



Additions to black mildews of India

Kerala is located in the south-west corner of peninsular India and towards the western side of the southern Western Ghats, harbouring rich vegetation. It is a treasure of biological wealth and it needs the specialized personalities to identify and name them. Senior author is being engaged in the study of this never completing treasure of microfungual wealth of Kerala state since three decades. This paper gives an account of four taxa, hitherto unrecorded from India, belonging to the genera *Asterina* and *Meliola*, namely, *Asterina garciniicola*, *Meliola abrupta*, *Meliola bakeri* and *Meliola hugoniae* are described and illustrated.

Taxonomy

1. *Asterina garciniicola* Ouyang & Song, 1995 in Ouyang, Song & Hu, *Acta Mycologica Sinica*, 14: 244. (Pl. 5, Fig. 1)

Colonies epiphyllous, dense, velvety, up to 5 mm in diameter, rarely confluent. Hyphae straight to substraight, branching opposite at acute to wide angles, loosely to closely reticulate, cells 14-29 x 7-10 μm . Appressoria alternate to 2% opposite, subopposite, unicellular, globose to cylindrical, straight to curved, antrorse to spreading, entire, 9-14 x 7-10 μm . Thyriothecia scattered, orbicular, often connate, up to 270 μm in diameter, stellately dehisced at the centre, margin crenate to fimbriate, fringed hyphae flexuous; asci globose to ovate, octosporous, up to 65 μm in diameter; ascospores conglobate, uniseptate, constricted at the septum, 31-36 x 14-17 μm .

Material examined: On leaves of *Garcinia* sp. (Clusiaceae); *Loc.* Pandipathal, Peppara Wildlife Sanctuary; *Coll.* Jacob Thomas *et al.*; *Date.* 29-II-2008; *Cat. no.* HCIO 48847, TBGT 3223.

Asterina garciniae Hansford and *A. garciniicola* Ouyang & Song are known on the host genus (Hansford, 1946; Ouyang *et al.*, 1995). The latter

species was reported on *G. multiflora* from China and is reported for the first time from India.

2. *Meliola abrupta* Sydow & Sydow, 1917. *Annales Mycologici*, 15 (3-4): 181; Hansford, 1961. *Sydowia Beih*, 2: 292. (Pl. 5, Fig. 2)

Meliola derridis Yates, 1918. *Philippine Journal of Science*, 13: 368.

Colonies amphigenous, mostly epiphyllous, dense, velvety, up to 2 mm in diameter, confluent and covering entire upper surface of the leaves. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, loosely to closely reticulate, cells 14-38 x 4-7 μm . Appressoria alternate, about 5% opposite, antrorse, curved, 12-17 μm long; stalk cells cylindrical to cuneate, 2-5 μm long; head cells globose to subglobose, straight to curved, entire, 9-14 x 7-12 μm . Phialides mixed with appressoria, alternate to opposite, ampulliform, 16-29 x 6-12 μm . Mycelial setae numerous, scattered, straight, simple, acute to dentate at the tip, up to 520 μm long. Perithecia scattered, verrucose, globose, up to 160 μm in diameter; ascospores cylindrical to ellipsoidal, 4-septate, constricted, 36-43 x 12-17 μm .

Materials examined: On leaves of *Derris* sp. (Fabaceae); *Loc.* near Peppara dam, Peppara Wildlife Sanctuary; *Coll.* Jacob Thomas; *Date.* 18-XI-2007; *Cat. no.* HCIO 49034, TBGT 3289.

This species reported for the first time from India (Hosagoudar, 1996 & 2008).

3. *Meliola bakeri* Sydow, 1916. *Annales Mycologici*, 14: 335; Hansford, 1961. *Sydowia Beih*, 2: 374. (Pl. 6, Fig. 3)

Colonies epiphyllous, scattered, up to 2 mm in diameter. Hyphae straight to undulate, branching opposite at acute angles, closely reticulate, cells 17-24 x 4-7 μm . Appressoria alternate to opposite, antrorse to subantrorse, retrorse to spreading, 17-20 μm long; stalk cells cuneate, 4-7 μm long; head cells ovate, globose, entire, 13-16 x 8-11 μm .

