

MELIOLACEOUS FUNGI ON RARE MEDICINAL PLANTS IN SOUTHERN INDIA

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Abstract

This paper gives an account of eleven species of the genus *Meliola* on eight rare medicinal plants in southern India. All the fungal species are described in detail with their geographical distribution and host range. Of these, *Meliola ardigoosii*, *M. banosensis* var. *puerariicola*, *M. bucharaniicola*, *M. chandrasekharanii*, *M. kingiodendri* and *M. thitei* are endemic fungi.

Keywords

Fungi, Black mildews, Meliolaceae, medicinal plants, southern India

Abbreviations

HCIO - Herbarium Cryptogamae Indiae Orientalis, New Delhi
TBGT - Tropical Botanic Garden, Thiruvananthapuram

Introduction

India is located in a very important geographical position in Southeast Asia having all the climatological zones of the world. It harbours more than 17,000 flowering plants of which 7500 are used by all the ethnic groups and ca. 400 are industrially viable in producing ca. 10,000 herbal drugs. Increasing demand of these drugs resulted in over collection of the plants from their natural habitat. Only 20 plant species are being commercially cultivated for this purpose but the rest are collected from their natural habitat of the individual species. Depending on the drugs, different plant parts, such as leaves, bark, roots and whole plants are used. The over use of roots and whole plant resulted in the habitat loss, and brought 75 medicinal plants under Red Listed Criteria of rare plants to protect them from the natural loss (Shankar *et al.*, 1997; Dhar, 2002). Though all efforts have been made to protect these plants from the biotic factors, their association with the other microbial world like fungi, bacteria, virus, MLOs, etc. is yet to be known. Hence, an attempt has been made here to know their association with the

meliolaceous fungi.

Meliolaceous fungi

Meliolaceous fungi are the foliicolous ectoparasites, produce black colonies on the hosts, hence the name black or dark mildews. Superficially produced brown mycelium supplemented with appressoria on either side, which are usually with two cells (lower stalk cell and an apical head cell); conidiogenous cells or phialides are bottle shaped and unicellular. Mycelium also supplemented with stick-like, upright mycelial setae. Ascumata or fruiting body or perithecia are globose, black, \pm ostiolate; asci few to many, unitunicate, mostly clavate, 2-4-spored, evanescent; ascospores brown, oblong to cylindrical, obovoid, fusiform, 3-4-septate, more or less constricted at the septa.

These fungi are classified under the family Meliolaceae of the order Meliolales and have been extensively studied by Hansford (1961), Hosagoudar (1996), Hosagoudar *et al.* (1997), Hu *et al.* (1997, 1999) and Mibey & Hawksworth (1997).

The genus *Meliola*

Meliola Fries emend. Bornet, Ann. Sci. Nat. III: 16: 267, 1851.
Meliola Fries, Syst. Orb. Veg. P., 111, 1825.
Amphitrichum Fries, Syst. Mycol. 2: 513, 1829 (*p.p.*)
Myxothecium Kuntze ex Fries, Syst. Mycol. 3: 232, 1829.
Couturea Cast. In Fries, Summ. Veg. Sand. P., 407, 1846.
Asteridium Sacc., Syll. Fung. 1: 49, 1882.

Type: *M. psidii* Fries

Diagnostic features

Mycelium superficial, brown, septate, branched, appressoriolate, mycelial setae present. Perithecia globose, discrete, \pm ostiolate; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.

Remarks

Meliola psidii Fries is conserved over the earlier synonym *M. trichostroma* (Kuntze) Toro (Crane & Jones, 2001).

Received 21 October 2002;

Revised received 3 February 2003;

Finally accepted xx xxxxx 2003

Meliola ardigoosii

Hosag. & Abraham, Indian Phytopathol. 51: 301, 1998.
(Fig. 1)

Materials examined

6.ii.1997, Kerala, India, on leaves of *Buchanania lanzan* Sprengel (Anacardiaceae), coll. V.B. Hosagoudar, HCIO 42523 (holotype), TBGT 148; 4.xi.2000, TBGRI Campus, Palode, Thiruvananthapuram, Kerala, India, coll. H. Biju, HCIO 44531, TBGT 817; 12.xii.2001, TBGRI Campus, Palode, Thiruvananthapuram, Kerala, India, coll. H. Biju, HCIO 44532, TBGT 818.

Distribution

India: Kerala. The fungus is endemic to Western Ghats.

Diagnostic features

Colonies epiphyllous, dense, up to 2mm in diameter, rarely confluent. Hyphae straight, branching opposite at acute angles, loosely to closely reticulate, cells 15-23 x 7-8 µm. Appressoria alternate, antrorse, straight to rarely curved, 22-28µm long; stalk cells cuneate, 7-10µm long; head cells ovate to cylindrical, entire, 15-18 x 12-15µm. Phialides mixed with appressoria, alternate to opposite, ampulliform, 15-25 x 7-10µm. Mycelial setae numerous, scattered, simple, straight, acute at the tip, up to 835µm long. Perithecia loosely grouped to scattered, verrucose, up to 140µm in diameter; ascospores slightly ellipsoidal, 4-septate, slightly constricted, 50-53 x 24-26µm.

