

Methodology of Teaching the Topic "Getting to Know Representatives of Lycopodiaceae"

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Abstract: The article helps students to understand, facilitate and consciously, independently master the topic of Lycopodiopsida in practical training classes in the department of systematics of higher plants in botany. The representatives of this section are among the oldest plants among the higher plants, and they developed well on the earth at the end of the Paleozoic era. Currently, there are more than a thousand types of herbaceous representatives of them in the world. Among the species of Kazilma there are also large trees.

Key words: Lycopodiophyta, moss, Antheridium, archegonium, rhizoid, reproductive galling, sporophyte, gametophyte, dichotomous branching, mycorrhiza, heterotrophic nutrition.

Systematic position of representatives of the *Plaun family*.

Division Plauntoifa- *Lycopodiophyta*

Ancestor of plauniformes - *Lycopodiopsida*

Plaunnamo tribe - *Lycopodiales*

Family of plants - *Lycopodiaceae*

Representative: *Lycopodium clavatum*.

The purpose of the lesson: to explain to the students the complex changes in the structure of Lycopodiophyta due to the emergence of land, comparing them with the structure of mosses.

Necessary equipment: Newly excavated mosses and Lycopodiophyta, Herbariums of mosses and Lycopodiophyta. microscope, object and cover glass, needle, magnifier, diagram showing the life processes of Lycopodiophyta, pictures and presentation.

Theoretical concepts: Lycopodiophyta appeared in the middle of the Devonian period, and they flourished during the Carboniferous period, when its tree forms were widespread. Lycopodiophyta dominated the earth and played an important role in the formation of coal. Lycopodiophyta are highly spore-bearing plants, their reproduction occurs by fertilization of asexual, sexual offspring (sporophyte, gametophyte). Currently, there are about 1000 species of Lycopodiophyta belonging to 2 classes, 3 orders, 4 families. The Lycopodiophyta that have come down to us are perennial herbs with simple leaves and dichotomously branched roots. The stem is not well developed, and the leaves are spiral, opposite and rounded. Let's consider the characteristic features of Lycopodiopsida on the example of Lycopodiophyta. Lycopodiophyta is 30-50 cm tall. and the length of the stem is 1 cm. from 3 m. There are species that grow on the ground. The length of the leaves is 3-5 mm, the width is 0.7-1 mm.

It differs from mosses in that its leaves are small, lanceolate, coin-shaped, located in a tight spiral shape on the stem, and has a dichotomous true root that divides the stem and leaves. When the spores fall into the soil under favorable conditions, a gametophytic plant grows from it. In lycopodiopsia, successive reproduction of offspring is observed. In the asexual genus, sporophylls with sporangia develop, forming a pair of spikes at the tip of the stem of Lycopodiophyta. Spores in sporangia do not differ from each other physiologically and morphologically. The gametophyte growth of Lycopodiophyta is usually mycorrhizally associated with soil fungi, which feed heterotrophically. In the gametophyte, it is produced after 10 years of development, according to the case of archogonium and antheridium. A new sporophyte generation appears

from the zygote formed by the fusion of the spermatozoa formed in the antheridium with the egg cell formed in the archegonium. Lycopodiopsida differs from mosses in that the sporophytic generation is superior to the gametophytic generation.

Progress of the work: Before starting the practical training, after the students have learned the theoretical concepts of the subject, a question-and-answer interview will be held in order to give some information about the Lycopodiophyta plants and to introduce them to the topic.

Interview questions:

1. What kind of plants are called high plants?
2. What are high-spored plants?
3. In what period did Lycopodiophyta appear and dominate?
4. How does Lycopodiophyta differ from mosses?
5. What conditions are necessary for the growth of Lycopodiophyta and mosses?
6. How do mosses and Lycopodiophyta reproduce?
7. Which genus dominates mosses and Lycopodiophyta?

Complete the practice session using the following instructions:

Using the visual materials brought to the lesson:

1. Study the appearance of newly discovered Lycopodiophyta by comparing it to moss.
2. Measure the height of the Lycopodiophyta and the length of the above-ground stem.
3. Find the additional roots that have grown from the soil.
4. Compare and contrast moss to rhizoids.
5. Observe the additional roots that have sprouted from the ground. Compare it to rhizoids of moss, and show the difference. Determine from which part of the stem this extra root originates.
6. Carefully observe the Lycopodiophyta leaf using a magnifying glass. Cut off one leaf with tweezers, measure its width and length and record it in your notebook. Pay attention to its color, shape, location on the stem.
7. Study the life cycle of Lycopodiophyta - plant reproduction and development using a picture, table, diagram or presentation. Observe the spores on the backside of growing Lycopodiophyta leaves. Identify a pair of spikes at the tip of an erect stem, the sporophytes with sporangia that produce it.
8. You know that a sporophyll is a change in shape of a leaf. Using tweezers, take one of the sporophyll and Lycopodiophyta assimilating leaves and put them on a white paper, compare them, measure them and find the signs of similarity and difference. See the kidney-shaped sporangium with one at the top of the sporophyll.
9. Observe the physiological and morphological similarity of the sporangia spore from the prepared micropreparation.
10. Find a gametophyte-plant with a small rhizoid from the growth of a spore in the picture. Identify the function of the rhizoid and how it feeds the gametophyte.
11. On the upper part of the gametophyte see the Antheridia and archegonia, which are very much formed, similar to those of mosses. Show the development of the fertilized egg cell - zygote - gametophyte - and the independent Lycopodiophyta plant (sporophyte) that arises from it. Determine which genus dominates the reproduction of the Lycopodiophyta.
12. *Outline Lycopodiophyta, drawing the process of reproduction and development. number the parts and write down their names. Complete the diagram representing the life cycle of the Lycopodiophyta.*

Homework: Draw a diagram of the reproductive cycles of sedimentary Lycopodiophyta in your notebook and write down a description of the changes that occur during each cycle.

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