
Five *Asteridiella* species from Kodagu, Karnataka, India

Hosagoudar VB^{1*}, Jagath Thimmaiah C² and Jayashankara M²

¹Tropical Botanic Garden and Research Institute, Palode 695 562, Thiruvananthapuram, Kerala.

²Department of Studies and Research in Microbiology, Mangalore University post Graduate Centre, Cauvery Campus, Madikeri 571 201, Kodagu, Karnataka

Hosagoudar VB, Jagath Thimmaiah C, Jayashankara M 2011 – Five *Asteridiella* species from Kodagu, Karnataka, India. Mycosphere 2(6), 611-615, Doi 10.5943/mycosphere/2/6/1

This paper gives an account of five *Asteridiella* species collected from Kodagu, Karnataka, India. Of these, *Asteridiella chowrirae*, *Asteridiella homaligena*, *Asteridiella madikeriensis* and *Asteridiella viticis-negundoii* are new species, while *Asteridiella depokensis* is reported for the first time from India.

Key words – black mildews – Meliolaceae – new species

Article Information

Received 1 November 2011

Accepted 11 November 2011

Published online 19 November 2011

*Corresponding author: VB Hosagoudar – e-mail – vbhosagoudar@rediffmail.com

Introduction

Kodagu (or Coorg) is a small district in Karnataka State with an area of 4120 sq km. It is the largest coffee producing area in India, located at an altitude of 750–1100 m above sea level. The annual rainfall of 1000–2500 mm and temperatures of 19–22°C, favour the luxuriant growth of foliicolous fungi (Hosagoudar et al. 2006).

Methods

Collection methodology and mounting techniques are in accordance with Hosagoudar (1996, 2008)

Results

Taxonomy

Asteridiella chowrirae Hosagoudar, Thimmaiah & Jayashankara, **sp. nov.** (Plate 1)
Mycobank: 563634

Coloniae epiphyllae, densae, ad 3 mm diam. Hyphae subrectae vel flexuosae, alternate vel opposite acuteque vel laxe ramosae, laxe reticulatae, cellulae 23–25 × 6–8 µm.

Appressoria alternata, antrorsa, subantrorsa vel reflexa, recta vel varie curvula, 22–30(–48) µm longa; cellulae basilares cylindratae vel cuneatae, raro ad 2-septatae, 6–12(–20) µm longae; cellulae apicales ovatae, globosae, cylindratae, integrae, angularis vel raro sublobatae, paucae attenuatae ad apicem, 16–23 × 12–20 µm. Phialides numerosae, producentes in hyphis separatis sed mixtus appressoriis, alternatae vel oppositae, ampulliformes, 15–30 × 5–8 µm. Perithecia dispersa, ad 120 µm diam.; cellulae peritheciales conoideae, projectus, attenuatae ad apicem, ad 20 µm altae; ascosporae rectae vel leniter curvulae, oblongae vel cylindratae, 4-septatae, constrictus ad septatae, 42–45 × 16–18 µm.

Colonies epiphyllous, dense, up to 3 mm in diameter. Hyphae substraight to flexuous, branching alternate to opposite at acute to wide angles, loosely reticulate, cells 23–25 × 6–8 µm. Appressoria alternate, antrorse, subantrorse to reflexed, straight to variously curved, 22–30(–48) µm long; stalk cells cylindrical to cuneate, rarely up to 2-

