

Schiffnerulaceous fungi of Kodagu, Karnataka, India

V.B. Hosagoudar¹, C. Jagath Thimmaiah² & M. Jayashankara³

¹Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala 695562, India

^{2,3}Department of Studies and Research in Microbiology, Mangalore University Post Graduate Centre, Cauvery Campus, Madikeri, Kodagu, Karnataka 571201, India

Email: ¹vbhosagoudar@rediffmail.com (corresponding author), ²jgtct@rediffmail.com, ³jayashankara@yahoo.com

The genus *Schiffnerula* represents four synanamorphs: *Mitteriella*, *Questieriella*, *Sarcinella*, *Digitosarcinella* and their teleomorph, *Schiffnerula*. This genus has been revised for India (Hosagoudar 2011). During the study of foliicolous fungi of Kodagu, we could study several collections belonging to this genus and of which the following four taxa turned as new to science and are described and illustrated here.

Questieriella ophiorrhizae sp. nov.

(Image 1)

Material examined: 21.xi.2009, on leaves of *Ophiorrhiza* sp. (Rubiaceae), in the campus of Bharatiya Vidyabhavan Kodagu Vidyalaya, Madikeri, Kodagu, Karnataka, C. Jagath Thimmaiah, TBGT 5706 (holotype), (Mycobank 564009).

Coloniae epiphyllae, tenues, velutinae, ad 3mm diam., confluentes. Hyphae rectae vel flexuosae, alternatae, oppositae vel irregulariter acuteque vel laxe

ramosae, laxe reticulatae, cellulae 12–19 x 5–7 µm. Conidiophorae producentes hyphis lateralis, simplices, micronematae, macronematae, 0–2-septatae, simplices, raro ramosae, 15–18 x 6–8 µm; cellulae conidiogenae terminalis, integratae, ovalis vel cylindraceae; conidia solitaria, simplices, sicca, ellipsoidea, fusiformes, falcata, sigmoidea, pallide brunnea, 3-septata, cellulae terminalis acutae ad apicem, 38–45 x 9–11 µm.

Colonies epiphyllous, thin, velvety, up to 3mm in diameter, confluent. Hyphae straight to flexuous, branching alternate, opposite to irregular at acute to wide angles, loosely reticulate, cells 12–19 x 5–7 µm. Conidiophores produced lateral to the hyphae, simple, micronematous, macronematous, 0–2-septate, simple, rarely branched, 15–18 x 6–8 µm; conidiogenous cells terminal, integrated, oval to cylindrical; conidia solitary, simple, dry, ellipsoidal, fusiform, falcate, sigmoid, pale brown, 3-septate, terminal cells acute at the tip, 38–45 x 9–11 µm.

Schiffnerula craterispermi (Hansf.) Hughes, *S. hendrickxii* (Hansf.) Hughes, *S. psychotriae*

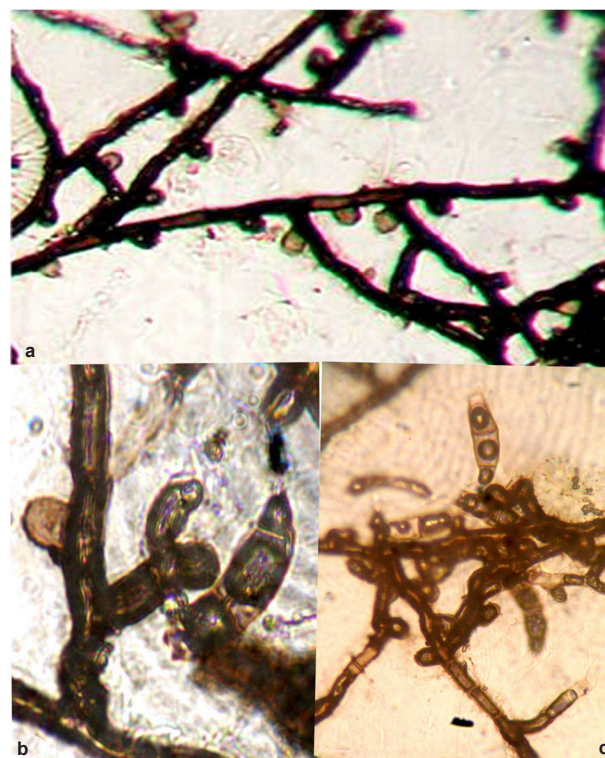


Image 1. *Questieriella ophiorrhizae* sp. nov. a - Appressorial mycelium; b-c - Conidiophore and conidia

