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Research Article

BASIC TEACHING OF BRYOPHYTA, THE DIVISION OF ALGAE IN BOTANY TO BLOOM'S TAXONOMY

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ABSTRACT

This article includes an analysis of the organization of a lesson in botany based on Bloom's taxonomy, the botanical descriptions of lichens, the interpretation of objects through pictures, and the innovative approach of describing them. In addition, the goals of the subject were achieved by providing non-standard training sessions. Therefore, it is the duty of every professor-teacher to make fundamental changes in the process of education and upbringing and to work in harmony with the achievements of science. If the result of the lesson he gives is based on new pedagogical technologies, the student's mastery of the field will increase even more. Therefore, in the era of globalization and digitization, the innovative approach is of great importance in the education system of our country. In fact, effective organization of the lesson is achieved based on this approach. The content of education is covered in curricula and programs, textbooks, etc. Various methods, tools, organizational systems and forms (lecture, conversation, experiments, use of visual aids, observation, exercise, etc.) are used to achieve the goal set in education. Wide use of technical means (film, television, radio, computer, projector, etc.) in the educational process greatly helps to develop the educational method.

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KEYWORDS

Yosin, funaria, tortula, funaria, richia taxonomy, teaching, method, knowledge, understanding.

INTRODUCTION

As the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, noted, "It should be said openly that along with the great achievements in independent development, our path was not free from some mistakes and shortcomings. The processes aimed at abandoning the authoritarian regime and establishing a democratic society, the complex and dangerous period itself has put various problems and tasks before us. There were cases where our knowledge and experience, will and determination were sometimes enough to solve them successfully, and sometimes not." Therefore, it is the duty of every professor-teacher to make fundamental changes in the process of education and training and to work in harmony with the achievements of science. If the result of the lesson given by him is conducted on the basis of new pedagogical technologies, the student's mastery of the field will increase even more. Therefore, in the era of globalization and digitization, the innovative approach is of great importance in the education system of our country. In fact, effective organization of the lesson is achieved based on this approach. The content of education is covered in curricula and programs, textbooks, etc. Various methods, tools, organizational systems and forms (lecture, conversation, experiments, use of visual aids, observation, exercise, etc.) are used to achieve the goal set in education. The wide use of technical means (film, television, radio, computer, projector, etc.) in the educational process has a great impact on the development of the educational method. In general, we can understand streams based on Bloom's taxonomy:

Knowledge is the initial level of thinking, in which the student acquires terms, concrete rules, concepts, facts, criteria, directions, categories, classifications, as well as abstract knowledge: principles, axioms, theorems, generalizations, structures, etc. knows, remembers, repeats, can describe the events of the work.

When the student has thinking at the level of comprehension, he can understand facts, rules, drawings, tables, can reconstruct them, change them (from words to numbers or images), and can predict the future consequences based on the available information.

In application-level thinking, the student can use the acquired knowledge not only in traditional, but also in non-traditional situations and apply them correctly based on a certain model, formula, instruction.

In thinking at the level of analysis, the student can distinguish parts of the whole and their interrelationships, see errors based on logical thinking, distinguish between facts and consequences, evaluate the importance of information.

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Synthesis - At the generalization level of thinking, the student performs creative work, plans an experiment, uses knowledge from several areas. On the basis of some materials, it creates the image and appearance of the whole. This stage requires a creative activity that emphasizes the creation of a new table from the relevant results.

Evaluation - this category requires the achievement of educational results in all categories indicated above and evaluation judgments based on clearly defined criteria. Evaluates on the basis of internal and external criteria, the student can distinguish criteria, observe them, see the variety of criteria, evaluate the compatibility of conclusions with available information, distinguish between facts and evaluative opinions [4].

RESULTS AND DISCUSSIONS

Let's get acquainted with the learning objectives of the subject "Bryophyta" based on Bloom's taxonomy from the subject of Botany, which is taught in the 2nd year of the biology education.

