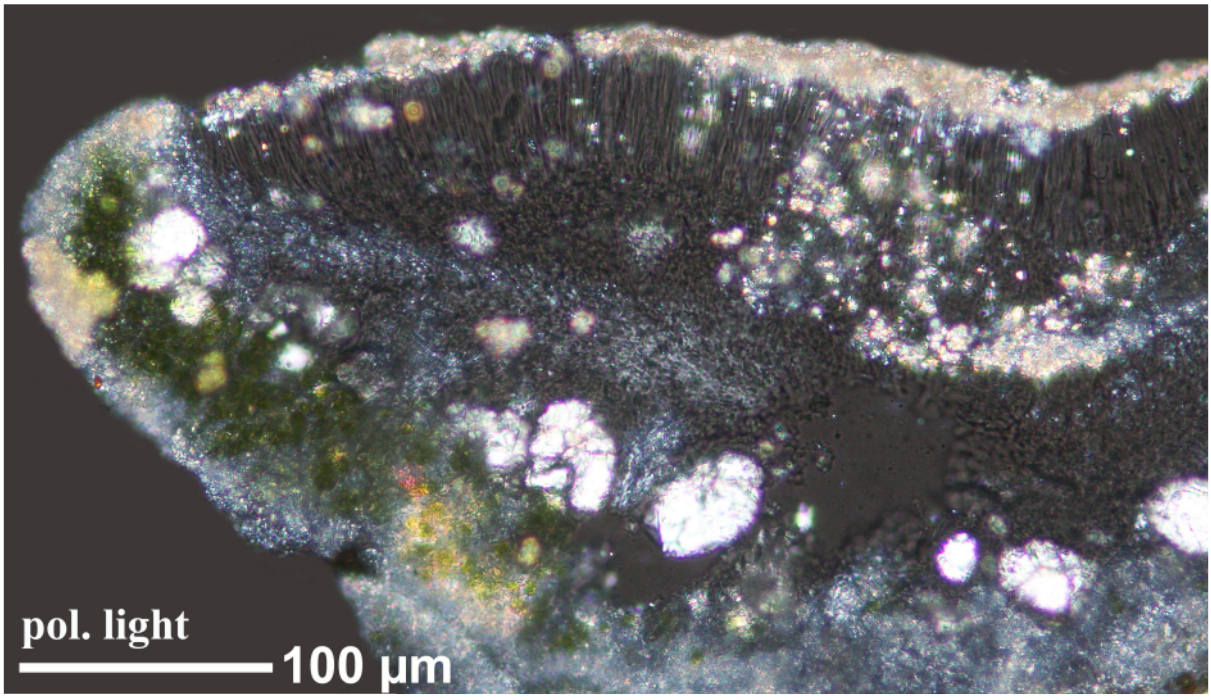
***Lecanora helva*** Stitzenb.

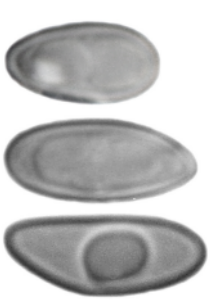
Thallus yellowish greenish, continuous or rimose-areolate to verruculose. Soredia usually absent or in roundish 0.1-0.3 mm diam. patches. Prothallus blackish brown. Apothecia 0.3-0.9 mm wide, disc pale yellowish to greenish brown. Amphithecium with large crystals. Ascospores hyaline, simple, 8/ascus, (9-)10-12(-14) x 5-6 µm. Chemistry: 2'-O-methylperlatolic acid (maj), atranorin (min); Thallus K+ yellow, C-, P+ pale orange. ***Lecanora leprosa*** differs by containing gangaleoidin instead of 2'-O-methylperlatolic acid. Pantropical

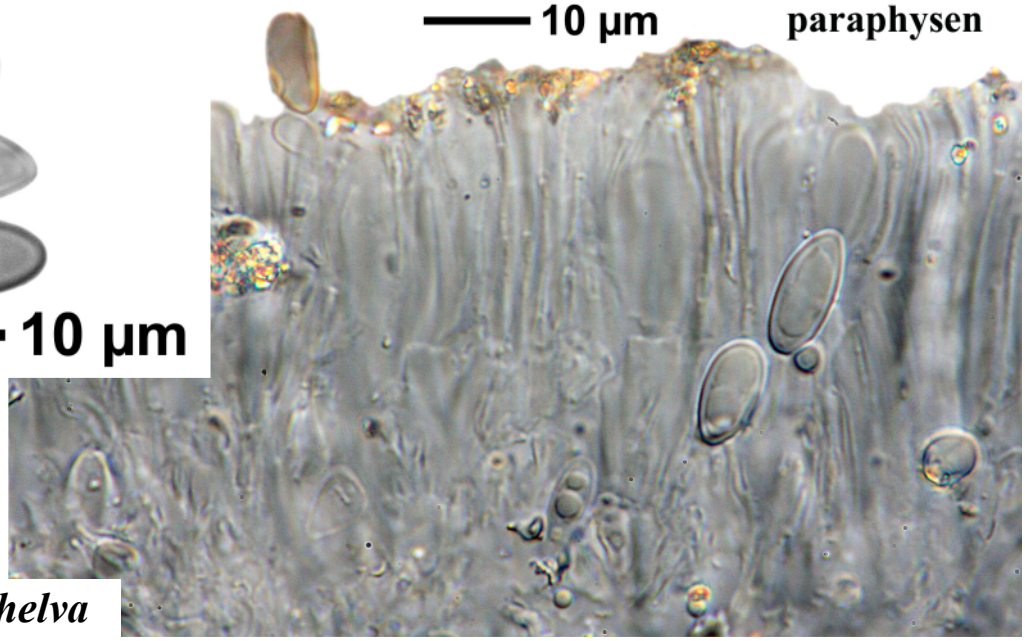
[17594], Thailand, Trat province, Ban Phu Resort, 12.16619° N, 102.56977° E, 8 m. Leg. Schumm (IAL7) 17.01.2012, det. Schumm (TLC anal.)



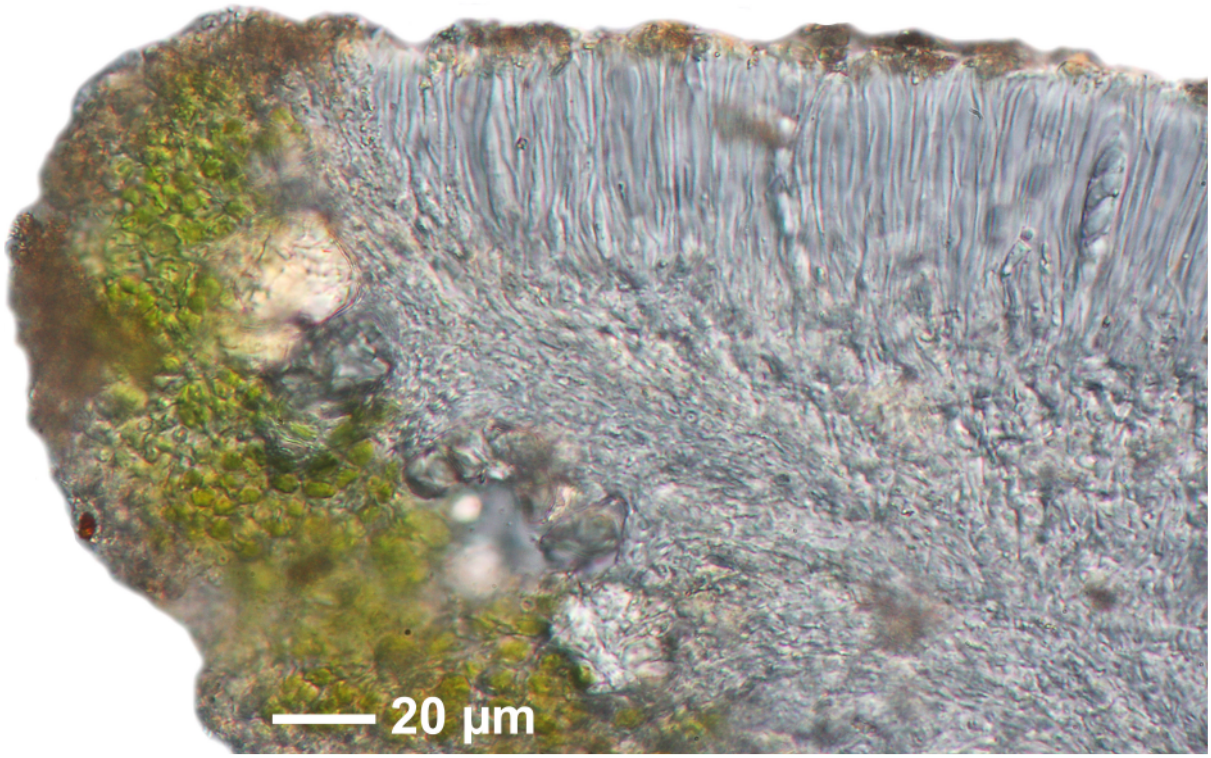


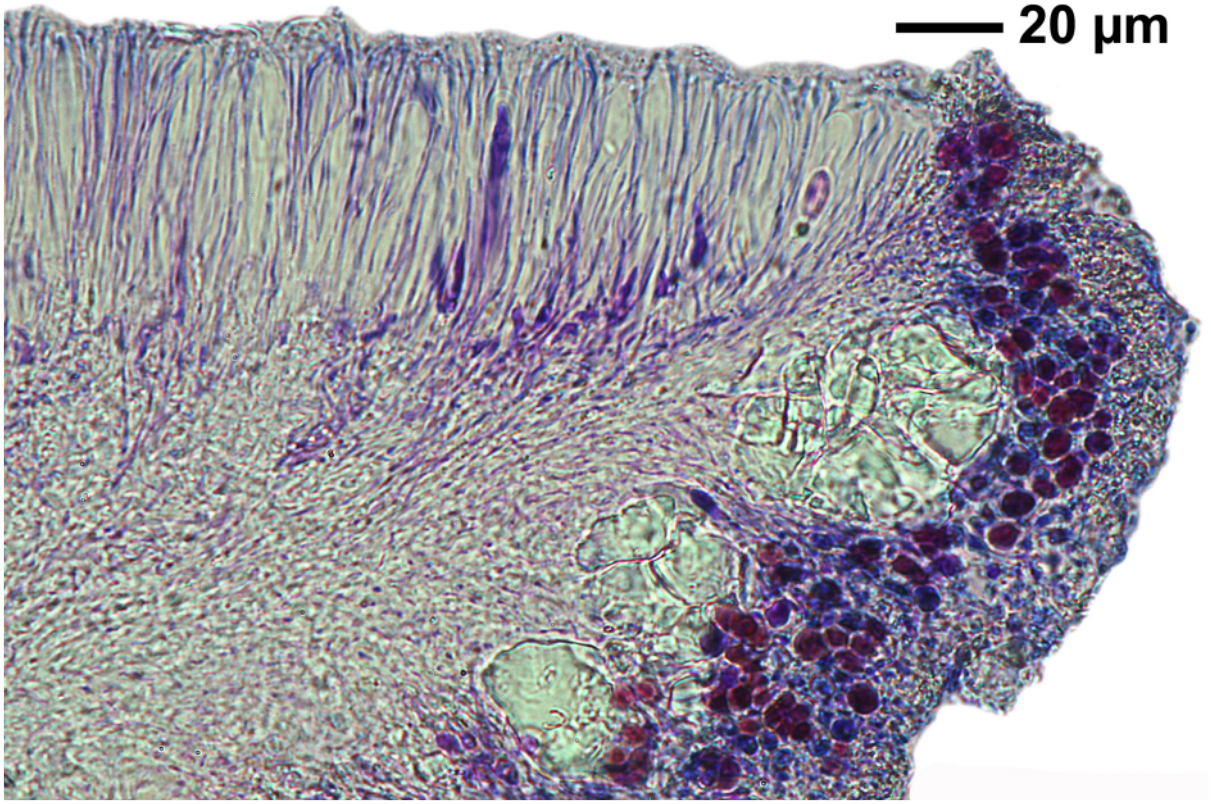



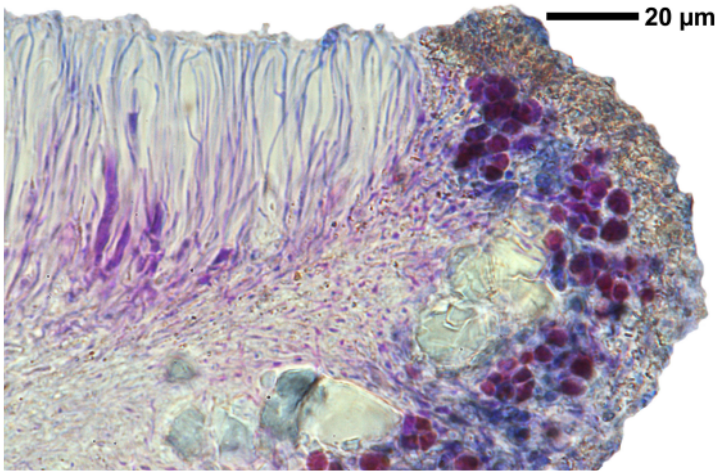




***Lecanora helva***



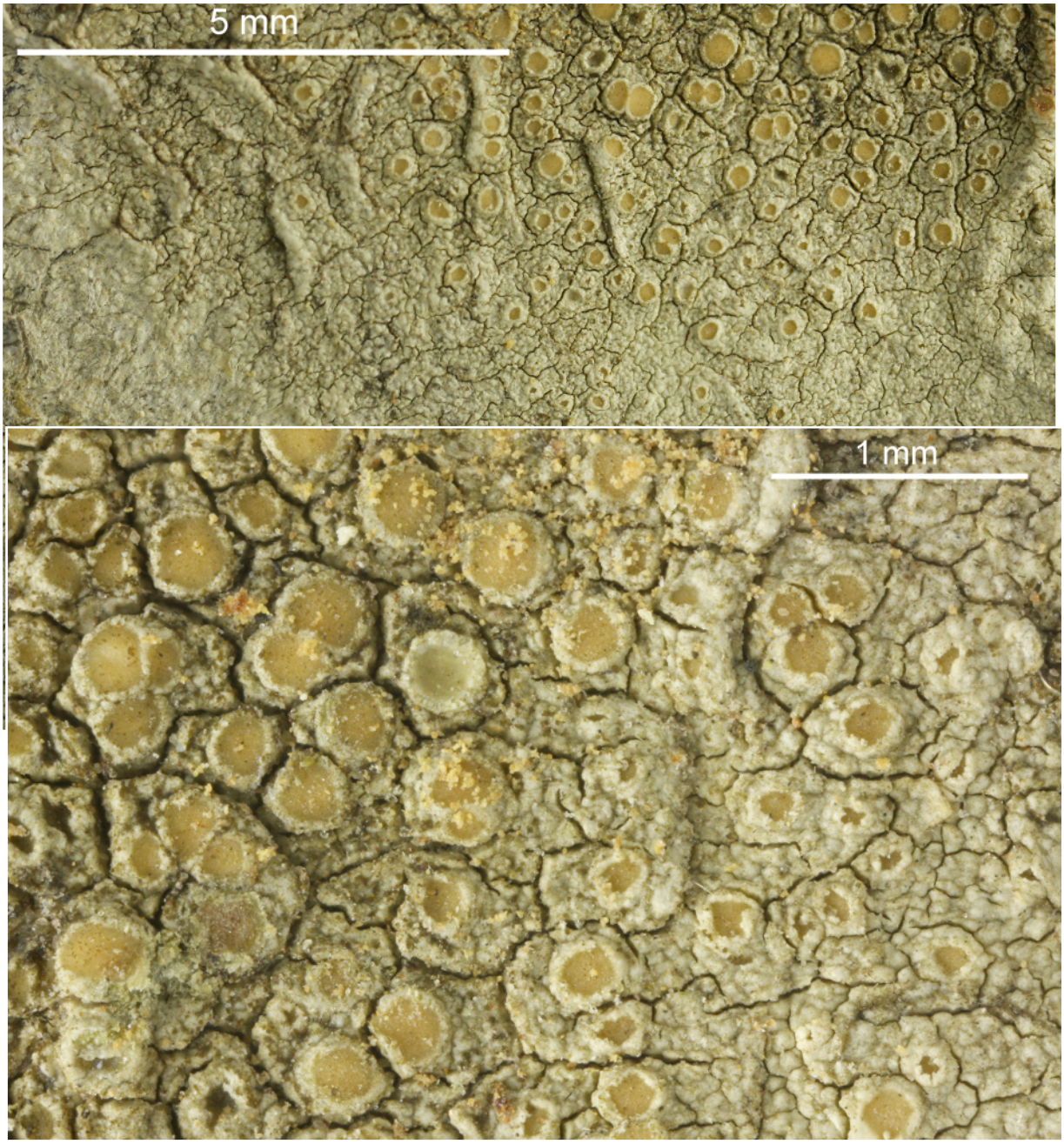



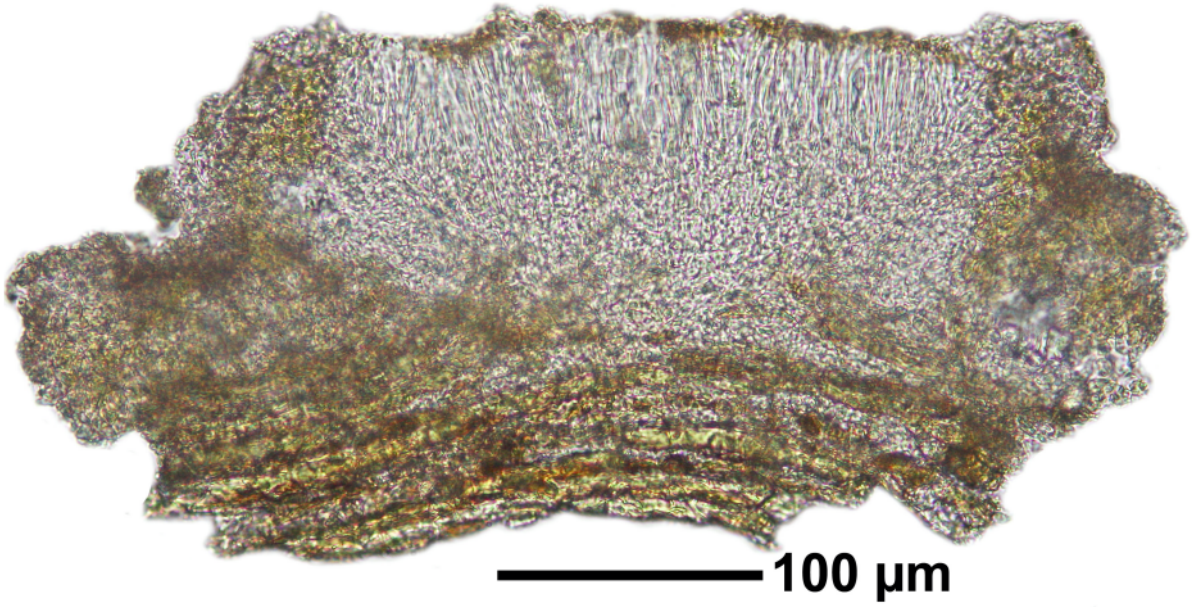

***Lecanora helva***

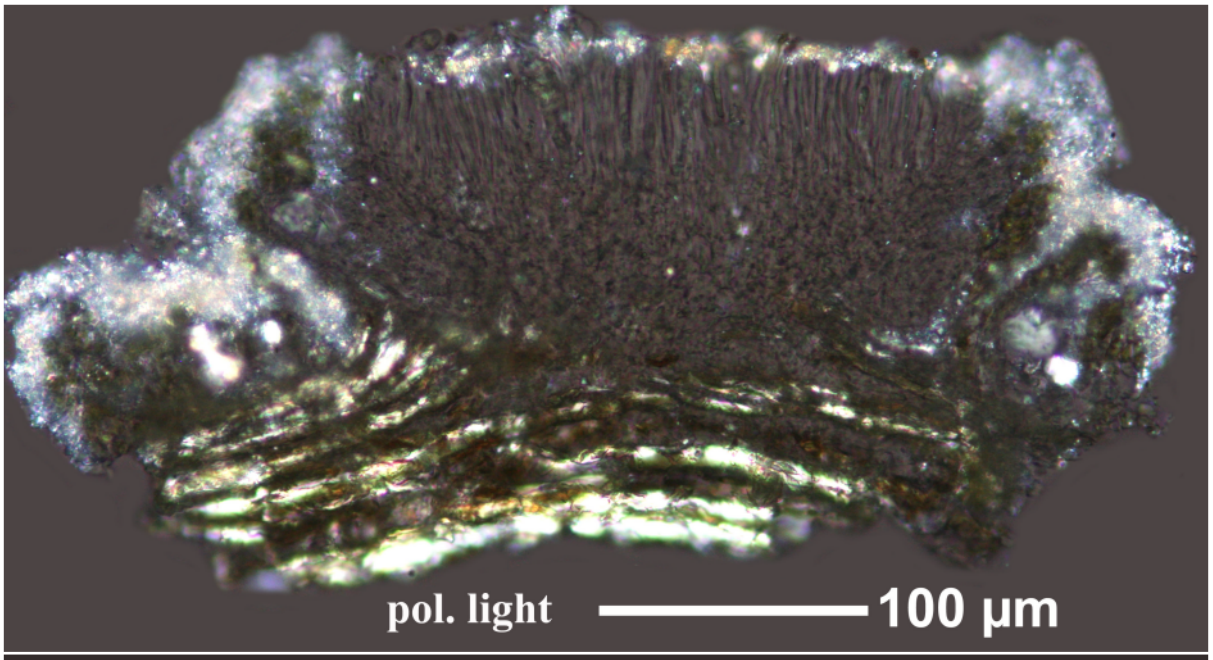
***Lecanora leprosa*** Fée

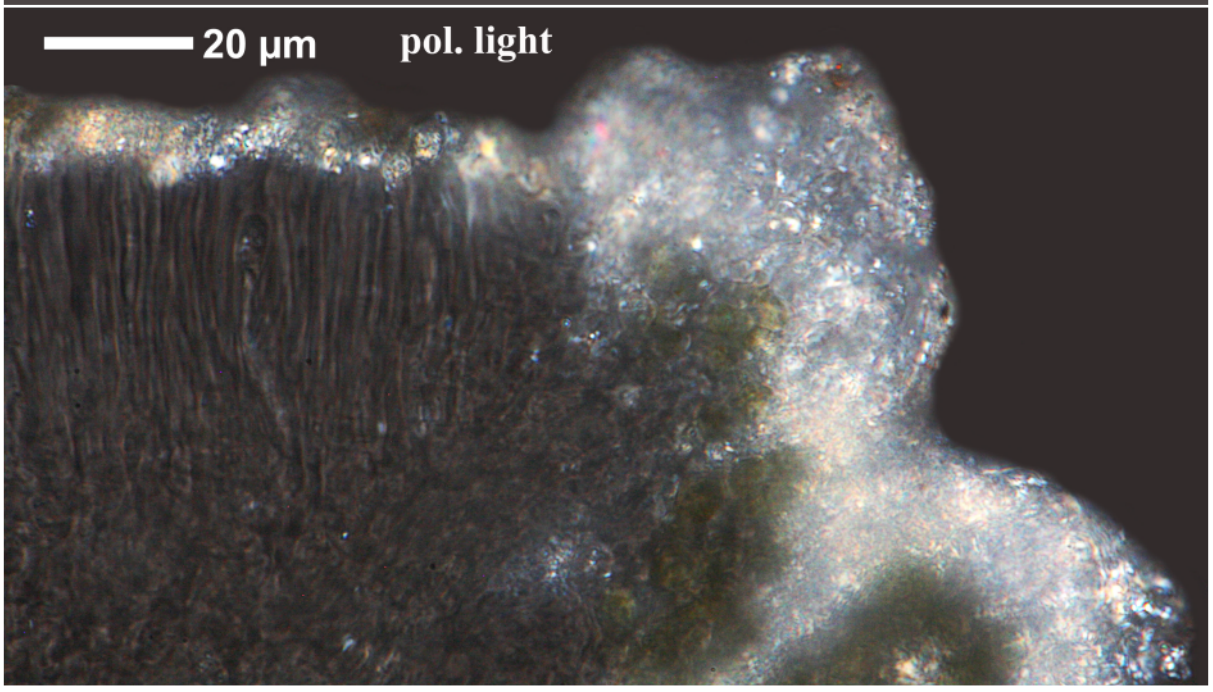
Thallus corticolous, yellowish, warty, without soredia. Prothallus absent or whitish grey. Apothecia 0.2-1.1 mm, first sunken then sessile. Disc orange to yellowish brown. Margins´first warty, later thin or disappearing. Amphithecium and parathecium with crystals. Hypothecium colourless to yellowish. Paraphyses appr. 1.5 µm thick, tips branched. Ascospores hyaline, 1-cellular, 7-14 x 3-7 µm. Chemistry: atranorin, gangaleoidin, chloroatranorin (min), norgangaleoidin (min), chlorolecideoidin (tr), leoidin (tr). Lit.: Lumbsch et al. (1993, Tropical Bryology 7: 71-75).

[9542], Thailand, Tempelanlage von Sukhothai. 17°01.019' N, 99°42.273 E, 78 m, corticol. Leg. Schumm 29.03.2002, det. Aptroot 2009.

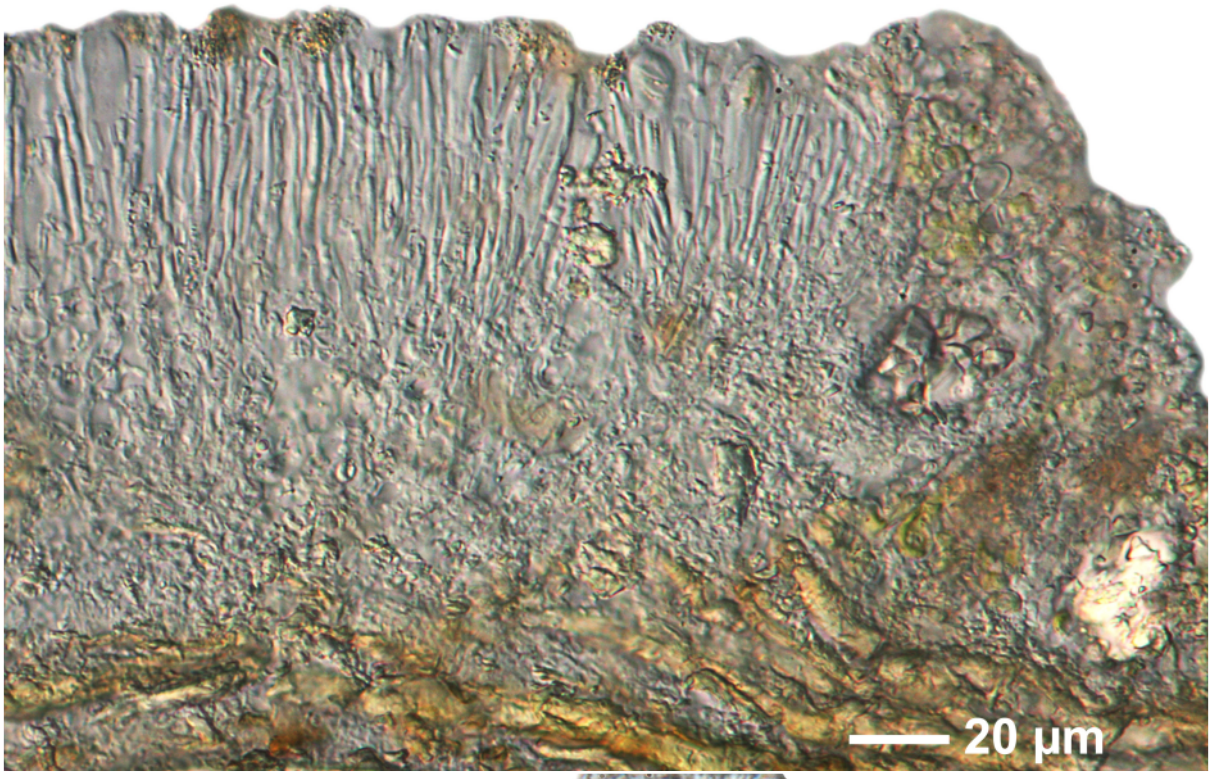


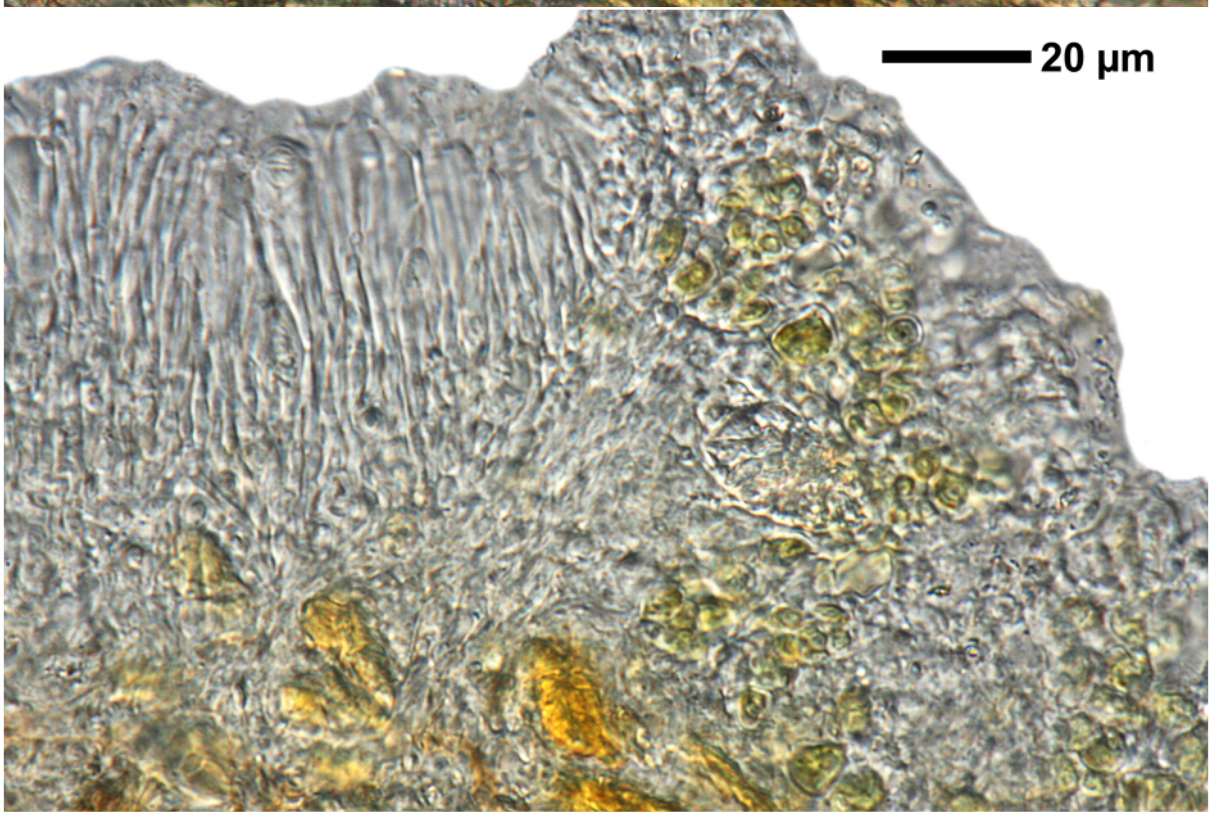


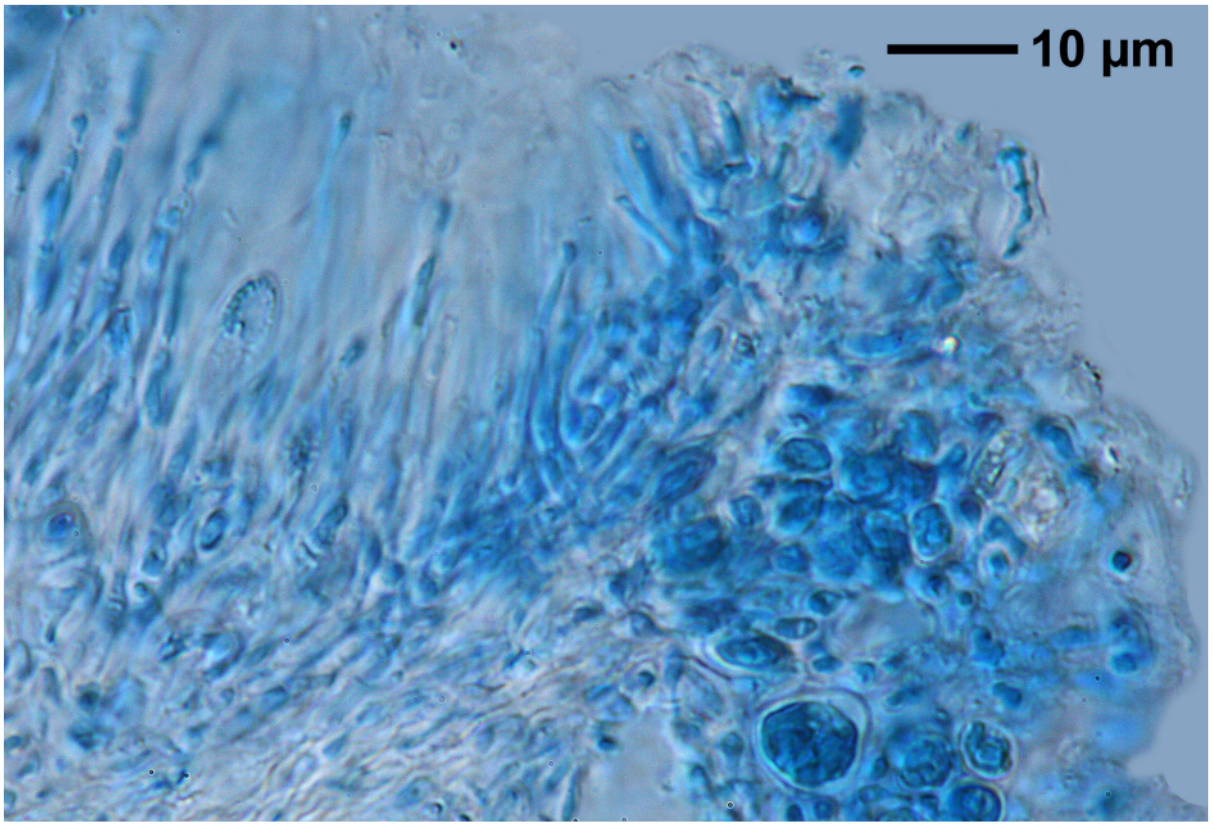



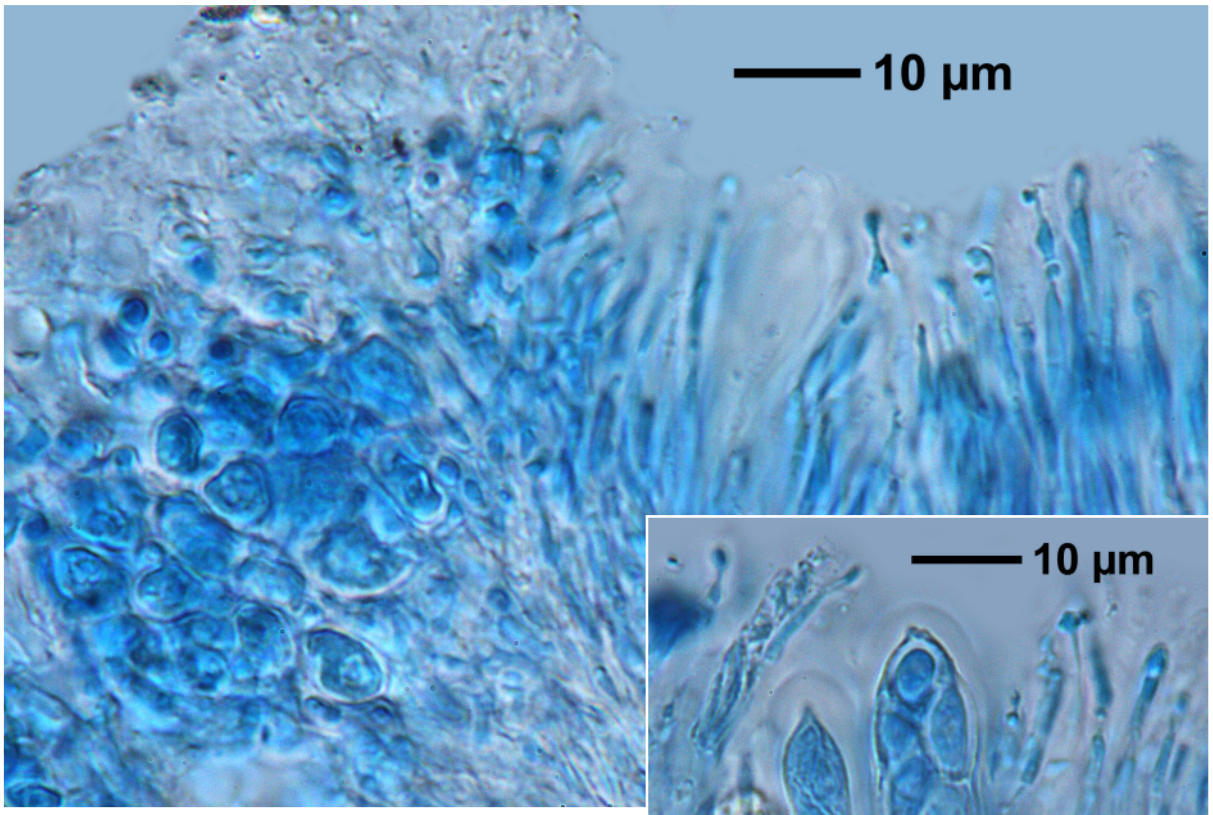

***Lecanora leprosa***

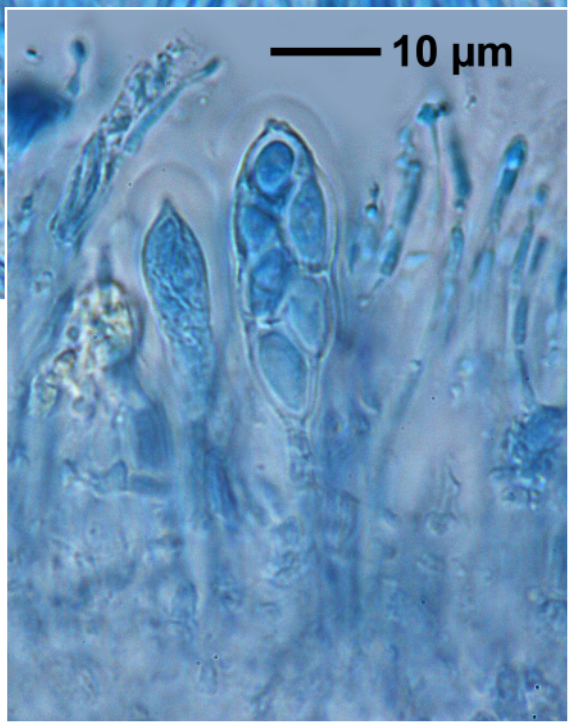



***Lecanora leprosa***




***Lecanora leprosa***

***„Lecidea“ turbinea*** Vain. (1921)

Thallus sorediate. Ascospores hyaline, 1-locular, 8/Ascus, 24-25 x 13-15 µm. Hypothecium pale. Lit.: Vainio (1921): Lichenes Insularum Philippinarum III, p. 130. Note: Probably a species of Malmidea?

[7768], Philippinen, Leyte, Prov. Leyte, Weg vom Gipfel des Mt. Agipo (10°46.729’ N, 124°49.781’ E, 885 m) nach Kadwa-An (10°46.249’ N, 124°48.167’ E, 195 m), bei 750 m. Leg. Schumm 18.08.2000, det. K. Kalb 2011.