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(Doidge) Hughes, *S. palicoureae* (Farr) Hughes, *S. ugandensis* (Hansf.) Hughes are known from other parts of the country (Hosagoudar 2003). From India, *Schiffnerula canthii* Hosag. & Archana on *Canthium* sp. and *Schiffnerula braunii* Hosag. & Sabeena on *Morinda* spp. are known on the members of the family Rubiaceae (Hosagoudar & Sabeena 2010). All these species are in their teleomorphs but the present fungus persists only in its *Questieriella* form. Hence, it has been accommodated in a new species.

Etyymology: Based on the host genus

***Sarcinella caralliae* sp. nov.**

(Image 2)

Material examined: 01.xi.2009, on leaves of *Carallia brachiata* (Lour.) Merr. (Rhizophoraceae), Kaimada field, Hoddur, Kodagu, Karnataka, C. Jagath Thimmaiah TBGT 5708 (holotype), (Mycobank 564010).

Coloniae amphigenae, plerumque epiphyllae, tenues vel densae, patentiae, ad 3mm diam. Hyphae rectae vel flexuosae, pallide brunnae, irregulariter acuteque vel laxe ramosae, laxe reticulatae, cellulae 12–20 × 4–6 µm. Appressoria dispersa, alternata, unilateralis, ovata vel plerumque globosa, integra, 8–10 × 6–8 µm. Conidiophorae producentes hyphis lateralis, simplices, micronematae, 6–8 µm longae; cellulae conidiogenae terminalis vel intercalaris, monoblasticae, integratae, determinatae, cylindratae. Conidia solitaria, sicca, simplices, subspherica vel ovalis, 2–10-cellulae, brunnea vel nigra, muriformes,

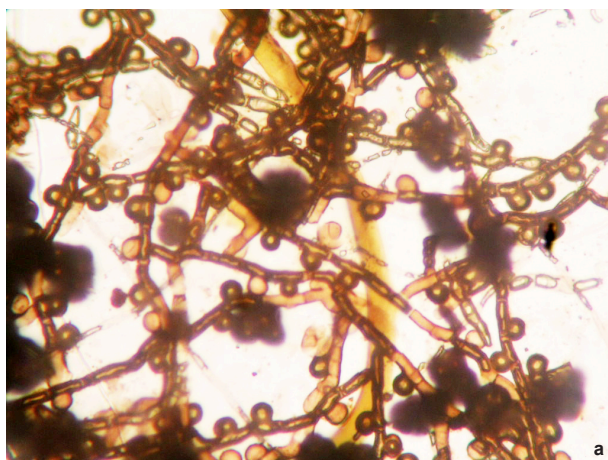


Image 2. *Sarcinella caralliae* sp. nov.
a - Appressoriate mycelium with sarciniform conidia

sarcinatim septatis, constrictus ad septatis, 21–30 µm diam., parietus glabrus.

Coloniae amphigenous, mostly epiphyllous, thin to dense, spreading, up to 3mm in diameter. Hyphae straight to flexuous, pale brown, branching irregular at acute to wide angles, loosely reticulate, cells 12–20 × 4–6 µm. Appressoria scattered, alternate, unilateral, ovate to mostly globose, entire, 8–10 × 6–8 µm. Conidiophores produced lateral to the hyphae, simple, micronematous, 6–8 µm long; conidiogenous cells terminal, intercalary, monoblastic, integrated, determinate, cylindrical. Conidia solitary, dry, simple, subspherical to oval, 2–10-celled, brown to charcoal black, muriform, sarcinately septate, constricted at the septa, 21–30 µm in diameter, wall smooth.

This is the first species of schiffnerulaceous fungus infected the members of the family Rhizophoraceae (Hosagoudar 2003, 2011).

Etyymology: Based on the host genus.

***Schiffnerula aristolochiae* sp. nov.**

(Image 3)

Material examined: 04.xii.2009, on leaves of *Aristolochia tagala* Cham. (Aristolochiaceae), Devara kadu, Hoddur, Kodagu, Karnataka, C. Jagath Thimmaiah TBGT 5703 (holotype), (Mycobank 564011).

