



## First report of powdery mildew of *Polyscias cumingiana* caused by *Pseudoidium* sp. in India

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### Abstract

In January 2014, leaves of *Polyscias cumingiana* (= *P. crispata*) with typical symptoms of powdery mildew were collected in the Botanical garden of Yashwantrao Chavan Institute of Science, Satara (MS), India. Based on its morphological characters, the pathogen was identified as *Pseudoidium* sp. (*Erysiphe* sp.). This is the first report of powdery mildew on *P. cumingiana* in India.

**Key words** – Erysiphales – *Erysiphe* sp. – Araliaceae – Asia.

### Introduction

The Western Ghats, one of the twenty five unique hot spots of biological diversity in the world has a rich and diverse flora and fauna. The western part of Satara (MS, India), falls under Western Ghats and its eastern part exhibits arid conditions. The variations in the altitude, humidity and edaphic factors provide favourable situations for development of all types of ecosystems which inhabit the richest phytodiversity. The natural forest microhabitats and tropical warm humid climatic conditions favour and establish many rare and new fungi.

Well established exotic plants in India are suffering from various new pests and diseases. *Polyscias cumingiana* (C. Presl) Fern.-Vill. (= *P. crispata* (Hort. ex W. Bull) M.R. Almeida (Araliaceae) is exotic to India introduced from Brazil for its ornamental value. It is a green, foliar ornamental shrub up to 2 m tall with triangular leaves, decompose; deeply incised and toothed, oblong to broadly ovate leaflets, alternate with sheathing bases (Fig. 1a). It has three leaflets two larger ones split at the tips and flanking a smaller one. Stems are branched, cylindrical and inflorescence are umbellate. *P. cumingiana* is mostly a container plant, and has roles in landscape designing and in bonsai.

In January 2014, during routine survey of the Botanical Garden of YCIS, Satara (17° 42.940'N, 0.73° 48.786'E, Altitude 733 m, Temperature 28°C, Humidity 57%) all plants (28) of *P. cumingiana* were found to be infected with powdery mildew. The plants were fully developed and about one year old. The disease appeared as small irregular, grayish-white powdery spots with very thin effused mycelium on adaxial and abaxial surfaces of leaves (Fig. 1b, c). Infected leaves became at young stage deformed, showing irregular chlorotic patches with curled margin of lamina. Premature leaf fall was also observed. As a result the plants get defoliated and lost their ornamental value. The disease continued up to April 2014 (Temperature 36°C and Humidity 36%). The disease

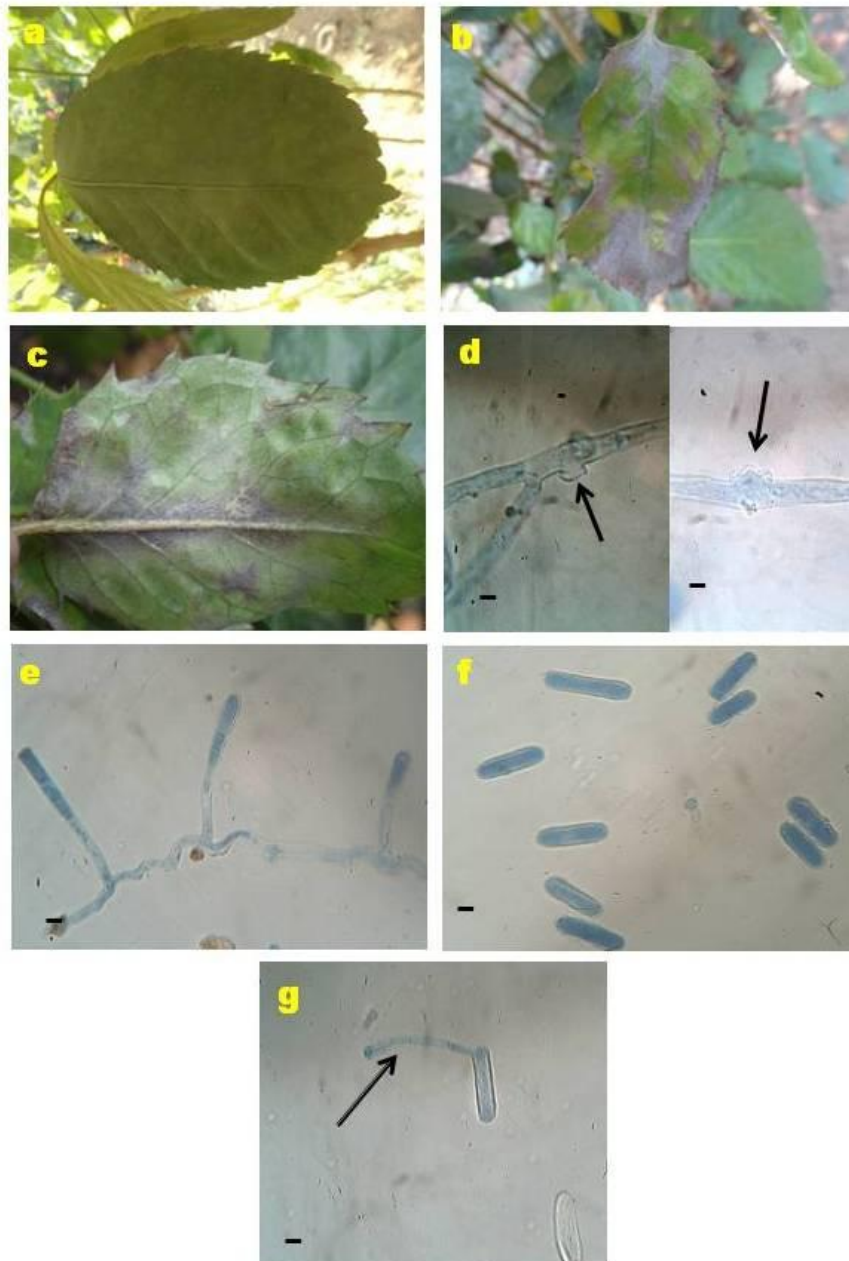
has been collected from many localities in Satara Dist. (MS) and seems to be widespread and common. Based on microscopic examinations, the asexual powdery mildew morph on *P. cumingiana* was easily identifiable as *Pseudoidium* sp.

