

SPATIAL EFFECTS OF ROADS ON SOIL NEMATODE COMMUNITIES IN FORESTED AREAS OF VERMONT

ABSTRACT

Roadways have a potential number of ecological effects on adjacent soil communities via physical and chemical alteration of the roadside. The objective of this study was to determine the spatial extent of the effect of the road and these transported materials on forest soil nematode communities immediately surrounding roadways based on road type (highway, 2-lane paved, and gravel rural). This research is located within two watersheds in the state of Vermont, where deicing salts are spread regularly on roads during winter months. Transects were constructed at right angles to the road, with samples along each transect based upon micro-topography. Soil quality was also determined by chemical and physical analysis.

The proportion of nematode trophic groups proved to be a more useful indicator of micro-topography effects than did the maturity index or genera diversity, though there were statistical differences ($p \leq 0.05$) in most measures based upon road type. Transect topography also affected the results. The ditch is a specific feature with a different nematode community including the prevalence of algal feeders, probably due to the water, pollutants and nutrient regime. It was difficult to separate out the effects of pollutants from the effects of alteration in vegetation. In many cases the forest nematode community was different from that of the grassy roadside. However, results suggest that pollutants are being filtered by the forest edge. There was a higher proportion of fungal feeders in the forest, and higher proportion of plant feeders in the roadside. Canonical Correspondence Analysis revealed that not only did nematode trophic structure change with distance from the road, but also the composition of families and genera. Results suggest that larger grassy areas associated with high traffic, high speed roads may be vectors of plant parasites.