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Schiffnerula dioscoriae sp. nov. from Malabar Wildlife Sanctuary, Kerala

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Abstract

A new species of the genus *Schiffnerula* on *Dioscorea wallichii*, collected from Malabar Wildlife Sanctuary, Kerala, India, is described and illustrated in detail.

Keywords – Black mildew – India **–** new species – Western Ghats

Introduction

During a study of foliicolous fungi in Malabar Wildlife Sanctuary of the Western Ghats of Peninsular India, an endemic plant, *Dioscorea wallichii* Hook.f. (Dioscoreaceae), found infected with a black mildew fungus. Microscopic examination of the fungus revealed that it belongs to a undescribed species of the genus *Schiffnerula*, hence the note.

The genus *Schiffnerula* is the member of an ectophytic black colony forming fungus, classified under the family Englerulaceae of bitunicate Ascomycetes (Arx & Muller 1975, Hyde et al 2013). It is characterized by the superficial mycelium with unicellular appressoria, having *Digitosarcinella*, *Mitteriella*, *Questieriella* and *Sarcinella* sexual morph (synanamorph) states. Ascomata produced at the end of the short lateral branches or sessile on the hyphae, initially flattened with radiate cells, later become globose and the wall cells gelatinize; asci persistent, bitunicate, ovate to globose; ascospores brown, uniseptate. This genus along with its synanamorphs represents around 100 taxa in the world, while, more than 50 are known in India (Hughes 1987, Bilgrami et al 1991, Hosagoudar 2003, 2011).

Materials & Methods

Infected plant parts were selected in the field, field notes were made regarding their 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

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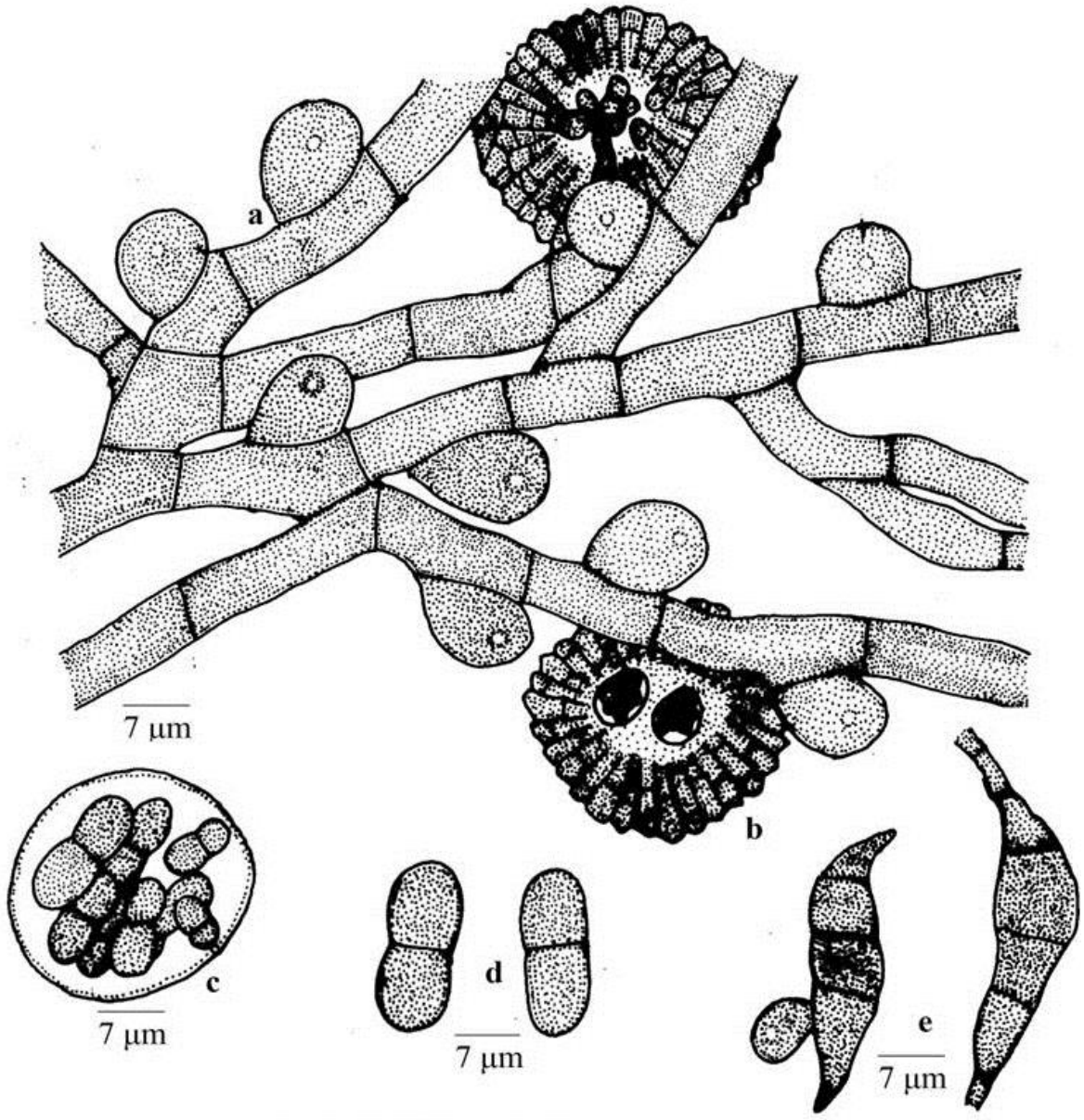

