

Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

Fusarium pseudocircinatum Causing Stunting and Malformation of Sunflower Plants in Brazil

O. R. Farias,^{1,†} J. M. F. L. Cruz,² J. S. Veloso,³ J. T. Souza,² I. G. Duarte,³ P. R. R. Barbosa,⁴ C. M. R. Varanda,⁵ P. Materatski,⁵ M. R. F. Félix,⁵ M. D. M. Oliveira,¹ and L. C. Nascimento¹

¹ Programa de Pós-Graduação em Agronomia, Universidade Federal da Paraíba, Areia 58.397-000, Brazil

² Programa de Pós-Graduação em Fitopatologia, Universidade Federal de Lavras, Lavras 37.200-000, Brazil

³ Programa de Pós-Graduação em Fitopatologia, Universidade Federal Rural de Pernambuco, Recife 52.171-900, Brazil

⁴ Instituto de Ciências Agrárias, Universidade Federal dos Vales do Jequitinhonha e Mucuri – Campus Unaí, Unaí 38.610-000, Brazil

⁵ Mediterranean Institute for Agriculture, Environment and Development, Universidade de Évora, 7006-554 Évora, Portugal

Funding: This work was funded by the project “Control of olive anthracnose through gene silencing and gene expression using a plant virus vector” with the references ALT20-03-0145-FEDER-028263 and PTDC/ASP-PLA/28263/2017 and the project “Development of a new virus-based vector to control TSWV in tomato plants” with the references ALT20-03-0145-FEDER-028266 and PTDC/ASP-PLA/28266/2017, cofinanced by the European Union through the European Regional Development Fund, under the ALENTEJO 2020 (Regional Operational Program of the Alentejo), ALGARVE 2020 (Regional Operational Program of the Algarve), and through the Foundation for Science and Technology, in its national component. Plant Dis. 107:216, 2023; published online as <https://doi.org/10.1094/PDIS-01-22-0212-PDN>. Accepted for publication 27 April 2022.

Sunflower (*Helianthus annuus* L.) is among the main oleaginous crops used in Brazil. During January 2017, at CCA/UFPB laboratory and greenhouses (Areia, Brazil, 6°58'12"S; 35°42'15"W), we observed various sunflower seeds (cultivar Olisun 3, 2017 to 2018 crop) highly infested with *Fusarium*. Those seeds were from crops in the municipality of Alagoinha, Paraíba, Brazil (06°57'00"S; 35°32'42"W), supplied by Empresa Brasileira de Pesquisa Agropecuária/EMBRAPA. The emerged seedlings from these seeds were also contaminated, with 5 to 26% of them exhibiting stunting and malformation. *Fusarium* strains were isolated from symptomatic plants, and a single spore was used to grow pure colonies on potato dextrose agar (PDA) and synthetic nutrient-poor agar (SNA) media. Mycelia of PDA colonies were floccose and dense, varying from yellow to orange. Fungal colonies

developed aerial mycelium, producing orange pigments. On SNA, hyaline macroconidia were 2.9 to 4.1 × 32.4 to 65.0 µm, slightly falcate, and with three to six septa. Oval microconidia, measuring 2.4 to 3.6 × 5.1 to 9.0 µm, were abundant in false heads forming on monophialides. Chlamydospores were absent. Sterile hyphae were rarely formed. Collectively, the morphological features corresponded to species of the *Fusarium fujikuroi* species complex (Leslie and Summerell 2006). To assure the species identity, we sequenced the elongation factor 1α region of two representative isolates (F2 and F3, GenBank accession nos. MZ666934 and MZ666935, respectively) and compared them to other *Fusarium* species found at *Fusarium*-ID and GenBank databases. Subsequently, we performed a maximum likelihood phylogenetic analysis including previously published sequences (Nicolli et al. 2020). Both isolates exhibited 100% similarity with *Fusarium pseudocircinatum* (MN386745), and clustered with its ex-type at 100% bootstrap values. The isolates were then grown on PDA amended with manitol to adjust the osmotic pressure to −1.0 MPa at 25 ± 2°C for 7 days (Souza et al. 2008). A total of 100 disinfested sunflower seeds (cultivar Olisun 3, 2018 to 2019 crop) were distributed over the colonies and 48 h later they were sown on sterile substrate maintained inside a greenhouse. About 30 days after inoculation, the emerged plants exhibited symptoms of stunting and malformation (60%); controls were healthy. *F. pseudocircinatum* was reisolated from the symptomatic plants, completing Koch's postulates, and identified based on the above morphological and molecular methods. This test was performed twice. *Fusarium pseudocircinatum* is a broadly distributed and ecologically diverse species that infects several wild and cultivated plants. For instance, it was reported on seeds of the wild ‘Peroba Rosa’ (*Aspidosperma polyneuron* Muell. Arg.) in Brazil (Mazarotto et al. 2020). Infection of sunflowers may cause plant stand failures, resulting in yield and economic losses for Brazilian growers. The correct identification of any pathogen, especially a generalist one such as *F. pseudocircinatum*, is crucial to develop efficient management strategies. To our knowledge, this is the first report of *F. pseudocircinatum* causing stunting and malformation of sunflower plants in Brazil.

References:

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The author(s) declare no conflict of interest.

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Keywords: disease warning systems, epidemiology, field crops, fungi, oilseeds and legumes, pathogen detection

[†]Indicates the corresponding author.
O. R. Farias; otliararias@gmail.com