# *Meliola peruvannamuzhiensis* sp. nov. (Ascomycetes, Meliolales) from Malabar Wildlife Sanctuary in Kerala State, India

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*Abstract: -* A new fungal species, *Meliola peruvannamuzhiensis*, infected the leaves *Ipomoea tridentata* (Convolvulaceae) collected from Malabar Wildlife Sanctuary of Kozhikode district has been described and illustrated in detail.

*Key words: -Meliola*, new species, *Ipomoea*, Black mildew, Kerala, India

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## 1 Introduction

During a survey of the foliicolous fungi in Malabar Wildlife Sanctuary in Western Ghats region of Kerala State, India, a black mildew fungus was collected on the leaves of *Ipomoea tridentata* (Convolvulaceae). Microscopic examinations of the infected plants revealed that it is hitherto undescribed species of the genus *Meliola* Fries, and hence, this note.

## 1.1 Black Mildews

Black Mildews are the group of black colony forming parasitic fungi belong to several taxonomic groups, namely Hyphomycetes, Meliolales, *Schiffnerula* and its anamorphic forms, Asterinales, etc. Black mildews are distinct from the saprophytic sooty moulds, which grow on the secretions of insects or nectar produced by glands of plants. Majority of the black mildews are obligate biotrophs but a few are necrotrophs (Kar and Bhattacharyya, 1982). They are host specific with a very narrow host range (Florence, 2004). Hence, identity of the host plant, preferably up to species level, needs to be known for the correct identification of these fungi.

Fungi have played a major role in the establishment and maintenance of ecosystem and have developed mutualistics relationship with many other organisms. Many species depend on specific plants for food and habitat, the destruction of plant diversity affect the microbial diversity. At many instances, it is possible that we may loose species to extinction much before they have been discovered. Fungi are important components of biodiversity in tropical forests, knowledge about the taxonomy and biology of tropical fungi has immediate relevance to the control of harmful interactions and the harnessing of useful fungal activities for human welfare, this implies the need for fungal taxonomist. Therefore, this work becomes the manual for the identification of the foliicolus fungi of the area (Kapoor, 1967; Cooke, 1880).

## 2 Study Area

The Malabar Wildlife Sanctuary is a part of Nilgiri Biosphere Reserve of the Western Ghats, a biodiversity hotspot, located in Chakkittappara and Koorachundu revenue villages of Quilandy Taluk in Kozhikode district, Kerala State. It lie between 11° 75’ and 11° 76‘ north and 76° 20’ and 75° 38’ east, the forests lie on the Northwest slopes of the Western Ghats contiguous with the forests of Ladysmith Reserved Forests and Kurichiar mala of Kalpetta Forest Range of South Wayanad Forest Division. The sanctuary lies along the boundary of Kozhikode district with Wayanad district to the north of the Tamarassery – Kalpetta Ghats. The sanctuary covering a total of 74.22 sq. km., altitude ranges from 40 to 1506 m, temperature ranges from 16 to 35°C, rainfall about 2800mm. The forests of Kakkayam is contiguous with the unique mountain systems of Banasuramala, Vellarimala, Kurichyarmala, Kakkanmala and Vannathimala and thereby occupy a unique position in the Southern Western Ghats. The sanctuary area constitutes the watersheds of Kuttiady River. The reservoirs at Kakkayam, Peruvannamuzhy and Banasuramala are lifeline of the inhabitants in

Kozhikode district as they are the source of drinking water. Electricity is also generated from the hydro-electric project. The Sanctuary has diverse vegetation types. These are the West-coast Tropical Evergreen, West-coast Semi evergreen, Southern Moist Mixed Deciduous, Southern Hill-top Evergreen forests, Grasslands, and Marshy grasslands (Vayals). The variety of vegetation types harbours more than 680 species of flowering plants including 226 species endemic to southern Western Ghats (about 30%). Steep hills, deep valleys, marshy lands etc. with hillocks, perennial water sources combined with altitudinal variations make it an ideal habitat for a variety of flora and fauna. This area is well known for its endemic phanerogams and is one of the centres of Mega Biodiversity.

## 4 Materials and 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 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 (Hosagoudar and Kapoor, 1985).

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).

## 5 Result and Discussion

***Meliola peruvannamuzhiensis*** sp. nov. Lini K. Mathew

**Etmology:** The specific epithet is based on the host genus.

Coloniae epiphyllae, densae, magnum quae sparsa, usque ad IV mm diam. Compositum recta undulata, acutae vel sub-opposite ramosae, dense reticulatae formare crescentes lecto cellulis 5-7 9-20 μm. Appressoria fere 2% alternis antrorse subantrorsa vel patentibus, curva recurvis apte dispositae longae 9-16; cellulae cylindraceae vel cuneatae 2-5 longae; cellulae apicales globosae, subglobosae, leviter attenuatus raro ad apicem, integrae, eodem , 6 – 9 x 4 – 8 μm. Phialides appressoriis intermixtae, oppositae, alternatae, ampulliformes, 9 - 15 x 4 – 7 μm. Setae myceliales dispersae sunt distincti etiam juxta perithecia aggregatae, simplices, rectae vel curvulae, acutae vel obtusae ad apicem, ad 500 μm long. Perithecia dispersa grouped, verrucosa, ad 200 μm diam .; ascosporae ellipsoideae, 4-septatae, leniter constrictae, , 26 – 29 x 9 - 13 μm.

