STUDIES ON FOLIICOLOUS FUNGI – XIII A NEW GENUS AND A NEW SPECIES

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Abstract

This paper gives an account of a new genus *Krishnamyces* with the type, *K. indica* and a new species *Schiffnerula hughesii,* collected on the leaves of *Trema orientalis* from Kerala. Both the taxa are described and illustrated in detail. *Krishnamyces* gen. nov. is an anamorph genus of *Rhytidenglerula* having appresoraite mycelium.

Keywords

India, Kerala, Krishnamyces *gen. nov., new genus, new species,* Schiffnerula hughesii *sp. nov.*

Abbreviations

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

Introduction

The foliicolous ectophytic fungi having brown mycelium with globose perithecia, having deluscent peridial wall are classified under the family Englerulaceae (Arx & Muller, 1975). This family comprises five genera namely, *Englerula*, *Parenglerula*, *Thrauste*, *Schiffnerula* and *Rhytidenglerula*. The genera *Parenglerula* and *Thrauste* are devoid of anamorphs, while, the genus *Schiffnerula* represents four hyphomycetous anamorphs, namely, *Digitosarcinella*, *Sarcinella*, *Mitteriella* and *Questieriella*. In contrast to these, the genera *Englerula* and *Rhytidenglerula* have anamorphs with pycnidia. The non-appressoriate pycnidial form is an anamorph of the genus *Englerula* and has been assigned to the form genus *Capnodiastrum* Speg. with the type, *C. macarangae* (Petrak) Petrak, infecting the host genus *Macaranga* (Muller & Arx, 1962). The anamorph of the fungus *Rhytidenglerula tremae* (Sydow) Arx infecting the host genus *Trema* has appressoria and it needs a separate generic status. Hence, the new genus *Krishnamyces* has been proposed.

Krishnamyces gen. nov.

Coelomycetes, Fungi Imperfecti (anamorph of the genus *Rhytidenglerula*)

Type species
K. indica sp. nov.

Etymology
Named after the Hindu God, Lord Krishna

Diagnostic features
Foliicolae, ectophyticae, mycelia brunnea, septata, appressoriata, appressoria unicellula. Pycnidia superficialia, globosa, non-ostiolata, cellulae parietus polygoniae, olive brunneae, transluscentes vel muciliginosae ad maturitatae; pycnidiophorae micronematae, mononematae; cellulae conidiogenae holoblasticae, hyalinae; pycnidiosporae olive brunneae, ovoideae vel oblongae, toties fascia hyalinae ad centro.

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Foliicolous, ectophytic, mycelium brown, septate, appressoriate, appressoria unicellular. Pycnidia superficial, globose, non-ostiolate, pycnidial wall cells polygonal, olivaceous brown, become translucent or mucilaginous at maturity; pycnidiophores micronematous, mononematous; conidiogenous cells holoblastic, hyaline; pycnidia olivaceous brown, ovoid to oblong, often with hyaline band at the middle.

***Krishnamyces indica* sp. nov.**
(Fig. 1)

Materials examined
Holotype: 18.ii.2000, Adivaram, Kalpetta, Wyanad, Kerala, India, on leaves of *Trema orientalis* (L.) Blume (Ulmaceae), coll. C.K. Biju, HCIO 44002 (as *Capnodiastrum tremae*),
Isotype: TBGT 421.

