



TWO NOVEL BLACK MILDEW FUNGI FROM KERALA, INDIA

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ABSTRACT

This paper deals with two new black mildew fungi, namely, *Meliola cymbopogonigena* infected the leaves of *Cymbopogon* sp. and *Asterostomella salacigena* infected the leaves of *Salacia* sp., collected from the Placherry Reserve forest in the Western Ghats of Kerala state are described and illustrated in detail.

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INTRODUCTION

During a survey of the foliicolous fungi in the Western Ghats region of Kerala State, authors could study *Cymbopogon* sp. (Poaceae) and *Salacia* sp. (Celastraceae) infected with black mildews. Critical microscopic study of these materials revealed that both are undescribed species of the genera *Meliola* and *Asterostomella*.

MATERIALS AND METHODS

Scrapes were made directly from the infected host plants and mounted in 10% KOH solution for 30 minutes and then by Lactophenol for the clear vision of septation. Nail polish technique (Hosagoudar and Kapoor, 1984) was used to prepare permanent slides to study the colonies *in situ*.

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Taxonomy

***Asterostomella salacigena* sp. nov.:** Colonies mostly hypophyllous, dense, up to 6 mm in diameter. Hyphae substraight, branching opposite to unilateral at acute to wide angles, loosely to closely reticulate, cells 20-35 x 5-7 µm. Appressoria opposite to unilateral, ovate, attenuated towards at the apex, unicellular, 7-15 x 5-7µm. Pycnothyria orbicular, small, up to 57µm in diameter, stellately dehisced at the centre. Pycnothyriospores unicellular, globose, ovate, 15-20 x 6-15 µm.

Materials examined: On leaves of *Salacia* sp. (Celastraceae), Placherry Reserve Forest, Pathanamthitta, Kerala, India, December 25, 2008, P.J. Robin & al TBGT 7043 (holotype). This species resembles *Asterina loeseneriellae* Hosag. & Goos but differs from it in having only alternate and smaller appressoria (7-15 x 5-7 against 12-19 x 6-8 µm.) (Hosagoudar & Goos, 1996; Hosagoudar, 2012).

***Meliola cymbopogonigena* sp. nov.:** Colonies epiphyllous, thin, up to 2 mm in diameter.

Table 1: Comparative account of *Meliola* species known on the members of Poaceae

Name of species	Colonies	Mycelial cells	Appressoria	Phialides	Mycelial Setae	Ascospores
<i>Meliola phyllostachydis</i>	Epiphyllous	21-31 x 5-7 μ m	Alternate, 27- 40.5 μ m, head cells ovate to globose, stellately to irregularly lobate.	Born on a separate mycelial branch, 15-22 x 7-9.5 μ m	Dichotomously branched, up to 200 μ m long till branching, up to 60 μ m long till second branching, final branchlets up to 50 μ m long, all branches and branchlets reflexed, acute to obtuse at the tip.	Oblong to cylindrical, 46-56 x 18-22 μ m
<i>Meliola cymbopogonigena</i>	Epiphyllous	15-30 x 5-10 μ m.	Alternate, 20-27 μ m long, head cells oblong, truncate, angular, entire to sublobate 12-17 x 10-15 μ m.	born on a separate mycelial branch, 12-20 x 5-7 μ m	Mycelial setae two types, one simple, straight, acute to obtuse at the tip, up to 500 μ m long, second type simple, straight dentate to furcate at the tip, up to 150 μ m long.	Elliptic to cylindrical 37-42 x 12-17 μ m
<i>Meliola arundinis</i>	Amphigenous	cells 15-18.5 x 8-10 μ m	Alternate, 21-28 μ m long, head cells ovate, globose, entire, angular and rarely sublobate, 12-15.5 x 12-14 μ m.	Phialides born on a separate mycelial branch, 15-18.5 x 7-9.5 μ m	Straight, 1-2 times dichotomously branched, up to 214 μ m long till branching, up to 70 μ m long till the second branching, branchlets up to 45 μ m long, tip either entire or dentate.	slightly ellipsoidal to cylindrical, 46-53 x 15-18.5 μ m.
<i>Meliola cymbopogonis</i>	Epiphyllous, rarely amphigenous	cells 14-22 x 6-8 μ m	Alternate, 10-24 μ m long; head cells ovate, globose, angular to sublobate, 10-14 x 12-14 μ m	mixed with appressoria 12-18 x 10-12 μ m	setae straight, dichotomously branched at the tip, up to 176 μ m long till branching, primary branch up to 20 μ m long, while tertiary up to 10 μ m long, branchlets reflexed, acute to obtuse at the tip	ellipsoidal, 38-44 x 12-14 μ m.
<i>Meliola sacchari</i>	Amphigenous, mostly epiphyllous	cells 18-22 x 6-8 μ m	21-37 μ m long head cells globose, mostly angular, rarely slightly lobate, 12-18.5 x 15-18.5 μ m	born on a separate mycelial branch, 15-22 x 6-9.5 μ m	2-3 times furcate and dentate at the apex, up to 572 μ m long	slightly ellipsoidal to cylindrical, 43-46 x 12-15 μ m.
<i>Meliola panici</i>	Epiphyllous	cells 15.5-22 x 6-8 μ m.	15.5-22 μ m long head cells ovate, globose, entire, angular to sublobate, 11-15.5 x 12-15.5 μ m.	born on a separate mycelial branch, 12-15.5 x 6-8.5 μ m	straight, simple, acute to obtuse, up to 310 μ m long	obovoidal, 34-37 x 12-14 μ m.
<i>Meliola themedicola</i>	Mostly epiphyllous	cells 20-26 x 6-8 μ m.	19-56 μ m long head cells ovate to globose, entire, angular, sublobate to irregularly and deeply lobate, 11-20 x 11-16 μ m.	mixed with appressoria 14-19 x 8-10 μ m	simple, straight, acute to broadly obtuse at the tip, up to 350 μ m long.	oblong to mostly cylindrical, 48-52 x 14-20 μ m