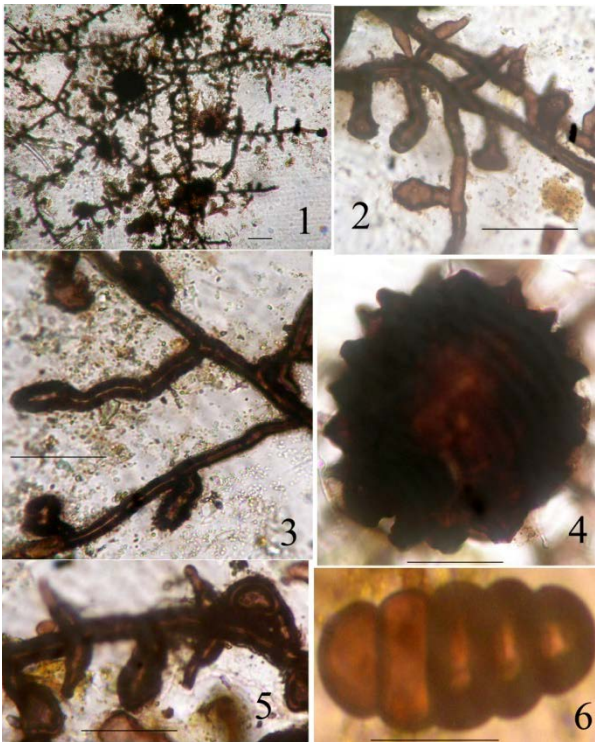


Plate 1 – *Asteridiella chowrirae*. 1. Fungal colony. 2. Appressorial mycelium. 3. Elongated basal cell of the appressorium. 4. Perithecium with perithecial wall cells. 5. Phialides mixed with appressoria. 6. Ascospore. Bars = 24 μ m

septate, 6–12(–20) μ m long; head cells ovate, globose, cylindrical, entire, angular to rarely sublobate, very few attenuated at the apex, 16–23 \times 12–20 μ m. Phialides numerous, apparently borne on a separate mycelium but mixed with appressoria, alternate to opposite, ampulliform, 15–30 \times 5–8 μ m. Perithecia scattered, up to 120 μ m in diam.; perithecial wall cells conoid, projected, attenuated at the apex, up to 20 μ m high; ascospores straight to slightly curved, oblong to cylindrical, 4-septate, constricted at the septa, 42–45 \times 16–18 μ m.

Material examined: INDIA, Karnataka, Kodagu, Hoddur, Chowrira House, on leaves of *Euphorbia pulcherrima* Willd. ex Klotz. (*Poinsettia pulcherima* Graham) (Euphorbiaceae), 29 November 2009, C. Jagath Thimmaiah TBGT 5708 (holotype).

Asteridiella antidesmatis Hansf., *A. cleistanthi* Hansf., *A. drypeticola* Hansf., *A. malloticola* Yamam., *A. sapii* Hansf. and *A. subapoda* Syd. have the same digital formula 3101.4220. Of these, it is similar to *A. sapii*

Syd. in having entire to sublobate head cells of the appressoria but differs from it in having longer and often septate stalk cells of the appressoria and the head cells are entire, angular to sublobate (Hansford 1961).

Asteridiella depokensis Hansf., *Sydowia* 10: 47, 1957; *Sydowia Beih.* 2: 688, 1961. (Plate 2)

Colonies epiphyllous, dense, up to 7 mm in diameter. Hyphae flexuous to crooked, branching alternate to opposite at acute to wide angles, closely reticulate, cells 12–17 \times 6–8 μ m. Appressoria alternate, closely placed, antrorse to closely antrorse, often appressed to the hyphae, straight to curved, 14–24 μ m long; stalk cells cylindrical to cuneate, 4–13 μ m long; head cells globose, clavate, distinctly angular to truncate, rarely rounded, 9–16 \times 12–18 μ m. Phialides many, mixed with appressoria, ampulliform, 16–20 \times 6–7 μ m. Perithecia scattered, up to 130 μ m in diam.; perithecial cells mammiform, broadly rounded at the apex, up to 12 μ m long; ascospores oblong to cylindrical, 4-septate, constricted at the septa, 35–38 \times 14–16 μ m.

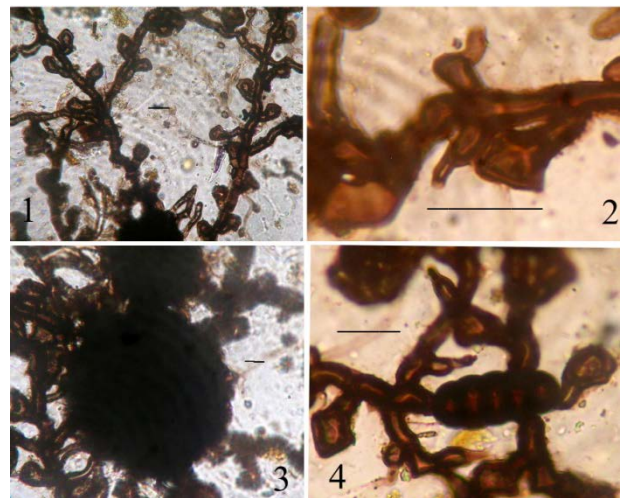


Plate 2 – *Asteridiella depokensis*. 1. Appressorium. 2. Phialide. 3. Ascospores. 4. Perithecial wall cells. Bars = 8 μ m

Material examined: INDIA, Karnataka, Kodagu, Hoddur, on leaves of *Vitex negundo* L. (Verbenaceae), 16 November 2009, C. Jagath Thimmaiah TBGT 5698.

