

Nematodes



Biology

Microscopy / Cell Biology

Humans & Animals

Biology

Animal Physiology / Zoology

Invertebrates

Applied Science

Medicine

Histology & Medical Microbiology



Difficulty level

easy



Group size

1



Preparation time

10 minutes



Execution time

30 minutes

This content can also be found online at:

<http://localhost:1337/c/61275269870bca000351f76a>

PHYWE

Teacher information



Application

PHYWE



Nematode (400x), in neutral red

The nematodes (Nematoda) are among the most species-rich tribes of the animal kingdom. Soil-dwelling species play an important role in the material cycle, as they recycle organic material and are involved in humus formation. Of great importance as agricultural pests are the alewives, which attack the roots of crops, causing weakening or death of the host plants. Known human parasites include pinworm (*Oxyuris*), roundworm (*Ascaris lumbricoides*), *Trichinella spiralis* (trichinosis pathogen), medina worm (*Dracunculus medicinalis*) and elephantiasis pathogen (*Wuchereria bancrofti*). Infection usually occurs through worm eggs ingested with contaminated food.

Other teacher information (1/4)

PHYWE

Prior knowledge



Students should have a good background knowledge of nematodes and be familiar with their lifestyle and structure. They should also be familiar with the use of a microscope.

Scientific Principle



Students look at nematodes under a microscope and get an idea of how they look and move.

Other teacher information (2/4)

PHYWE

Learning objective



Students should be able to identify nematodes and name the body parts.

Tasks

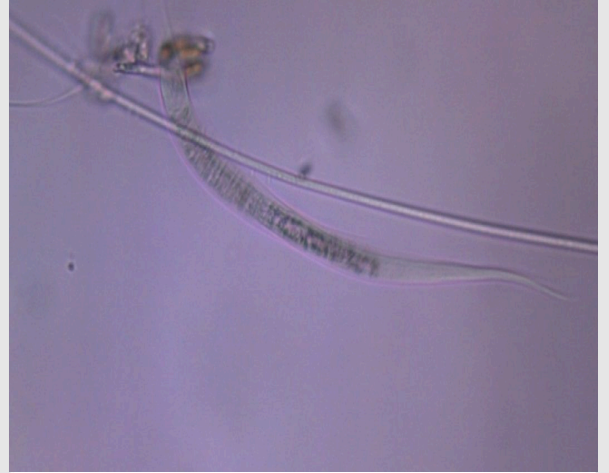


Students should observe the locomotion and structure of a nematode under a microscope and compare it to an earthworm if possible.

Other teacher information (3/4)

Notes on material procurement

Nematodes can be found in almost every soil sample. Reliable occurrences are moist locations: at the edge of a garden pond, a small water body, in a moss cushion or in an aquarium filter you will find these nematodes.



Nematode (400x)

Other teacher information (4/4)

Notes on implementation

Since nematodes feel very comfortable in water, soil samples can be brought into the preparation room many days or weeks before the planned examination. The container with the sample should preferably not be exposed to direct sunlight and should not dry out.

2. Nematodes are round in cross-section and have a filamentous, unlike the earthworm (*Lumbricus terrestris*) unsegmented body. The anterior end with the mouth is blunt and may be surrounded by appendages. The hind end is pointed. Nematodes have only longitudinal muscles, except at the body openings, and can therefore only move forward in a sinuous, whipping manner.

Safety instructions

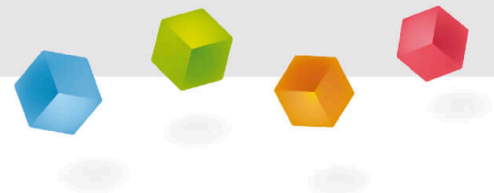
PHYWE



- Working with microscopes for too long can lead to physical discomfort (fatigue, headache, nausea), especially when students are untrained.
- Microscopes are sensitive. During transport and handling, care should be taken to ensure that everything is done carefully and without rushing.
- The general instructions for safe experimentation in science lessons to be applied to this experiment.