Phialides mixed with appressoria, alternate to opposite, ampulliform, 19-24 x 4-7 µm. Mycelial setae straight, simple, acute to obtuse at the tip, up to 580 µm long. Perithecia scattered, verrucose, up to 128 µm in diameter; ascospores obovoidal, 4-septate, constricted, 30-38 x 13-16 µm.

Materials examined: On leaves of *Cayrtia pedata* (Lam.) A. L. Juss ex Gagnepain (Vitaceae); *Loc.* Thiruvalla, Pathanamthitta, Kerala; *Coll.* Jacob Thomas; *Date.* 19-XI-2006; *Cat. no.* HCIO 48261, TBGT 3000.

This species reported for the first time from India (Hosagoudar, 1996 & 2008).

4. *Meliola hugoniae* Hanford & Deighton, 1948. *Mycological Papers.* 23: 5; Hansford, 1961. *Sydowia Beih.* 2: 91. (Pl. 6, Fig. 4)

Colonies epiphyllous, subdense to dense, velvety, up to 2 mm in diameter. Hyphae straight to substraight, branching mostly opposite at acute to wide angles, loosely to closely reticulate, cells 15-29 x 4-7 µm. Appressoria opposite, about 2% alternate to unilateral, straight to curved, antrorse to spreading, 13-20 µm long; stalk cells cylindrical to cuneate, 2-5 µm long; head cells ovate to oblong, entire, broadly rounded at the apex, 11-15 x 6-9 µm. Phialides mixed with appressoria, alternate to opposite, ampulliform, 17-26 x 5-7 µm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 1200 µm long. Perithecia scattered, up to 160 µm in diameter; ascospores obovoidal, 4-septate, constricted at the septa, 28-41 x 11-17 µm.

Materials examined: On leaves of *Hugonia belli* Sedgwick (Linaceae); *Loc.* Aaralam Wildlife Sanctuary, Kannur, Kerala; *Coll.* Jacob Thomas *et al.*; *Date.* 28-II-2007; *Cat. no.* HCIO 49036, TBGT 3291.

This species reported for the first time from India (Hosagoudar, 1996 & 2008).

Acknowledgements

We thank Director, (TBGRI) for providing facilities. We are grateful to Ministry of Environment and Forest, New Delhi for the financial support and to Forest Department of Kerala for the forest permission.

Literature cited

Hansford, C. G., 1946. Contribution towards the fungus flora of Uganda - VVIII. New Records. *Proceedings of the Linnean Society of London*, 151: 138-212.

Hansford, C. G., 1961. The Meliolineae. A Monograph. *Sydowia Beih.* 2: 1-806.

Hosagoudar, V. B., 1996. *Meliolales of India*. Botanical Survey of India, Calcutta: 363.

Hosagoudar, V. B., 2008. *Meliolales of India. Vol. II*. Botanical Survey of India, Calcutta: 390.

Ouyang, Y., B. Song, and Y. Hu, 1995. Studies on the taxonomy of Asterina in China-I. *Acta Mycologica Sinica*, 14: 241-247.

Submitted: 16 May 2011, *Accepted:* 24 June 2011
Sectional Editor: R. K. Verma

V. B. Hosagoudar^{1,2}, Jacob Thomas¹ and
D. K. Agarwal³

¹Tropical Botanic Garden and Research Institute,
Palode - 695 562, Thiruvananthapuram, Kerala, India
² vbhosagoudar@rediffmail.com

³ Indian Agricultural Research Institute,
Plant Pathology Division, New Delhi, India