Angular head cells of the appressoria distinguish this species from others.

Asteridiella homaligena Hosagoudar, Thimmaiah & Jayashankara, sp. nov. (Plate 3) MycoBank: 563635

Coloniae amphigenae, plerumque epiphyllae, subdensae, ad 4 mm diam. Hyphae rectae vel subrectae, alternate vel opposite acuteque vel subacuteque ramosae, laxe reticulatae, cellulae 17–25 × 6–9 µm. Appressoria alternata, ad 5% opposita, antrorsa vel patentia, 16–25 µm longa; cellulae basillares cylindratae vel cuneatae, 3–6 µm longae; cellulae apicales ovatae vel obovatae, integrae vel leniter angularis, 14–20 × 11–15 µm. Phialides appressorii mixtus, alternatae vel oppositae, ampulliformes, 21–27 × 4–9 µm. Perithecia dispersa, ad 130 µm diam., cellulae peritheciales mammiformes, ad 15 µm altae; ascosporae obovoideae, oblongae vel cylindratae, 4-septatae, constrictus ad septatae, 37–40 × 13–16 µm.

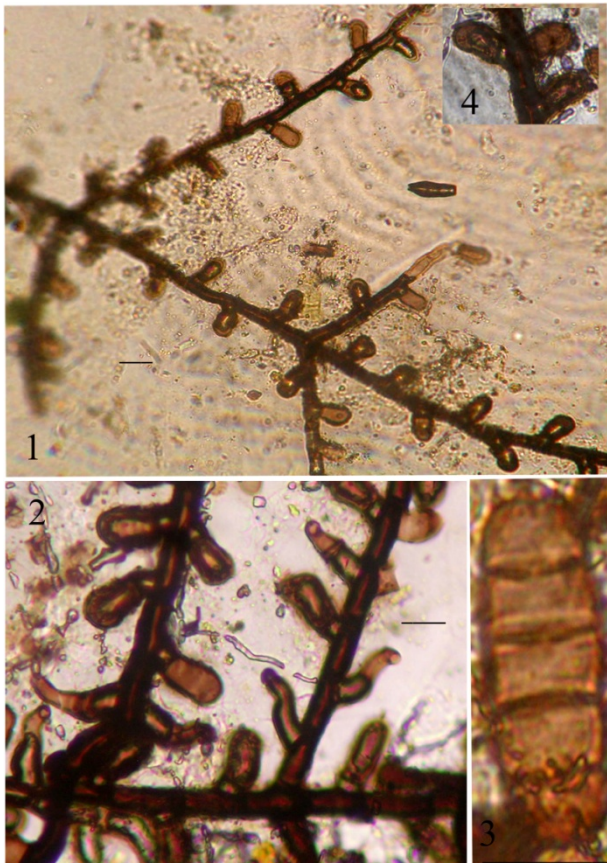


Plate 3. *Asteridiella homaligena*. 1. Fungal colony. 2. Phialides mixed with appressoria. 3. Ascospore. 4. Opposite appressoria. Bars = 12 µm

Colonies amphigenous, mostly epiphyllous, subdense, up to 4 mm in diameter. Hyphae straight to substraight, branching alternate to opposite at acute to subacute angles, loosely reticulate, cells 17–25 × 6–9 µm. Appressoria alternate, about 5% opposite, antrorse to spreading, 16–25 µm long; stalk cells cylindrical to cuneate, 3–6 µm long; head cells ovate to obovate, entire to slightly angular, 14–20 × 11–15 µm. Phialides mixed with appressoria, alternate to opposite, ampulliform, 21–27 × 4–9 µm. Perithecia scattered, up to 130 µm in diam., perithecial wall cells mammiform, up to 15 µm high; ascospores obovoidal, oblong to cylindrical, 4-septate, constricted at the septa, 37–40 × 13–16 µm.

Material examined: India, Karnataka, Kodagu, Hoddur, River side, on leaves of *Homalium zeylanicum* Benth. (Flacourtiaceae), 22 August 2009, C. Jagath Thimmaiah TBGT 5696 (holotype).

Asteridiella homalii-angustifolii (Deighton) Hansf. is known on *Homalium angustifolium* from Sierra Leone. However, the present new species differs from it in having entire head cells of the appressoria in contrast to lobate ones (Hansford 1961, Hosagoudar 1996, 2008, Hu et al. 1996, 1999).

