Statistical Validation of Cultivar Screening Parameters against Tea Nematodes: A Preliminary Comparison

Biyanvila HUMRW[1], Mohotti K[2], Wasantha Kumara KL[1], Nugaliyadde L[1], and Mannakkara A[1]

[1]*Department of Agricultural Biology, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya*
[2] *Tea Reasearc Institute, Thalawakele*

Abstract

Current study was carried out to compare and validate the cultivar screening parameters against tea nematodes. Different tea cultivars exposed to *Pratylenchus loosi* under standard controlled conditions at "Nematology experimental areas" in Talawakelle and Passara were used in the statistical validation. Growth parameters and nematode infestation levels in the different cultivars tested were monitored under nematode infestation and healthy conditions with known resistant, moderately resistant and susceptible cultivars. As a case study, biochemical parameters *i.e.* levels of polyphenols and amino acids were also compared with the nematode infestation. Results indicated that there were significant differences between infestation level, cultivar and their interaction in relation to different growth parameters. However, there were very high CV values observed in most of the growth parameters tested. In Thalawakelle, only inter nodal length (IL) and weight of root fragments (RF) significantly differed ($P<0.05$) between infestation levels and among cultivars recording low CV values whereas in Passara, IL and girth of the plant recorded significant differences having low CV (< 20%) values. The correlation between growth parameters and nematode infestation was not significant ($P>0.05$) in both locations. Since cluster analysis didn't show any clear clusters, principle component analysis was performed for various parameters. Considering results of principle component analysis, analysis of variance and CV values, only inter nodal length can be considered as the best parameter for cultivar screening in both locations. Biochemical investigation revealed that, root polyphenol content and amino acid content had significant effect with nematode infestation and different cultivars tested and therefore, can be potential factors in determining resistance/susceptible levels of plants when screening against tea nematodes.

Keywords: Amino acids, cultivar screening, growth parameters, polyphenols, *Pratylenchus loosi*