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Title	Warming Induced Effect On Soil Nematode Community Structure Using Open Top Chamber In Alpine Meadows Of Indian Himalayan Region - Climate Change Scenario.
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Abstract

Earth's climate has been changing and evolving, which can be seen by comparing the status of the Indian Himalayan Region (IHR). Changes in Snow water equivalent, snowmelt, and glacier melt runoff have altered the soil structure and fauna, especially soil nematodes at various trophic levels. Soil nematode community structure influences the soil ecosystem functioning as they play an important role in some crucial soil ecological processes and are considered a potential instrument for assessing soil conditions and biomonitoring system. Keeping this in consideration, an experimental study using an Open top chamber (OTC) was conducted in high altitude region of Gangotri valley in Western Indian Himalaya to understand the effect of altered temperature on abundance, diversity, and metabolic footprint of soil inhabiting nematodes.

To assess the effect of temperature on soil nematodes of the study area, soil cores were collected from experimental (OTC) and control plots with its replicates. Nematodes were extracted, identified up to the genus level, allotted to trophic groups and ecological indices were calculated. Data loggers were installed in the OTC and the adjacent control plots at the height of 14-15 cm above and 5 cm below the surface for recording air and soil temperature every hour.

Soil and the air temperature was ~1 °C higher inside OTC compared to the control plot for almost throughout the year except for August- September, and the temperature difference was nearly 1.9 °C higher inside OTC in the second year. Forty two genera belong to 20 families, and eight orders were recorded for the study region. Nematode community structure analysis showed that bacterial feeder abundance is higher in OTC. Acrobeloides and Rhabdolaimus are the only bacterial feeder whose density significantly increased by the elevated condition of OTC. Predatory nematode abundance was slightly lower in OTC compared to the control plot. Maturity Index (an indicator of disturbance) was lower in OTC and significantly differed. Dissimilarity tests showed that nematode communities in OTC were significantly different from the control plots. The soil moisture was different among the treatment and control plots, suggesting that warming indirectly affects nematode diversity by affecting soil moisture in the treatment plot. As a result, it can be hypothesized that warming-induced soil moisture could be the primary reason for differences in nematode responses between OTC and Control. The experimental baseline information regarding nematode community structure and nematode-specific indices can be used as soil health indicators and long-term climate change impact assessment studies.