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New and Less Known Fungi From Kerala, India

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ABSTRACT: This paper gives an account of five foliicolous fungal taxa collected from Thiruvananthapuram district of Kerala state. Of these, *Irenopsis xeromphidis* and *Schiffnerula braunii* are the new species; *Meliola geniculata* and *Schiffnerula mirabilis* are rare fungi and *Meliola pterocarpi* found on a hitherto unrecorded endemic host plants.

KEY WORDS: foliicolous fungi, new species, Kerala, India.

INTRODUCTION

During a survey of the foliicolous fungal flora of Western Ghats region in Kerala state, authors have collected several fungi. Of these, two new species are described and illustrated in detail, while, others are listed.

MATERIALS AND METHODS

Infected plant parts were selected in the field, field notes were made regarding their pathogenicity, nature of colonies, nature of infection and the collection locality. For each collection, a separate field number was given. In the field, each infected plant was collected separately in polythene bags along with the host twig (preferably with the reproductive parts to facilitate the identity of the corresponding host). These infected plant parts were pressed neatly and dried in-between blotting papers. After ensuring their dryness, they were used for microscopic study. Scrapes were taken directly from the infected host and mounted in 10% KOH solution. After 30 min, KOH was replaced by Lactophenol. Both the mountants work well as clearing agents and made the septa visible for taking measurements.

To study the entire colony in its natural condition, a drop of high quality natural colored or well transparent nail polish was applied to the selected colonies and carefully thinned with the help of a fine brush without disturbing the colonies. Colonies with hyper parasites showing a woolly nature were avoided. The treated colonies along with their host plants were kept in dust free chamber for half an hour. When the nail polish on the colonies dried fully, a thin, colorless or slightly apple rose colored (depending upon the colour tint in the nail polish) film or flip was formed with the colonies firmly embedded in it. In case of soft host parts, the flip was lifted off with a slight pressure on the opposite side of the leaves and just below the colonies. Incase of hard host parts, the flip was eased off with the help of a razor or scalpel. A drop of DPX was spread on a clean slide and the flip was spread properly on it. One or two more drops of DPX were added additionally on the flip and a clean cover glass was placed over it. By gently pressuring on the cover glass, excessive amount of DPX was removed after drying. Care was taken to avoid air bubbles. These slides were labeled and placed in a dust free chamber for one to two days for drying. These permanent slides were then used for further studies. For innate fungi, sections were made and stained in cotton blue.

After the study of each collection, a part of the material was retained in the regional herbarium, Tropical Botanic Garden, Thiruvananthapuram (TBGT) and a part of it was deposited in the Herbarium Cryptogamae Indiae Orientalis (HCIO), IARI, New Delhi.

TAXONOMIC TREATMENTS

1. ***Irenopsis xeromphidis*** V. B. Hosagoudar et A. Sabeena, *sp. nov.* Fig. 1

Etymology: This species is named after the host genus *Xeromphis*

Coloniae epiphyllae, tenues, ad 2 mm diam., confluentes. Hyphae subrectae vel flexuosae, opposite vel unilateralis acuteque vel laxe ramosae, laxe reticulatae, cellulae 15-35 x 5-10 µm. Appressoria alternata, circa 1% opposita vel unilateralis, antrorsa vel subantrorsa, 20-30 µm longa; cellulae basilares cylindraceae vel cuneatae, 5-10 µm longae; cellulae apicales ovatae, oblongae, rectae vel curvulae, integrae, angularis vel raro leniter lobatae, 15-20 x 12-15 µm. Phialides appressoriis mixtus, opposite vel unilateralis, ampulliformes, 12-25 x 5-10 µm. Perithecia dispersa, ad 150 µm diam.; setae peritheciales 5-8, rectae vel leniter curvulae, perpendicularis, parietus glabrus, ad apicem

