

***P. ramorum* detected on *Cotoneaster pannosus* in Marin County:
First detection in the U.S.**

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During a 2022 survey of native and invasive plants in Marin County, necrotic leaf spots were detected on *Cotoneaster pannosus* (silverleaf cotoneaster). The dark brown spots were observed near the tips or margin of the leaves, covering less than half of the leaf surface; no twig dieback or cankers were detected (Fig. 1). Isolations yielded two *P. ramorum* isolates from different leaf samples from the same tree (Fig. 2) and were confirmed by sequence analysis of the ITS-region. The *Cotoneaster* sampled in 2022 was again symptomatic in spring 2023. Official regulatory samples were taken by the California Department of Food and Agriculture (CDFA) and submitted to USDA APHIS for confirmation. Other symptomatic *Cotoneaster* plants were also observed in 2023.

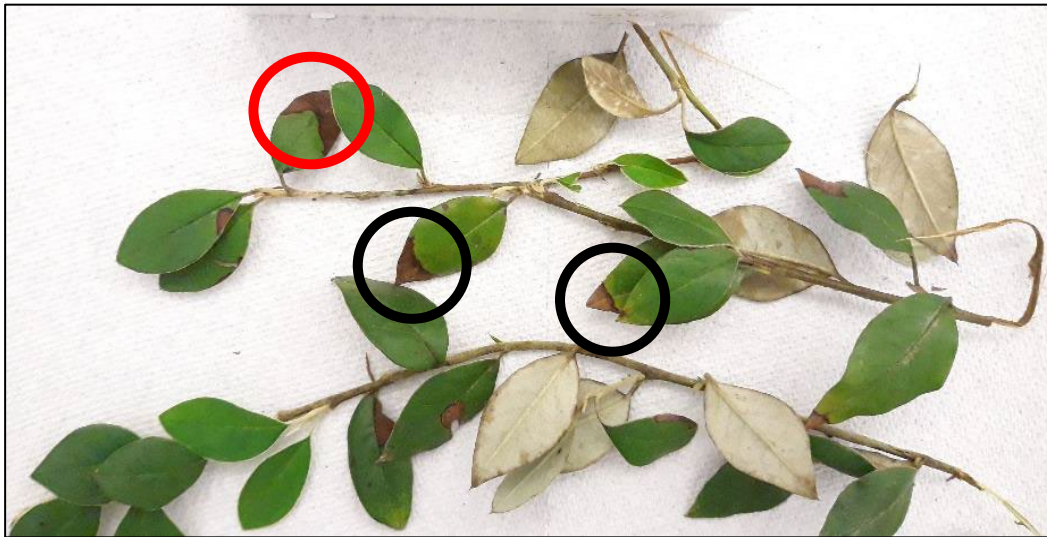


Figure 1. Symptomatic leaves of *C. pannosus* sampled in Marin Co. Photo: NORS-DUC.

Koch's postulates were completed by inoculating detached leaves of *C. pannosus* and *C. lacteus* (milkflower cotoneaster). Both *Cotoneaster* species developed symptoms after one week (Fig. 3). After prolonged incubation, symptomatic leaf spots were larger on *C. lacteus* than on *C. pannosus*. *P. ramorum* was re-isolated from the symptomatic leaf tissue from both *Cotoneaster* species and sporulation was observed on *C. lacteus* leaves.

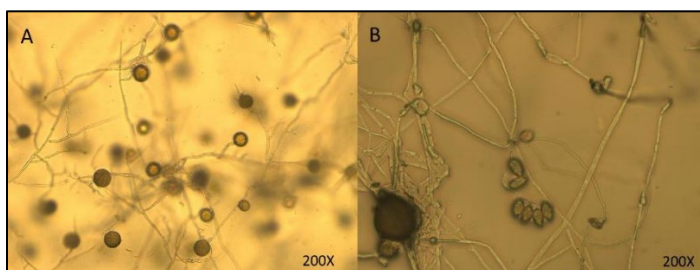


Figure 2. *P. ramorum* isolated from *C. pannosus* (A: chlamydospores; B: sporangia).

Pathogenicity tests were also performed on whole plants of *C. dammeri* (bearberry cotoneaster), a common evergreen groundcover. Symptoms developed after seven to ten days depending on the inoculation method used (Fig. 4). *P. ramorum* was re-isolated from symptomatic leaves. Plants treated with a soil drench did not develop symptoms on the aerial parts, and sampled roots also did not show symptoms. Immunological tests of the roots using AGDIA-immunostrips for *Phytophthora* were all negative.

Figure 3. Symptoms of *P. ramorum* after inoculation with mycelial plugs, on detached leaves of *C. lacteus* (larger leaves) and *C. pannosus* (smaller leaves). Photo: NORS-DUC.

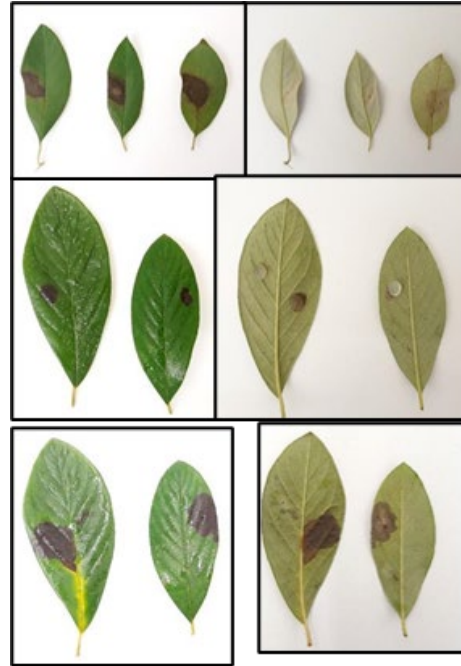


Figure 4: Symptoms developing on whole plant inoculations of *C. dammeri*. Left. Plants that were sprayed with a zoospore solution. Right. Leaves that were dipped in a small tube containing zoospores. (The photo was taken after removal of the tube). Photos: NORS-DUC.

This is the first report of *P. ramorum* occurring on *Cotoneaster* in the U.S. and is being submitted for publication. Previously, *P. ramorum* inoculation studies of detached leaves of *C. dammeri* and *C.*

horizontalis were conducted in Serbia resulting in symptom expression (Bulajić et al. 2010). *P. ramorum* was also reported from *Cotoneaster sp.*, large leaf variety, in the UK in 2010, and Koch's postulates completed (FERA 2015).

The California Invasive Plant Council lists *C. pannosus* and other *Cotoneaster* species as moderately invasive.

[Hidden Link <https://www.cal-ipc.org/plants/profile/cotoneaster-pannosus-profile/>].

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Literature cited

Bulajić, A.; Djekić, I.; Jović, J.; Krnjajić, S.; Vučurović, A. and Krstić, B. 2010. *Phytophthora ramorum* occurrence in ornamentals in Serbia. *Plant Disease*. 94(6): 703-708.

UK Food and Environment Research Agency (FERA). 2015. FERA list of natural hosts of *Phytophthora ramorum* with symptom and location. Online:

<https://planthealthportal.defra.gov.uk/assets/uploads/P-ramorum-host-list-finalupdate-NOV-20-15.pdf>