

Abstract

Soil health assessment has been based on narrow disciplinary approaches that overlook the multiple and interacting biological processes that are the basis of sustainable crop productivity. This study was carried out to determine the influence of seasonal variations in nematode assemblages in different soil groups, sites and disturbance levels as an indicator of soil health. Sampling was done in areas characterized by small scale subsistence agriculture in Kenyan northern and southern sites over three distinct seasons. The sampling points included disturbed (tilled) and the adjoining undisturbed (untilled) soils within three soil groups, namely vertisols, cambisols and arenosols.

Nematodes were extracted using the centrifugal-floatation technique, enumerated and assigned 6th International Congress of Nematology to their respective trophic groups. Total nematode abundance in the three seasons varied significantly with a mean of 68.4, 93.1 and 51.6 nematodes in 200 cm³ of soil in season 1, season 2 and season 3, respectively. Nematode abundance in the undisturbed soils was higher (97.74) compared to the disturbed soils (62.08 nematodes per 200 cm³). Mean abundance of nematodes was highest in Cambisols. In addition, nematode abundances, in all trophic levels across the three seasons, were significantly higher in the northern compared to the southern sites. Bacterivores (28%) had the highest incidence followed by herbivores (27%) and fungivores (21%) while omnivores (11%) had the least. The study demonstrated that nematode communities do vary in the different soil groups and between seasons, suggesting that they can be utilized as viable bio-indicators of soil health.