

The Genus *Lembosia* on *Humboldtia* species in Kerala, India

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Abstract: The genus *Humboldtia* comprises six species and of which five are in India. All these five species are endemic to Peninsular India. Of these, *Humboldtia unijuga* and *H. vahliana* were infected with three species of the genus *Lembosia*, namely, *Lembosia humboldtiae*, *L. humboldtiicola* and *L. humboldtiigena*. The former species was described from Kerala State and the latter two are described here as new to science. All these species are described and illustrated in detail to provide the consolidated account of the species known on this host genus.

Key words: Fungi, *Lembosia*, *Humboldtia*, Kerala, India, new species

Introduction

The genus *Humboldtia* is the Indo-Sri Lankan plant, comprises six species, of which five are known in India and are endemic to Southern Western Ghats. These are mostly distributed in the ever green forests at an altitude from 150-1250 m. Of these, *Humboldtia unijuga* Bedd. and *H. vahliana* Wight were found infected with *Lembosia* species.

The genus *Lembosia*, a type genus of the family Lembosiaceae, represents 144 species in the world (Song & Hosagoudar, 2003), characterized by the brown, septate mycelium with laterally placed appressoria; ovate, elongated to furcate thyriothecia dehisce longitudinally at

the centre. Asci ovate to globose with 4-8 brown uniseptate ascospores.

Taxonomy

Key to the species of the genus *Lembosia* on *Humboldtia* species:

1. Appressoria oblong to elongated, 1-3 celled, straight, flexuous to crooked, cells of ascospores unequal ... *humboldtiae*
1. Appressoria and ascospores not so ...2
2. Appressoria opposite, ovate to conoid ... *humboldtiicola*
3. Appressoria alternate, globose ... *humboldtiigena*

Descriptions to the species

1. *Lembosia humboldtiae* Hosag. & Abraham, Mycol. Res. 102: 186, 1996 (*humboldtiae*) (Plate 1, Fig.1)

Colonies amphigenous, dense, crustose, up to 5 mm in diameter, confluent. Hyphae flexuous to crooked, branching opposite at acute to wide angles, closely reticulate, cells 15-44 x 2-4 µm. Appressoria scattered, some part of the mycelium devoid of appressoria, alternate to opposite, straight, curved, flexuous to crooked, 1-3 celled, 11-44 µm long; stalk cells 1-2

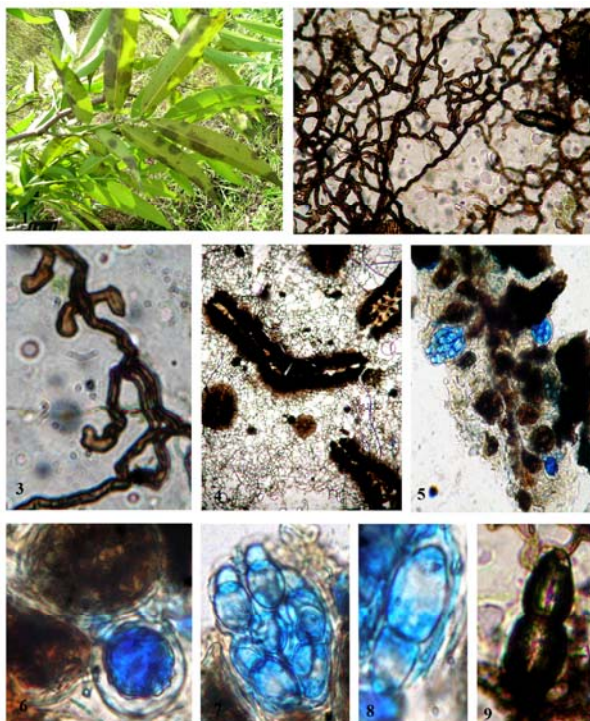


PLATE-1. *Lembosia humboldtiae* Hosag. & Abraham

1. Infected leaves, 2. Mycelium, 3. Mycelium with opposite and many celled appressoria, 4. Thyriothecia, 5. Broken thyriothecium with exposed asci, 6. Ascus, 7. Ascus having ascospores showing unequal cells, 8-9. Ascospores having unequal cells.