Coloniae epiphyllae, subdensae vel densae, ad 2 mm diam., confluentes. Hyphae rectae vel subrectae, alternatae vel oppositae acuteque vel laxe ramosae, laxe reticulatae, cellulae 16–20 × 5–8 µm. Appressoria unilateralis, alternata vel raro opposita, ovata, globosa, mammiformes, crassa posita, integra, 10–15 × 7–10 µm. Conidiophorae *Questieriella* producentes hyphis lateralis, simplices, rectae, micronematae, mononematae, 0–2-septatae, 20–25 × 4–6 µm; cellulae conidiogenae terminalis, monoblasticae, integratae, solitaria, ellipsoidaleae; conidia recta vel curvula, pallide brunnea, 3-septata, plerumque in coloniis dispersa, 20–25 × 4–6 µm. Thyriothecia numerata, orbicularis, portio ad centralis dissolutus, portio marginalis intactus et radiatus, ad 50µm diam.; asci ovalis, globosi, octospori, ad 20µm diam.; ascosporae conglobatae, brunneae, uniseptatae, plus minus constrictus ad septatus, 25–30 × 12–15 µm.

Coloniae epiphyllous, subdense to dense, up to 2mm in diameter, confluent. Hyphae straight to

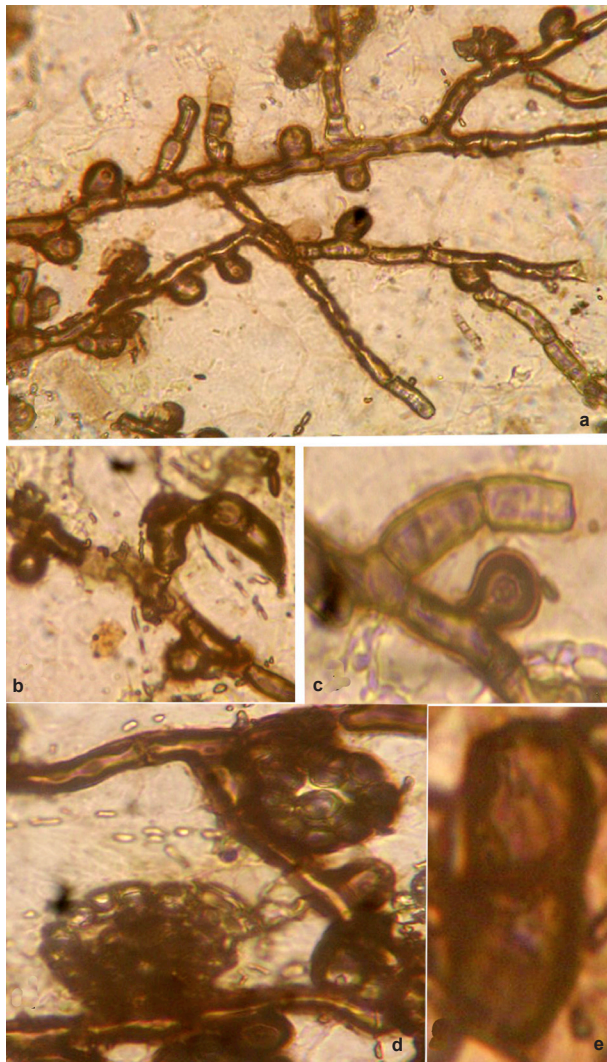


Image 3. *Schiffnerula aristolochiae* sp. nov.
 a - Appressoriate mycelium; b - *Questieriella* conidia on conidiophores; c - Conidiophore; d - Thyriothecia; e - Ascospore

substraight, branching alternate to opposite at acute to wide angles, loosely reticulate, cells 16–20 x 5–8 μm . Appressoria unilateral, alternate to rarely opposite, ovate, globose, mammiform, broad based, entire, 10–15 x 7–10 μm . Conidiophores of *Questieriella* produced lateral to the hyphae, simple, straight, micronematous, mononematous, 0–2-septate, 20–25 x 4–6 μm ; conidiogenous cells terminal, monoblastic, integrated, solitary, ellipsoidal; conidia straight to curved, pale brown, 3-septate, mostly scattered in the colonies, 20–25 x 4–6 μm . Thyriothecia numerous, orbicular, central portion dissolved by exposing asci but the marginal cells remain intact and radiating, up to 50 μm in diameter; asci oval, globose, octosporous, up

to 20 μm in diameter; ascospores conglobate, brown, uniseptate, more or less constricted at the septum, 25–30 x 12–15 μm .