Remarks

Meliola buchananiae Stev. ex Hansf. and *M. buchananiicola* Hosag. are known on this host genus from Philippines and

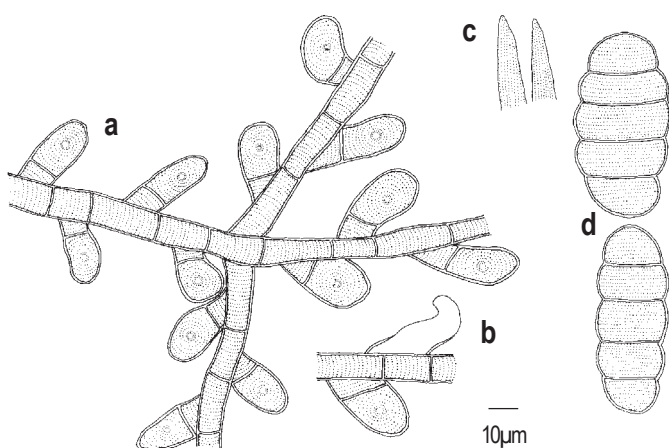


Figure 1. *Meliola ardigoosii* Hosag. & Abraham
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

India (Hansford, 1961; Hosagoudar; 1996; Hosagoudar *et al.*, 1997). However, this species differs from both in having epiphyllous colonies, straight hyphae and regularly antrorse appressoria.

Meliola banosensis* Sydow var. *puerariicola

Hosag., Meliolales of India, p. 138, 1996.
(Fig. 2)

Materials examined

13.iii.1994, Koomati, Anamalai, Coimbatore, Tamil Nadu, India, on leaves of *Pueraria tuberosa* DC. (Fabaceae), coll. V.B. Hosagoudar, HCIO 41570 (holotype).

Distribution

India: Kerala. The fungus is endemic to Western Ghats.

Diagnostic features

Colonies epiphyllous, thin, scattered to confluent. Hyphae flexuous, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 15-22 x 6-8µm. Appressoria alternate, about 10% opposite, antrorse to subantrorse, 12-15.5µm long; stalk cells cylindrical to cuneate, 3-6.5µm long; head cells mostly globose, entire, rarely angular, 9-12.5µm. Phialides mixed with appressoria, alternate to opposite, ampulliform, 15-18.5 x 9-11µm. Mycelial setae very few, straight,

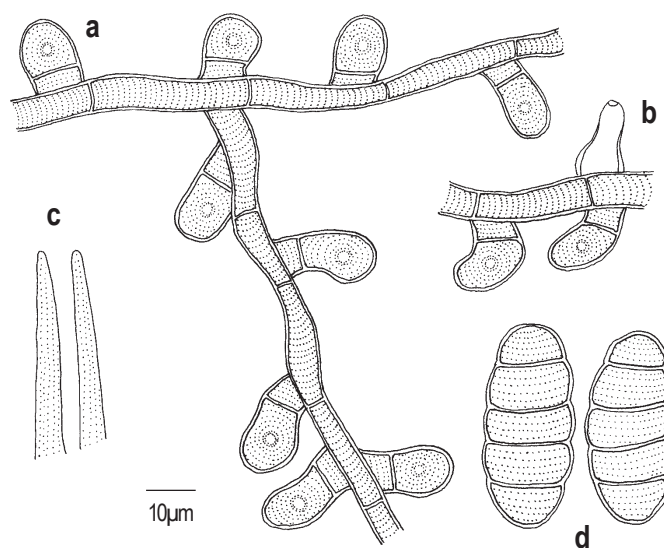


Figure 2. *Meliola banosensis* Sydow var. *puerariicola* Hosag.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

simple, acute at the tip, up to 372µm long. Perithecia immature, up to 100µm in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 34-37.5 x 15-18.5µm.

Remarks

Meliola banosensis Sydow and *M. banosensis* Sydow var. *puerariae* Hosagoudar (Hansford, 1961; Hosagoudar, 1996) have been reported on this host genus. This variety differs from the var. *banosensis* in having phialides mixed with appressoria, while it differs from the latter taxon in having 10% opposite appressoria

3. *Meliola buchaniicola* Hosag.

in Hosag. & Goos, Mycotaxon 37: 223, 1990;
Hosag., Meliolales of India p.147, 1996.
(Fig. 3)

Materials examined

Holotype: 14.xii.1982, Calvary Mount, Idukki, Kerala, India, on leaves of *Buchanania lanzan* Sprengel (Anacardiaceae), coll. V.B. Hosagoudar, HCIO 40501.

Isotype: 14.xii.1982, Calvary Mount, Idukki, Kerala, India, on leaves of *Buchanania lanzan* Sprengel (Anacardiaceae), coll. V.B. Hosagoudar, MH 75750.

Distribution

India: Kerala. The fungus is endemic to Western Ghats.