PLATE 05

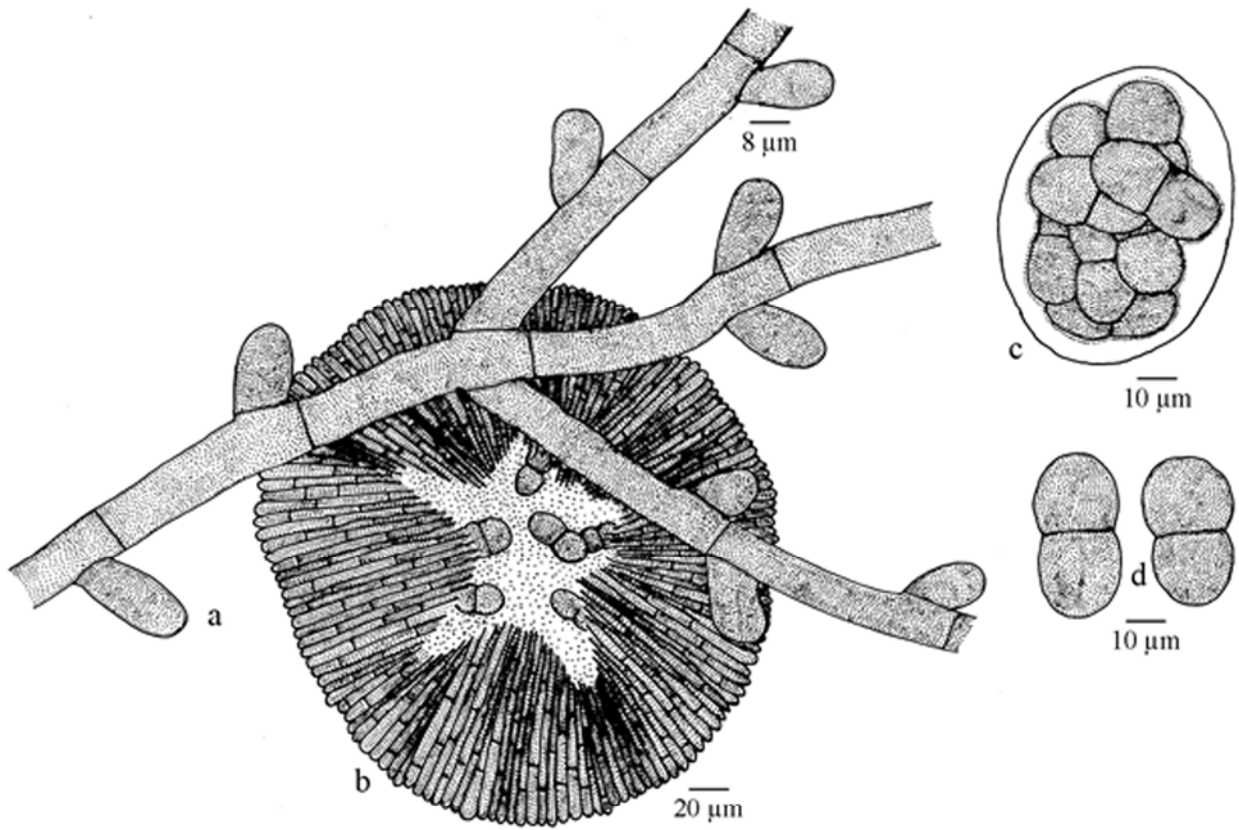


Fig. 01: *Asterina garciniicola* Ouyang & Song, 1995
a. Appressoriolate mycelium, **b.** Thyriothecium, **c.** Ascus, **d.** Ascospores

