

Two new species of *Meliola* from India

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ABSTRACT: Two new species of *Meliola* Fries. collected from Nagaland (India) viz: *M. holarrhenae-pubescens* and *M. gymnemae* are described and illustrated in this paper.

Key words: Mycotaxonomy: foliicolous ascomycotes, New species

Leaf inhabiting fungi are the most fascinating ones which attracted attention of many workers all over the world since long time. They cover wide range of fungi whose occurrence is wide spread. A review of literature (Bilgrami *et. al.*, 1979, 1981, 1991; Hansford, 1961; Hosagoudar 1996, 2004, Sarbhoy *et. al.*, 1996) reveals that this has not been worked out by any worker in Nagaland.

During a survey of leaf inhabiting fungi of Nagaland, the authors encountered with two new species of *Meliola* Fries, growing parasitically on living leaves of *Holarrhena pubescens* (Buch-Ham.) Wallich ex G. Don. and *Gymnema* sp.

MATERIALS AND METHODS

The fungi were collected from plains and foot hills of Nagaland through out the year from 2000 to 2004. They were worked out from fresh and preserved materials and preparations were stained in lactophenol-cotton blue.

Holotype collections have been deposited in Indian Agricultural Research Institute, New Delhi and isotypes in the Post Graduate Department of Botany, Presidency College, Kolkata, West Bengal, India as Presidency College Collection (PCC).

RESULTS AND DISCUSSION

***Meliola holarrhenae-pubescens* T.K. Jana, S.N. Ghosh et A.K. Das, sp. nov. (Fig. 1)**

Coloniae amphigenae, tenuis vel subdensae, nigrae, dispersae, ad 5 mm diameter epiphyllae et ad 10 mm diam. hypophyllae, raro confluentes. Hyphae rectae vel subrectae, brunneae, septatae,

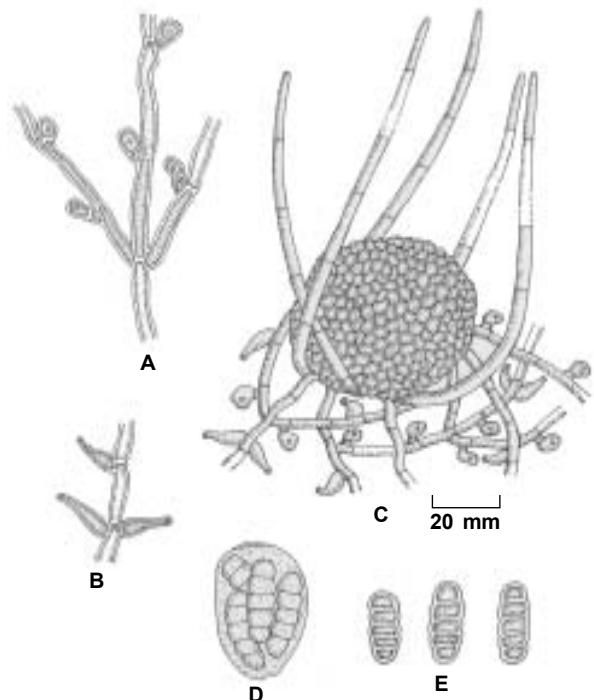


Fig 1. *Meliola holarrhenae-pubescens*

- A. Hyphae with appressoria
- B. Hyphae with phialides
- C. Perithecium associated with mycelium and setae
- D. Ascus bearing ascospores
- E. Ascospores

