Three New Species and Ten New Records of *Trypetheliaceae* (Ascomycota) from Sri Lanka

Author(s): André Aptroot & Gothami Weerakoon


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Three new species and ten new records of
*Trypetheliaceae* (Ascomycota) from Sri Lanka

André APTROOT\textsuperscript{a}\textsuperscript{*} & Gothamie WEERAKOON\textsuperscript{b}

\textsuperscript{a} ABL Herbarium, G.v.d.Veenstraat 107, NL-3762 XK Soest, The Netherlands.

\textsuperscript{b} Department of Life Sciences, The Natural History Museum, Cromwell Road, London, UK.

**Abstract** – The following three new species of *Trypetheliaceae* are described from Sri Lanka: *Astrothelium inspersoconicum*, *A. isohypocrellinum*, and *Polymeridium fernandoi*. Ten species are newly recorded from Sri Lanka: *Astrothelium flavoduplex*, *A. galligenum*, *A. scoria*, *A. straminicolor*, *Constrictolumina planorbis*, *C. porospora*, *Dictyomeridium proponens*, *Marcelaria cu mingii*, *Polymeridium jordanii*, and *Pseudopyrenula media*.

*Astrothelium / Constrictolumina / corticolous / Dictyomeridium / lichens / Marcelaria / Polymeridium / Pseudopyrenula*

**INTRODUCTION**

The family *Trypetheliaceae* is an almost strictly tropical corticolous lichen family. The first members were encountered near the end of the 18\textsuperscript{th} century on pieces of medicinal bark (mainly *Cinchona* for quinine) that were collected in South American forests (Zenker 1827). The conspicuous, often brightly coloured ascomata with complex structures intrigued the lichenologists of the time. Relatively few species were known for a long time, and from most species usually essentially the type was in existence. Recently, a monograph of the family was published (Aptroot & Lücking 2016), with which the number of known species doubled to 420. At the same time, based on regional levels of collecting intensity and variation in biomes, a further c. 380 species were predicted to exist in this family (Aptroot *et al.* 2016). Here we describe three of these, found during field work in 2017 in Sri Lanka, and we also report 10 already described species for the first time from Sri Lanka.

**MATERIAL AND METHODS**

Identification and descriptive work was carried out in Soest using an Olympus SZX7 stereomicroscope and an Olympus BX50 compound microscope with interference contrast, connected to a Nikon Coolpix digital camera. Sections have been mounted in tap water, in which also all measurements were taken.

* Corresponding author: Email: andreaptroot@gmail.com

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The chemistry of all specimens has been investigated by a UV bulb, and often a test with 10% K was made, generally on sections. The chemistry of many specimens, including many types of all newly described species, has been investigated by thin-layer chromatography (TLC) using solvent A (Orange et al. 2010).

RESULTS

New species

**Astrothelium inspersoconicum** Aptroot & Weerakoon, *sp. nov.*

*Mycobank Number:* MB827867

*Etymology:* The epithet refers to the inspersed hamathecium and the *conicum*-aggregate to which this species belongs.

*Type:* SRI LANKA, Roonakanda – Maguruganga, 6° 27’ N and 80° 19’ E, 249 m, site 7, 22 April 2017, *G. Weerakoon* 1394 (*holotype:* PDA; *isotype:* ABL and BM).

*Diagnosis:* *Astrothelium* similar to *A. cinnamomeum*, but hamathecium inspersed.

