



## ***Prillieuxina aeglicola* sp. nov. (ascomycota), a new black mildew fungus from Himachal Pradesh, India**

**Gautam AK**<sup>1,2</sup>

<sup>1</sup> Department of Botany, Abhilashi Institute of Life Sciences, Mandi-175008 (H.P.) India.

<sup>2</sup> Faculty of Agriculture, Abhilashi University, Mandi-175045 (H.P.) India.

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### **Abstract**

A black mildew infection was observed on leaves of *Aegle marmelos* from Himachal Pradesh, India. The fungus as a species of *Prillieuxina* was characterized by substraight, branched hyphae without appressoria and setae; orbicular thyriothecia and brown uniseptate ascospores. *Prillieuxina* and its species are host specific fungi and no earlier reports on *A. marmelos*. Therefore new species is described and illustrated in the present paper based on morphology and specificity of host association.

**Key words** – Black mildew – India – new species – *Prillieuxina* – taxonomy

### **Introduction**

The genus *Prillieuxina* is an important group of fungi known to cause black mildew infection on variety of plant hosts. The genus is an ectophytic parasite differs from other black mildew fungi in having mycellium devoid of appressoria and setae. The genus possesses orbicular and astomatous thyriothecia with radiating cells and dehisces stellately at the center. The asci are of globose, octosporous, bitunicate type and ascospores brown, conglobate, uniseptate.

During October 2013, a black mildew infection was observed on leaves of *Aegle marmelos* (Bael), a sacred subtropical tree species of Indian subcontinent. The plant possesses numerous phytochemicals exhibit anti-inflammatory, antimicrobial, anticancer and anti-oxidative activities. The plant is native to India but found to be distributed abundantly in whole Himalayan tract, including Bengal, Central and South India (Kirtikar & Basu 1980; Yadav & Chanotia 2009).

The *Prillieuxina* and its species have been reported on a wide range of angiosperms from tropical to subtropical regions. Number of plants namely *Anamirta cocculus*, *Ardisia solanacea*, *Argyreaia* sp., *Diospyros malabaricus*, *Elaeagnus kologa*, *Garcinia imberti*, *Ilex denticulate*, *Ixora coccinea*, *Jasminum flexile*, *Polyalthia longifolia* and *Pterygota alata* are reported to infect with black mildew caused by different species of *Prillieuxina* (Hosagoudar 2012; Hongsanan et al. 2014). No species of *Prillieuxina* have been previously recorded on *A. marmelos*, and hence, it is accommodated as a new species.

## Materials & Methods

The plant leaves showing infection with black superficial fungal colonies were collected from Berthin (District Bilaspur) of Himachal Pradesh, India. These infected leaves along with a host twigs and reproductive parts were dried between sheets of blotting paper and preserve for further studies. Host plants were identified and confirmed by matching the collections with herbarium and by consulting botanists. The specimen was deposited at Department of Botany, Abhilashi Institute of Life Sciences (AILS), Mandi, Himachal Pradesh, India.

The morphological examination of colonies was carried out with the help of hand lens for colour and texture. In the laboratory, the Nail polish technique was used to study the micro-morphological characters of the fungi. Black colonies were scraped directly from infected host, mounted in 5% KOH solution and then replaced by lactophenol to make the septa visible (Hosagoudar & Kapoor 1984). Microscopic dimensions of the fungus like mycelium, thyriothecia, asci, ascospores, pycnothyria and pycnothyriospores were studied in detail. All measurements were given in the form: min–max (mean  $\pm$  standard deviation).

## Results

### Taxonomy

*Prillieuxina aeglicola* A. K. Gautam, **sp. nov.**

Figs 1–2

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Etymology – named after the host species.

Colonies amphigenous, often epiphyllous or hypophyllous, dense, coalesced, up to 4 mm in diameter; hyphae substraight to crooked, branching irregular at acute angles, opposite to alternate, loosely to closely reticulate, 2.75–6.05 (3.93 $\pm$ 1.2)  $\mu$ m wide, cells 5.5–10 (7.86 $\pm$ 1.48)  $\mu$ m; appressoria and setae absent; thyriothecia few, orbicular, scattered, up to 114 (84.15 $\pm$ 13.31)  $\mu$ m in diameter, stellately dehisced at the centre, margin fimbriate; asci globose, ovate, octosporous, up to 22 (16.32 $\pm$ 5.88)  $\mu$ m in diameter; ascospores oblong, brown, 1– septate, constricted at the septum, smooth walled, 7.7– 15.4 (12.18 $\pm$  2.87)  $\times$  3.3–7 (5. 23 $\pm$  1.46)  $\mu$ m; pycnothyria similar to thyriothecia, scattered, smaller than the thyriothecia; pycnothyriospores brown, unicellular, pyriform, 6.6 – 11 (10 $\pm$  1.6)  $\times$  3.3– 4.4 (4.22 $\pm$  1.46)  $\mu$ m, wall smooth.

Material examined – India, Himachal Pradesh, Bilaspur, Berthin, 686 meters (2,495 ft), on leaves of *Aegle marmelos* (L.) Corr. Serr. (Rutaceae), 24 November 2013, Ajay Kumar Gautam (AILS 1021).