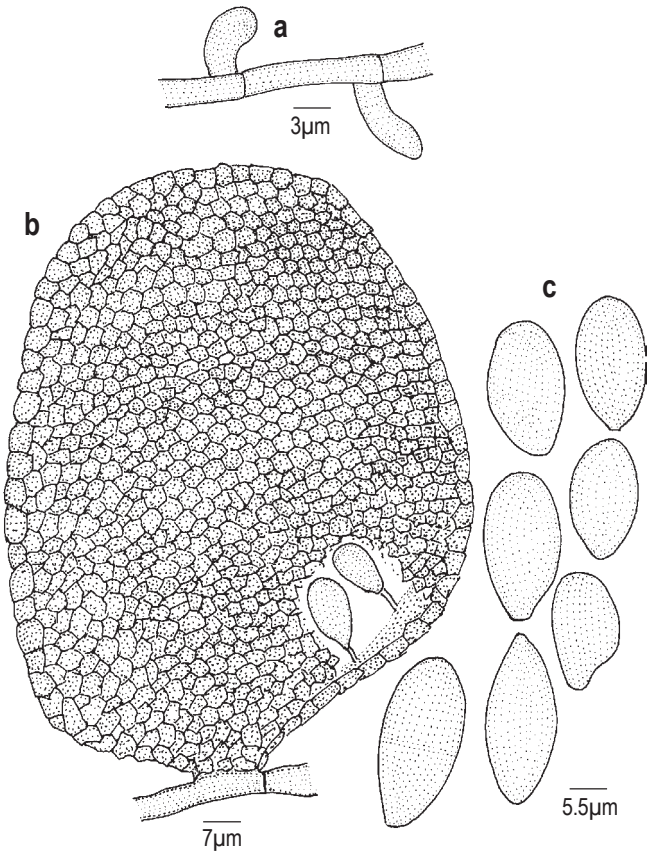

Figure 1. **Krishnamyces indica *gen.* et *sp. nov.***
a. Appressoriate mycelial branch; b. Pycnidia with two exposed pycnidiospores and a unilayered pycnidial wall; c. Pycnidiospores

Etymology
Named after the host country India.

Diagnostic features
Coloniae amphigenae, densae, crustosae, ad 2mm diam. in folia superiora et densae, velutinae, ad 5mm diam. in folia inferiora. Hyphae ectophyticae, ramosae, fortiter hostes adpressae, brunneae, cellulae 10-18 x 5-6µm. Appressoria dispersa, alternata, unicellula, ovata, curvula, integra, 6-8 x 3-4µm. Pycnidia superficialis, ovata vel piriformes, brunnea, uniloculata, 80-112 x 70-80µm, plerumque dehiscentes vel dissolvens ad apicem, parietus plerumque unitunicatus, cellulae parietales brunneae, 6-10µm crassae. Pycnidiosporae unicellulae, brunneae, ovatae vel ellipsoideae, toties fascia hyalinae ad centro, capitula mucosae ad apicem, truncata ad basim, 16-26 x 11-13µm.

Colonies amphigenous, dense, crustose, up to 2mm in diameter on the upper side, while dense, velvety, up to 5mm in diameter on the lower surface. Hyphae ectophytic, branched, closely pressed to the host surface, brown, branched, cells 10-18 x 5-6µm. Appressoria scattered, alternate, unicellular, ovate, curved, entire, 6-8 x 3-4µm. Pycnidia superficial, ovate to pyriform, brown, unilocular, 80-112 x 70-80µm, mostly dehisce or dissolve at the apex to release the pycnidiospores; wall mostly one-layered, cells brown, 6-10µm thick. Pycnidiospores unicellular, brown, oval to ellipsoidal, often with pale equatorial band, often with hyaline mucous cap at one side, often truncate at the base, 16-26 x 11-13µm.

Remarks
Cooke (1882) proposed *Asterina stylospora* on *Sponia guineensis* from Inanda based on Medley Wood's collection. Sydow (1930b) proposed *Oothecium consimile*. After the study of the type collection, Doidge (1942) brought these two taxa under *Oothecium stylosporum* (Cooke) Doidge. This taxon is devoid of appressoria and based on this character, Sivanesan (1984) brought all these under *Capnodiastrum stylosporum* (Cooke) Petrak. However, the present collection is with appressoria.

***Schiffnerula hughesii* sp. nov.**
(Fig. 2)

Materials examined
Holotype: 15.i.2002, in the campus of Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, India, on leaves of *Trema orientaslis* (L.) Blume (Ulmaceae), coll. V.B. Hosagoudar, HCIO 44411.
Isotype: TBGT 598.

Etymology
This species is named in honour of Dr. S.J. Hughes, for his contributions towards the genus *Schiffnerula.*

Diagnostic features
Coloniae epiphyllae, densae, ad 2mm diam., raro confluentes. Hyphae rectae vel flexuosae, irregulariter acuteque ramosae, laxe vel dense reticulatae, cellulae 19-23 x 3-5µm. Appressoria alternata, plerumque unilateralis, toties 1% opposita, globosa, mammiformes, sessilis vel leniter stipitata, integra, angularis vel leniter lobata, 6-8µm diam. Thyriothecia dispersa vel laxe aggregata, toties connata, orbicularis, radiatus ad initio, anthracinus ad maturitata, ad 100 µm diam., margine cellulis radiatus et tabidus ad centro; asci 4-5, globosi, raro leniter ovati, octospori, 28-40µm diam.; ascosporae oblongae, conglobatae, brunneae, uniseptatae, constrictae, 19-23 x 9-11µm, parietus glabrus.