Asteridiella madikeriensis Hosagoudar, Thimmaiah & Jayashankara, sp. nov. (Plate 4) MycoBank: 563636

= *Asteridiella depokensis sensu* Hosag., *Meliolales of India*, vol. 2: 127, 2008 (*non* Hansford 1957).

Coloniae epiphyllae, densae, ad 2 mm diam. Hyphae flexuosae vel anfractuae, alternate, opposite vel irregulariter acuteque ramosae, laxe vel arte reticulatae, cellulae 19–21 × 8–10 µm. Appressoria alternata, antrorsa, subantrorsa, retrorsa, recta vel varie curvula, 24–37 µm longa; cellulae basillares cylindratae vel cuneatae, 8–10 µm longae; cellulae apicales ovatae, oblongae, globosae, angularis vel variae sublobatae, 16–21 × 12–14 µm. Phialides appressorii mixtus, alternatae vel oppositae, ampulliformes, 19–23 × 6–8 µm. Perithecia dispersa, ad 196 µm diam.; cellulae peritheciales conoideae vel mammiformes, ad 24 µm longae; ascosporae ellipsoideae, 4-

septatae, constrictus ad septatae, 41–45 × 16–18 µm.

Colonies epiphyllous, dense, up to 2 mm in diameter. Hyphae flexuous to crooked, branching alternate, opposite to irregular at acute angles, loosely to closely reticulate, cells 19–21 × 8–10 µm. Appressoria alternate, antrorse, subantrorse, retrorse, straight to variously curved, 24–37 µm long; stalk cells cylindrical to cuneate, 8–10 µm long; head cells ovate, oblong, globose, angular to variously sublobate, 16–21 × 12–14 µm. Phialides mixed with appressoria, alternate to opposite, ampulliform, 19–23 × 6–8 µm. Perithecia scattered, up to 196 µm in diam.; perithecial wall cells conoid to mammiform, up to 24 µm long; ascospores ellipsoidal, 4-septate, constricted at the septa, 41–45 × 16–18 µm.

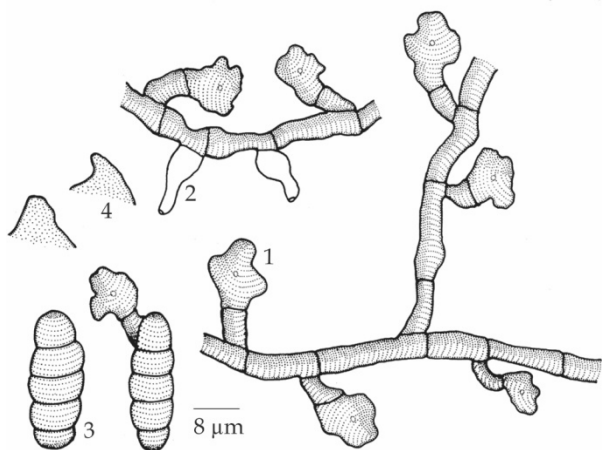


Plate 4. *Asteridiella madikeriensis*. 1. Appressorium. 2. Phialide. 3. Ascospores. 4. Perithecial wall cells.

Material examined: India, Karnataka, Kodagu, Madikeri, Nishane motta, on leaves of *Premna* sp. (Verbenaceae), 14 November 2003, V.B. Hosagoudar & al. HClO 46240 (holotype), TBGT 1652 (isotype).

This species differs from *Asteridiella depokensis* in having sublobate head cells of the appressoria (Hosagoudar 2008).

Asteridiella viticis-negundoii Hosagoudar, Thimmaiah & Jayashankara, sp. nov. (Plate 5) MycoBank: 563637

Coloniae epiphyllae, densae, ad 3 mm diam. Hyphae rectae, subrectae vel flexuosae, alternate vel opposite acuteque vel laxae

ramosae, laxae reticulatae, cellulae 18–23 × 7–10 µm. Appressoria alternata, antrorsa vel subantrorsa, recta vel curvula, 20–32 µm longa; cellulae basiliares cuneatae vel cylindratae, 6–12 µm longae; cellulae apicales globosae, ovatae, clavatae vel cylindratae, plerumque angularis, pauca sublobatae, raro integrae, truncatae, 15–23 × 11–20 µm. Phialides numerosae, producentes in hyphis separatis sed appressoriis mixtus, plerumque oppositae, saepe unilateralis, ampulliformes, 16–22 × 5–7 µm. Perithecia dispersa, globosa, ad 150 µm diam.; cellulae peritheciales mammiformes vel conoideae, attenuatae ad apicem, ad 22 µm longae; ascospores oblongae vel cylindratae, 4-septatae, constrictus ad septatae, 48–50 × 18–21 µm.

