First report of *Geotrichum candidum* causing sour rot of longkong fruits (*Lansium domesticum*) in Southern Thailand

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*Lansium domesticum* is an endemic fruit tree belonging to the Meliaceae family, originating and cultivated in Southeast Asia (Techavuthiporn, 2018). Longkong is the most popular of three main groups of cultivars of *Lansium* spp. (Te-chato et al., 2005). During the last few years, ripe longkong fruits have been spoiled by sour rot symptoms. The symptoms of disease include the growth of white mycelium on the fruit peel, resulting in decayed, watery, and sour-smelling fruit within a few days post-harvest (Fig. 1). Therefore, sour rot is considered a significant problem at the post-harvest, storage, and shipment stages.

Fifty symptomatic fruit were collected in October 2019 from orchards in Lam Phaya, Yala Province, located in the southern region of Thailand. The fruit peels were cut into 1×1 cm fragments under aseptic conditions. They were surface-sterilised with sodium hypochlorite solution (5 ml/l), washed three times in sterilised water, and plated on dichloran Rose Bengal chloramphenicol agar as a selective medium and potato dextrose agar (PDA) as a relatively rich medium. All inoculated agar plates were incubated at 30°C for seven days in the dark. Subsequently, the isolated fungal colonies and emerging fungal mycelium were inoculated for culture purification on PDA. All purified isolates showed similar colony, mycelium and conidia morphology. The fungal colonies were flat with white floccose mycelium (Fig. 2). Mycelium were hyaline and septate. Conidia were hyaline with cylindrical to sub-globose in shape.

Total genomic DNA of the fungus was extracted from a seven-day-old culture using the GF Fungus DNA Extraction Kit (Vivantis, Malaysia) and PCR amplified using OnePCR reaction mixture (Bio-Helix, Taiwan) with ITS1/ITS4 primers (White et al., 1990). The PCR product was sequenced (Macrogen Inc., Korea) and the resulting sequence was deposited in GenBank (Accession No. MW063486). Sequence alignment using the BLASTn showed that the isolated fungus was closely related to *Geotrichum candidum* strain S001 (KY486783.1) with 100% coverage and 98.13% identity.

A pathogenicity test was done on 20 healthy longkong fruits, surface-sterilised using sodium hypochlorite solution and washed in
Colony morphology of *G. candidum* isolated from symptomatic fruits, cultured on potato dextrose agar at 30°C for seven days in the dark.

Pathogenicity test of *G. candidum* on longkong fruits: inoculated (A) and control (B) fruits after seven days incubation.

Sterilised water according as described previously. A conidial suspension (10^5 conidia/ml) of the isolated fungus was sprayed onto the surface of the fruits. The control comprised 20 additional fruits that were sprayed with sterilised water. All fruits were incubated in separate sterilised plastic bags at 30°C for seven days in the dark and observed for sour rot symptoms. Symptom development was observed daily. All experiments were assayed in triplicate. Symptoms of sour rot were produced on the inoculated fruits, whereas the controls did not develop any symptoms at the end of the experiment (Fig. 3). The symptoms were similar to those observed on naturally infected fruits. The pathogenic fungus was re-isolated from the symptomatic fruits and identified by PCR as *G. candidum*, thus fulfilling Koch’s postulates.

To our knowledge, this is the first report of *G. candidum* causing sour rot of longkong fruits in Thailand. Previous reports from other countries have described *G. candidum* causing sour rot and the decay of various fruits and vegetables such as carrot, citrus fruit, loquat, nectarine, peach, and tomatoes (Thornton et al., 2010; Hafeez et al., 2015). The symptoms mainly occur on ripe fruits, but may also occur on damaged premature fruits (Hafeez et al., 2015). The findings of this study will help in the development of disease management and preventative methods.

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