Diagnostic features

Colonies hypophyllous, subdense to dense, up to 8mm in diam., confluent. Hyphae tortuous, branching opposite to irregular at

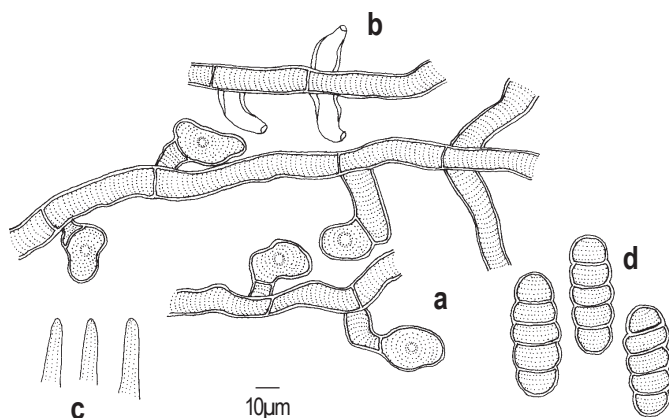


Figure 3. *Meliola buchaniicola* Hosag.
a - Appressorium; b - phialide; c - mycelial setae;
d - ascospores

acute to wide angles, closely reticulate and form almost solid mycelial mat, cells 20-38 x 6-10µm. Appressoria alternate, straight to variously curved, antrorse to reflexed, 36-50µm long; stalk cells cylindrical to cuneate, often tortuous, 14-22µm long; head cells ovate, globose, angulose, sublobate, straight to variously curved, 22-30 x 12-16 µm. Phialides few, mixed with appressoria, opposite to alternate, conoid to ampulliform, 14-22 x 6-8µm. Mycelial setae numerous, simple, acute to obtuse at the tip, up to 954µm long. Perithecia scattered, verrucose, up to 234µm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted, 42-50 x 14-18µm.

Remarks

This species is similar to *Meliola buchaniae* Stev. ex Hansf. and *M. hamata* Sydow & Sydow known on this host genus (Hansford, 1961). However, differs from both in having flexuous stalk cells of the appressoria and longer mycelial setae.

4. *Meliola chandrasekharanii* Hosag.

in Hosag. & Goos, Mycotaxon 37:225, 1990; 42:133, 1991;
Hosag., Meliolales of India p.164, 1996.
(Fig. 4)

Materials examined

Holotype: 15.xii.1982, Lakshmi Estate, Idukki, Kerala, India, on leaves, stems and petioles of *Apodytes dimidiata* E.Meyer ex Arn. (Icacinaceae), coll. V.B.Hosagoudar, HCIO 40506.

Isotype: 15.xii.1982, Lakshmi Estate, Idukki, Kerala, India, on leaves, stems and petioles of *Apodytes dimidiata* E.Meyer ex Arn. (Icacinaceae), coll. V.B.Hosagoudar, MH75781; coll. 25.xii.1983, V.B. Hosagoudar, MH 79089; 20.x.2000, Idukki, Kerala, India, coll. M. Kamarudeen, HCIO 43983, TBGT 478; 20.xii.2001, Kannimala Estate, Munnar, Kerala, India, *Apodytes* sp., coll. S. Shiburaj HCIO 44387, TBGT705; 27.xii.1990, Mabblerly, Shankarankudi, Valparai, Coimbatore, Tamil Nadu, India, *Nothapodytes nimmoniana* (Graham), coll. V.B. Hosagoudar, HCIO 30538; ii.1977, Mahabaleshwar, Maharashtra, India, coll. V.P. Kaul, HCIO 33811; 1.iii.1984, Bhagamandala, Karnataka, India, coll. C.R. Patil, HCIO 40004; 22.ii.1994, Veerapuli Reserve Forest, Kanniyakumari, Tamil Nadu, India, V.B. Hosagoudar HCIO 41532.

Distribution

India: Karnataka, Kerala, Maharashtra and Tamil Nadu. The fungus is endemic to Western Ghats.

Diagnostic features

Colonies amphigenous, caulicolous, mostly hypophyllous, subdense, velvety, up to 3mm diameter, confluent. Hyphae undulate, branching opposite at acute angles, loosely to closely reticulate and form almost solid mycelial mat, cells 16-30 x 6-8µm. Appressoria alternate (few opposite), straight to curved,

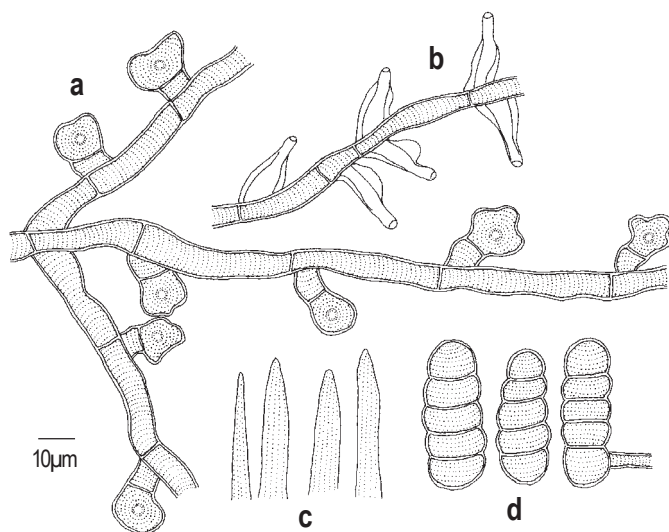


Figure 4. *Meliola chandrasekharanii* Hosag.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