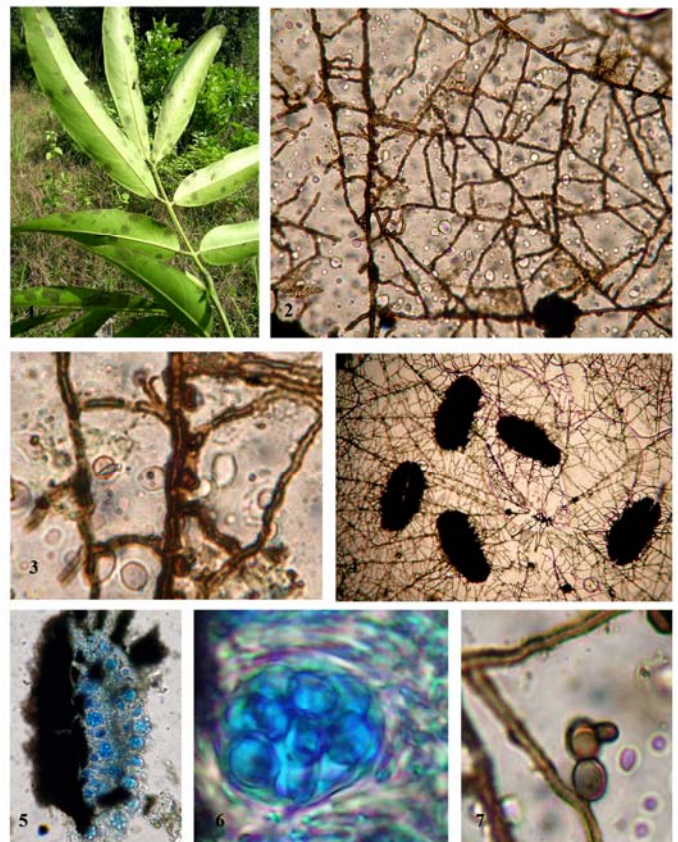


PLATE-2. *Lembosia humboldtiigena* sp. nov

1. Infected leaves, 2. Branched mycelium, 3. Appressariate mycelium, 4. Elongated thyriothecia in the colony, 5. Dehiscing thyriothecium with exposed asci, 6. Ascus, 7. Ascospore.

septate, 12-22 μm long; head cells ovate, straight, curved, entire to rarely lobate, 6-22 x 2-4 μm . Thyriothecia scattered, rounded to elongated, longitudinally fissured at the centre, 200-1000 x 180-250 μm , margin crenate to fimbriate, fringed hyphae flexuous to crooked; asci octosporous, subglobose to ovoid, 22-42 μm in diameter; ascospores 1-septate, brown, constricted at the septum, 22-35 μm long, lower cell smaller, ovate, 9-15 x 6-11 μm , upper cell larger than the lower, ovate, 13-20 x 11-13 μm , wall smooth.

Materials examined: On leaves of *Humboldtia vahliana* Wight (Caesalpiniaceae), Kombe, Meenmutty, Neyyar Wildlife Sanctuary, Thiruvananthapuram, Kerala, March 9, 1996, V.B. Hosagoudar HCIO 42179 (type), TBGT 51 (isotype); *Humboldtia* sp., TBGRI Campus, Palode, Thiruvananthapuram, Kerala, Nov. 25, 2000, T. Sabu HCIO 43829, TBGT 379; Dec. 28, 2006, A. Sabeena & M.C. Riju HCIO, TBGT 3008; Kulamavu, Idukki, Kerala, Sept. 5, 2001, M. Kamarudeen HCIO 45109, TBGT 1164; Arboretum, TBGRI Campus, Palode, Thiruvananthapuram, Nov. 4, 2004, T. Sabu HCIO 47318, TBGT 2356; near Peppara Dam, Peppara Wildlife Sanctuary, Nov. 18, 2007, Jacob Thomas and Vimalkumar HCIO 48290, TBGT 3009.

This species is distinct from rest of the two in having unicellular to multi cellular, flexuous to crooked stalk cells of the appressoria and unequal cells in the ascospores (Hosagoudar & Abraham, 1998).

2. *Lembosia humboldtiigena* sp. nov. (Plate-2, Fig. 2)

Coloniae amphigenae, densae, ad 5 mm diam., confluentes. Hyphae subrectae vel flexuosae, alternate vel irregulariter acuteque vel laxe ramosae, laxe vel arte reticulatae, cellulae 44-55 x 3-5 μm . Appressoria dispersa, alternata vel unilateralis, unicellularis, crassa posita, ovata, globosa, integra vel sublobata, 2-9 x 2-6

μm . Thyriothecia dispersa, rotundata vel elongata, dehiscentes longitudinalis ad centro, 150-480 x 100-330 μm , margine crenatae vel fimbriatae, hyphae fringiorae flexuosae, exapressoriatae; asci sub globosi, octospori, 31-44 μm diam.; ascosporae hyalinae ad initio, brunneae ad maturitatae, 1-septatae, conglobatae, constrictae ad septatae, 13-17 x 4-9 μm , parietus glabrus.

