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Lasiodiplodia hormozganensis: First report as an endophyte and a new record for India

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ABSTRACT

Lasiodiplodia hormozganensis* Abdollahz, Zare & A.J.L. Phillips is isolated and described as an endophyte from *Ficus krishnae* L. It constitutes the first report of *L. hormozganensis* as an endophytic fungus from *F. krishnae* world-wide and a new record for India. It is one of the most frequently occurring species in different vegetative parts of *F. krishnae.

Key Words: Endophytic fungus, *Lasiodiplodia hormozganensis,* India.

INTRODUCTION

The species of *Lasiodiplodia* Ellis & Everh. occur mostly in tropical and subtropical regions where they cause a variety of diseases on a variety of plant hosts (Punithalingam, 1980). *Lasiodiplodia theobromae* (Pat.) Griffon & Maubl. is the most common species of the genus in tropical parts of the world recorded on more than 500 host species. It is regarded as type species of genus *Lasiodiplodia*. It has been reported from different geographical regions of India (Bilgrami *et al.,* 1991, Jamaluddin *et al.*, 2004) along with *L. indica* (Prasher and Singh 2014), recently recorded on unidentified angiospermic host from Chandigarh, North India. In the present study; involving isolation of endophytic fungi from *Ficus krishnae*; different species of endophytic fungi were isolated from different parts (bark, bud, bark, stem, leaf blade, vein, and petiole) of the plant. *Lasiodiplodia hormozganensis* was found to be one of the most frequently occurring species out of the different isolated species from different parts of *Ficus krishnae*. A survey of literature reveals that it is the first report of *Lasiodiplodia hormozganensis* as an endophytic fungus and also first from *Ficus krishnae* world-wide and a new record for India. *Lasiodiplodia hormozganensis* was recently reported from Iran (Abdollahzadeh *et al.,* 2010), from non-native environments in Australia (Sakalidis *et al.,* 2011), from Brazil (Marques *et al.*, 2013, Netto *et al.,* 2014), from Oman (UAE) (Al-Sadi *et al.,* 2013, 2014) as a pathogen.

MATERIALS AND METHODS

The fungus was isolated from different parts of the *Ficus krishnae* which were collected from the campus of Panjab University, Sector 14, Chandigarh in ziplock plastic bags and taken to the laboratory. Various segments of bark, leaves, bud, vein, stems and petiole of plant were first washed in running water. The leaves, stems and roots were cut into pieces (5 mm in length) and surface sterilized in 0.01% mercuric chloride followed by washing of segments in sterilized distilled water thrice (Janardhanan *et al.*, 1991; Ahmad, 1991; Bills, 1996; Moutia and Dookuna, 1999). Different plant segments were then placed on PDA (in Petri dishes) and incubated at 27 ± 1 ºC. Each plate was examined after 48 hrs. The purity of culture was confirmed by transferring 4 to 5 times to PDA plates to get the pure culture (Stierle *et al.,* 1993). Pure cultures were examined periodically. Identification of fungal strain is based on colony, hyphal morphology of the fungal culture, characteristics of the spores and reproductive structures.

Morphological characters were studied from the isolates sporulating on PDA plates. Cross-sections of conidiomata were made by hand, stained in Cotton blue (cotton blue 0.01g, lactic acid 100 ml). These were then mounted in glycerol to observe conidial and paraphyses morphology. Conidial masses were mounted in Amann's Lactophenol (Phenol-20 g, Lactic acid-20 g, Glycerol-40 g, distilled water 20 ml). All digital images were recorded with Matrix VRS-2f transmission microscope manufactured by Matrix Ltd, India. Measurements were made using dgsoft ProMed software. The specimen cultures have been deposited in the herbarium of Botany Department, Panjab University, India.

TAXONOMY

Lasiodiplodia hormozganensis Abdollahz, Zare & A.J.L. Phillips, *Persoonia* **25**: 6. 2010.