Algae - Bryophyta section teaching content

Learning goals	Content of educational goals
Knowing	Learn about the Bryophyta division; Determining the specific characteristics of the department; Classification; Know procedures; Separation of families.
Understanding	Understanding departmental signs; Providing information about classes; Morphological processing of patterns through samples; Coming to a certain opinion on the characteristics of families and groups and defending one's opinion.
Application to practice	Modeling of features specific to the Bryophyta section; To distinguish representatives of the class of liverworts; Retelling the rules, views and theories learned from the module.

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Analysis	Comparison of the characteristics of the Bryophyta division with other plants; Analysis of hepatic algal proliferation Distinguishing the similar and sharply different sides of herbarium specimens collected due to different age conditions of liverworts; Analysis of the development cycle of algae.
Synthesis	Processing of orders specific to the Bryophyta section within families and categories; Differentiate the life cycle characteristic of funaria; Separation of herbariums of the Funaria way; Synthesis of life cycles and biological characteristics of species.
Conclusion	Evaluation of mastered subject materials; Comment on the systematic sequence of the division Bryophyta; Support of students' aspirations for education.

Basic concepts: section, class, order, family, genus, species, reproduction, life cycle, description.

The purpose of the work: to familiarize with the family, genus and species of the Bryophyta division.

Materials and equipment: Lecture text, textbooks, pictures, tables, herbariums, ruler, magnifying glass.

Theoretical material

Algae - Bryophyta division are plants with the simplest structure among higher plants. The department includes about 25,000 species. That is, in terms of the number of species, among tall plants, it ranks second after flowering plants. This section includes more than 20,000 species. They are widespread in almost all continents of the globe. For these to live, it is important to have a moisture, i.e., water environment. That is why they are found in dry places, mountains, along streams, and sometimes in deserts.

The plants of this section differ from other higher plants, and its main feature is the predominance of the gametophyte generation in the life process. But even in these, both generations, i.e. gametophyte and sporophyte, develop interdependently.

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Algae are the oldest plants, they have developed since the Silurian and Devonian periods of the Paleozoic era, and even now occupy an important place in the vegetation of the forest and tundra zones of the Northern Hemisphere. They are considered to have originated from algae. The department of algae is divided into 3 classes:

a) Class of liverworts - Marchantiopsida;

b) Anthocerotopsidae class - Anthocerotopsida;

c) Sphagnum-like or stem-leaved moss class - Sphagniopsida.

Order of work

a) Identify each family and order by showing the external structure of the herbarium specimens and using information from the method guide.

b) Distinguish the characters of the species by means of drawings presented in herbariums and posters.

c) Based on herbarium and internet information, schematically express the morphological characteristics of the species and draw conclusions about their life cycles.

d) Fill in the tables using theoretical materials.

Assignments

Task 1. Identify the characteristics of higher plants and complete the table.

Table 1

Higher plants	Botanical characteristics
Division Bryophyta	
Class Anthocerotidae	
Family Antocerotoceae	
Anthoseros genus	

Answers.

High plant	Botanical characteristics
Division Bryophyta	This section includes about 25,000 species. They are widespread in almost all continents of the earth. For these to live, it is important to have a moisture, i.e., water environment. The

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	plants of this department differ from other higher plants, and its main feature is the predominance of the gametophyte generation in the life process. However, in these, both generations, i.e. gametophyte and sporophyte, develop interdependently.
Class Anthocerotidae	The anthocerotopsid class includes one family of anthocerotidae. These plants are found on cultivated lands and along streams. Spores are spread out as a result of splitting of the sporogone into two parts.
Family Antocerotoceae	The Anthocerotaceae family includes about 200 species. In monoecious representatives, sexual organs antheridium and archegonium are formed in one plant.
Atoseros species	*The genus Antoseros is widespread in nature and has about 200 species. The body of anthocerotes is flat and ribbon-like, 2-3 cm long, 1-3 cm in diameter, the body consists of several layers of thin cells. Rhizoids are located on the lower side of the thallus. Reproduction of anthoserotlam occurs in vegetative, sexual and asexual ways. Nodules are formed on the underside of the thallus of vegetatively propagating perennial representatives, and they reproduce using them [1].*

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Task 2. Explain the plant in the picture taxonomically and fill in Table 2.

