First report of *Fusarium oxysporum* causing leaf spot on white spider lily in Malaysia

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White spider lily [*Hymenocallis littoralis* (Jacq.) Salisb.] is a widely cultivated horticultural plant worldwide. In September 2016, outdoor plantings of *H. littoralis* in Universiti Sains Malaysia, Penang, Malaysia displayed severe leaf spot symptoms. Brownish to blackish spots surrounded by red haloes were observed on the infected leaves. At severe stage, the disease resulted in defoliation and affected the aesthetic value of the plant. Two isolates were recovered from symptomatic leaf samples after they were disinfested with 1% NaOCl, and plated on potato dextrose agar (PDA) at 28 °C for one week. Both isolates produced cottony white to pale violet mycelia. Macroconidia were straight to slightly curved, 3–4 septate and 27.06 to 33.09×3.56 to 5.87 μm ($n = 50$). Microconidia were oval, aseptate and 5.56 to 9.34×3.23 to 5.40 μm ($n = 50$). Chlamydospores were abundant and false heads were on short monophialides. These morphological characteristics are similar to those of *Fusarium oxysporum* (Leslie and Summerell 2006) which was further confirmed by DNA sequencing of translation elongation factor 1- α (TEF1- α) and mitochondrial small subunit (mtSSU) using primer pairs EF1/EF2 (O'Donnell et al. 1998) and MS1/MS2 (White et al. 1990), respectively. Resultant sequences were deposited in GenBank as accession Nos. MH645143 and MH645144 for TEF1- α and MH645141 and MH645142 for mtSSU. Pairwise sequence alignment using Fusarium MLST database showed that MH645143 and MH645144 had 100% identity to AF008506 (CBS 794.70), MH645141 (99.8%) and MH645142 (99.7%) identity to AF008506 (CBS 794.70), a *Fusarium oxysporum* (f. sp. *perniciusum*) from Iran. Both isolates were used to conduct path-

ogenicity test by wound inoculating fungal mycelial discs (6 mm in diameter, prepared from seven-day-old PDA cultures) onto *H. littoralis* leaves. Controls were treated with PDA discs without mycelia using the same technique. The inoculated plants were placed in a plant house at 30 °C with ~80% relative humidity. Three weeks after inoculation, symptoms similar to those observed in the field were developed on the leaves inoculated with *F. oxysporum* isolates. Control leaves remained symptomless. The same fungus was reisolated from the inoculated leaves. Previously, *Neoscytalidium dimidiatum* was reported to cause leaf blight on white spider lily in Malaysia (Azni et al. 2017). *Fusarium oxysporum* is a well-known phytopathogen that infects several economically important crops (Leslie and Summerell 2006). To our knowledge, this is the first report of *F. oxysporum* causing leaf spot on *H. littoralis* in Malaysia.

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References

- Azni NNM, Mohamed Nor NMI, Latiffah Z, Mohd MH (2017) First report of leaf blight on white spider lily caused by *Neoscytalidium dimidiatum* in Malaysia. New Dis Rep 35:16
- Leslie JF, Summerell BA (2006) The *Fusarium* Laboratory Manual. Blackwell Publishing Ltd., Oxford
- O'Donnell K, Kistler HC, Cigelnik E, Ploetz RC (1998) Multiple evolutionary origins of the fungus causing Panama disease of banana: concordant evidence from nuclear and mitochondrial gene genealogies. Proc Natl Acad Sci (USA) 95:2044–2049
- White TJ, Bruns T, Lee S, Taylor JW (1990) Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: Innis MA, Gelfand DH, Sninsky JJ, White TJ (eds) PCR Protocols: A Guide to Methods and Applications. Academic Press, New York

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