

# plant disease

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## Disease Notes

### **First Report of the *Armillaria* Root-Disease Pathogen, *Armillaria gallica*, Associated with Several Woody Hosts in Three States of Mexico**

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In September 2007, rhizomorphs with morphological characteristics of *Armillaria* were collected from woody hosts in forests of Mexico State, Veracruz, and Oaxaca, Mexico. Based on pairing tests, isolates were assigned to five somatically compatible genets or clones (MEX7R, MEX11R, MEX23R, MEX28R, and MEX30R). These genets were all identified as *Armillaria gallica* based on somatic pairing tests against known tester isolates and nucleotide sequences of the translation elongation factor 1 $\alpha$  (*tef-1 $\alpha$* ; GenBank Accession Nos. KF156772 to 76). Sequences of *tef-1 $\alpha$*  for all genets showed a max identity of 97 to 99% to *A. gallica* (ST23, JF313125) (3,4). However, *A. gallica* comprises a genetically diverse complex that likely represents multiple cryptic species (3). In Mexico, this species has been previously reported in northeastern Morelos on *Quercus* sp., eastern Mexico State on *Pinus hartwegii*, and southwestern Mexico State on *Prunus persica* (1,2). This study identified associations with 10 new hosts

within three states of Mexico, but only five hosts were diseased. Genet MEX7R comprised seven isolates collected in the University of Chapingo forest near Texcoco, Mexico State (19°18'10.764" N, 98°42'14.147" W, elevation 3441 m). Four MEX7R isolates were collected from diseased *Alnus* sp. including the root ball of a 130 cm dbh, root-disease killed tree, one isolate from a symptomless *Senecio* sp. s.l. (*Roldana* sp.) shrub and two isolates from symptomless *Abies religiosa*. Genet MEX11R comprised four isolates from a cloud forest near Xalapa, Veracruz (19°31'14.628" N, 96°59'22.812" W, elevation 1496 m). MEX11R isolates were collected from the roots of a root-disease killed *Carpinus caroliniana*, and from trees with no obvious symptoms (*Miconia mexicana*, *Quercus xalapensis*, and *Liquidambar styraciflua*). Two isolates of genet MEX23R were collected from the Jardín Botánico Francisco Javier Clavijero, Instituto de Ecología, A.C., Xalapa, Veracruz (19°30'49.067" N, 96°56'32.999" W, elevation 1344 m). These isolates were from root-diseased *Eriobotrya japonica* (non-native fruit tree) that showed obvious symptoms (flaccid, chlorotic, and senescing leaves) and from an adjacent, infected *Platanus mexicana* that did not show readily observable symptoms. Two collections near Oaxaca, Oaxaca, included a single isolate MEX28R from the root ball of a recently root disease-killed *Arbutus xalapensis* within a small root disease center at Peña Prieta, in Parque La Cumbre, near Ixtepeji (17°09'42.084" N, 96°38'15.936" W, elevation 2853 m) and a single isolate MEX30R from the base of an asymptomatic *Alnus acuminata* near the El Carrizal fish hatchery 10 km northeast of San Miguel del Valle (17°06'45.036" N, 96°24'03.743" W, elevation 2594 m). *Armillaria gallica* has a circumpolar distribution with an extremely wide host range, and its ecological behavior varies greatly. Continued surveys are needed to better understand the distribution and ecological impacts of this pathogen in relation to Armillaria root disease in Mexico and the potential influences of climate change. Although *A. gallica* displays diverse ecological behavior, trees infected with *A. gallica* are less likely to survive the stresses of human activity and a changing climate (4).

*References:* (1) D. Alvarado-Rosales and R. A. Blanchette. *Phytopathology* 84:1106, 1994. (2) R. D. Elias-Roman et al. *For. Pathol.* 43:390, 2013. (3) M.-S. Kim et al. *Phytopathology* 102:S4.63, 2012. (4) B. Marçais and N. Breda. *J. Ecol.* 94:1214, 2006