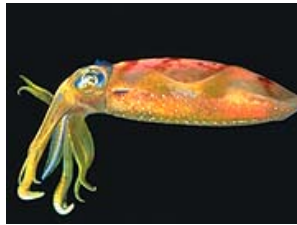
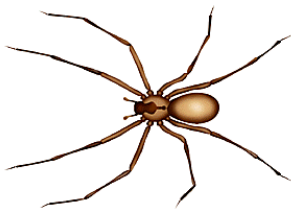


Chapter II. The Little Things

Invertebrates, Bacteria, Protozoans, and Fungi

This is the most important section in the wildlife chapter in understanding ecological systems. It is ironic that the organisms in this section form such an integral part of ecosystems but are often overlooked. **Invertebrates** are animals that lack a backbone. Invertebrates include insects, mollusks, spiders, scorpions, millipedes, worms, and myriad marine animals. There are more than one million described species of invertebrates in the world and this number may be less than 10% of those in existence. Bacteria are minute, unicellular plant organisms that are important agents of fermentation, putrefaction, and decay. Protozoans are single-cell organisms that get nutrition from other tiny animals, decaying plant material, and from inorganic nutrients.



All of the biomass in ecosystems ends up as detritus, or dead organic material. As was pointed out earlier, the majority of plant mass in terrestrial ecosystems is not consumed by grazers, but usually dies and falls to the ground. Sustained productivity of an ecosystem depends on recycling the nutrients from detritus. Bacteria, invertebrates, protozoans and fungi are the chief consumers of this dead material and thus are hugely important in recycling nutrients in a system. For example earthworms feed on dead leaves and soil that pass through their bodies where they digest some of its organic matter, leaving the rest for other detritivores. Termites consume dead wood. The little things progressively break dead material down until it reaches a condition where plants will use it again. Eventually this process releases inorganic nutrients and energy back into the environment to feed the entire cycle.

Invertebrates make up a large part of an ecosystem's biomass, hence are integral in food chains. As we have seen, many vertebrates feed on invertebrates including snakes, birds, frogs, bats, and many others. Many invertebrates also play invaluable roles as pollinators of plants. Invertebrates are predators as well; ants make up the greatest biomass of predators in many ecosystems. Because these ecosystem functions are so important and because invertebrate biomass is so great, they perform more ecosystem functions than vertebrates.

Protozoans are found wherever life exists and they make up a large part of the biomass of many ecosystems. They form a large part of floating plankton that help to feed large fish and mammals. Their skeletons have formed gigantic ocean and soil deposits. In some animals they play a role as parasites and in others they live in some mutually beneficial relationship.

Invertebrates are often overlooked because they are too little to see, not considered glamorous, and everyone assumes that they will always just be there. Application of

pesticides and fertilizers, soil disturbance, changing hydrology of areas, ultraviolet light and other human actions affect these things greatly. Please review the list of ecosystem functions at the beginning of the chapter and consider the many functions invertebrates help with, such as decomposition cycles and food chains. These “little things” are the major drivers of ecosystem functions.

