

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of the Armillaria Root-Disease Pathogen, *Armillaria gallica*, Associated with Several Woody Hosts in Three States of Central Mexico (Guanajuato, Jalisco, and Michoacán)

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In July-August 2019, seven *Armillaria* isolates (derived from rhizomorphs and mycelial fans of infected roots) were collected in association with woody hosts in the central Mexico: states of Guanajuato (MEX204), Jalisco (MEX206, MEX208, MEX209), and Michoacán (MEX211, MEX214, MEX216). All seven isolates were identified as *Armillaria gallica* based on translation elongation factor 1 α (*tef1*) gene sequences (GenBank accession nos. MN839636 to MN839642 for MEX204, MEX206, MEX208, MEX209, MEX211, MEX214, and MEX216) and somatic pairing tests against known tester isolates. GenBank nucleotide BLAST results showed *tef1* similarity for all isolates was highest for with *A. gallica* ($\geq 97\%$; GenBank accession nos. KF156775 and KF156772). In replicated pairings against three tester isolates each for *A. gallica*, *A. mellea*, and *A. mexicana*, all isolates showed the highest compatibility with *A. gallica* (67 to 100%), with lower compatibility against *A. mellea* and *A. mexicana*, with 3 to 11% and 2 to 11%, respectively. Variations in compatibility among different tester isolates could reflect cryptic speciation within *A. gallica* (Klopfenstein et al. 2017). In Tarimoro, Guanajuato, MEX204 was isolated from infected *Quercus jonesii* (20°13'46.2"N, 100°42'51.1"W, elevation 2,265 m) that displayed root disease symptoms/signs (wilting/defoliation

and mycelial fans within the roots). In a forested area of Mazamitla, Jalisco, MEX206 was isolated from infected *Q. laevis* (19°54'52"N, 103°00'07"W, elevation 2,388 m) with root disease symptoms/signs (e.g., wilting, foliar chlorosis, and mycelial fans within the root crown); MEX208 was isolated from infected *Pinus pseudostrabus* (19°54'53"N, 102°59'54"W, elevation 2,373 m) with basal resinosis and mycelial fans; and MEX209 was collected from a symptomless *P. devoniana* (19°54'13.1"N, 103°00'14.1"W, elevation 2,434 m). In Zinapécuaro, Michoacán, MEX211 (19°53'28.8"N, 100°39'44.0"W, elevation 2,474 m) was isolated from infected *Malus domestica* with root disease that resulted in mortality; in Hidalgo, Michoacán, MEX214 (19°46'49"N, 100°39'25.2"W, elevation 2,903 m) and MEX216 (19°46'58"N, 100°39'24"W, elevation 2,894 m) were isolated from infected *P. devoniana* and *P. teocote*, respectively, which both displayed root disease symptoms/signs (basal resinosis and mycelial fans). Previously, *A. gallica* was reported in the State of Mexico, Veracruz, and Oaxaca, Mexico (Elías-Román et al. 2013; Klopfenstein et al. 2014), but this represents the first report of *A. gallica* in Guanajuato, Jalisco, and Michoacán, Mexico. In contrast to other regions of North America (e.g., Bruhn et al. 2000), *A. gallica* was demonstrated to be a virulent pathogen on peach (*Prunus persica*) in central Mexico (Elías-Román et al. 2013). Unfortunately, tree seedlings cannot be used for *Armillaria* pathogenicity tests in a greenhouse or nursery; however, all root-diseased trees in this report showed *Armillaria* mycelial fans under the bark of a living tree, which are reliable indicators of pathogenicity, and no other root diseases were found. This report demonstrates that *A. gallica* is distributed across central Mexico, where it is associated with disease on *Quercus*, *Pinus*, and *Malus*. Such information is critical to increase our understanding of *Armillaria* root disease across diverse geographic regions and climates.

References:

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