Research Note

FIRST REPORT OF SOOTY MOLD OF LONGAN (DIMOCARPUS LONGAN L.) *CAUSED BY* TRIPOSPERMUM POROSPORIFERUM *MATSUSHIMA AND* T. VARIABILE *MATSUSHIMA IN PUERTO RICO*[1]

Luz M. Serrato-Díaz[2], *Lydia I. Rivera-Vargas*[3] *and Ricardo Goenaga*[4]

J. Agric. Univ. P.R. 94(3-4):285-287 (2010)

Longan (*Dimocarpus longan* L.) is a tropical and subtropical exotic fruit native of Southeast Asia; it is a member of the Sapindaceae family. The tree can reach a height of 20 m with dense canopy of 30-cm-long alternate compound leaves and six to nine leaflet pairs. Longan produces small, yellow-brown flowers with white petals in terminal or axillary panicles. Fruits are round, 1.0 to 2.5 cm in diameter with leathery skin, yellow-brown at maturity. In the tropics, longan can be grown from sea level to 550 m (Rivero and Brunner, 2007). Longan trees have been grown for more than 75 years in Puerto Rico In 1999, experimental plots were established by USDA-ARS at the Agricultural Experiment Station of the University of Puerto Rico inAdjuntas, Puerto Rico, and at the USDA-Tropical Agriculture Research Station in Isabela, Puerto Rico.

A survey of longan diseases w as conducted throughout the island of Puerto Rico . Sooty mold was observed affecting the pedunc le and the whole fruit of cultivars Ew ai, Biew Kiew and Sri Chompoo inAdjuntas (13° 11' 52.84 N;66° 49' 57.70W) and Cabo Rojo (18° 4.245' N; 67° 8.994' W) (Figures 1A and 1B). Symptoms included brown, blackish-brown or black, often crust-like, superficial mycelium (Figures 1A and 1B). Plant material was collected and examined at the Plant Pathology Laboratory of the UPR-Mayagüez Campus. Free hand thin sections of fruit peel were mounted in lactophenol and examined under a compound microscope at 40X. Conidia morphology and taxonomic keys were used for identification (Barnett and Hunter, 1998; Santos-Flores and Betancourt-López, 1997).

The fungi causing sooty mold of longan in Puerto Rico were identified as *Tripospermum* spp. The genus was easily identified by the star-shaped conidia also known as stauroconidia. On longan fruits and pedunc les, *Tripospermum* spp. developed an extensive network of branched pigmented mycelia. Dry conidia were solitary, branched with a pyriform stalk cell and tri- to tetra-divergent, subulate, multiseptate arms. Conidiophores, setae and hyphopodia were absent. Two species were identified: *T. porosporiferum* Matsushima and *T. variabile* Matsushima. *Tripospermum porosporiferum* produced hyaline to pale brown tri- or tetraradiate conidia. Conidia measured 40 × 6.6 µm with four septate appendages, with a shorter two-celled axis 16 µm long (Figure 1C). Conidia were constricted at septa. *Tripospermum variabile* produced pale brown, triradiate (T-shape) conidia (36 × 6.6 µm) with main axis not bent back (Figure 1D). Conidia were constricted

[1]Manuscript submitted to Editorial Board 3 June 2010.

[2]Former Graduate Student, Department of Crops and Agroenvironmental Sciences, P.O. Box 9000, University of Puerto Rico, Mayagüez, P.R. 00681.

[3]Professor, Department of Crops and Agroenvironmental Sciences, P.O. Box 9000, University of Puerto Rico, Mayagüez, P.R. 00681.

[4]Research Leader, USDA-ARS, Tropical Agriculture Research Station, 2200 Pedro Albizu Campos Ave., Suite 210, Mayagüez, P.R. 00680.