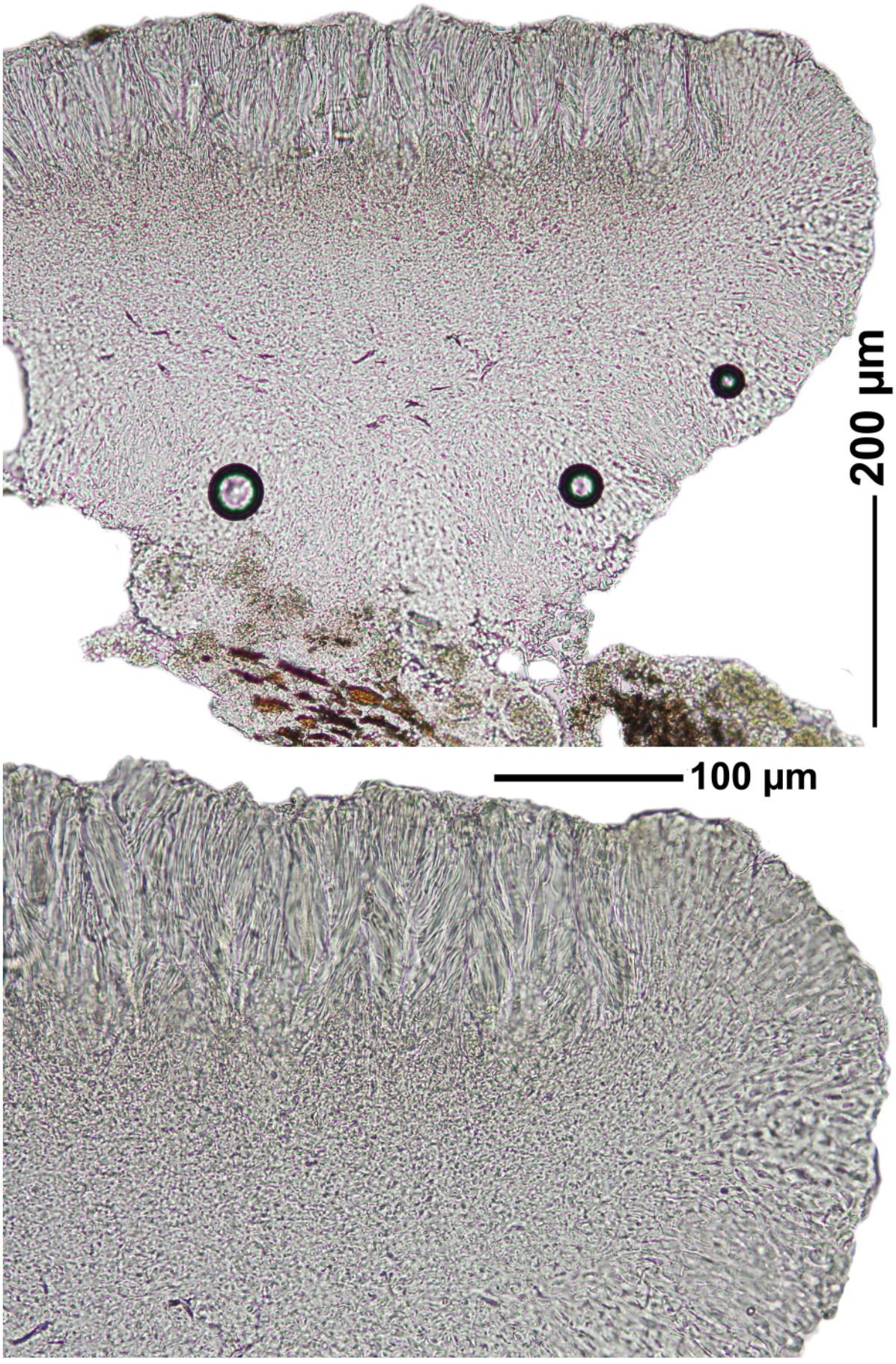




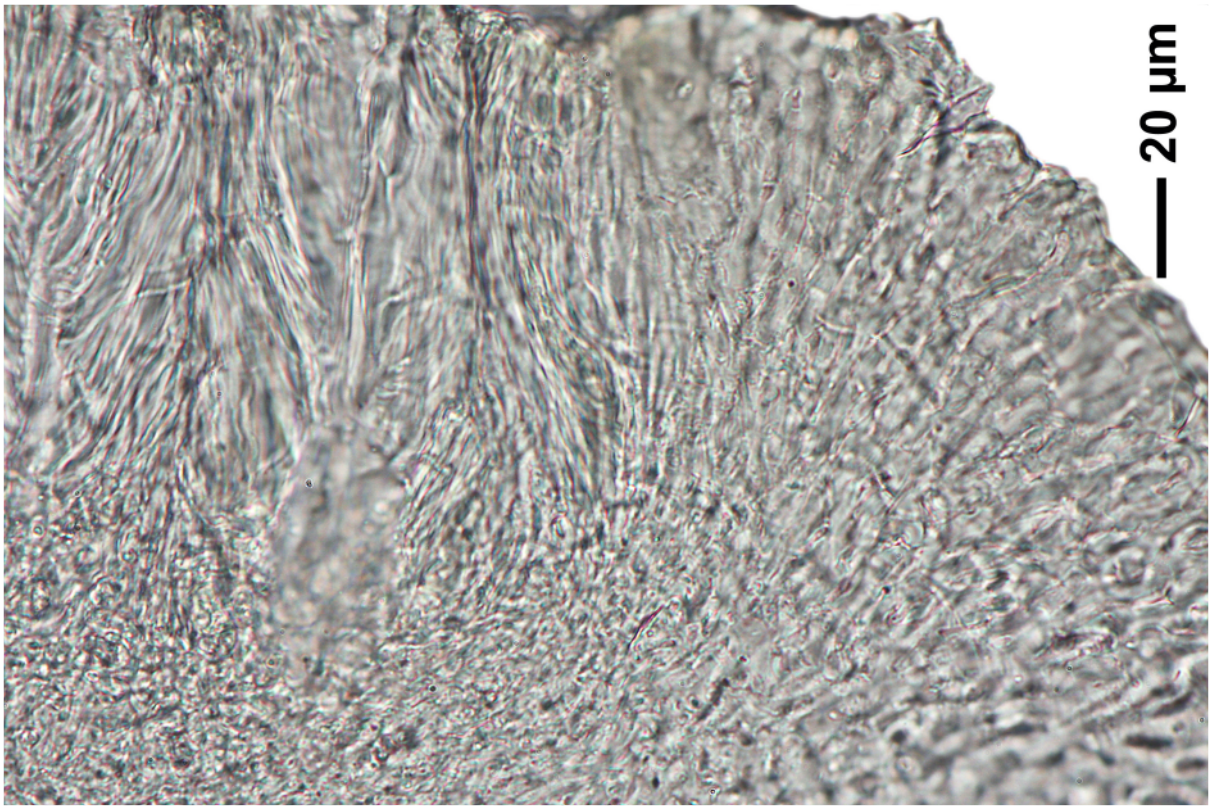

***Lecidea turbinea***

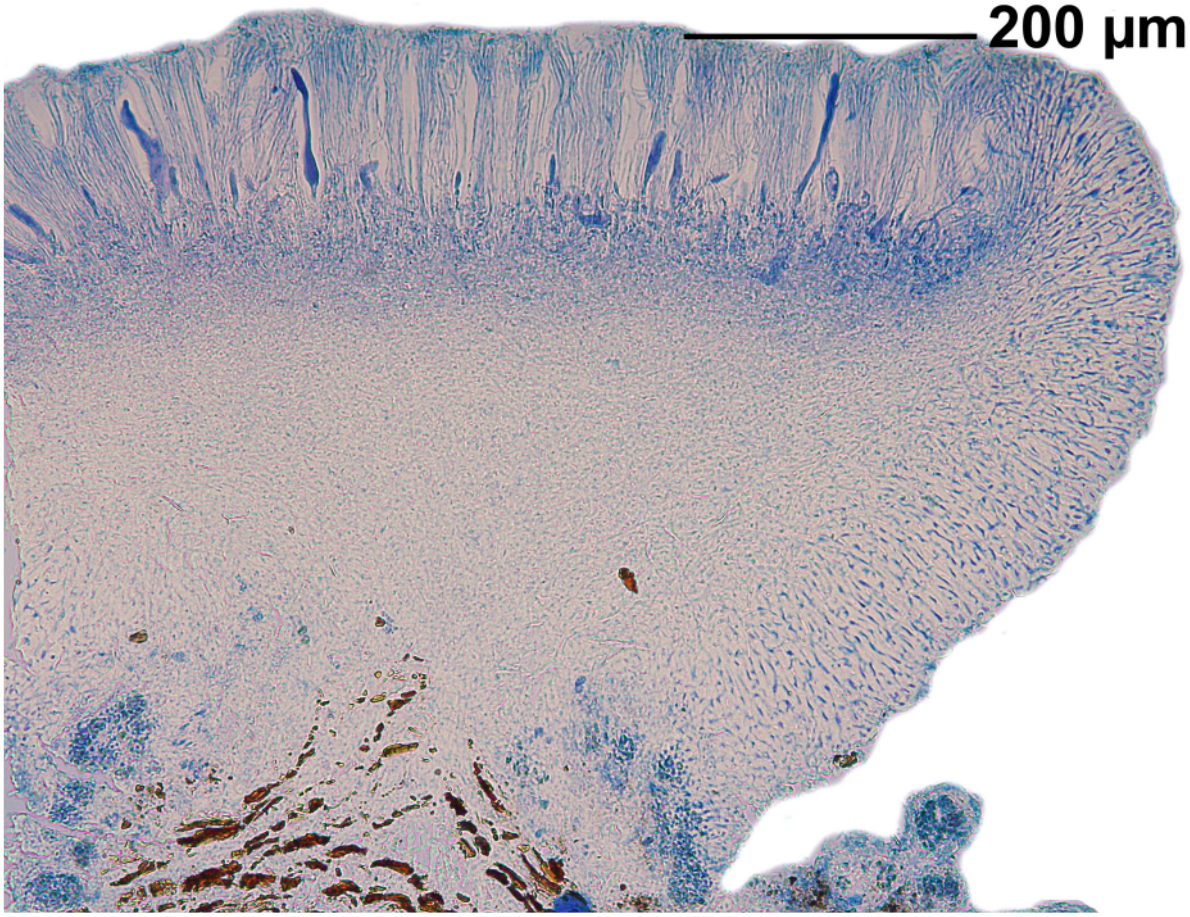



***Lecidea turbinea***

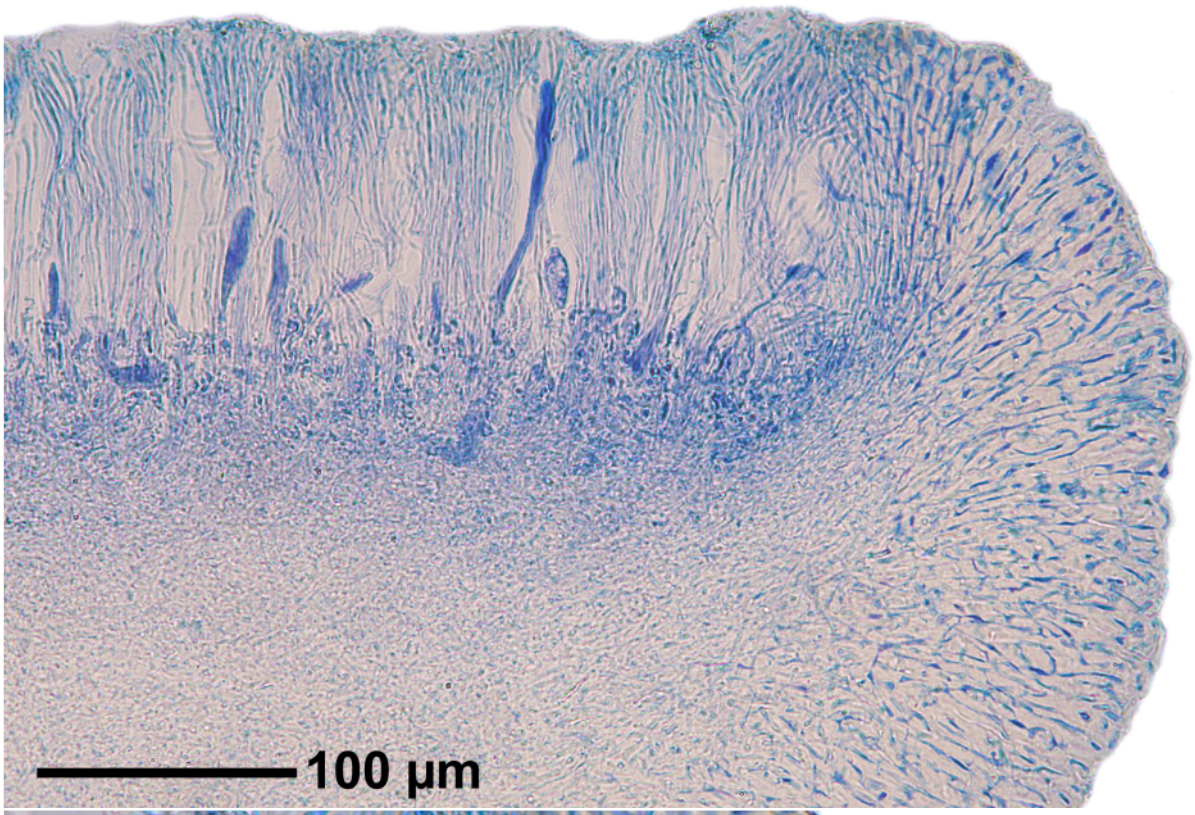


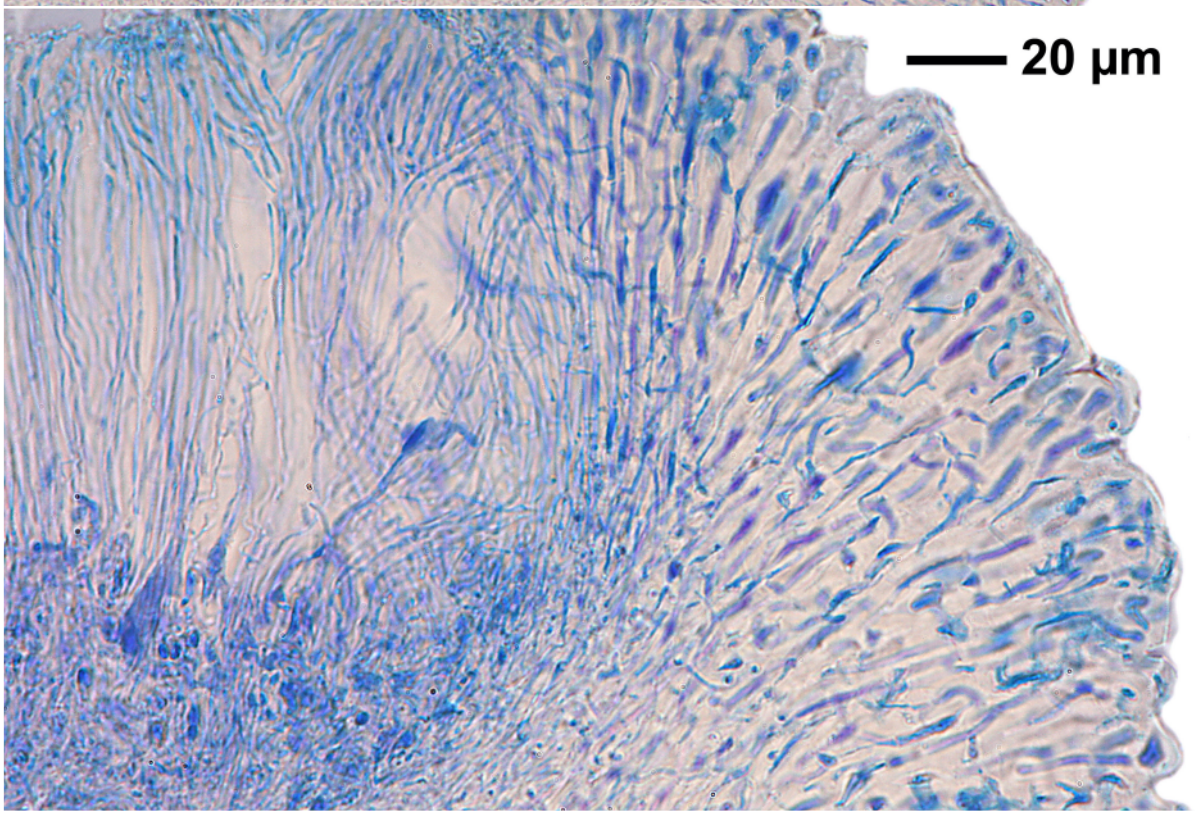

***Lecidea turbinea***

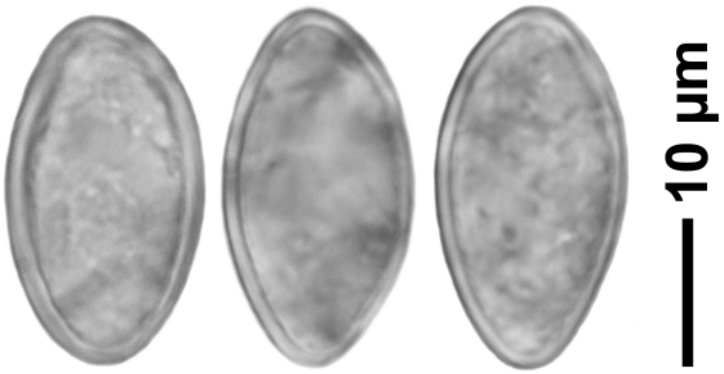


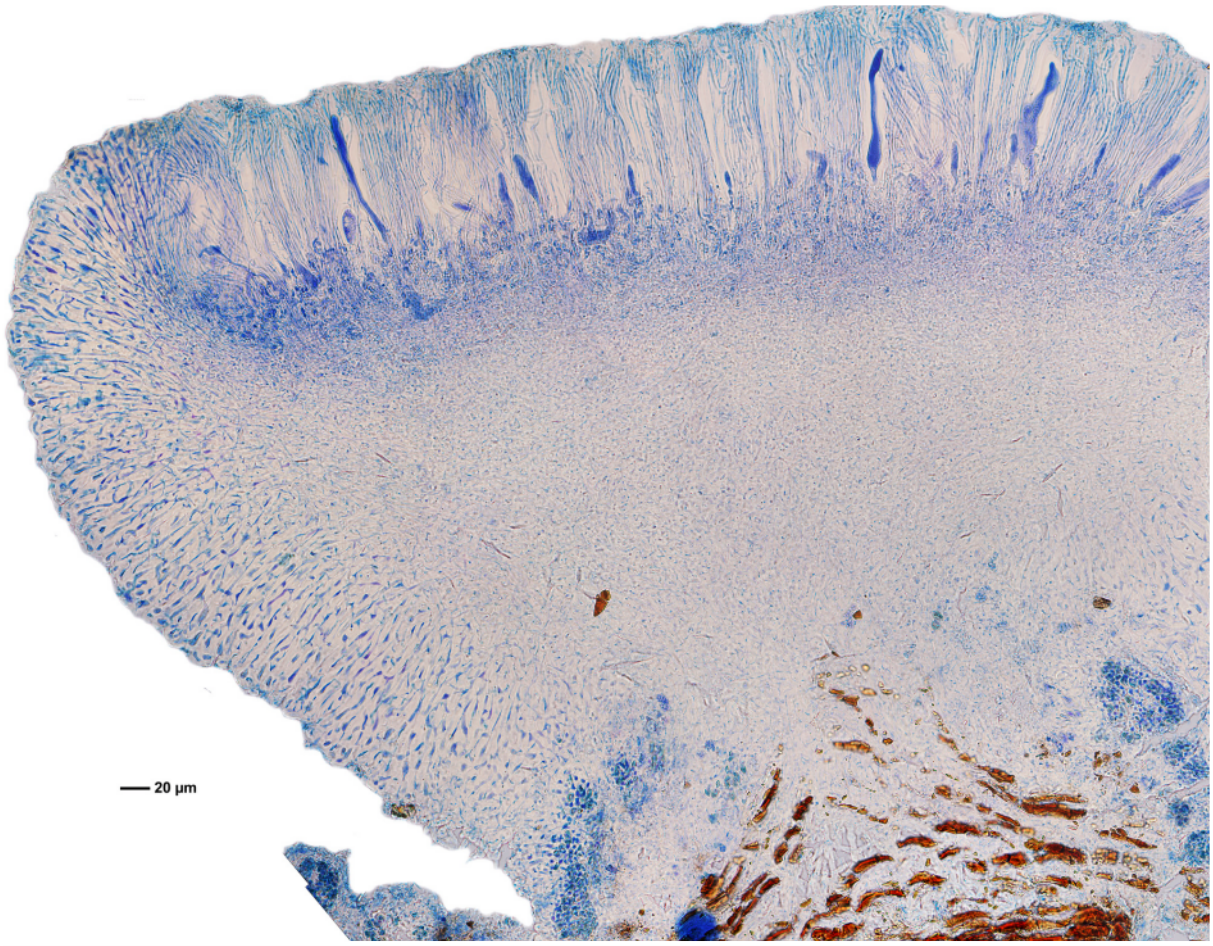

***Lecidea turbinea***

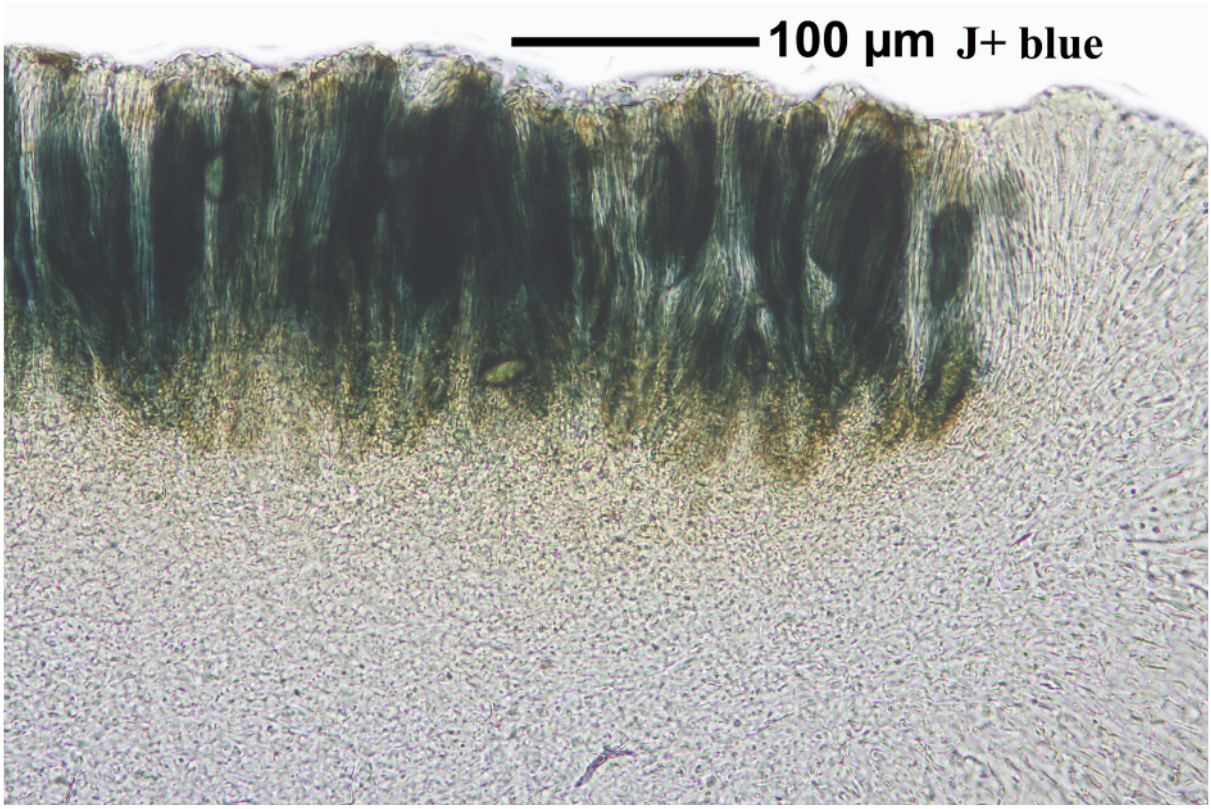


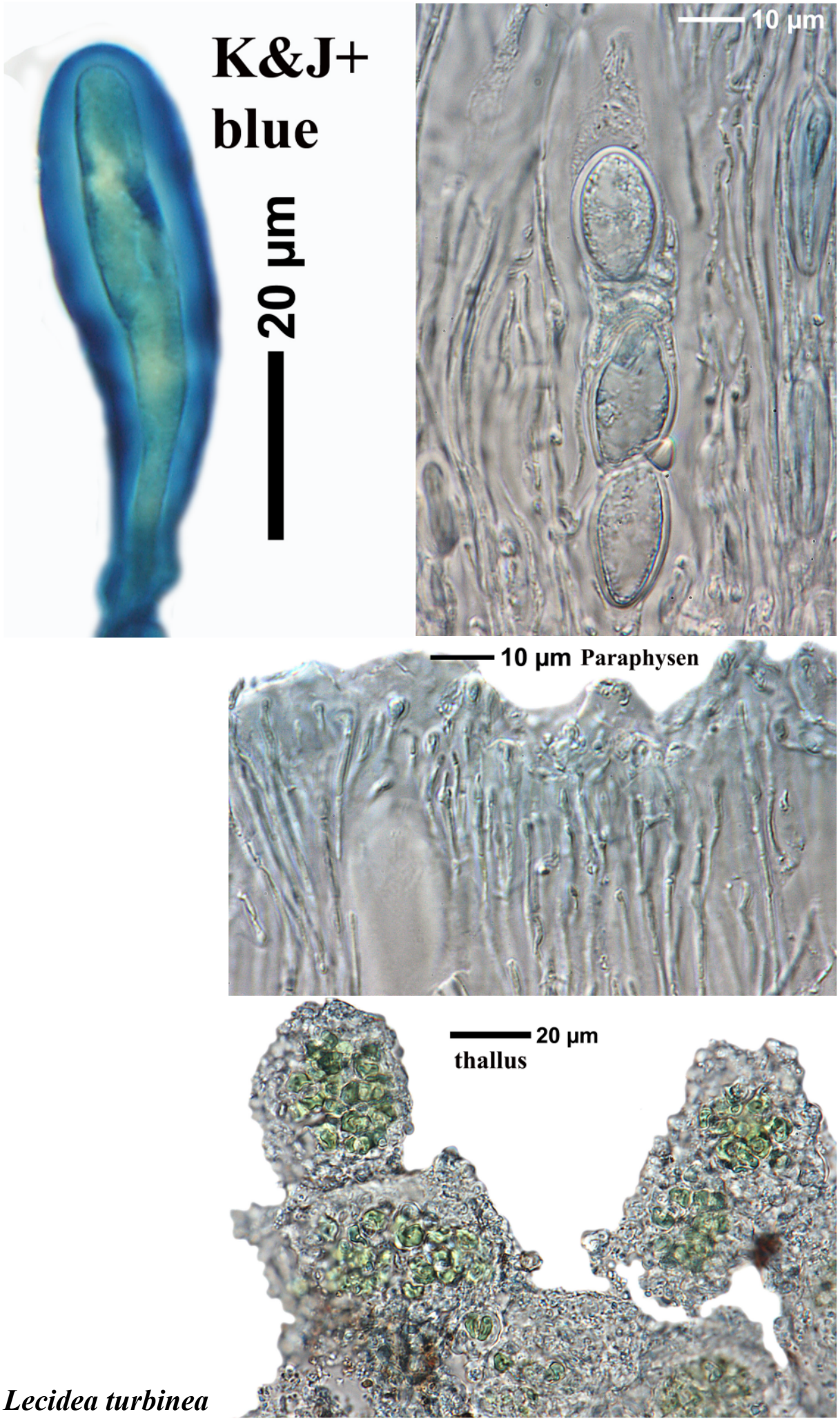




***Lecidea turbinea***




***Lecidea turbinea***



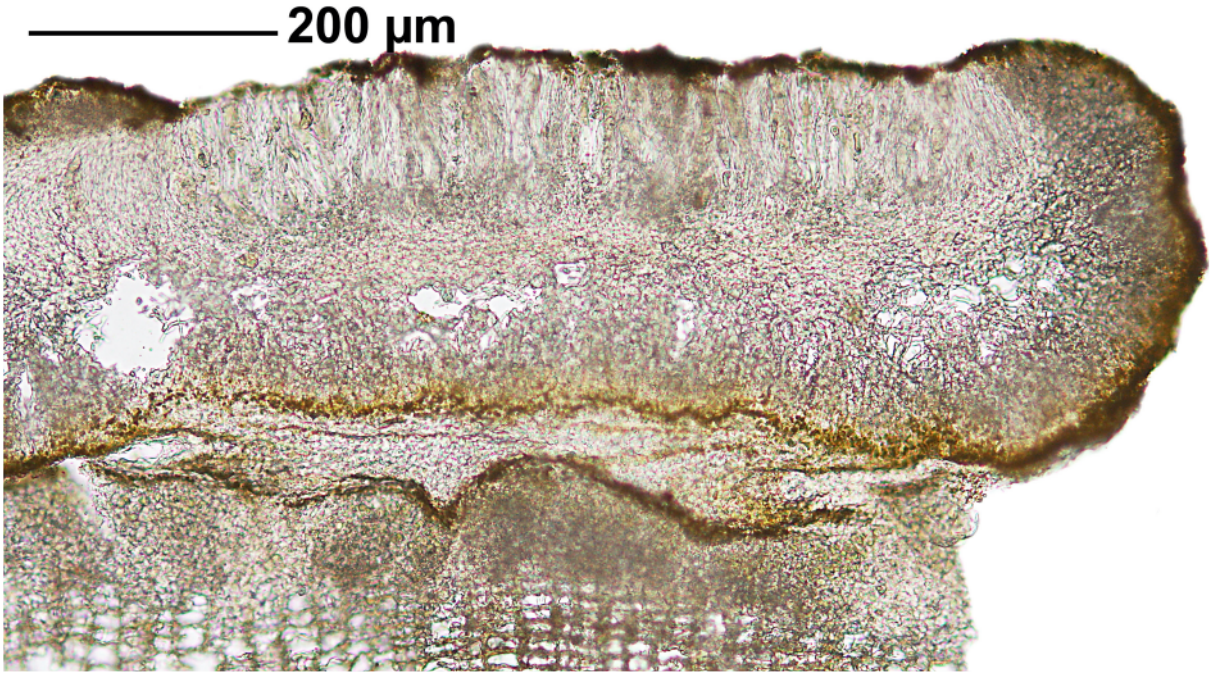

*Lecidea turbinea*

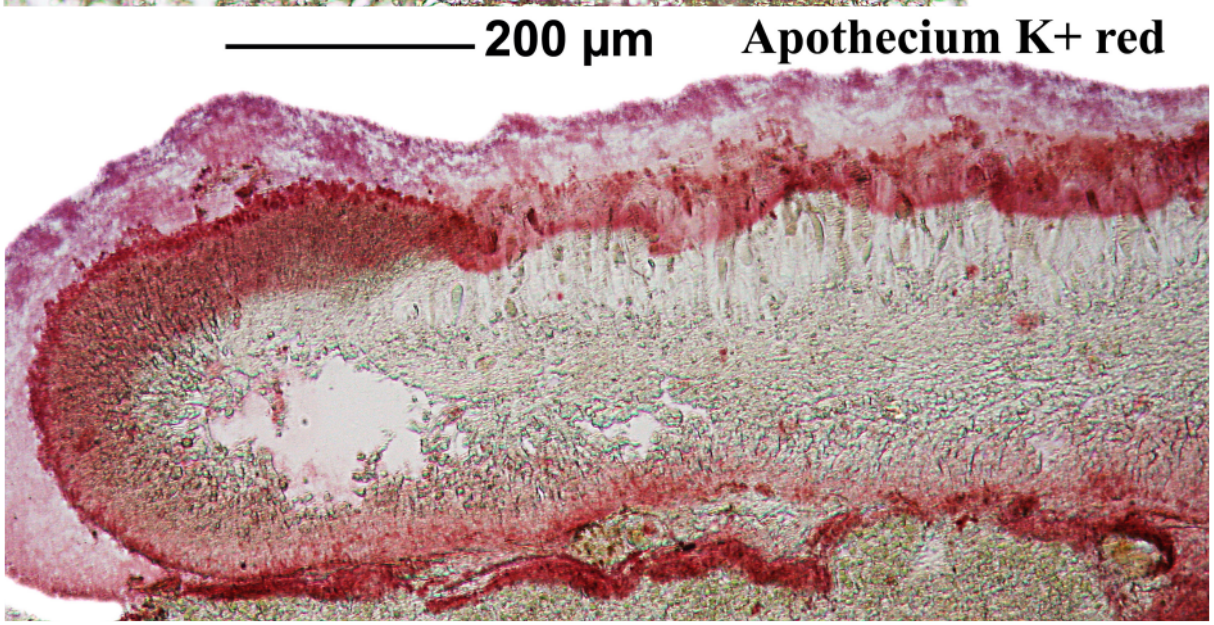
***Letrouitia domingensis*** (Pers.) Hafellner & Bellem.
[= ***Bomyliospora domingensis*** (Pers) Zahlbr.]

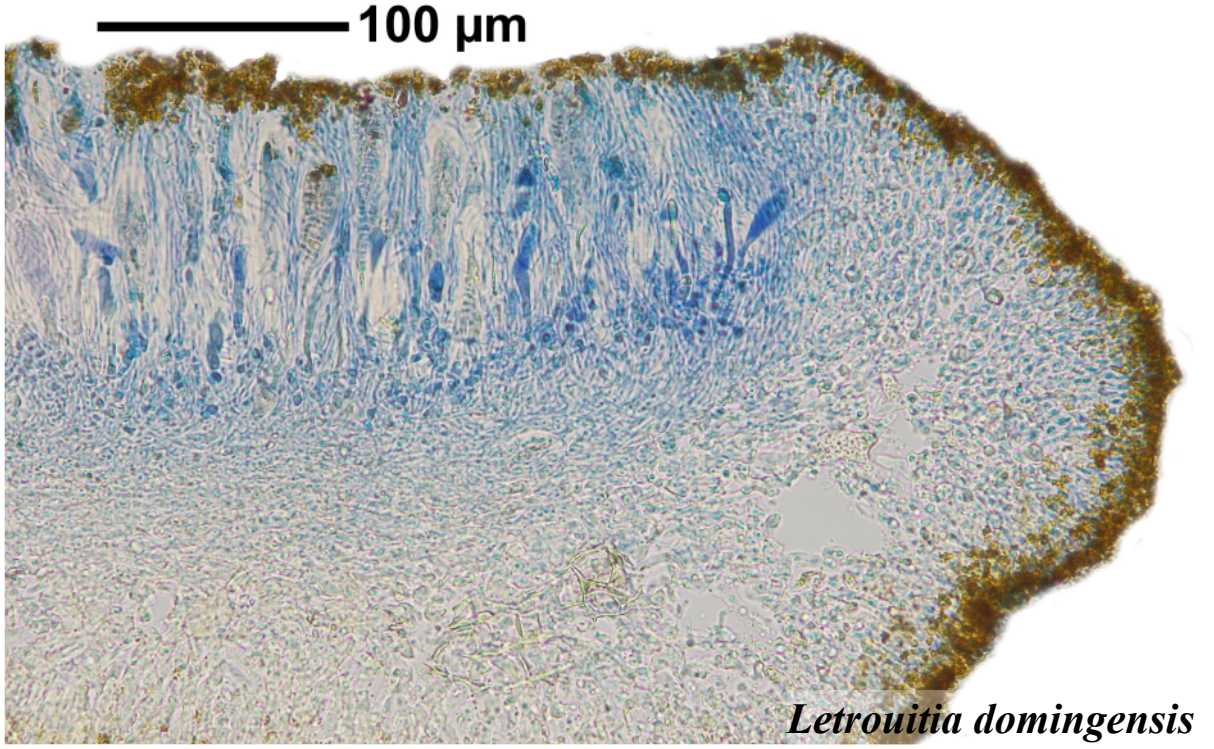
Ascospores hyaline, 6-8/ascus, 7-septate, (rarely with 1 additional longitudinal septum in the loculi) , 21-29(-35) x 6.5-9(-10) µm. with wavy gelatinous halo. Thallus and apothecia. K+ red, parietin, fragilin.

[9532], Thailand, Floatel Jungle Rafts am River Kwai Noi, 14°19.144' N, 98°58.089'E, 108 m. Leg. Schumm 27.03.2002, det. Aptroot 2009.