Colonies epiphyllous, dense, up to 2mm in diameter, rarely confluent. Hyphae straight to flexuous, branching irregular at acute angles, loosely to closely reticulate, cells 19-23 x 3-5µm. Appressoria alternate, mostly unilateral, often 1% opposite, globose, mammiform, sessile to slightly stipitate, entire, angular to slightly lobate, 6-8µm in diameter. Thyriothecia scattered to loosely grouped, often connate, orbicular, initially radiate, later carbonaceous black, up to 100µm in diam., margin with radiating cells, central portion dissolved and asci exposed at maturity; asci 4-5 per thyriothecia, globose, rarely slightly ovate, octosporous, 28-40µm in diameter; ascospores oblong, conglobate, brown, uniseptate, constricted at the septum, 19-23 x 9-11µm, wall smooth.

Remarks
Schiffnerula tremae Sydow and *S. clemensiae* Petrak are known on host genus *Trema* from Venezuela and Philippines. A comparative account of these is given in Table 1.

Schiffnerula tremae H. Sydow and *S. clemensiae* Petrak appear to be conspecific because both the species occur hypophyllously, have very few appressoria and almost have the same measurements in perithecia, asci and ascospores (Sydow, 1930a,b, Hughes, 1987). However, the present species stands very distinct from both the species in having epiphyllous and smaller colonies, entire to angular to slightly lobate and also with 1% opposite appressoria and smaller ascospores. Sivanesan (1984) has treated *Schiffnerula tremae* Sydow synonymous to *Rhytidenglerula tremae* (Sydow) Arx. *Schiffnerula hughesii* differs from it in having sessile perithecia in contrast to stipitate one and the ascospores lack hyaline band in each cell.

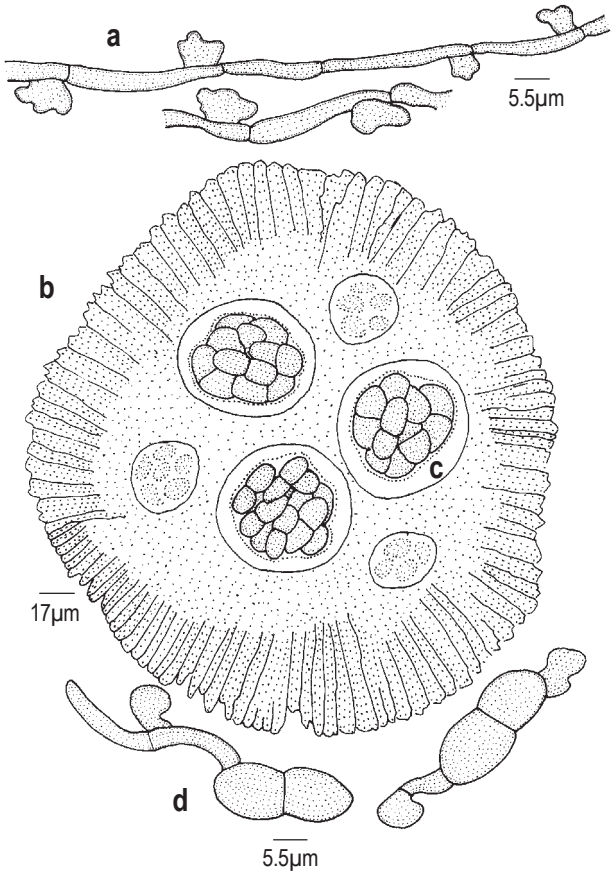

Figure 2.* Schiffnerula hughesii *sp. nov.
a. Appressoriate mycelium; b. Thyriothecia with dissolved upper wall showing exposed asci; c. Ascus; d. Ascospores germinated by producing appressoria and mycelium

Table 1. Comparative account of* Schiffnerula tremae, Schiffnerula clemensiae *and* Schiffnerula hughesii *sp. nov.

Scientific name	Colonies	Appressoria	Perithecia	Asci	Ascospores
Schiffnerula tremae	Hypophyllous, running along the veins, up to 8mm in diameter.	Few, depressed globose to disciform, entire, 10-12 x 7-10µm	50-110µm in diameter	35-40µm	21-28 x 13-15µm
Schiffnerula clemensiae	Hypophyllous, on nerves, up to 4mm in diameter.	Few, depressed-globose to pulvinate, 7-11µm	Globose to stipitate, 90-150µm in diameter.	45-55µm	22-26 x 12-15µm
Schiffnerula hughesii sp. nov.	Epiphyllous, up to 2mm in diameter	Alternate, unilateral, 1% opposite, globose, entire, angular to slightly lobate, 6-8µm	Up to 100µm in diameter.	28-40µm	19-23 x 9-11µm

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