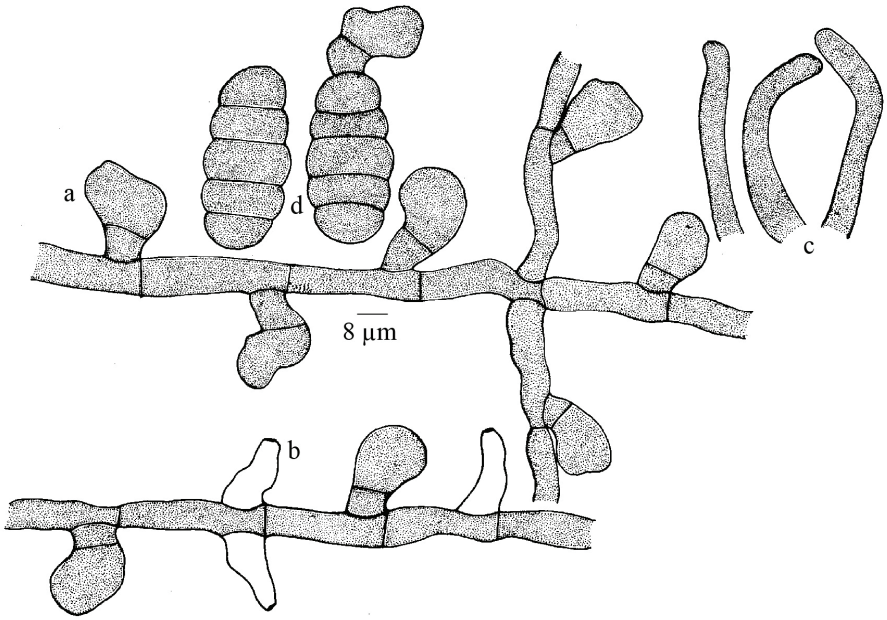

Fig. 1. *Irenopsis xeromphidis* sp. nov. a: Appressoria. b: Phialides. c: Apical portion of perithecial setae. d: Ascospores.

late rotundatae, ad 110 µm longae; ascosporae cylindraceae vel obovoideae, 4-septatae, constrictus ad septatae, 40-45 x 17-20 µm.

Colonies epiphyllous, thin, up to 2 mm in diameter, confluent. Hyphae substraight to flexuous, branching opposite to unilateral at acute to wide angles, loosely reticulate, cells 15-35 x 5-10 µm. Appressoria alternate, 1% opposite to unilateral, antrorse to subantrorse, 20-30 µm long; stalk cells cylindrical to cuneate, 5-10 µm long; head cells ovate, oblong, straight to curved, entire, angular to rarely slightly lobate, 15-20 x 12-15 µm. Phialides mixed with appressoria, opposite to unilateral, ampulliform, 12-25 x 5-10 µm. Perithecia scattered, up to 150 µm in diameter; perithecial setae 5-8, straight to slightly curved, upright, smooth walled, broadly rounded at the tip, up to 110 µm long; ascospores cylindrical to obovoidal, 4-septate, constricted at the septa, 40-45 x 17-20 µm.

Specimen examined: On leaves of *Xeromphis uliginosa* (Thunb.) Keay (Rubiaceae), in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, Sept. 24, 2008 A. Sabeena & M.C. Riju HCIO 49241 (type), TBGT 3480 (isotype).

Irenopsis bayamonensis Tehon var. *guettardae* (Cif.) Hansf. and *I. chiococcae* Stev. are known on the members of the family Rubiaceae. The former taxon is of doubtful nature (Hansford, 1961). The present new species differs from *I. chiococcae* in having longer appressoria, smooth walled perithecial setae in contrast to asperulate ones and straight to curved setae in contrast to twisted.

2. ***Meliola geniculata*** Sydow & Butler, Ann. Mycol. 9: 381, 1911.

Specimen examined: On leaves of *Lannea coromandelica* (Houtt.) Merr.(Anacardiaceae), in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, Nov.15, 2007 A. Sabeena & M.C. Riju HCIO 49240, TBGT 3479.

This species was collected by Sir E.J. Butler on Oct. 8, 1907 on this host from Puliyanur, Kerala, which is the type locality of this species. Subsequently, this species was reported on *Lannea welwitschii* from Uganda, *L. acidissima* from Gold Coast, *Antrocaryon micraster* from Sierra Leone, *Spondias pinnata* from Java and *Lannea* sp. from Gold Coast. After the type, there were no collections from this locality. Hence, the present species is re-located after a lapse of more than hundred years. Interestingly, even after a century, the present collection matches well with its protologue.

3. ***Meliola pterocarpi*** Yates, Philippine J. Sci. 13: 235, 1918.

Specimen examined: On leaves of *Pterocarpus santalinus* L.f. (Ceasalpiniaceae), in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Nov.15, 2008, A. Sabeena & M.C. Riju HCIO 48358, TBGT 3079; *P. dalbergioides* Roxb. (*Dalbergia andamanica*), in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, April 30, 2008, A. Sabeena & M.C. Riju TBGT 3536.