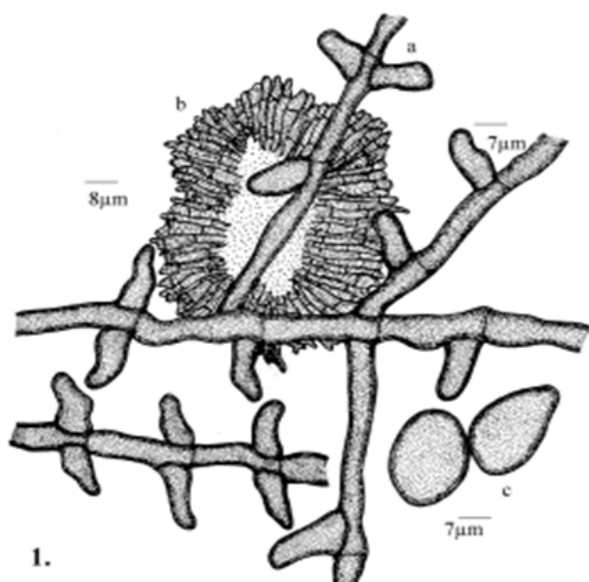


Fig. 1. *Asterostomella salacigena* sp. nov.

a.Appressorium, b. Pycnothyrium, c. Pycnothyriospores

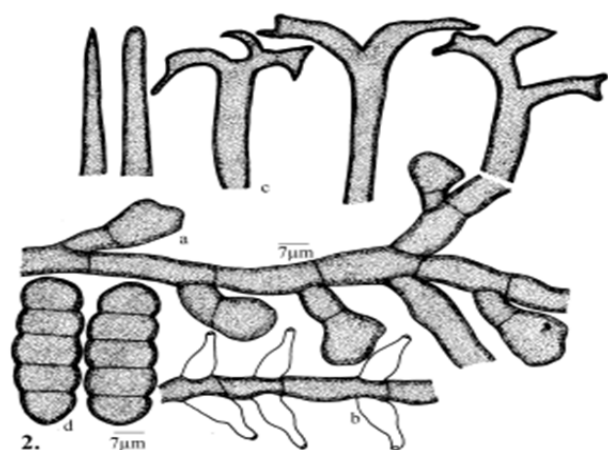


Fig. 2. *Meliola cymbopogonigena* sp. nov.

a .Appressorium, b. Phialide, c. Simple and branched mycelial setae, d. Ascospores

Hyphae straight to substraight, branching opposite to unilateral at acute to wide angles, loosely to closely reticulate, cells 15-30 x 5-10 µm. Appressoria alternate to unilateral, straight to curved, antrorse to subantrorse, 20-27 µm long; stalk cells cylindrical to cuneate, 7-10 µm long; head cells oblong,

truncate, angular, entire to sublobate, 12-17 x 10-15 µm. Phialides born on a separate mycelial branch, alternate to opposite, ampulliform, 12-20 x 5-7 µm. Mycelial setae first uniformly scattered over the colonies and are two types: First one - simple, straight, acute to obtuse at the tip, up to 500 µm long and the second type- simple, straight, dentate to 1-2-times furcate at the tip, up to 150 µm long, secondary branches 5-15 µm long. Perithecia scattered, up to 150 µm in diameter; ascospores elliptical to cylindrical, 4- septate, constricted at the septa, 37-42 x 12-17 µm.

Materials examined: On leaves of *Cymbopogon* sp. (Poaceae), Placherry Reserve Forest, Pathanamthitta, Kerala, India, December 25, 2008, P.J. Robin & al TBGT 7044 (holotype). *Meliola panici* Earle, *M. sacchari* Sydow, *M. cymbopogonis* Kapoor, *M. arundinis* Pat., *M. phyllostachydis* Yamam., *M. themedicola* Hosag. et al. are reported on the members of family Poaceae (Hansford, 1961; Hosagoudar, 1996, 2008, 2013). However, the present taxon is similar to *Meliola cymbopogonis* Kapoor known on *Cymbopogon nardus*, collected from Kerala but differs from it in having phialides born on a separate mycelial branch and possessing both simple and branched mycelial setae.

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