

THE METHODOLOGY OF PRACTICAL TRAINING IN ENTOMOLOGY LESSONS

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Abstract. This article describes the methodology for conducting practical classes in entomology classes. The article presents the main goals and objectives of practices, methodological approaches necessary for their effective organization, as well as various types and methods of practices. Collection, identification, morphological and ecological analysis of insect samples are important for students when teaching the practical side of entomology. At the same time, for effective practical classes, it is necessary to correctly apply preparatory work, the necessary equipment and scientific methods. The article provides practical support to teachers and students when conducting practical classes, provides a methodological basis for consolidating students' knowledge and increasing their interest in scientific research through practical classes in entomology.

Key words: entomology, ecological analysis, biological analysis, polymorphism, adaptation, practical training, teaching methods, practical skills.

МЕТОДИКА ПРАКТИЧЕСКИХ ЗАНЯТИЙ НА УРОКАХ ЭНТОМОЛОГИИ

Аннотация. В данной статье описывается методика проведения практических занятий на уроках энтомологии. В статье представлены основные цели и задачи практик, методические подходы, необходимые для их эффективной организации, а также различные виды и методы практик. Сбор, идентификация, морфологический и экологический анализ образцов насекомых имеют важное значение для студентов при обучении практической стороне энтомологии.

При этом для эффективного проведения практических занятий необходимо правильно применять подготовительную работу, необходимое оборудование и научные методы. В статье оказывается практическая поддержка преподавателям и студентам при проведении практических занятий, дается методическая основа для закрепления знаний студентов и повышения их интереса к научным исследованиям посредством практических занятий по энтомологии.

Ключевые слова: энтомология, экологический анализ, биологический анализ, полиморфизм, адаптация, практическое обучение, методика обучения, практические навыки.

ENTRANCE

Entomology, the science of insects, is the main branch of biology. Insects play an important role in ecology, agronomy, medicine, pharmaceuticals, and many other fields. Also, knowledge related to entomology, namely practical classes, is considered highly effective for students.

Practical classes allow for the practical application of theoretical knowledge of entomology, providing students with knowledge in the study of insect species, biological characteristics, and related ecological processes.

However, the methodology for organizing practical classes in entomology lessons plays an important role in the effective organization of the educational process for teachers. Analysis of the main methods and methodological approaches for planning and conducting practical classes is of great importance. The main goal is to organize entomology lessons.

LITERATURE ANALYSIS AND METHODOLOGY

Research and scientific works in the field of methodology for organizing practical classes in entomology lessons include a number of approaches aimed at increasing the effectiveness of the educational process. When analyzing the literature on the methodology of teaching entomology, first of all, the features of the methodology of teaching entomology lessons and the role of practical classes in the educational process are considered.

A significant contribution to the development of applied entomology was made by Professor N.A. Kholodkovsky, who founded the scientific school of entomology and wrote the book "Course of Theoretical and Applied Entomology."

Bogdanov-Katkov made a great contribution to the training of specialists who protect plants from insects[4].

A.P.Fedchenko, V.I.Plotnikov, V.P.Nevsky, M.S.Gilyarov, V.V.Yakhontov, L.M.Isaev, R.O.Olimjonov, A.M.Muhammadiyev, Kh.Kh.Kimsanboev contributed to the development of the field of entomology in Uzbekistan.

The conducted research shows the effectiveness of practical classes in strengthening theoretical knowledge and forming students' skills in the learning process. Through classes, students gain experience, conduct their own observations, and draw conclusions based on experiments, which further increases the effectiveness of the educational process.

There are also a number of works devoted to methodological approaches to the organization of practical classes and laboratory work in teaching in the field of entomology. This literature explains the role of practical training in teaching students the necessary skills and suggests the methods necessary to ensure their active participation in scientific research.[2]

In the literature, an important place is also occupied by the pedagogical qualifications of teachers, their creative approach to the application of the methodology, methods of communication with students and their motivation.

There are also scientific studies that have shown the interrelationship between the study of insect species, the identification of their biological characteristics, and applied research on ecological processes.[3]

When organizing practical classes, the most important method is directing students to practical classes by providing theoretical knowledge about practice based on entomological materials and textbooks.

It is also important to conduct experiments in entomology classes and directly observe insects. This will involve students in practice and develop their independent thinking skills.

When students conduct observations independently, they acquire new knowledge.

