The genus *Asterostomula* from Kerala, India, including one new species

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Asterostomula is the anamorph of *Echidnodes* and *Prillieuxina* and comprises 13 species and one variety. The present paper gives an account of two species; *Asterostomula syzygii* sp. nov. is described as a new species on *Syzygium* sp., while *A. loranthi* is reported for the first time from India. The species are characterized and illustrated with line drawings.

Key words – Anamorph – Black mildew –New record – New species

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Introduction

Asterostomula is reported be to the anamorph of *Prillieuxina* Arn. (Hofmann & Pipenbring 2008) and *Echidnodes* Theiss. & Syd. (Hyde et al. 2011) and is thought to be an obligate biotroph. Species are characterised by superficial, septate mycelium lacking appressoria (Batista & Ciferri 1959). Pycnothyria are scutate, orbicular, with radiating cells on the upper surface, stellately dehiscing at the centre, with a crenate to fimbriate margin (Batista & Ciferri 1959). Pycnothyriospores are brown, unicellular, ovate, clavate, and pyriform to cylindrical. The type species of the genus is *A. loranthi* Theiss. (Theissen 1916). In addition to the type, Theissen (1916) introduced *A. lepidotricha* Theiss., while Sydow (1934) introduced *A. pinatubensis* Syd., from the Philippines. Petrak (1950) introduced *A. patula* Petr. and *A. puyana* Petr. from Eucador, while Batista & Ciferri (1959) gave an account of 11 known species at this time. Subsequently, *A. bauhiniae* Bat. & J.L. Bezerra and *A. sycopsidis* Petr. were added to this genus (Petrak 1959, Batista et al. 1960). Species are thought to be host-specific (*fide* Hofmann & Pipenbring 2008) and thus species are generally differentiated based on host occurrence. During our investigation in the Western Ghats, we came across two species of the genus *Asterostomula*, which have not previously been reported from India. One is previously described and the other is described here as new. A key and synopsis is provided to all 13 species and one infraspecific taxa to facilitate their identification.

Methods

Scrapes made from colonies were mounted in 5% KOH, later replaced by lactophenol to clear the melanin pigment to observe the septa. To study the colonies *in situ*, a nail polish technique was used (Hosagoudar & Kapoor 1985).

Taxonomy

Asterostomula loranthi Theiss., Ann. Mycol. 14: 270, 1916. Fig. 1

Colonies amphigenous, subdense to dense, up to 4 mm in diameter, confluent. Hyphae flexuous to crooked, branching irregular at acute to wide angles, closely

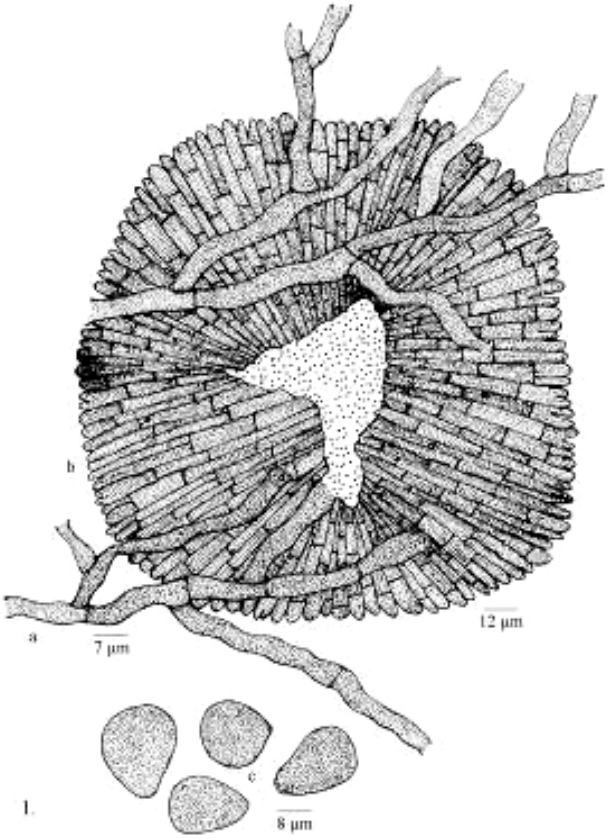

Fig. 1 – *Asterostomula loranthi* (TBGT 4564). **a** Mycelium without appressoria. **b** Thyriothecium. **c** Pycnothyriospores.

reticulate, cells 25–40 × 3–5 µm. Appressoria lacking. Pycnothyria many, orbicular, joined together marginally, up to 180 µm in diameter, dehiscing stellately at the centre, margin crenate to fimbriate, fringed hyphae flexuous; pycnothyriospores unicellular, pyriform, ovate, 20–25 × 12–17 µm, wall smooth.

Material examined – India, Kerala, Thiruvananthapuram, on leaves of *Loranthus* sp. (Loranthaceae), 14 February 2008, Jacob-Thomas & K. Anilkumar TBGT 4564. Part of the collection has been deposited in HCIO, New Delhi.

Asterostomula loranthi is reported here for the first time from India (Bilgrami et al. 1991, Jamaluddin et al. 2004).

