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# 229. Integrated strategies for the control of Nacobbus aberrans s.l. in tomato

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**ABSTRACT:**

Microorganisms in the tomato rhizosphere ecosystem develop associations, many of which can be beneficial or pathogenic for this crop. The plant parasitic nematode (PPN) *Nacobbus* sp. cause significant economic losses to horticultural farmers in Argentina. The distribution of this genus is limited to the American continent and is consider a quarantine pest. Biological control strategies of PPN are environmentally friendly alternatives that ensure the sustainability of the horticultural system. The aim of this study was to evaluate the potential of the combined application of broccoli aqueous extract (BAE) and *Purpureocillium lilacinum* SR14 fungus in tomato plants (*Solanum lycopersicum* var. Platense) for the management of *N. aberrans* s.l. Three-week-old seedlings were transplanted into pots containing the following treatments: T1: control (sterile horticultural soil), T2: naturally infested horticultural soil (NIHS), T3: NIHS + SR14(1x106 spores/g), T4: NIHS + BAE(12%), T5: SHNI + SR14(1x106 spores/g) + BAE(12%). Six replicates per treatment were carried out and plants were maintained in a greenhouse. Data, collected at 120 days post-transplant, revealed that tomato growth was affected in NIHS(T2). Plants showed a 47% and 30% reduction in weight and length, respectively, compared to uninfected soil (T1). The highest number (4 tomatoes/plant) and weight mean (80 g) of fruits were recorded in T4. The fungus alone or combined with BAE (T3, T4 and T5) effectively controlled N. aberrans s.l. population (reduction percentages: galls = 35, 90 and 93%, egg masses = 5, 94 and 90% and reproduction factor = 90, 93 and 98%). Physicochemical and biological analyzes were also performed to evaluate the effect of the treatment on the soil ecosystem. The data showed an increase in organic matter for all treatments compared to the initial condition. Nutrient values such as P, N and S were maintained throughout the trial. Regarding the soil mycobiota, the fungal count (cfu/g) was around 106 for all treatments, but a lower diversity was observed in T5 with a prevalence of *P. lilacinum* (3x104). As regards the nematofauna, treatments did not significantly influence the number of individuals (n°/g of soil) belonging to the different trophic groups (phytopathogens: 16, bacteriophages: 19, predators: 10 and fungivores: 15), with the exception of T4, where a higher count of omnivores was observed (30). Finally, studies on microbial activity revealed that treatments did not influence the counts (MPN/g) of ammonifying (mean: 1.9x102) and denitrifying agents (mean: 2.7x1013), while T4 and T5 reduced the density of 1 log unit of nitrate - reducing bacteria (mean: 3.4x106) and aerobic-heterotrophic bacteria (mean: 3.9x108). In

conclusion, the integrated strategy reveal a synergistic effect for the control of *N. aberrans* s.l., without affecting tomato plant development, nutrient content and soil microbiome.