By creating project work on entomology for students, tasks based on analysis and observations, students learn to establish logical connections between practical classes and apply scientific approaches.

With the help of interactive teaching methods, students have the opportunity to freely express their opinions, work in groups, and exchange ideas with each other.

For students to consolidate their practical skills, the support of teachers, pedagogical knowledge, and methodology are of great importance.

Also, in the organization of practical classes, a great role is played by the teacher's communicative skills, creative approaches to teaching, and mastery in directing the scientific activity of students.

The development of the methodology of entomological training is based on scientific research. By introducing new methods, technologies, and pedagogical approaches, it is possible to increase the effectiveness of entomological education.

It is also important to study the methodological approaches and methods used in entomological education worldwide. In particular, research and experiments conducted in entomology can be useful for the further development of entomological education.

When analyzing the literature on the methodology of entomological training, there is a need to increase the effectiveness of training, the use of modern technologies and methods, as well as the development of methods that help students to deeply master knowledge. The educational process can be made more effective with the help of literature, scientific research, and teaching aids on the science of entomology and its pedagogical approaches.

OBTAINED RESULTS AND DISCUSSION

Analysis of practical classes conducted in entomology classes showed that students achieved effective results in practical classes in strengthening entomological knowledge and forming a deeper understanding of the biological world, in particular the diversity and complexity of insects.

During the practical classes, students got acquainted with various insect species and their ecological role, that is, bioecology, had the opportunity to perform morphological analysis under a microscope, as well as study polymorphism, types of adaptation and its ecological significance.

During these practical exercises, students gained a clear understanding of ecological and biocenotic features, habitats, and the dynamics of insect populations.

The study of knowledge about insects is carried out in practical classes based on the following goals and objectives.

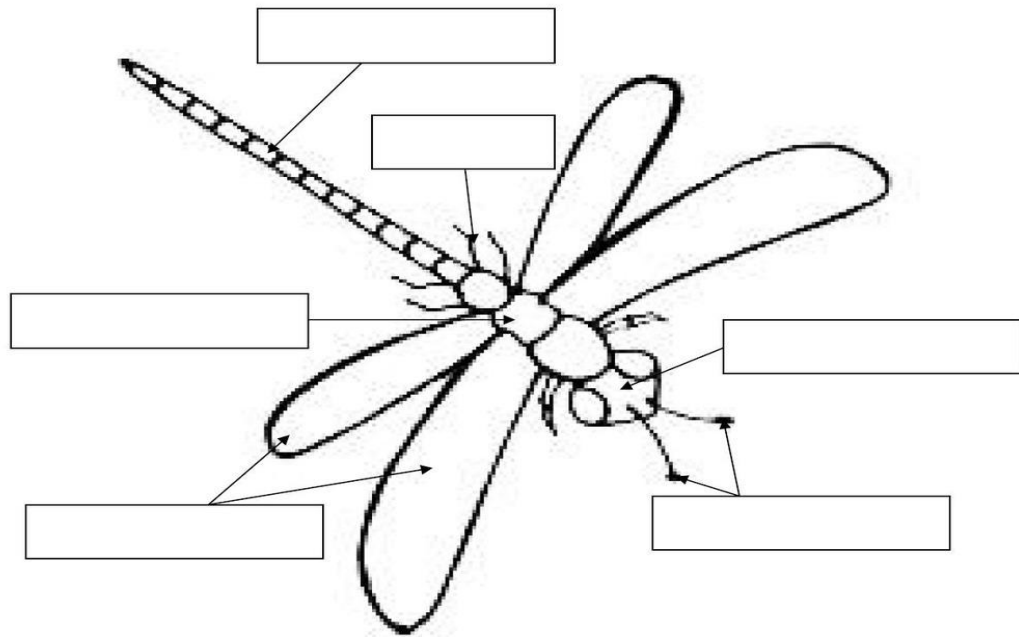
№	Lesson Title	Goals	Tasks
1	Classification of insects	Insect species identification	Identification of insect species.
			Study of their morphological characteristics.
2	Environmental analysis	Understanding the ecological role and habitat of insects	Ecological analysis.
			Studying the living conditions of insects.
3	Biological analysis	Understanding the biological processes of insects	Analysis of their reproductive characteristics.
			Study of insect feeding patterns

In practical classes on entomology, giving students assignments further develops their freedom of expression and increases their interest in science.