Asterostomula syzygii V.B. Hosagoudar, A. Sabeena et Jacob-Thomas **sp. nov.** Fig. 2 MycoBank 561062

Coloniae hypophyllae, tenues vel densae, ad 2 mm diam., confluentes. Hyphae flexuosae vel anfractuae, irregulariter acuteque vel laxe ramosae, laxe vel arte reticulatae, cellulae

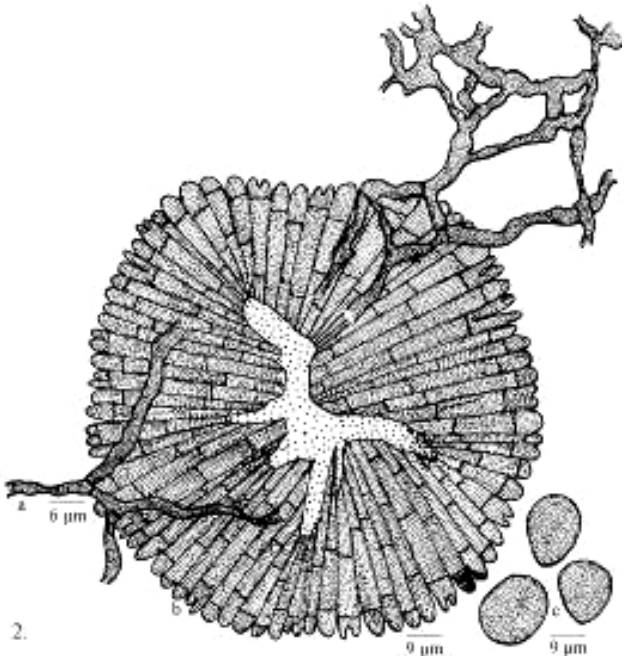

Fig 2 – *Asterostomula syzygii* sp. nov. (TBGT 3474) on leaves of *Syzygium* sp. **a** Mycelium without appressoria. **b**. Thyriothecium. **c**. Pycnothyriospores.

13–40 × 2–3 µm. Appresoria nulla. Pycnothyria dispersa, orbicularis, ad 125 µm diam., stellatim dehiscentes ad centre; pycnothyriosporae globosae vel ovatae, brunneae 14–19 × 11–14 µm.

Colonies hypophyllous, thin to dense, up to 2 mm in diameter, confluent. Hyphae flexuous to crooked, branching irregular at acute to wide angles, loosely to closely reticulate, cells 13–40 × 2–3 µm. Appresoria absent. Pycnothyria scattered, orbicular, up to 125 µm in diameter, dehiscing stellately at the centre; pycnothyriospores globose to ovate, brown, 14–19 × 11–14 µm.

Material examined – India, Kerala, Thiruvananthapuram, Peppara Wildlife Sanctuary, on leaves of *Syzygium* sp. (Myrtaceae), 18 November 2007, Jacob-Thomas (TBGT 3474, **holotype**). Part of the collection has been deposited in HCIO, New Delhi.

There is no record of the genus *Asterostomula* on members of the family Myrtaceae and hence, we introduce it as a new species.

Discussion

Asterostomula species are obligate biotrophs and thus believed to be host specific. It has not been possible to culture these taxa to

Table 1 Synopsis of important characters of *Asterostomula* species.

Species	Pycnothyria	Pycnothyriospores
Asterostomula bauhiniae Bat. & J.L. Bezerra	-	-
A. caperoniae (Speg.) Bat. & Ciff.	90–100 µm	18–22 × 10–12 µm
A. lepidotricha Theiss.	50–70 µm	19–23 × 12–14 µm
A. loranthi Theiss.	up to 180 µm	20–25 × 12–17 µm
A. patula Petrak	40–80 µm	15–23 × 10–18 µm
A. pelladensis (P. Henn.) Bat. & Vital	60–80 µm	15–20 × 10–13 µm
A. pinatubensis Sydow	50–90 µm	17–22 × 11–14 µm
A. premnae Bat. & Nasc.	55–105 µm	-
A. pseudospondiadis Bat. & Maia	85–110 µm	21–37 × 10–19 µm
A. puyana Petrak	80–150 µm	15–39 × 8–12 µm
*A. subreticula*ta (Speg.) Bat. & Ciff.	100–150 µm	20–24 × 14–16 µm
A. subreticulata var. *microspora* (Speg.) Bat. & Ciff.	100–150 µm	16–20 × 1012 µm
A. sycopsidis Petrak	60–100 µm	14–19 × 12–16 µm
A. syzygii sp. nov.	up to 125 µm	14–19 × 11–14 µm

date. A key and synopsis to species is provided (Table 1).

Key to the species of *Asterostomula*

1. On *Bauhinia* .....*A. bauhiniae*
1. On other hosts.....2

2. On Hammamelidaceae .....*A. sycopsis*
2. On other hosts.....3

3. Pycnothyriospores more than 30 µm long . 4
3. Pycnothyriospores less than 30 µm long.... 5

4. On Anacardiaceae .....*A. pseudospondiadis*
4. On Euphorbiaceae .....*A. puyana*

5. On Myrtaceae .....*A. syzygii*
5. On other families.....6

6. On *Cestrum* 7
6. On other hosts.....8

7. Spores 20–24 × 14–16..... *A. subreticulata*
7. Spores 16–20 × 10–12 µm ....*A. subreticulata* var. *microspora*

8. Pycnothyria more than 100 µm indiam.....9
8. Pycnothyria less than 100 µm in diam. 10

9. On *Premna* .....*A. premnae*
9. On *Caperonia* hosts..... *A. caperonia*

10. Spores more than 15 µm broad.....11
10. Spores less than 15 µm broad 12

11. On *Loranthus* .....*A.loranthi*
11. On Buettneria..... *A. patula*

12. On *Ilex*..... *A. pinatubensis*
12. On other hosts 13

13. On *Cissipourea* .....*A. pelladensis*
13. On undetermined hosts ..... *A. lepidotricha*

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