Meliola pterocarpi is known on *Pterocarpus marsupium* (Hosagoudar, 1996). However, the two endemic plants, namely, *Pterocarpus dalbergioides* Roxb. (*Dalbergia andamanica*), a native of Andaman Islands and *Pterocarpus santalinus* L.f., endemic to India, are planted in the present locality and were found infected with this fungus.

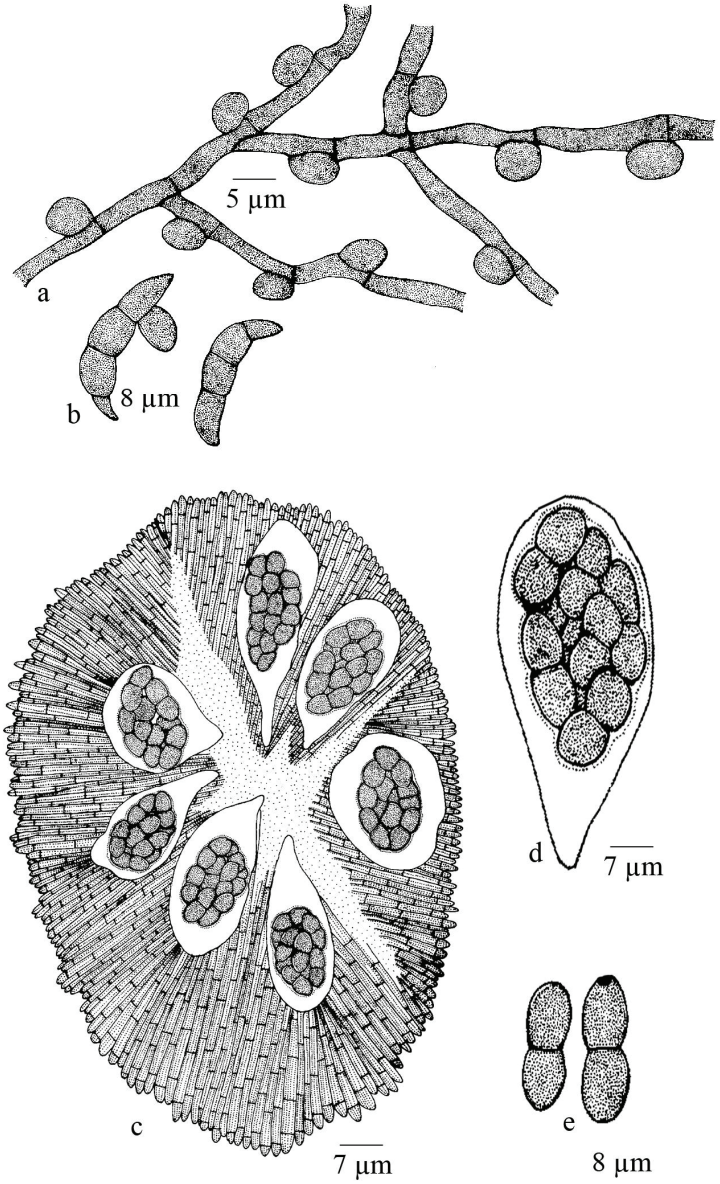

Fig. 2. *Schiffnerula braunii sp. nov.* a: Appressoriate mycelium. b: Conidia of *Questieriella*. c: Thyriothecia. d: An ascus. e: Ascospores.

4. ***Schiffnerula braunii*** V. B. Hosagoudar et A. Sabeena, sp. nov. Fig. 2

Anamorph: *Questieriella braunii* Hosag., Abraham & C. K. Biju, New Botanist 23: 211, 1996.

Etymology: This species is named in honour of Dr. Uwe Braun, well-known personality in the fungal taxonomy.