*Description:* Thallus corticate, smooth, somewhat shiny, continuous, covering areas up to 15 cm diam., c. 0.5 mm thick, pale greenish grey, with a c. 1 mm wide brown, glossy prothallus line, not inducing galls of the host bark. Ascomata pyriform, c. 0.4–0.7 mm diam., mostly aggregated with 4–10, mostly immersed (sometimes part of the black wall exposed) in the bark tissue in pseudostromata which are not or indistinctly raised above the thallus and partly whitish and decorticated, partly covered by thallus and up to 2 mm wide. Wall carbonized, up to c. 40 μm thick. Ostioles eccentric, fused, conical, black, covered by orange pruina. Hamathecium inspersed with oil globules. Asci with 8 ascospores. Ascospores hyaline, 3-septate, 23–25 × 7–8μm, fusiform, ends pointed, lumina diamond-shaped, not surrounded by a gelatinous layer. Secondary chemistry. Thallus UV–, K–; ostiole pruina K+ purple, UV+ red. TLC: A yellow to orange anthraquinone.

*Distribution:* Asia (Sri Lanka).

*Discussion:* This is only the second member of the core group of the genus, the *Astrothelium conicum*-group, with inspersed hamathecium. Species of the group are very numerous and often abundant (we examined almost a 1000 specimens), and they are almost never inspersed. The new species is closest to *A. cinnamomeum*, which was for a long time known as *A. conicum*. It would key out in Aptroot & Lücking (2016) in *Astrothelium* group 3 in couplet 38: Hamathecium inspersed (the two other taxa in couplet do not have an inspersed hamathecium).

**Astrothelium isohypocrellinum** Aptroot & Weerakoon, *sp. nov.*

*Mycobank Number:* MB827868

*Etymology:* The epithet refers to the the substance isohypocrellin.

*Type:* SRI LANKA, Kitulgala rain forest, site 41, 6° 58’ N and 80° 24’ E,189 m, 11 May 2017, *G. Weerakoon* 723 (*holotype:* PDA; *isotype:* ABL and BM).

*Diagnosis:* *Astrothelium* similar to a *Pyrenula* with hamathecium inspersed with red, K+ grass green pigment (isohypocrellin).
Description: Thallus corticate, smooth, somewhat shiny, continuous, covering areas up to 5 cm diam., c. 0.2 mm thick, olivaceous brown, with a c. 1 mm wide black prothallus line, not inducing galls of the host bark. Ascomata almost globose, c. 0.4–0.7 mm diam., single, immersed in hemispherical black pseudostromata which are single or occasionally two fused sideways, covered by translucent thallus cortex when young and exposed when older, distinctly raised above the thallus and c. 1 mm diam. Wall carbonized, up to c. 60 μm thick. Ostioles central, apical, flat, black, usually surrounded by a whitish zone. Hamathecium inspersed with red oil globules, which are not washing out in water, but react strongly KOH+ grass green (isohypocrellin); in addition, a yellowish pigment is present in the hamathecium which is washing out in water. Ascii with 8 ascospores. Ascospores hyaline, 3-septate, 24–26 × 6–7 μm, fusiform, ends pointed, lumina diamond-shaped, not surrounded by a gelatinous layer. Secondary chemistry. Thallus UV–, K–; hamathecium K+ grass green. TLC: isohypocrellin.

Discussion: This new species superficially resembles a Pyrenula. It is described here in Astrothelium because of the corticate thallus and the occasionally aggregated ascomata, but it might turn out to belong to Pseudopyrenula, in which also one species with corticate thallus is known. It is only the fifth member of the Trypetheliaceae with isohypocrellin, and the first one where this substance is inspersed in the hamathecium; the other species have the substance on the thallus, in the medulla of the pseudostromata or only in the ostiole (Aptroot et al. 2013; Aptroot & Lücking 2016). It would key out in Aptroot & Lücking (2016) in Astrothelium group 1 in couplet 18: Pigment in hamathecium, K+ grass green due to isohypocrellin.

Polymeridium fernandoi Aptroot & Weerakoon, sp. nov. Figs 1E-G

Mycobank Number: MB827870

Etymology: This new species honours the founder of Dilmah Conservation Mr. Meril J. Fernando who has funded lichen research projects conducted in Sri Lanka in 2015 and 2017, including the publication of “Fascinating Lichens of Sri Lanka”.

