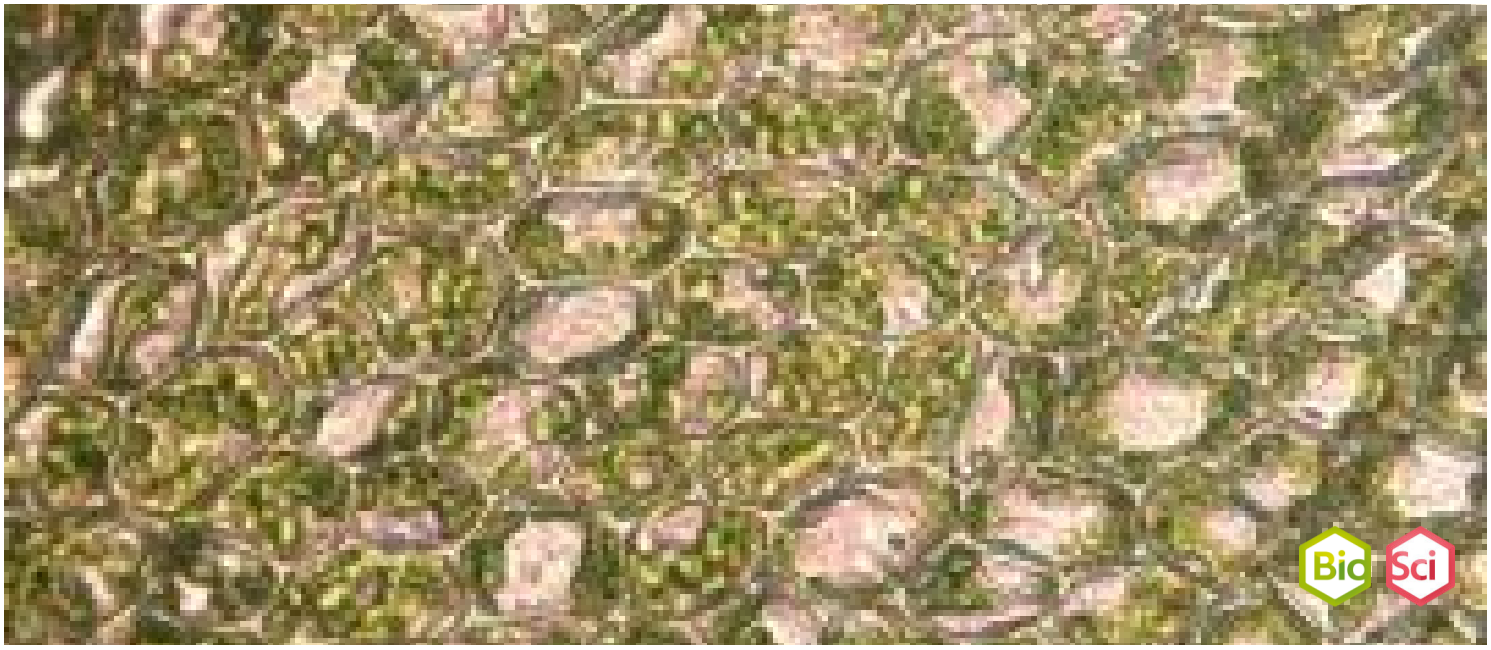
Chloroplasts in moss leaves



Biology > Microscopy / Cell Biology > Basics of Microscopy & Work Technology

Biology > Microscopy / Cell Biology > Plants & Fungi

Biology > Microscopy / Cell Biology > Cell structure

Nature & technology > From the very small & the very big

Nature & technology > Plants & animals

Difficulty level	Group size	Preparation time	Execution time
easy	1	10 minutes	30 minutes