Coloniae amphigenae, densae, velutinae, ad 2 mm diam., confluentes. Hyphae subrectae vel flexuosae, opposite vel unilateralis acuteque vel laxe ramosae, laxe vel arte reticulatae, cellulae 11-21 x 3-6 µm. Appressoria alternata vel unilateralis, unicellularis, globosa, ovata, integra, 5-10 x 6-11 µm. Conidia *Questieriella* solitaria, curvula, 3-septata, leniter constrictus ad septata, attenuata ad ambi apicem, 25-42 x 5-10 µm. Thyriothecia dispersa vel connata, orbicularis vel ovata, cellulae peridiales radiatus ad initio, portionio centralis dissolutus ad maturitata et asci visa, ad 170 µm diam.; asci 5-6 per thyriotheciis, globosi, ovati, octospori, ad 20 µm diam.; ascosporae conglobatae, uniseptatae, constrictus ad septatae, 15-20 x 5-8 µm.

Colonies amphigenous, dense, velvety, up to 2 mm in diameter, confluent. Hyphae substraight to flexuous, branching opposite to unilateral at acute to wide angles,

loosely to closely reticulate, cells 11-21 x 3-6 µm. Appressoria alternate to unilateral, unicellular, globose, ovate, entire, 5-10 x 6-11 µm. Conidia of *Questieriella* were solitary, curved, 3-septate, slightly constricted at the septa, taper towards both ends, 25-42 x 5-10 µm. Thyriothecia scattered to connate, orbicular to ovate, peridial cells initially radiating, later central portion dissolved by exposing asci, up to 170 µm in diam.; asci 5-6 per thyriothecia, globose, ovate, clavate, octosporous, up to 15-25 x 18-20 µm; ascospores conglobate, uniseptate, constricted at the septum, 15-20 x 5-8 µm.

Speimen examined: On leaves of *Morinda pubescence* I.E.Smith (Rubiaceae), in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, India, Sept. 29, 2008, A. Sabeena HCIO 49236 (type), TBGT 3475 (isotype).

There are five species of the genus *Schiffnerula* on the members of the family Rubiaceae, namely *S.craterispermi (*Hansf.) Hughes on *Craterispermum laurinum* from Uganda; *S. hendrickxii* (Hansf.) Hughes on *Graumiliae* sp. from Belgium Congo; *S. psychotriae* (Doidge) Hughes on *Psychotria capensis* from South Africa; *S. palicoureae* (Fair) Hughes on *Palicoureae croca* from Dominica; *S.ugandensis* (Hansf.) Hughes on Rubiaceae member (*Pavetta*) from Uganda (Hughes, 1987) and *Questieriella braunii* Hosag. et al. on *Morinda pubescence* from India (Hosagoudar, 1996). Of these, the genus *Craterispermum*, *Grumulia* and *Palicourea* are not represented in India (Santapau and Henry, 1984). *Schiffnerula braunii* differs from *S. psychotriae* and *S. ugandensis* in having very much narrow *Questieriella* conidia, smaller thyriothecia, asci and ascospores. Further, it can be distinguished from these species in having entire and globose in contrast to mammiform appressoria, attenuated towards apex, which are often sublobate (Sivanesan, 1984). This species was persisted only in anamorph and was described as *Questieriella braunii*. However, our subsequent efforts resulted in recording its teleomorph.

5. ***Schiffnerula mirabilis*** Hohnel, Sitzungsber. K. Akad. Wiss. Wien., math.-nat. kl., 1. Abt., 118: 867, 1909; Muller and Arx, Beitr. Krypt. Der Schweiz 11: 160, 1962.

Sciffnerula pitteriana Sydow, Ann. Mycol. 28: 161, 1930.
Schiffnerula malabarensis Ramakr. & Sundar., Proc. Indian Acad. Sci. 38: 188, 1953.

Specimen examined: On leaves of *Passiflora edulis* Sims (Passifloraceae), Kallara, Thiruvananthapuram, Kerala, Nov. 28, 2008, A. Sabeena HCIO 49118, TBGT 3373.

Ramakrishnan and Sundaram (1953) reported this species on *Passiflora edulis* from Wayanad, Kerala. After a lapse of half a century, this fungus is relocated from the lower altitudes in the southern part of Kerala State.

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印度喀拉拉邦新種與稀有種真菌

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摘要：本文記述印度喀拉拉邦特里凡得琅區的五種葉生真菌。其中 *Irenopsis xeromphidis* 與 *Schiffnerula braunii* 是新種，*Meliola geniculata*、*Meliola pterocarpi* 與 *Schiffnerula mirabilis* 是稀有種真菌，並且 *Meliola pterocarpi* 是當地的新紀錄特有植物。

關鍵詞：葉生真菌、新種、喀拉拉邦、印度。