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# Black mildew disease on the neotropical medicinal shrub *Pothomorphe umbellata* in Brazil, caused by *Irenopsis tortuosa* var. *potomorphes*

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**Abstract.** A black mildew disease caused by *Irenopsis tortuosa* var. *potomorphes* (Meliolales) was observed on leaves of the neotropical medicinal shrub *Pothomorphe umbellata* collected in a stretch of Atlantic rain forest in the municipality of Viçosa, Minas Gerais, Brazil. This is the fourth record of *Irenopsis tortuosa* var. *potomorphes* on *Pothomorphe umbellata* and the first record of this fungus in Brazil.

## Introduction

*Pothomorphe umbellata* (L.) Miq. (Piperaceae), also known as 'pariparoba' is a native plant endemic to a stretch of Atlantic rain forest in the municipality of Viçosa, Minas Gerais, Brazil, growing under shaded sites (Carvalho-Okano and Alves 1998) (Fig. 1). This species has been the subject of many pharmacological studies into its therapeutic properties, including photo-protection, anti-inflammatory, analgesic, anti-venom and anticancer activity (Sacoman *et al*. 2008).

**Fig. 1.** *Pothomorphe umbellata* medicinal shrub in the 'Mata da Agronomia', Universidade Federal de Viçosa, Viçosa, state of Minas Gerais, Brazil.

## Materials and methods

In April 2008, plants of *P. pothomorphes* were found colonised by a black mildew fungus in the 'Mata da Agronomia', Universidade Federal de Viçosa, Viçosa, state of Minas Gerais, Brazil (Fig. 2). Samples of infected leaves were collected, photographed and dried in a plant press. Observations and measurements were carried out by means of a Carl Zeiss Standard W and photographs by means of an Olympus BX 51 light microscope fitted with a digital camera (Evolt E330).

**Fig. 2.** *Irenopsis tortuosa* var. *potomorphes* ex *Pothomorphe umbellata*. Detail of scattered black thin colonies on adaxial leaf surface.


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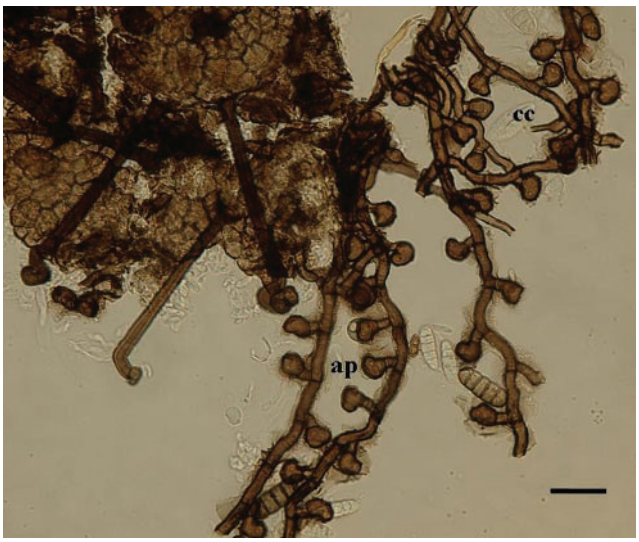


**Fig. 3.** *Irenopsis tortuosa* var. *potomorphes* ex *Pothomorphe umbellata*. Hyphae with opposite conidiogenous cells (cc) and unilateral or alternate appressoria (ap). Bar = 40 µm.

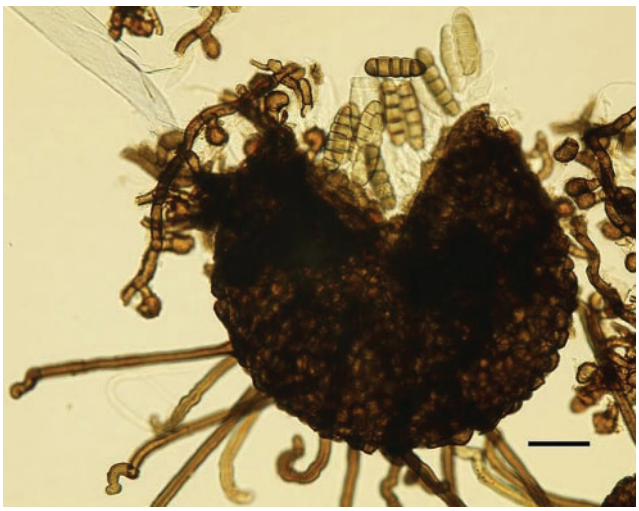

**Fig. 4.** *Irenopsis tortuosa* var. *potomorphes* ex *Pothomorphe umbellata*. Black perithecia releasing 4-septate, narrowly elliptic ascopores. Bar = 40 µm.

Wherever possible, 80 measurements were made of the structures mounted in lactophenol.