## Material & Methods

Voucher specimen has been deposited in Ajrekar mycological herbarium at Agharkar Research Institute, Pune (MS) India. (Accession No.: AMH – 9643).

## Results and Discussion

*Pseudoidium* sp. (*Erysiphe* sp.) on *Polyscias cumingiana* is morphologically characterized as follows: Mycelium amphigenous, white, thin, forming patches; hyphae hyaline, septate, profusely



**Fig.1** a) Healthy leaflet b) Infected upper surface of leaflet c) Infected lower surface of leaflet d) Appressoria i- Slightly lobed (Bar = 20  $\mu$ m),ii- Lobed (Bar = 20  $\mu$ m) e) Conidia with conidiophore (Bar = 20  $\mu$ m) f) Conidia at 45X (Bar = 20  $\mu$ m) g) Arrow indicates germinated conidium.

branched, persistent; hyphal appressoria distinctly or slightly lobed (Fig. 1d). Conidiophores arising from the upper surface of mother cells, erect, foot-cells cylindrical, straight, occasionally somewhat flexuous,  $44 \pm 5 \mu\text{m}$ , followed by 1–2 shorter cells or sometimes by a cell of about the same length, subsequent cells rarely longer than the foot-cells (Fig. 1e). Conidia formed singly, ovoid, about  $39 \pm 4 \times 14 \pm 6 \mu\text{m}$  (Fig. 1f), fibrosin bodies absent, germ tube terminal or subterminal, perihilar, more or less straight, up to  $60 \pm 10 \mu\text{m}$ , with lobed appressoria at the end (Fig. 1g).

According to the combination of these features, this powdery mildew can be readily identified as species of *Pseudoidium* Y.S. Paul & J.N. Kapoor (Braun & Cook 2012). Based on the new ICN, *Pseudoidium* is now a heterotypic synonym of *Erysiphe* DC. The sexual morph (chasmothecia) was not observed.

A literature survey (Bilgrami et al. 1991, Jamaluddin et al. 2004, Paul & Thakur 2006, Pande 2008, Hosagoudar & Agarwal 2009, Braun & Cook 2012, Anonymous 2013) showed that no powdery mildew has been reported on *Polyscias* spp. in general and on *P. cumingiana* in India in particular. However, Braun & Cook (2012) reported *Pseudoidium araliacearum* (U. Braun & Oehrens) U. Braun & R.T.A. Cook on *Raukana valdiviensis* (Araliaceae) in South America and *Erysiphe panacis* R.L. Bai & W.C. Liu (Bai & Liu 1998) was described from China on *Panax* (Araliaceae), but the two species are morphologically quite distinct from powdery mildew on *Polyscias cumingiana*. This is the first report of powdery mildew caused by *Pseudoidium* sp. (*Erysiphe* sp.) on *Polyscias cumingiana* in India and the first record of powdery mildew on *Polyscias* in general. However, a formal description and naming of this powdery mildew is not justified and not advisable. The sexual morph is unknown. The host plant, which is an exotic ornamental plant in India, is native to SW Pacific Islands, but in its natural areal powdery mildew has never been found. Thus, infections of *P. cumingiana* in India have been possibly caused by native Indian powdery mildews. Such host switches are known. *Erysiphe quercicola* S. Takam. & U. Braun is, for instance, known in Asia from a wide range of tree species belonging to unrelated families (Braun & Cook 2012). Kirschner (2010) demonstrated that *Erysiphe magnifica* can be transferred from *Magnolia* to lotus. Results of molecular sequence analyses and corresponding data for comparison are necessary to elucidate the true identity of asexual powdery mildew collections on new hosts.

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