spreading, mostly antrorse, 16-24µm long; stalk cells cuneate to cylindrical, 4-10µm long; head cells subglobose, ovate, angular to sublobate, 12-16 x 14-16µm. Phialides borne on a separate mycelial branch and also few mixed with appressoria, alternate, mostly opposite, ampulliform, 12-20 x 6-10µm. Mycelial setae fairly numerous, straight, simple, acute to subacute at the tip, up to 477µm long. Perithecia scattered, verrucose, up to 153µm in diam.; ascospores obovoidal to cylindrical, 4-septate, constricted at the septa, 32-42 x 10-16µm.

Remarks

This species stands distinct in having entire to sublobate head cells of the appressoria and straight but subacute mycelial setae.

5. *Meliola groteana* Sydow & Sydow

Ann. Mycol. 11: 402, 1913;

Hansf., Sydowia Beih. 2: 511, 1961;

Thite & Patil, Kavaka 10:30, 1982;

Hosag., Meliolales of India p., 211, 1996;

Meliola maesae Rehm, Philippine J. Sci. 8: 392, 1913.

(Fig. 5)

Materials examined

Holotype: 10.xi.1975, Radhanagari, Kolhapur, Maharashtra, India, on leaves of *Embelia viridiflora* Blume (Myrsinaceae), coll. M.S. Patil, HCIO 31942; 6.xii.1984, Nechal, Koyna dam, Satara, Maharashtra, India, *E. ribes* Burm. f., coll. C.R. Patil, HCIO 40015; 2.ii.1968, Coorg, Karnataka, *Maesa indica* (Roxb.)

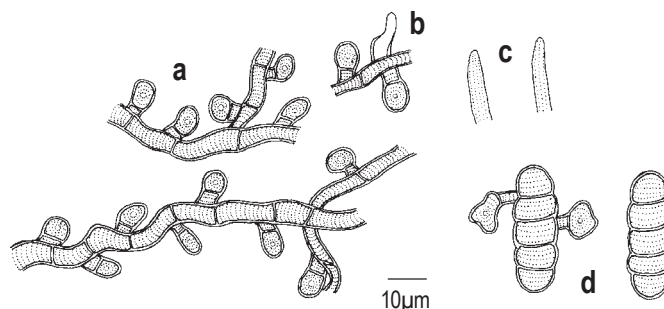


Figure 5. *Meliola groteana* Sydow & Sydow
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

DC. (Myrsinaceae), coll. K.H. Anahosur, HCIO 31136; AMH 572; 8.i.1982, Calvary Mount, Idukki, Kerala, India, coll. V.B. Hosagoudar, MH 73719, HCIO 40530; 25.xii.1990, near Sholayar dam, Valparai, Coimbatore, Tamil Nadu, India, V.B. Hosagoudar, HCIO 30509.

Distribution

India: Karnataka, Kerala, Maharashtra and Tamil Nadu, The Philippines, South Africa. The fungus persists in the tropical region.

Diagnostic features

Colonies hypophyllous, dense, velvety, up to 5mm in diameter, rarely confluent, corresponding upper surface of the leaf turns yellowish brown. Hyphae straight to slightly crooked, branching opposite at wide angles, loosely to closely reticulate, cells 10-28 x 6-8µm. Appressoria alternate, about 10% opposite, antrorse, spreading, 10-15µm long; stalk cells cylindrical to cuneate, 2-5µm long; head cells globose, slightly angular, entire, 8-10 x 8-12µm. Phialides mixed with appressoria, opposite to alternate, ampulliform, 10-16 x 8-10µm. Mycelial setae fairly numerous, straight, simple, acute at the tip, up to 3-2µm long. Perithecia scattered, verrucose, up to 200µm in diam.; ascospores oblong, 4-septate, constricted, 40-44 x 12-16µm.

6. *Meliola kingiodendri* Hosag., Dayal & Goos, 1993

Mycotaxon 46: 205, 1993;

Hosag., Meliolales of India p., 234, 1996.

(Fig. 6)

Materials examined

Holotype: Sampaje forest nursery, Sampaje, Kodagu, Karnataka, on leaves of *Kingiodendron pinnatum* (Roxb.) Harms (Caesalpinaceae), coll. B.R. Dayal, HCIO 30836.

Distribution

India: Karnataka. The fungus is endemic, known only from the type collection.