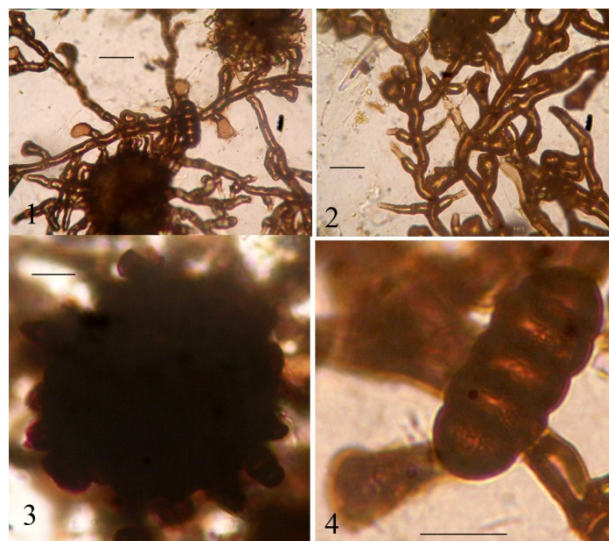


Plate 5. *Asteridiella viticis-negundoii*. 1. Fungal colony formed from the ascospores. 2. Appressoria mixed with phialides. 3. Perithecium with projected wall cells 4. Germinated ascospore. Bars = 12 µm

Colonies epiphyllous, dense, up to 3 mm in diameter. Hyphae straight, substraight to flexuous, branching alternate to opposite at acute to wide angles, loosely reticulate, cells 18–23 × 7–10 µm. Appressoria alternate, antrorse to subantrorse, straight to curved, 20–32 µm long; stalk cells cuneate to cylindrical, 6–12 µm long; head cells globose, ovate, clavate to cylindrical, mostly angular, few sublobate, rarely entire, truncate, 15–23 × 11–20 µm. Phialides many, apparently borne on a separate mycelial branch but mixed with

apressoria, mostly opposite, often unilateral, ampulliform, $16\text{--}22 \times 5\text{--}7 \mu\text{m}$. Perithecia scattered, globose, up to $150 \mu\text{m}$ in diam.; perithecial wall cells mammiform to conoid, attenuated at tip, up to $22 \mu\text{m}$ long; ascospores oblong to cylindrical, 4-septate, constricted at the septa, $48\text{--}50 \times 18\text{--}21 \mu\text{m}$.

Material examined: India, Karnataka, Kodagu, Hoddur, on leaves of *Vitex negundo* L. (Verbenaceae), 29 December 2008, C. Jagath Thimmaiah TBGT 5704 (holotype).

Based on the morphology of apressoria and measurements, this collection can be compared with *Asteridiella lagerheimii* (Gaill.) Hansf. and *A. depokensis* Hansf. known on *Citharexylum ilicifolium* and *Vitex paniculata* and *Premna subglabra* from Ecuador, Java and Philippines. However, differs from the former species in having distantly placed and recurved apressoria with typically angular head cells. It differs from the latter species in having flexuous hyphae and larger ascospores (Hansford 1961).

Acknowledgements

We are grateful to the Director, Tropical Botanic Garden and Research Institute, Palode for facilities and C. Jagath

Thimmaiah is grateful to UGC for awarding FIP through Mangalore University. We thank Prof. Kevin Hyde for the valuable suggestions.

References

- Hansford CG. 1961. The Meliolineae. A Monograph. Sydowia. Beihefte 2: 1–806.
- Hosagoudar VB. 1996. Meliolales of India Botanical Survey of India, Calcutta, pp. 363.
- Hosagoudar VB. 2008. Meliolales of India. Vol. II. Botanical Survey of India, Calcutta, pp. 390.
- Hosagoudar VB, Biju H, Anu Appaiah KA 2006. Studies on foliicolous fungi–XX. Microfungi of Coorg, Karnataka. Journal of Mycopathological Research 44, 1–25.
- Hu Y, Ouyang Y, Song Bin, Jiang G. 1996. Flora Fungorum Sinicorum. Vol. 4. Meliolales (1). Science Press Beijing pp. 270, plate IV.
- Hu Y, Song Bin, Ouyang Y, Jiang G. 1999. Flora Fungorum Sinicorum. Vol. 11. Meliolales (2). Science Press Beijing pp. 252.