This content can also be found online at:

http://localhost:1337/c/5f510194739d0a0003ee3c71

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Teacher information

Application

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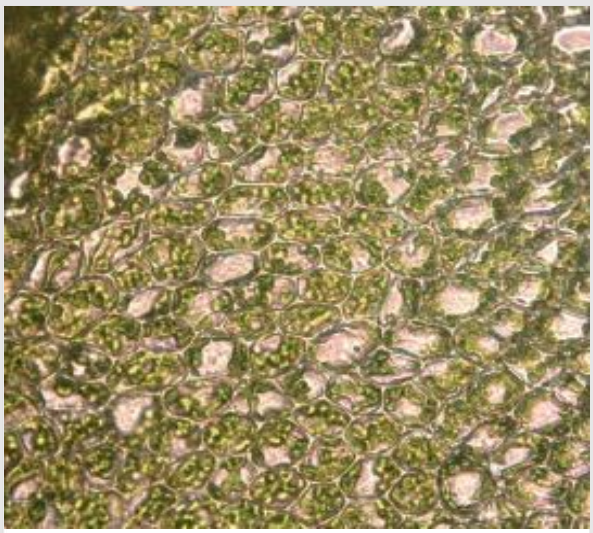

Moss (400x)

The typical characteristic of almost all plants is their green colour. It is caused by a dye which is also the catalyst for the most important biochemical process on earth, photosynthesis. The name of the dye is chlorophyll. The dye is not evenly distributed in the cell, but is found in certain reaction spaces, the chloroplasts. This is where photosynthesis takes place.

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Other teacher information (1/3)

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Prior knowledge

Plants contain plastids in their cytoplasm that are delimited by membranes. Chloroplasts (with chlorophyll/green), chromoplasts (with carotenes/red or xanthophyllene/yellow) and leucoplasts or amyloplasts (colourless) are distinguished according to their dye content. Chloroplasts are mostly lenticular and contain disc-shaped membrane structures inside, on which the green dye is contained. Chloroplasts are mobile within the cell, so that plasma flows can be derived from their movement.

Scientific principle

The pupils are to use the microscope to get to know the areas of plants where photosynthesis takes place: the chloroplasts.

Other teacher information (2/3)

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Learning objective

The students learn how to make a micro-preparation from a moss in which they have to identify the chloroplasts.

Tasks

1. Production of a micropreparation from a moss
2. Microscopy of the prepared preparation

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Other teacher information (3/3)

To "make the drug"

If the moss is procured some time before the experiment, some leaves become quite wavy and are therefore not easy to microscope. Therefore the moss has to be moistened with lime-poor water shortly before the beginning of the experiment. The students will have no difficulty in making the preparation, as no cuts etc. are necessary.

To "microscopy"

The chloroplasts could be described as follows: the chloroplasts look round / oval / lenticular.

Comments on the position of the chloroplasts could be: They are not evenly distributed in the cell... Individual areas of the cell are free of chloroplasts... The chloroplasts are located at the edges.

Safety instructions

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- Working with microscopes for too long can lead to physical discomfort (fatigue, headaches, nausea), especially when the 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 teaching apply to this experiment.

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Student Information

Motivation

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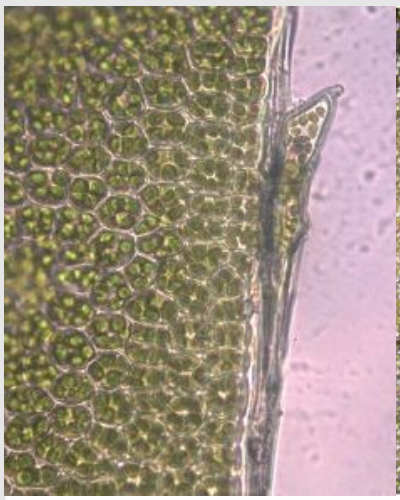
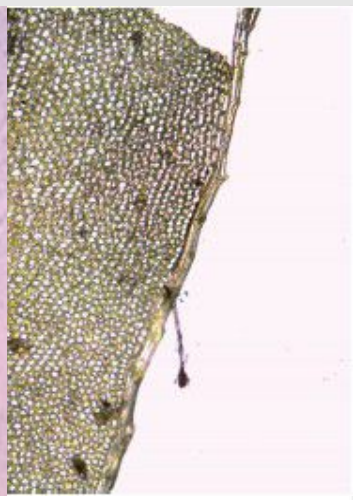


Moss (400x)



Moss (100x)

In this experiment you will create a plant preparation of moss leaves. You will learn how to recognize chloroplasts and their shape and arrangement under the microscope.