Colonies with a rapid growth and abundant aerial mycelium. Mycelium branched, septate; aerial mycelium initially creamish becoming smoke-grey after 2 weeks. Conidiomata solitary, globose, thick-walled usually covered with dense mycelium, mostly uniloculate, non-papillate with a central ostiole. Paraphyses hyaline, cylindrical, thin-walled, initially aseptate, becoming up to 1-7-septate when mature, rarely branched, occasionally basal, middle or apical cells swollen, rounded at apex, up to 83µm long, 2-4µm wide. Conidiophores absent. Conidiogenous cells holoblastic, discrete, hyaline, smooth, thin-walled, cylindrical, 9-16 × 23µm. Conidia initially hyaline, aseptate, ellipsoid to cylindrical, with granular contents, rounded at the apex, base round or truncate, wall <2 µm, becoming pigmented, verruculose, ellipsoid to ovoid, 1-septate with longitudinal striations, 18-24 × 11-14 µm.(L/W ratio = 1.7).

Material Examined: India, Chandigarh, Panjab University, On bark, bud, leaf and stem of *Ficus krishnae*, 6 June 2014, Reena (PAN: 34701, 34702, 34703, 34704).

DISCUSSION

Lasiodiplodia hormozganensis was recently described on diseased wood of *Mangifera indica* and *Olea* sp. from Iran as a pathogen (Abdollahzadeh *et al.,* 2010). It was isolated from *Adansonia digitata* and a dying *Adansonia za* in the Northern territory and from a dying *Adansonia gregoriii* from Australia (Sakalidis *et al*., 2011). It was found to be associated with dieback and stem rot of *Mangifera indica* in semi-arid region of Northeastern Brazil (Marques *et al.,* 2013). *Lasiodiplodia*

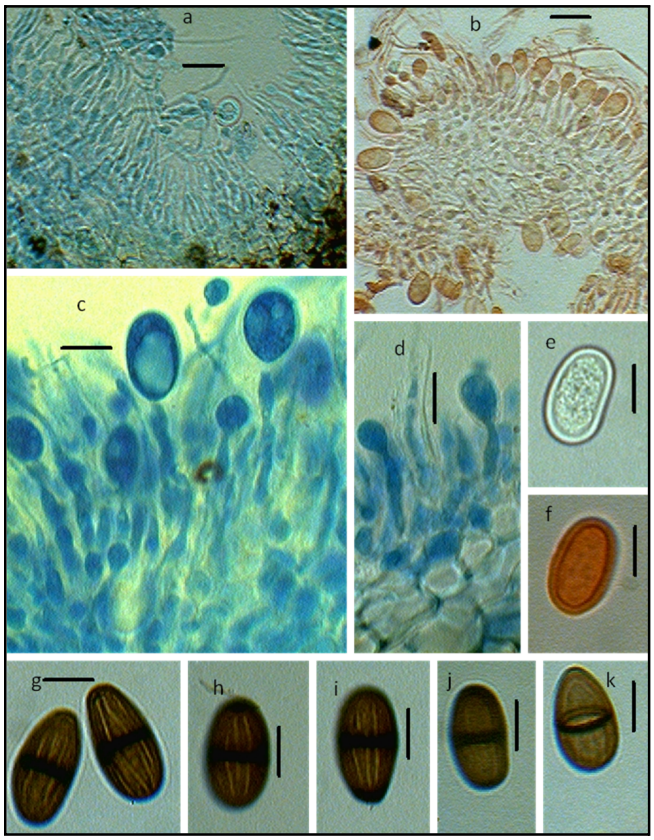

Fig.1(a-k) *Lasiodiplodia hormozganensis*: a- Cross-section of pycnidium, b to d- Conidia developing on conidiogenous cells between paraphyses, e&f- immature, hyaline conidia, g to k- mature conidia in different planes showing longitudinal striations. Bars a&b = 20 µm; b-k = 10 µm.

hormozganensis has been reported as a causal agent of root necrosis of *Phoenix dactylifera* and dieback and wilt of *Citrus aurantifolia* from Oman, UAE (Al-Sadi *et al.,* 2013, 2014). It was found to be the most virulent species causing stem-end rot in *Carica papaya,* proving to be a potential threat to this crop in Brazil (Netto *et al.,* 2014). This is for the first time that *Lasiodiplodia hormozganensis* is being reported from *Ficus krishnae* as an endophyte. *Lasiodiplodia hormozganensis* is one of the most frequently occurring species in different vegetative parts of *Ficus krishnae* and this is the first report of *L. hormozganensis* from India. The morphological details of the species matches completely with the description given by Abdollahzadeh *et al*. (2010).

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