plerumque oppositae ad acuteque remosae, dense reticulatae, cellulae 24-40 x 5-8 mm. Appressoria alternata, raro irregulariter, atrobrunnea, bicellula, recta vel raro curvula, antrorsa, 12-20 mm longa; cellulae basiliares cylindratae vel cuneatae, 2-8 mm longae; cellulae apicales globosae, ovatae, integrae, 10-14 x 8-12 mm. Phialides paucae, producentes in ramis separatis myceliales, oppositae vel alternatae, unicellulae, ampulliformes, pallide brunneae, 16-20 x 4-8 mm. Setae myceliales paucae hypophyllae, plerumque epiphyllae, dispersae vel plerumque juxta perithecia aggregatae, simplices, nigrae, septatae, rectae vel leniter curvulae, subacutae vel obtusae ad apicem, 300 x 6-8 mm. Perithecia dispersa vel laxa aggregata, nigra, globosa, leniter verrucosa, ad 220 µm diam. Asci paucae, ovalis vel elliptici, sessiles, 2-4 spori, 40-44 x 28-36 µm. Ascospores oblongae vel cylindratae, 4 septatae, utrinque rotundatae, parietibus laevibus, septis constrictae, rectae vel leniter curvulae, atrobrunneae, 28-32 x 9-13 µm.

Colonies amphigenous, thin to subdense, black, scattered, up to 5 mm diameter on the upper surface and up to 10 mm in diam. on lower surface, rarely confluent. Hyphae straight to substraight, brown, branching mostly opposite at acute angles, closely reticulate, cells 24-40 x 5-8 µm. Appressoria alternate, rarely irregular, dark brown, 2 celled, straight to rarely bent, antrorse, 12-20 mm long; stalk cells cylindrical to cuneate, 2-8 mm long; head cells globose, ovate, entire with a small hyaline circular spot at the centre, 10-14 x 8-12 µm. Phialides few, borne on a separate mycelial branch, opposite to alternate, unicellular, ampulliform, pale brown, 16-20 x 4-8 µm. Mycelial setae few on lower surface of the leaf, more on upper surface, scattered to mostly aggregated around perithecia, simple, black, septate, straight to slightly curved, subacute to obtuse at the tip, 340x6-8 µm. Perithecia scattered to loosely grouped, black, round with slightly verrucose wall, up to 200 µm in diameter. Asci few, oval to elliptical, broad, sessile, 2-4 spored, 40-44 x 28-36 µm. Ascospores oblong to cylindrical, 4 septate, rounded at ends, smooth walled, constricted at the septa, straight to slightly curved, dark brown, 28-32 x 9-13 µm.

Specimen examined: On leaves of *Holarrhena pubescens* (Buch-Ham.) Wallich ex. G. Don. (Family—Apocynaceae), Veterinary Colony, Dimapur,

Nagaland, India, T.K. Jana, Feb.16, 2000, ITCC 4313.2K (Holotype), PCC 5115 (Isotype).

So far only two species of *Meliola*, namely *M. holarrhenae* Hansf. & Thirum. and *M. simillima* Ellis & Everh. var. *major* Hansf. have been recorded on *Holarrhena antidysenterica* Wall. under the family Apocynaceae from India (Hansford, 1961; Hosagoudar, 1996; Bilgrami *et al.*, 1979, 1981, 1991; Sarbhoy, 1996).

The present species *M. holarrhenae-pubescens* sp. nov. has been compared with the above mentioned two species of *Meliola* and with two other species viz. *M. euopla* Syd. and *M. tabernaemontanae* Speg. var. *odontadeniae* Hansf. (Table 1).

Based on the Beeli formula 3111. 3221, this new species is close to *M. holarrhenae* Hansf. & Thirum. (Hansford, 1961) and *M. simillima* Ell. & Everh. var. *major* Hansf. (Hansford, 1961) but differs from these in having phialides borne on a separate mycelial branch, smaller subacute mycelial setae, few on lower surface and more on upper surface of the leaf, larger perithecia with slightly verrucose wall, smaller oblong ascospores. It differs from *M. euopla* Syd. and *M. tabernaemontanae* Speg. var. *odontadeniae* Hansf. (Hansford, 1961) in having amphigenous colonies, phialides borne on a separate mycelial branch, longer acute mycelial setae, larger perithecia, smaller oblong ascospores.

Species epithet is based on the host genus.