Colonies epiphyllous, dense, scattered, up to 4 mm in diameter. Hyphae straight to slightly undulate, branching opposite at sub-acute to wide angles, closely reticulate to form a mycelial mat, cells 9-20 x 5-7 µm. Appressoria opposite, about 2% alternate, subantrorse to antrorse, spreading, curved to recurved, closely arranged, 9-16 µm long; stalk cells cylindrical to cuneate, 2-5 µm long; head cells globose, subglobose, rarely slightly attenuated at the tip, entire, 6 – 9 x 4 – 8 µm. Phialides mixed with appressoria, opposite and alternate, ampulliform, 9 - 15 x 4 – 7 µm. Mycelial setae scattered to grouped around perithecia, simple, straight to curved, acute to obtuse at the tip, up to 500 µm long. Perithecia scattered to grouped, verrucose, up to 200 µm in diam.; ascospores ellipsoidal, 4-septate, slightly constricted, 26 – 29 x 9 - 13 µm.

**Materials examined:** On leaves of *Ipomoea tridentata* (Convolvulaceae), Peruvannamuzhy, Malabar Wildlife Sanctuary, Calicut, Kerala, April, 28, 2014, Lini K. Mathew, MTCHT 71 (Type), TBGT 6950 (Isotype).

## 6 Conclusion

***Meliola peruvannamuzhiensis*** sp. nov. Lini K. Mathew was found infected on leaves of *Ipomoea tridentata* (Convolvulaceae). This species is very close to *M. bonamiae* and Hansf. and Deight. *M. malacotricha* but differs from it in having shorter appressoria and mycelial setae (Hansford, 1961; Hosagoudar, 1996, 2008, 2013). Based on the host specificity, and morphological features the present species can be accommodated as a new species.

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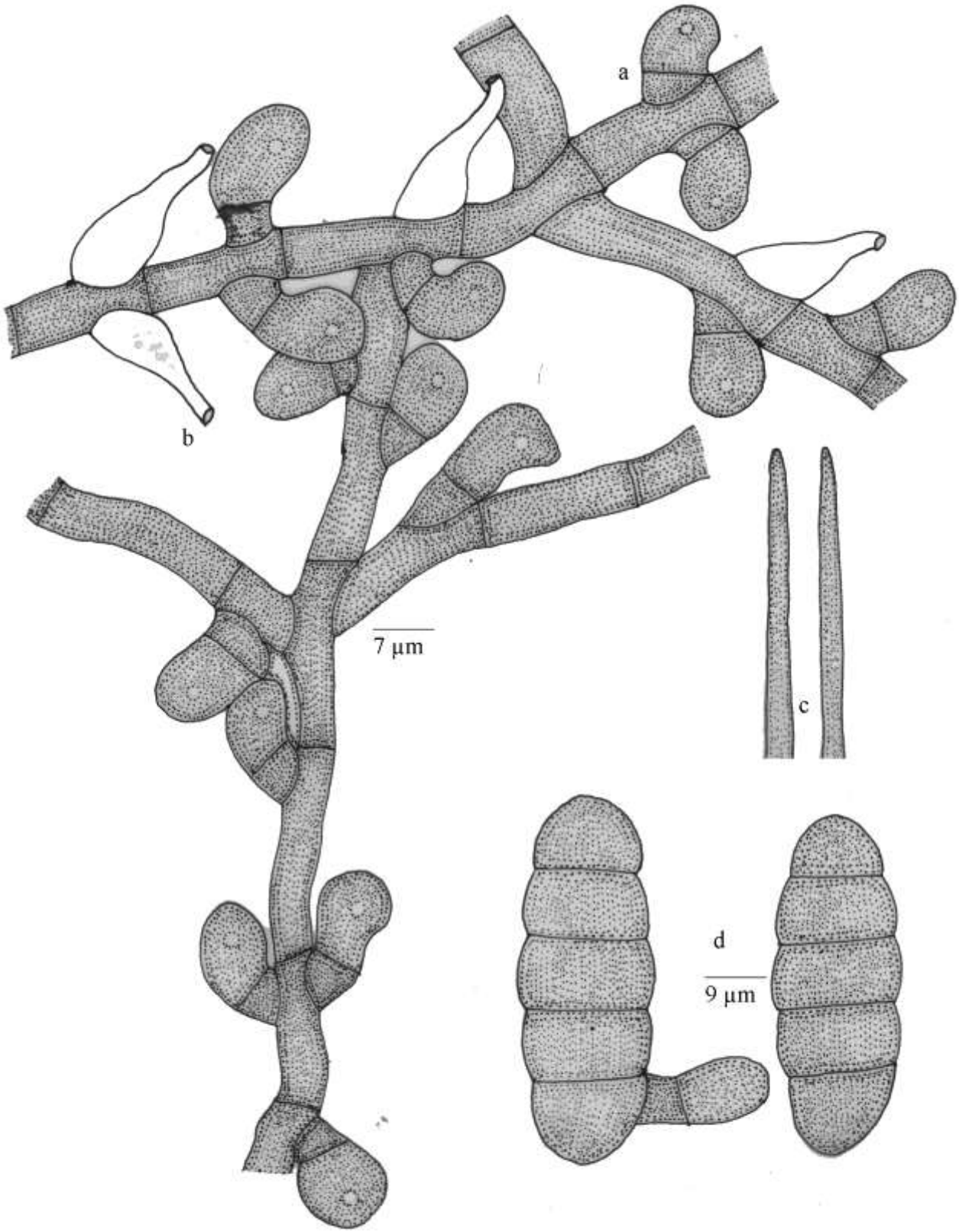