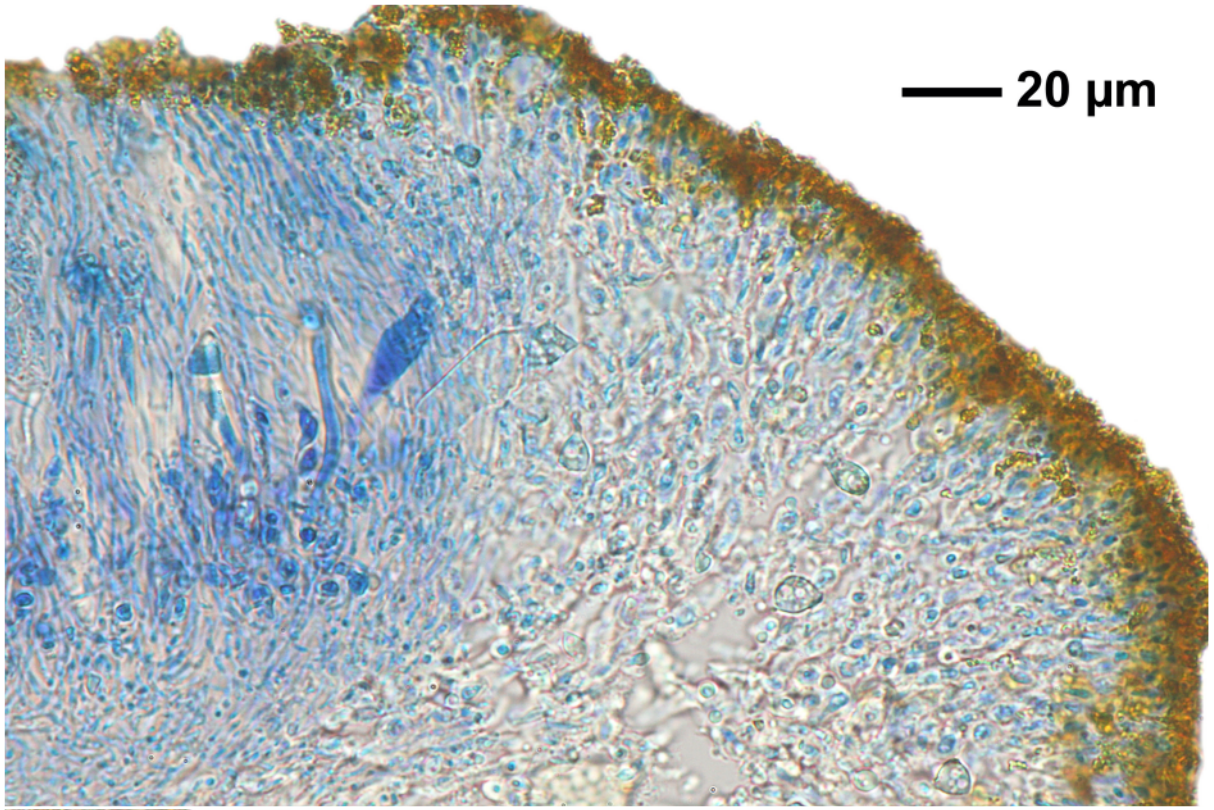


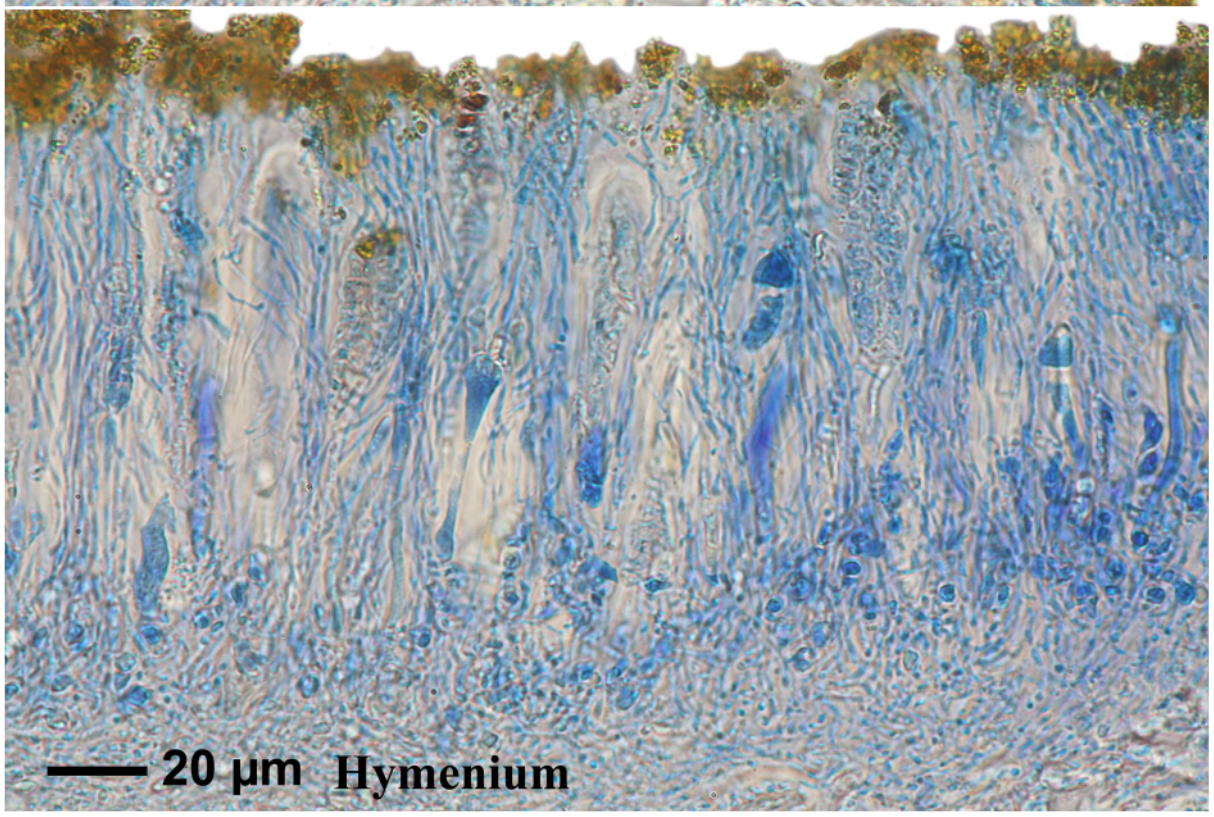



***Letrouitia domingensis***

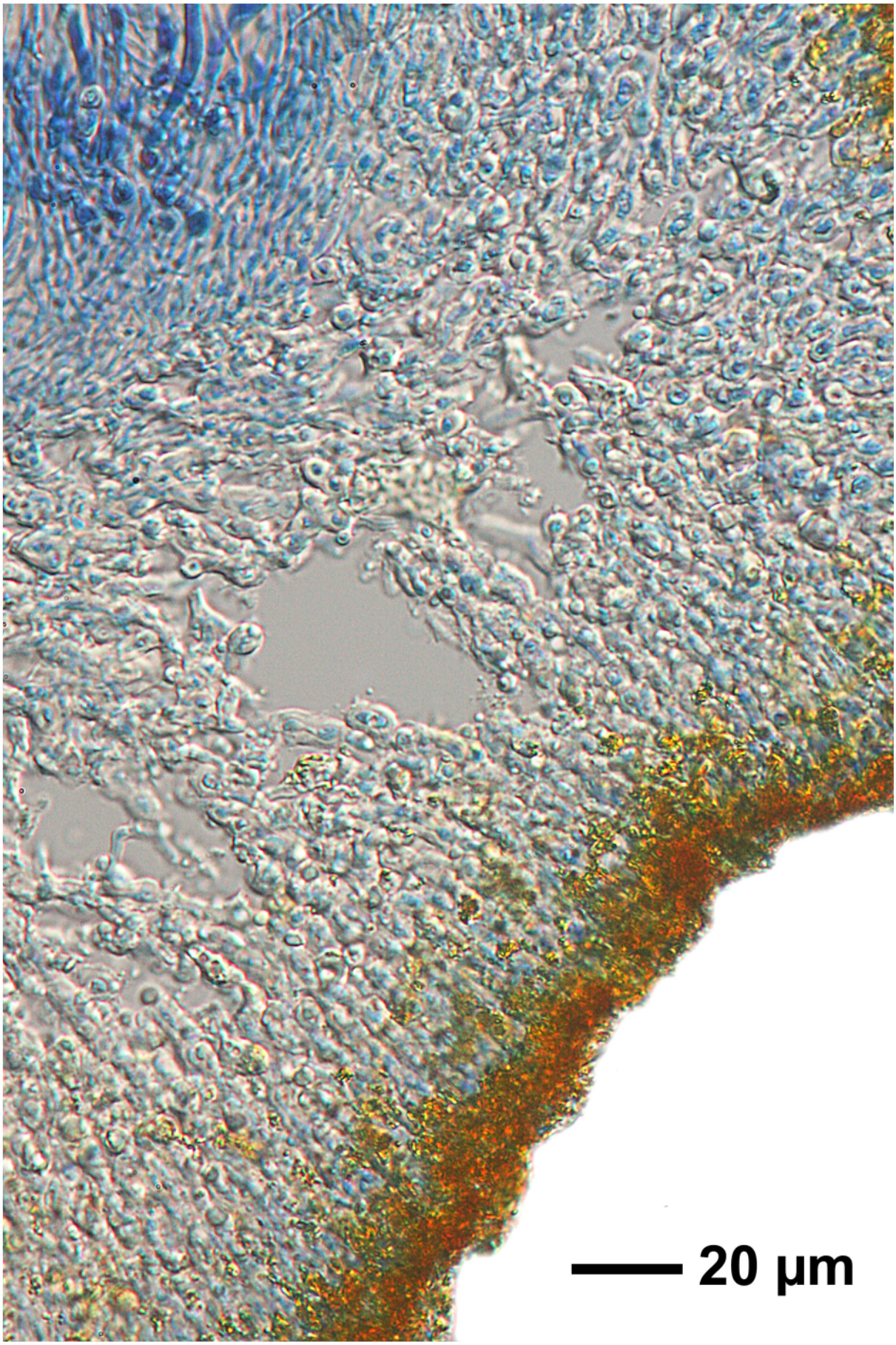


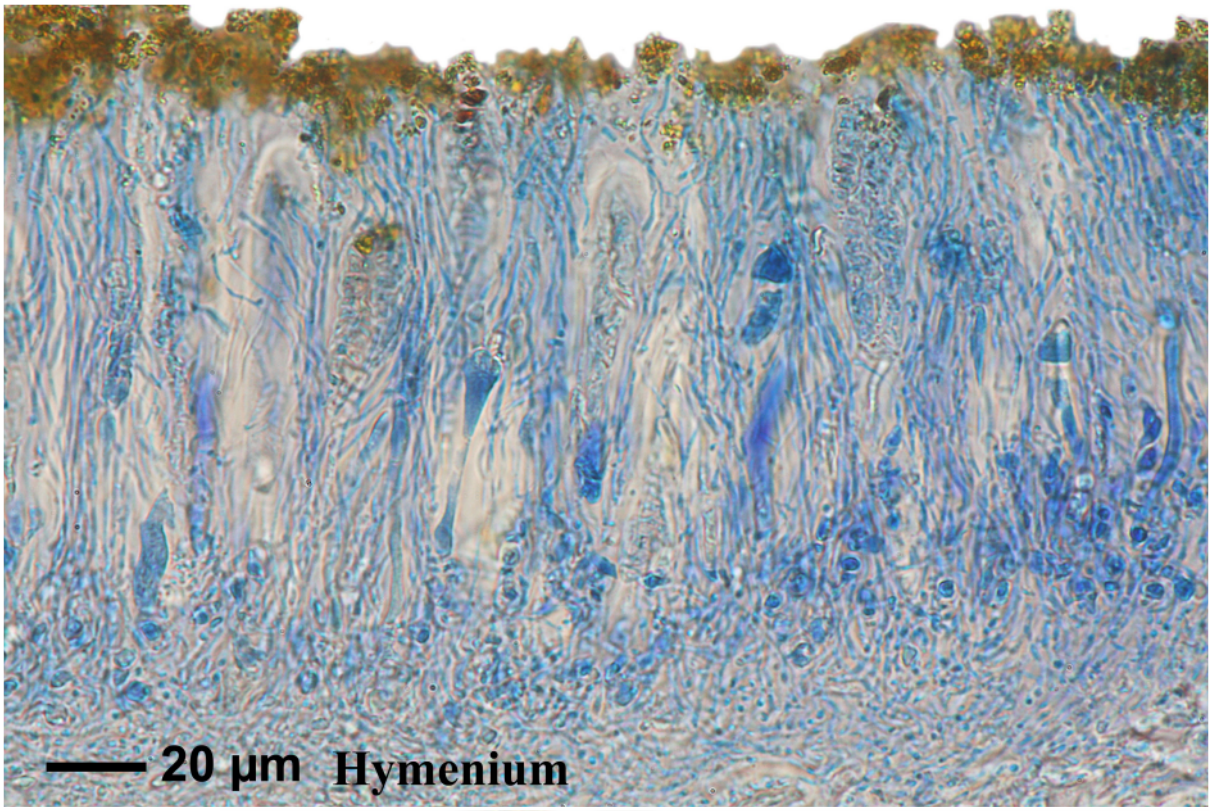


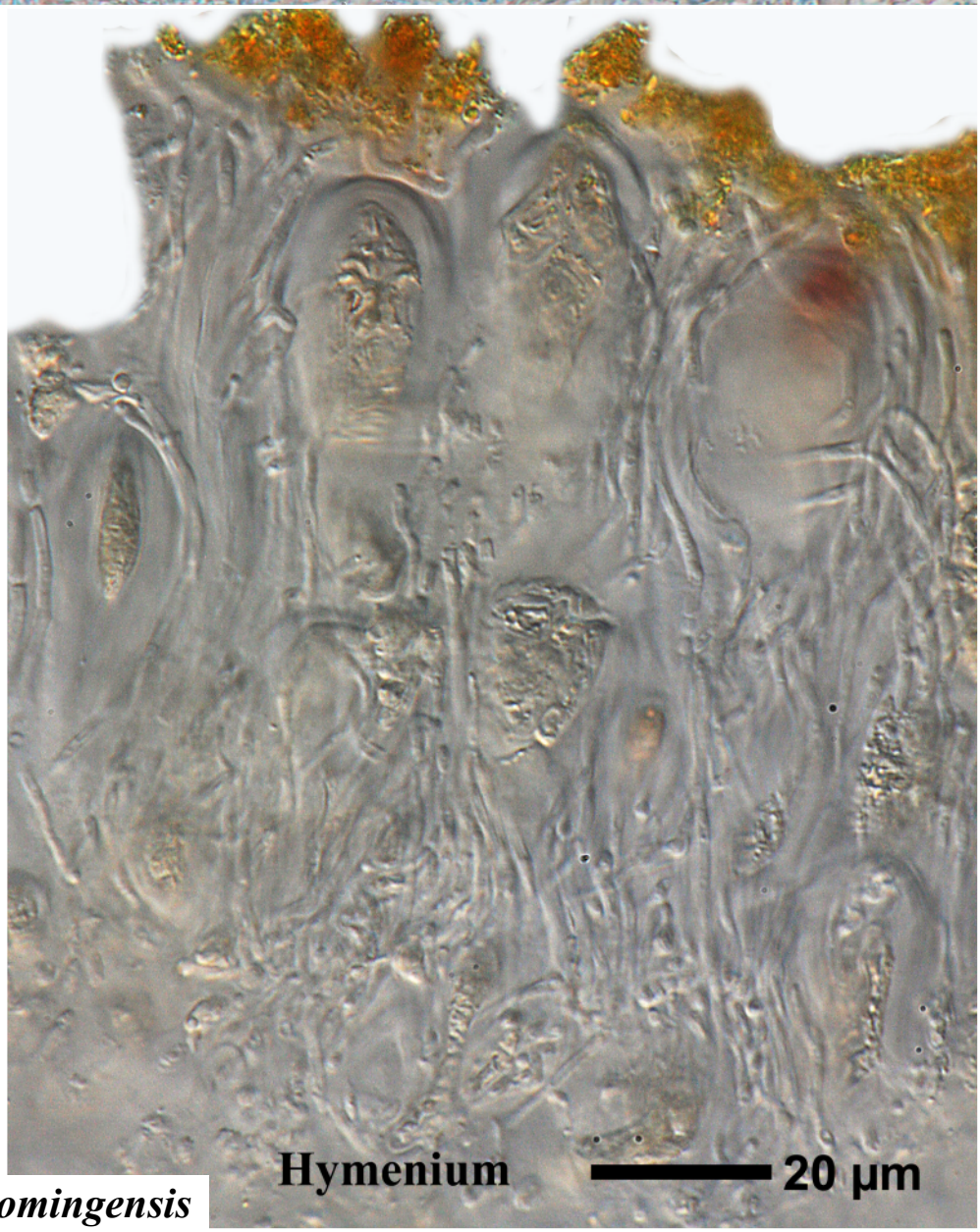


***Letrouitia domingensis***

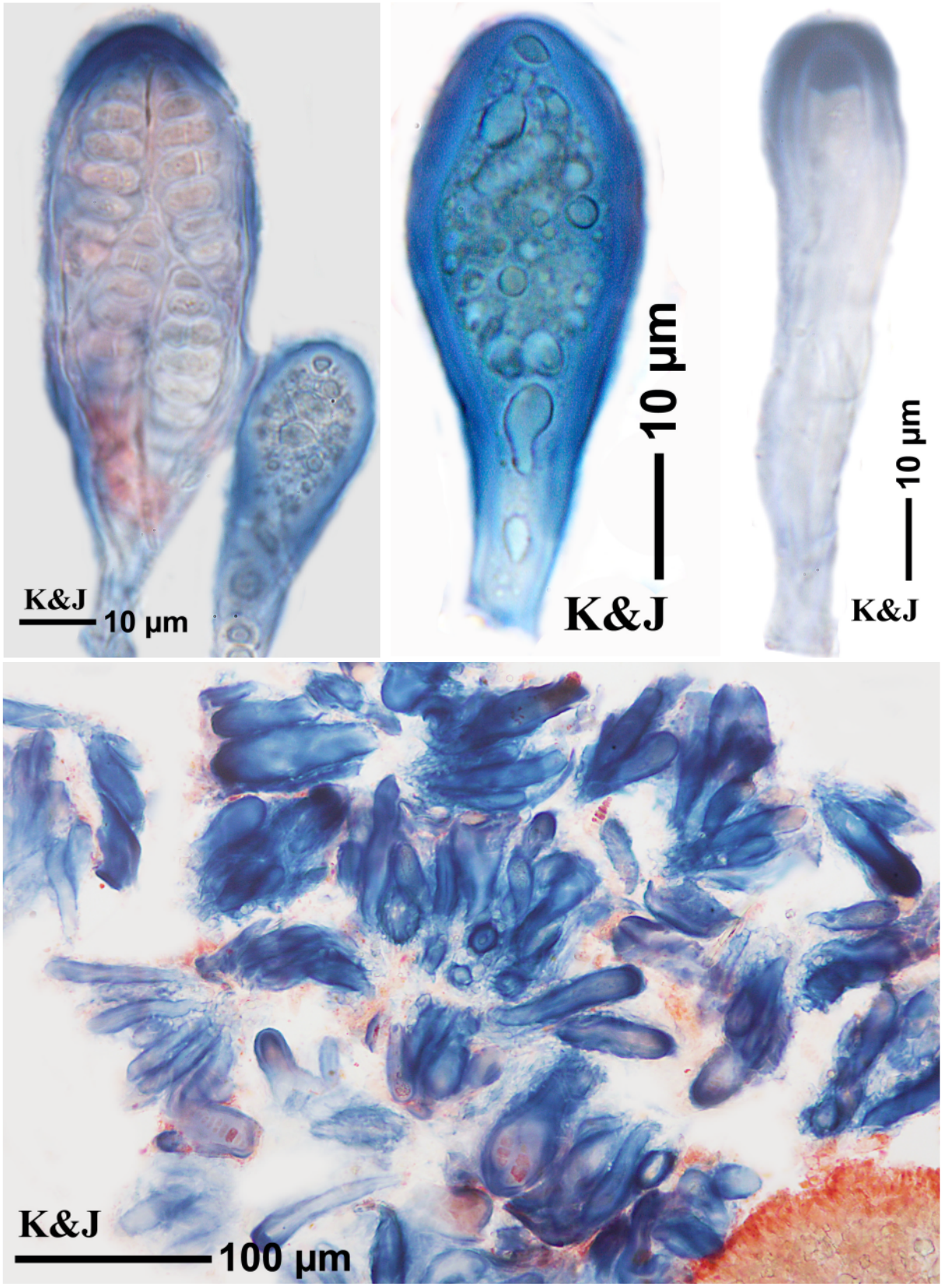



***Letrouitia domingensis***




***Letrouitia domingensis***

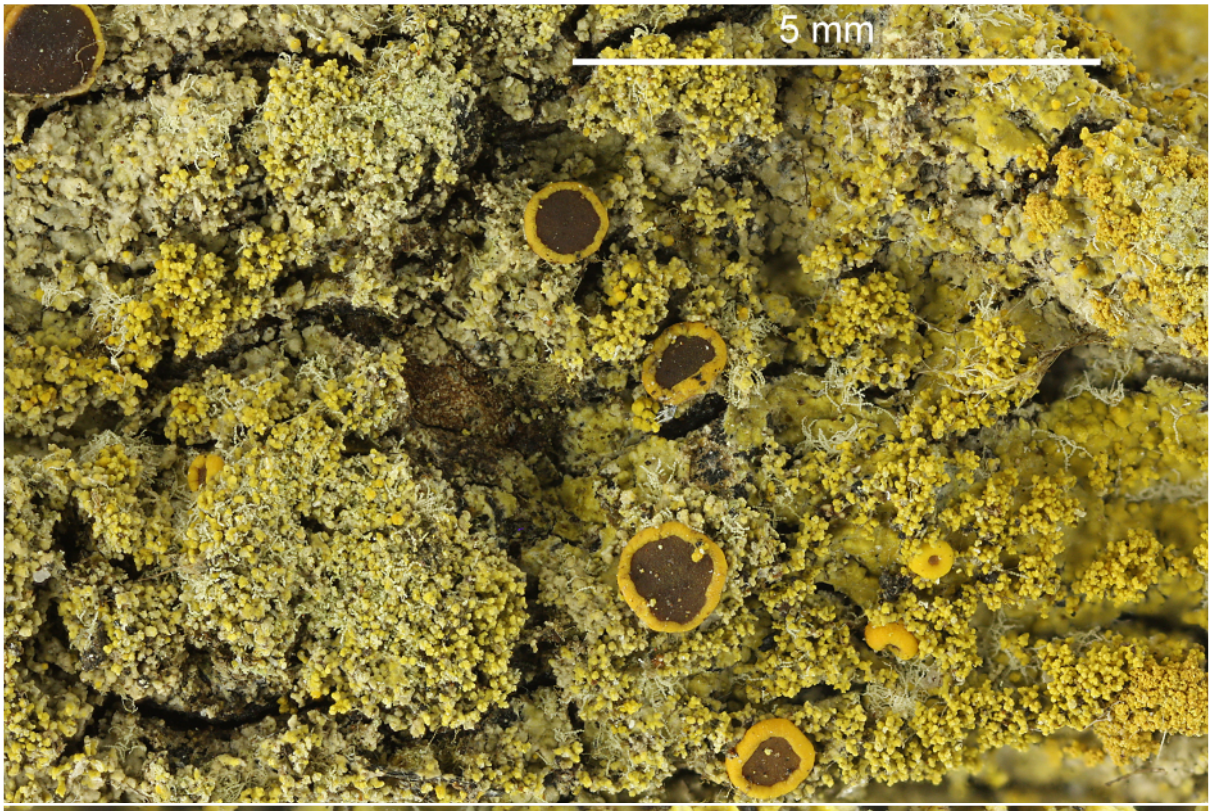


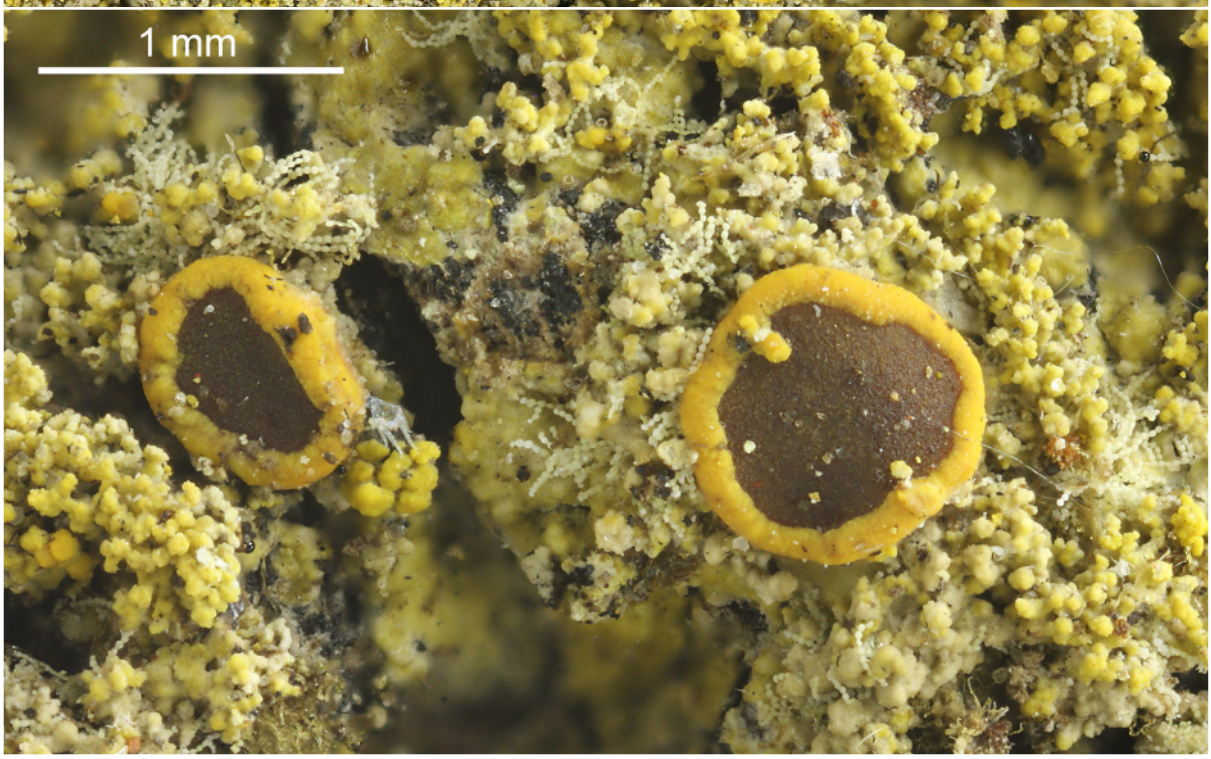

***Letrouitia domingensis***

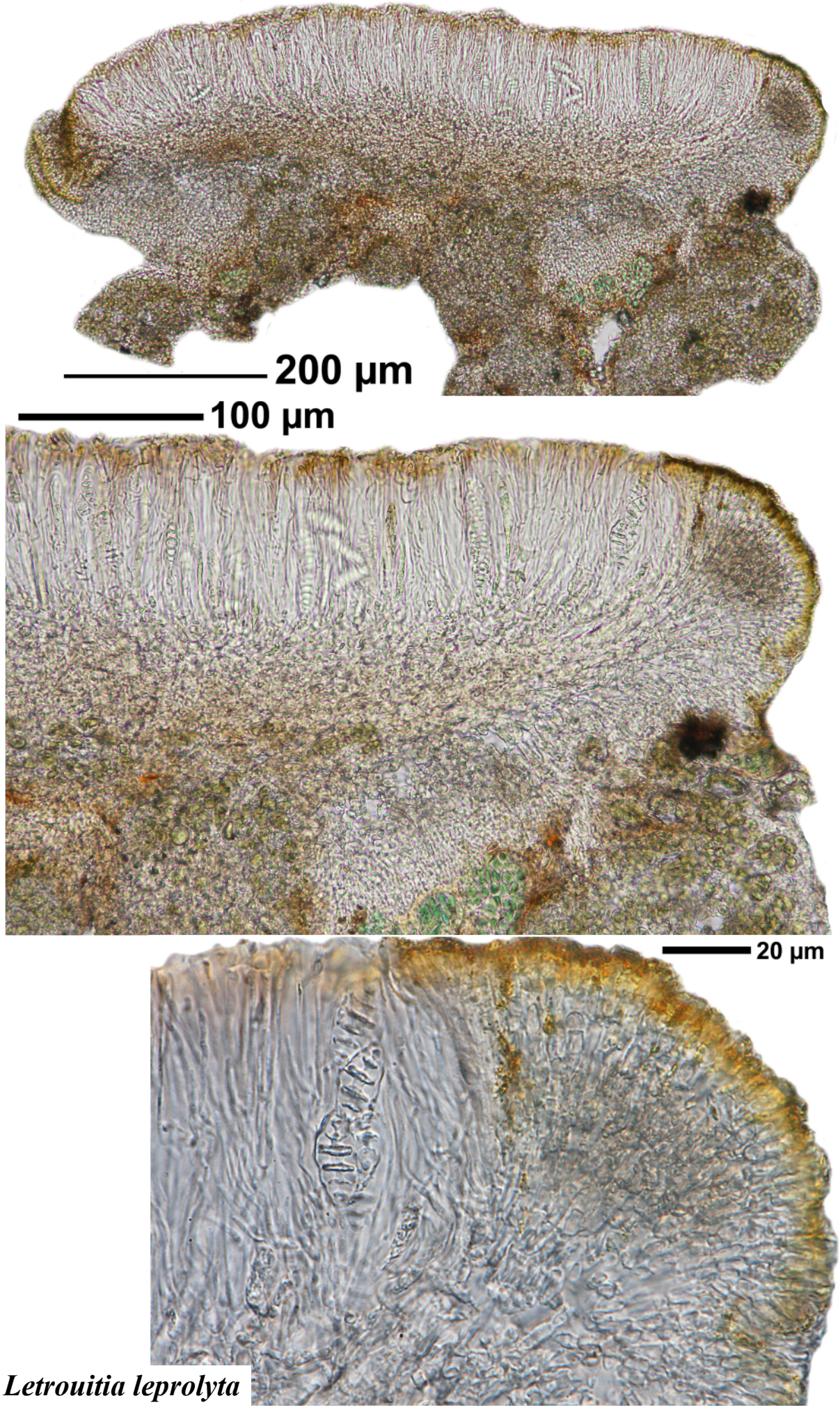
***Letrouitia leprolyta*** (Nyl.) Hafellner
[= ***Bombyliospora leprolyta*** (Nyl.) Zahlbr.]

Thallus yellow (K+ red), isidiate. Ascospores 20-34 x 9-10(-12) µm, 5-7-septate.

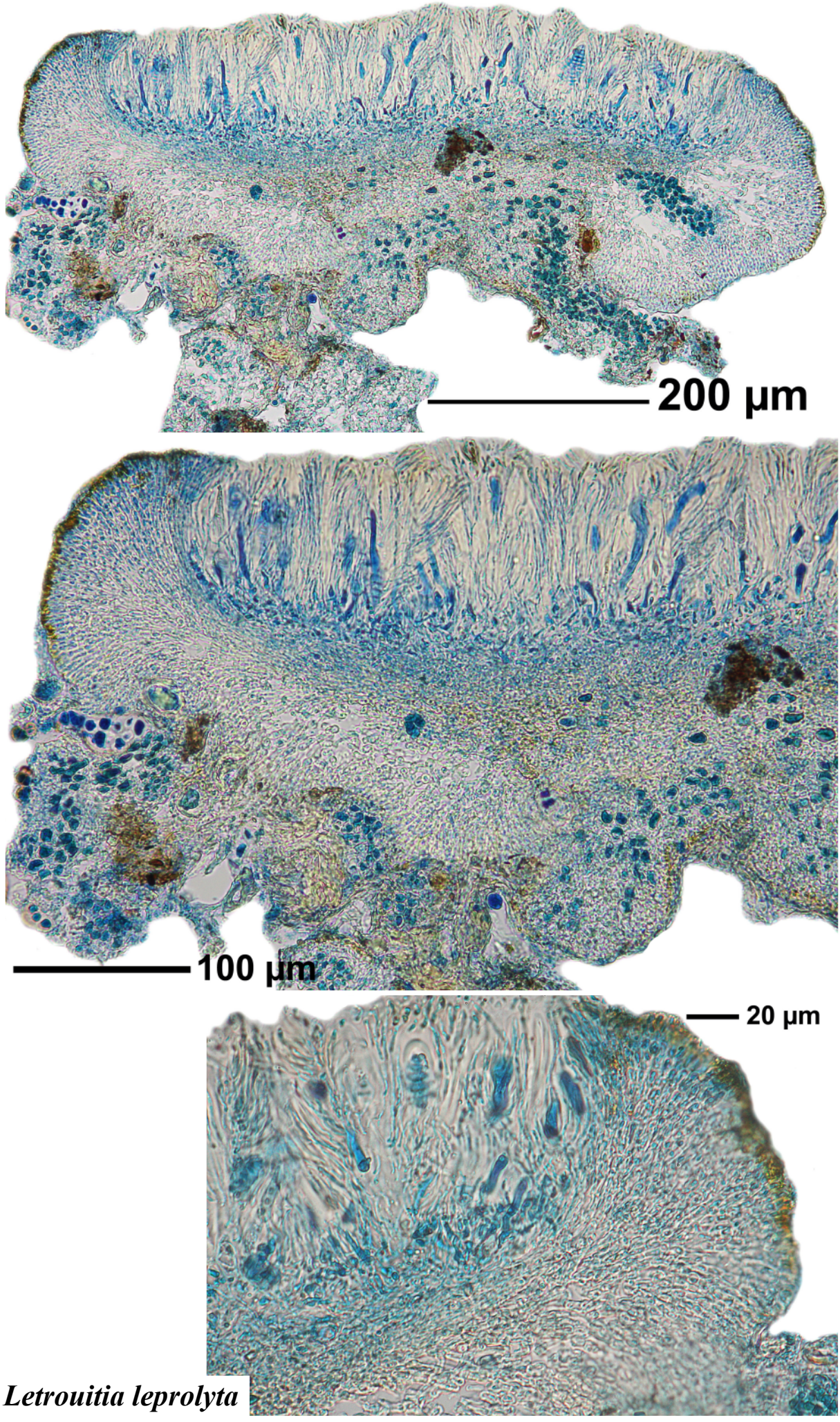
[14725], Kambodscha, Provinz Siem Reap, Ta Prohm, 13°22'14" N, 101°35'34" E, 9.2 km ENE Siem Reap, ca. 100 m, auf Rinde. Leg. U. Schwarz 15.02.1998 (Nr.3042), det. Aptroot 2009. Bem.: In Thailand an gleicher Stelle wie *Letrouitia domingensis* gefunden [9533]



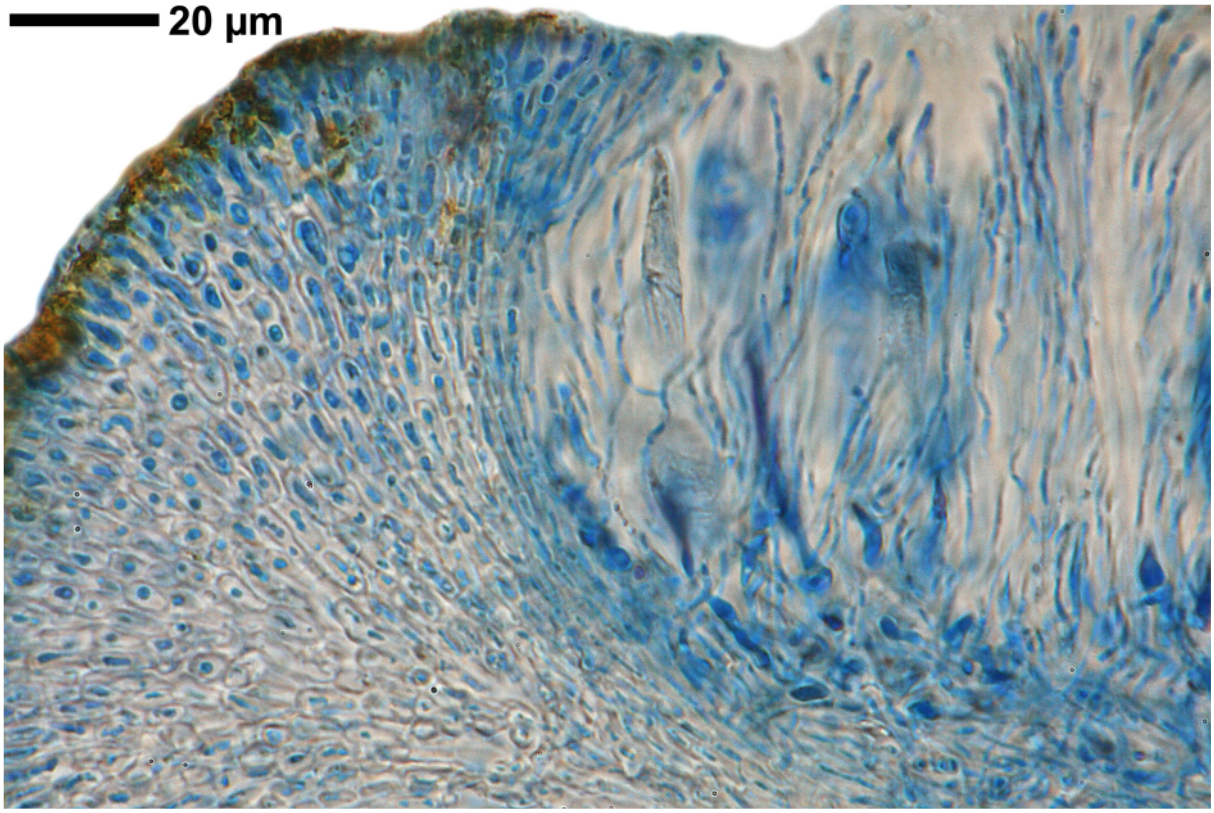



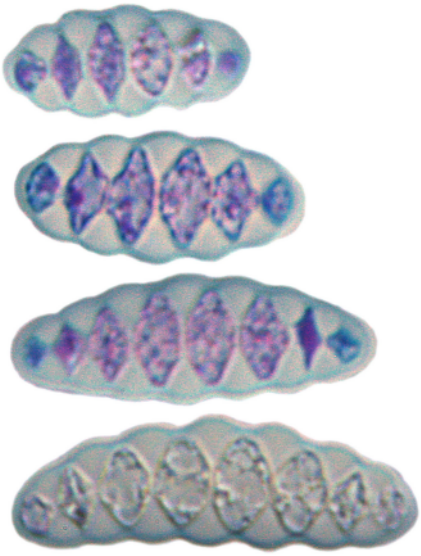


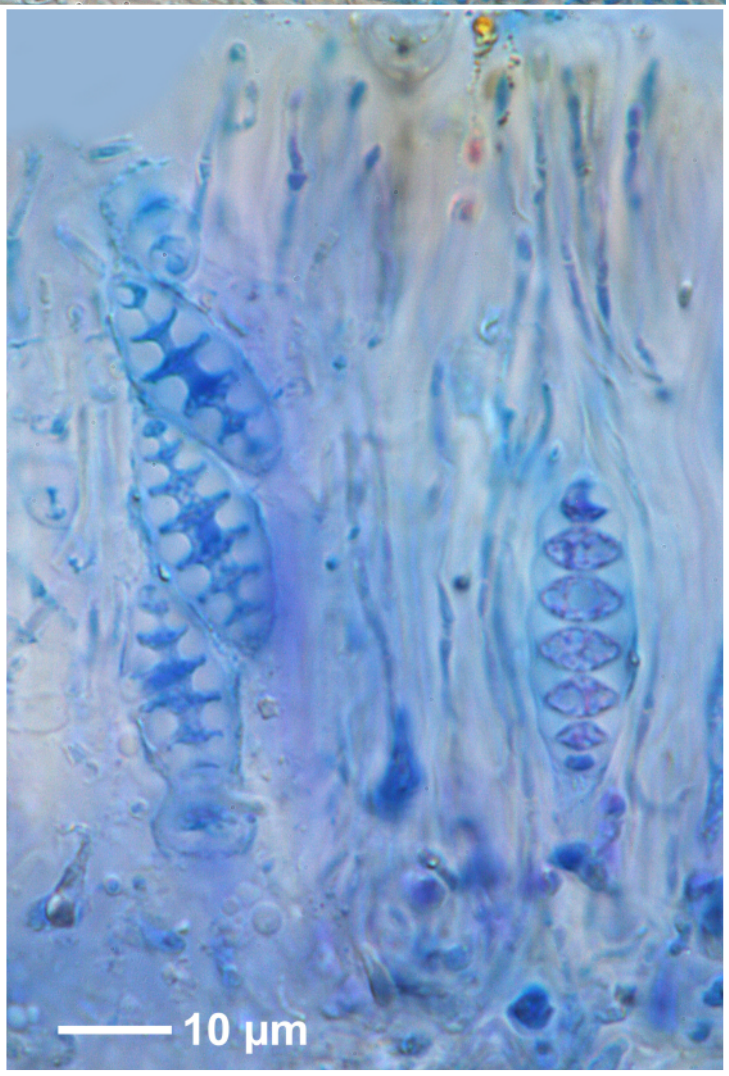

***Letrouitia leprolyta***



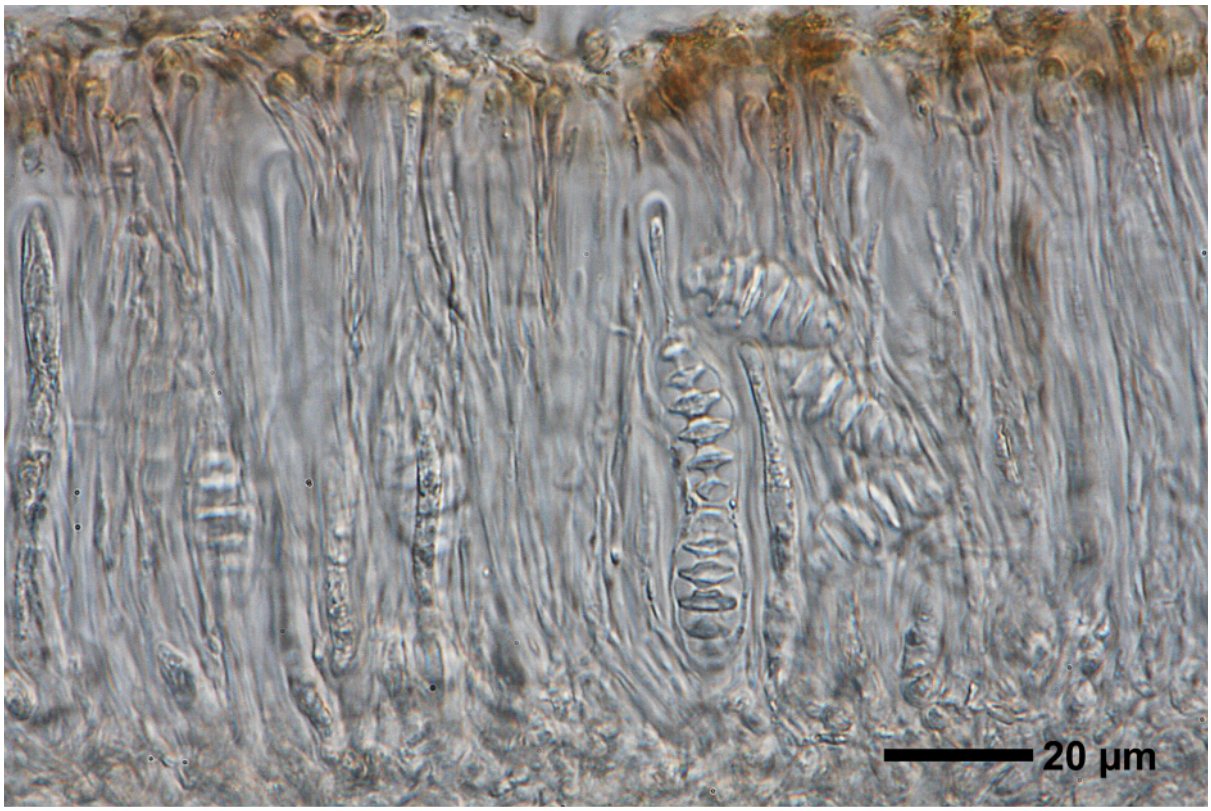

***Letrouitia leprolyta***

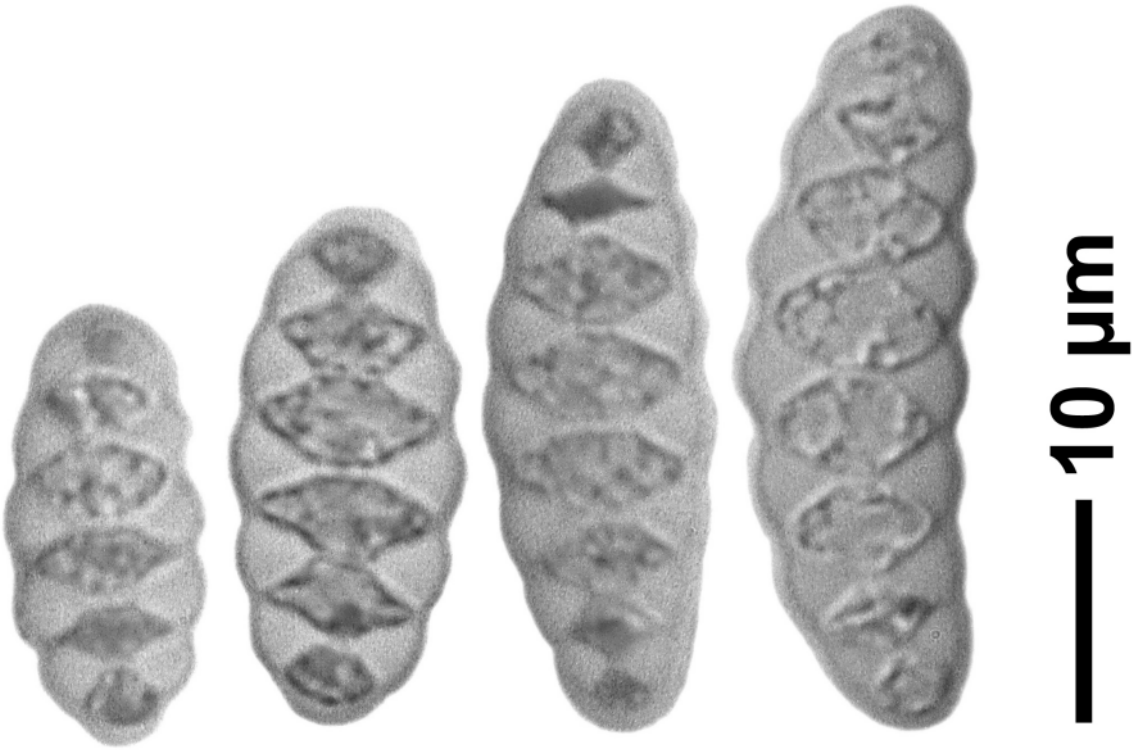



***Letrouitia leprolyta***



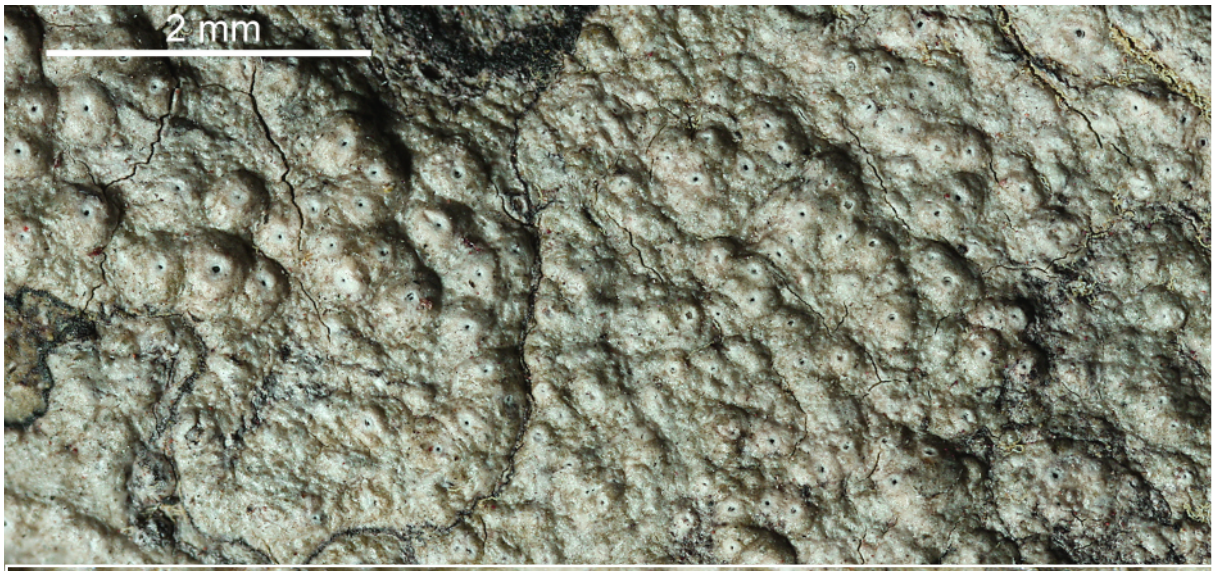



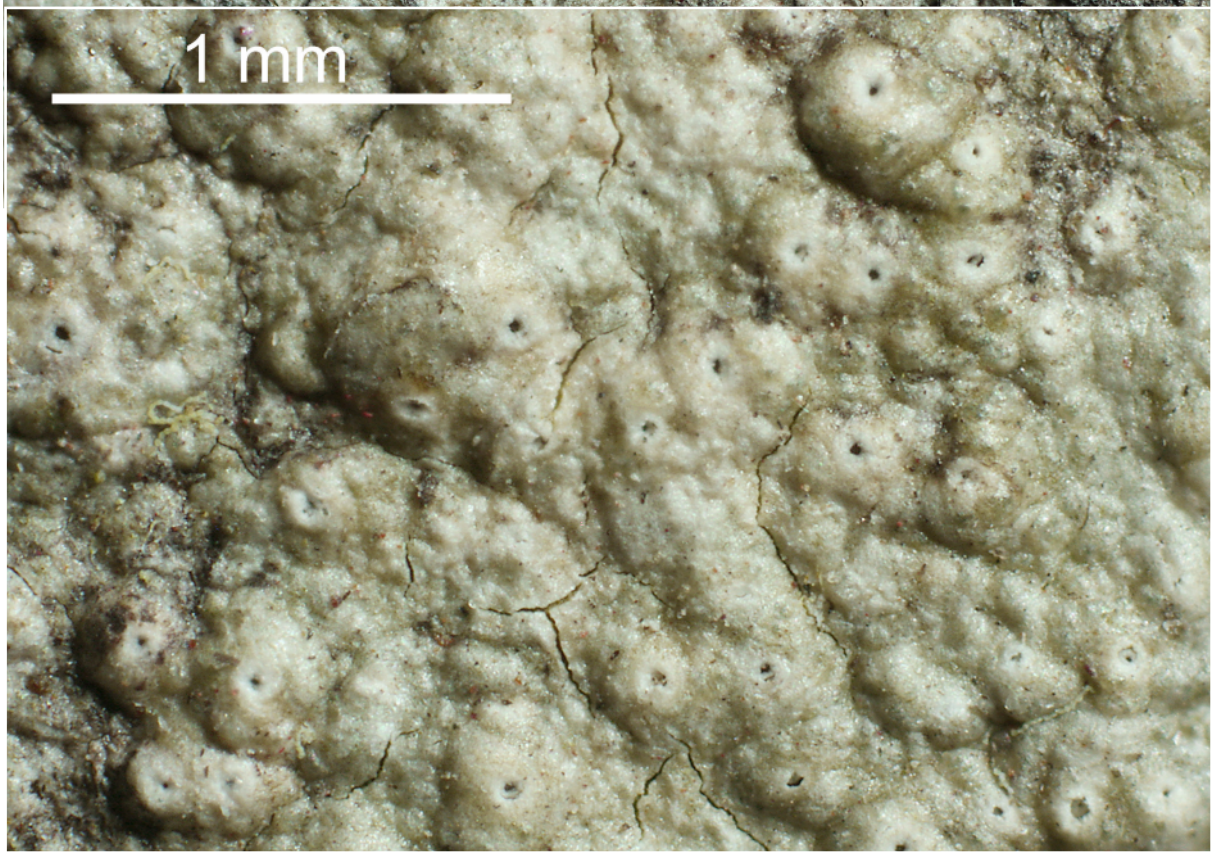

***Letrouitia leprolyta***

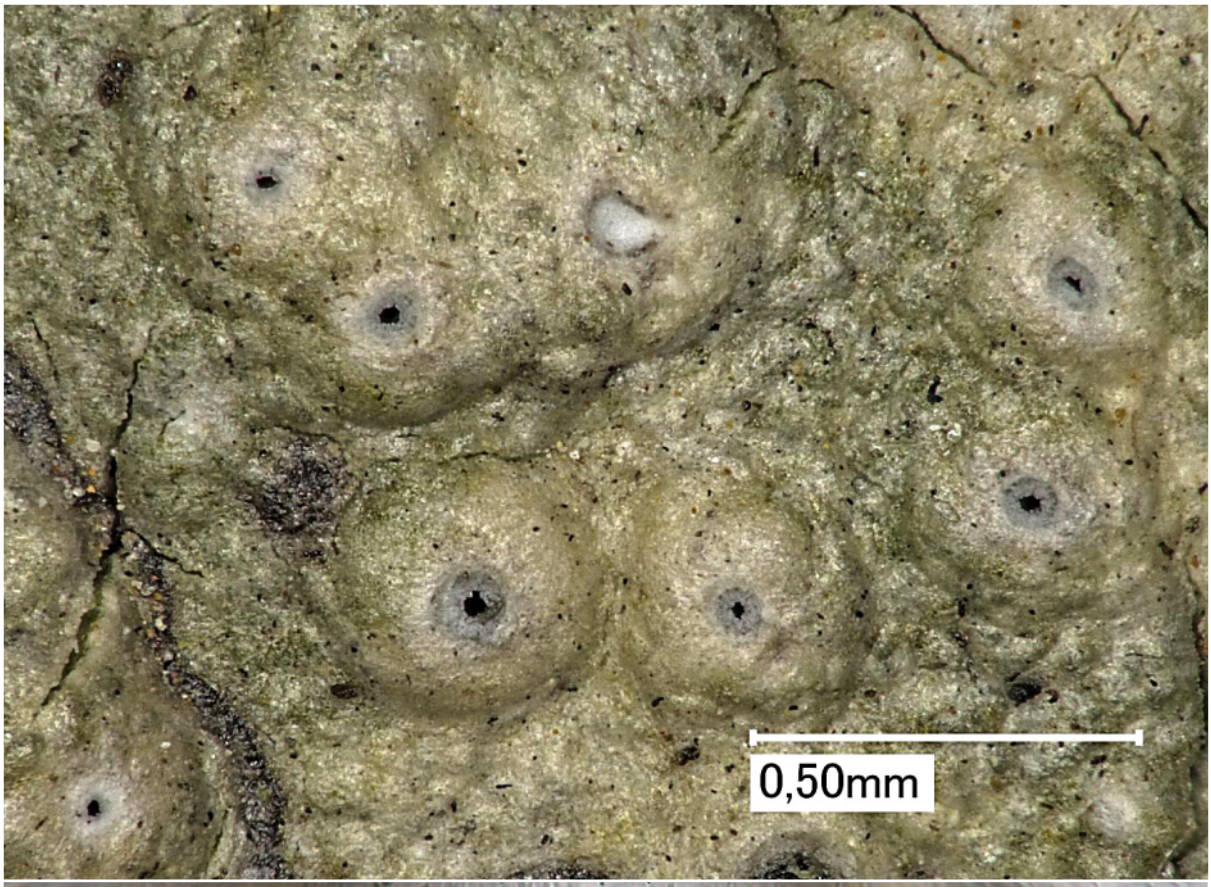
***Leucodecton compunctellum*** (Nyl.) A.Frisch

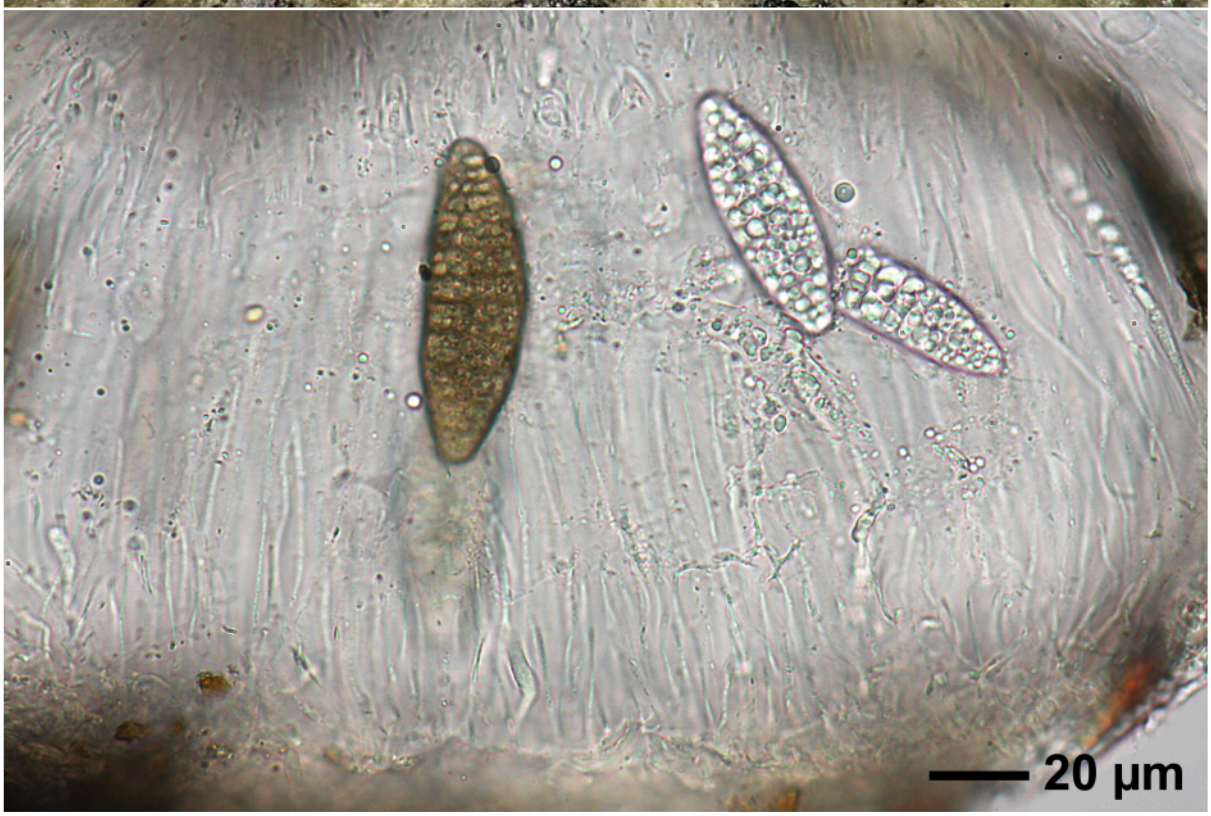
Thallus grey-green, without soralia, glossy. Apothecia immersed, ostiolum 0.03-0.06 mm wide. Excipulum not carbonized. Hymenium not inspersed, without periphyses, all parts J-. Ascospores, J-, muriform, hyaline but becoming brown, 1-2/ascus, ca. 14 transversal septae, each segment with 3-6 longitudinal septae, 44-67 x 14-23 µm. Chemistry: stictic acid (maj), hypostictic acid, constictic acid; medulla K+ yellow, C-, KC+ yellow-orange, P+ orange.