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Tasks

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Moss (100x)

1. Preparation of the preparation
2. Microscopy

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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	Beaker, 100 ml, plastic (PP)	36011-01	1
5	Dropping pipette with bulb, 10pcs	47131-01	1
6	Tweezers,straight,pointed,120mm	64607-00	1

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Procedure (1/2)

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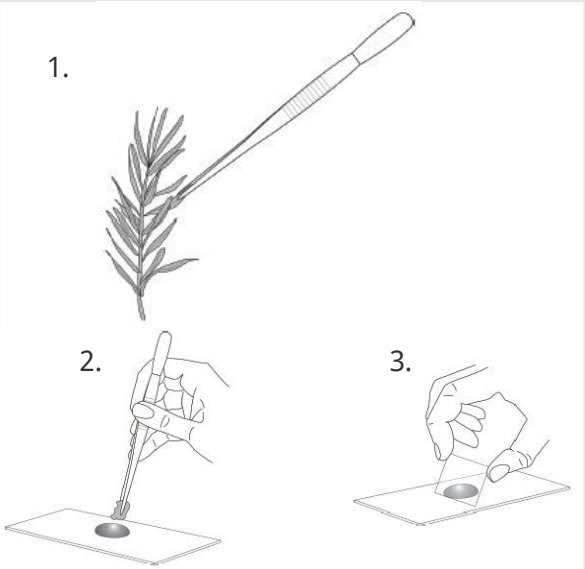


(1) Preparation of the preparation

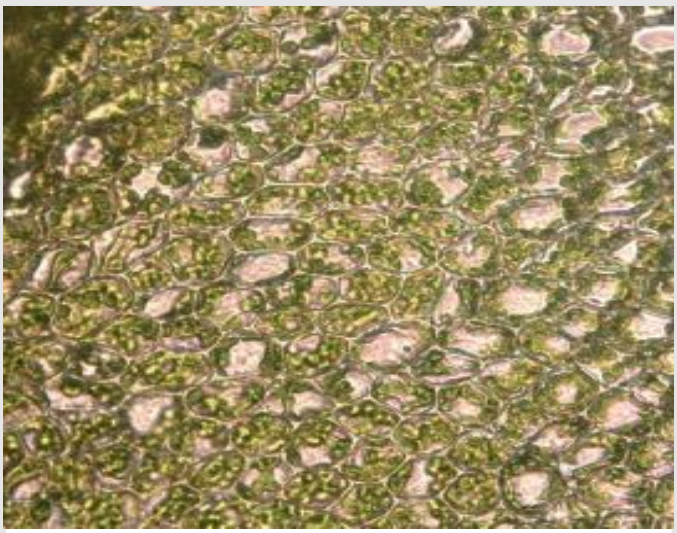
Deciduous mosses have very thin, almost transparent leaves and are particularly suitable for this examination

- Prepare a slide with a drop of water.
- Pluck off a single leaf of a moss plant with the tweezers.
- The leaf is placed directly into the water drop.

Procedure (2/2)

(2) Microscopy

Microscope at the lowest magnification. You will find single cells with the chloroplasts in the border area or in the area of the midrib. When you see a nice cell, you push this interesting spot right in the middle of the field of view. Now adjust the medium magnification by turning the revolving nosepiece.



Moss (400x)

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Report

Task 1

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What do the chloroplasts look like?

- ☐ Uniformly
- ☐ Round
- ☐ Square
- ☐ Lens shaped
- ☐ Oval

Check

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Task 2

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Where does the photosynthesis of plants take place?

- Golgi apparatus
- Chloroplasts
- Chromosomes
- Nucleus

What is the name of the dye that is responsible for the green colour?

- Soylent Green
- Methyl green
- Chlorophorm
- Chlorophyll

Task 3

PHYWE

Complete the missing words

The chloroplasts are not [ ] distributed in the cell. Individual areas of the cell are free from [ ]. [ ] takes place in the chloroplasts.

Check

Complete the equation of photosynthesis

12 H2O + 6 [ ] ------>

C6H12O6 + 6 O2 + 6 [ ]

For this process the plants need the [ ] of the sun.

Check

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Slide	Score / Total
Slide 14: Chloroplasts	0/3
Slide 15: Multiple tasks	0/2
Slide 16: Multiple tasks	0/6

Total amount 0 / 11

Solutions Repeat

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