

# A new record of a Black Powdery Mildew disease of Henna (*Lawsonia inermis* L.) caused by *Meliola* species in Western Ghat of Maharashtra State, India

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## SHORT COMMUNICATION

# A new record of a Black Powdery Mildew disease of Henna (*Lawsonia inermis* L.) caused by *Meliola* species in Western Ghat of Maharashtra State, India

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*Lawsonia inermis* L. is cultivated as hedge plant throughout India and a commercial crop in certain states of India. Leaves of *Lawsonia inermis* L. are extensively used as medicine and dye for skin, hair, fingernails, and temporary tattoos on skin. It is naturally and abundantly found in Western Ghat region of Maharashtra state, India. Recently, a new Black Powdery Mildew disease on leaves of *Lawsonia inermis* L. caused by *Meliola* sp. has been firstly observed in Ratnagiri Districts of Maharashtra state, India. Further, as part of Western Ghat disease spread can be recorded from the three districts of Maharashtra state namely Ratnagiri, Raigad and Shindhudurg. Hence this is here for the first time from India recorded that the Henna (*Lawsonia inermis* L.) plant is new host for *Meliola* sp.

**Key words:** Henna, Leaf Spot, Maharashtra, *Meliola*, Western Ghat

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## INTRODUCTION

*Lawsonia inermis* L. popularly known as Henna, Mehndi, Mignontte tree, Egyptian Privet is a flowering plant belongs to family Lythraceae. It is native to northern Africa, Asia and northern Australia, in semi-arid zones and tropical areas (<https://www.britannica.com/plant/henna>). *Lawsonia inermis* L. is cultivated as hedge plant throughout India and a commercial crop in certain states of India. It is shrub plant reaching up to the height of 6 to 25 ft. It is glabrous, multi-branched, with spine-tipped branchlets. The leaves present opposite to each other on the stem. Henna fruits are small, brownish and capsules type (Kumar *et al.* 2005). An ideal temperature between 35 and 45 °C is good for the development of dye compounds in plants (Bechtold and Mussak 2009).

*Lawsonia inermis* L. leaves are extensively used as medicine and dye for skin, hair, fingernails and temporary tattoos on skin in India. It has been traditionally reported in use of headache,

ophthalmia, syphilitis, sores, amenorrhea, scabies, hemicranias, bronchitis, boils, lumbago, diseases of the spleen, dysuria, bleeding disorder, skin diseases, diuretic, antiamoebiasis, astringent, anti-hemorrhagic, hypotensive and sedative effect. A number of bioactive compounds present in *Lawsonia inermis* L. are known to possess antibacterial and antifungal properties (Buddhadev and Buddhadev 2016). But over the past 2 years (2019 to 2021) in Western Ghat region of Maharashtra state it has been observed that *Lawsonia inermis* L. highly attacked by *Meliola* sp. A new Black Powdery Mildew disease on leaves of *Lawsonia inermis* L. caused by *Meliola* sp. was first observed in Tulsi villege of Mandangad tahsil, Ratnagiri district of Maharashtra state. Black Powdery Mildew disease of *Meliola* sp. on *Lawsonia inermis* L. has not been recorded before in India, and therefore, the main aim of author is to report the occurrence of this disease is an important in cultivation of Henna (*Lawsonia inermis* L.) plant.

## MATERIALS AND METHODS

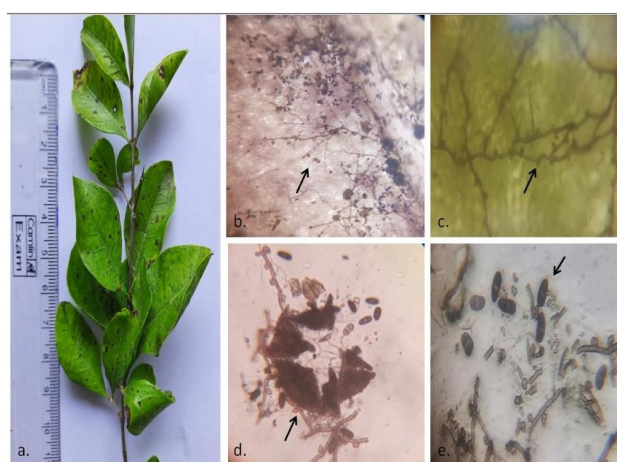
Infected leaves of *Lawsonia inermis* L. were collected from the three districts of Maharashtra