***Taxonomic description*** Irenopsis tortuosa (*G. Winter*) *F. Stevens var.* potomorphes (*Cif.*) *Hansf*

A description of the fungus on host tissue follows. Colonies on the adaxial surface of leaves, mostly epiphyllous, black, velvety, scattered, numerous, up to 1–2 mm in diameter. Internal mycelium not observed. External mycelium adaxial, net-forming, sinuous to tortuous, branching usually opposite, acute, composed of dark brown septate hyphae, 12–30 × 5–8 µm in diameter, loosely reticulate, producing appressoria and conidiogenous cells. Appressoria alternate to unilateral, spreading to antrorse, straight to curved; stalk cells cylindrical to cuneate, 3–11 × 4–8 µm; head cells ovate to globose, entire, 10–16 × 10–16 µm. Conidiogenous cells (phialides) mixed with appressoria, alternate to opposite, ampulliform, 15–25 × 5–10 µm (Fig. 3). Perithecia black, scattered, globose, verrucose, 90–225 µm in diameter (Fig. 4). Perithecial setae 3–11, erect-spreading, simple, obtuse, continuous, dark brown, the upper part irregularly twisted to

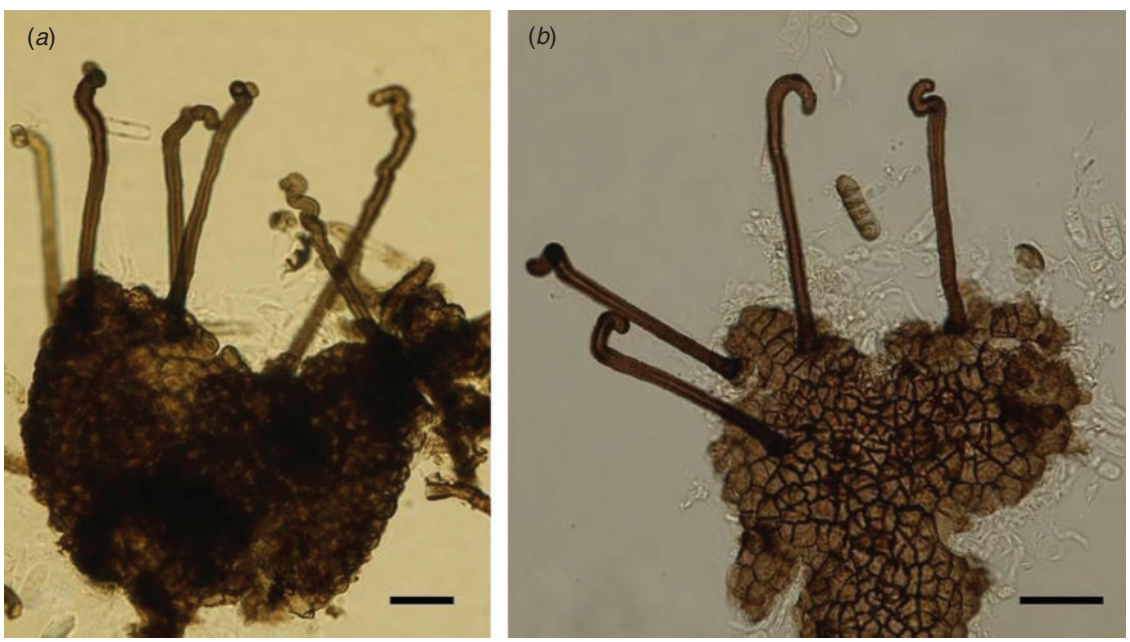


**Fig. 5.** Perithecial setae of *Irenopsis tortuosa* var. *potomorphes* ex *Pothomorphe umbellata*. (*a*) Twisted and (*b*) uncinate. Bars = 40 µm.

uncinate (Fig. 5), 120–198 × 7–11 µm. Asci evanescent. Ascospores oblong to subellipsoidal, hyaline when inside the ascus, becoming brown with age, broadly rounded at the ends, 4-septate, constricted at the septa, 32–50 × 10–18 µm.

***Material examined***: *VIC 31207, on leaves of* P. umbellata*, Mata da Agronomia, Viçosa city, State of Minas Gerais, Brazil, J. Honorato-Junior, April 2008, VIC Herbarium*

The black mildew fungus found on *P. umbellata* belongs to the genus *Irenopsis* by possessing only perithecial setae and differs from *Appendiculella* by the presence of perithecia with larviform appendages on the latter. *Meliola* have setae on external mycelia and *Asteridiella* differs from all others by its glabrous perithecia and mycelia (Hansford 1961). Three species belonging to the Meliolales are known to occur on *P. umbellata. viz. Meliola piperina* Syd. and *M. stenospora* G. Winter reported in Ghana, *Irenopsis tortuosa* (G. Winter) F. Stevens reported in Puerto Rico and Virgin Islands and *Irenopsis tortuosa* (G. Winter) F. Stevens var. *potomorphes* (Cif.) Hansf. reported in the Dominican Republic, Puerto Rico and Virgin Islands (Hansford 1961; Farr and Rossman 2009). The fungus found on *P. umbellata* in Brazil matched well with the description of *I. tortuosa* var. *potomorphes* due to its thin colonies and uncinate to twisted perithecial setae, while *I. tortuosa* showed dense colonies and coiled perithecial setae (Hansford 1961). This forms the first report of *I. tortuosa* var. *potomorphes* in Brazil.

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