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Phytophthora root and crown rot caused by *Phytophthora* spp. is one of the major limiting factors in pistschio inflicting economic losses in Iran. Arbuscular Vesicular Mycorrhizal (VAM) fungi are the most common type of plant symbiosis in natural and agricultural ecosystems. The objective of the present experiment was to study the effect of *Glomus mosseae* colonization on growth, plant nutrition and root rot caused by *P. drechsleri* in susceptible (Sarakhs) and tolerant (Qazvini and Atlantica) pistachio rootstocks under greenhouse conditions. *G. mosseae* was inoculated to pistachio rootstocks prior to pathogen inoculation. In the absence of *P. drechsleri*, mycorrhized pistachio seedlings had higher shoot and root dry weight, height and concentration of P, K, Ca, Mg, Fe, Cu, Zn and Mn than non-mycorrhized plants. Inoculation of *P. drechsleri* in non-mycorrhized susceptible seedlings caused in significant reduction of the above mentioned parameters compared to none inoculated control, but low or no reduction was observed in tolerant rootstocks. Non-mycorrhized susceptible cultivar died 40 days after inoculation but the mycorrhized one delayed and decreased their mortality. It is concluded that mycorrhizal colonization in pistachio seedlings increased growth, nutrition and decreased mortality by *P. drechsleri* than non-mycorrhizal one especially in susceptible rootstocks.