Diagnostic features

Colonies hypophyllous, rarely amphigenous, dense, up to 5mm in diameter, rarely confluent. Hyphae straight, very rarely crooked, branching mostly opposite at acute to wide angles, loosely reticulate, cells 27-35.5 x 6-9.5 μ m. Appressoria opposite, rarely solitary, antrorse to recurved to spreading, 15-18 μ m long; stalk cells cylindrical to cuneate, 3-6.5 μ m long; head cells pyriform, conoid with rounded ends, straight, curved to recurved, entire, 12-15.5 x 6-9.5 μ m. Phialides mixed with appressoria, alternate to opposite, ampulliform, straight to curved at the apex, 18-25 x 9-12 μ m. Mycelial setae evenly scattered on the colonies, simple, straight, obtuse to dentate at the tip, up to 575 μ m long. Perithecia scattered, globose, up to 248 μ m in diam.; perithecial cells projected, rounded at the apex; ascospores ellipsoidal, 4-septate, constricted at the septa, 37-40.5 x 18-22 μ m.

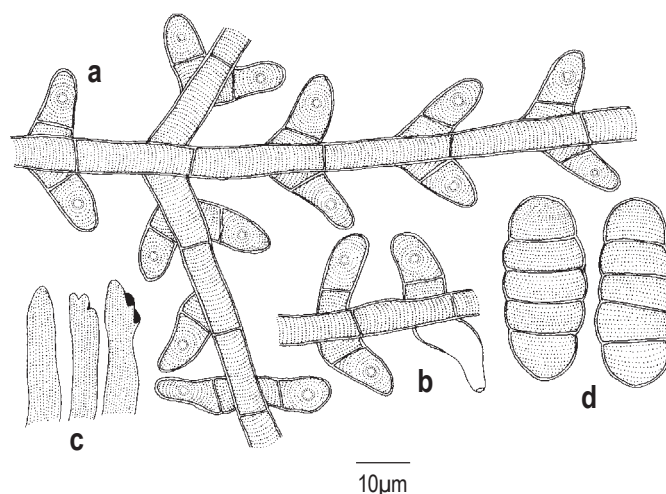


Figure 6. *Meliola kingiodendri* Hosag. et al.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

7. *Meliola pterocarp* Yates, 1918

Philippine J. Sci. 13: 235, 1918;

Hansf; Sydowia Beih. 2: 299, 1961;

Hosag., Dayal & Goos, Mycotaxon 46: 208, 1993;

Hosag., Meliolales of India, p. 290, 1996.

(Fig. 7)

Materials examined

22.xii.1991, Sampaje forest nursery, Sampaje, Kodagu, Karnataka, India, on leaves of seedlings of *Pterocarpus marsupium* Roxb. (Fabaceae), coll. B.R. Dayal, HCIO 30835; 18.xii.2001, Tropical Botanic Garden Research Institute campus, Thiruvananthapuram, Kerala, India, coll. H. Biju, HCIO 44494, TBGT 783; 18.xii.2001, Tropical Botanic Garden Research Institute campus, Thiruvananthapuram, Kerala, India, *Pterocarpus santalinus* L.f., coll. H. Biju, HCIO 44492, TBGT 781.

Distribution

India (Karnataka, Kerala), The Philippines and Sumatra. The fungus is known from Asia.

Diagnostic features

Colonies amphigenous, mostly epiphyllous, dense, up to 3mm in diam., rarely confluent. Hyphae substraight to flexuous, branching opposite at acute angles, loosely to closely reticulate, cells 18-31 x 6-9.5 μ m. Appressoria alternate, straight to curved, antrorse to reflexed, 15-18 μ m long; stalk cells cylindrical to cuneate, 6-9.5 μ m; head cells globose to obovoid, entire to rarely slightly angulose, 12-16 x 12-15.5 μ m. Phialides mixed with appressoria, alternate to opposite, ampulliform, 15-22 x 7-9.5 μ m. Mycelial setae mostly grouped around perithecia, simple,

straight, acute to obtuse at the tip, up to 300 μ m long. Perithecia scattered, globose, up to 168 μ m in diam.; ascospores obovoidal, 4-septate, slightly constricted at the septa, 40-43.5 x 15-18.5 μ m.

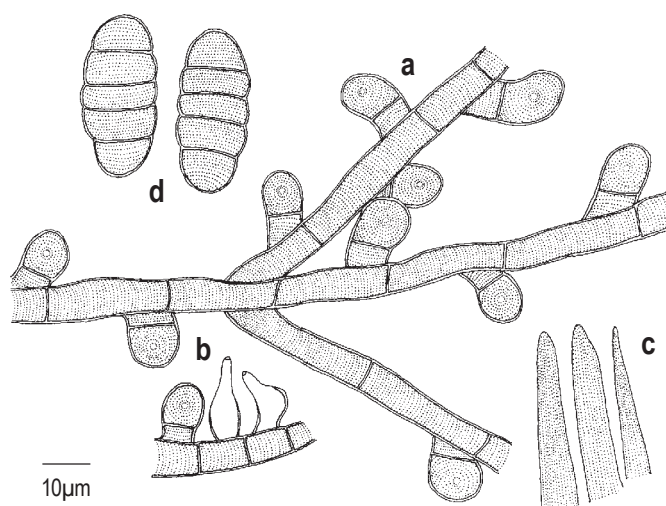


Figure 7. *Meliola pterocarp* Yates
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

Remarks

The Indian collection differs from the species description in having slightly larger appressoria, larger head cells and longer mycelial setae.

