

## **Comparative host range and aggressiveness of *Phytophthora ramorum* and *Phytophthora taxon C* on North American and European trees**

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*Phytophthora ramorum* and *Phytophthora taxon C* are recently introduced, invasive pathogens in woodlands in southern Britain. *P. taxon C* is a newly discovered taxon, shortly to be named *P. kernovii* sp. nov. Both species aggressively infect foliage and shoots of understory rhododendron, especially *R. ponticum*. From there they can spread aerially to attack the inner bark of tree stems, especially European beech (*Fagus sylvatica*) and some *Quercus* species (Brasier et al., Mycological Research 108, 1108-9, 2004). To date *P. taxon C* has been found on ca 30 mature *F. sylvatica* trees, two *Q. robur* (English oak) and a *Liriodendron* at three woodland sites. The comparative aggressiveness of *P. ramorum* and *P. taxon C* to bark and foliage of North American and European tree species is being investigated as part of a risk assessment.

The potential host range of *P. ramorum* on bark of UK native and plantation trees has been assessed previously (e.g. Brasier et al 2002: Monterey Symposium abstract): ca 30 hosts were assigned to 'more susceptible', 'less susceptible' and 'resistant' categories. The present comparisons of *P. taxon C* and *P. ramorum* are scheduled for both 2004 and 2005. They involve wound inoculation of fresh cut 1.1 m x 20-30 cm stems at 20°C, and assessment of lesion areas in the inner bark. Ca 28 hosts were inoculated in 2004 with three isolates of each *Phytophthora* species at 20°C. *F. sylvatica* was used as a control host. To date, *F. sylvatica* and European chestnut (*Castanea sativa*) have proved 'more susceptible' hosts to both *P. taxon C* and to *P. ramorum*. Over a series of tests, *P. taxon C* was on average slightly more aggressive than *P. ramorum* on *F. sylvatica*. *P. ramorum* was more aggressive than *P. taxon C* on most other affected hosts, including *Q. robur*. However, there was also evidence of seasonal or genetic influences on susceptibility. Some species were resistant to both pathogens. The North American *Q. palustris*, *Abies grandis* and *Tsuga heterophylla* and the European *Taxus baccata* and *Acer pseudoplatanus* fell into the 'more susceptible' category for the first time with respect to *P. ramorum*. These species were either not included in previous UK tests with *P. ramorum*, or were previously assigned to the 'less susceptible' category. The tests will be repeated.

Comparative foliage susceptibility tests involve dipping unwounded leaves of ca 30 hosts in zoospore suspensions with three isolates of *P. taxon C* and three of *P. ramorum* at 20°C. In tests to date, *P. taxon C* was more aggressive than *P. ramorum* on foliage of *Liriodendron tulipifera* (*Magnoliaceae*) and *Gevuina avellana* (*Proteaceae*). *P. taxon C* and *P. ramorum* were equally aggressive on Magnolia. *P. taxon C* has been less aggressive than *P. ramorum* on all other susceptible hosts.

To date, field data on host susceptibility are fairly consistent with the lab data. However there are anomalies e.g. only *P. taxon C* has so far been found on *Q. robur* in the field. The anomalies may be explained by local ecological, epidemiological and genetical factors - such as inoculum pressure and variation in resistance of individual trees- resulting in critical threshold effects. These aspects need investigation.