**Fig. - 1.** ***Meliola elaeocarpicola*** sp. nov. Lini K. Mathew

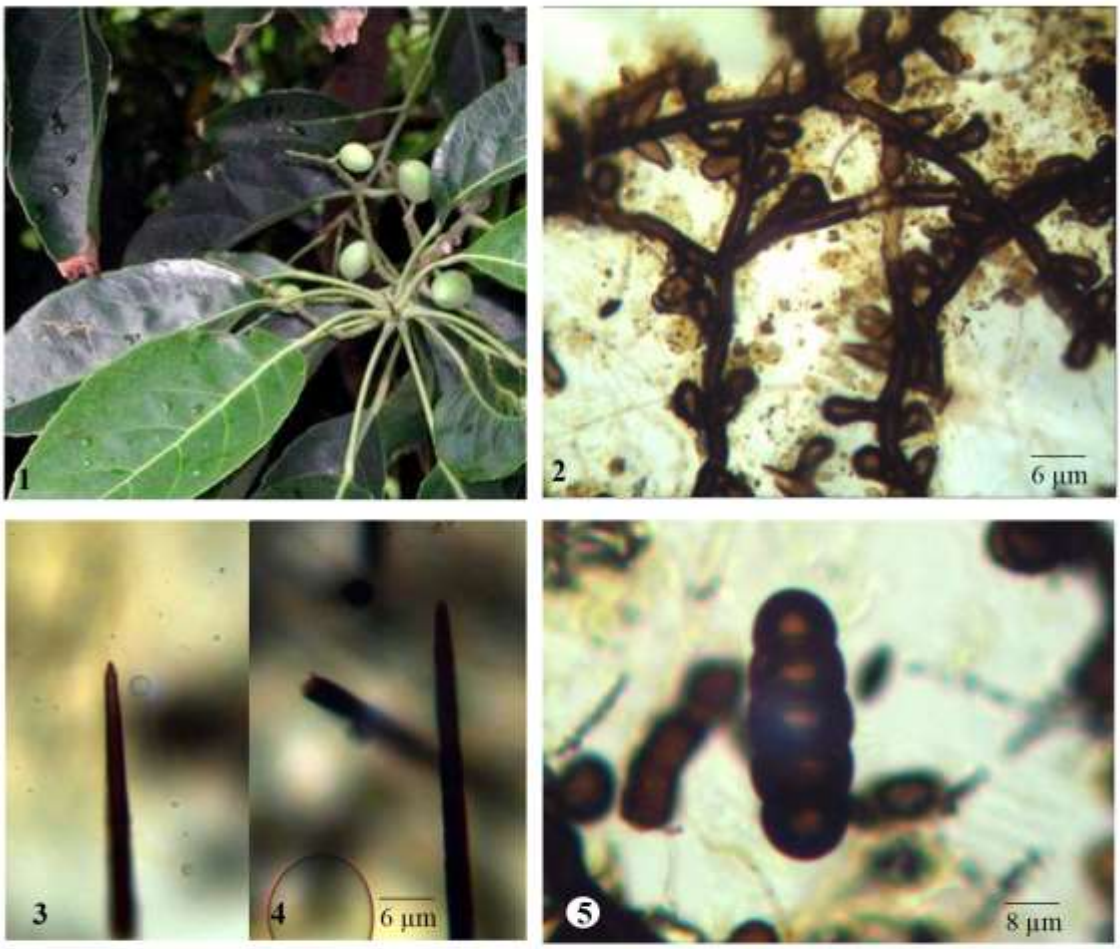


**Plate:1.** ***Meliola elaeocarpicola*** sp. nov. Lini K. Mathew

1. Infected leaf of *Elaeocarpus serratus.* (Elaeocarpaceae), 2. Appressoriate mycelium with phialides, 3 & 4. Aipcal portion of the mycelial setae, 5. Germinating ascospore.