Fig. 1 – ***Schiffnerula dioscoriae*** sp. nov. a. Appressoria, b. Thyriothcium, c. Ascus, d. Ascospores, e. *Quistierilla* conidia

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. In case 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, part of the material was retained in the regional herbarium, Mar Thoma College Herbarium, Thiruvalla (MTCHT).

Results

Taxonomic Descriptions

Schiffnerula dioscoriae Lini K. Mathew, Neeta N. Nair & S. Swapna **sp. nov.** (Fig. 1, 2)
MycoBank 806112

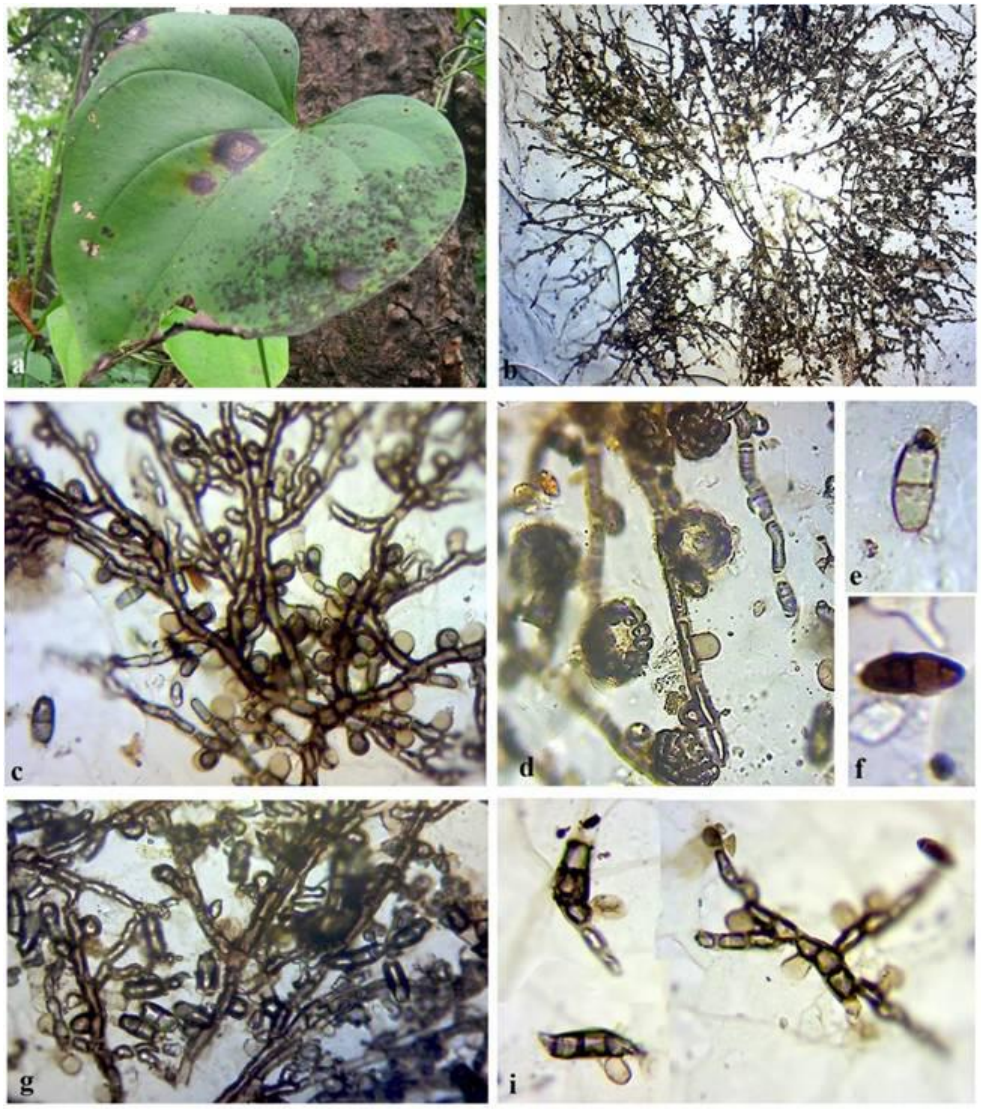

Fig. – 2 ***Schiffnerula dioscoriae*** sp. nov. a. Infected leaves of *Discorea wallachi*, b. Mycelial colony, c. Branched appressoriate mycelium, d. Thyriothecia, e&f. Ascospores, g. Colony with *Questieriella* conidia, ***i.*** Germinating *Questieriella* conidia

Etymology – Named after the host

Colonies epiphyllous, thin, up to 2 mm in diameter, confluent. Hyphae brown, substraight to flexuous, branching alternate at acute angles, closely reticulate to form a mycelial mat, cells 19–25.2 µm long and 2.4–4.8 µm wide. Appressoria alternate, unicellular, globose to subglobose, sessile, entire, 4.8–7.2 µm long and 4.8–9.6 wide.

Sarcinella conidiophores micronematous, mononematous, simple, unicellular, mostly straight,4.8–12 µm long and 4.8 –6µm wide; conidiogenous cells integrated, terminal, monoblastic, determinate, cylindrical; conidia few, simple, sessile, solitary, dry, ovate to globose, 5–8 celled, constricted at the septa, wall smooth, dark brown to charcoal black in colour, sarciniform, 16.8–21.6 µm wide.

Conidia of *Questeriella* present, scattered in the colony, straight to slightly curved, 3 –septate, slightly constricted at the septa, end cellsplae, acute, 28.6 –33.6 µm long and 9.6–12 µm wide.

