



Diagnostics of Armillaria Root Disease

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- STEP 4 -

Armillaria species identification

List of *Armillaria* species found within the North America

Species	Pathogenicity	Primary Host
<i>A. ostoyae</i>	High	Conifers
<i>A. mellea</i>	High	Hardwoods
<i>A. tabescens</i>	High?	Hardwoods
<i>A. gemina</i>	Moderate?	Hardwoods
<i>A. nabsnona</i>	Moderate?	Hardwoods
<i>A. calvescens</i>	Low	Mixed
<i>A. sinapina</i>	Low	Mixed
<i>A. gallica</i>	Low	Mixed
<i>A. cepistipes</i>	Low	Mixed
NABS X (Species not named)	Rarely pathogenic	Mixed



A. ostoyae



A. tabescens



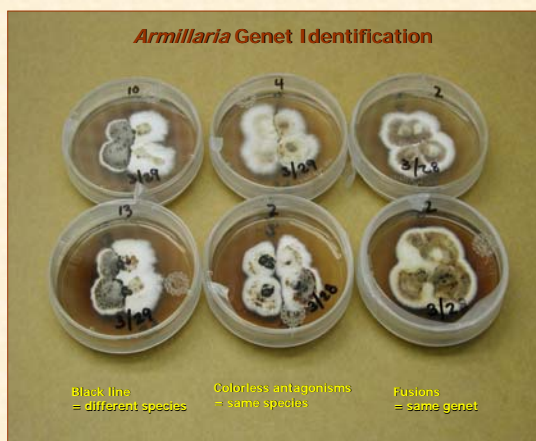
A. mellea



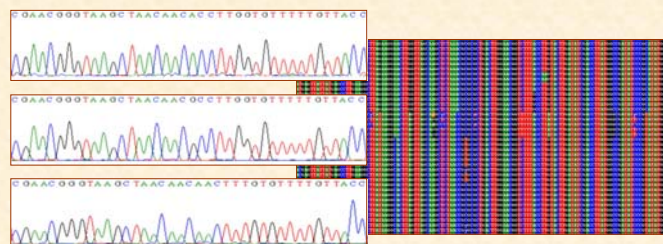
A. nabsnona

We use several test techniques for identifying species: mating tests, somatic incompatibility tests (pairing tests), and DNA sequencing.

Somatic (vegetative) incompatibility test

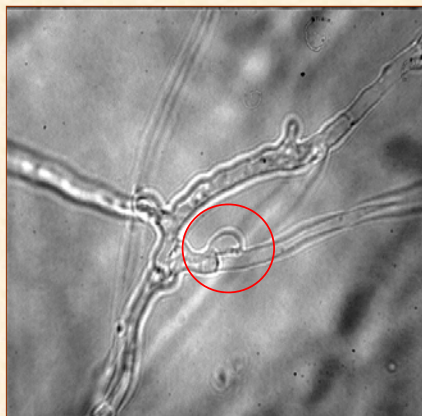


Results from DNA sequencing

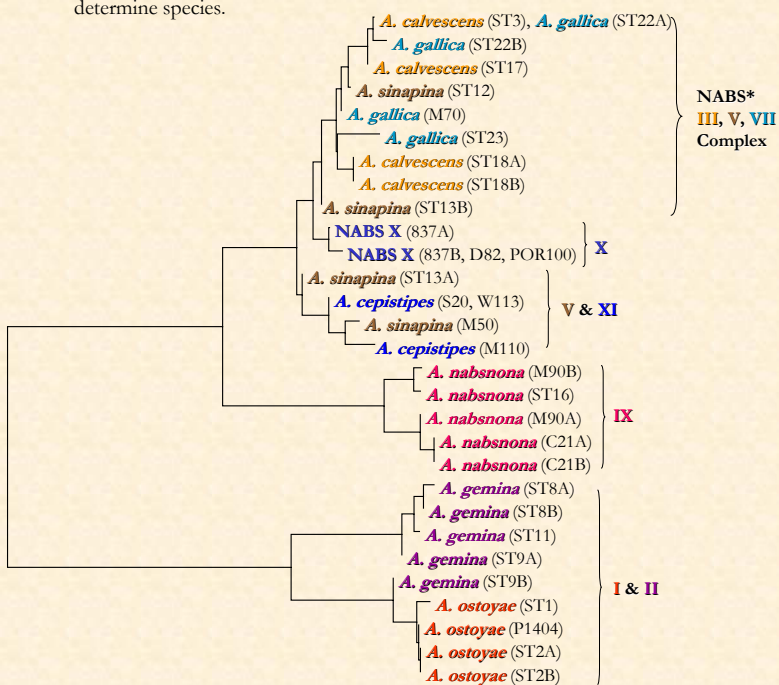


DNA sequences (left) are aligned and compared to each other (right) to determine species.

Mating tests



Basidiospore-derived isolates that are the same species form clamp connections (in circle) when mating is successful. Clamp connections disappear over time, after the mated culture becomes diploid.



0.01

A phylogenetic tree comparing sequences of different species of *Armillaria* using the IGS-1 region of ribosomal DNA.