state namely Ratnagiri, Raigad and Shindhudurg separately in polythene bags. For microscopic study, scrapes were taken directly from the infected host and mounted in 10% KOH solution for 25-30min. Then KOH was replaced by Lacto phenol, prepared according to Rangaswamy G. 1975. Nail polish technique of Hosagoudar and Kapoor (1985) with some modification was used to study the *Meliola* spp. DPX (Dibutylphthalate Polystyrene Xylene) was used to make permanent slide. These permanent slides were then used for further studies. Microscopic studies were carried with the help binocular microscope at the magnification of 675X

## RESULTS AND DISCUSSION

Black Powdery Mildew disease caused by *Meliola* sp. was first observed on leaves of *Lawsonia inermis* L. during the month of August 2019 in Tulsivillage of Mandangad Tahsil, Ratnagiri district, Maharashtra state. Leaves of *Lawsonia inermis* L. were brought to laboratory and examined by using binocular microscope at the magnification of 675X. As per microscopic observations colonies of *Meliola* sp. were found to be amphigenous, dark brown, circular to spreading and confluent. Hyphae dark brown, straight to sub straight, branching opposite to alternate and reticulate. Appressoria alternate moderately placed. Phialides mixed with appressoria, opposite to alternate. Perithecia globose, ascospore oblong to cylindrical, dark brown and septate (Fig.1). After minute observation, literature survey (Hosagoudar 2013) and discussing with Dr. Mahesh Borde (Mycologist), Dept. of Botany, Savitribai Phule Pune University, Maharashtra State it was confirmed that infecting pathogen is *Meliola* sp. Further, to check the disease distribution survey was done from the Ratnagiri, Raigad and Sindhudurg districts of Maharashtra state, India. After survey it was confirmed that plant *Lawsonia inermis* L. is new host for *Meliola* spp. Initial symptoms of disease generally were noted during month of August consisted of small black powdery layer on the leaf of *Lawsonia inermis* L. that extended further resulting in dark black powdery layer with some necrotic spot (Fig.1). Surprisingly, it was also noted that the infection of *Meliola* sp. to *Lawsonia inermis* L. have been seasonal because when the summer season starts infection was slowly decreasing down. A black powdery mildew disease was clearly observed on both mature and young leaves of

*Lawsonia inermis* L. Due to black powdery layer of *Meliola* sp. and its pathogenic activity reduction in photosynthetic activity as well as leaf biomass loss observed in *Lawsonia inermis* L. Thomas *et al* (2013) reported that majority of Meliolaceae family members are obligate biotrophs but few are necrotrophic and host specific with a narrow host range. Leaf spots were circular, commonly 0.2 to 0.4 mm in diameter. *Lawsonia inermis* L. is known to have an antifungal and antibacterial activity against various pathogens but here in this case adverse climatic conditions of Western Ghat region are highly favours the *Meliola* sp. to infect the *Lawsonia inermis* L. Monsoon season as well as nearby Arabian Sea contribute a lot to build higher humidity in the air as well as lower temperature (25 -30°C) can favour the growth of *Meliola* sp. (Chavan, 2020). Recently, Black Powdery Mildew of *Meliola* sp. on various plants species reported from Western Ghat region of India including Maharashtra state (Thomas *et al.* 2013; Hosagoudar 2013; Bhise *et al.* 2016; Dar and Rai 2017). But there is no evidence regarding *Lawsonia inermis* L. as host for *Meliola* sp. Hence, this is for the first time from India it has been recorded that the plant Henna (*Lawsonia inermis* L.) has been infected by *Meliola* sp. As medicine and dye for skin, hair, fingernails, and temporary tattoos on skin in India, *Lawsonia inermis* L. has great importance. Hence further study is needed to better understand the interaction between *Meliola* spp. and *Lawsonia inermis* L.



**Fig. 1 :** *Meliola* sp. a. Infected leaves of *Lawsonia inermis* L. b. Mycelial colonies on the leaves. c. Appressorium d. Burst Perithecia e. Ascospores

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