Colonies amphigenous, dense, up to 5 mm diameter, confluent. Hyphae substraight to flexuous, branching alternate to irregular at acute to wide angles, loosely to closely reticulate, cells 44-55 x 3-5 μm . Appressoria scattered, alternate to unilateral, unicellular, broad based, ovate, globose, entire to sublobate, 2-9 x 2-6 μm . Thyriothecia scattered, rounded to elongated, longitudinally fissured at the centre, 150-480 x 100-330 μm , margin crenate to fimbriate, fringed hyphae flexuous, exapressoriatae; asci sub globose, octosporous, 31-44 μm in diameter; ascospores initially hyaline, brown at maturity, 1-septate, conglobate, constricted at the septum, 13-17 x 4-9 μm , wall smooth.

Materials examined: On leaves of *Humboldtia vahliana* Wight (Caesalpiniaceae), TBGRI Campus, Palode, Thiruvananthapuram, Kerala, India, Dec. 28, 2006, A. Sabeena and M.C. Riju HCIO 48289 (type), TBGT 3008 (isotype).

Unicellular, scattered, ovate, globose, entire to sublobate appressoria distinguishes this from the other two species.

3. *Lembosia humboldtiicola* sp. nov. (Plate 3, Fig.3)

Coloniae hypophyllae, tenues, crustosae, ad 2 mm diam., confluentes. Hyphae rectae vel subrectae, opposite vel irregulariter acuteque vel laxe ramosae, laxe reticulatae, cellulae 9-14

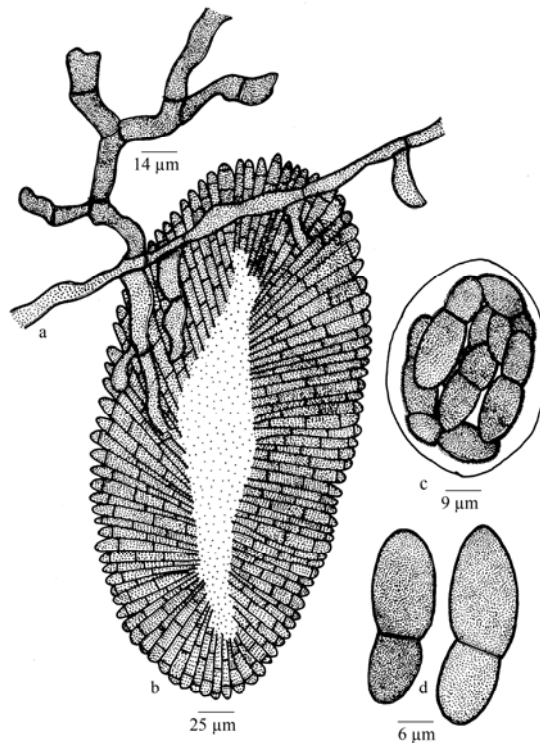


Fig. 1. *Lembosia humboldtiae* Hosag. & Abraham
a. Appressoriate mycelium, b. Thyriothecium, c. Ascus,
d. Ascospores

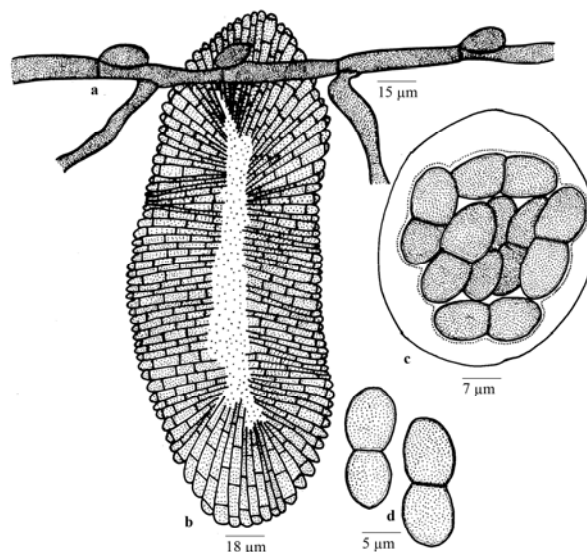


Fig. 2. *Lembosia humboldtiigena* sp. nov.
a. Appressoriate mycelium, b. Thyriothecium,
c. Ascus, d. Ascospores

x 2-5 μm . Appressoria plerumque opposita, subopposita, paucae unilateralis, unicellularis, ovata, conoidea vel cylindracea, crassa posita, sessilis, integra, 5-7 x 4-10 μm . Thyriothecia dispersa, ad intio rotundata, elongata ad maturitata, dehiscentes longitudinalis ad centro, 250-400 x 150-200 μm , margine crenatae vel fimbriatae, hyphae fringiorae subrectae vel flexuosae, exappressoriatae; asci octospori, globosi, ad 48 μm diam.; ascosporae hyalinae ad initio, fortiter brunneae ad maturitatae, uniseptatae, conglobatae, constrictae ad septatae, 31-36 x 11-13 μm , parietus echinulatus.

