Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Wilt of Rubber Tree Caused by *Chalaropsis thielavioides* in China

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Rubber tree (*Hevea brasiliensis* [Willd. ex A. Juss.] Müll. Arg.) is used for the extraction of natural rubber and is an economically and socially important estate crop commodity in many Asian countries such as Indonesia, Malaysia, Thailand, India, Sri Lanka, China, and several countries in Africa (Pu et al. 2007). Xishuangbanna City and Wenshan City are the main rubber cultivation areas in Yunnan Province, China. In November 2012, rubber trees showing typical wilt symptoms and vascular stains were found in Mengla County, Xishuangbanna City. This disease was destructive in these trees, and plant wilt death rate reached 5%. The diseased wood pieces (0.5 cm long) from trunk of rubber were surface disinfected with 75% ethanol for 30 s and 0.1% mercuric chloride (HgCl₂) for 2 min, rinsed three times with sterile distilled water, plated onto malt extract agar medium (MEA), and incubated at 28°C. After 7 days, fungal-like filaments were growing from the diseased trunk. Six cultures from six rubber trunks were obtained and incubated on MEA at 28°C for 7 days to observe the cultural features. The mycelium of each culture was white initially on MEA and then became dark green. Cylindrical endoconidia apices rounded, nonseptate, smooth, single or borne in chains (8.9 to 23.6 × 3.81 to 6.3 µm). Chlamydospores were abundant, thick walled, smooth, forming singly or in chains (11.1 to 19.2 × 9.4 to 12.0 µm). The mold fungus was identified as *Chalaropsis* based on morphology (Paulin-

Mahady et al. 2002). PCR amplification was carried out for three isolates, using rDNA internal transcribed spacer (ITS) primer pairs ITS1F and ITS4 (Thorpe et al. 2005). The nucleotide sequences were deposited in the GenBank database and used in a BLAST search of GenBank. BLAST analysis of sequenced isolates XJm8-2-6, XJm8-2, and XJm10-2-6 (accessions KJ511486, KJ511487, and KJ511489, respectively) had 99% identity to *Chalaropsis thielavioides* strains hy (KF356186) and C1630 (AF275491). Thus, the pathogen was identified as *C. thielavioides* based on morphological characteristics and rDNA-ITS sequence analysis. A pathogenicity test of the isolate XJm8-2 was conducted on five 1-year-old rubber seedlings. The soil of five rubber seedlings was inoculated by drenching with 40 ml of spore suspension (10⁶ spores/ml). Five control seedlings were inoculated with 40 ml of sterile distilled water. All the seedlings were maintained in a controlled greenhouse at 25°C and watered weekly. Six weeks after being inoculated, all the seedlings with spore suspension produced wilt symptoms; as disease progressed, inoculated leaves withered, and vascular stains were observed by 4 months. Control seedlings inoculated with sterile distilled water remained healthy. The pathogen reisolated from all inoculated symptomatic trunks was identical to the isolates by morphology and ITS analysis. No pathogen was isolated from the control seedlings. The pathogenicity assay showed that *C. thielavioides* was pathogenic to rubber trees. Blight caused on rubber tree by *Ceratocystis fimbriata* was reported previously in Brazil (Valdetaro et al. 2015), and wilt by *C. thielavioides* was not reported. The asexual states of most species in *Ceratocystis* are “chalar” or “thielaviopsis” (de Beer et al. 2014). To our knowledge, this is the first report of this fungus causing wilt of rubber in China. The spread of this disease may pose a threat to rubber production in China.

References:

- de Beer, Z. W., et al. 2014. Stud. Mycol. 79:187.
- Paulin-Mahady, A. E., et al. 2002. Mycologia 94:62.
- Pu, J. J., et al. 2007. Australas. Plant Dis. Notes 2:35.
- Thorpe, D. J., et al. 2005. Phytopathology 95:316.
- Valdetaro, D. C. O. F., et al. 2015. Trop. Plant Pathol. 40:184.

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