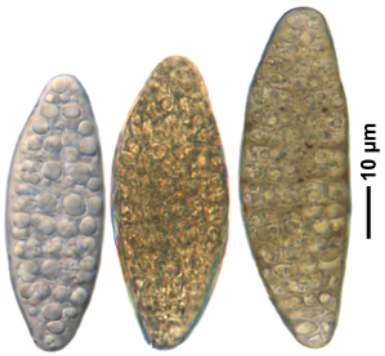
[17565], Thailand, Trat province, Had Sai Dum, Mangroven Wald, 12.17332° N, 102.40616° E, 0 m. Leg. Schumm (IAL 7) 16.01.2012, det. Kalb 06.2012.





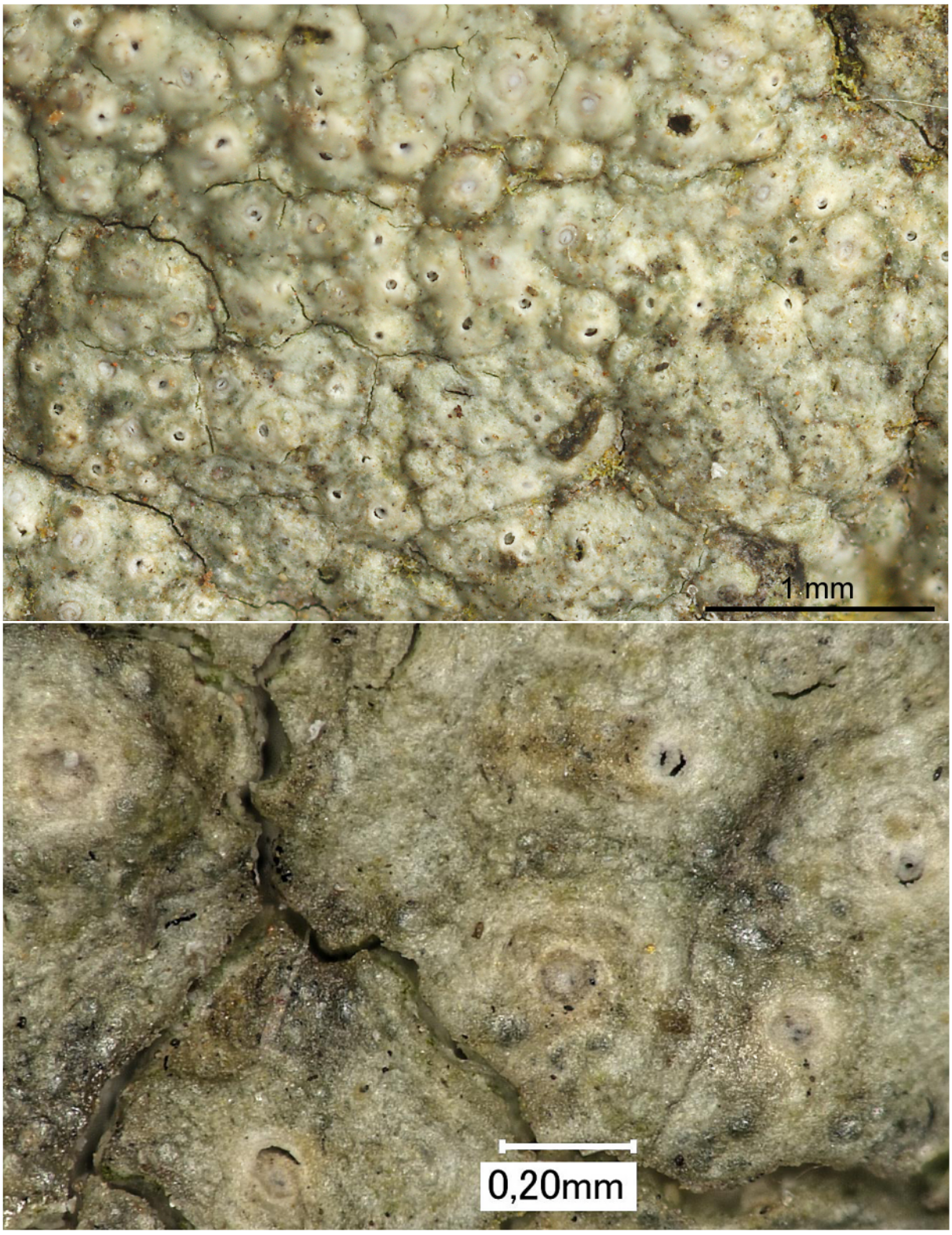



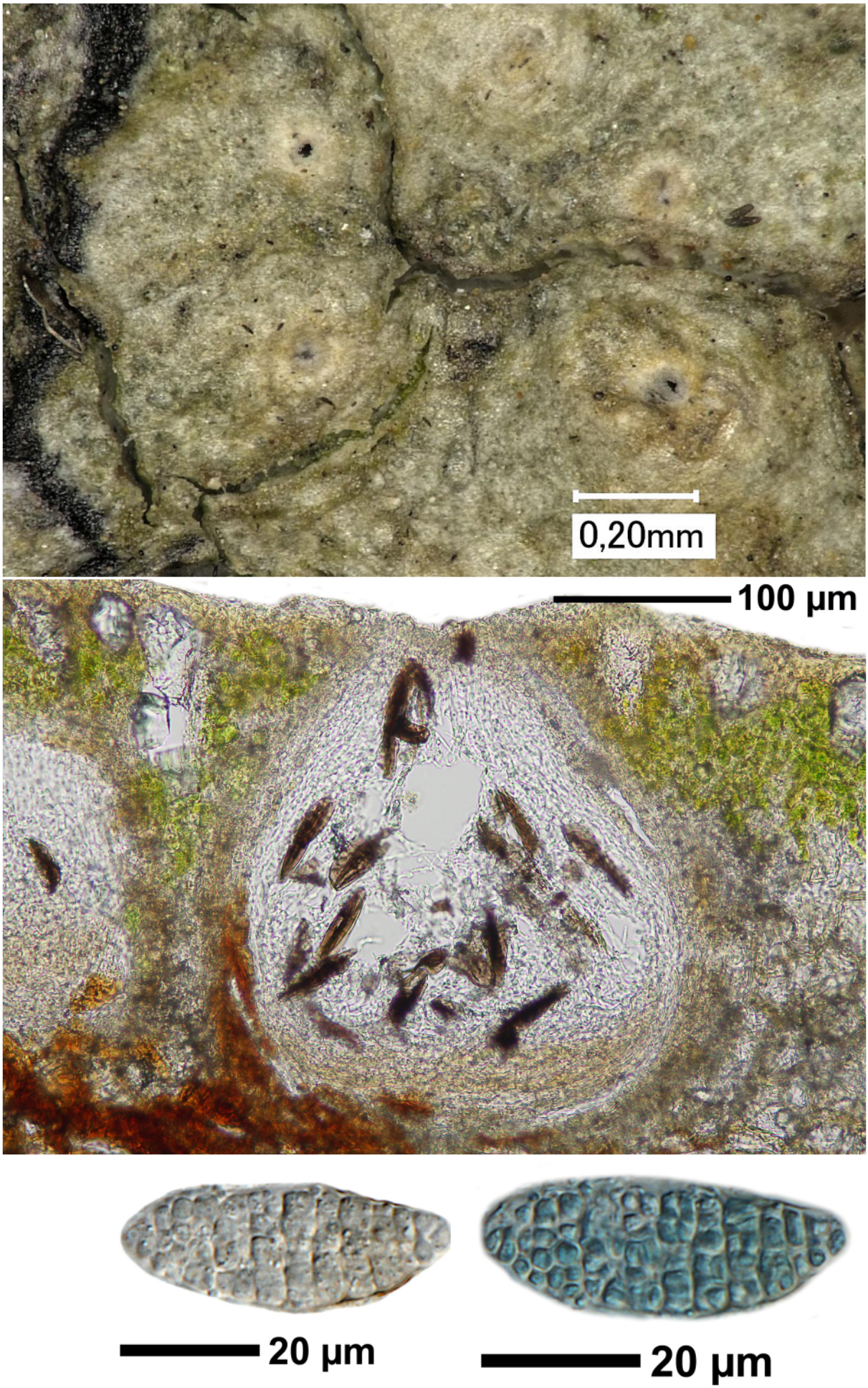




***Leucodecton compunctellum***

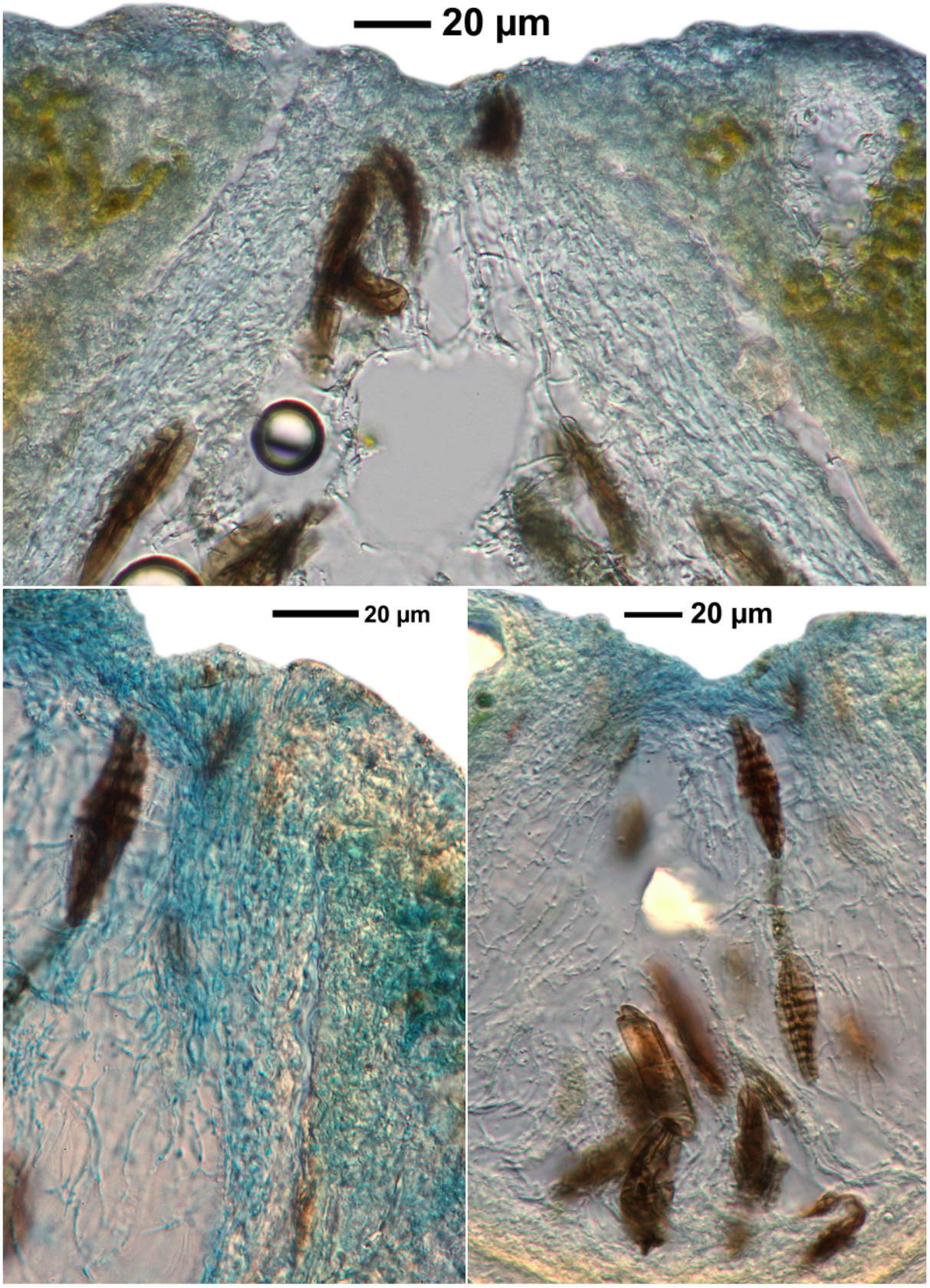
***Leucodecton compunctellum*** (Nyl.) A.Frisch

[17511], Thailand, Trat province, Ban-Dan Kao island, Mangroven Wald, 12.21359° N, 102.55290° E, 5 m. Leg. Schumm (IAL 7) 15.01.2012, det. Kalb 06.2012.






***Leucodecton compunctellum***




***Leucodecton compunctellum***





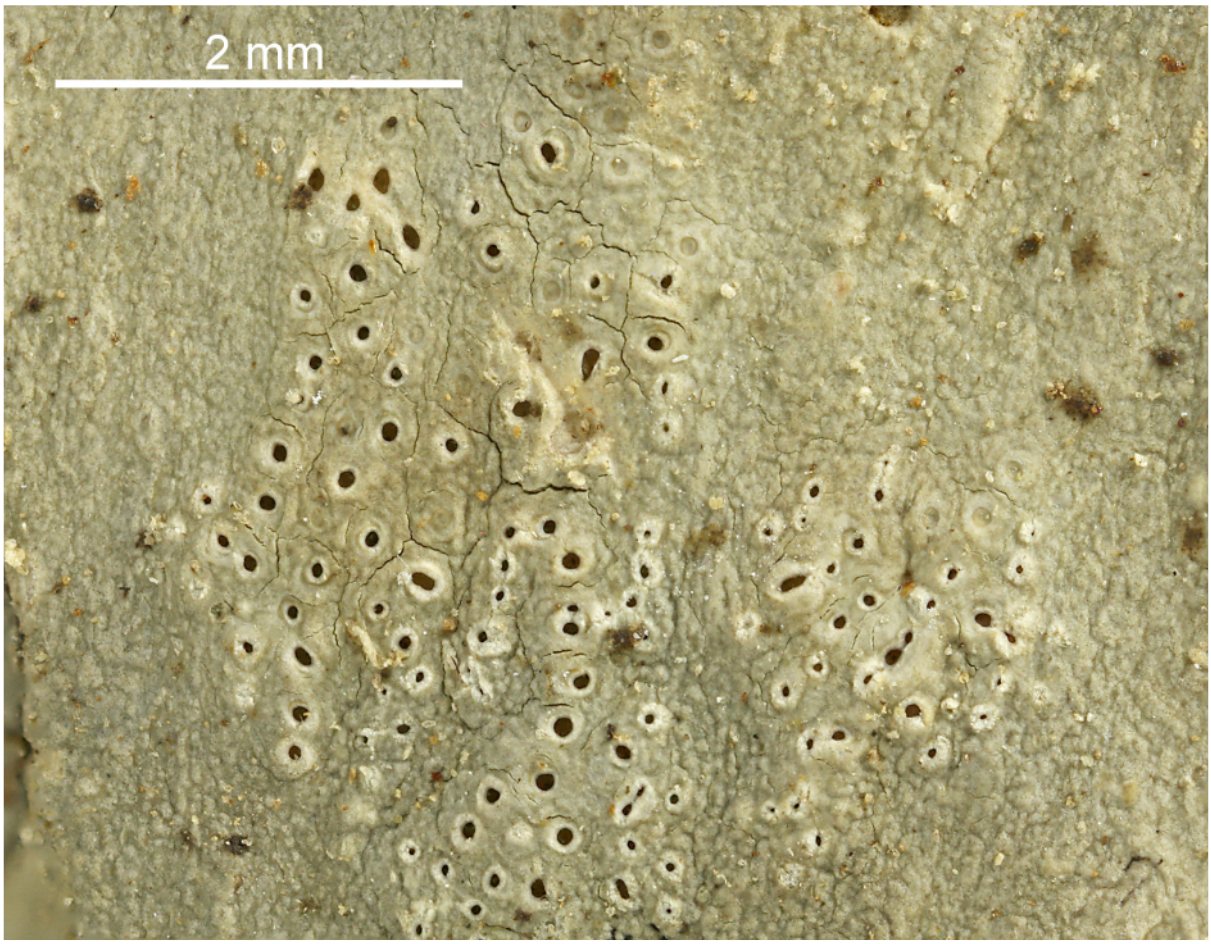


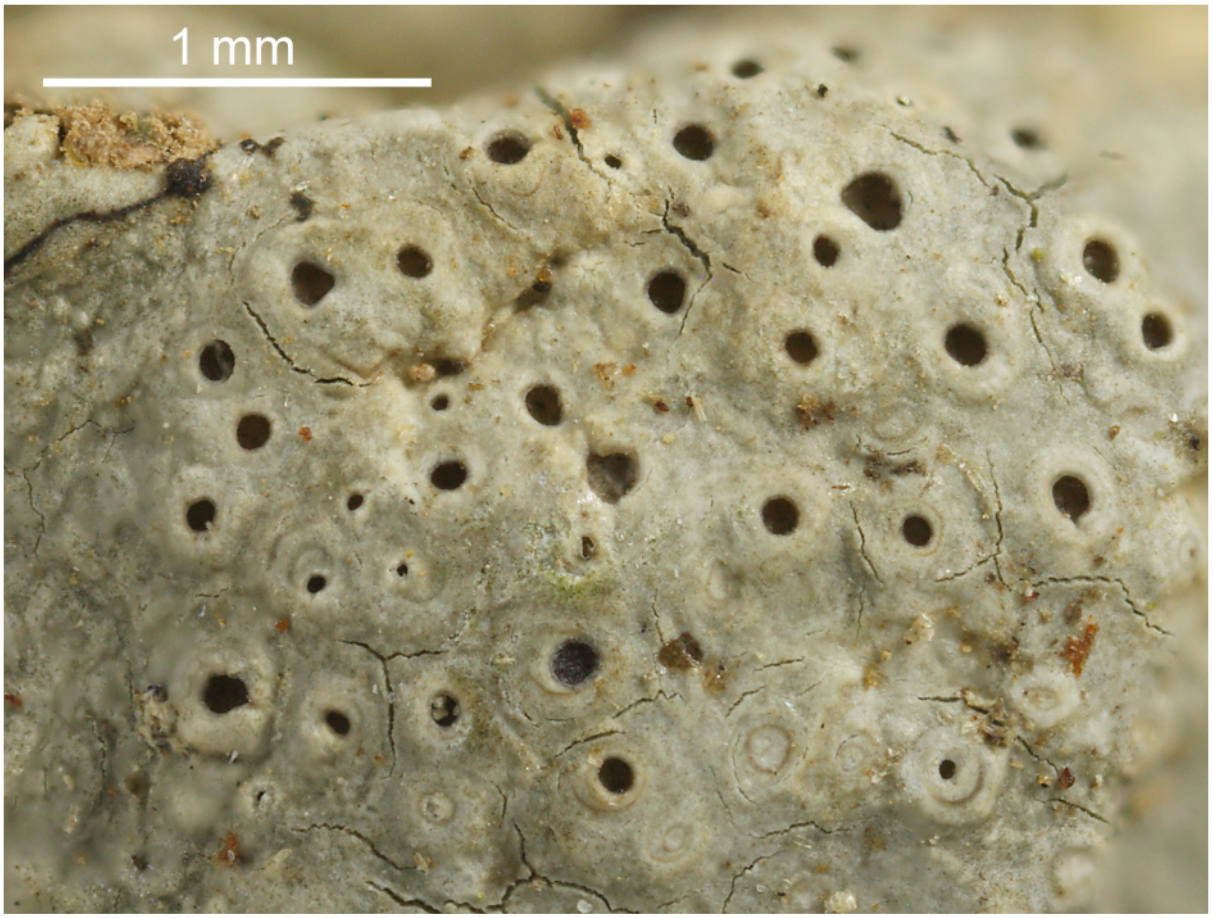
***Leucodecton compunctellum***

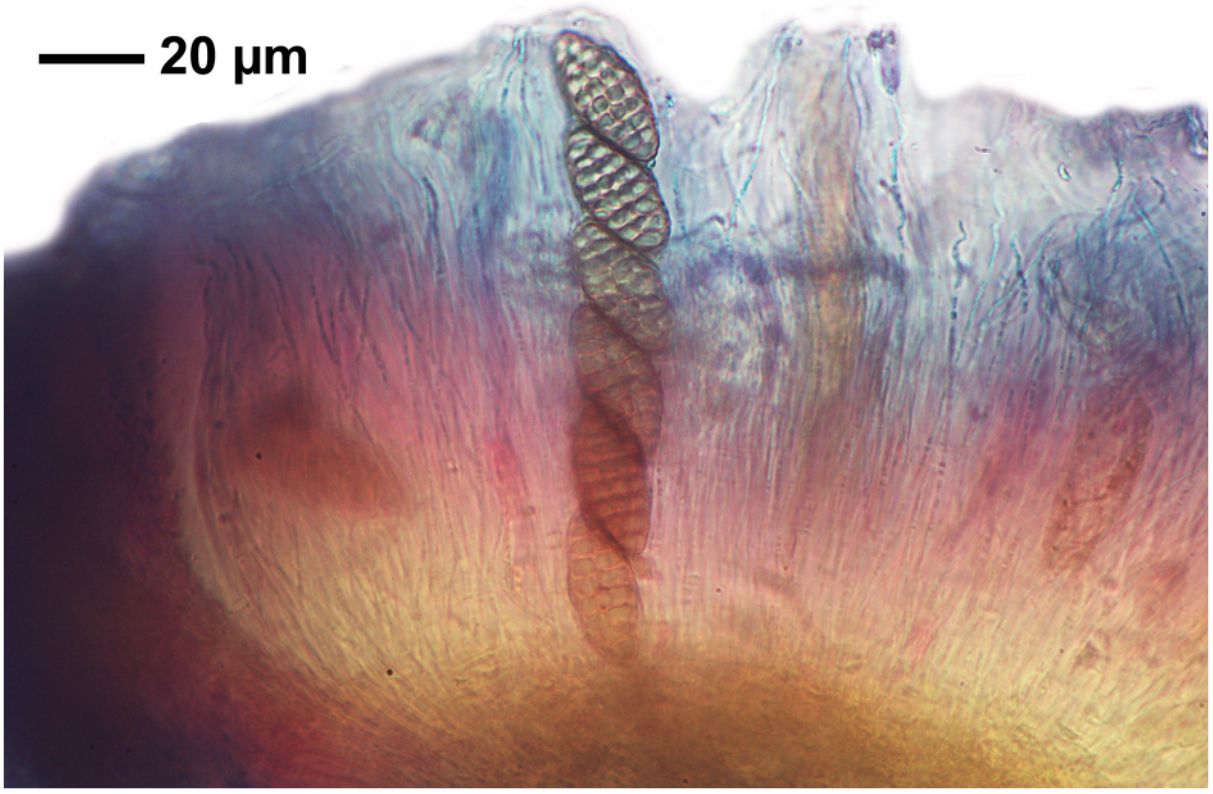
***Leucodecton fissurinum*** (Hale) A.Frisch

Thallus greenish grey, continuous to somewhat fissured. Apothecia immersed. Excipulum not carbonized, without periphyses. Columella absent. Hymenium not inspersed. Ascospores brown, muriform, J-, 6-8/ascus, 29-30 x 12-14 µm. Chemistry: stictic acid (maj), hypostictic acid (min), constictic acid.

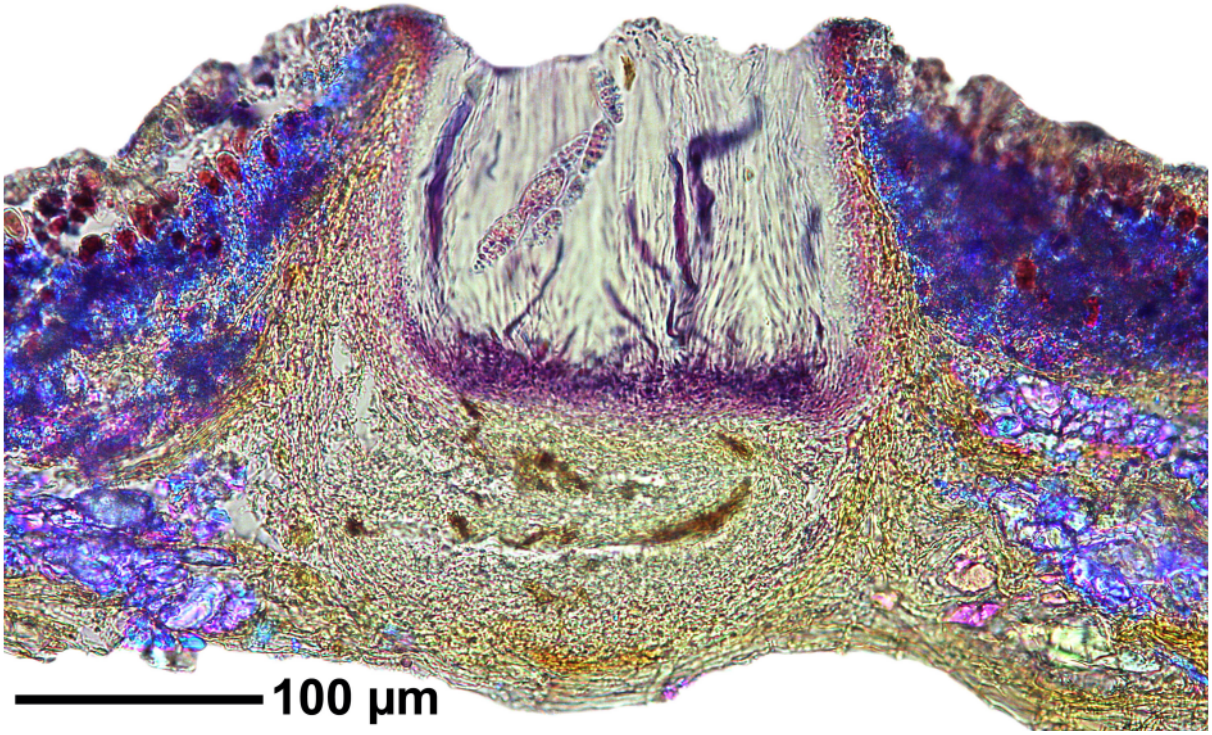
[6487], Philippinen, Mindanao, Prov. Misamis Oriental, südwestlich Gingoog City, Barangay Lunutan, 08°42.510'N, 125°01.241' E, 1120 m und am Weg auf den Mt. Lumot (Via Haruhay Trial) bis zum Zwischencamp im trop. Bergregenwald, 08°40.713' N, 125°01.649' E, 1680 m. Leg. Schumm 24.08.1999, conf. K.Kalb 2012.

