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MORTALITY OF FIVE POPULATIONS OF THE BURROWING NEMATODE, *RADOPHOLUS SIMILIS* IN AQUEOUS AND SOIL MEDIA UNDER DIFFERENT TEMPERATURES *IN VITRO*

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The Burrowing Nematode, *Radopholus similis* is the second important root damaging nematode pest of tea in the mid- and low elevations in Sri Lanka. The nematode incidence is governed predominantly by soil temperature and rainfall. The survival and population dynamics of *R. similis* are favored by soil temperatures between 24° and 30°C while high soil moisture contents hinder population growth.

In recent years, *R. similis* has been diminishing in its original locations while establishing in new areas despite integrated nematode management methods. This has been attributed to possible climate change experienced in the different tea growing areas. In this study, adult and live *R. similis* collected from Nawalapitiya, Deniyaya, Kanneliya, Morawaka and Hapugastenna were exposed to 24°C, 28°C and 30°C temperatures. Mortality of mature nematodes in aqueous and soil media under controlled conditions was studied *in vitro*.

Amongst the nematode sources, the Nawalapitiya population was highly sensitive to temperature which showed 66.6% and 84.6% mortality at 30°C in aqueous ($p=0.0054$) and soil media ($p=0.0031$) respectively. In contrast, the Kanneliya population showed the lowest mortality percentages at temperatures 28° and 30°C although they were not significantly different from that at 24°C in the two media ($p=0.2967$ in aqueous medium and $p=0.234$ in soil medium). A significant variation of mortality percentages at 30°C was demonstrated by Deniyaya, Hapugastenna and Morawaka populations, compared to the mortality percentage at 24°C in the soil medium. In contrast, nematode mortality in the aqueous medium did not vary significantly with soil temperature.

Despite mortality differences observed in the different *R. similis* populations, higher survival at increased temperature was probably due to better adaptation to changes in soil temperature. Field samplings of the present study showed the emergence and disappearance of nematode levels in under changing climate. These results highlight the need to develop adequate mitigation specific nematode management strategies. Furthermore, these results highlight the potential of harnessing nematodes as an indicator species in investigating the impacts of climate change in agriculture.