Thyriothecia scattered, globose to ovate, orbicular, peridial cells initially radiating, later central portion dissolved by exposing asci, upto 80 µm in diameter; asci 2 –4 per thyriothecia, globose, octosporous, upto30.6 µm in diameter; ascospores oblong, conglobate, uniseptate, slightly constricted at the septum,16.8 –19.2 µm long and 4.8 –7.2 µm wide, wall smooth.

Material examined – India, Kerala, Malabar Wildlife Sanctuary, near Urakuzhy water falls on the living leaves of *Dioscorea wallichii* Hook. f. (Dioscoreaceae), 27 January 2013, Lini K. Mathew, MTCHT 11 (holotype).

Notes – Schiffnerula fungi flourish well in the tropics and have extended their distribution to subtropical to temperate regions of the world. The connection between sexual morphs and asexual morphs are well established. The asexual morphs *Digitosarcinella*, *Mitteriella*, *Questieriella* and *Sarcinella* are the asexual morphs of the genus *Schiffnerula*. Hughes (1987) gave an excellent review of the genus *Schiffnerula* and its synanamorphs and later on Hosagoudar (2003, 2011) revised it with monographs.

The genus *Schiffnerula*was placed under the family Englerulaceae (Arx & Muller 1975, Hyde et al 2013), characterized by the globose deluscent ascomata. However, as we learn more and more about this genus, the radiating ascomata develops below the mycelium is the characteristic feature of thyriothecium.

Schiffnerula and its asexual morphs are host specific fungi and there were no earlier reports on the host family Dioscoreaceae (Hosagoudar 2011). Hence based on the host specificity it has been accommodated in a new species.

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