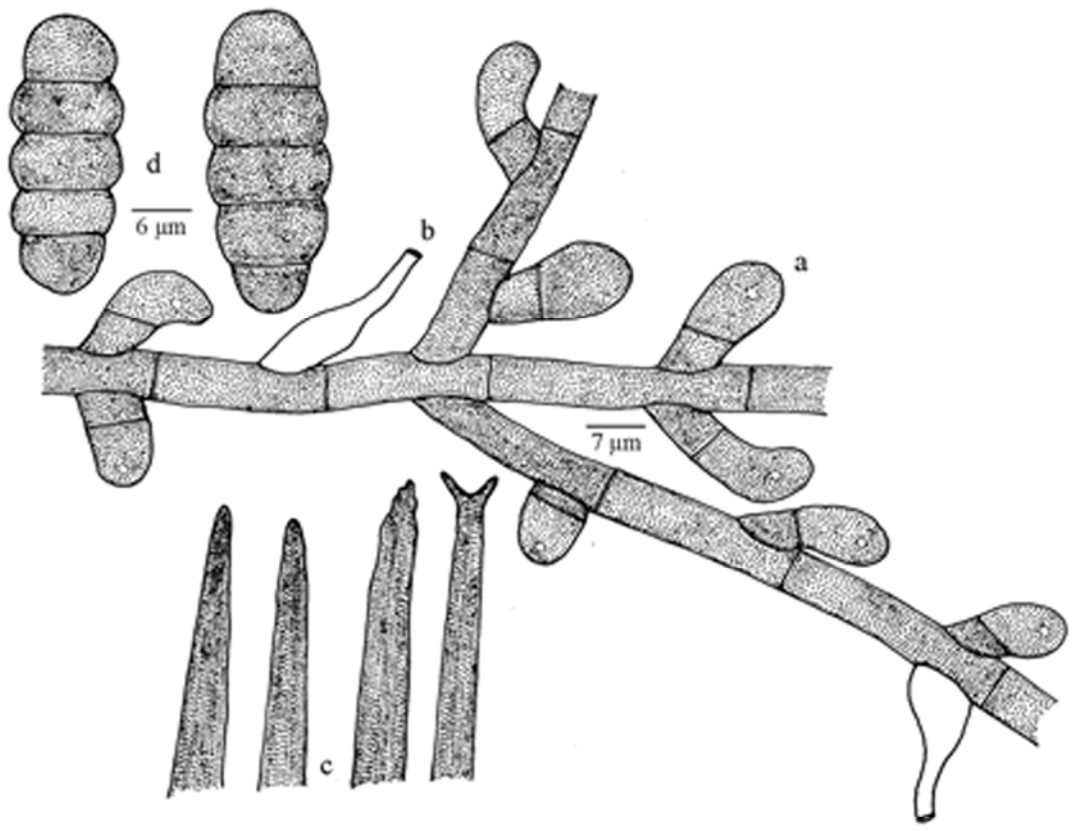


Fig. 02: *Meliola abrupta* Syd. & Syd., 1917.
a. Appressorium, **b.** Phialide, **c.** Apical portion of the mycelia setae, **d.** Ascospores

