



# #3585

## THE BIOLOGY OF NEMATODES, ROTIFERS, BRYOZOANS, AND SOME MINOR PHyla

Grade Levels: 9-12

19 minutes

ENVIRONMENTAL MEDIA CORPORATION 1997

### DESCRIPTION

Grab a stocking net and go hunting for fascinating creatures in the nearest pond or moss bed. Microphotography and graphics closely reveal the physical characteristics of nematodes, rotifers, bryozoans, and other minor protist phyla. Discusses digestion, elimination, and reproduction. Highlights their similarities and differences. Notes the human-infecting nematodes: pinworms, hookworms, and trichina.

### ACADEMIC STANDARDS

#### Subject Area: Science

- ◆ Standard: Knows about the diversity and unity that characterize life
  - Benchmark: Knows different ways in which living things can be grouped (e.g., plants/animals; pets/nonpets; edible plants/nonedible plants) and purposes of different groupings
  - Benchmark: Knows that plants and animals progress through life cycles of birth, growth and development, reproduction, and death; the details of these life cycles are different for different organisms
- ◆ Standard: Understands basic Earth processes
  - Benchmark: Knows that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time
  - Benchmark: Knows the composition and properties of soils (e.g., components of soil such as weathered rock, living organisms, products of plants and animals; properties of soil such as color, texture, capacity to retain water, ability to support plant growth)



## SUMMARY

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### Nematodes:

Roundworms are seldom seen but easily found. Tree moss, leaf litter and compost piles swarm with nematodes. Examine these materials using a stereomicroscope or Discovery Scope to discover and study free-living nematodes.

Microscopic examination of a roundworm shows the structure of its digestive tract and reproductive organs. A cross section shows the epidermal layers and the musculature that produces the nematode wiggle.

Human-infesting nematodes such as pinworms, hookworms, and trichinid worms are familiar temperate-zone parasites. Many more types are found in the tropics. The screen views from the Internet shows a condition known as elephantiasis of the scrotum, caused by worms clogging lymph passages. The microscopic larvae causing elephantiasis are carried from human to human by a mosquito.



### Rotifers:

These tiny multicellular animals are often smaller than their unicellular neighbors. Many have “wheel organs” that provide locomotion and feeding currents, a well-developed food grinder (the mastax), and bundles of flame cells called “flame bulbs” that move water and waste products to the bladder for elimination. In some species, males are rare or unknown.

The diversity of rotifers is stunning, and this video shows many of the different types. Planktonic rotifers have special adaptations for open water life. Some, like *Asplanchna*, are transparent, minimizing their chances of being seen by small plankton-feeding fish; *Kellicottia* has long spines that help to stabilize the animal; *Hexarthra* flexes its muscular “arms” to shoot away from the slightest touch; and a beautiful colonial rotifer--*Conochilus*--spins through the water.

### Bryozoans:

The large colonial bryozoan found in reservoirs and lakes is *Pectinatella*. Retreating into their jelly mass, *Pectinatella* individuals are able to avoid most hazards. These fresh water bryozoans produce unique reproductive structures called staloblasts, equipped with grappling hooks that catch in vegetation. Staloblasts withstand drying and freezing, assuring new bryozoan colonies when water returns.

Marine bryozoans such as *Membranopora* form sheets of calcareous apartment houses on kelp fronds. *Bugula* develops a branching colony with two kinds of individuals—tentacled feeding individuals and avicularia (bird mouths) that snap on parasites and settlers.

## Minor phyla:

The thinner branches of animal evolution include some easy-to-find representatives. Gastrotrichs are common in pond water. Tardigrades (water bears) are found in habitats such as moss clumps, tree lichens, wet leaf piles and moist earth. Nemertea is common in intertidal rubble piles and mussel beds. A few species live in freshwater habitats and we were fortunate to find a freshwater nemertean living in a soggy patch of gravel, beneath a mat of algae, near the edge of a small pond. Gnathostomulids are flatworm-like animals found living deep in the sand of ocean beaches, part of a hidden biotic community called the meiofauna. Gnathostomulids were first discovered in the 1950s—a new phylum.

## RELATED RESOURCES



### Captioned Media Program

- Biology: Ecology of the Human Body #3343
- The Biology of Ciliates #3583
- The Biology of Flagellates and Amoebas #3584

### World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and “kid-safe” sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **BIOLOGY4KIDS**

<http://www.kapili.com/biology4kids/>

Check out the “Aquatic Biomes” and “Food Chain” sections. Then browse for additional information.

- **AQUATIC PLANTS**

<http://www.aquatic.uoguelph.ca/plants/index.htm>

Learn about the aquatic plants that inhabit the ecosystems under study.

- **WATERWORLD AT THE MICROBE ZOO**

<http://commtechlab.msu.edu/sites/dlc-me/zoo/zwmain.html>

A visit to the often unseen worlds of microlife.

- **NEMATODE SITES ON THE INTERNET**

<http://pppweb.clemson.edu/NematodeSites.html>

A long list of links recommended from Clemson University.

- **LIFE SCIENCE INTERNET RESOURCES**

[http://www.wcsu.ctstateu.edu/library/life\\_microbiology.html](http://www.wcsu.ctstateu.edu/library/life_microbiology.html)

A list of professional hotlinks to journals, societies, research findings, and more.

- **LIVING THINGS**

<http://www.fi.edu/tfi/units/life/life.html>

Hundreds of living things links (plants, bugs, animals, ecosystems, etc.) from the Franklin Institute of Science online. Buttons include: "Individuals," "Families," "Neighborhoods," and "Circle of Life."

- **MS. OLSEN'S HOME PAGE**

<http://clab.cecil.cc.md.us/faculty/biology1/bio.htm>

Choose from a variety of related biology and microlife topics.

- **PLANTAE: LIFE HISTORY AND ECOLOGY**

<http://www.ucmp.berkeley.edu/plants/plantaelh.html>

Plants in ecosystem, "dealing with life differently from animals." Comparative microlife and water life information.