

CARBON CHANNELS AND FOOD WEB STRUCTURE. Ferris, Howard.  
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The services performed by soil food webs are determined by the identity, abundance and interactions of the component organisms. Food webs are shaped by resource availability, predation and environmental conditions. Resources enter the web through detritivore and herbivore channels which merge through the activities of generalist predators and omnivores. Biomass of omnivores and predators often does not correlate directly with that of lower trophic levels due to differing temporal and spatial dynamics. However, the abundance and diversity of predator and omnivore nematodes, and the inferred abundance of other organisms of similar sensitivity, must provide some indication of soil suppressiveness. The functional redundancy of a diverse food web suggests resilience of function to temporal population cycling or conditions unfavorable for some species. Functional complementarity, an amplification of functional redundancy, recognizes a positive relationship between level of a service and diversity of niche and attributes among organisms of a functional group. One determinant of the biomass of predator and omnivore nematodes may be the nature of the prey. Differences in metabolic rates of organisms in the bacterial and fungal channels lead to the speculation that conservation of C, and transfer to higher trophic levels, may be greater through the fungal than the bacterial channel. However, higher metabolic rates may be offset by higher rates of organism turnover. Expressing the biomass of herbivores and that of fungivores and bacterivores as a percentage of biomass of all nematodes reveals whether resources for higher trophic levels are supplied through channels in which negative or positive ecosystem services are performed; it may suggest need for reduction of the herbivore channel and amplification of the detritivore channels or the alteration of environmental conditions.