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FIRST REPORT ON *PHYTOPHTHORA CAMBIVORA* FROM AN OAK STAND IN POLAND

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In the last years, many studies reported on the occurrence of soilborne *Phytophthora* species in oak stands in Europe. Some of the reports proved the involvement of *Phytophthora* spp. in the oak dieback symptoms (Jung et al. 2000, Vettraino et al. 2002). Very little is known about the *Phytophthora* species associated with *Quercus robur* in Poland. There were only three reports about *Phytophthora* isolation from Polish oak forests (Jung et al. 2002, Oszako and Orlikowski 2005, Oszako et al. 2007). These studies reported associations of *P. uliginosa*, *P. cinnamomi* and *P. quercina* with oak ecosystems.

In autumn 2007, *P. cambivora* was recovered from the rhizosphere soil of a declining 150-year-old *Q. robur* tree in the Krzyszkowicki Forest (Myślenice Forest District, compartment 24), near Cracow, southern Poland (50°07' N, 20°01' E). Symptoms included crown transparency over 25% and leaf yellowing. Four *P. cambivora* isolates were obtained from the soil around the trunk base (the soil contained oak roots). Soil was flooded with water and baited with young oak leaves and apples. Necrotic, discoloured parts of baits were transferred to selective PARPNH medium (Jung et al. 2000). Isolates of *P. cambivora* formed fast growing, uniform, fluffy and sterile colonies on V8-juice-agar, potato dextrose agar (PDA) and malt extract agar (MEA) media. On V8-juice-agar flooded with non-sterile soil extract, nonpapillate, ovoid and internally proliferating sporangia were observed. Dimensions of sporangia were 37.5–60.0 × 25.0–37.5 μm (average diameter of 45.5 × 30.2 μm), with a length/breadth ratio of 1.3–1.8 (average 1.52). PCR amplicons of four strains generated with primers ITS 5 and ITS 4 were sequenced (Acc. No. FM199982-FM199985) and found identical to those of *P. cambivora* from the GenBank database (Acc. No. EF486693, EF032478, DQ512959, AY787029, AJ344548).

Pathogenicity tests were performed on one-year-old potted *Q. robur* seedlings, using two isolates. The seedling stems (seven per each of the two isolates) were wound-inoculated with mycelial plugs, 2 cm above the collar, and sealed with Parafilm. Five-mm-diameter mycelial plugs derived from the margin of se-

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ven-day-old cultures growing on V8-juice-agar. Within three weeks, 12 inoculated seedlings (85.7%) developed necrosis with a mean lesion length of 14.8 mm (4–52 mm) on the stems. *Phytophthora cambivora* was reisolated from symptomatic tissue. No symptoms were observed on any of the seven control plants treated with sterile V8-juice-agar.

This is the first finding of *P. cambivora* in oak ecosystems in Poland. The species was also reported from the same host in France (Camy et al. 2003), Germany (Jung et al. 2000), Italy (Vettraino et al. 2002) and Sweden (Jönsson et al. 2003).

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