

Elucidation of Resistant Response to *Phytophthora* Root Rot in a Susceptible Avocado Rootstock

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Abstract. Inoculation of susceptible Topa Topa rootstock with low-virulence isolates (LVI) of *Phytophthora cinnamomi* results in production of confined necrotic lesions, 1 to 2 cm long, as opposed to complete feeder root necrosis in roots inoculated with high-virulence isolates (HVI). With LVI, in a pathogen-free area one cm distal from the lesion, the root is resistant to challenge inoculation with both LVI and HVI. Resistance can be elicited by agents which are biotic (*Phytophthora* spp.) or abiotic (HgCl_2 , foestyl-Al, or heat treatment). Conversely, resistance can be suppressed by pretreatment with cyclohexamide (a protein synthesis inhibitor), aminooxy acetic acid (an anti-metabolite of phenylalanine ammonia lyase), abscisic acid, or flooding. Resistance is not correlated with the presence of suberin or extensin (a hydroxy-proline-rich cell wall protein associated with resistance in many plant species). It is positively correlated with a lignin-like material identified by the lignin thioglycolic acid (LTGA) method and negatively correlated with phenols. The inability of HVI to colonize into older portions of roots in the susceptible rootstocks is also correlated with lignin accumulation. Following inoculations with LVI, HVI and non-inoculated, incorporation of [^{35}S]-methionine into protein was examined by SDS-PAGE electrophoresis in pathogen-free area (above the lesions). Two bands, 43 and 60-Kd, appeared after 24 h only in the LVI-infected roots and after 48 h in HVI and control roots. Two additional bands, 20 and 56-Kd, unique to LVI-infected roots appeared 48 h after inoculation. The response of susceptible rootstocks to LVI is similar to the response of moderately-resistant rootstock to HVI.