### Discussion

The black mildew fungi examined in present study has substraight, branched mycellium devoid of appressoria and setae; orbicular thyriothecia and brown uniseptate ascospores. Taxonomically this fungi fall under genus *Prillieuxina* of the family Asterinaceae. Based on the size of Thyriothecia, ascospores and ascomata, this species can be compared with two more similar species of *Prillieuxina* (Table 1) but differs in having smaller size. Species of genus *Prillieuxina* are host specific fungi and no earlier reports on *A. marmelos*. Therefore this should be new species of *Prillieuxina* based on morphology and host specificity.

About 11 species of the genus *Prillieuxina* are known on the members of Gangagamyces (*P. polyalthiae*), Aquifoliaceae (*P. aquifoliacearum*) Clusiaceae (*P. garciniae*), Bheemamyces (*P. argyreae*), Ebenaceae (*P. diospyri*), Elaeagnaceae (*P. elaeagni*), Menispermaceae (*P. anamirtae*), Myrsinaceae (*P. ardisiae*), Oleaceae (*P. jasmine*), Rubiaceae (*P. ixorigena*) and Sterculiaceae (*P. pterigotae*) (Hosagoudar 2012).

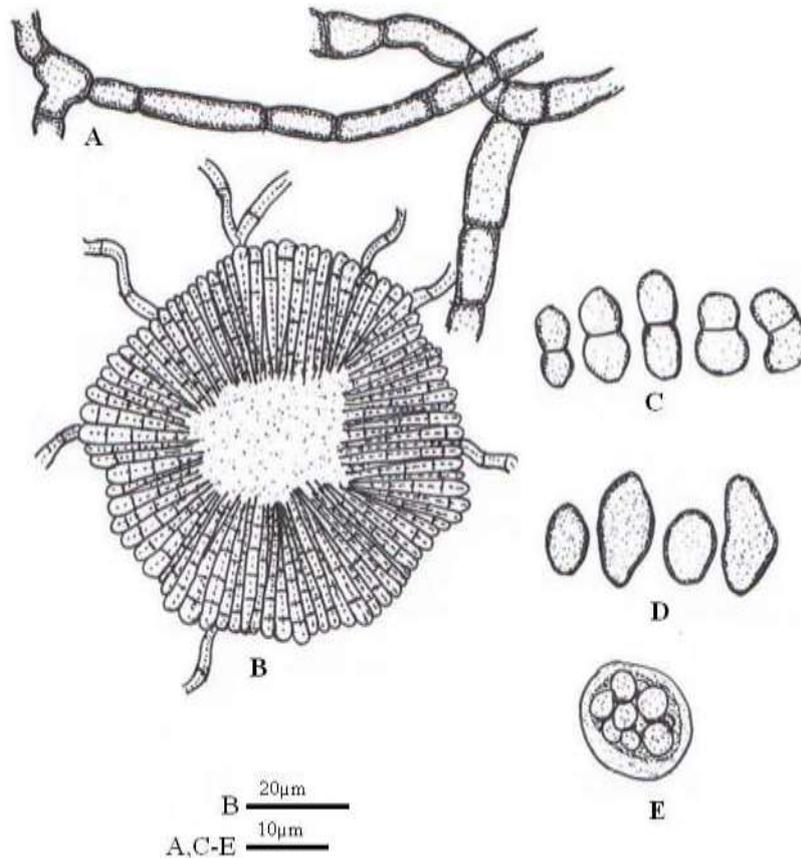
However, two black mildew fungi i.e. *Schiffnerula girijae* (Hosagoudar 2011; Gautam 2014) and *Asterina delicatula* (Hosagoudar 2012) were reported previously on *A. marmelos*. This is the first report of the genus *Prillieuxina* on the members of the family Rutaceae.

**Table 1** Comparative account of the *Prillieuxina* species.

Species	Colonies	Thyriothecia ( $\mu\text{m}$ )	Asci ( $\mu\text{m}$ )	Ascospores ( $\mu\text{m}$ )	Host
1 <i>Prillieuxina aeglicola</i> sp. nov.	Epiphyllous to hypophyllous	up to 114	up to 22	7.7– 15.4 $\times$ 3.3–7	<i>Aegle marmelos</i>
2 <i>Prillieuxina aquifoliacearum</i> Hosag., Ravikumar & Archana	hypophyllous	up to 192	–	16–19 $\times$ 6–10	<i>Ilex denticulata</i>
3 <i>Prillieuxina elaeagni</i> Hosag. & C.K. Biju	epiphyllous	up to 225	up to 30	17–23 $\times$ 9–11	<i>Elaeagnus kologa</i>



**Fig. 1** – *Prillieuxina aeglicola* sp. nov. Infected leaves.



**Fig. 2** – *Prillieuxina aeglicola* sp. nov. A. Branched mycelium B. Thyriothecia with stellate dehiscence C. Ascospores D. Pycnothyriospores E. Ascus. – Scale bars: A, D-E = 10  $\mu$ m, B= 20  $\mu$ m.

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