PLATE 06

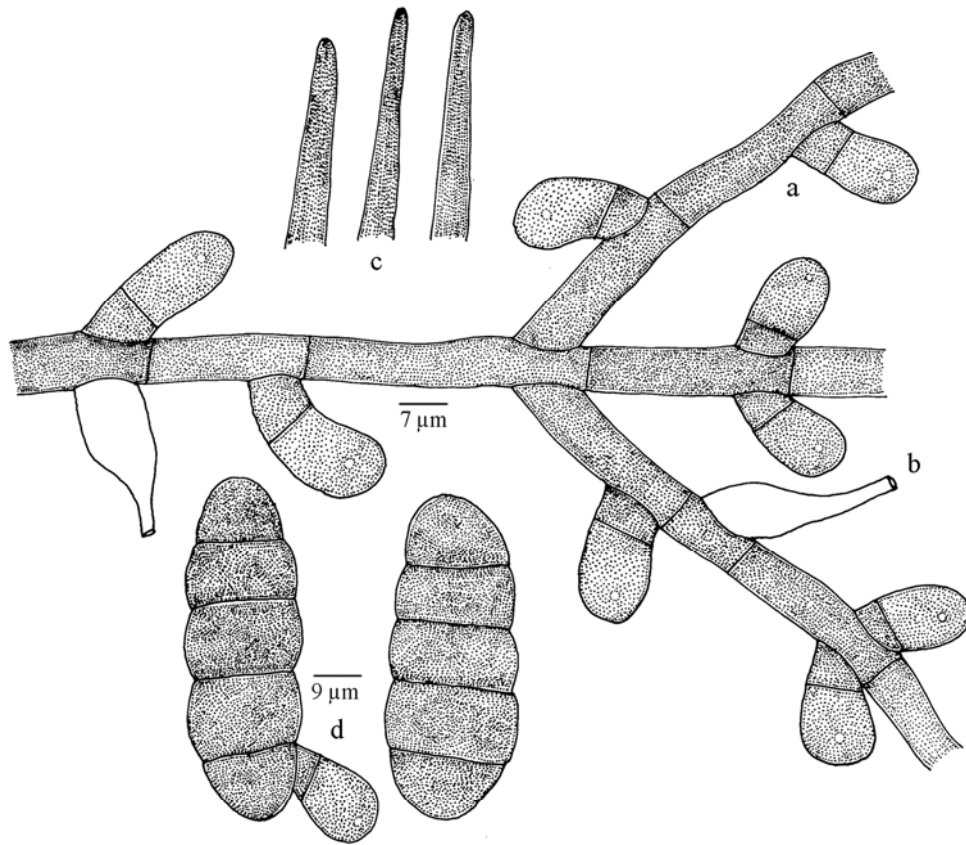


Fig. 03: *Meliola bakeri* Syd., 1916

a. Appressorium, b. Phialide, c. Apical portion of the mycelia setae, d. Ascospores

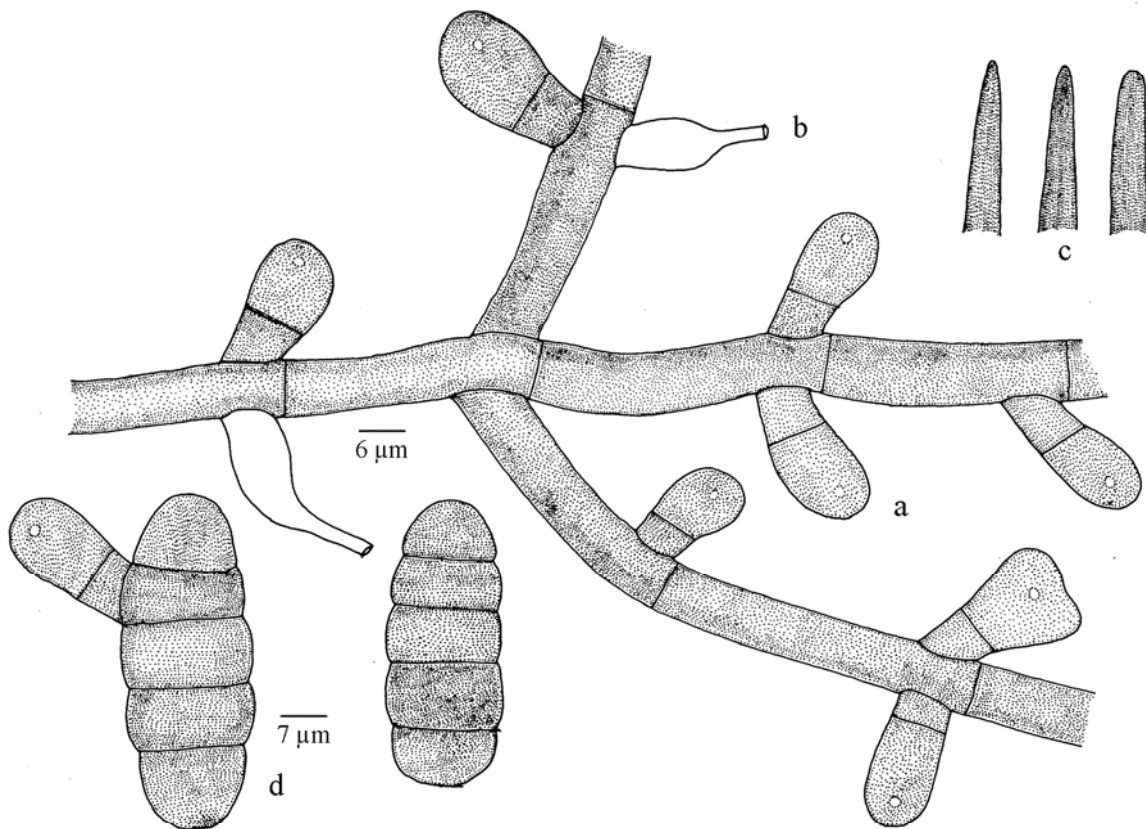


Fig. 04: *Meliola hugoniae* Hanf. & Deight., 1948

a. Appressorium, b. Phialide, c. Apical portion of the mycelia setae, d. Ascospores