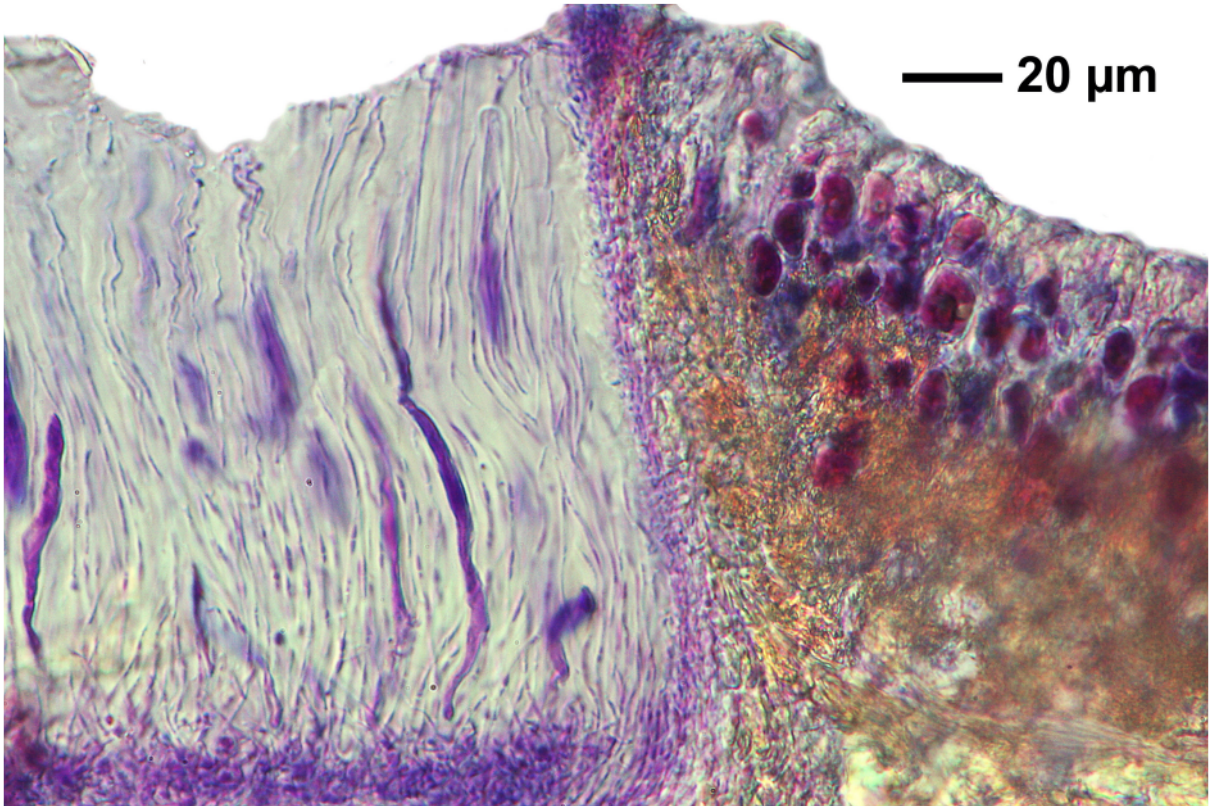




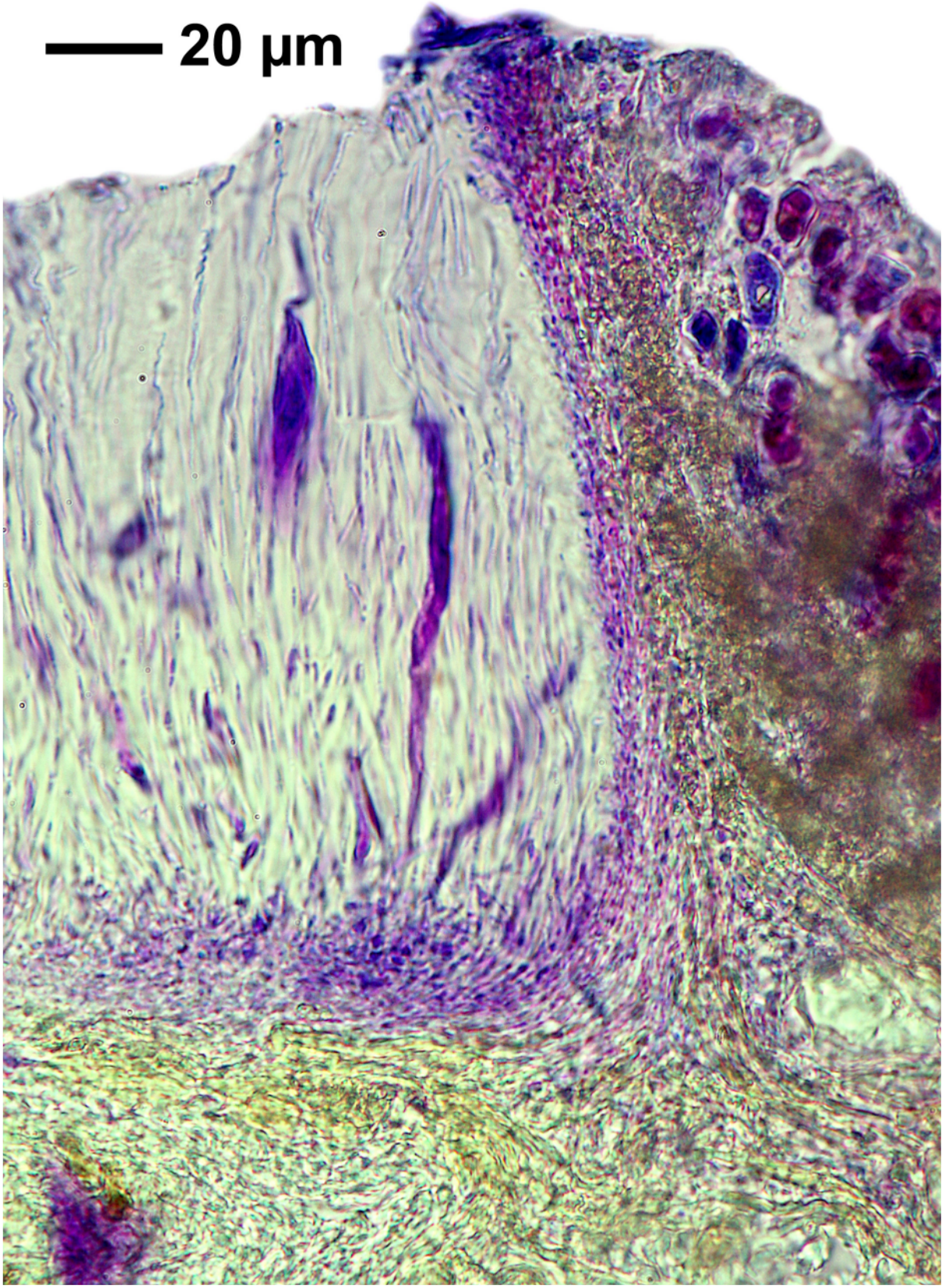




***Leucodecton fissurinum***

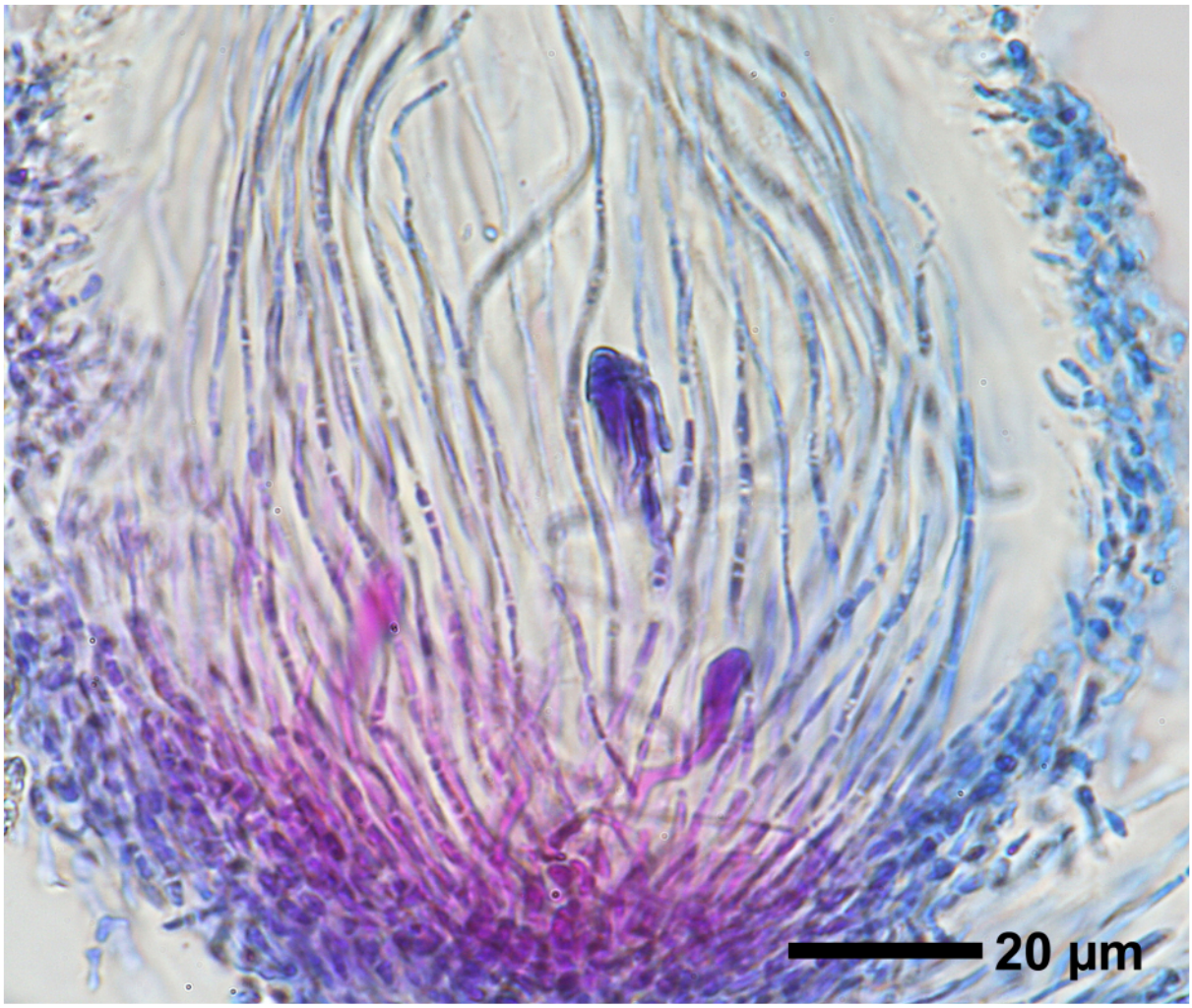



***Leucodecton fissurinum***

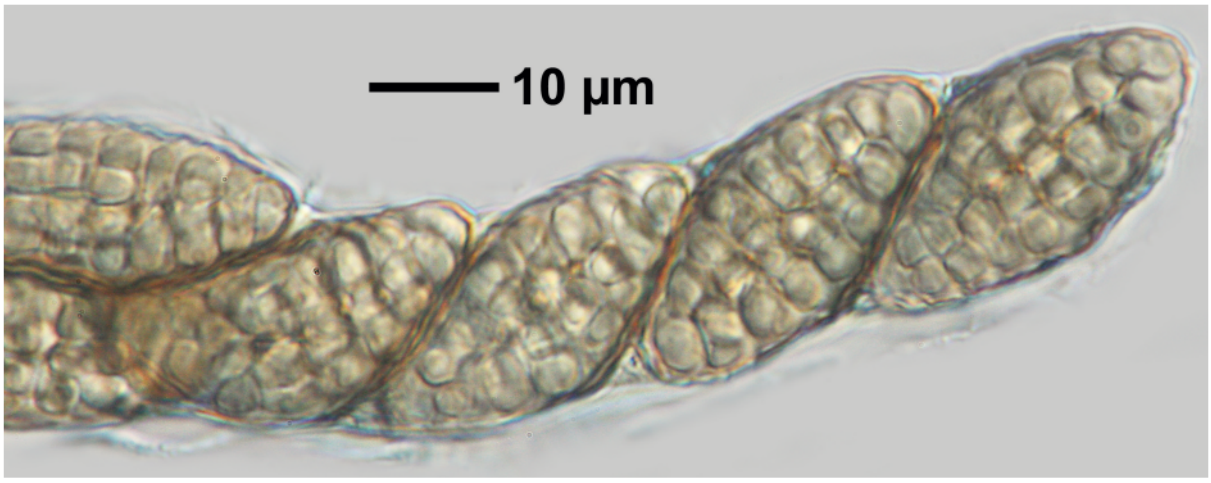



***Leucodecton fissurinum***



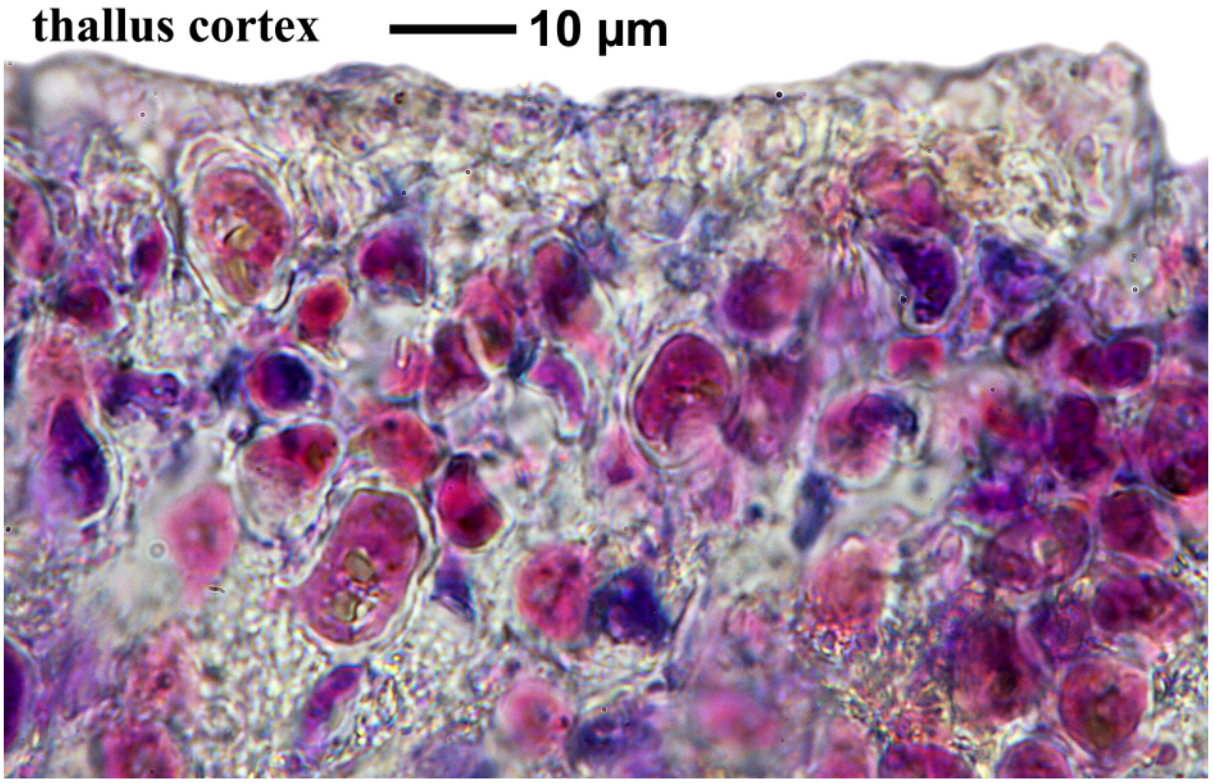







***Leucodecton fissurinum***



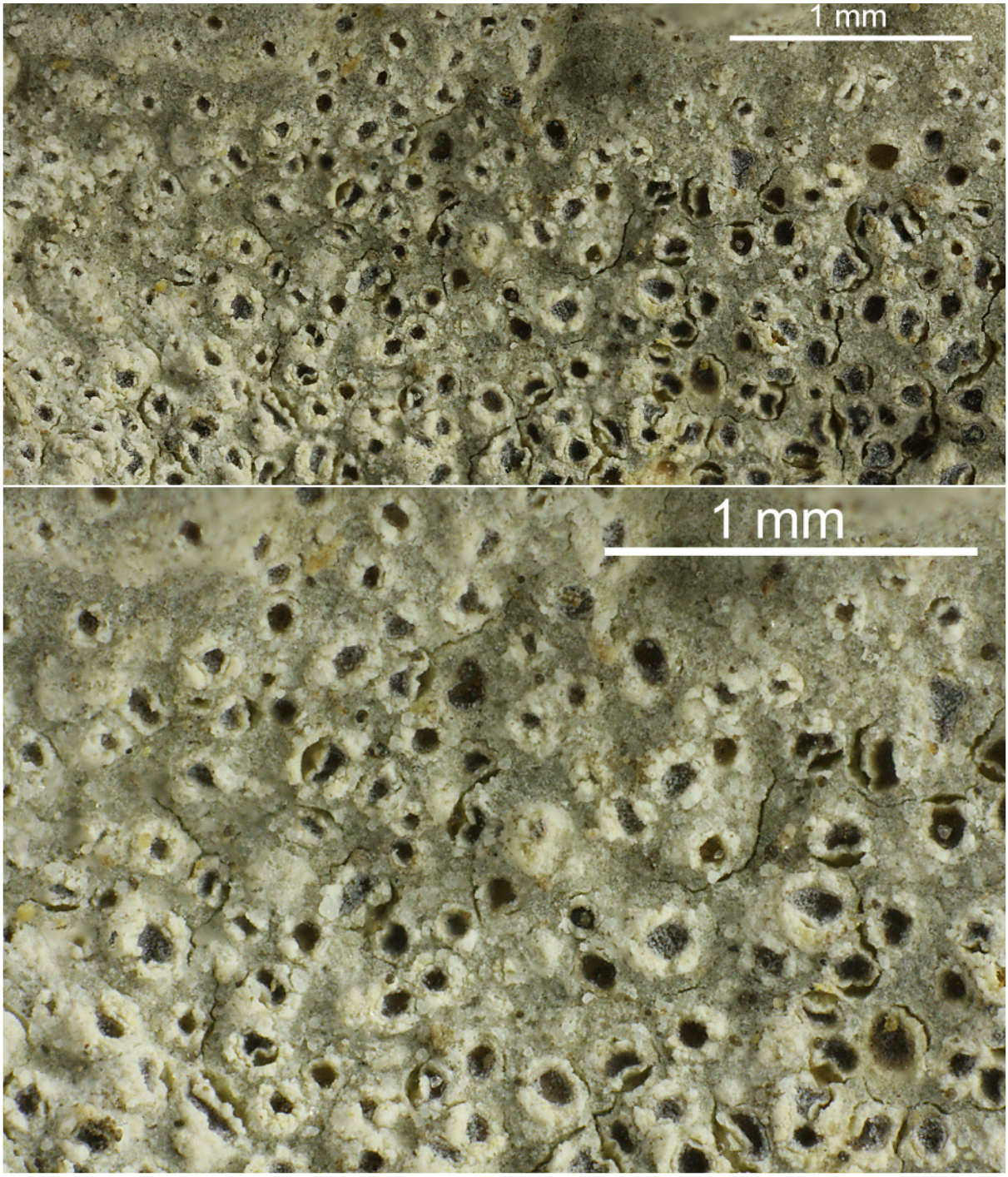



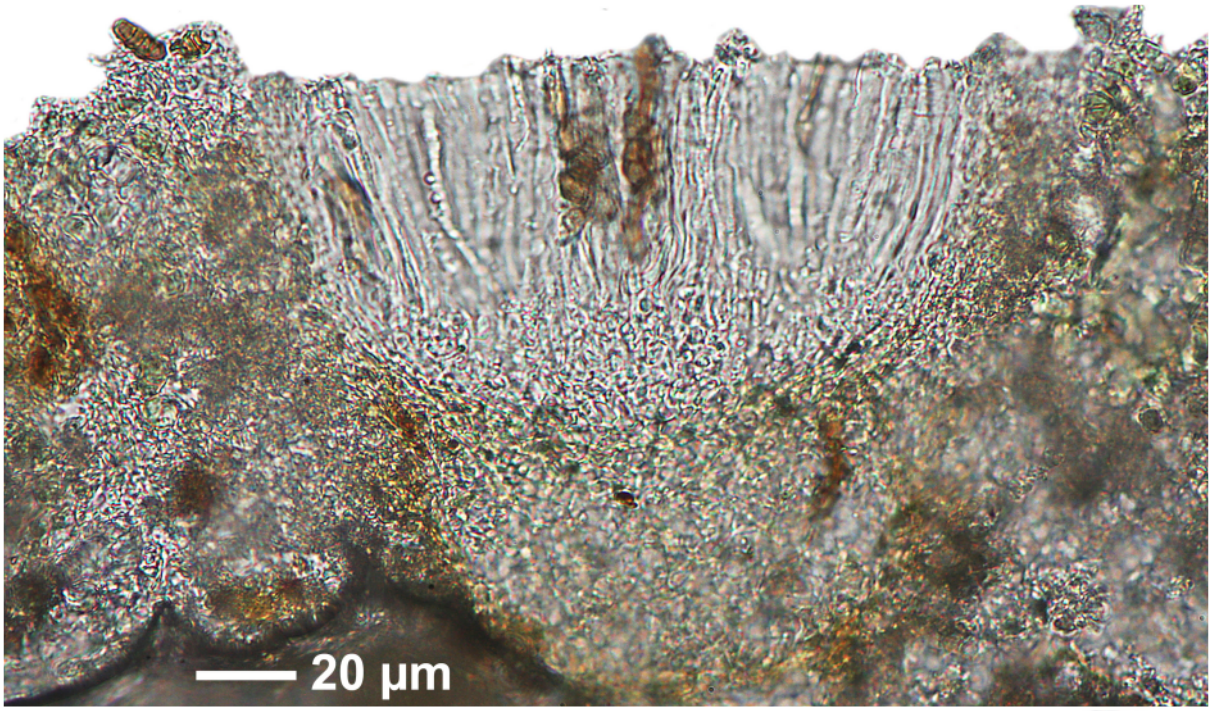

***Leucodecton fissurinum***

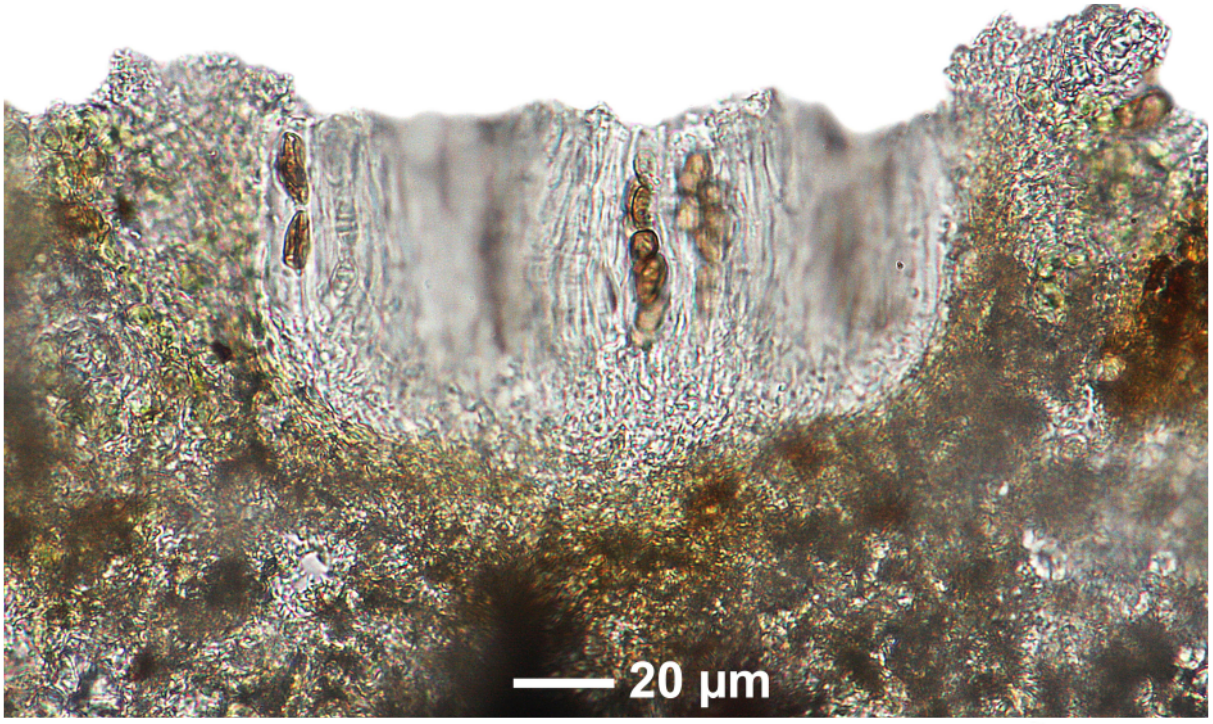
***Leucodecton glaucescens*** (Nyl.) A.Frisch
[= ***Myriotrema glaucescens*** (Nyl.) Hale]
[= ***Thelotrema glaucescens*** Nyl.]

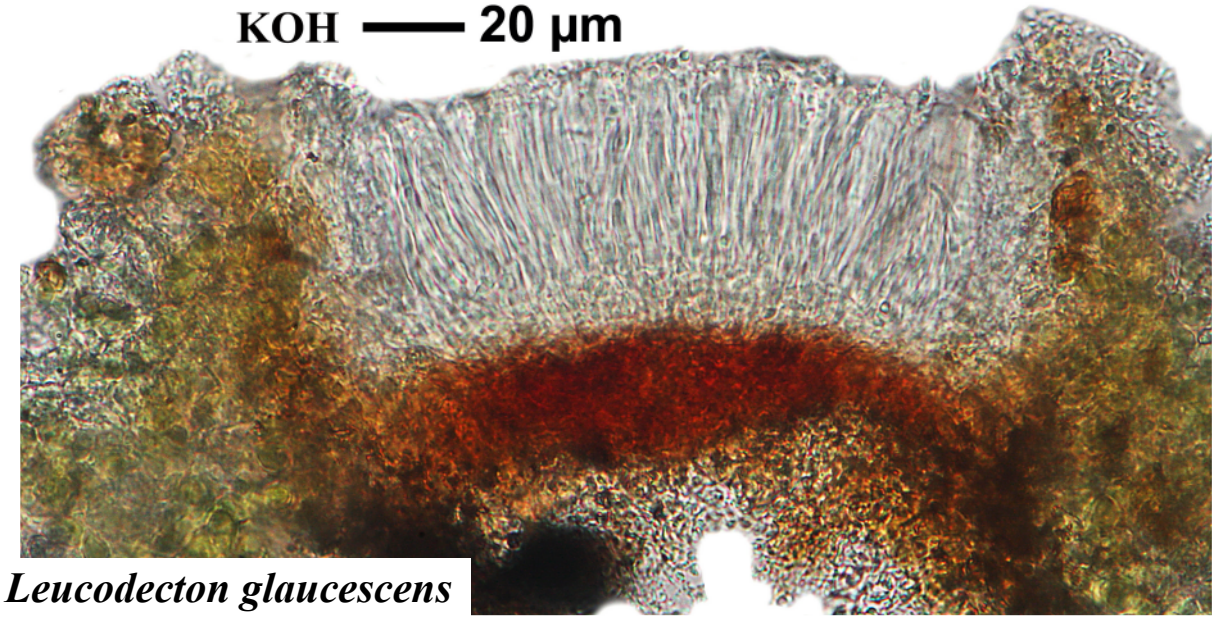
Hypothecium composed of irregularly interwoven hyphae. Ascosporen brown, transverse 3-4-septate with one longitudinal septum pro segment, 9-12 x 5-6 µm. Chemistry: stictic, constictic, cryptostictic, hypostictic acids; medulla (especially under the apothecia) K+ red (no crystals), P+ red.

[4848], Kambodscha, Provinz Siem Reap, 11,5 km ONO Siem Reap, Preah Khan, auf Rinde, 13°24'18" n.B. 101°33'57" ö.L., ca. 100 m. Leg. U. Schwarz 16.02.1998 (Nr. 3055), det. Schumm 1998, test. H.Sipman

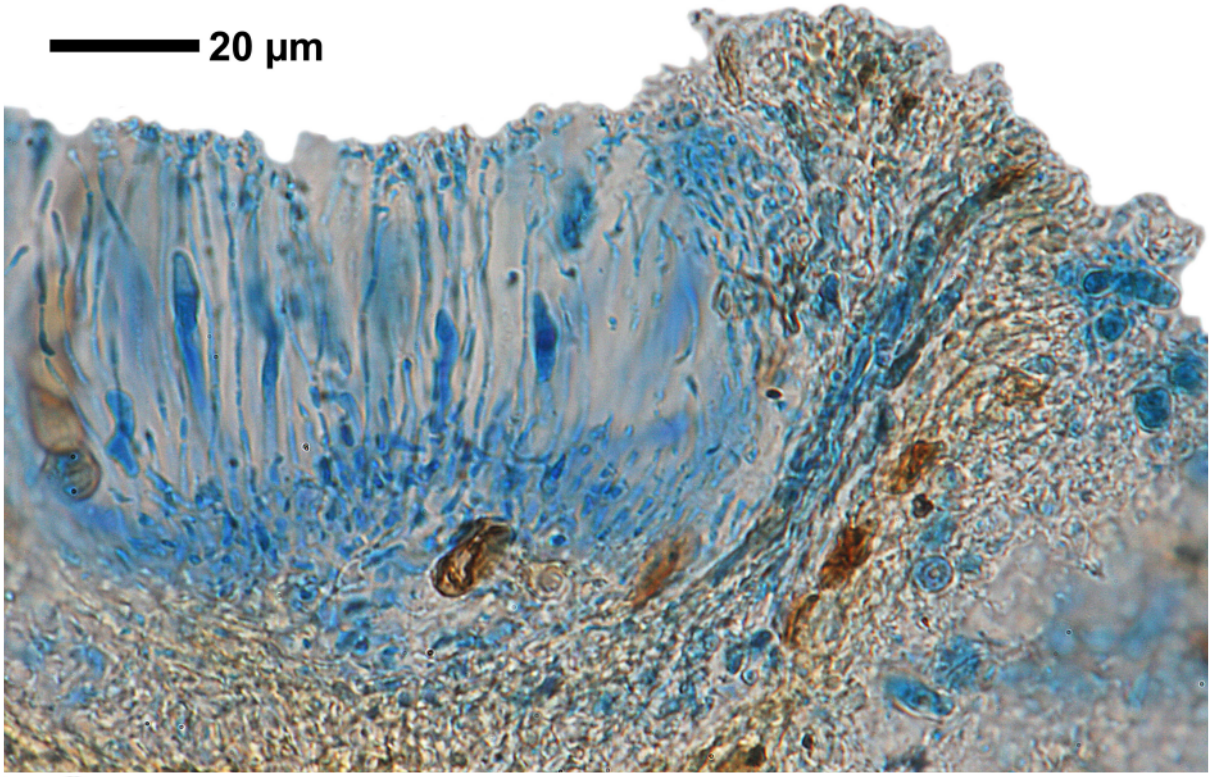


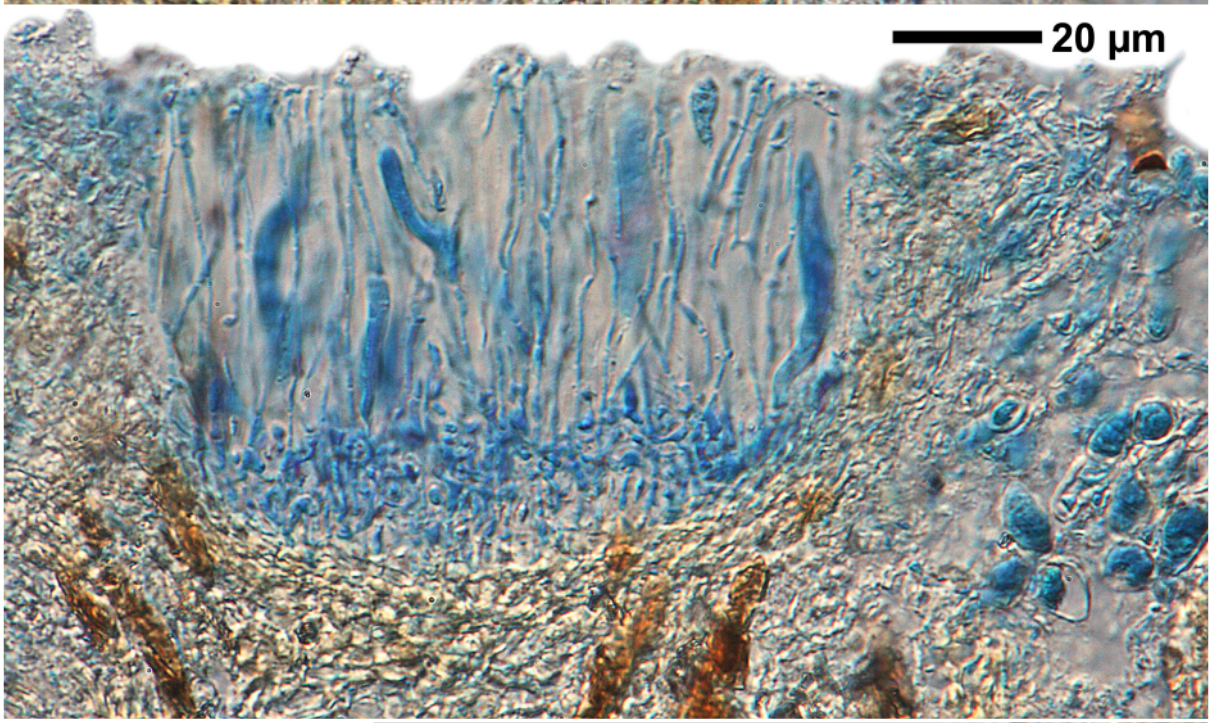


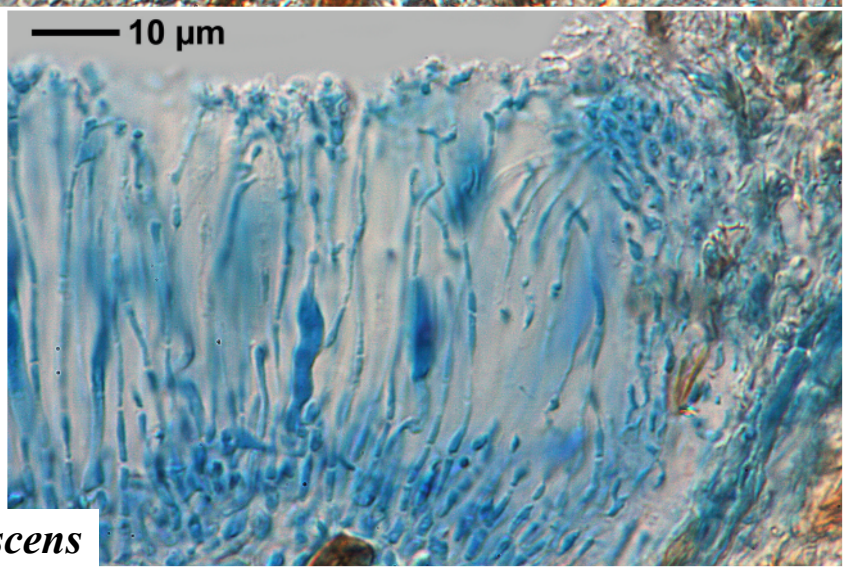



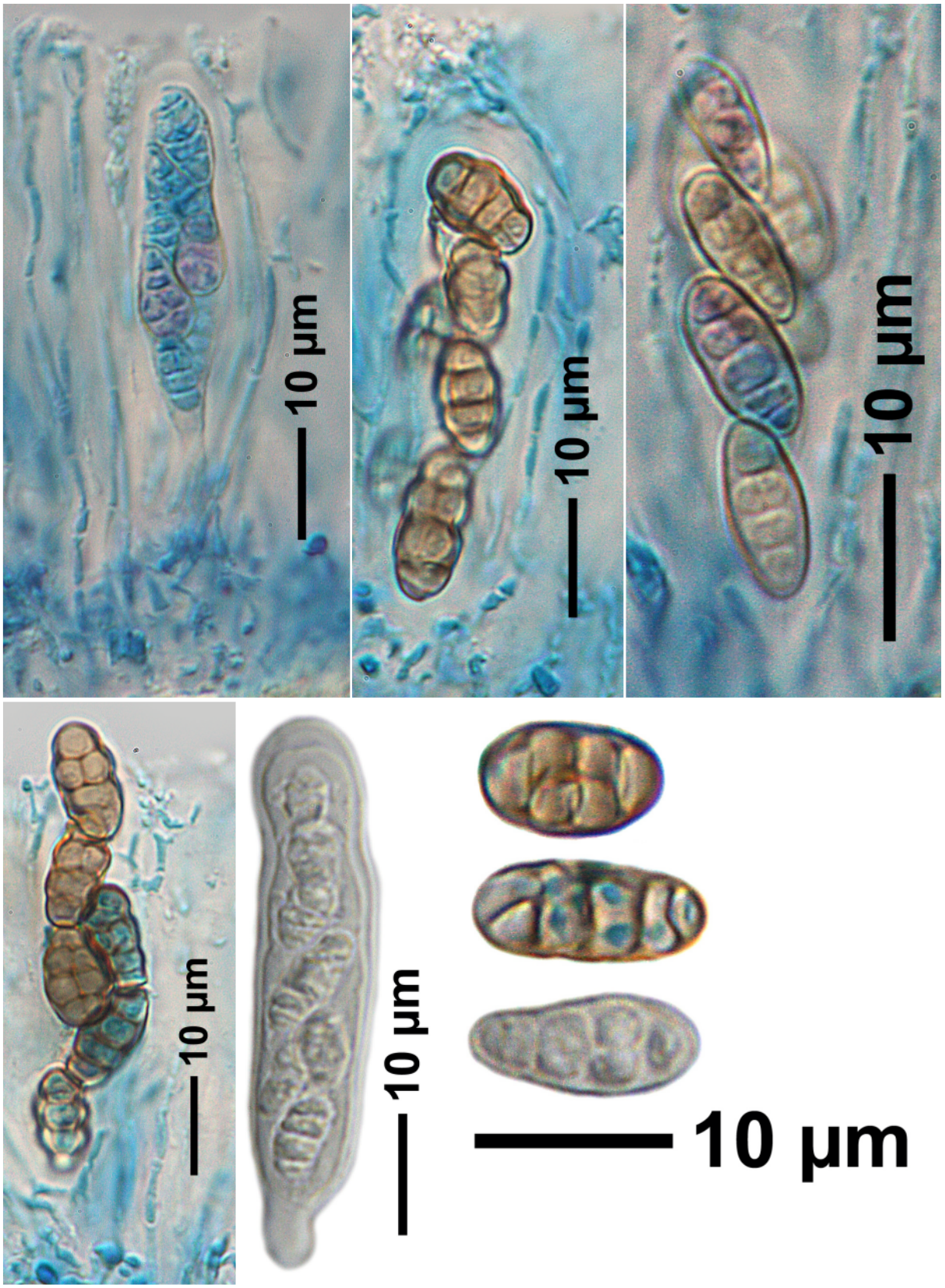

***Leucodecton glaucescens***




***Leucodecton glaucescens***

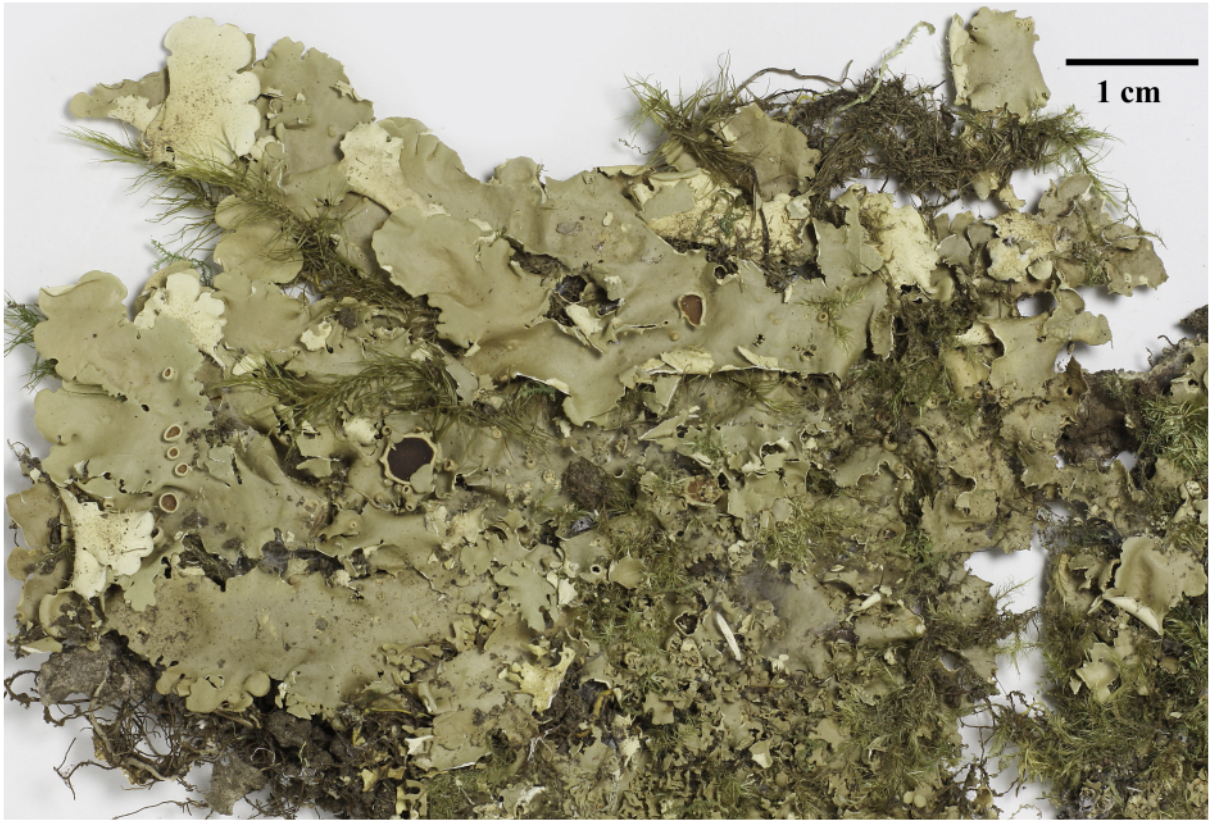


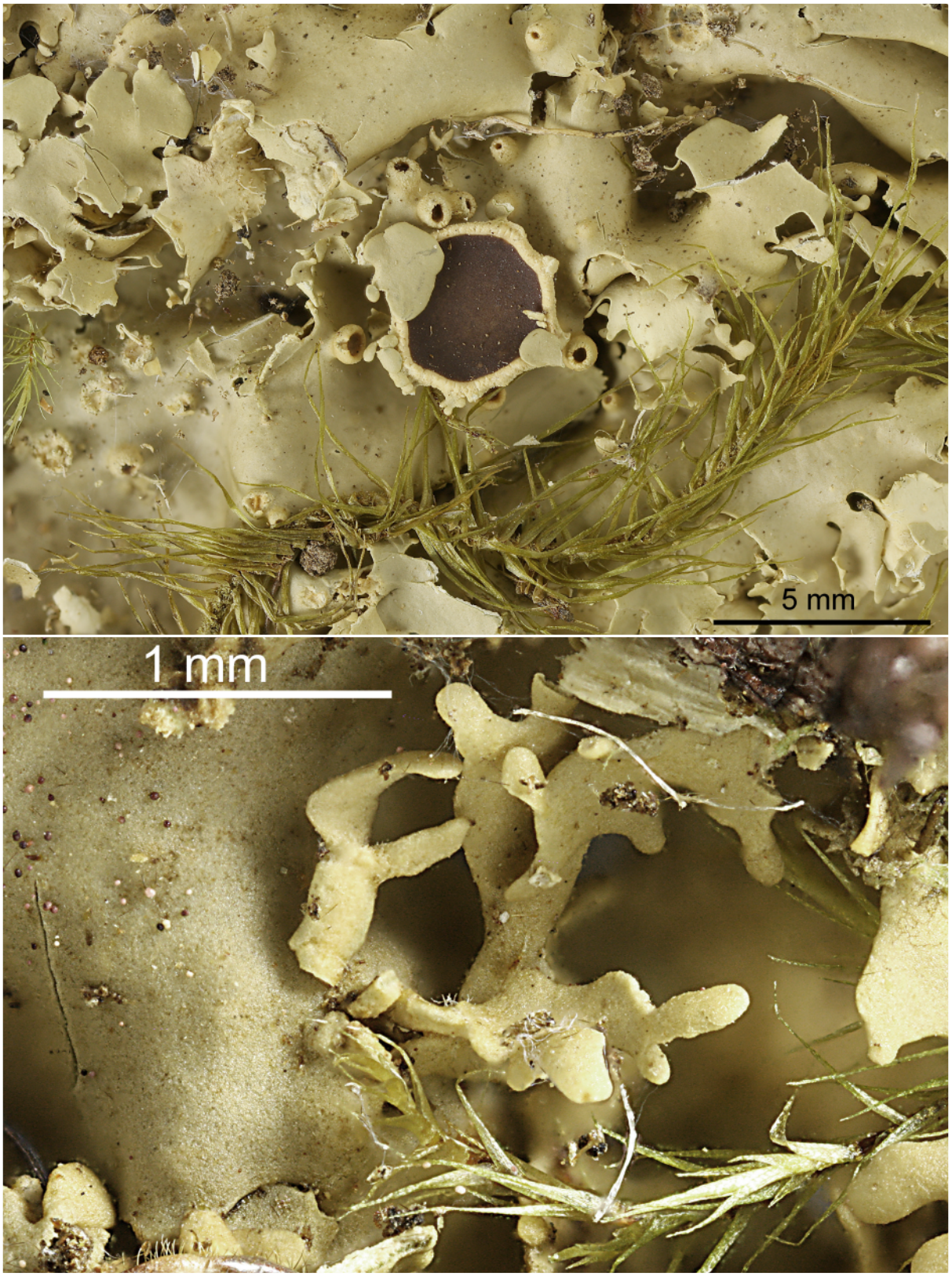

***Leucodecton glaucescens***

***Lobaria crassior*** Vain.

Thallus non reticulately ridged. Soredia absent. Margins or cracks with small lobules. Ventral surface pale brown, nitidous or tomentose, with up to 3 mm long simple rhizines. Apothecia rare. Spores long-fusiform to acicular, 3-septate, 65-80 x 6-7 µm. Photobiont: green algae.
Chemistry: Thallus K-, medulla KC+ rose, gyrophoric (major), 4-O-methylgyrophric acid (= congyrophoric acid). Lit. Yoshimura 1971, Journ. Hattori Bot. Lab. 34)

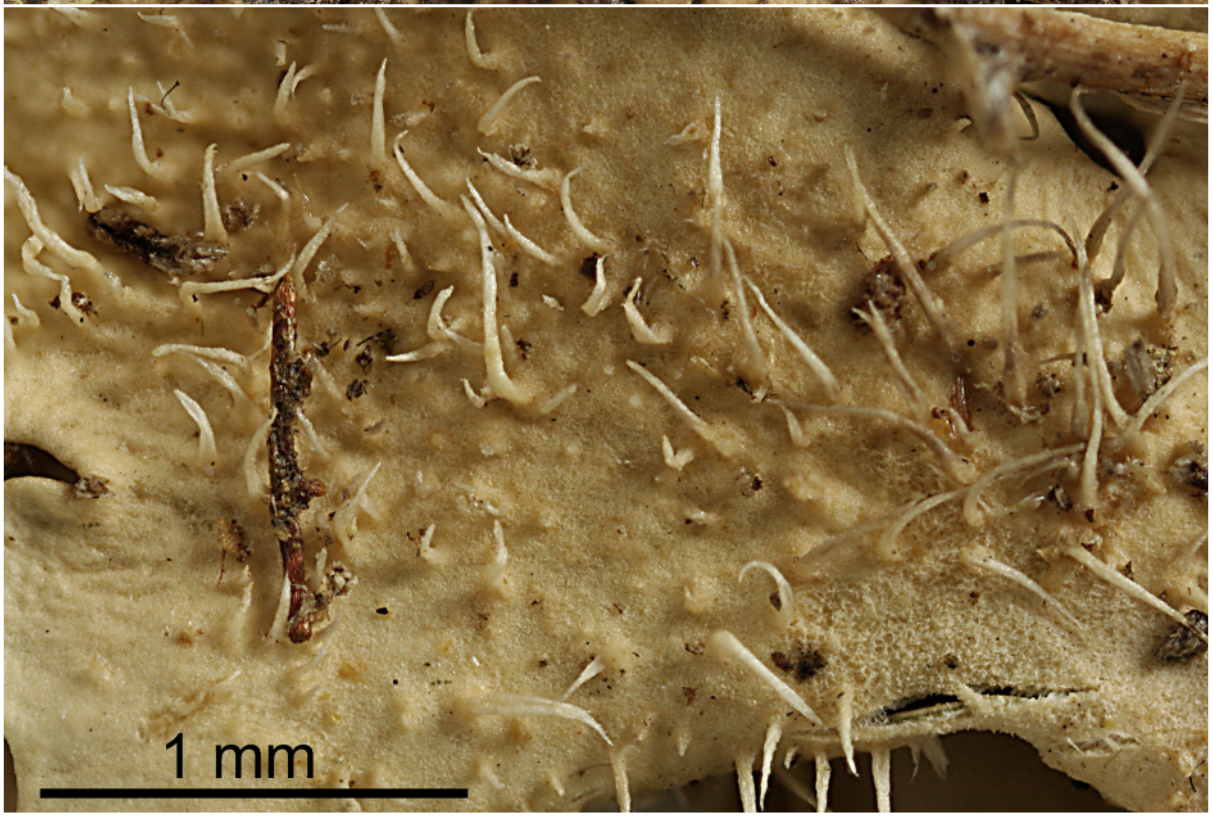
[8208], Philippinen, Panay, Provinz Antique, Muncipality Culasi, Mt. Madja-as, Wald am Trail vom Barangay Flores und Batang-Batang-Einschnitt; 11°21.529' N, 122°08.488' E, ca. 1370 m, auf Rinde. Leg. Uwe Schwarz 29.01.2001, det. Schumm 2001, test. J.A. Elix 2003






***Lobaria crassior***



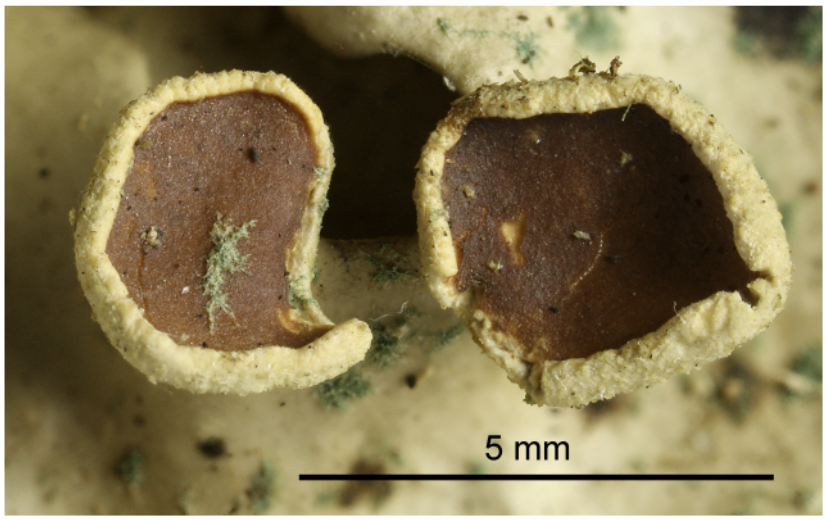

***Lobaria crassior***

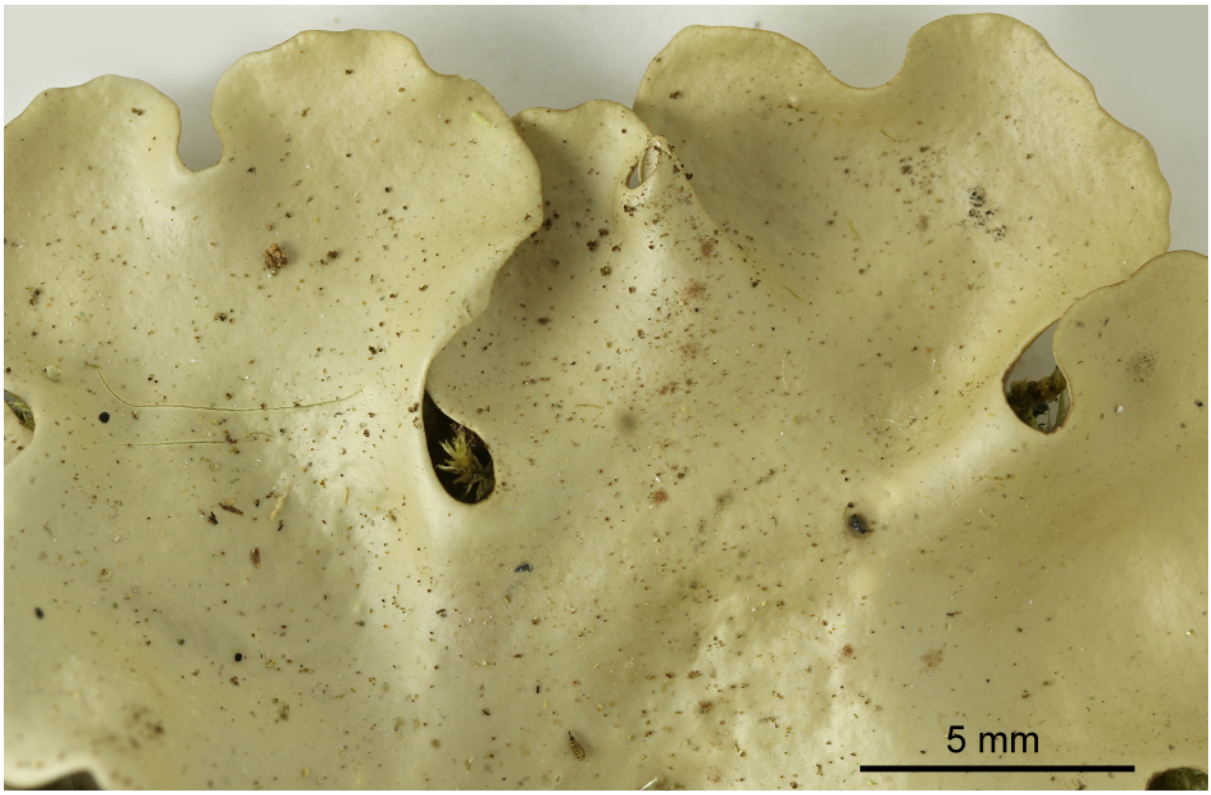
***Lobaria discolor*** (Bory in Del.) Hue

Thallus without lobules, isidia or soredia, upper surface not reticulately ridged, K+ yellow. Lower surface pale almost etomentose or with diffuse and not vein-like tomentose pattern. Algae grass-green. Apothecia laminal, constricted at base. Ascospores pale yellowish, 3-septate, fusiforme, c. 35-40 x 9 µm. Chemistry: Thallus K+ yellow, medulla KC+ rose, gyrophoric acid.

[7822], Philippinen, Leyte, Prov. Leyte, Lake Kasudsuran (11°01.539' N, 124°44.931' E, 740 m) bei Barangay Liberty (Ormoc-City). Leg. Schumm 23.08.2000, det. Schumm 2001.









***Lobaria discolor***

***Lobaria endochroma*** Sipman

Thallus corticolous, up to 12 cm wide. Lobes 2-5 cm long, 1-1.5 cm wide. Upper surface grey to brownish, plane. Soredia and isidia absent. Lower surface plane, margin 0.5-2 cm pale brown, black to the centre, with black-brown, dense tomentum. Algae grass-green, 5-6 µm wide. Apothecia constricted at the base, up to 4 mm wide. Disc brown, concave. Cephalodia with cyanobacteria present. Apothecium-margin rough, not crenulated, without lobules. Excipulum outside warty-areolate. Epithecium yellow, 10 µm, hymenium 130-150 µm, subhymenium 35 µm. Ascospores fusiform, hyaline, 1-3 septate, 30-35 x 10-12 µm. Chemistry: Thallus K-, lower part of the medulla brownish K+ brown-red to violet; pigmentosin B (maj), pigmentosin C (min), pigmentosin D (min), gyrophoric acid absent (TLC Elix 2003). Lit. Sipman (2004)

[7939], Philippinen, Leyte, Prov. Leyte, Lake Kasudsuran (11°01.539' N, 124°44.931' E, 740 m) bei Barangay Liberty (Ormoc-City). Leg. 23.08.2000, det. Schumm.