8. *Meliola stenospora* Wint.

Hedwigia 25: 97, 1886;

Hansf., Sydowia Beih. 2: 75, 1961;

Hosag. & Raghu, New Botanist 20: 72, 1993;

Hosag. & Sreekumar, J. Andaman Sci. Assoc. 8: 163, 1992;

Hosag., Meliolales of India p. 314, 1996.

(Fig. 8)

Materials examined

20.x.1992, Gersoppa, Uttar Kannada, Karnataka, India, on leaves of *Piper sp.* (Piperaceae), coll. P.A. Raghu, HCIO 40888; 20.iii.1984, Petland, Sangli, Maharashtra, India, *P. trichostachyon* (Miq.) DC., coll. C.R. Patil, HCIO 40005.

Distribution

India (Andaman Is., Karnataka, Maharashtra), Asia and South Africa. The fungus is known from Asia and South Africa

Diagnostic features

Colonies amphigenous, mostly hypophyllous, thin, spreading, up to 5mm in diameter. Hyphae substraight to flexuous, branching opposite to irregular at acute to wide angles, loosely to closely reticulate, cells 18-25 x 6-9.5µm. Appressoria alternate, antrorse to spreading, 15-25µm long; stalk cells cylindrical to cuneate, 6-9.5µm long; head cells ovate to globose, angular to

very slightly lobate, 9-16 x 9-15µm. Phialides borne on a separate mycelial branch, alternate to opposite, ampulliform, 15-18.5 x 6-9.5µm. Mycelial setae scattered to grouped around perithecia, simple, straight, acute to obtuse at the tip, up to 530µm long. Perithecia scattered, verrucose, up to 150µm in diam.; ascospores elliptic oblong to oblong, 4-septate, constricted at the septa, 40-46.5 x 12-18.5µm.

Remarks

This taxon differs from its variety *major* Hansf. in having only angular head cells in contrast to crenately lobate head cells.

9. *Meliola stenospora* Wint. var. *major* Hansf.

Sydowia 16: 303, 1963;

Patil & Pawar, Indian Phytopathol. 39: 306, 1986;

Hosag., Meliolales of India p., 316, 1996;

Meliola stenospora Wint. var. *major* Hansf., Sydowia Beih.2:75, 1961.

(Fig. 9)

Materials examined

March 22. iii.1980, Mahabaleshwar, Satara, Maharashtra, on leaves of *Piper nigrum* L. (Piperaceae), M.S. Patil, HCIO 36749; 25.ii.1994, Veerapuli Reserve Forest, Kanniyakumari, Tamil Nadu, India, coll. V.B. Hosagoudar, HCIO 41610.

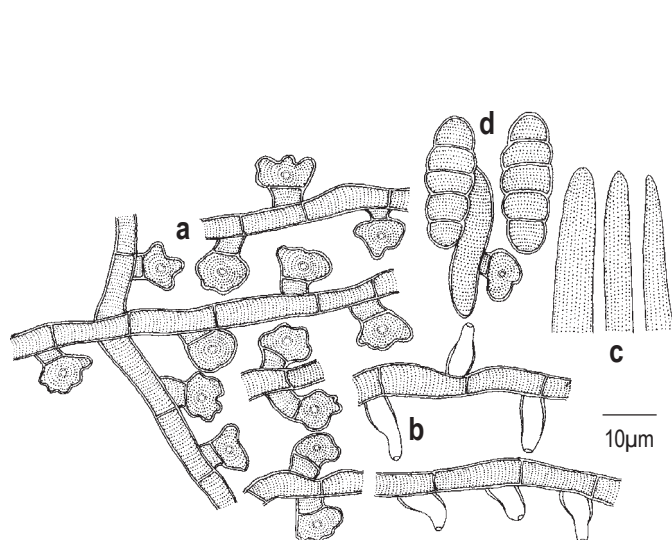


Figure 8. *Meliola stenospora* Wint
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

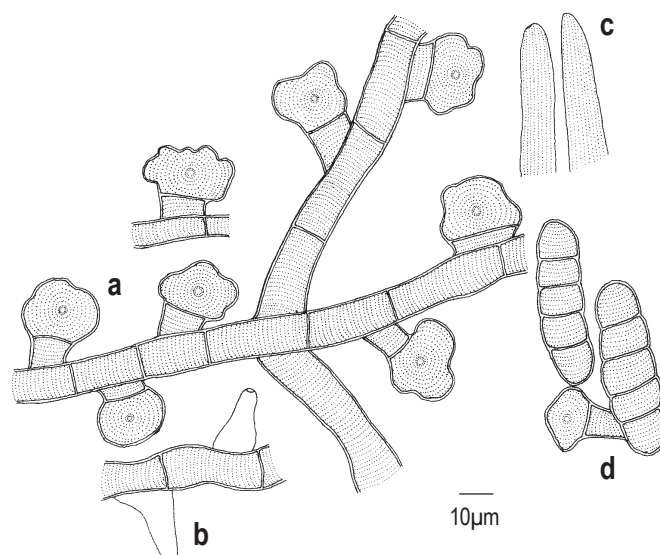


Figure 9. *Meliola stenospora* Wint. var. *major* Hansf.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

Distribution

India (Maharashtra and Tamil Nadu), Java and Philippines. The fungus is known from Asia.