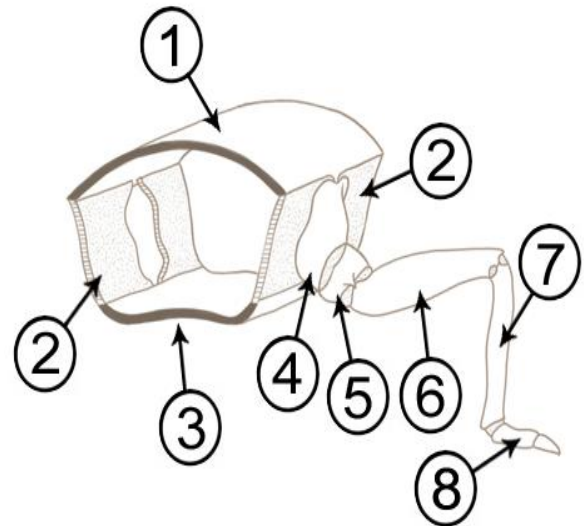
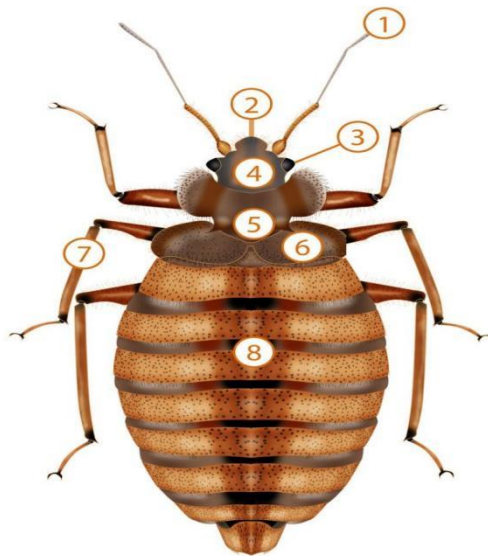
Practical exercises on the study of the morphological structure of insects were very effective, mainly by giving assignments.

Tasks can be given in the following forms.

Task 1. Fill in the empty cells.



Task 2. Write the names of the parts of the insect indicated by the numbers.



Task 3. Explain the terms.

1. Acron is.....
2. Abdomen is.....
3. Tergit is.....
4. Sternite is.....
5. Pleurisy is.....
6. Mandubula is.....
7. Prognostic head is.....
8. Hypognathic head is.....
9. Opistognathic head is.....

10.Ommatidi is.....

Entomology strengthens students' knowledge by conducting practical classes based on the above tasks.

The presented table shows the degree of influence of practical classes on students' knowledge. These indicators help to assess students' knowledge in practical classes from the initial level to the final level.

№	Name of classes	Initial level of knowledge (%)	Final level of knowledge (%)	Change (%)
1	Classification of insects	40%	85%	+45%
2	Environmental analysis	50%	80%	+30%
3	Biological analysis	45%	75%	+30%
4	Connection between plants and insects	55%	82%	+27%

According to the data in the table, the practical training increased the level of students' knowledge at a high level. This is a significant difference, the effectiveness of the methodology is directly related to the influence of practical exercises.

Thus, the full application of research methods in entomological practical classes allows students to apply theoretical knowledge in practice. In this case, during practical classes, it is recommended to give students special assignments and introduce exercises based on advanced scientific research.

Thus, improving the content of practical classes, teaching new scientific methods and increasing the number of laboratory work, plays an important role in the training of highly qualified specialists in the field of entomology.

CONCLUSION

The methodology of conducting practical classes in entomology classes plays an important role in the development of students' scientific and practical skills. Through practical exercises, students are provided with effective methods for identifying insect species and studying their bioecology.

This, in turn, contributes to increasing interest in entomology and training specialists who want to work in this field in the future.

According to the goals and objectives of the practical training, providing students with the necessary equipment and resources is of great importance in expanding their knowledge and skills.

Also, the knowledge obtained through practical exercises is important not only for scientific activity, but also for the development of ecological consciousness, a correct understanding of the relationship with insects and the ecosystem as a whole.

In conclusion, the methodology for conducting effective practical classes in the teaching of entomology provides students not only with knowledge, but also with the opportunity to develop deep scientific thinking and ecological awareness.

Therefore, in order to organize practical classes in entomology lessons more effectively in the future, it is necessary to improve the methodology and prepare students for more independent scientific research. This, in turn, contributes to a broader understanding of insects and their role in the ecosystem.

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