The conidia of *Questieriella* were scattered in the colonies, initially produced spores were intact and formed colonies. In case of subsequently produced spores, terminal cells were disintegrated; middle cells were deep brown, appressoria and mycelium produced from the central cells.

This forms the first report of the genus *Schiffnerula* on the members of Aristolochiaceae (Hosagoudar, 2003, 2011).

Etyymology: Based on the host genus.

***Schiffnerula hoddurensis* sp. nov.**

(Image 4)

Material examined: 16.xi.2009, on leaves of *Vitex negundo* L. (Vitaceae), Hoddur, Kodagu, Karnataka, C. Jagath Thimmaiah TBGT 5698 (holotype), (Mycobank 564012).

Coloniae epiphyllae, densae, ad 7mm diam. Hyphae flexuosae, suboppositae vel alternatae acuteque vel subacuteque ramosae, arte vel laxe reticulatae, cellulae 23–28 x 4–6 μm . Appressoria dispersa,

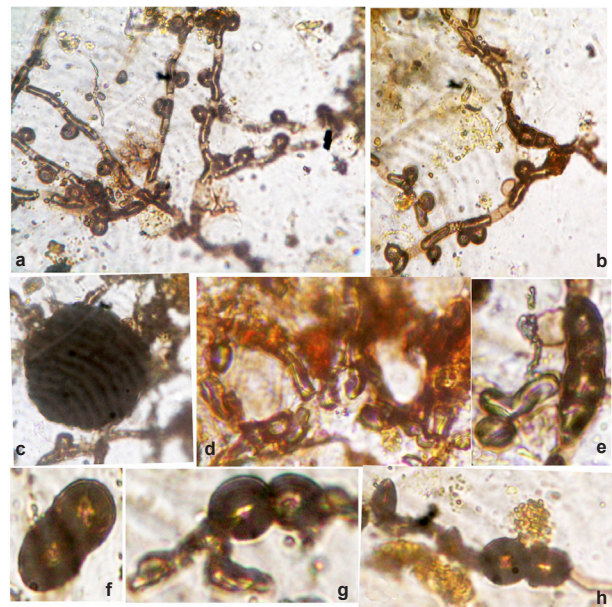


Image 4. *Schiffnerula hoddurensis* sp. nov.
 a - Appressoriate mycelium; b - Colony formed from the *Questieriella* conidia; c - Initial state of thyriothecium; d - Totally opened thyriothecium with the remnants of marginal cells; e - Germinating *Questieriella* conidia; f - Ascospore; g-h - Germinating ascospores

unilateralis vel alternata, raro opposita, unicellularis, globosa, mammiformes, crassa posita, integra, raro angularis, 5–10 x 6–11 µm. Conidia *Questieriella* pauca, dispersa, 3-septata, leniter constrictus ad septata, recta vel curvula, attenuatae ad ambi apicem, cellularae terminalis acutae vel subacutae, 17–36 x 8–10 µm. Thyriothecia dispersa, orbicularis, nigra ad initio, portio centralis dissolutus ad maturitatus; asci globosi vel ovati, 15–18 µm diam.; ascospores brunneae, conglobatae, uniseptatae, 23–26 x 11–13 µm.

Colonies epiphyllous, dense, up to 7mm in diameter. Hyphae flexuous, branching subopposite to alternate at acute to subacute angles, closely to loosely reticulate, cells 23–28 x 4–6 µm. Appressoria scattered, unilateral to alternate, rarely opposite, unicellular, globose, mammiform, broad based, entire, rarely angular, 5–10 x 6–11 µm. *Questieriella* conidia few, scattered, 3-septate, slightly constricted at the septa, straight to curved, taper towards both ends, end cells acute to subacute, 17–36 x 8–10 µm. Thyriothecia scattered, orbicular, initially charcoal black, central portion dissolved at the centre at maturity; asci globose to ovate, 15–18 µm in dia.; ascospores brown,

conglobate, uniseptate, 23–26 x 11–13 µm.

Sarcinella jabalpurensis R.C. Rajak & Soni is known on this host from Jabalpur, Madhya Pradesh (Rajak & Soni 1981). Since the *Sarcinella* state is not known in the present collection, it is not worth to state that both the taxa are the same. Hence, the present collection has been placed under a new species of its teleomorph.

This species was associated with *Asteridiella depokensis*.

Etyomology: The species is named after its collection locality.

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