

Variation in Phenotype for Resistance to *Phytophthora ramorum* in a Range of Species and Cultivars of the Genus *Viburnum*¹

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Introduction

Phytophthora ramorum is a recently introduced plant pathogen causing a range of diseases including sudden oak death, Ramorum shoot dieback and Ramorum blight (Rizzo and others 2002, 2004; Werres and others 2001). *P. ramorum* also attacks several nursery crops including viburnum and rhododendron (Werres and others 2001). Since its discovery *P. ramorum* has been shown to have a remarkably wide host range including many nursery crops (Parke and others 2002; Linderman and others 2002). It is well established that the ornamental plant *Viburnum plicatum* var. *tomentosum* cv. *Mariesii* and other *Viburnum* species or cultivars are highly susceptible to *P. ramorum*. What is not known is whether all cultivars in the genus *Viburnum* are equally susceptible, whether they are field- or container-grown. The objective of our research was to evaluate nine species of field-grown *Viburnum* for resistance to *P. ramorum*.

Materials and Methods

We evaluated nine species of field-grown *Viburnum* including *V. burkwoodii*, *V. dentatum*, *V. lantana*, *V. opulus*, *V. plicatum*, *V. lentago*, *V. nudum*, *V. sargentii*, and *V. trilobum* for a total of 23 cultivars for resistance to *P. ramorum* in detached leaf tests. Foliage of *Viburnum* was obtained from the Carlton Plants Nursery on September 20, 2004. Detached leaves were wound-inoculated with 6-mm agar plugs of 1-week-old colonies of *P. ramorum* using strain 4123 (isolated from *Rhododendron macrophyllum*, the predominant U.S. genotype of mating type A2) and strain 03-74-D12-A (isolated from *V. plicatum* var. *tomentosum* *Mariesii* the European genotype of mating type A1) grown on dilute V-8 agar. Four mycelial agar plugs were used to inoculate each of three leaves in each cultivar. Another leaf was inoculated as a control with four plain agar plugs. Leaves were incubated in moist chambers at 20 °C for 8 days before measurements were taken. Lesion area was determined as the percentage of the total leaf area using the Assess program (APS, St. Paul, MN).

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Results and Discussion

We obtained significant differences for levels of resistance based on percentages of leaf areas affected ($P < 0.001$) and no significant differences for isolates and interactions between isolates and cultivars. The percentages of lesion areas affected ranged from 95 percent (cvs. *V. burkwoodii* cv. unknown, *V. plicatum* var. *tomentosum* cv. *Mariesii*, and *V. trilobum* cvs. *Alfredo* and *Bailey*), to intermediate responses between 25 to 90 percent (cvs. *V. burkwoodii* cv. *Mohawk*, *V. lantana* cv. *Mohican*, *V. opulus* cvs. *Compacta* and *Hanum*, *V. lentago* cv. unknown, *V. sargentii* cv. *Onandaga*, *V. trilobum* cv. *Redwing*), to less than 15 percent infection (*V. dentatum* cvs. *Autumn Jazz*, *Blue Muffin*, *Chicago Lustre*, and *Burgundy*; *V. opulus* cv. *Sterile*, *V. plicatum* cv. *Newport*, *Popcorn*, *Shasta*, and *Shoshon*; *V. nudum* cv. *Winterthur*, *V. trilobum* cv. *Wentworth*). Our data indicate that there is a considerable range of resistance among phenotypes in the genus *Viburnum* from high susceptibility to resistance.

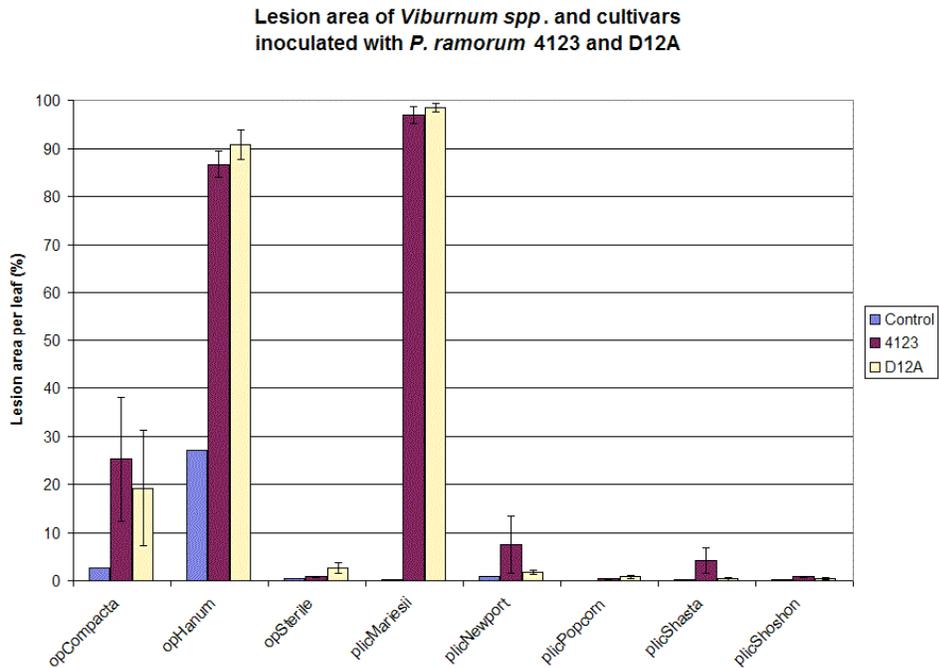


Figure 1 — Disease severity for 8 of the 23 cultivars of *Viburnum* tested for resistance to *Phytophthora ramorum* in detached leaf test assays.

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References

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