

Nematodes as Ecological Indicators during Phytoremediation of a Crude Oil-Contaminated Soil. (6018)

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Abstract:

As soil ecosystems are remediated following crude oil-contamination, below-ground ecology is expected to increase in diversity and resume ecological functioning. Nematodes are ubiquitous, represent a range of trophic groups, vary in sensitivity to contaminants, and are relatively easy to identify. Thus, investigating nematode communities has been suggested for assessing ecosystem recovery. Nematodes were identified in three treatments of a weathered crude-oil phytoremediation experiment: non-fertilized vegetation-free control; fertilized fescue; or fertilized bermudagrass. Vegetation was successfully established at a field with an initial soil total petroleum hydrocarbon concentration (by GC/FID) of 9,175 mg/kg. Nematodes were enumerated at 30, 37, and 53 months after initiation of the study. Plant parasitic and total nematode abundances were much higher in both grass treatments than in the control. In contrast, bacterivores were relatively abundant in the control at 30 and 37 mo, but not 53 mo. A succession of taxa occurred within the plant parasitic group. Additionally, predators were first observed at 53 months, along with the loss of a fungivorous colonizer group. Although a higher maturity index was calculated for bermudagrass before fescue, diversity for bermudagrass remained low at 37 months. Data suggest that recovery of nematode communities, while enhanced by phytoremediation, occurs slowly.

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