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Effects of *Phelipanche ramosa* Seed Bank on Parasitism and Growth of Tomato

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Abstract

Branched broomrape (*Phelipanche ramosa* (L.) Pomel), an achlorophyllous root parasitic weed on several dicotyledonous crops, is a major constraint to tomato production across the world. The size of the parasite seed bank is a determinant factor with respect to crop yield losses and efficacy of control measures. A pot experiment was undertaken in a glasshouse at the University of Kassel Germany to investigate the effects of *P. ramosa* seed bank on tomato growth parameters. Different *Phelipanche* seed banks were established by mixing the parasite seeds (0–32 mg) with the potting medium in each pot. Tomato (var Strain B) seedlings were planted (3/pot) and thinned 15 days later to one per pot. Treatments were arranged in a completely randomised design (CRD) with four replicates. The results revealed that *P. ramosa* reduced all tomato growth parameters measured and that the reduction progressively increased with increasing amounts of *P. ramonsa* per pot. Significant differences between treatments in tomato growth parameters including number of leaflets, plant height, root weight, root/ stem ratio, total root length and total dry matter were displayed. Total dry matter accumulation and the specific root length per tomato plant were the most and least affected parameters, respectively. *P. ramosa* emergence, dry and fresh weight, number of branches, number of tubers and tubers fresh and dry weights also increased with increasing amounts of *P. ramonsa* per pot. It is evident that tomato damage by *P. ramosa* is influenced by the parasite seed bank and that dry matter accumulation in tomato is the most affected parameter. It is also evident that the size of the parasite seed bank should be taken into account in experimental evaluations and intervention measures.

Keywords: *Phelipanche ramosa*, seed bank, tomato plants

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