

First report of teak leaf rust disease caused by *Olivea tectonae* in Brazil

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Abstract. This note reports the first occurrence of teak leaf rust disease caused by *Olivea tectonae* in Brazil. High severity of teak leaf rust was found on leaves of ornamental plants in the state of Minas Gerais and Espírito Santo, Brazil.

Teak (*Tectona grandis* L.f.) originated in India and China (Gradual *et al.* 1999), but it is also grown in the midwestern areas of Brazil. The first commercial teak plantations in Brazil were established in the 1960s; mostly in the state of Mato Grosso, where an area of around 30 000 ha has been planted (Passos *et al.* 2006).

Teak is economically very important. It is used in the manufacture of furniture, boat decks and other articles where resistance to the elements is desired. In shipbuilding teak is practically irreplaceable due to its resistance to sun, heat, cold, rain and sea water (Rondon Neto *et al.* 1998).

Teak leaf rust, caused by *Olivea tectonae* (T.S. Ramakr. & K. Ramakr.) R.L. Mulder., is reported in this work for the first time in Brazil. The fungus was collected on an ornamental teak plant of ~10 years old, in the region of Guaraciaba (578 m altitude, 20°60'29S and 43°05'43W), state of Minas Gerais, Brazil, in July 2010. One month later, leaf rust was also observed on other ornamental teak plants approximately 5 years old around the city of Viçosa (648 m altitude, 20°77'40S and 42°87'52W), also in Minas Gerais, and also in the Governador Lindenberg region (550 m altitude), state of Espírito Santo. Voucher specimens were deposited in the herbarium of the Universidade Federal de Viçosa (Herbarium Vic.) under the accession numbers: Vic. 31397 (Guaraciaba sample) and Vic. 31398 (Viçosa sample).

The symptoms observed on the leaves of the diseased plants consisted of small, angular brown to grey necrotic areas on the adaxial leaf surface. As the disease progressed, the lesions enlarged and coalesced to form larger necrotic lesions. The necrotic areas corresponded to numerous subepidermal areas of erumpent uredinia on the abaxial leaf surface. The lesions were also observed on the inflorescences of the plant (Fig. 1). Severely infected plants had lost most of their leaves.

Light microscope analysis revealed subepidermal erumpent uredinia measuring 90–180 × 55–112.5 µm, with basally united peripheral paraphyses of the *Malupa*-type, and hyaline to pale brown incurved uredinial paraphyses measuring 35–52.5 × 10–17.5 µm (Fig. 2). The urediniospores were produced singly on a short pedicel, subglobose or ellipsoid, mostly hyaline, occasionally pale brown, measured 17.5–25 µm (subglobose) and 22.5–30 × 15–22.5 µm (ellipsoid), echinulate (Fig. 3). Teliospores were not observed. The hyperparasite *Acremonium* sp. was commonly associated with the pustules of *O. tectonae*.

Olivea tectonae is known throughout Asia; mainly in Bangladesh, Myanmar, China, India, Indonesia, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand and Vietnam (Boedijn 1959; Lorsuwan *et al.* 1984; Kobayashi and Guzman 1988; Kaneko *et al.* 2007). Recently the fungus was identified in Australia, Central America (specifically in Cuba, Mexico, Costa

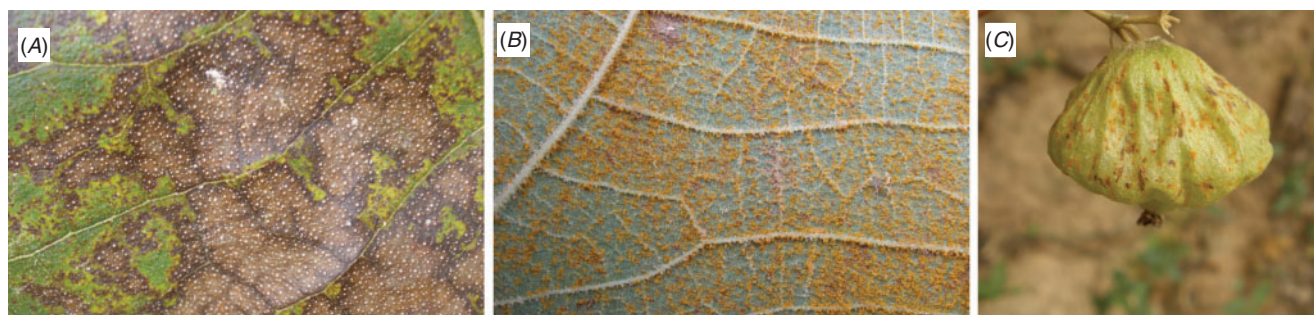


Fig. 1. Leaf and inflorescence of *Tectona grandis* (teak) showing symptoms of teak leaf rust disease (*Olivea tectonae*). (A) Necrosis on adaxial surface of the leaf, (B) urediniospores on abaxial surface, (C) symptoms and signs on flower.

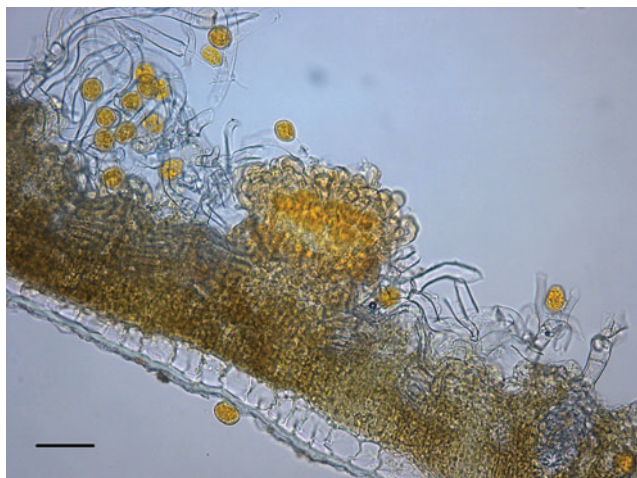


Fig. 2. Uredia, urediniospores and uredinial paraphyses of *Olivea tectonae*. Bar = 100 microns.



Fig. 3. Subglobose and ellipsoid urediniospores of *Olivea tectonae*. The presence of the hyperparasite *Acremonium* sp. can be seen among urediniospores. Bar = 50 microns.

Rica and Panama) (Arguedas 2004; EPPO 2005; Daly *et al.* 2006; Perez *et al.* 2008) and South America (Ecuador) (EPPO 2005). This is the first report of teak leaf rust in Brazil. It is possible that the pathogen arrived in South America via spores being carried by wind currents presumably from Central America.

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