Diagnostic features

Colonies mostly epiphyllous, subdense, thinly velvety, up to 3mm in diameter, confluent. Hyphae substraight to slightly undulate, branching opposite to irregular at wide angles, closely reticulate, cells 20-25 x 8-10µm. Appressoria alternate, about 1% opposite, spreading to antrorse, straight to curved, 17-23µm long; stalk cells cuneate to cylindrical, 3-9µm long; head cells subglobose with crenate to lobulate margin, 11-15 x 12-20µm. Phialides borne on a separate mycelial branch, opposite to alternate, ampulliform, 17-20 x 7-9µm. Mycelial setae mostly grouped around perithecia, straight, simple, acute to obtuse at the tip, up to 1000µm long. Perithecia loosely grouped, verrucose, up to 170µm in diam.; ascospores oblong, 4-septate, slightly constricted, 37-43 x 11-15µm.

10. *Meliola symplocicola* Yamam.

Trans. Nat. Hist. Soc. Taiwan 31:57, 1941;

Hansford Sydowia Beih. 2:519, 1961;

Hosag. & Goos, Mycotaxon 37: 249, 1990;

Hosag., Meliolales of India p., 318, 1996.

(Fig. 10)

Materials examined

Holotype: 20.ii.1983, Meenmutty forest, Idukki, Kerala, India, on leaves of *Symplocos cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.) Nooteboom (Symplocaceae), coll. V.B. Hosagoudar, HClO 40564, MH 75875; 20.viii.1983, Meenmutty forest, Idukki, Kerala, India, coll. V.B. Hosagoudar, MH 75876; 5.x.1983, Meenmutty forest, Idukki, Kerala, India, coll. V.B. Hosagoudar, MH 72162.

Distribution

India (Kerala), Taiwan. The fungus is known from South East-Asia.

Diagnostic features

Colonies hypophyllous, subdense, velvety, up to 8mm in diameter, confluent. Hyphae substraight to flexuous, branching mostly opposite at wide angles, loosely reticulate, cells 18-34 x 6-8µm. Appressoria alternate to unilateral, straight to variously curved, antrorse, spreading, 22-26µm long; stalk cells cylindrical to cuneate, 6-10µm long; head cells globose, angulose, truncate, variously curved, entire, 12-18 x 8-12µm. Phialides mixed with appressoria, opposite to alternate, ampulliform, 20-30 x 8-10µm. Mycelial setae grouped around perithecia, straight, simple, acute, very few 2-3 dentate, up to 360µm long. Perithecia scattered, verrucose, up to 200µm in diam.; ascospores 4-septate, obovoidal to cylindrical, constricted, 48-59 x 16-20µm.

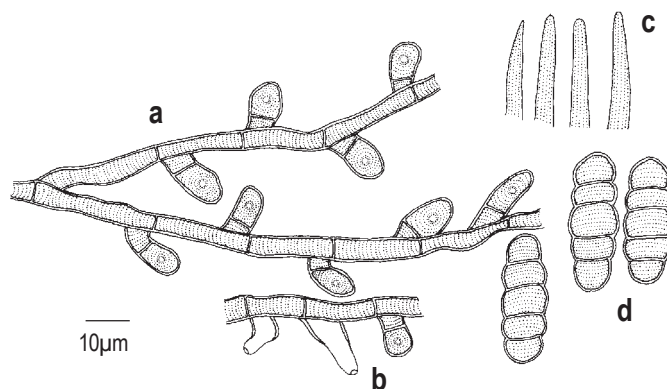


Figure 10. *Meliola symplocicola* Yamam.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

Remarks

The Indian collections slightly vary from the type description in having dense hypophyllous colonies, substraight to flexuous mycelia, shorter appressoria, mycelial setae and ascospores. Based on the morphology of the appressoria and dentate mycelial setae, the present collections are placed under *M. symplocicola* Yamam.

11. *Meliola thitei* Hosag.

Meliolales of India, p. 328, 1996. (*thitei*);

Meliola piperis Thite & Patil, Geophytology 13: 124, 1983.

(*piperae*)

(Fig. 11)

Materials examined

xii.1980, Amboli, Radhanagari, Maharashtra, On leaves of *Piper nigrum* L. (Piperaceae), coll. A.N. Thite, HClO 33672 (type).

Distribution

India, Maharashtra. The fungus is endemic, known only from the type collection.

