

**Balci, Y.** 2010. Ecological adaptations in *Phytophthora*. Understanding their role in forest ecosystems. *Phytopathology* 100:S151.

We have examined two species of *Phytophthora* for their role in plant health in Appalachian oak ecosystems; one from soil and the other from streams; *P. cinnamomi* and *P. appalachiensis*, respectively. *P. cinnamomi* was found to be the most common and widespread species in eastern U.S. oak forests during a multi State survey. *P. appalachiensis* has been identified as a new species from a stream in West Virginia. It could only be isolated during June-October and no other species was isolated from the same stream. It also was found infecting fallen leaves in the stream and live foliage if shoots of rhododendrons were dipped into the stream. During leaf inoculations, it was pathogenic, but significantly more when wounded. *P. cinnamomi* was the most common *Phytophthora* species below the N 40° latitude range. Its occurrence in the eastern U.S. oak forests most likely is restricted by the low minimum temperature extremes as reflected by the overlapping incidences with plant hardiness zone maps. In infested sites, multiple woody plants harbored the pathogen. When examined with the oak decline incidences in Ohio, we found significant root mortalities on infested white oaks (*Q. alba*) and greater inoculum levels in lower moist bottomlands. This pathogen appears to be mainly affecting tree health by killing fine roots particularly when site conditions are favorable, whereas, *P. appalachiensis* seems to be opportunistic in behavior.