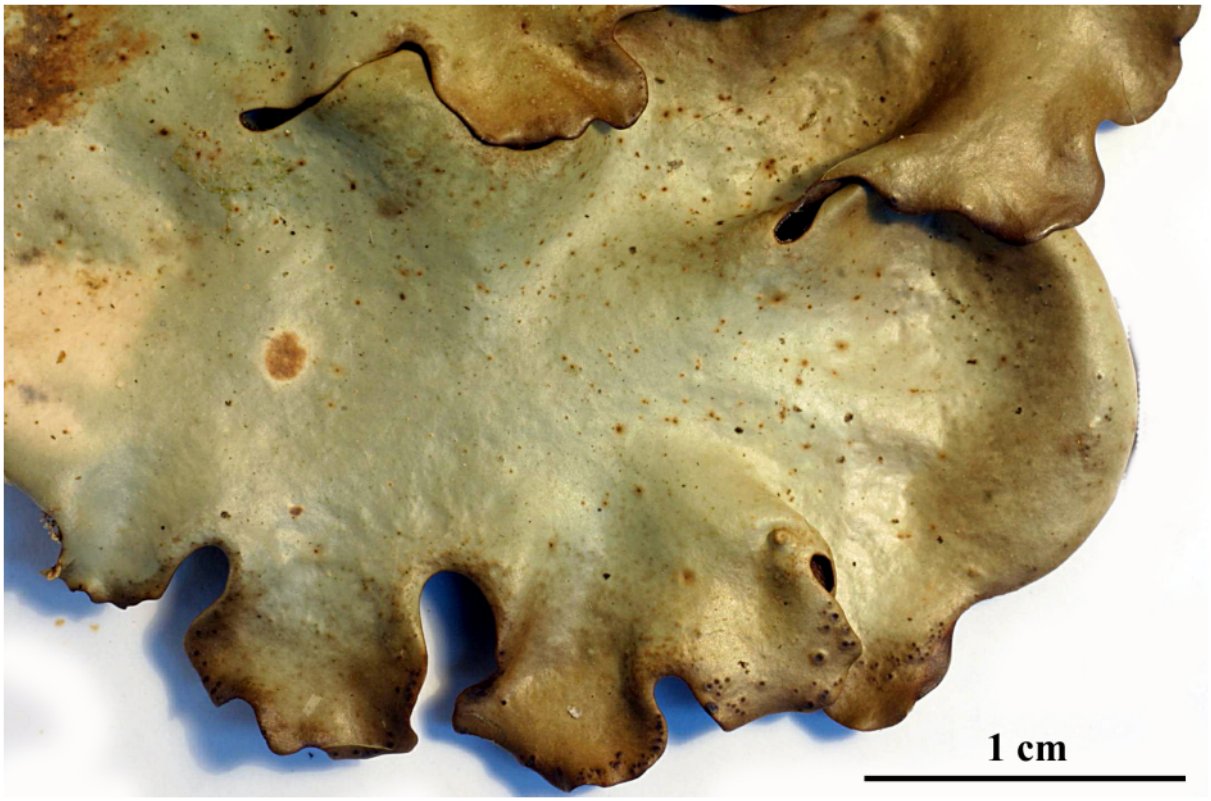


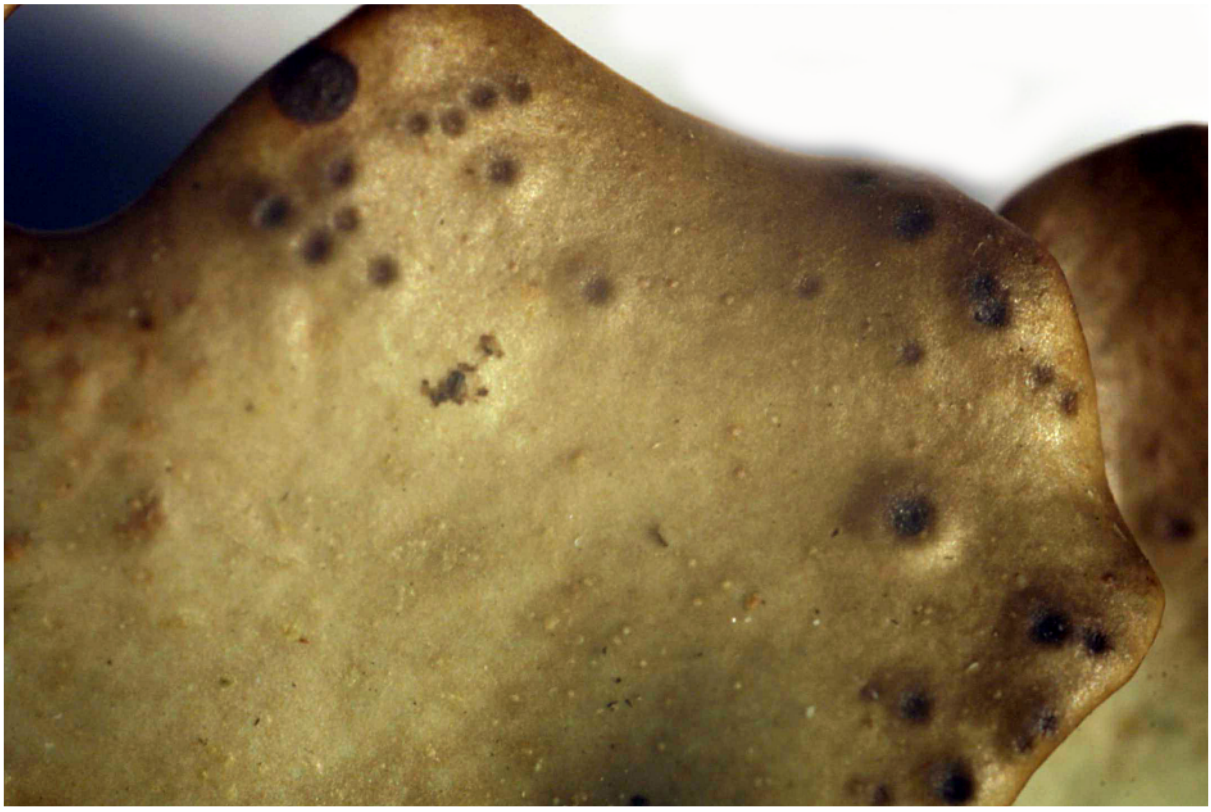






***Lobaria endochroma***

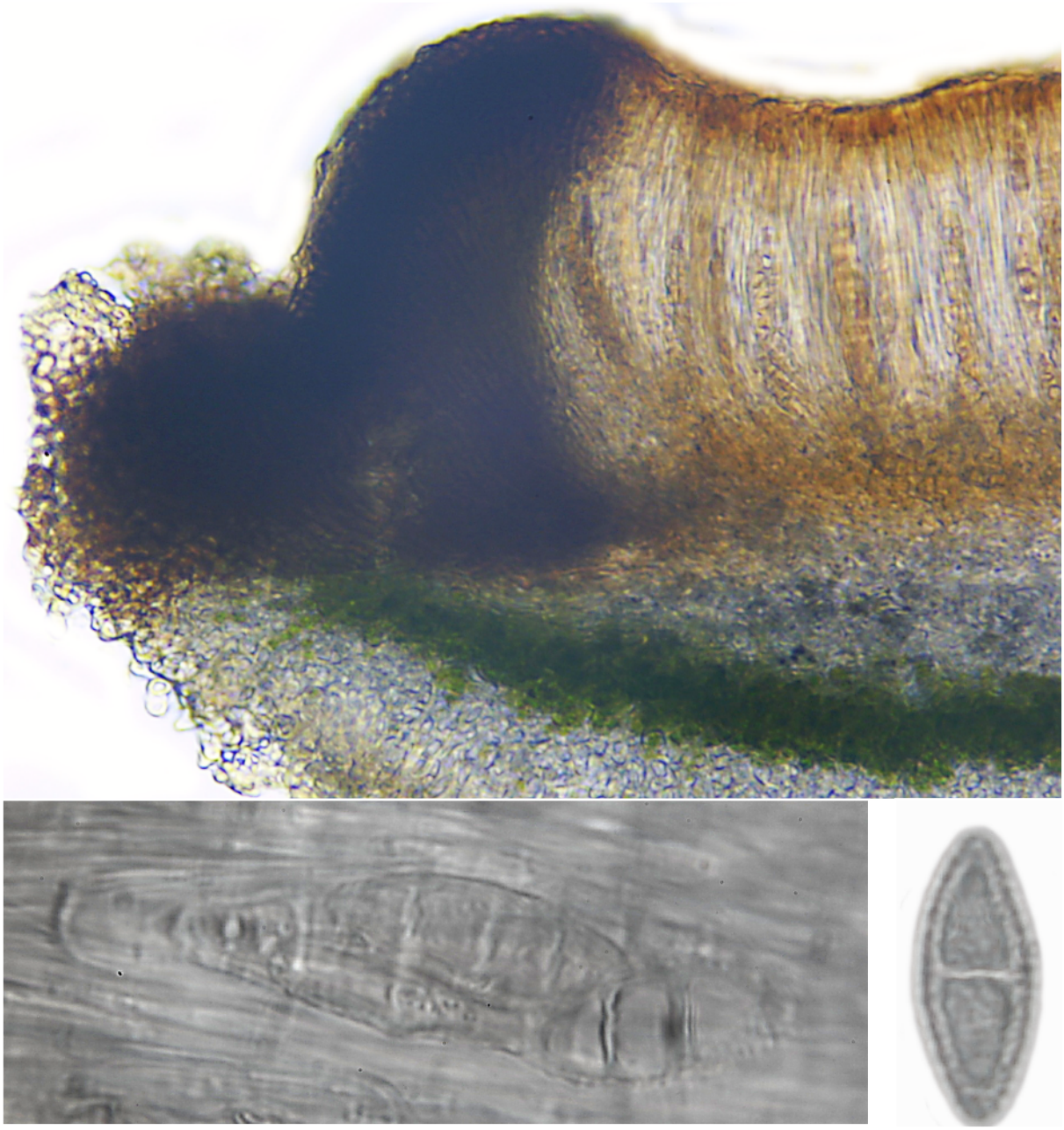


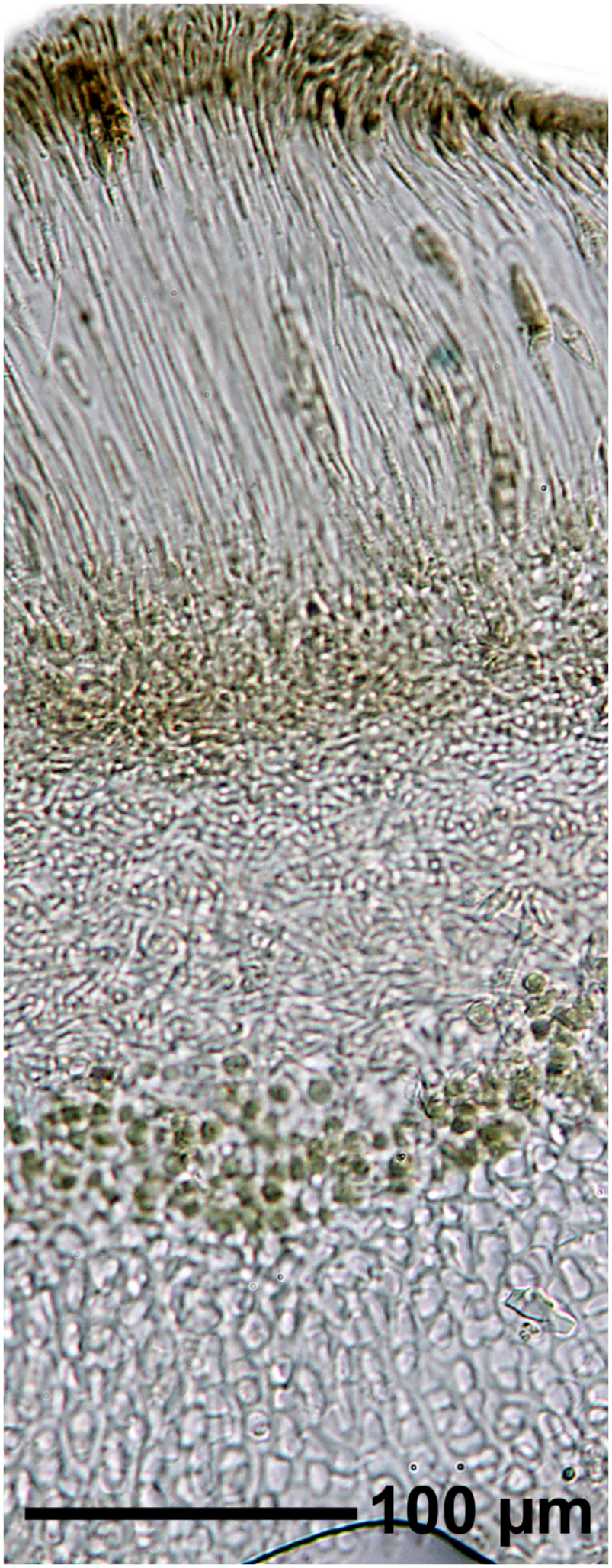
***Lobaria endochroma***



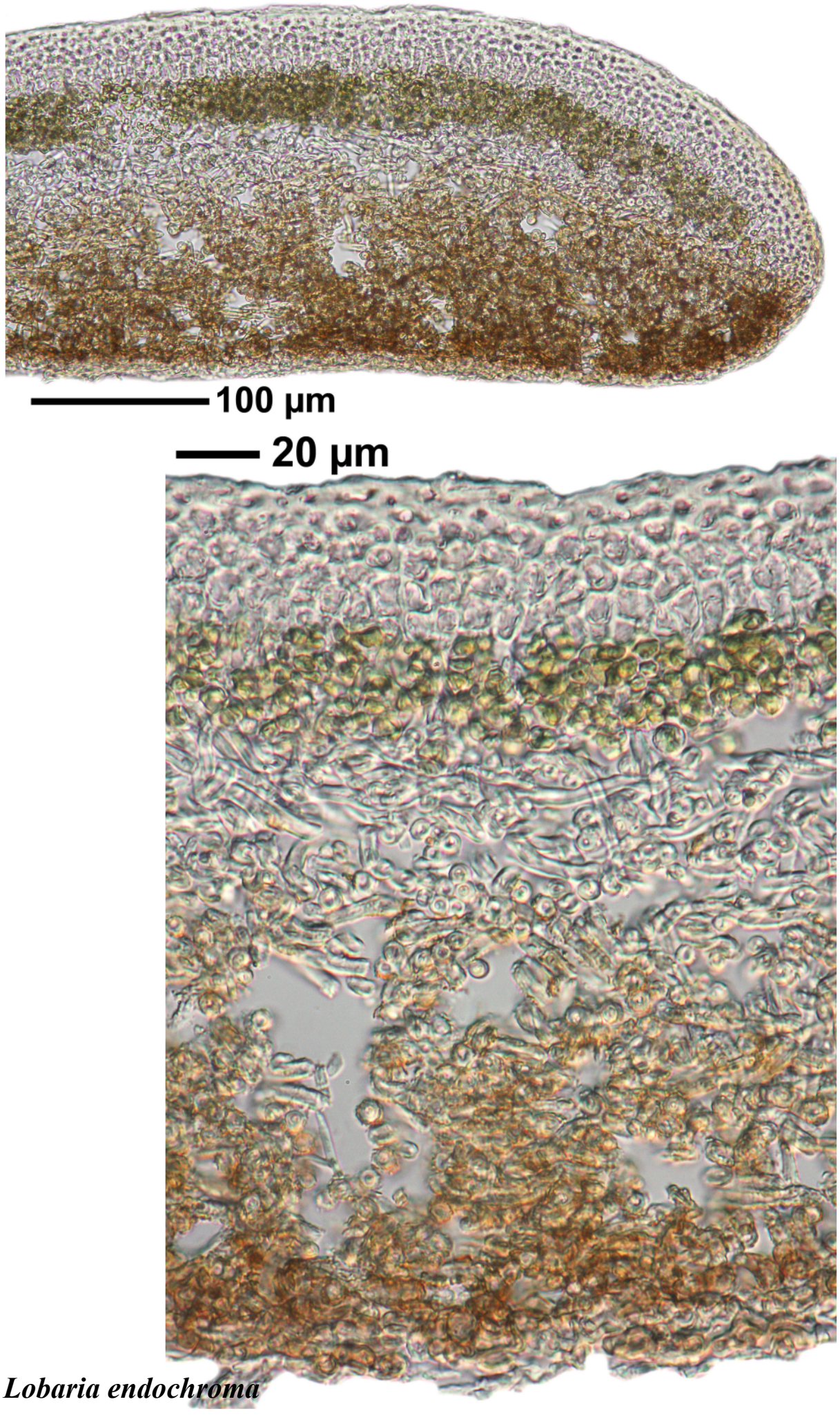
***Lobaria endochroma***



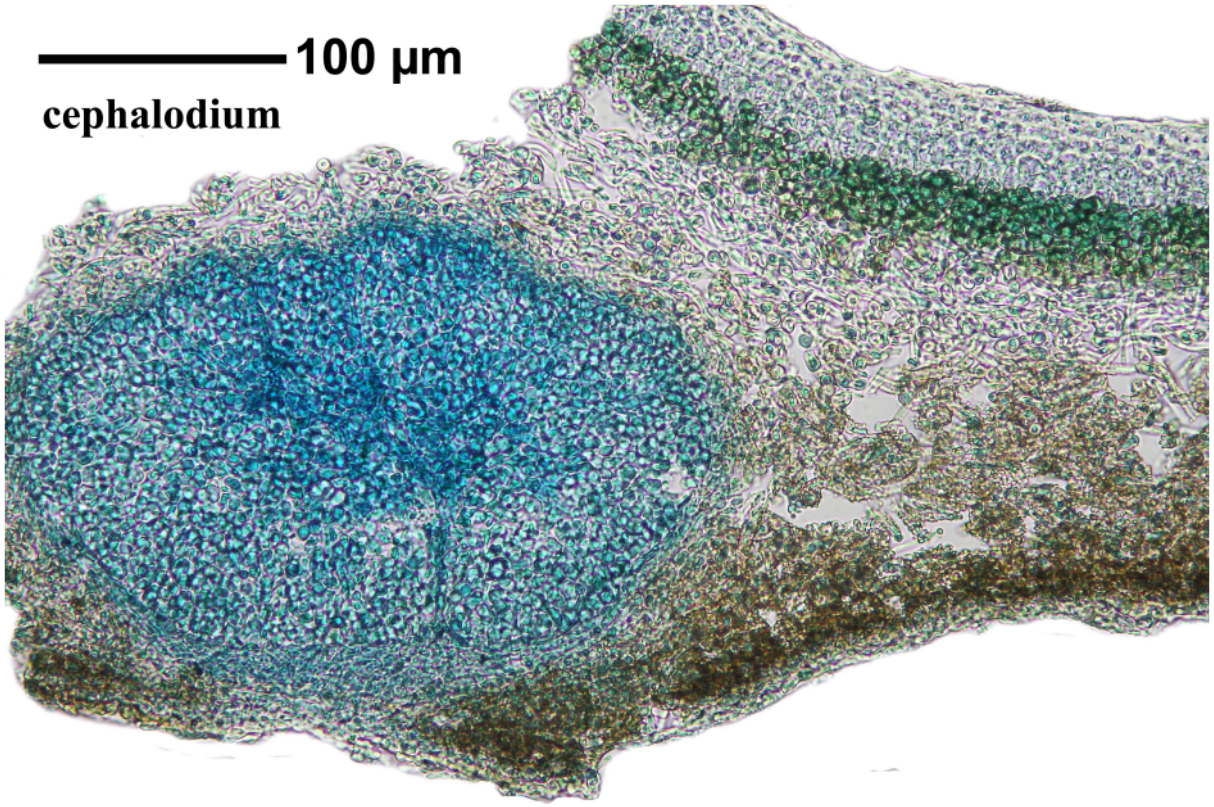

***Lobaria endochroma***

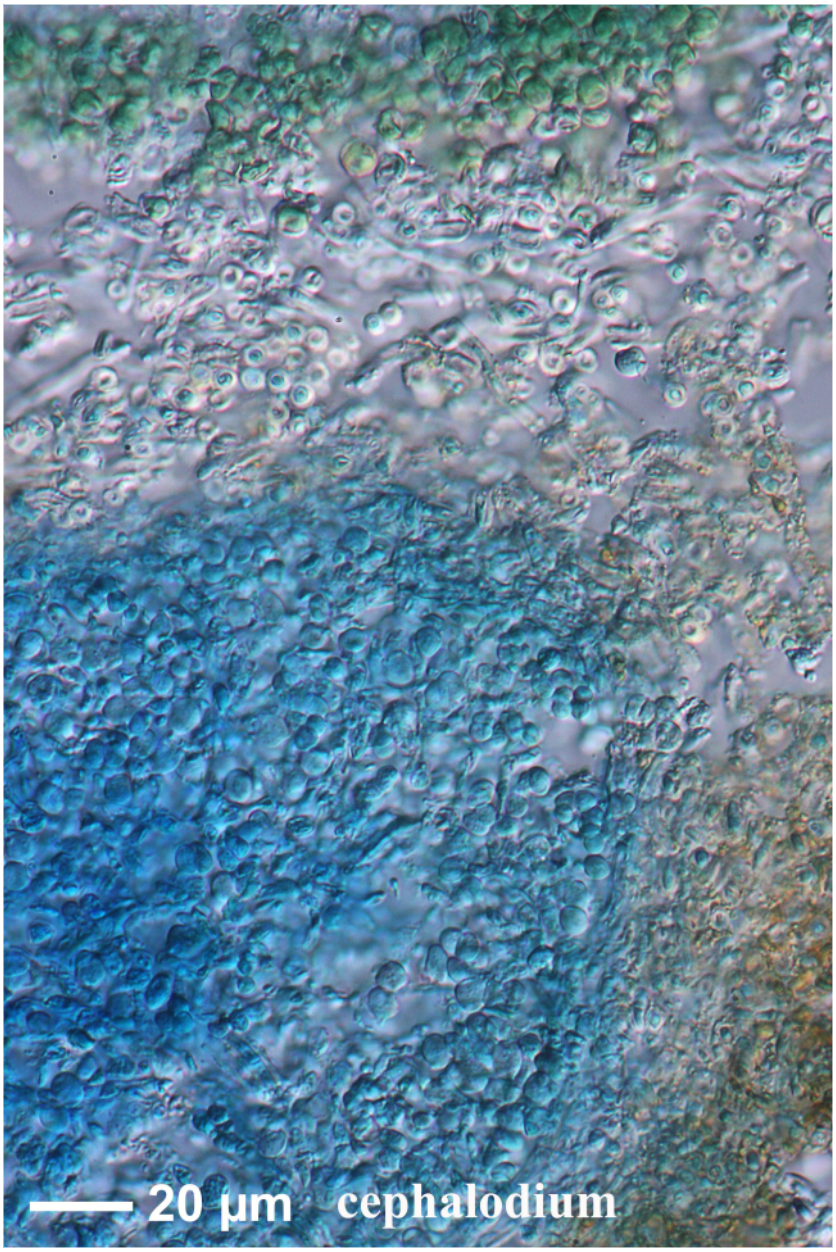



***Lobaria endochroma***




***Lobaria endochroma***




*Lobaria endochroma*

***Lobaria isidiophora*** Yoshim.

Thallus upper surface reticulately ridged; with very fragile, cylindrical isidia on ridges and margins. Lower surface densely tomentose in grooves between nitidous, pale swellings. Tomentum dark blue or brown. Algae grass-green (*Myrmecia* ?). Ascospores hyaline, fusiform, 8/ascus, (1-)3(-4)-septate, 16-25 x 7.5-10 µm. Chemistry: Thallus K-, medulla K+ yellow or red, P+ yellow to orange, KC+ rose, gyrophoric acid (maj), norstictic acid (maj), ± stictic acid (min, or tr).

[6288], Philippinen, Mindanao, Provinz Bukidnon, westlich Malabalay, tropischer Regenwald am Mt. Kitanglad ab Zwischen-Campsite , N 08°09.637’ N, E 124°55.871’ E, 1870-2800 m. Leg. Schumm 19.08.1999, det. Schumm 2001.





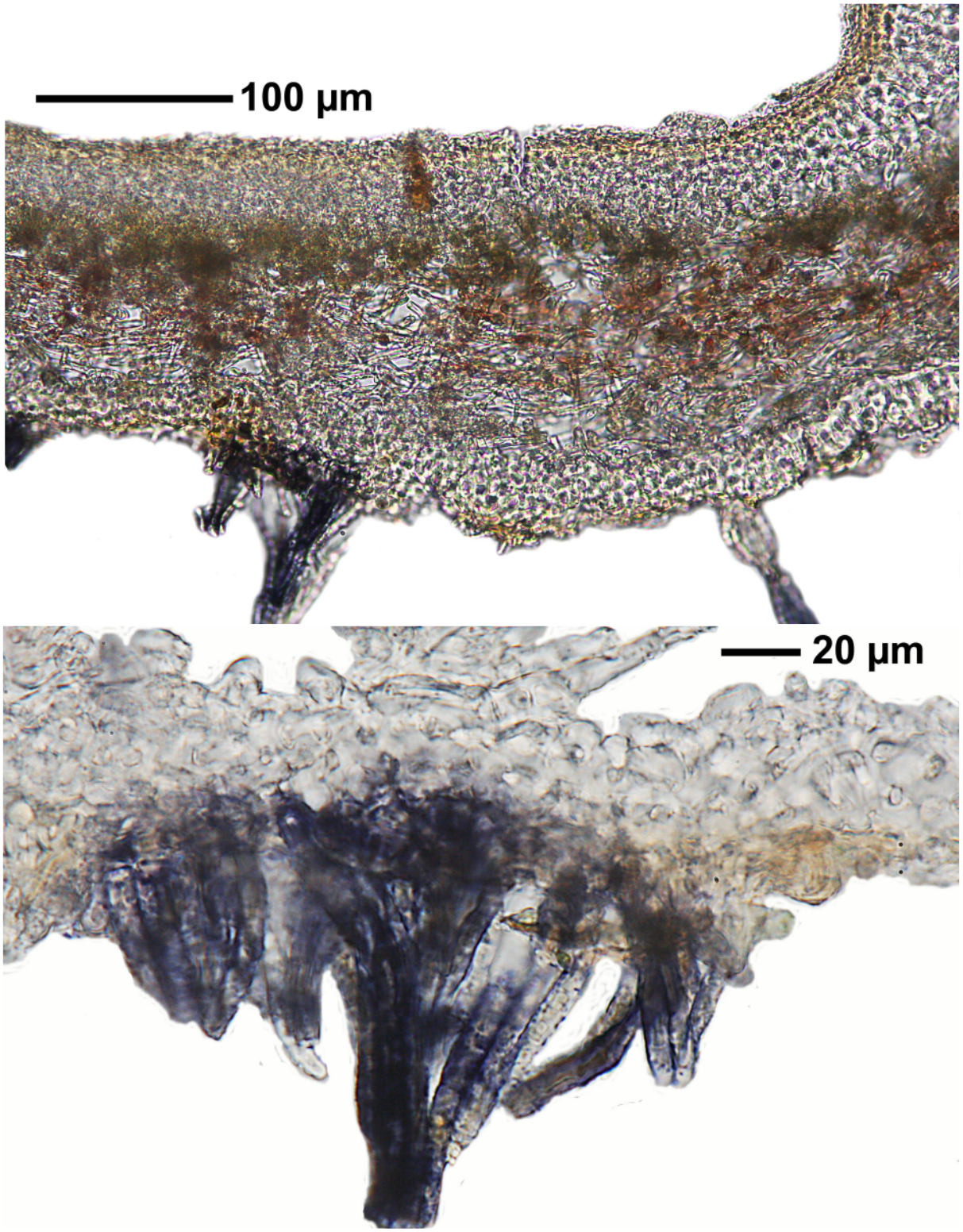




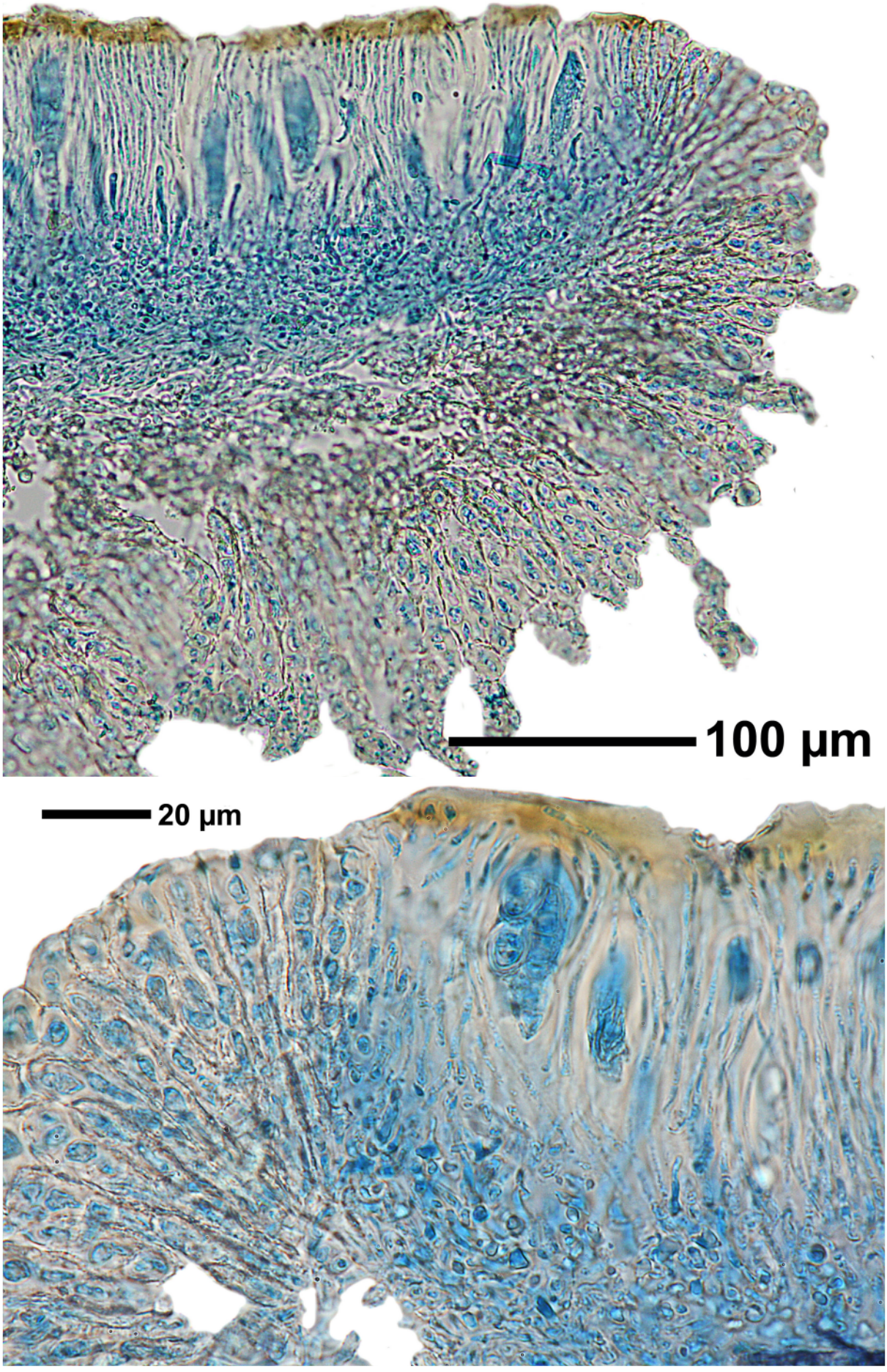
***Lobaria isidiophora***



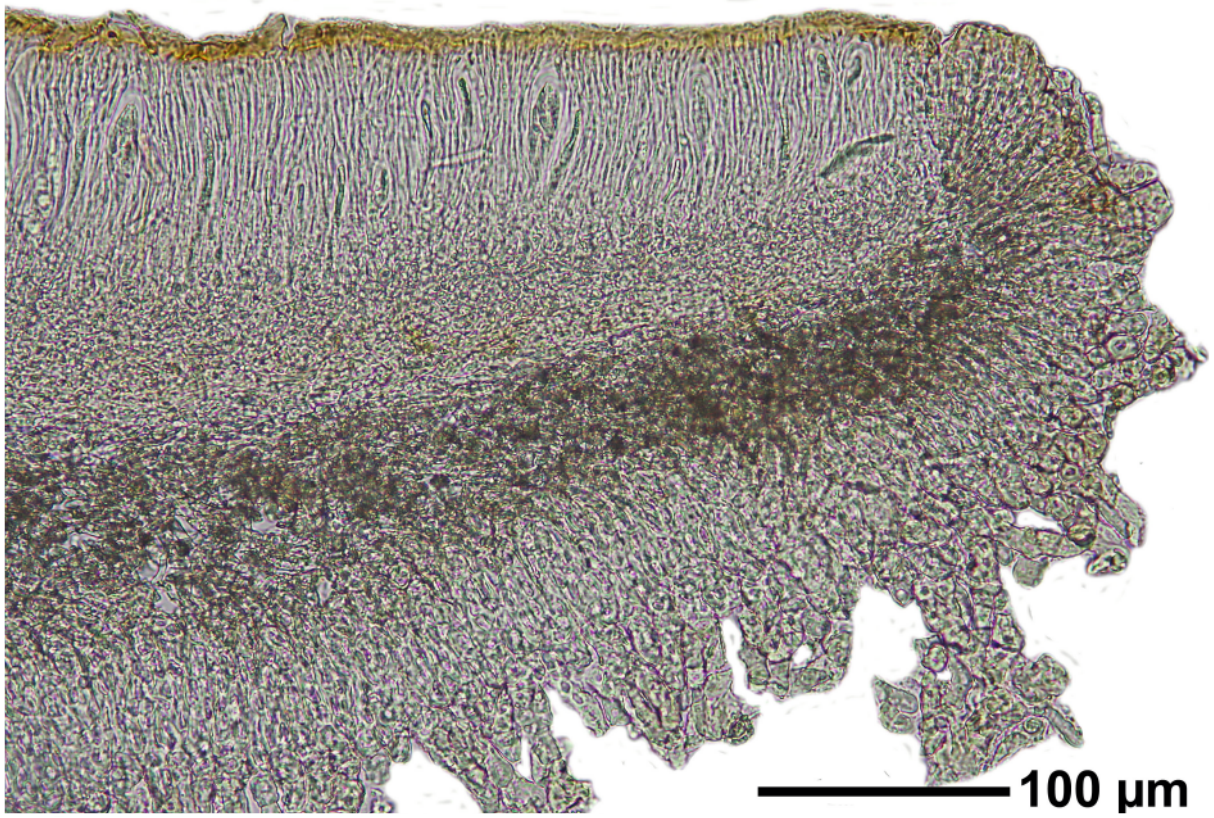

***Lobaria isidiophora***

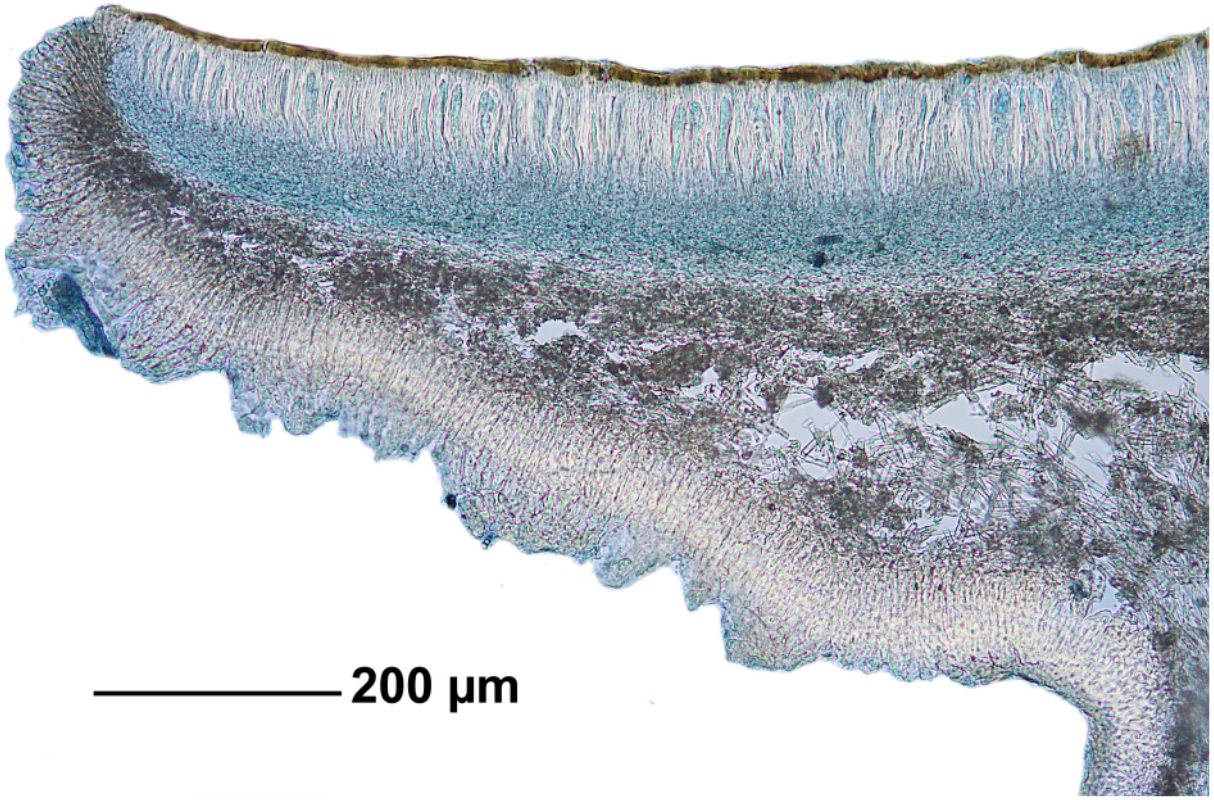



***Lobaria isidiophora***




***Lobaria isidiophora***

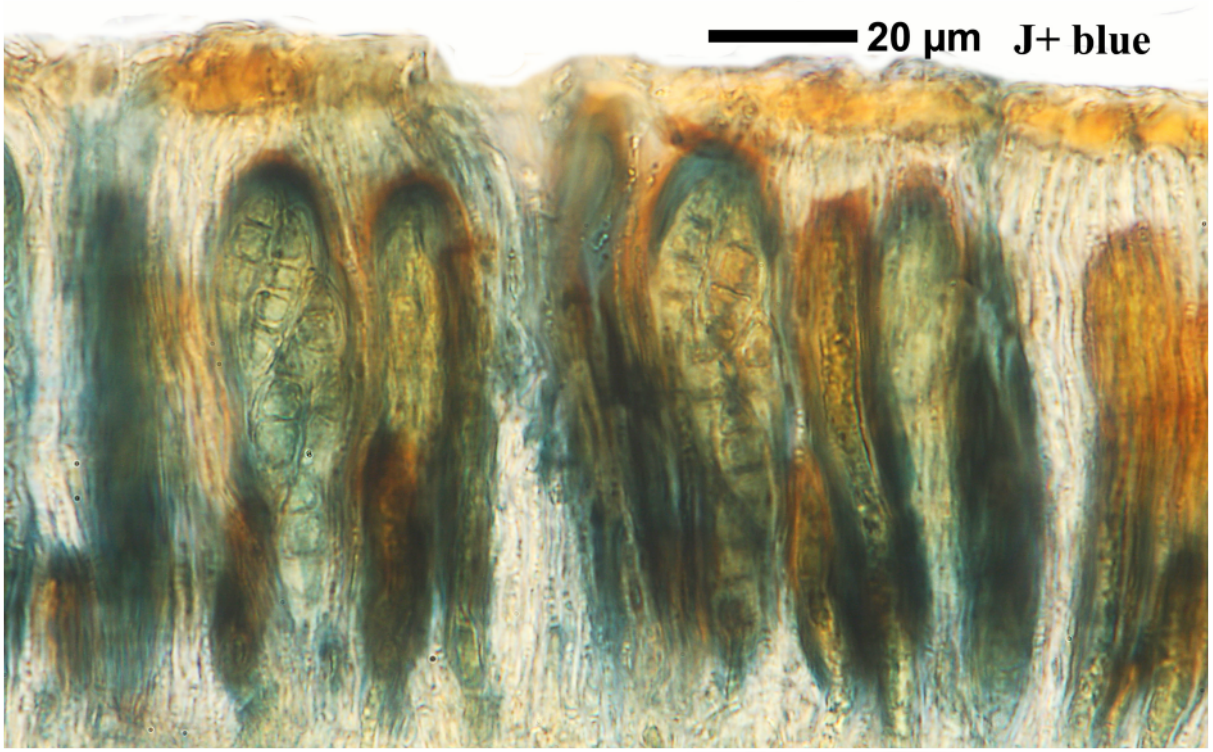


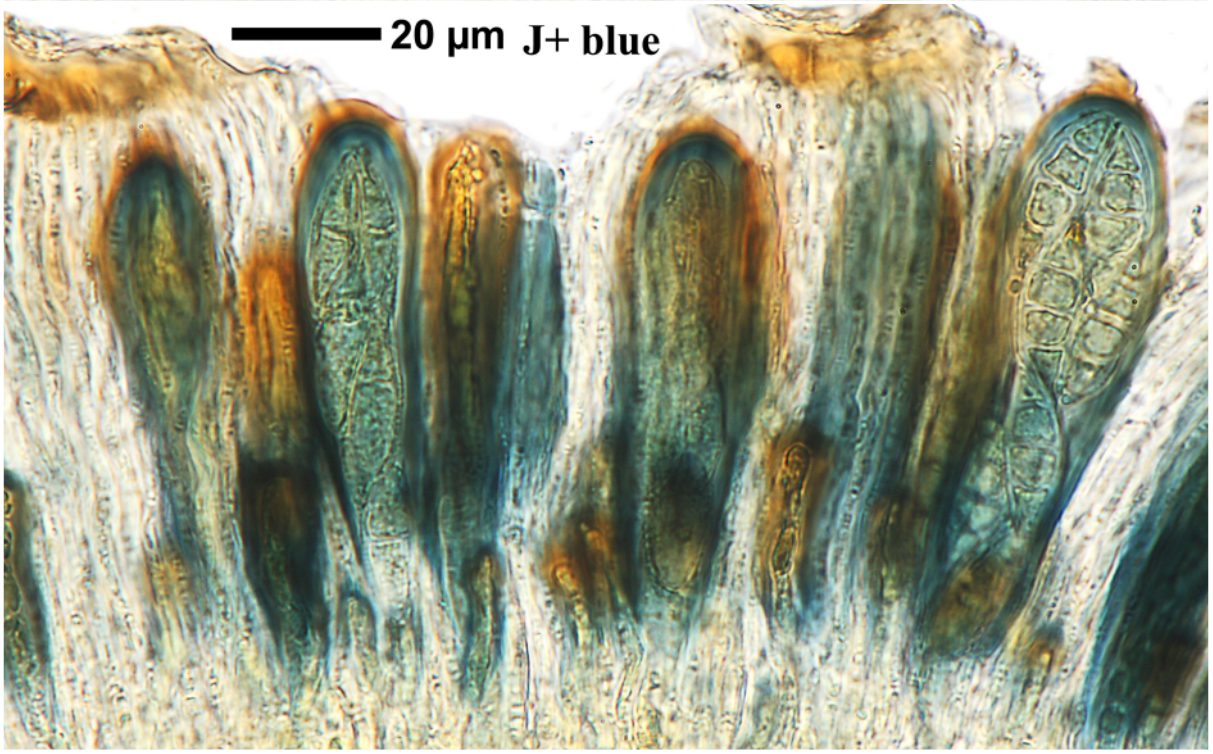







***Lobaria isidiophora***







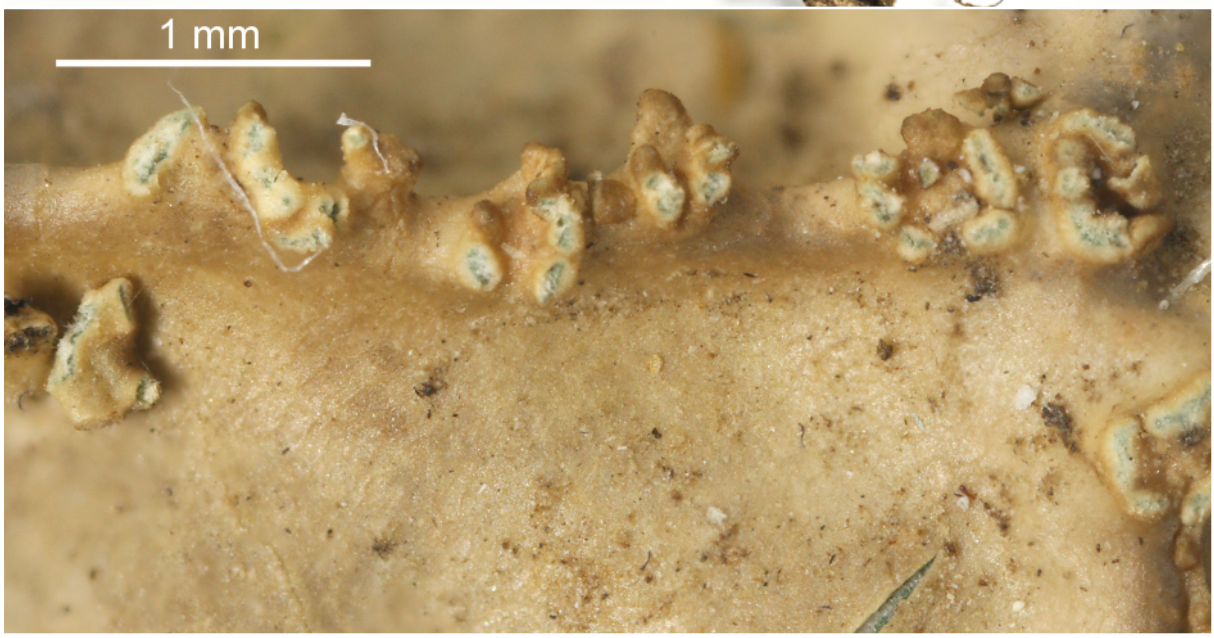
***Lobaria isidiophora***

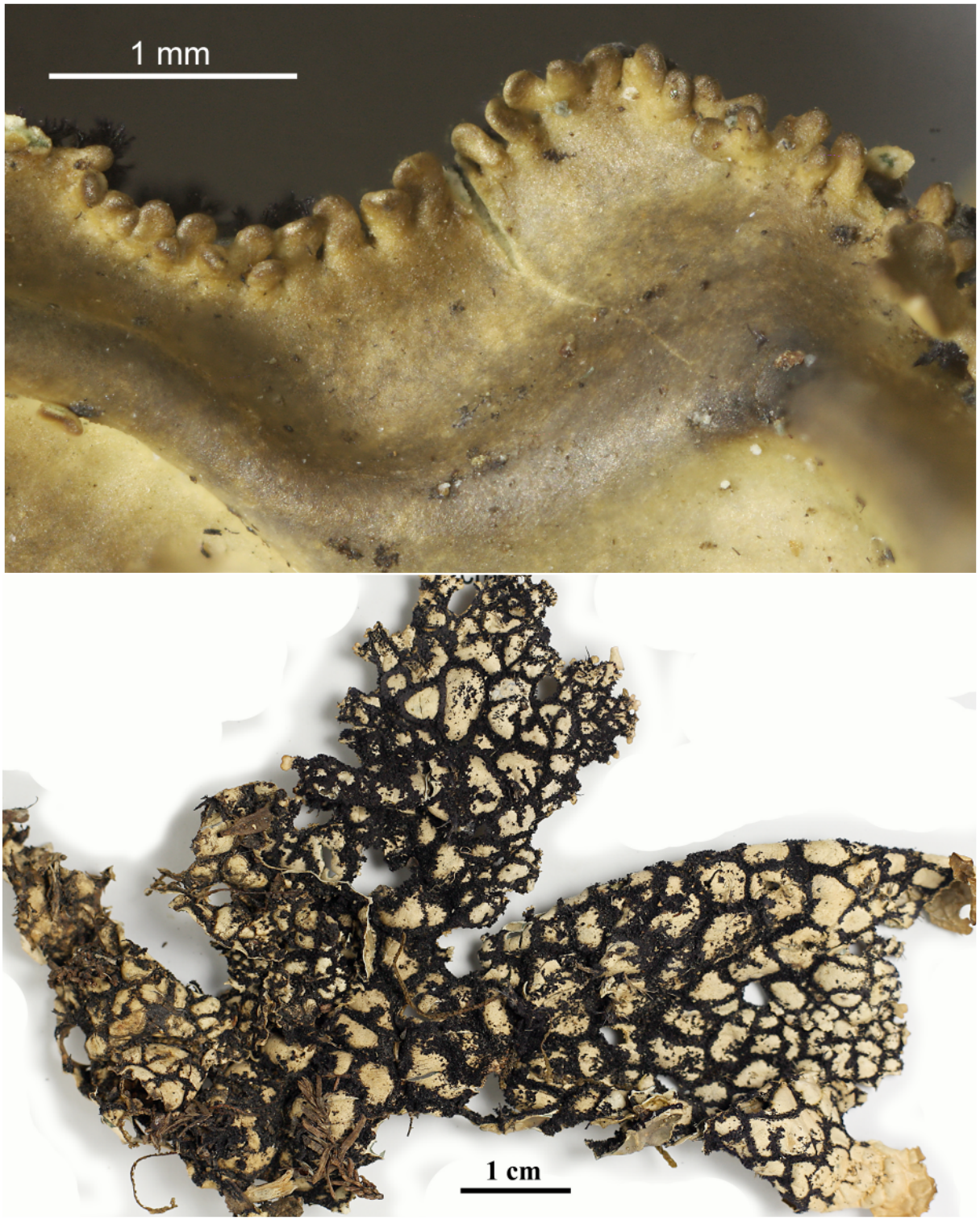
***Lobaria isidiosa*** (Müll.Arg.) Vain.