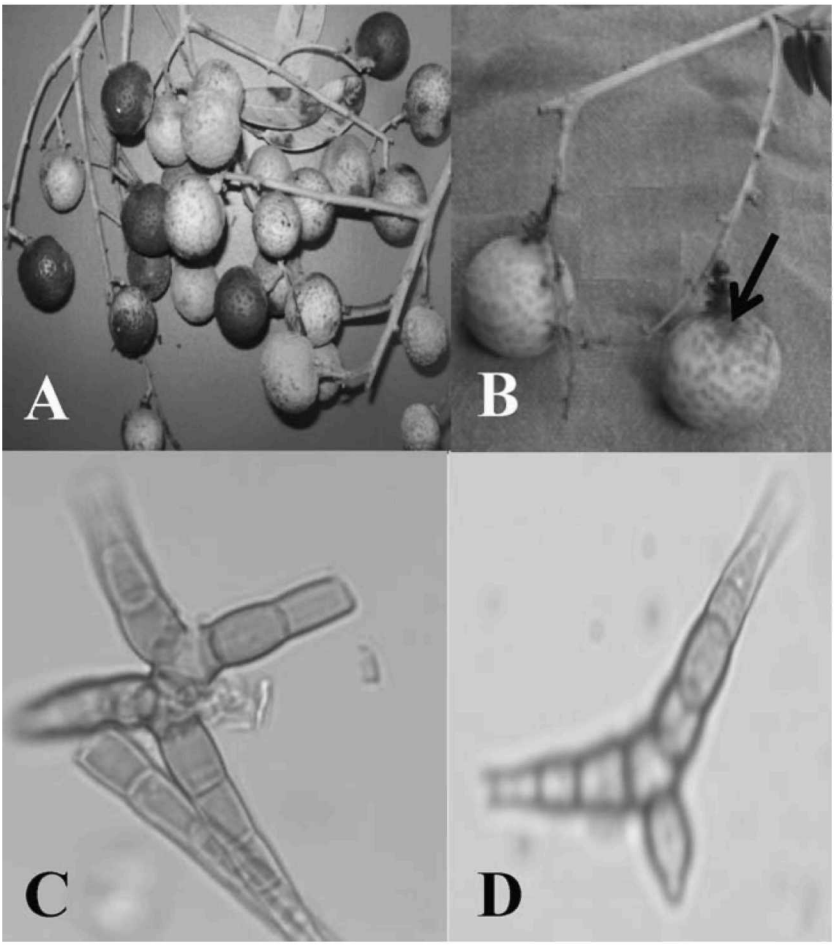

FIGURE 1. Symptoms of sooty mold on longan (*Dimocarpus longan* L.) fruits collected at A) Adjuntas, and B) Cabo Rojo, Puerto Rico. C) *Tripospermum porosporiferum* Matsushima tetraradiate conidia, and D) *T. variabile* Matsushima triradiate conidia.

at septa; the shorter part of axis was 6.39 µm long Their perfect states often belong to the Capnodiales (Crous et al., 2004; Lim and Khoo, 1985; Robert et al., 2005).

In Puerto Rico, *T. porosporiferum* has been reported on deca ying *Roystonea borinquena* Cook bracts collected from the Espíritu Santo River in Río Grande; on decaying palm petioles and foam collected from the Salto Collazo waterfall, San Sebastián; at the Doña Juana waterfall, Villalba; and in the Río Nacos at Naguabo , Puerto Rico (Santos-Flores and Betancourt-López, 1997). *Tripospermum variabile* has been reported in water and on submerged lea ves of *Cecropia peltata* in the Quebrada Oro , Mayagüez, Puerto Rico (Santos-Flores and Betancourt-López, 1997).

Sooty molds are fungal leaf epiphytes, associated with the honeydew of insects such as whiteflies, aphids, mealybugs and scales (Agrios, 2005; Nelson, 2008; Lim and Khoo, 1985). They are disseminated by air currents, rainwash or rainsplash. The spores land on plant surfaces upon which honeydew has been deposited by phloem-feeding insects, thus providing a unique ecological habitat for their development (Agrios, 2005; Lim and Khoo, 1985; Nelson, 2008). They can also obtain nutrients from leaf diffusates or guttation fluids, plant cuticle which supplies a rich source; chemical contaminated rain; organic and inorganic dust particles; pollen; and spores of other microflora (Lim and Khoo , 1985). They reproduce by fungal spores produced on the foliage and can survive saprophytically as mycelium or spores on plant debris or on inanimate objects such as rocks (Crous et al., 2009).

Sooty molds are a diverse non-host specific, non-parasitic and non-pathogenic group of fungi that produce black mycelial growth on leaf, fruit and twig surfaces (Cooprider and Brown, 2010; Crous et al., 2009; Lim and Khoo, 1985; Nelson, 2008). These sooty molds may cause significant postharvest problems , especially in fruit and vegetable crops, and produce aesthetically detrimental blemishes on ornamentals (Cooprider and Brown, 2010; Lim and Khoo, 1985; Nelson, 2008). Cosmetic damages caused by sooty molds often reduce quality, grade and marketability of agricultural products (Nelson, 2008). In addition, sooty molds reduce photosynthetic and gas exchange rates on leaf surface, and produce unsanitary mold-spore counts in processed foods made from infested materials (Agrios, 2005; Nelson, 2008).

This research note is the first report of *T. porosporiferum* and *T. variabile* causing sooty mold of longan in Puerto Rico. Impact of these species on longan fruit quality and marketability should be assessed.

LITERATURE CITED

Agrios, G. N., 2005. Plant Pathology. 5th ed. Elsevier Academic Press, Burlington, MA. 922 pp.

Barnett, H. L. and B. B. Hunter, 1998. Illustrated genera of imperfect fungi. APS Press, St. Paul, Minnesota, USA. 218 pp.

Cooprider, K. and S. H. Brown, Revised May 2010. Causes and Control of Sooty Mold. Lee County Extension Service. University of Florida. www.lee.ifas.ufl.edu.

Crous, P. W., W. Gams, J. A. Stalpers, V. Roberts and G. Stegehuis, 2004. MycoBank: An online initiative to lunch mycology into the 21st century. *Studies in Mycology* 50:19-22.

Crous, P. W., C. L. Schoch, K. D. Hyde, A. R. Wood, C. Gueidan, G. S. de Hoog and J . Z. Groenewald, 2009. Phylogenetic lineages in the Capnodiales . *Studies in Mycology* 64:17-47.

Nelson, S., 2008. Sooty Mold. Cooperative Extension Service. College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. Plant Disease, PD-52. 6 pp.

Lim T. K. and K. C. Khoo, 1985. Diseases and disorders of mango in Malaysia. Art Printing Works SDN, BHD, Kuala Lampus, Malaysia. 101 pp.

Rivero, J. and B. Brunner, 2007. Árboles frutales exóticos y poco conocidos en Puerto Rico. Editorial Universidad de Puerto Rico. San Juan, Puerto Rico. 357pp.

Robert, V., G. Stegehuis and J. Stalpers, 2005. The MycoBank engine and related databases. http://www.mycobank.org.

Santos Flores, C. and C . Betancourt-López, 1997. Aquatic and w ater-borne Hyphomycetes (Deuteromycotina) in streams of Puerto Rico . Caribbean J ournal of Science. Special Publication No. 2, 116 pp.