



# DNA-BASED IDENTIFICATION OF *ARMILLARIA* ISOLATES FROM PEACH ORCHARDS IN MÉXICO STATE

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## ABSTRACT

A collaborative project between the Programa de Fitopatología, Colegio de Postgraduados, Texcoco, Estado de México and the USDA Forest Service - RMRS, Moscow Forest Pathology Laboratory has begun this year (2011) to assess which species of *Armillaria* are causing widespread and severe damage to the peach orchards from México state, México. We are employing a DNA-based approach in which several genes will be sequenced and compared to known *Armillaria* species.

## BACKGROUND

Peach cultivation was first introduced to México by Spanish explorers in the sixteenth century and now constitutes an important crop with approximately 40,500 ha currently devoted to peach production (Anonymous 2011). Most production consists of the clingstone type of peach, which has been grown in the highlands of central México for decades (around 60% of national production). In México state, approximately 3,000 ha of peach orchards are typically established in areas where native forests are cleared. These orchards are relatively short-lived, with a production life span of about 10 years.

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*Armillaria* is one of the most damaging pathogens of peach trees in México, where it causes significant annual mortality of orchard-grown peach trees.

## OBJECTIVES

The objective of this research is to use DNA-based methods to identify *Armillaria* isolates collected from peach trees growing in orchards throughout México state for comparisons with *Armillaria* spp. from native forests. This information will be used to help develop species-specific, *Armillaria*-resistant peach rootstocks, and evaluate potential invasiveness of these *Armillaria* species.

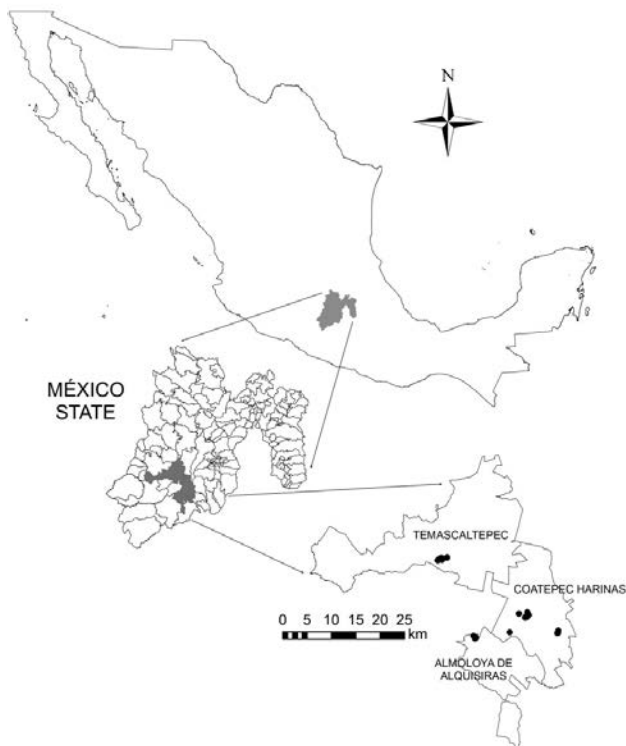
## METHODS

*Armillaria* isolates (n = 62) were collected from 15 peach orchards located throughout México state (Fig. 1). For each of these isolates, up to four loci are being sequenced (ITS, IGS-1, LSU-D, and EF1- $\alpha$ ).

## RESULTS AND DISCUSSION

Based on IGS-1 sequence alignments, three species of *Armillaria* have been isolated from infected peach trees: *A. mellea*, *A. gallica*, and an undescribed species. These *Armillaria* species are not the same as the species typically associated with *Armillaria* root disease in the southeastern USA (*A. tabescens*) and may require the development of specialized root stock for resistance (Beckman 2007).

Understanding the distribution of *Armillaria* spp. in México is critical toward predicting potentially invasive *Armillaria* pathogens for the USA and México. This information will also lay a foundation for predicting potential influences of climate change on *Armillaria* root disease in the USA and México.



## REFERENCES

Anonymous. 2011. SAGARPA Database-avance de siembras y cosechas. <http://www.siap.sagarpa.gob.mx/>.

Beckman, T.G. 2007. Managing peach tree short life and *Armillaria* root rot in peach orchards. Pages 28-41 In: Proceedings of 3rd National Peach Congress, December 6-8, 2007, Ixtapan de la Sal, Mexico.



**Figure 1:** Map showing the location of *Armillaria* collection sites within México state, México (top); Peach trees infected with *Armillaria* spp. (bottom).



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