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Soil food web composition of 4 soil samples

Summary

All samples are compacted, and due to the high amount of clay, required a very high level of dilution to count bacteria. All samples are bacterial, with no fungi, protozoa or nematodes visible. One thing to note about the values of bacterial counts; they are high, but potentially higher than what is the actual amount, due to the clay content. Often clay particles are indistinguishable from the smallest bacteria. We solve this issue by doing time trials at different times of the year, and changes in numbers usually relate to changes in bacterial populations. Another point of note, is that the samples have been collected in January, and usually this is when most of the soil food web is inactive. On the flip side of that, I did not see any dormant forms of protozoa in the samples.

Method

From the sample, 10ml of soil was mixed with farm well water, and the ratio was included in calculating biomass of each group of microorganisms respectfully. Nematodes, protozoa, and fungi counts used dilution of 10 to 1 total volume. Bacterial counts used a dilution of 10000 to 1. One drop of the dilution was transferred onto a slide, and observed under a bright field microscope. General morphology is used as a differentiator of the elements of soil food web present.

Key to results

Green colour indicates a desirable element, or a positive result, or values above bare minimum required for nutrient cycling to occur.
Red colour indicates a non-desirable element, or a negative result, or values below bare minimum required for nutrient cycling to occur.
Orange colour indicates element that could be positive or detrimental depending on other conditions. In this case actinobacteria would be desirable for early successional plants, like brassicas.

All values are total visible, both active and dormant organisms.

Fungi to bacteria biomass ratio affects groups of plants that the soil/compost will best support.
F:B = 0.1 - weedy stage, or irrigated wheat (not much biomass, or highly bacterial due to use of chemicals). Example plant - crabgrass
F:B = 0.3 - early successional plants (early annuals, dryland wheat). Bromus, bermuda, brassicas, mustard and kale crops as examples.
F:B = 0.75 - 0.8 - mid successional grasses, vegetables, herbs and forbes
F:B = 1 - late successional grasses, productive row crops, pastures, turf, prairies (fescues, corn, wheat, lucerne)
F:B = 2 - 5 - fruit bushes
F:B = 5 - 100 - deciduous trees, orchards
F:B = 100 - 1000 - late successional, old growth, conifer systems

In every case both bacterial and fungal feeders need to be present in order for nutrient cycling to occur.

In general, aerobic conditions promote the development of beneficial elements of the soil food web, and anaerobic promote the development of the opportunistic, detrimental elements. On the flip side, beneficial bacteria and fungi through their activity build the porous structure of compost and soil, which in turn allows for water and oxygen to penetrate as deep as this structure exists.

Results

sample	bacteria microgram per ml	actinobacteria microgram per ml	fungi microgram per ml	oomycetes microgram per ml	flagellate per ml	amoeba e per ml	ciliates per ml	nematodes per ml
Sample 1	41380	0	0	0	0	0	0	0
Sample 2	17902	0	0	0	0	0	0	0
Sample 3	33749	0	0	0	0	0	0	0
Sample 4	36097	0	0	0	0	0	0	0

Notes

No images of interest from these samples

Kind regards
Daniel Tyrkiel - Lab Manager and Consultant.