



First report of brown spot of Gannan navel orange caused by *Cladosporium tenuissimum* in Jiangxi Province, China

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Received: 24 June 2023 / Accepted: 26 September 2023 / Published online: 19 October 2023
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Keywords *Cladosporium tenuissimum* · Brown spot · *Citrus sinensis* · China

In November 2022, symptoms of brown spot were observed in approximately 5% fruits of the Gannan navel orange (*Citrus sinensis* Osbeck cv. Newhall) in an orchard in Anyuan County, Ganzhou City, Jiangxi Province, China (25.13° N, 115.38° E). Ten infected fruits were surface sterilized with 75% ethanol and plated on potato dextrose agar at 25 °C for 5 days. Ten isolates were obtained. Colonies of these consisted of dark green hyphae with fluffy gray spores, edges white. Ramoconidia were cylindrical, knee-like bent, septate, 8.4 to 14.7 × 3.4 to 4.6 μm ($\bar{x} = 11.8 \pm 2.3 \times 3.93 \pm 0.4$ μm, n = 30), while conidia were melon shaped to nearly oval, 3.8 to 5.9 × 2.4 to 3.3 μm ($\bar{x} = 5.93 \pm 0.7 \times 2.9 \pm 0.3$ μm, n = 30). Morphological characteristics of these isolates were consistent with those of *Cladosporium tenuissimum*. The internal transcribed spacer (ITS) region, actin (*ACT*), and translation elongation factor (*TEF1-a*) regions of the representative isolate (JFRL-03-759, JFRL-03-760) were amplified using primers ITS1/ITS4, ACT-512 F/ACT-783R and EF1-728 F/EF1-986R, respectively (Udayanga et al. 2015). These nucleotide sequences ITS (OQ592886, OQ592887), *ACT* (OQ603382, OQ603383), *TEF1-a* (OQ603384, OQ603385) were deposited into GenBank. The phylogenetic tree showed that the two isolates clustered with *C. tenuissimum* (Zhang et al. 2020). The pathogenicity test was conducted on 10 healthy fruits

by inoculating mycelial plugs from a 5-day-old culture into wounds with sterile scalpels. Control fruits (n = 10) were inoculated with sterile PDA agar. All fruits were cultured at 25 °C and 85% relative humidity. Brown spots appeared all the inoculated fruits, whereas control fruits remained asymptomatic. To fulfill Koch's postulates, the pathogen was re-isolated from all inoculated fruits and confirmed as *C. tenuissimum* by morphological and molecular analysis. To our knowledge, this is the first report of *C. tenuissimum* causing brown spot of Gannan navel orange in China.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s42161-023-01533-8>.

Funding National Natural Science Foundation of China (31,560,574); National Science Foundation of Jiangxi Province (20171ACB200214); Youth Fund of Jiangxi Provincial Department of Education (GJJ190225).

Declarations

Conflict of interests The author(s) declare no conflict of interest.

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Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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