Daniel Tyrkiel
T.I. Soil Ecology Laboratory
28 Meadow Ct
Anchor Meadow, Farnborough
GU14 0HX

Customer

Soil food web composition of a compost sample

Summary

In general the sample is bacterial. If standard deviation was ignored, however, the F:B ratio lands around 0.07. There were quite a few strands in the sample, however due to the uneven distribution, the resulting numbers are inconclusive. Numbers of bacteria are adequate - within the prescribed range. There is a substantial number of flagellates, and quite a few testate amoebae. Some yeast and some motile and spiral shaped bacteria indicate low oxygen conditions at some point in time. The absence of ciliates points to adequate moisture levels though.

Method

From the sample, 10ml of soil was mixed with dechlorinated tap water, and the ratio was included in calculating biomass of each group of microorganisms respectfully. Nematodes, protozoa, and fungi counts used dilution of 5 to 1 total volume. Bacterial counts used a dilution of 50 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

Bacteria: (Required minimum 135µg/g) 186 micrograms/ml of soil
large and small cocci, bacillus, coccobacillus, lactobacillus, some motile bacteria, spiral, and spiral motile visible occasionally

Actinobacteria: none observed (less than standard deviation)
Fungi: (Required minimum 135µg/g) none observed (less than standard deviation)
Oomycetes: none observed (less than standard deviation)
Fungi to bacteria biomass ratio: (Required minimum equal or greater than 0.3:1) strictly bacterial

Protozoa:
(Required minimum 1-5 per view @400x = 10-20/slide, or 10,000/g)
Amoebas: 0 - 2 per view
Flagellates: 0 - 2 per view
Ciliates: none observed

Nematodes: (Required minimum 1-5 per slide, or 100/g)

Bacterial feeder: 3 observed
Fungal feeder: none observed
Predatory: none observed
Root feeder: none observed

Kind regards
Daniel Tyrkiel - Lab Manager and Consultant.