Colonies hypophyllous, thin, crustose, up to 2 mm in diameter, confluent. Hyphae straight to substraight, branching opposite to irregular at acute to wide angles, loosely reticulate, cells 9-14 x 2-5 μm . Appressoria mostly opposite, sub opposite, few unilateral, unicellular, ovate, conoid to cylindrical, broad based, sessile, entire, 5-7 x 4-10 μm . Thyriothecia scattered, initially rounded, elongated at maturity, longitudinally dehisced at the centre, 250-400 x 150-200 μm , margin crenate to fimbriate, fringed hyphae substraight to flexuous, appressoriatae; asci octosporous, globose, up to 48 μm diameter; ascospores initially hyaline, deep brown at maturity, uniseptate, conglobate, constricted at the septum, 31-36 x 11-13 μm long, wall echinulate.

Materials examined: On leaves of *Humboldtia unijuga* Bedd. (Caesalpiaceae), Athirumala, Peppara Wildlife Sanctuary, Thiruvananthapuram, Kerala, India, Feb. 28, 2008, Jacob Thomas & al HClO 48291 (type), TBGT 3010 (type).

Opposite to sub opposite, ovate to conoid appressoria distinguishes this species from the other two species.

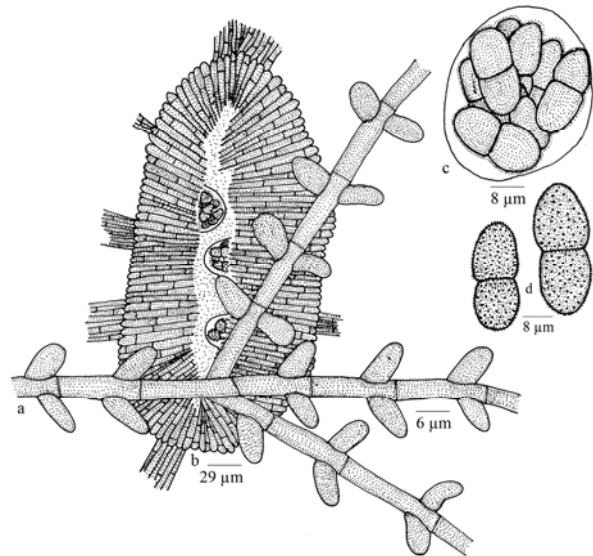


Fig. 3. *Lembosia humboldtiicola* sp. nov.
a. Appressariate mycelium, b. Thyriothecium,
c. Ascus, d. Ascospores

References

1. Hosagoudar VB and Abraham TK (1998) Four new foliicolous Ascomycetes from Kerala, India. *Mycol. Res.* 102, 184-86.
2. Song B and Hosagoudar VB (2003) A list of *Lembosia* species based on the literature. *Guizhou Science* 21, 93-101.

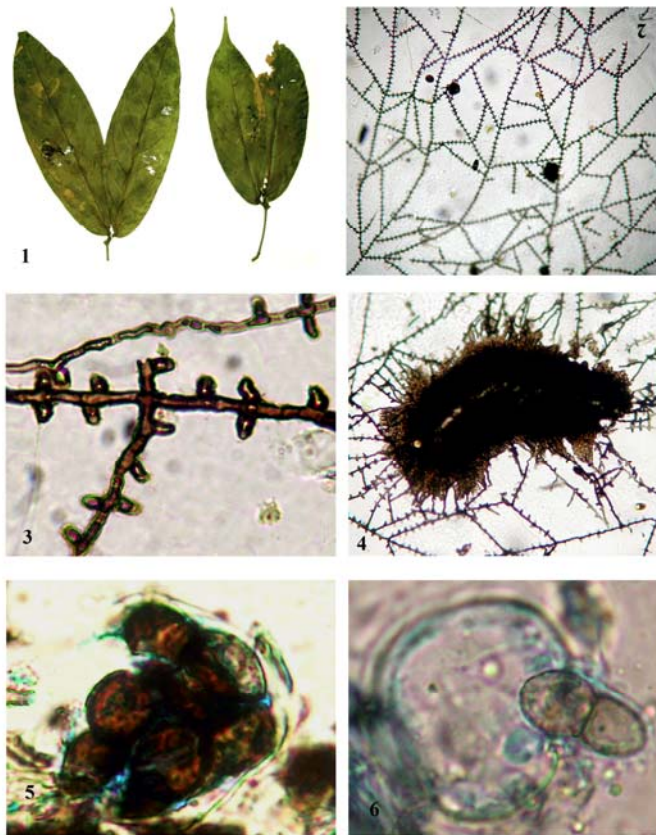


PLATE-3. *Lembosia humboldtiicola* sp. nov.

1. Infected leaves, 2. Mycelium, 3. Appressariate mycelium,
4. Thyriothecium, 5. Broken ascus, 6. Ascospore emerging from the ascus.