Thallus surface strongly reticulate. With mostly somewhat flat isidia on ridges and margins. Soredia absent. Photobiont: blue-green (*Nostoc*). Ascospores 3-septate, fusiform, 25-30(-35) x 10-12 µm. Chemistry: medulla P+ orange, K+ yellow>red, norstictic (maj), stictic (±), thelephoric (in black tomentum) acids, triterpenoids (2, maj.). Note: the similar *Lobaria pseudopulmunaria* has no isidia.

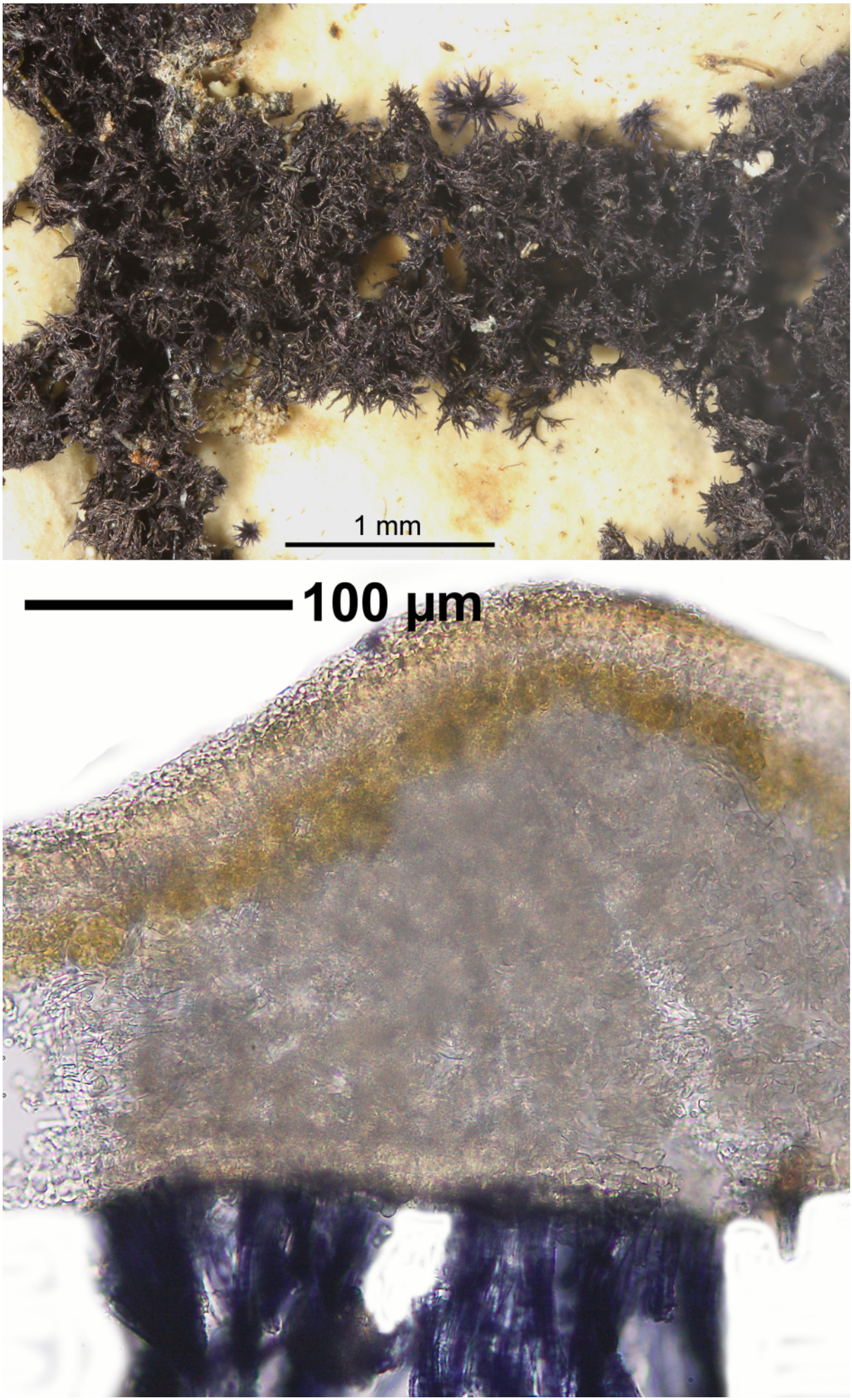
[5436], Philippinen, Mindanao, Provinz Cotabato, Mt. Apo, Ostufer des Lake Venado, Waldrand des Bergregenwaldes, halbschattig, 2210 m, 7°00.155' N, 125°16.179' E, an Rinde. Leg. Uwe Schwarz 20.03.1999, det. Schumm 2001.



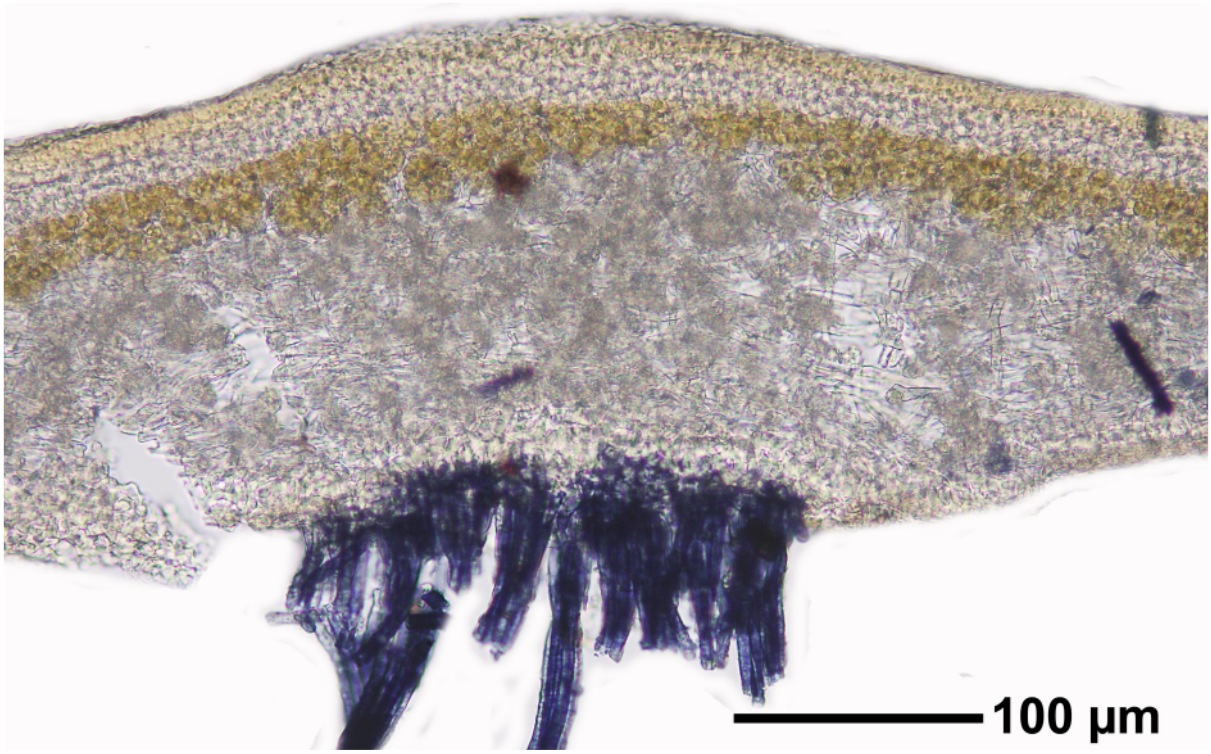



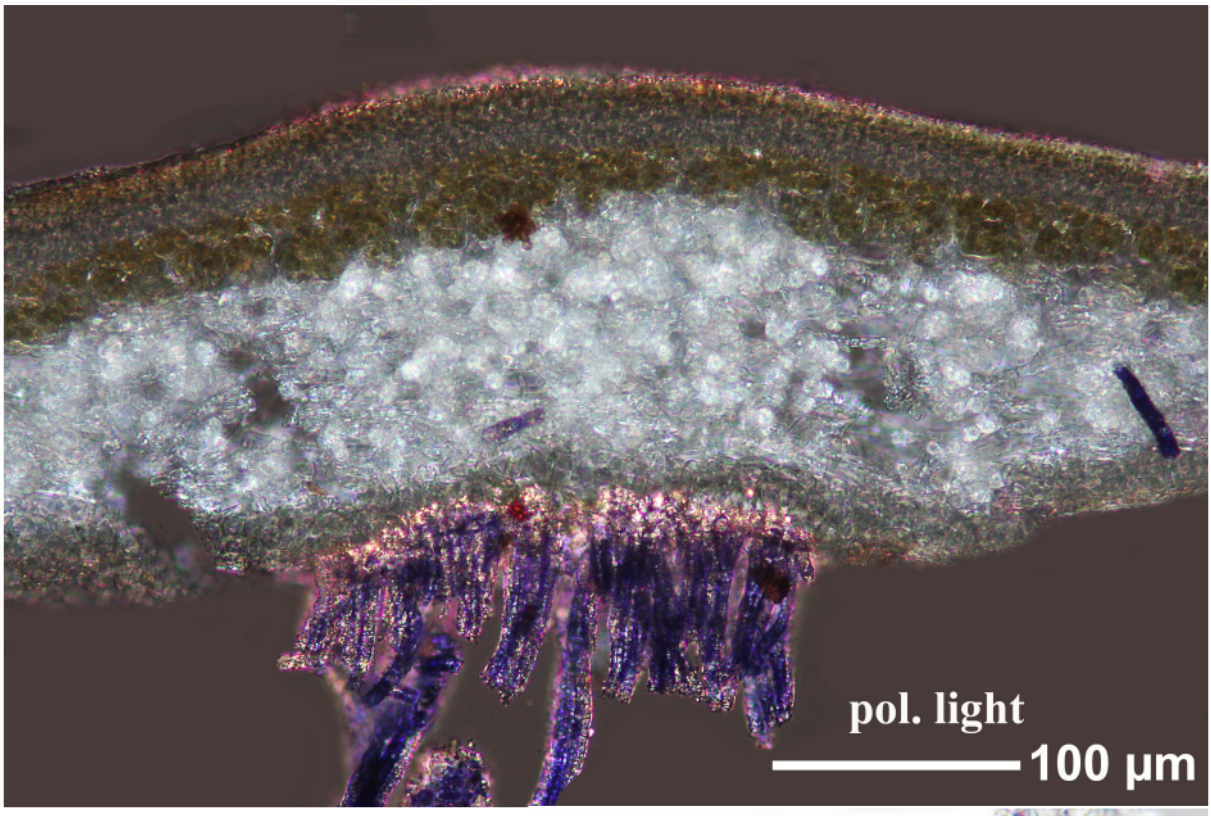


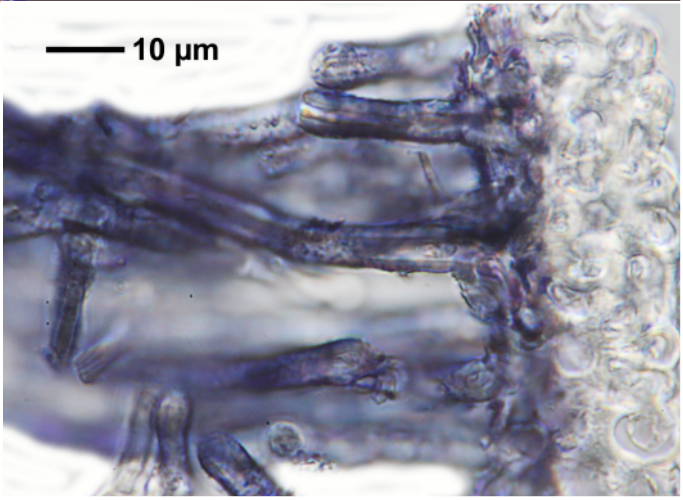

***Lobaria isidiosa***



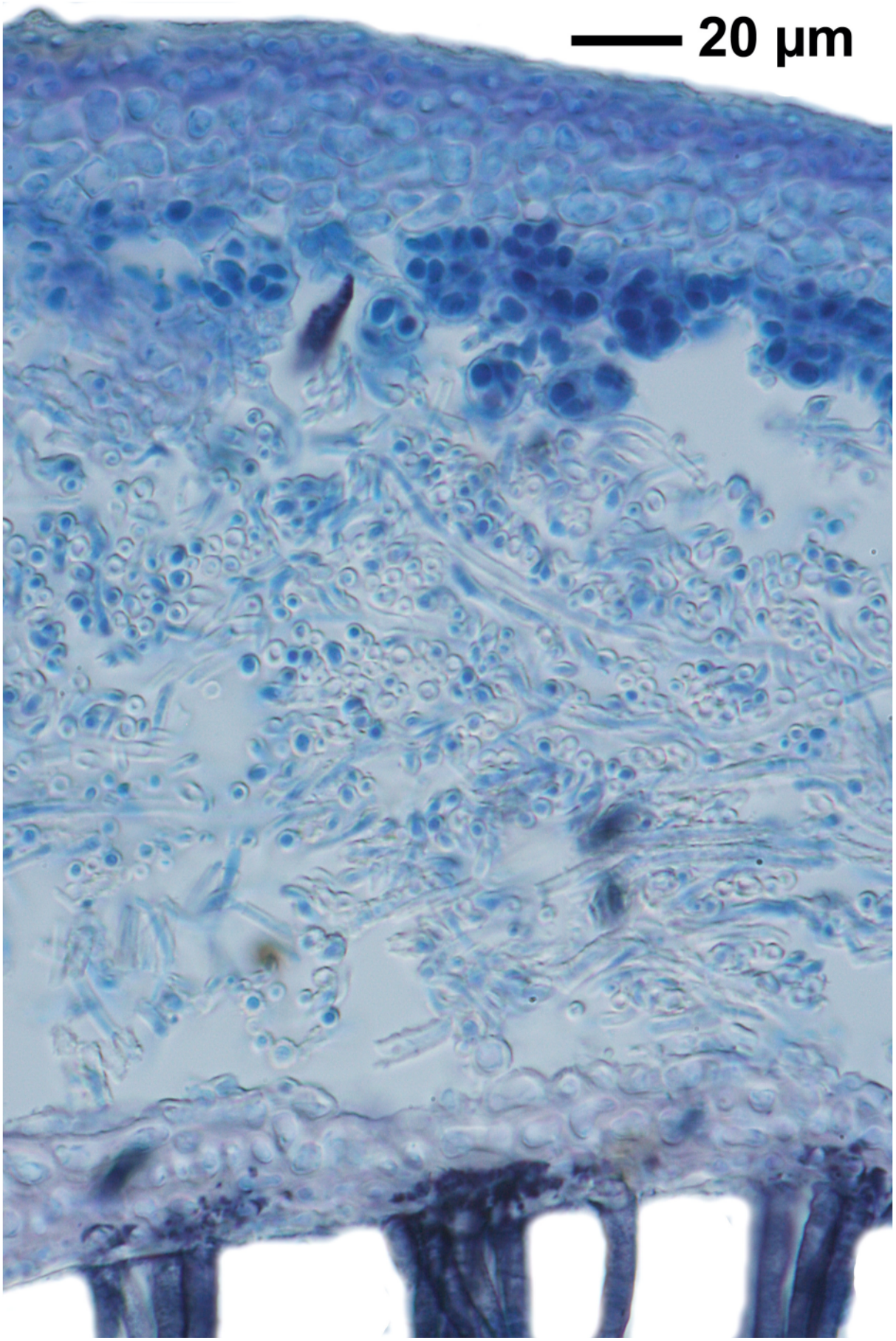

***Lobaria isidiosa***



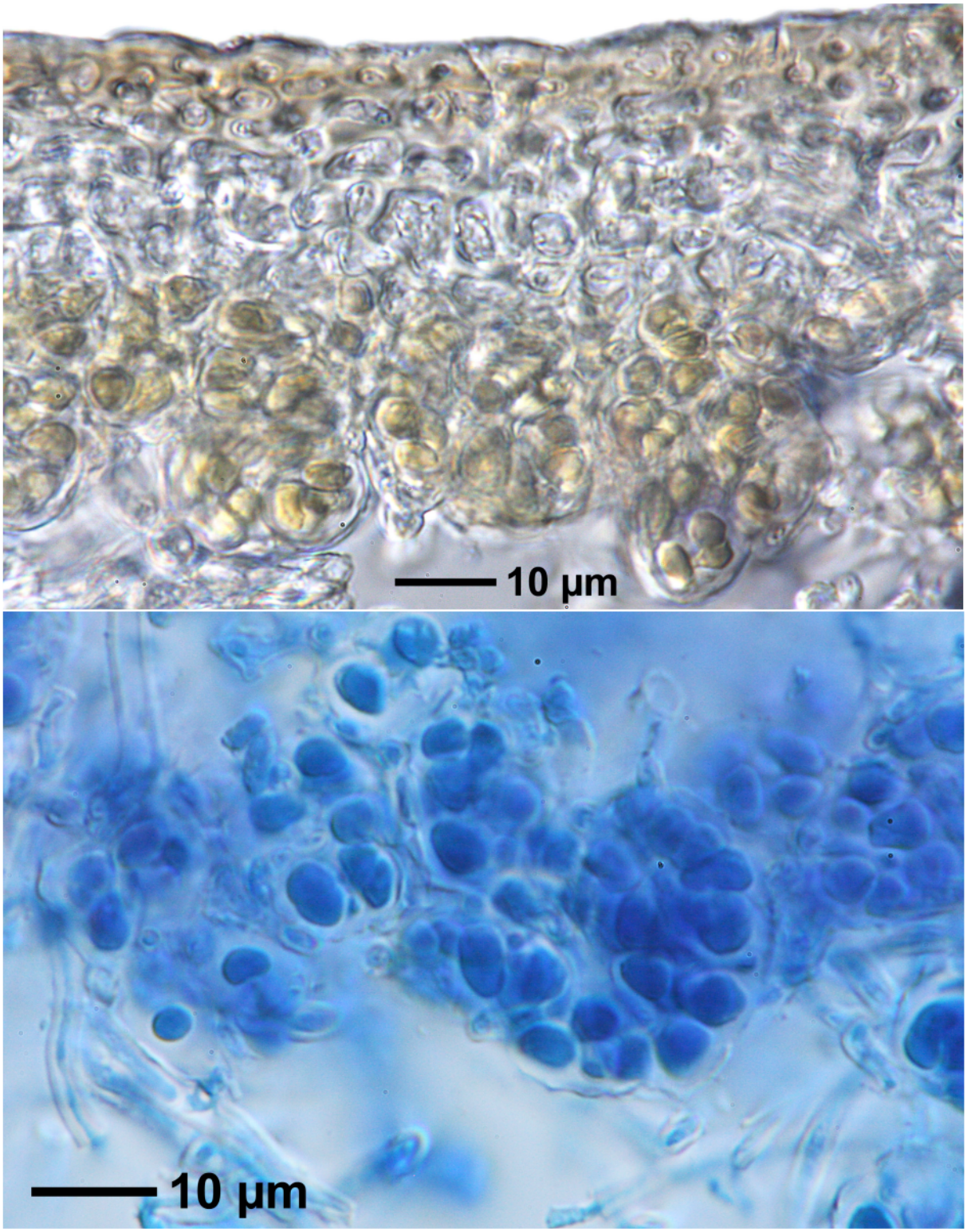




***Lobaria isidiosa***




***Lobaria isidiosa***



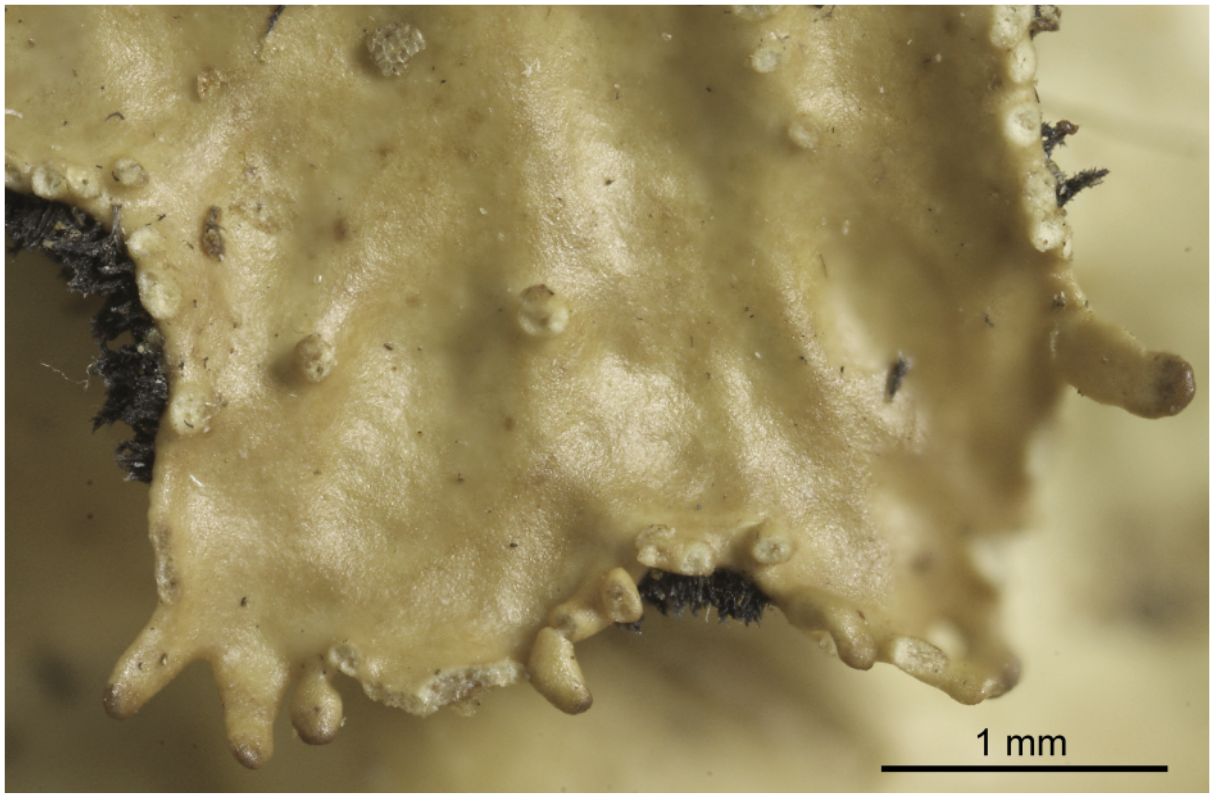

***Lobaria isidiosa***

***Lobaria meridionalis*** Vain.

Thallus reticulately ridged. Soredia absent. Isidia present, fragile, marginal or on ridges, cylindrical or mostly somewhat flattened. Algae grass-green (*Myrmecia* ?). Apothecia on margins and ridges. Ascospores 3-septate, fusiform, 21-33 x 7-11 µm. Chemistry: thallus K-, medulla K+ yellow>red, P+ orange, KC-, stictic (major), norstictic, constictic, cryptostictic acids (TLC).

[7577], Philippinen, Negros, Prov. Negros Oriental, Mt. Talinis (Cuernos de Negros), Lunga Nature Trail beim Lake Yagumyum, N 9°15.040' N, E 123°11.172' E, 1360 m. Leg. Schumm 11.08.2000, det. Schumm. 07.2001.

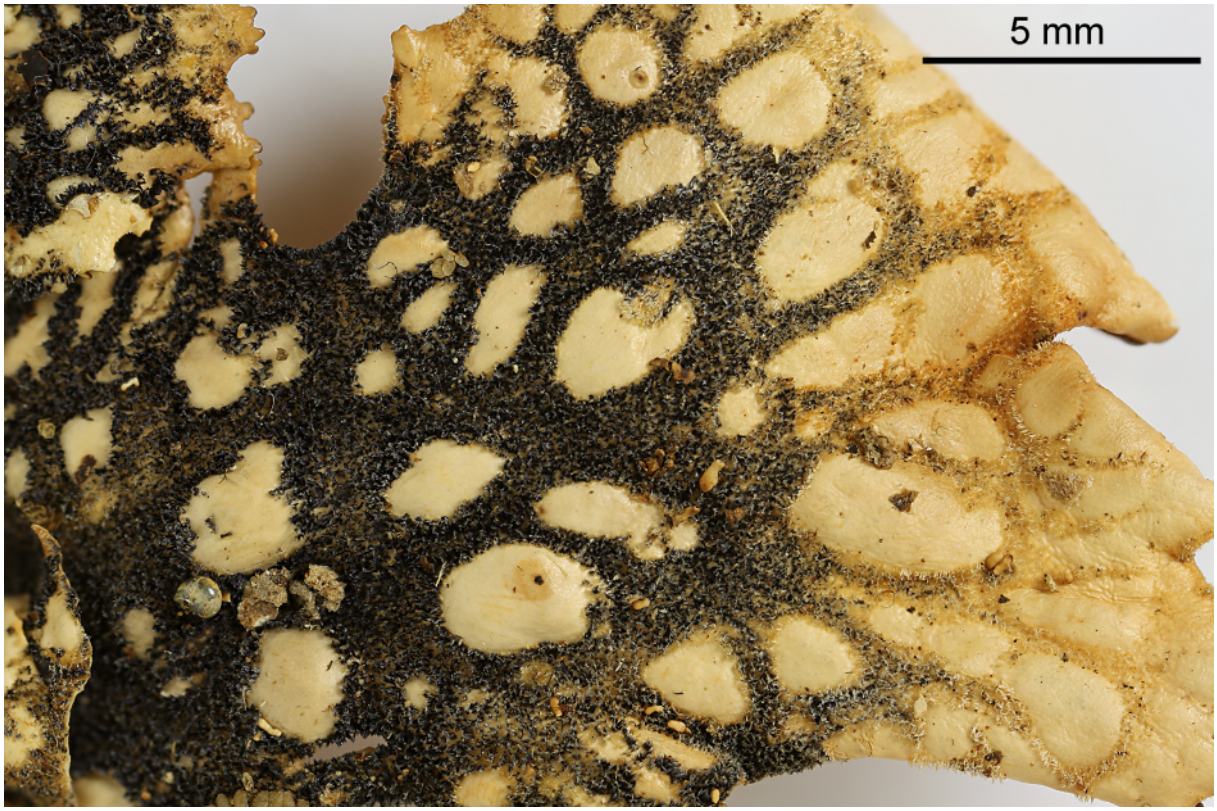


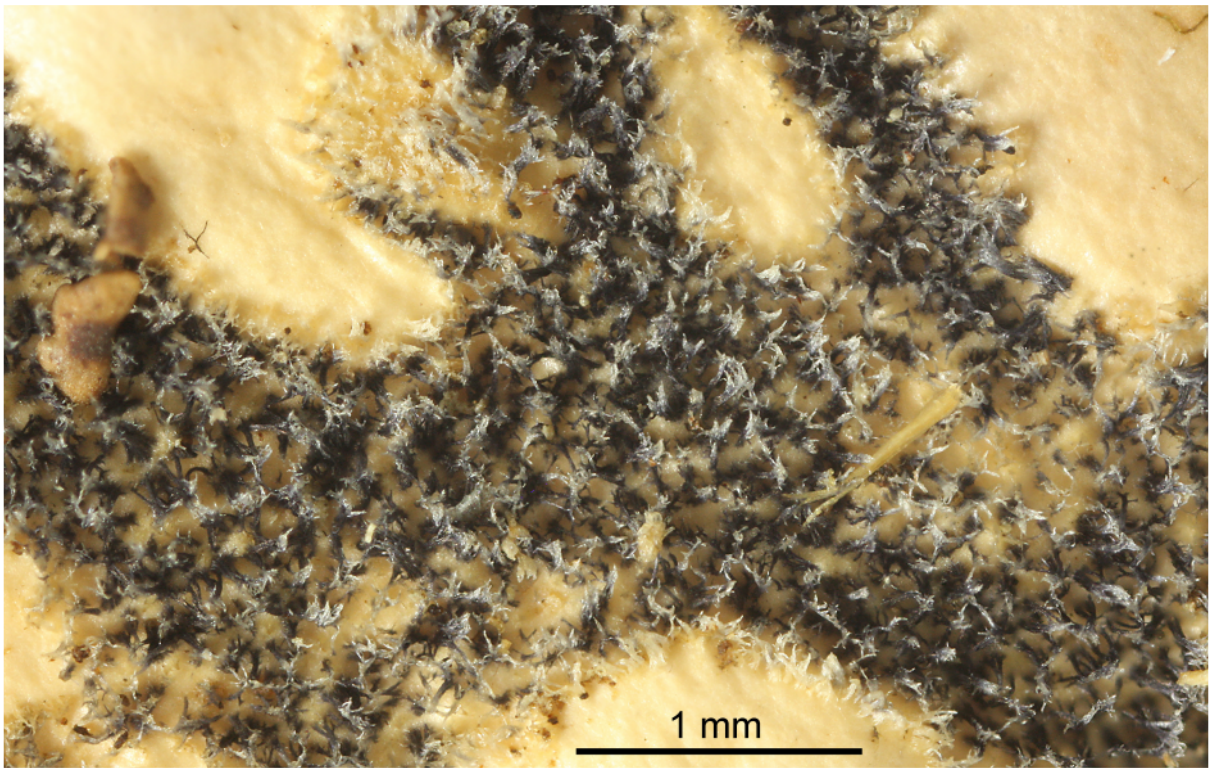






***Lobaria meridionalis***



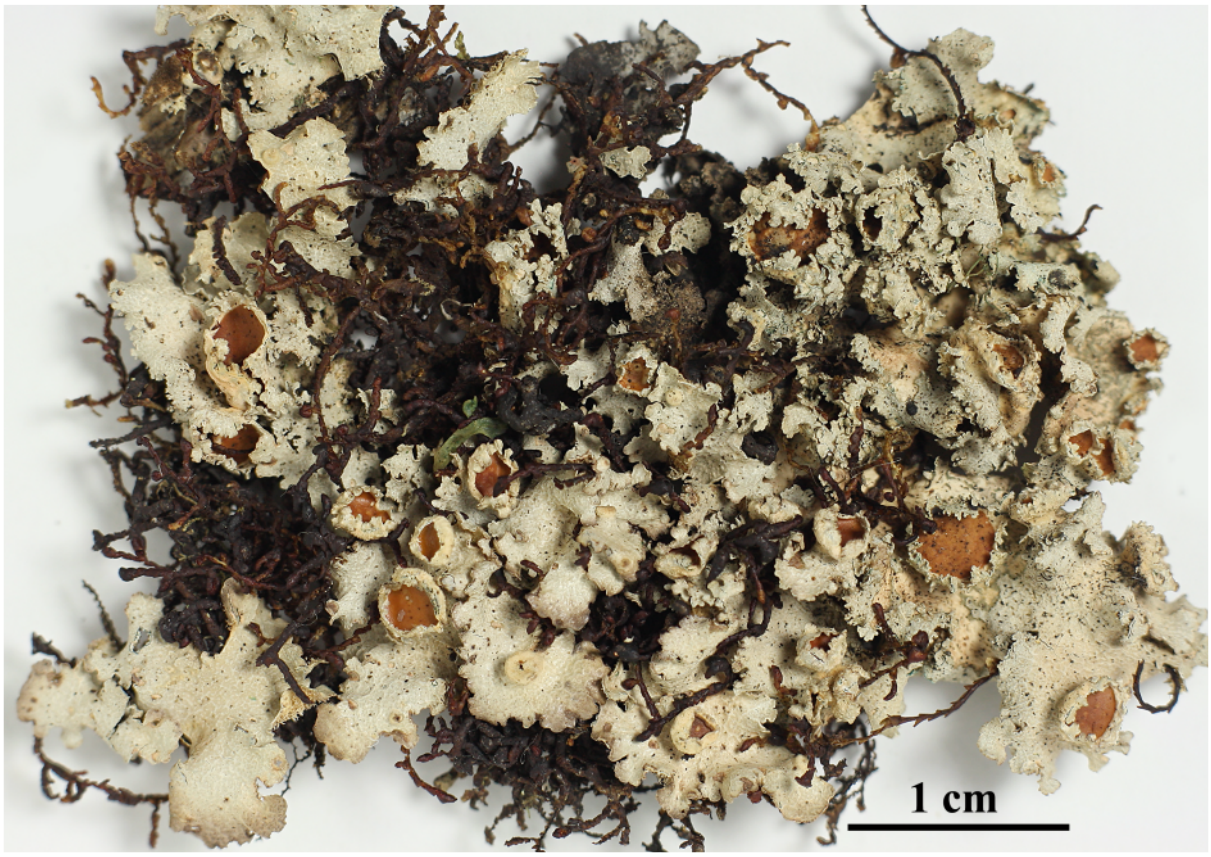




***Lobaria meridionalis***

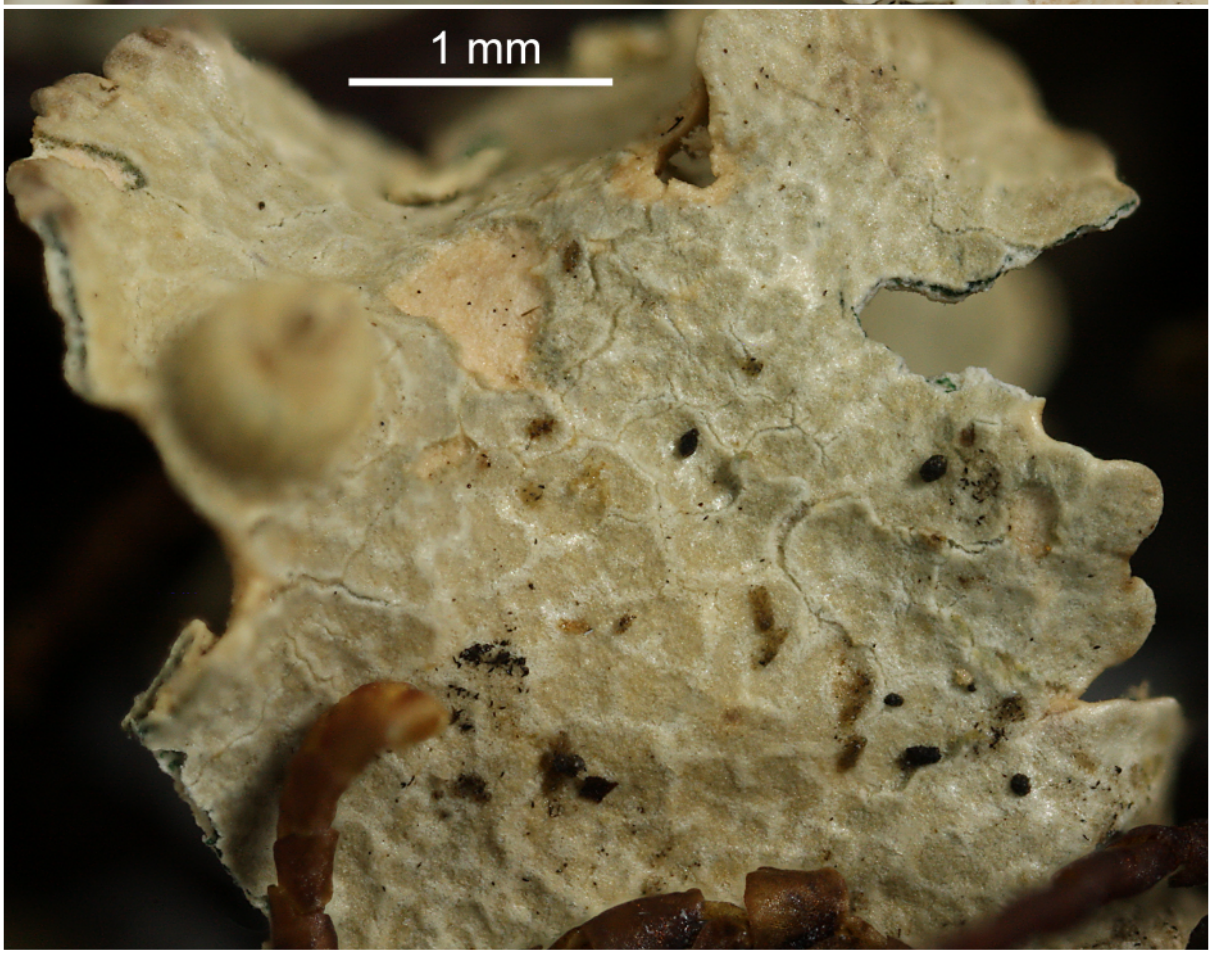
***Lobaria pallida*** (Hook. in Kunth) Trevis.
[= ***Durietzia pallida*** (Hook.) Yoshim.]

Thallus without isidia or soredia but sometimes with small marginal lobules. Upper surface with white reticulate maculae. Lower surface pale to browenish, densely rhizinate. Tomentum pale and short. Algae blue-green. Apothecia constricted at base, margins lobulate. Ascospores hyaline, acicular, 70-80 x 4-6 µm, 7(-12) septate. Chemistry: cortex K+ yellow, medulla K-, KC+ rose, P-, gyrophoric acid (maj).

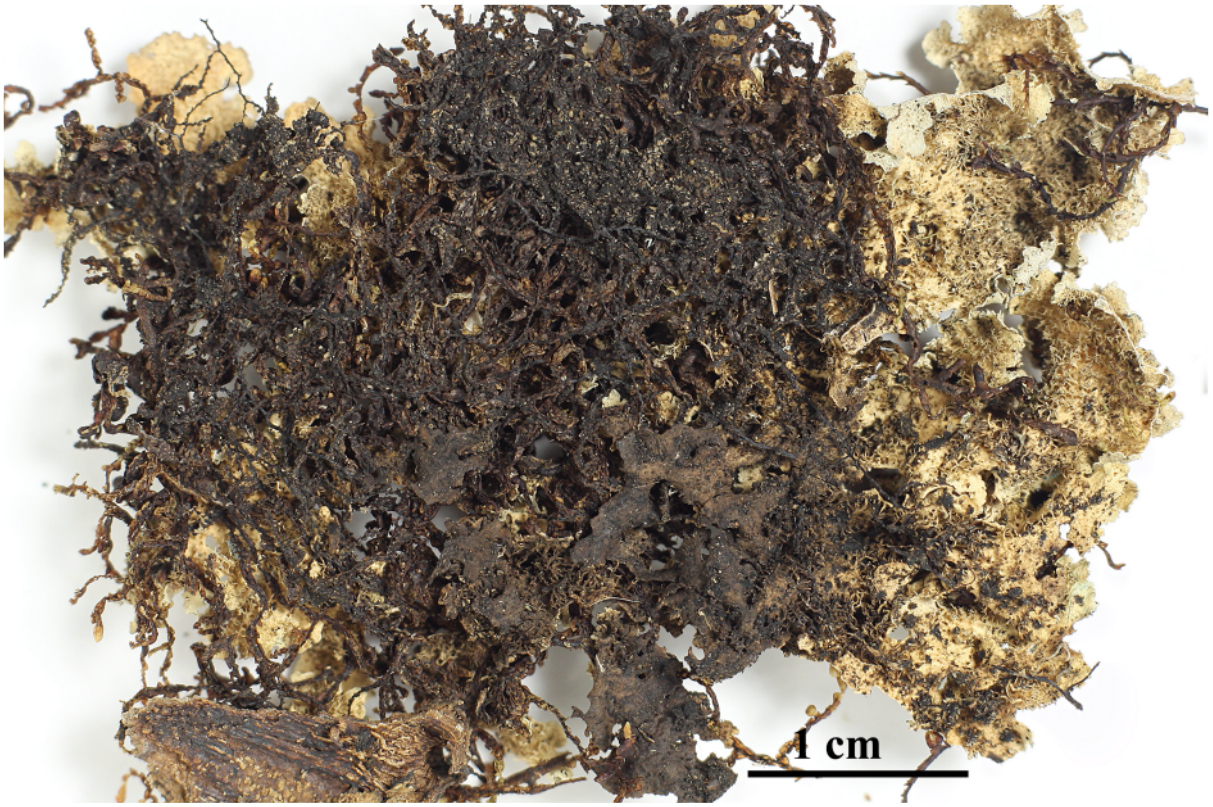
[11965], Ecuador, Prov. Carchi, Reservada Ecologica El Angel, Sendero El Voladero ca. 15 km oberhalb von El Angel, *Espeletia*-Paramo, offene Gebüsch-Vegetation bei der Lagune, an Strauch, 3700 m.Leg. A. Schäfer-Verwimp, J. Heinrichs, R.A. Wilson & S.O. Yandún 19.08.2004, dubl. ex Herb. Schäfer-Verwimp Nr. 24379/A, det. Schumm.