Type: SRI LANKA, Sinharaja rain forest, Mulawella trail, 6˚ 25’ N and 80˚ 25’ E, 576 m, site 53, 16 May 2017, G. Weerakoon 890 (holotype: PDA; isotype: ABL).

Diagnosis: Polymeridium similar to P. fl avothecium, but ascospores 6–8-septate, 35–39 × 7.5–8 μm, hamathecium K+ violet and ostioles apical.

Description: Thallus not corticate, smooth, dull, continuous, covering areas up to at least 5 cm diam., c. 0.2 mm thick, whitish grey. Ascomata hemispherical, c. 0.3–0.5 mm diam., single, black, erumpent to distinctly raised above the thallus. Wall carbonized, up to c. 80 μm thick. Ostioles central, apical, flat, dark brown. Hamathecium inspersed with yellow oil globules that are KOH+ violet. Ascii with 8 ascospores. Ascospores hyaline, 6–8-septate, 35–39 × 7.5–8 μm (swelling to 42 μm long in KOH), slightly clavate, ends rounded, surrounded by a c. 1.5 μm thick gelatinous layer. Secondary chemistry. Thallus UV–, K–. No TLC performed.

Distribution: Asia (Sri Lanka).

Discussion: This would key out in Aptroot & Lücking (2016) in the Polymeridium key in couplet 38: Hamathecium yellow; ascospores 6–8-septate, 35–39 × 7.5–8 μm; ostioles apical. It is closest to P. fl avothecium R.C. Harris, that differs in all these characters, except the yellow inspersion, which is however due to another substance it is reacting K+ red (Aptroot & Lücking 2016), not violet.
New records of Trypetheliaceae to Sri Lanka

_Astrothelium flavoduplex_ Aptroot & M. Cáceres: Hurulu forest reserve, 8° 04’ N and 80° 46’ E, 213 m, site 67, 30 May 2017, G. Weerakoon 1353 (PDA, ABL, BM).

Trypetheliaceae (Ascomycota) from Sri Lanka

Astrothelium scoria (Fée) Aptroot & Lücking: Home garden adjacent to Kitulgala rain forest, 7° 31’ N and 80° 44’ E, 1188 m, site 12, 25 April 2017, G. Weerakoon 1396 (PDA, ABL, BM); Knuckles mountain range, 6° 27’ N and 80° 19’ E, 249 m, G. Weerakoon 114 (PDA, ABL, BM); Home garden in Uduwela - Matugama, 6° 32’ N and 80° 08’ E, 68 m, 21 April 2017, G. Weerakoon 403 (PDA, ABL, BM).


Constrictolumina planorbis (Ach.) Lücking, M.P. Nelsen & Aptroot: Hurulu forest reserve, 8° 07’ N and 80° 48’ E, 140 m, site 68, 30 May 2017, G. Weerakoon 1339 (PDA, ABL, BM).


Dictyomeridium proponens (Nyl.) Aptroot, M.P. Nelsen & Lücking: Leveland tea estate, 7° 08’ N and 8° 41’ E, 408 m, site 8, 24 April 2017, G. Weerakoon 168 (PDA, ABL, BM).

Marcelaria cumingii (Mont.) Aptroot, M.P. Nelsen & Parnmen: Hurulu forest reserve, 8° 18’ N and 80° 51’ E, 128 m, site 62, 29 May 2017, G. Weerakoon 194 (PDA, ABL, BM); site 63, 30 May 2017, G. Weerakoon 1280 (PDA, ABL).


Pseudopyrenula media Aptroot & Diederich: Knuckles mountain range, 7° 31’ N and 80° 43’ E, 1344 m, site 17, 26 April 2017, G. Weerakoon 3 (PDA, ABL, BM); Sinharaja rain forest, Mulawella trail, 6° 25’ N and 80° 24’ E, 483 m, site 53, 18 May 2017, G. Weerakoon 703 (PDA, ABL).

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REFERENCES