***Meliola gymnae* T.K. Jana, S.N. Ghosh et A.K. Das, sp. nov. (Fig. 2)**

Coloniae epiphyllae, pertenuis, nigrae, patentiae, ad 3 mm diam. Hyphae rectae vel leniter flexuosae, brunneae, septatae, oppositae, raro irregulariter, acuteque vel laxa remosae, laxa reticulatae, cellulae plerumque 12-22 x 4-7 µm. Appressoria alternata, raro unilateralia, recta vel leniter curvula, antrorsa vel subantrorsa, bicellula, brunnea, 13-24 mm longa; cellulae basiliares cylindratae vel cuneatae, 4-6 mm longae; cellulae apicales subglobosae vel cylindratae, integrae, attenuatae vel rotundatae ad apicem, 10-13 x 6-8 µm. Phialides in hyphis distinctis, oppositae, ad 20% alternatae, unicellulae, ampulliformes, 16-23 x 7-9 µm. Setae myceliales dispersae vel juxta perithecia aggregatae, simplices, rigens, rectae vel curvulae, acutae vel obtusae ad

Table 1. Comparative account of *Meliola holarrhena*-*pubescens* sp. nov. with other species of *Meliola*

Name of species	Colonies	Hyphae	Phialides	Mycelial setae	Perithecia	Ascospores
<i>M. holarrhena</i>	Amphigenous, mostly epiphyllous, and confluent	Substraight to undulate	Mixed with appressoria	Tip acute, up to 450 µm long	Scattered, up to 190 µm diam., verrucose	Cylindric to subellipsoid, 30-38 x 12-15 µm.
<i>M. simillima</i> var. <i>major</i>	Amphigenous	Sinuuous to crooked	Mixed with appressoria	Tip obtuse, up to 330 µm long	Scattered, up to 140 µm diam, verrucose	Cylindric, 33-40 x 12-15µm.
<i>M. euoplia</i>	Hypophyllous, often confluent	Substraight to undulate	Mixed with appressoria	Tip obtuse, up to 250 µm long	Scattered, up to 150µm diam., slightly verrucose	Cylindric, 25-36 x 12-14µm
<i>M. tabernaemontanae</i> var. <i>odontadeniae</i>	Epiphyllous	Straight to undulate	Separate or mixed with appressoria	Tip obtuse, up to 280µm long	Scattered, up to 140 µm diam., verrucose	Cylindric, 30-35 x 10-15µm
<i>M. holarrhena</i> - <i>pubescens</i>	Amphigenous, rarely confluent	Straight to substraight	Borne on a separate mycelial branch	Few on lower surface of the leaf, more on upper surface, tip subacute to obtuse, up to 300 µm long	Scattered to loosely grouped, up to 200µm diam., slightly verrucose	Oblong to cylindrical, 28-32 x 9-13µm

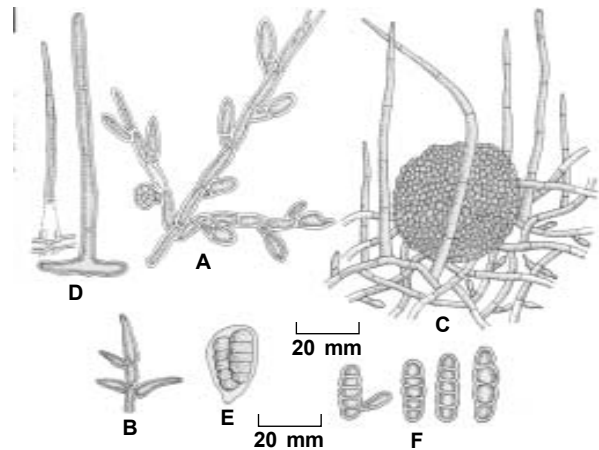


Fig 2. *Meliola gymnemae*

- A. Hyphae with appressoria
- B. Hyphae with phialides
- C. Perithecium associated with mycelium and setae
- D. Mycelial setae
- E. Ascus bearing ascospores
- F. Ascospores

apicem, nigrae, 370 x 6-8 mm. Perithecia dispersa vel aggregata, nigra, globosa, verrucosa, ad 125 mm diam. Asci ovalis vel elongati, sessiles, 2-spore. Ascosporae cylindraceae vel ellipsoideae, 3-4 septatae, utrinque rotundatae, septis constrictae, rectae, atrobrunneae, parietibus laevibus, 32-46 x 10-16 mm.