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Student Information



Motivation



Nematode (400x), in neutral red

The nematodes (Nematoda) are among the most species-rich tribes of the animal kingdom. Soil-dwelling species play an important role in the material cycle, as they recycle organic material and are involved in humus formation. Of great importance as agricultural pests are the alewives, which attack the roots of crops, causing weakening or death of the host plants. Known human parasites include pinworm (*Oxyuris*), roundworm (*Ascaris lumbricoides*), *Trichinella spiralis* (trichinosis pathogen), medina worm (*Dracunculus medicinalis*) and elephantiasis pathogen (*Wuchereria bancrofti*). Infection usually occurs through worm eggs ingested with contaminated food.

Tasks



Nematode (400x)

Nematodes are very simply constructed, whitish or colorless roundworms that are found almost everywhere in moist soil, water, and also as parasites of plants, animals, and humans. Explore the construction and movement of nematodes.

Equipment

Position	Material	Item No.	Quantity
1	PHYWE Binocular student microscope, 1000x, mechanical stage	MIC-129A	1
2	Microscopic slides, 50 pcs	64691-00	1
3	Cover glasses 18x18 mm, 50 pcs	64685-00	1
4	Magnifier, plastic, 5x, d=35mm	88002-01	1
5	Beaker, 250 ml, plastic (PP)	36013-01	1
6	Glass rod, boro 3.3, l=200mm, d=5mm	40485-03	1
7	Petri dishes, plastic, d=94mm, 20/pkg	64709-03	1
8	Dropping pipette with bulb, 10pcs	47131-01	1

Procedure

PHYWE

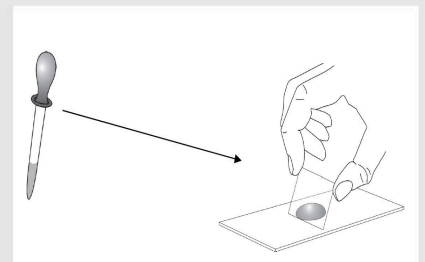
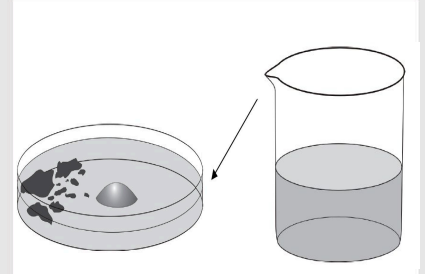
Nematode search

- In a soil sample from a mostly moist location, there are countless tiny worms that you will only discover under the microscope. Put the soil sample into a Petri dish, add some water and stir.

Observation of nematodes

- Take a water sample and microscope at lowest magnification!

Nematodes usually hide under solid substances. Soon you will see how they stir up the mud flakes with powerful movements. Describe these movements and the appearance of a nematode. If possible, compare it with the body structure of an earthworm.



Report

Task 1

Which statements are correct?

- ☐ Nematodes are tapeworms.
- ☐ Nematodes are round in cross-section and have a filamentous body that is unsegmented, unlike the earthworm (*Lumbricus terrestris*).
- ☐ Nematodes are threadworms.
- ☐ Nematodes are found in almost every soil sample.

✓ Check

Task 2

Some nematodes are parasites. Infection usually occurs through worm eggs ingested with fecal contaminated food.

☐ True

☐ Incorrect

✓ Check

Nematodes have no muscles except at the body orifices, which means that locomotion is only possible by water movement.

☐ True

☐ Incorrect

✓ Check

Task 2

Some nematodes are parasites. Infection usually occurs through worm eggs ingested with fecal contaminated food.

☐ True☐ Incorrect☒ Check

Nematodes have no muscles except at the body orifices, which means that locomotion is only possible by water movement.

☐ True☐ Incorrect☒ Check

Task 3

Draw a nematode and compare the body structure with that of an earthworm if possible. Mark the differences in your drawing.

