Diseases Caused by Fungi and Fungus-Like Organisms

Occurrence of Powdery Mildew Caused by *Erysiphe buhrii* on *Dianthus chinensis* in Inner Mongolia, China

Mo Zhu (朱墨),^{1,2,†} Xiao Duan,¹ Haoran Guo,¹ Wei Huang,¹ Ke Quan,¹ Xiao Yan,¹ Jie Ji,¹ Yong-Fang Li,^{1,2} and Zhengnan Li (李正男)^{3,†}

¹ College of Life Sciences, Henan Normal University, Xinxiang 453007, Henan, P.R. China

² Henan International Joint Laboratory of Agricultural Microbial Ecology and Technology, Henan Normal University, Xinxiang 453007, Henan, P.R. China

³ College of Horticulture and Plant Protection, Inner Mongolia Agricultural University, Hohhot, 010018, Inner Mongolia, P.R. China

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Dianthus chinensis is widely cultivated for ornamental and medicinal use in China (Guo et al. 2017). The plant has been used in traditional Chinese medicine for the treatment of urinary problems such as strangury and diuresis (Han et al. 2015). In June and July 2020, powdery mildew-like signs and symptoms were seen on leaves of *D. chinensis* cultivated on the campus of Inner Mongolia Agricultural University, Hohhot, Inner Mongolia, China. White powder-like masses occurred in irregular shaped lesions on both leaf surfaces and covered up to 50% of leaf area. Some infected leaves were deformed on their edges and some leaf senescence occurred. More than 40% of plants ($n = 180$) exhibited these signs and symptoms. Conidiophores ($n = 50$) of the suspect fungus were unbranched and measured 70 to 140 μm long $\times$ 6 to 10 μm wide and had foot cells that were 25 to 48 μm long. Conidia ($n = 50$) were produced singly, elliptical to cylindrical shaped, 30 to 45 μm long $\times$ 12 to 19 μm wide, with length/width ratio of 2.0 to 3.2, and lacked fibrosin bodies. No chasmothecia were found. Based on these morphological characteristics, the fungus was tentatively identified as an *Erysiphe* sp. (Braun and Cook 2012). Fungal structures were isolated from diseased leaves and genomic DNA of the pathogen extracted utilizing the

method described by Zhu et al. (2019). The internal transcribed spacer (ITS) region was amplified by PCR employing the primers PMITS1/PMITS2 (Cunnington et al. 2003) and the amplicon sequenced by Invitrogen (Shanghai, China). The sequence for the powdery mildew fungus (deposited into GenBank under accession no. MW144997) showed 100% identity (558/558 bp) with *Erysiphe buhrii* (accession no. LC009898) that was reported on *Dianthus* sp. in Japan (Takamatsu et al. 2015). Pathogenicity tests were done by collecting fungal conidia from infected *D. chinensis* leaves and brushing them onto leaves of four healthy plants. Four uninoculated plants served as controls. Inoculated and uninoculated plants were placed in separate growth chambers maintained at 19°C, 65% humidity, with a 16 h/8 h light/dark period. Nine days postinoculation, powdery mildew disease signs appeared on inoculated plants, whereas control plants remained asymptomatic. The same results were obtained for two repeated pathogenicity experiments. The powdery mildew fungus was identified and confirmed as *E. buhrii* based on morphological and molecular analysis. An *Oidium* sp. causing powdery mildew on *D. chinensis* was previously reported in Xinjiang Province, China (Zheng and Yu 1987). This is, to our knowledge, the first report of powdery mildew caused by *E. buhrii* on *D. chinensis* in China (Farr and Rossman 2020). The sudden occurrence of this destructive powdery mildew disease on *D. chinensis* may adversely affect the health, ornamental value, and medicinal uses of the plant in China. Identifying the cause of the disease will support efforts for its future control and management.

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[†]Indicates the corresponding authors.

M. Zhu; zhumo@htu.edu.cn, and Z. Li; lizhengnan@imau.edu.cn