Specimen studied : On leaves of *Gymnema* sp. Patkai Hill, Dimapur, Nagaland, India, Nov.15, 2000, T.K. Jana. ITCC 4323. 2K (Holotype), PCC 5122 (Isotype).

A review of literature (Bilgrami *et al.*, 1979, 1981, 1991; Crane and Jones, 2001; Hansford, 1961; Hosagaudar, 1996, 2002a, 2002b; Mibey and Hawksworth, 1997; Patil and Mahamulkar, 1999; Sanchez and Carrion, 1992; Sarbhoy *et al.*, 1996) shows that no species of *Meliola* has yet been reported on host *Gymnema* sp. Based on the Beeli formula 3111. 4222, this new species is close to *M. asclepiadacearum* Hansf. in having epiphyllous colonies (Hansford, 1961) but differs from it in having smaller appressoria with subglobose to cylindrical head cells, phialides borne on a separate mycelial branch, longer acute mycelial setae, 3-4 septate smaller ascospores. It differs from *M. asclepiadacearum* Hansf. var. *brasiliensis* Hansf. (Hansford, 1961) in having epiphyllous colonies, smaller subglobose to

Table 2. Comparative account of *Meliola gymnemae* sp. nov. with other species of *Meliola*.

Name of species	Colonies	Appressoria	Phialides	Mycelial Setae	Ascospores
<i>M. asclepiadacearum</i>	Epiphyllous	20-30 mm long; head cells ovate to clavate - cylindrical, entire, rounded	Mixed with appressoria, opposite or alternate	Scattered, straight, obtuse, up to 330 mm long	Cylindric to narrowly ellipsoid, 4 septate, constricted, 45-49 x 15 - 18 mm
<i>M. asclepiadacearum</i> var. <i>brasiliensis</i>	Hypophyllous	20-25mm long; head cells ovate, entire or sometimes slightly angulose, 13-18 x 10-13mm	Mixed with appressoria	Scattered and grouped around perithecia, straight, obtuse, up to 330 mm long	Oblong to ellipsoid, 4 septate, 40-48 x 16-18 (14-15 mm)
<i>M. secamonis</i>	Amphigenous & epiphyllous	17-26mm long; head cells subglobose, ovate or clavate, entire or angulose, rarely sublobate, 15-21x10-13 mm	Mostly borne on a septate mycelial branch	Scattered, straight, acute, branch up to 450 mm long	Cylindric, 4 septate, rather deeply constricted, 37-45 x 12-15mm (14-17 mm)
<i>M. hughesiana</i>	Amphigenous	21-30mm long; head cells ovate, widely rounded or slightly pointed at the apex, entire, 13-20x9-11mm	Borne on a separate mycelial branch	Scattered, straight, obtuse, up to 430 mm long	Subellipsoid, obtuse, 4septate, constricted, 37-44 x 14-17mm
<i>M. gymnemae</i>	Epiphyllous	13-24 mm long ; head cells subglobose to cylindrical, entire, attenuated and rounded at the apex, 10-13x6-8 mm	Borne on a separate mycelial branch	Scattered to grouped around perithecia, straight to curved in the middle, acute to obtuse, up to 370 mm long	Cylindrical to ellip soid, 3-4 septate, rounded at end, constricted at each septum, 32-46 x 10-16 mm

cylindrical head cells, phialides borne on a separate mycelial branch, longer acute mycelial setae, smaller 3-4 septate and cylindrical ascospores. It also differs from *M. secamonis* Hansf. and *M. hughesiana* Hansf. (Hansford, 1961) in having only epiphyllous colonies, smaller subglobose to cylindrical head cells, smaller straight to curved mycelial setae, 3-4 septate smaller ascospores (Table-2). Species epithet is based on the host genus.

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