Diagnostic features

Colonies amphigenous, mostly epiphyllous, dense, confluent and cover the entire leaf surface. Hyphae straight to flexuous, branching mostly opposite at acute to wide angles, loosely reticulate, cells 18-28 x 6-8µm. Appressoria alternate, antrorse, straight, 18-25µm long; stalk cells cylindrical to cuneate, 3-9.5µm long; head cells ovate, clavate, versiform, entire, 12-15.5 x 9-12.5µm. Phialides numerous, mixed with appressoria, alternate to opposite, conoid to ampulliform, 12-18.5 x 9-11µm. Mycelial

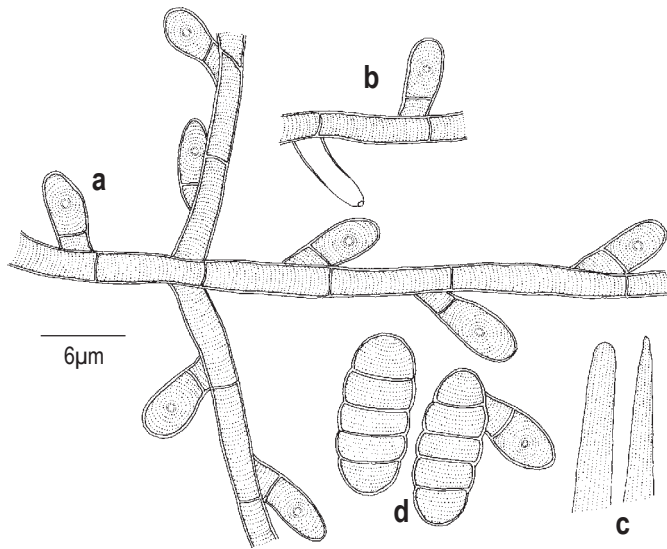


Figure 11. *Meliola thitei* Hosag.
a - Appressorium; b - Phialide; c - Mycelial setae;
d - Ascospores

setae thinly scattered, simple, straight, rarely curved, up to 315µm long. Perithecia scattered, up to 150µm in diam.; ascospores oblong to cylindrical, straight to slightly curved, 4-septate, slightly constricted, 30-34.5 x 12-15.5µm.

Remarks

The ovate and entire head cells of appressoria distinguishes this species from others. The name, *M. piperis* Earle is preoccupied and hence, the new name has been proposed. The identity of the host plant is to be confirmed.

Acknowledgements

Thanks are due to Dr. G.M. Nair, Director and Dr. T.K. Abraham, Deputy Director, TBGRI, Palode for the facilities.

References

Crane, J.L. and A.G. Jones (2001). Nomenclatural and taxonomic revisions in the Meliolaceae. *Mycotaxon* 77: 145-151.
Dhar, U. (2002). *Wild Plant Biodiversity: Thematic Biodiversity Strategy and Action Plan.* G.B. Pant Institute of Himalayan Environmental and Development, Kosi-Katarmal, Almora, Uttaranchal, India, 238pp.
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, 363pp.
Hosagoudar, V.B., T.K. Abraham and P. Pushpangadan (1997). *The Meliolineae.* A Supplement. Tropical Botanic Garden and

Research Institute, Palode, Thiruvananthapuram, Kerala, 201pp.
Hu, Y.X., Y.S. Ouyang, B. Song and G.Z. Jiang (1996). *Flora Fungorum Sinicorum.* Vol. 4. *Meliolales.* Science Press, Beijing, 270pp.
Hu, Y.X., B. Song, Y.S. Ouyang and G.Z. Jiang (1999). *Flora Fungorum Sinicorum.* vol.11. *Meliolales II.* Science Press, Beijing, 218pp.
Mibey, R.K. and D.L. Hawksworth (1997). Meliolaceae and Asterinaceae of the Shimba Hills, Kenya. *Mycological Papers* 174: 1-108.
Shankar, D., D.K. Ved, V. Tandon, S.R. Ramesh, A. Kareem and P. Singh (1997). Conserving a national resource. In: P. Pushpangadan and K.S.S. Nair (editors). *Biodiversity and Tropical Forests. The Kerala Scenario.* The State Committee on Science, Technology and Environment, Kerala, pp.103-117.

Host-Fungus Association

Buchanania lanzan

Meliola

- 1. Colonies epiphyllous, hyphae straight, appressoria antrorse *ardigoosii*
- 1. Colonies hypophyllous, hyphae tortuous, appressoria variously curved *buchananiicola*

Embelia ribes

Meliola

- *groteana*

Kingiodendron pinnatum

Meliola

- *kingiodendri*

Nothapodytes nimmoniana

Meliola

- *chandrasekharanii*

Piper nigrum

Meliola

- 1. Head cells of appressoria entire *thitei*
- 1. Head cells of appressoria sublobate to crenately lobate 2
- 2. Mycelial setae up to 500 µm long *stenospora*
- 2. Mycelial setae more than 500 µm long
 *stenospora* var. *major*

Pterocarpus santalinus

Meliola

- *pterocarpi*

Pueraria tuberosa

Meliola

- *banosensis* var. *puerariicola*

Symplocos cochinchinensis* var. *laurina

Meliola

- *symplocicola*