Soil Food Web Assessment

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Client: Joshua Finch

Company: Novia

Sample name: Sample 1

Sample type: Soil

Sample received: 20.9.2022

Sample observed: 21.9.2022

Fungal-to-bacterial (F:B): **0,005**

Very low.

Organism group	Est. total / g	Std. Dev. (% of mean)	Notes
Beneficial organisms:			
Decomposers			
Fungi	39 µg	88 (224%)	Very low biomass with high uncertainty due to few observations. Increase recommended.
Bacteria	8129 µg	1444 (18%)	Very high biomass.
Actinobacteria	0.4 µg	0.9 (224%)	Low biomass. High uncertainty due to few observations.
Predators			
Protozoa			
Flagellates	0	0 (0%)	None observed. Increase recommended.
Amoebae	0	0 (0%)	None observed. Increase recommended.
Nematodes			
Bacterial-feeding	0		None observed. Increase recommended.
Fungal-feeding	200		One observed.
Predatory	0		None observed. Increase recommended.
Detrimental organisms:			
Oomycetes	62	139 (224%)	One observed, hence high uncertainty.
Anaerobic protozoa			
Ciliates	0	0 (0%)	None observed.
Nematodes			
Root-feeding	200		One observed. Increase in other nematode populations recommended.

Comments

The sample was very dense with both mineral particles and bacteria (photo 1), which is a sign of a lack of structure in the soil. This lack of structure and low organic matter mean there is a lack of habitat for a diverse food web to establish.

Bacterial biomass is very high at over 8000 µg / g. Conversely fungal biomass is very low with only one hypha observed (photo 3). At a minimum, fungal biomass should be significantly over 100 µg / g. The fungal-to-bacterial ratio (F:B) is 0,005, which is indicative of a compacted, structureless soil. Moreover, one long filament of oomycetes was observed (photo 2).

No protozoa were observed. This is one explanation for the high bacterial biomass: predators of bacteria are lacking from the soil. Two nematodes were observed: one a detrimental root-feeding nematode (photo 4), which will parasitize plant roots; the other a fungal-feeding nematode. The fungal feeder is an outlier, as it's food source, fungi, seems to be all but missing from the soil.

In order to achieve better nutrient cycling, more aggregation and predators (aerobic protozoa and nematodes) are required.

Photos

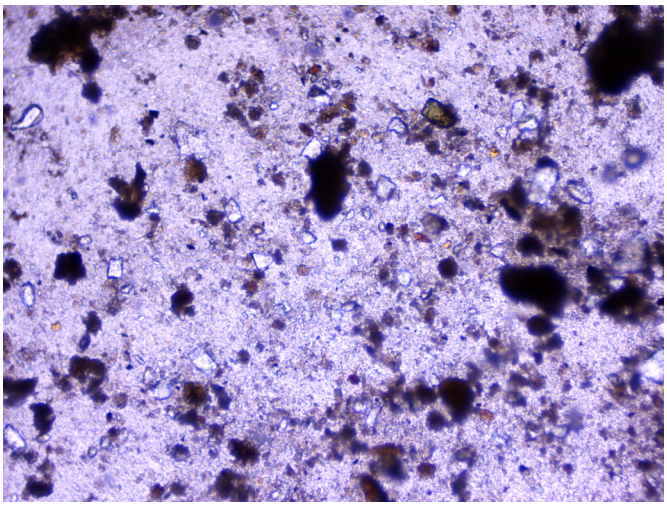

Photo 1: General view, 100x. Sample dense with small particles and bacteria. Some organic matter present.

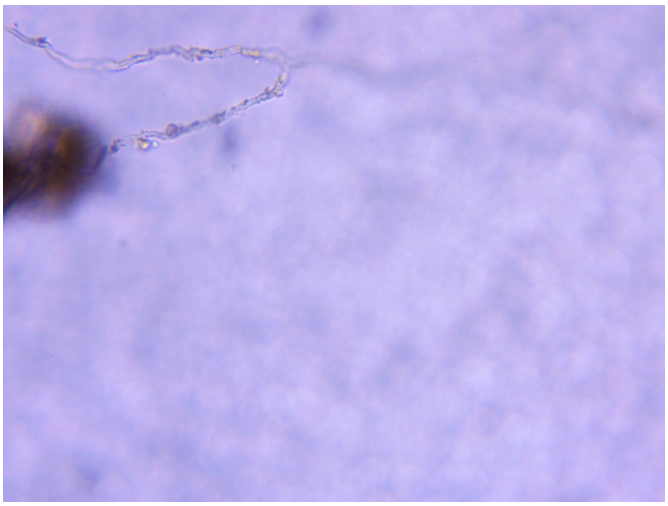

Photo 2: Oomycete, 400x. Oomycetes contain many disease causers, such as blights, root rots and mildews.

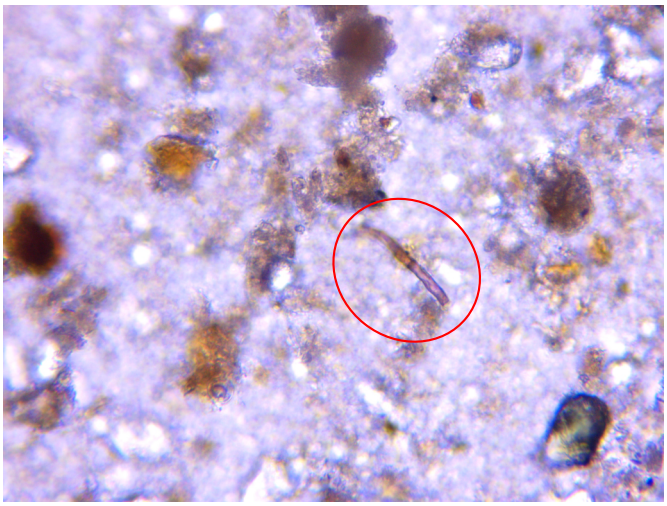

Photo 3: fungal hyphae, 400x

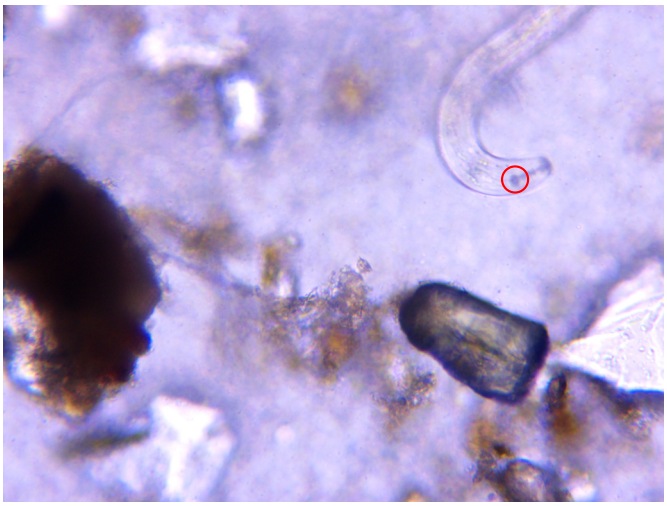

Photo 4: Root-feeding nematode, 400x. Knob below stilet identifies as root feeder. Will harm plant roots.