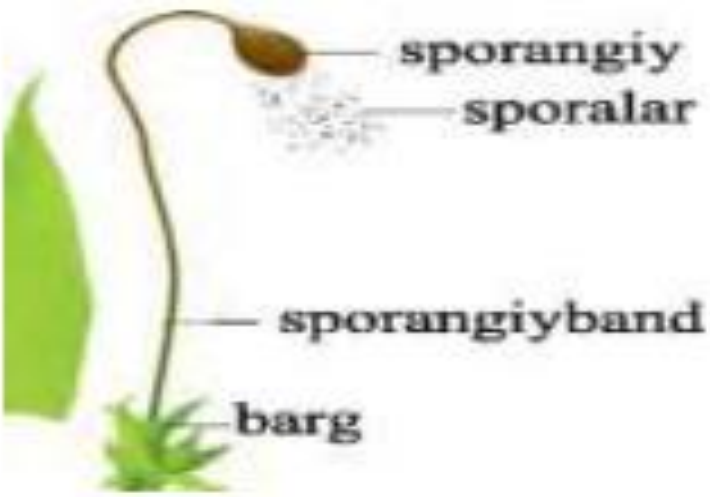

Table 2

A picture of the studied object.	Classification of the studied object.
 Picture 1	

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Picture 2

Picture 3

Picture 4

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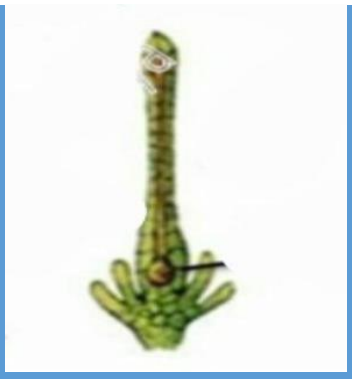

Picture 5

Picture 6

Assignment answers:

Figure 1. A gametophyte develops from a spore. A gametophyte is a sexual joint.

Figure 2. From the antheridium, where the antheridium and archegonium are located, spermatozoa enter the archegonium.

Figure 3. Spores emerging from the sporangium.

Figure 4. A spore that falls on a moist surface grows and forms a multicellular, branched, thin green fibrous growth.

Figure 5. An ovum formed by the fertilization of two gametes.

Figure 6. A new stem emerging from each bud is a leafy funaria.

Non-standard educational task on the topic

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Biological dictation

_____ _____ class. This class consists of 6000 species. The main characteristics of these plants are that the gametophyte has a dorsoventral structure, that is, the upper and lower sides are different from each other [1]. The shape of the thalli has a leaf-like structure. Asexual offspring consists of sporangium, band and sac. This class is divided into 2 classes:

1. _____ class – _____ (Latin name).

2. _____ class – _____(Latin name).

Merchant class. An important classroom routine is _____. This order includes more than 10 families. One of them is the Marchantiaceae family. A typical representative of the family is Marchantia polymorpha. This plant is a _____ plant according to its distribution.

The teaching of biology is undergoing a clear shift in the direction of student-centered learning. Because now the goals of nutrition in biology are being modernized. When computer modeling, simulation, and problem-based learning become part of teaching strategies, biology teaching becomes more student-centered to enhance students' critical thinking about complex biological processes [2]. Pedagogical technologies are a project based on a set of social purpose-oriented methods, forms and associations of the pedagogical process. Pedagogical technologies-reconstruction of the pedagogical process is also a mechanism of management and organization [3]. Therefore, increasing the content of the lesson through pedagogical technologies is considered an important stage.

CONCLUSION

On the basis of the given tasks, information about the structure of mosses, their practical importance, classification is presented in the order of work. Information on the study of algae according to Bloom's taxonomy, their development in various ecological environments, their structure, economic and pharmaceutical importance is given. As a result of increasing students' knowledge in botany classes based on new innovative technologies and re-examination of their understanding of the subject, the planned goals will be realized. The student identifies the objects on the subject, describes them, processes data, expresses his opinion, distinguishes the specific features of a certain process, object and event, concludes and makes a decision. achieves the accumulation of credits. It is important to have complete knowledge of science by using new methods.

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