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# Nematodes as *Ghosts of Land Use Past*: Elucidating the Roles of Soil Nematode Community Studies as Indicators of Soil Health and Land Management Practices

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## Nematodes as Ghosts of Land Use Past: Elucidating the Roles of Soil Nematode Community Studies as Indicators of Soil Health and Land Management Practices

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### Abstract

Soil health is a matter of growing concern because of its degradation due to unsustainable anthropogenic activities over the last few decades. It is maintained by interactions among the components of the soil food web commonly concentrated in the vicinity of the plant roots, called the rhizosphere. The soil food web is dominated by nematodes. They occupy various trophic positions because of their diverse feeding habits. The free-living forms are mainly dependent on soil bacteria and fungi for their nutrition, while the parasitic forms feed on plant roots. The population of these two groups is regulated by the activities of predatory nematodes which can be carnivorous or omnivorous. The soil nematodes thereby partake responsibilities in nutrient cycling, mineralization and decomposition pathways which, in turn, affects the aboveground productivity. This intricately connected food web structure is vulnerable to disturbances like increased soil salinity, acidity, nitrogen enrichment, tillage, crop rotations, fertilizers, pesticides, soil amendment techniques and heavy metal pollution. The effects are reflected by alterations in the abundance and diversity of soil nematodes belonging to various trophic groups. These alterations have been formulated into measurable indices like maturity index (MI), structure index (SI), enrichment index (EI) and channel index (CI). The faunal profile and metabolic footprints of soil nematodes are latest developments in the field of nematode community analyses. Though these indices cannot replace the conventional soil ecotoxicological assays, they can give added information about soil biology which can be utilized to design sustainable land use practices.

**Keywords** Soil health · Nematodes · Soil food web · Rhizosphere · Nematode community indices · Sustainable land use

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