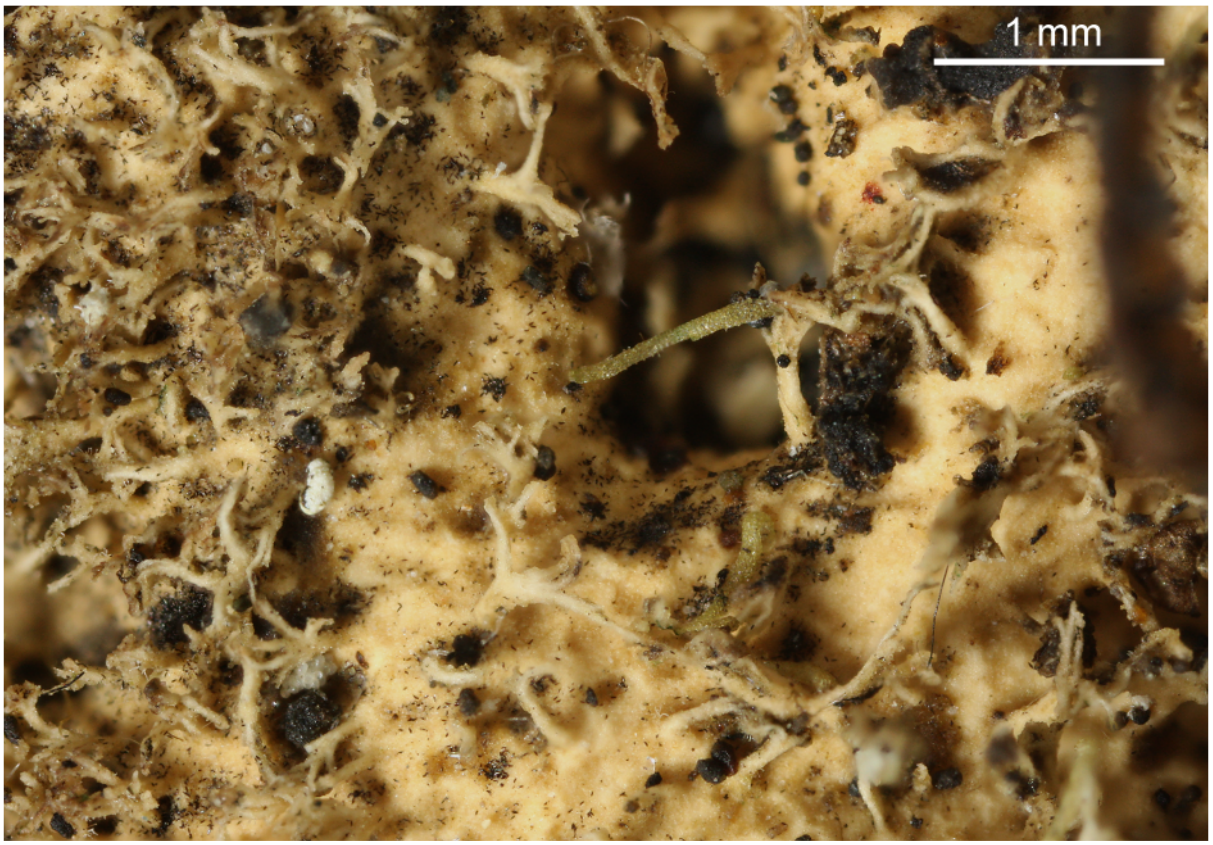




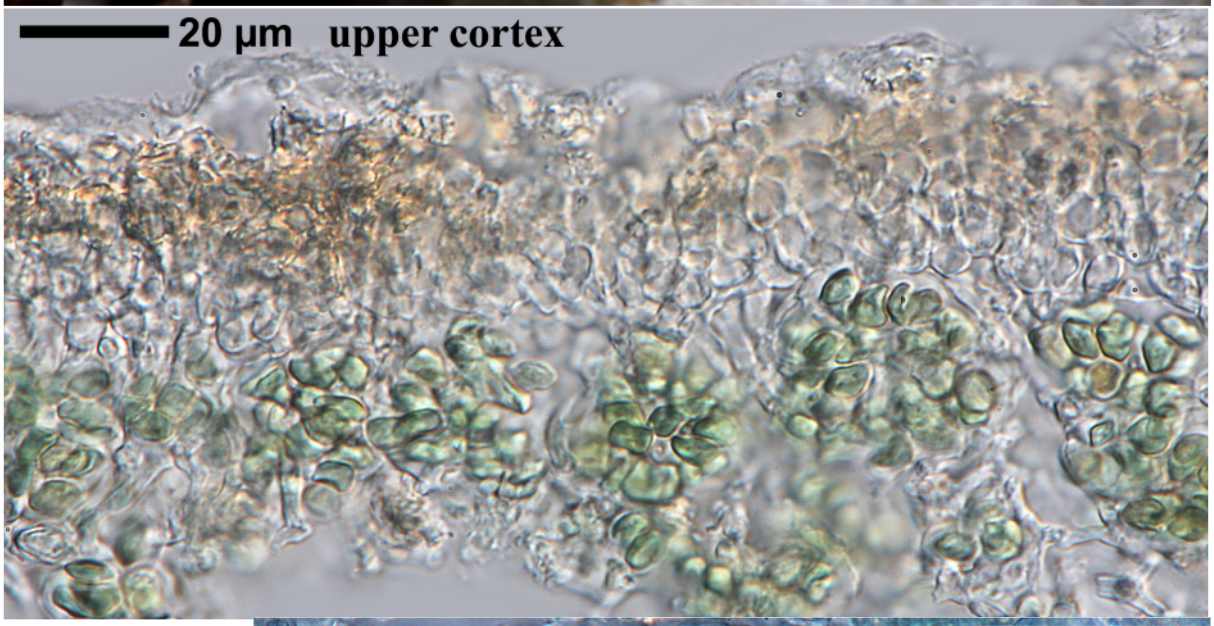

***Lobaria pallida***

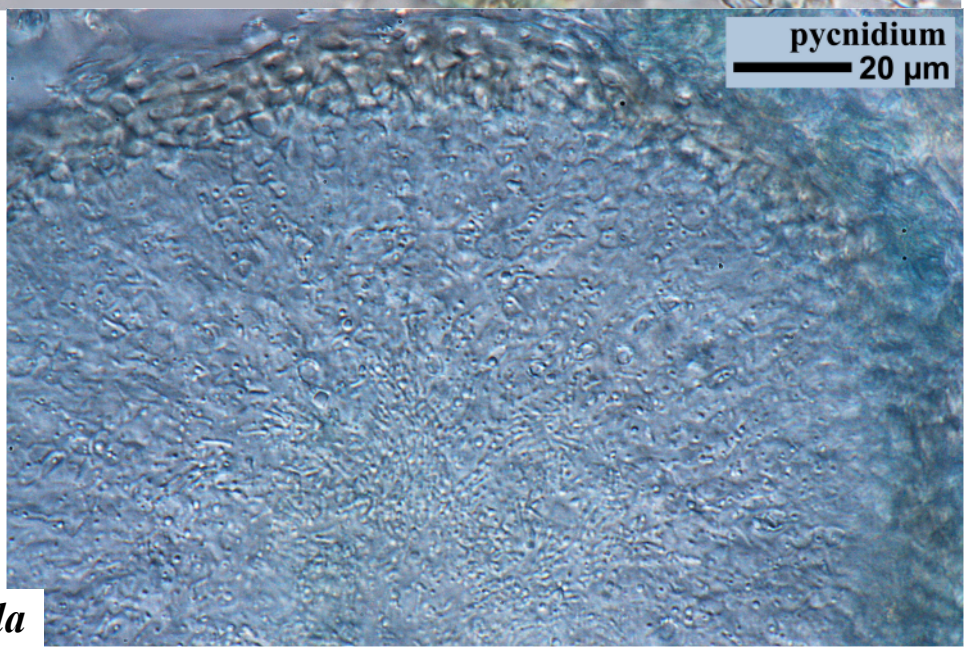


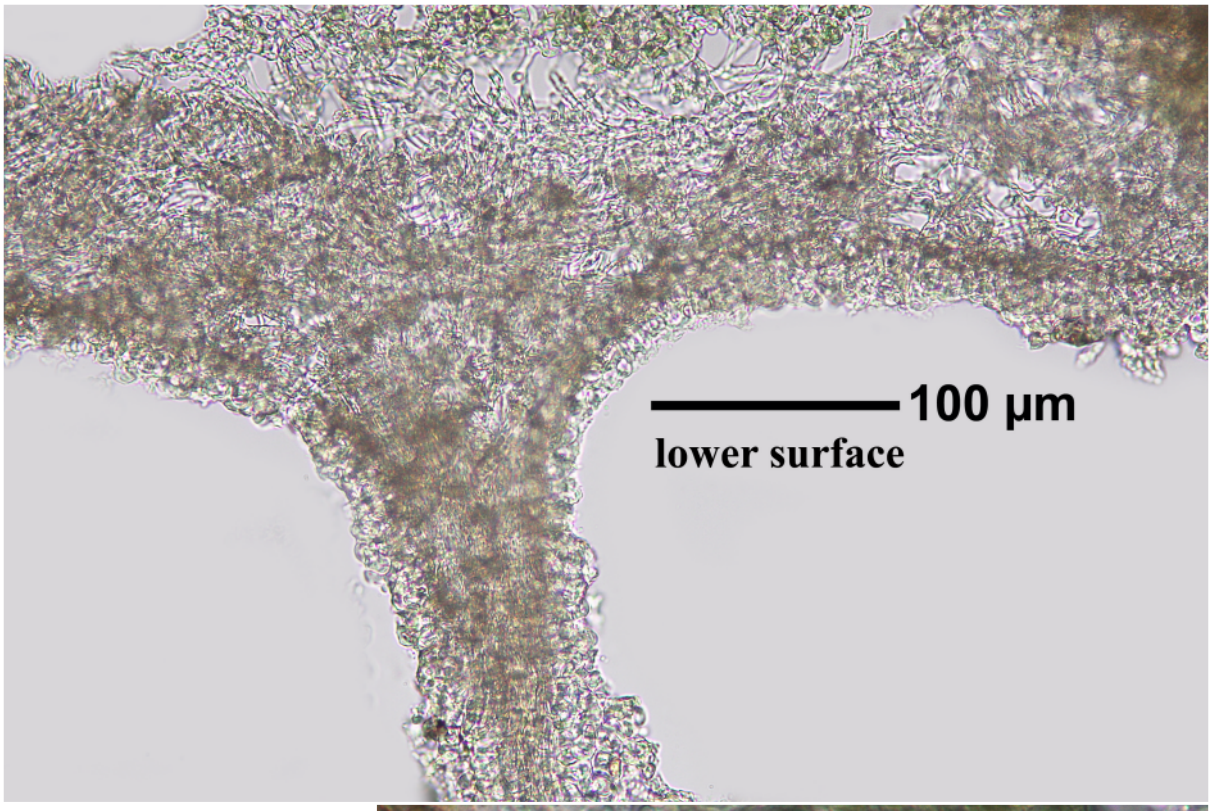

***Lobaria pallida***

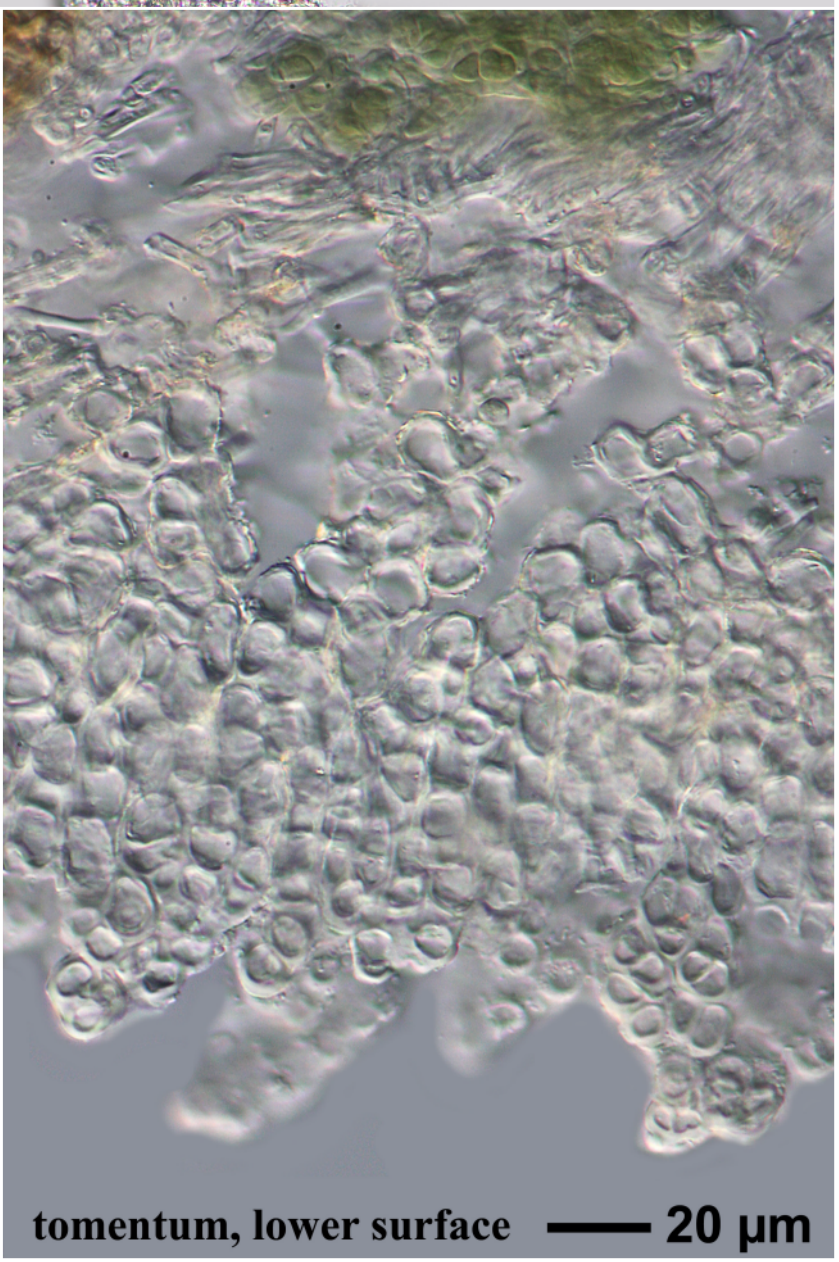


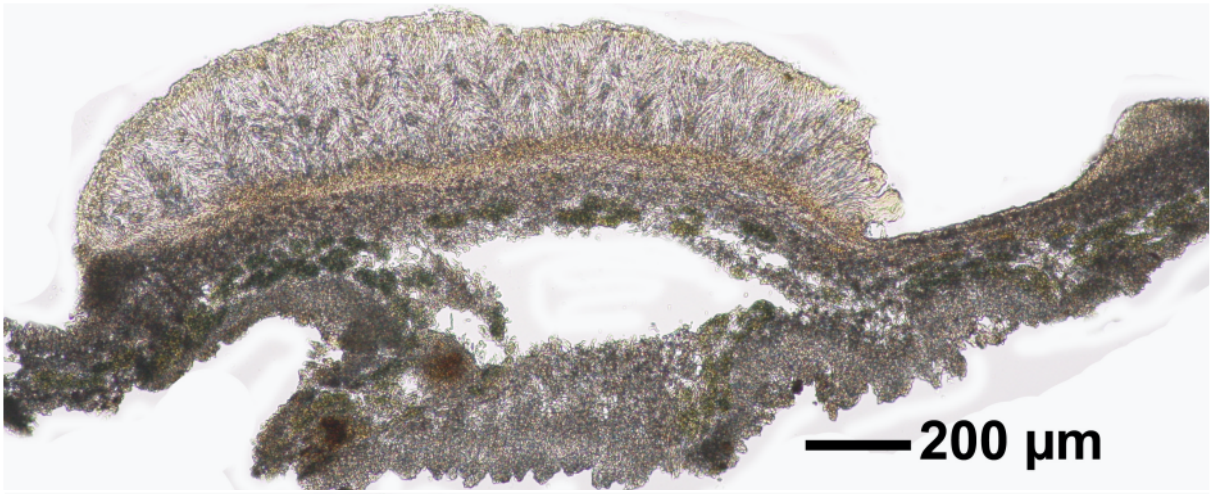



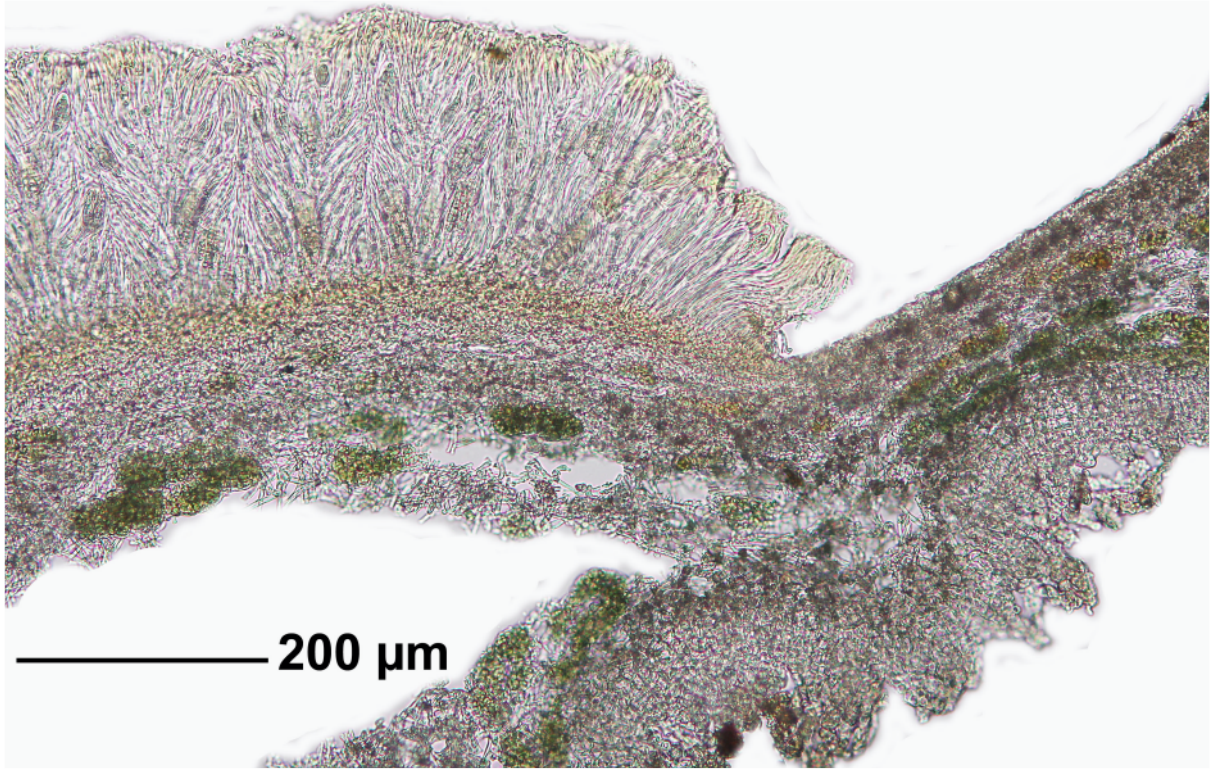

***Lobaria pallida***

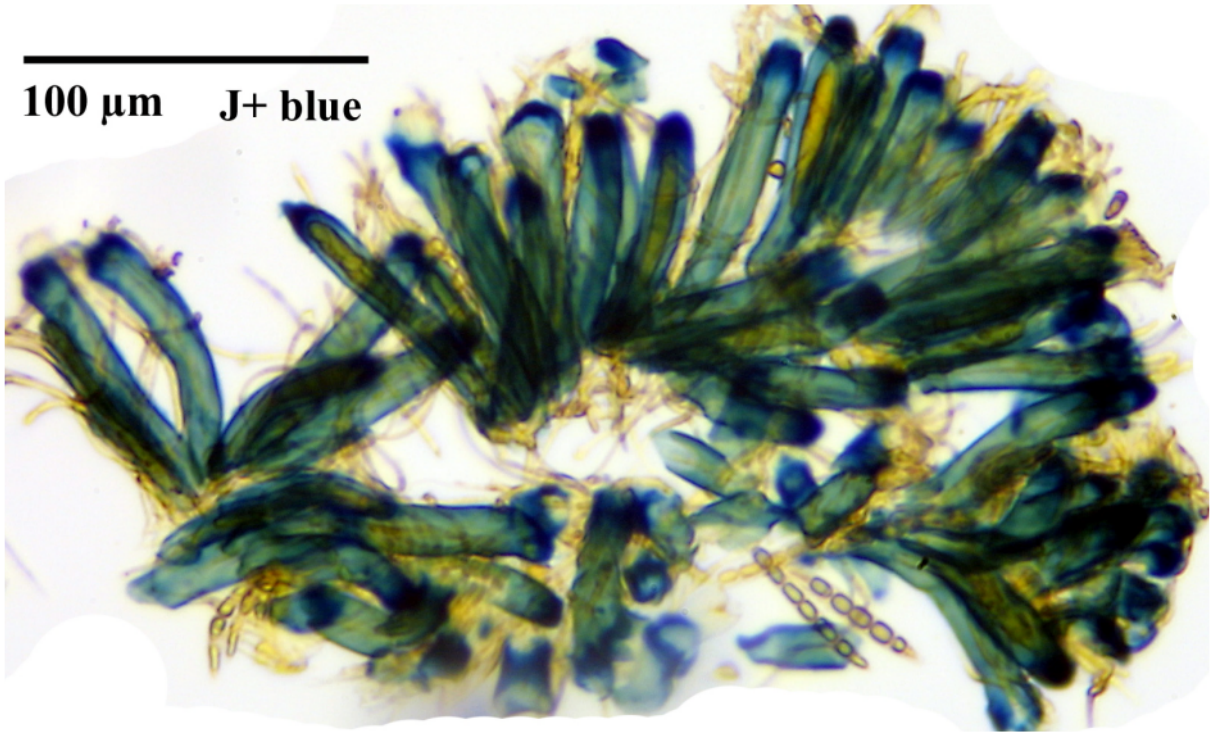


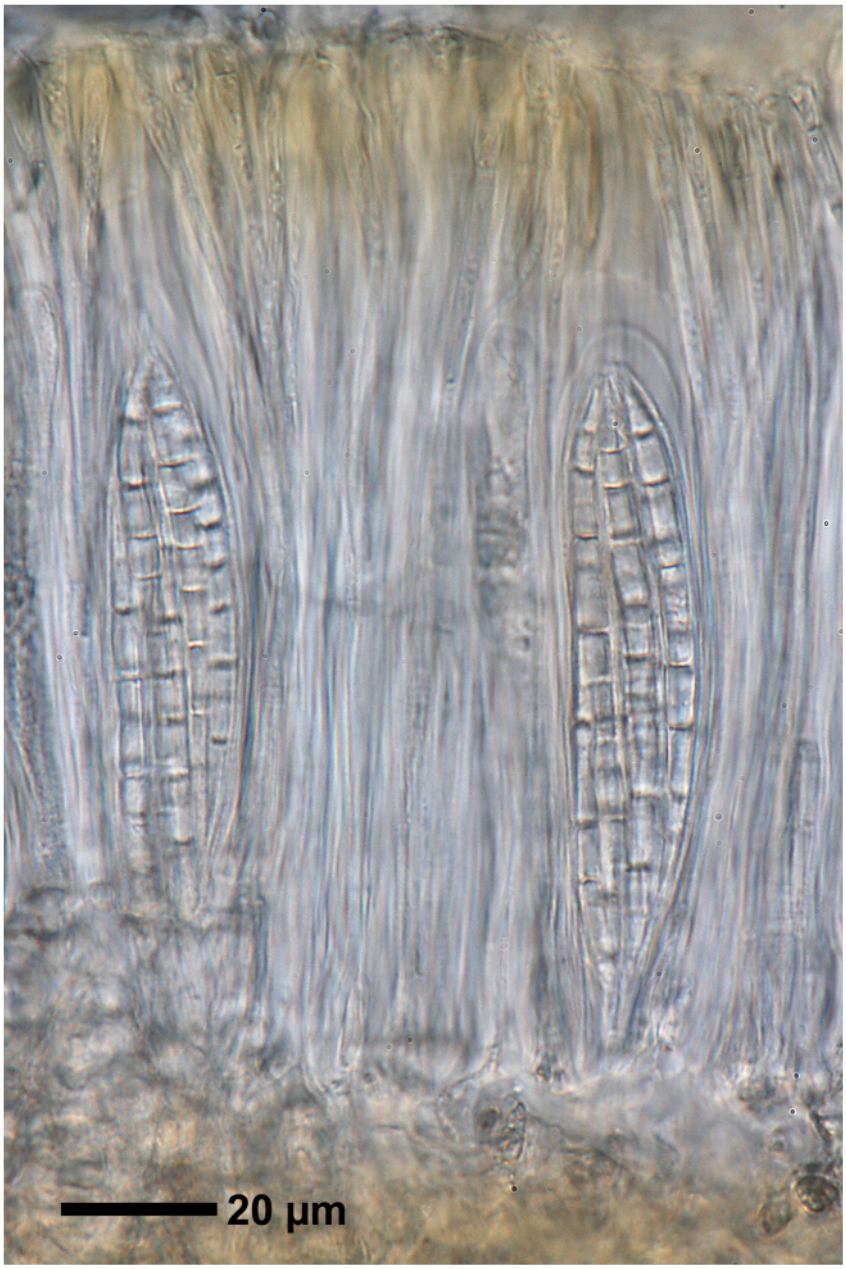

***Lobaria pallida***

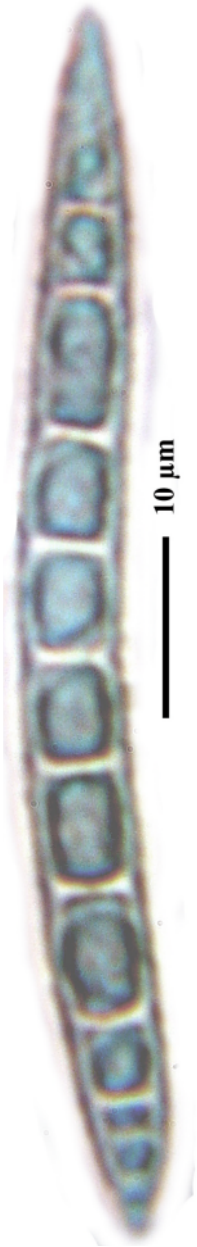


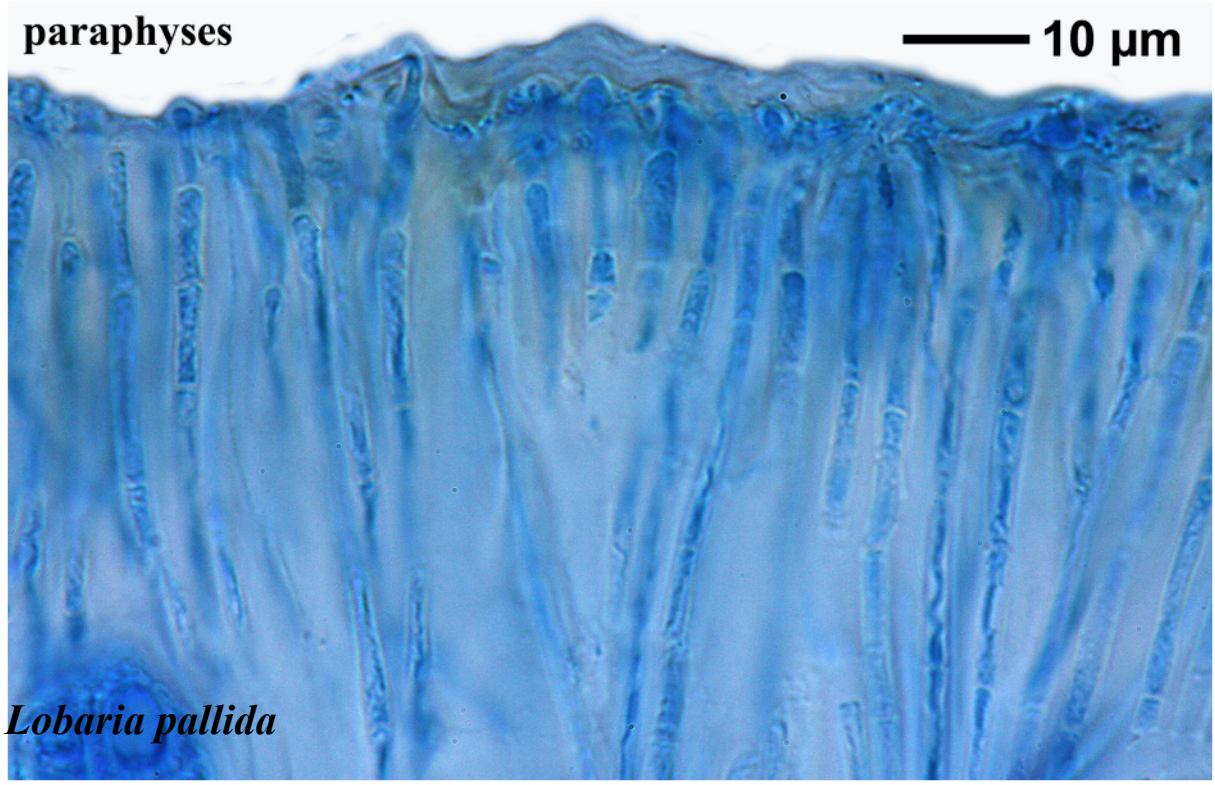




***Lobaria pallida***


20 µm


10 µm


paraphyses
10 µm
Lobaria pallida

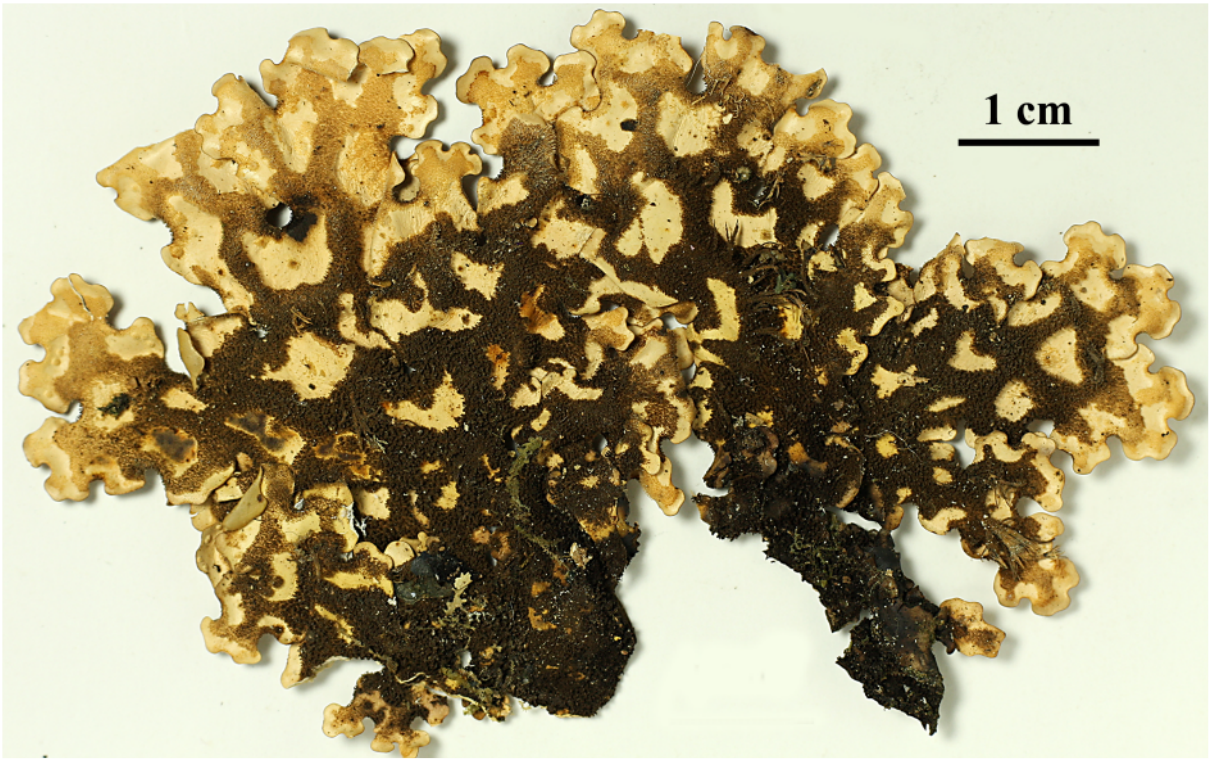
***Lobaria peltigera*** (Delile) Vain.

Thallus not reticulately ridged. Isidia and soredia absent. Tomentum on lower surface vain-like. Photobiont: grass-green algae. Ascospores 1-3-septate, 30-40 x 10-12 µm. Chemistry: thallus K+ yellowish, medulla K-, KC+ rose, gyrophoric, congyrophoric acids, pseudocyphellarin A. Lit. Wainio (1890, pars I, 199), Yoshimura (1998, Lobaria in Latin America)

[5516], Ecuador, Coynja, ca. 3000 m, an morschem Holz eines Zaunes. Leg. Ralf Erben 24.07.1977, det. A. Aptroot 2009.







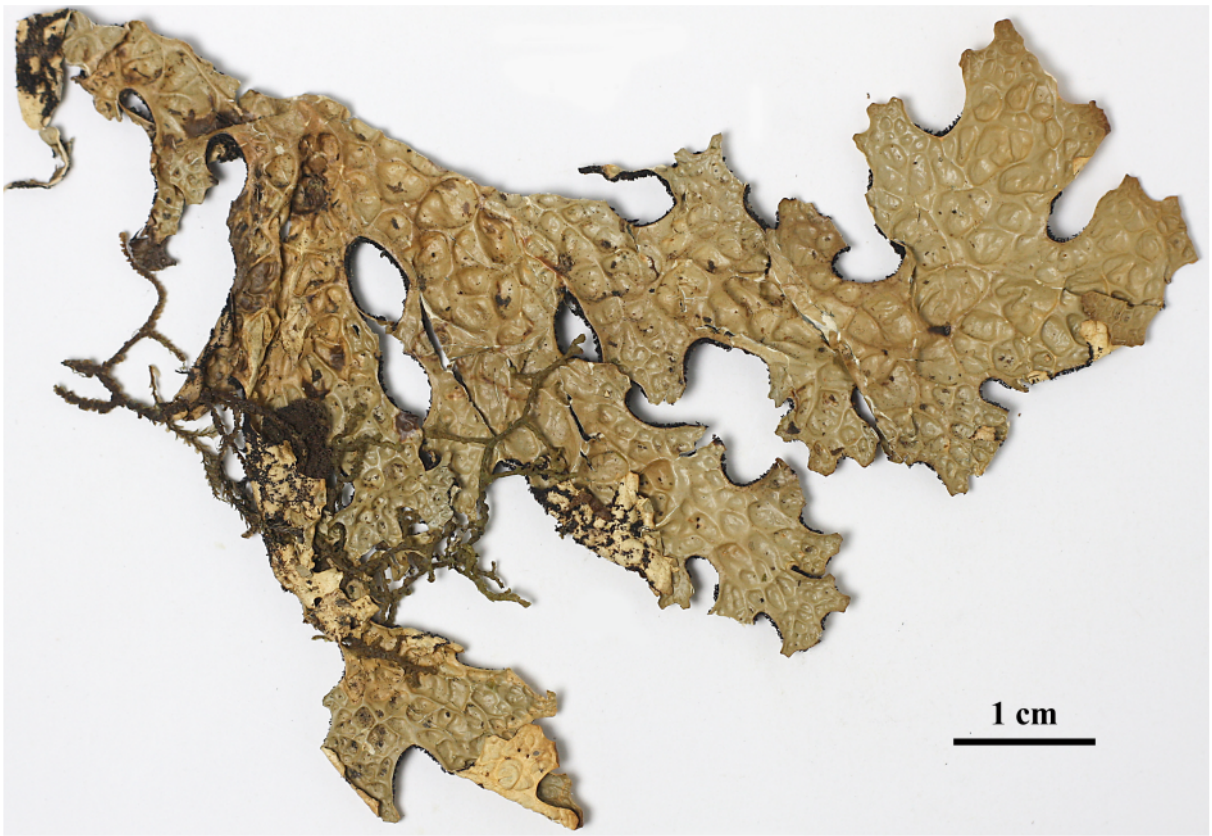


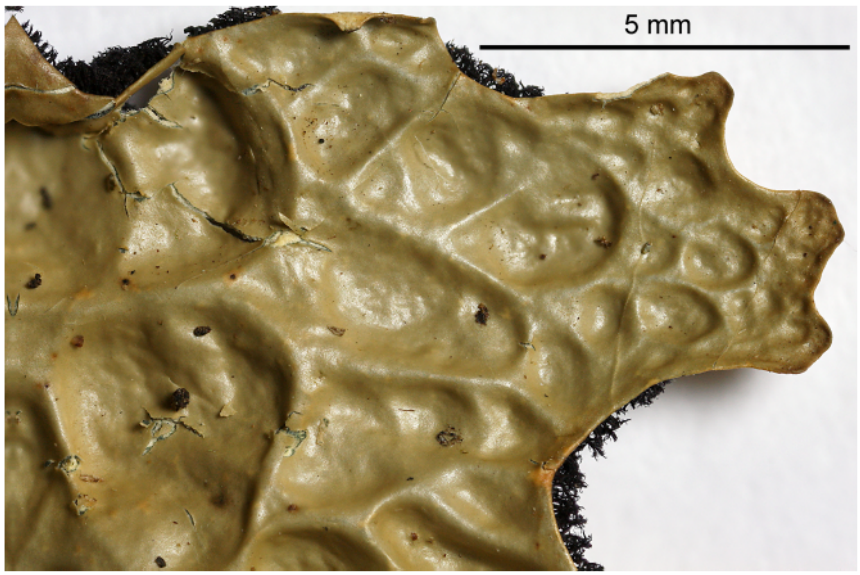
***Lobaria peltigera***

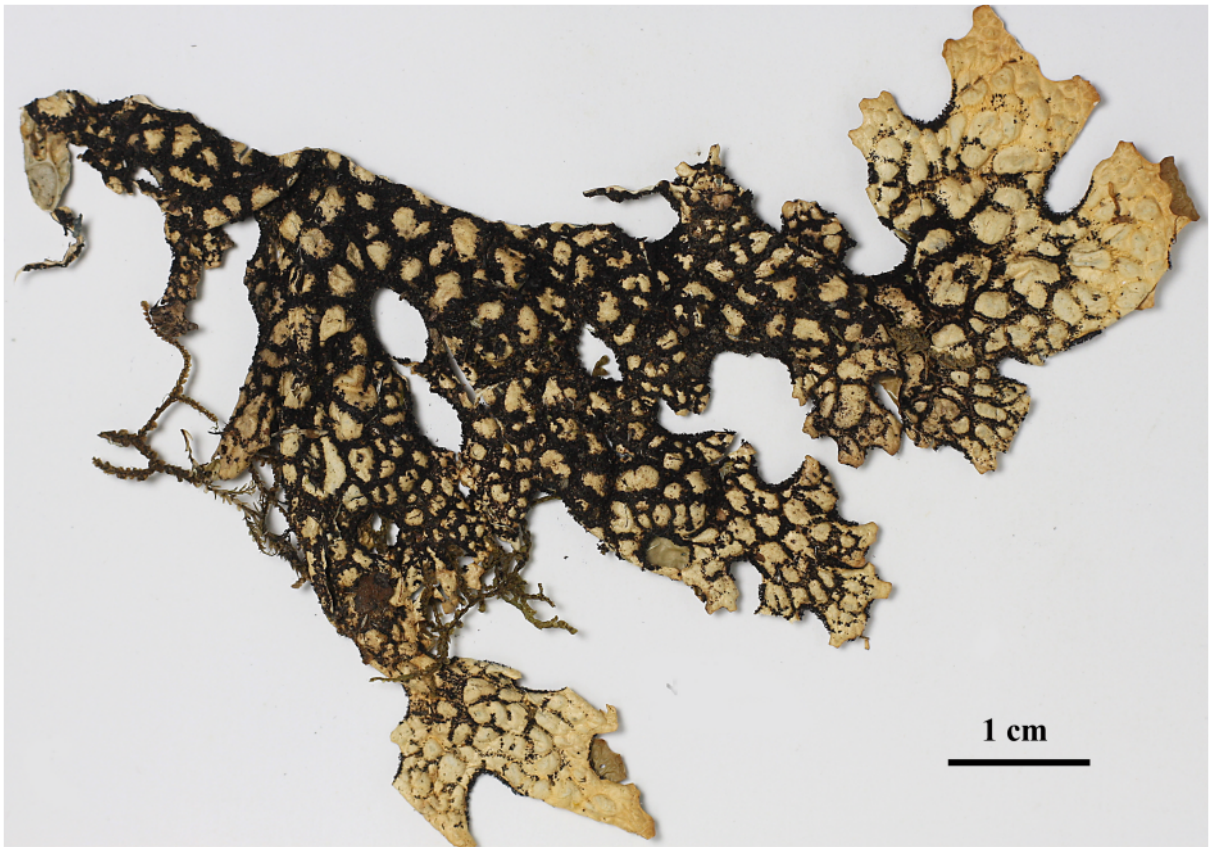
***Lobaria pseudopulmonaria*** Gyeln.

Thallus reticulately ridged. Isidia and soredia absent. Photobiont blue-green (*Nostoc*). Lower surface with blackish brown tomentum in grooves between swellings. Ascospores 3-septate, fusiform, c. 25 x 7-8 µm. Chemistry: thallus K-, medulla K+ yellow>orange, C-, KC-, P+ orange; norstictic (maj), stictic (±) acids, 2 triterpenoids, thelephoric (in the blackish tomentum) acid.

[6093], Philippinen, Mindanao, Provinz Cotabato, Mt. Apo, tropischer Bergregenwald am Lake Venado, c. 07°00.181' N, 125°16.166' E, 2200 m. Leg. Schumm 10.08.1999, det. Schumm 02.03.2000, test. Sipman 09.03.2000.









***Lobaria pseudopulmonaria***

Lichens are most diverse in the tropics, where they cover most trees.
This book gives detailed illustrations and descriptions of c. 210 species which occur in East Asia.
Most of the species are illustrated for the first time ever in colour. From each species, habitus pictures are presented, but also illustrations of microscopical details. In some cases where the species are variable in some characters, more than one specimen is fully illustrated.
All illustrated specimens were found recently by the first author.

New species in this book:
*Malmidea corallophora, Ocellularia protomegaspora*

CONTENTS

VOLUME ONE
Preface
Some frequently used abbreviations
*Anisomeridium - Lobaria* .....1-455

VOLUME TWO
*Malmidea - Trypethelium*..... 456-862
Literatur..... 863-874
Index to species and synonyms..... 875-881

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