BIOLOGY OF GASTROPOD MOLLUSCS DISTRIBUTED IN THE FERGANA VALLEY

Mamatyaqubova Malohat Sharof qizi

Andijan state medical institute

Annotation: In this scientific thesis, the biology of crustacean molluscs distributed in the Fergana Valley, their taxonomic composition, distribution dynamics, mechanisms of ecological adaptation and the influence of anthropogenic factors were studied. Monitoring studies have revealed the major gastropod species found in the area's aquatic ecosystems, their sensitivity, biogeographic characteristics, and bioindicatory importance. The data obtained is of practical importance in assessing the quality of aquatic ecosystems and maintaining environmental sustainability.

Keywords: Gastropoda, mollusks, Fergana Valley, bioindication, hydrobiocenosis, ecotoxicology, population dynamics.

Introduction:

The bellied molluscs (Gastropoda) are among the most common invertebrates found in various aquatic and terrestrial environments around the world. They play an important role in ensuring the natural stability of the ecosystem, as they break down organic matter, feed on microorganisms and are a food source for other animals.he bellied molluscs (Gastropoda) are among the most common invertebrates found in various aquatic and terrestrial environments around the world. They play an important role in ensuring the natural stability of the ecosystem, as they break down organic matter, feed on microorganisms and are a food source for other animals. Bellied molluscs are also widely used as bioindicators, which means that they are animals that perceive changes in water quality and environmental conditions. Therefore, the study of their biology and habitat is of great importance in environmental monitoring and Natural Resource Management.

The Fergana Valley is one of the most densely populated and developed agricultural areas in Central Asia. The climate, soil structure, and water resources of the area provide favorable living conditions for a variety of fauna, including crustacean molluscs. Wetlands, rivers, canals, and artificial reservoirs meet the diverse environmental requirements of the molluscan population in the area. At the same time, anthropogenic activities, such as the construction of water bodies, changes in irrigation systems and agricultural work, have a significant impact on the distribution of crustacean molluscs.

Previous research has been largely limited to biodiversity and the identification of certain species, not providing sufficient information on their reproductive characteristics, growth rate and adaptability to the habitat.t the same time, anthropogenic activities, such as the construction of water bodies, changes in irrigation systems and agricultural work, have a significant impact on the distribution of crustacean molluscs.

Previous research has been largely limited to biodiversity and the identification of certain species, not providing sufficient information on their reproductive characteristics, growth rate and adaptability to

the habitat. Therefore, a comprehensive biological and ecological study of crustacean molluscs in the Fergana Valley is an urgent scientific issue.

The purpose of this study is to identify crustacean molluscs in the Fergana Valley, study their biological characteristics, assess their ecological indicators related to the distribution and habitat of the species. The results of the study can be used not only in the monitoring of molluscs in the area, but also in programs to preserve biodiversity and ensure environmental sustainability.

Materials and methods:

This study was carried out on the three main regions of the Fergana Valley, namely the watersheds, adir regions and garden-field areas near the river banks of the Fergana, Andijan and Namangan regions. In the course of the research, the crustacean molluscs found in the natural environment were collected, their habitat, environmental conditions and biological activity were observed.aterials and methods

This study was carried out on the three main regions of the Fergana Valley, namely the watersheds, adir regions and garden-field areas near the river banks of the Fergana, Andijan and Namangan regions. In the course of the research, the crustacean molluscs found in the natural environment were collected, their habitat, environmental conditions and biological activity were observed. The collection of the specimen was carried out in the spring and summer, taking into account the seasonal period, since this period is considered to be the period when the activity of molluscs is high.

The hand collector method and special plastic containers were used to collect the sample. The corresponding location and time indicators were recorded for each sample. Molluscs living in water bodies were taken using a grid net, and the collection of species between moist soil and moist leaves was done by hand. The collected molluscs underwent preliminary classification in field conditions and were delivered to the laboratory, labeled on the presevator. At the laboratory stage, with the help of magnifying glass, binocular microscope and morphological analysis equipment, their external and internal structural features, shell shape and color changes were determined and classified.

During the study, the physicochemical indicators of water, in particular temperature, pH level, oxygen content and water clarity, were studied using special portable measuring instruments. The soil of the region was also studied, the level of humidity, the amount of organic matter and the mechanical composition were analyzed in the laboratory. Based on the data obtained, factors affecting the habitat and survival of crustacean molluscs were identified, and their ecological needs and adaptive characteristics were studied.

In the course of the research, methods of statistical analysis were used, the data obtained was processed on the basis of a comparative analysis and generalized conclusions were drawn on the distribution, abundance and biological status of mollusk species in the regions of the Fergana Valley.

The results of the study showed that the distribution of crustacean molluscs in the Fergana Valley is closely related to natural conditions, moisture of the area, water resources and vegetation cover. During observations, it was found that molluscan populations were high in areas with humid climates and close to water, while in dry adir zones, their numbers decreased dramatically. Natural water bodies, irrigated land, ditches and gardens have been recorded as the most suitable habitat for molluscs.

Microscopic analysis has shown differences in The Shape of the shell of molluscs, the degree of spiral rotation, and color pigmentation. The minerals and pH levels contained in the water directly affected their shell structure. Populations of molluscs have become stable in areas where water has a pH close to neutral. In areas with high soil moisture, biological activity and abundance of species were observed.scopic analysis has shown differences in The Shape of the shell of molluscs, treas.

Area	**Species diversity**	**The most common environment**	**Ecological status**
Fergana province	high	water bodies, areas with moist soil	stable, high biodiversity
Namangan province	medial	irrigated lands, gardens and ditches	moderately stable
Andijan province	low	marginal water bodies and wet areas	low, dry zones prevail

The data obtained indicate that the presence of Natural Resources, in particular water, in the Fergana Valley is a decisive factor for the vital processes and distribution of molluscs. While the rate of their development is high in humid and plant-rich environments, anthropogenic pressure has increased and populations have decreased dramatically in areas where water shortages have been observed. The results of the study confirm the sensitivity of this group to changes in the ecological environment and show that they are important as bioindicators in assessing the ecological status of the area.

Discussion

The results of the study of the biology of crustacean molluscs in the Fergana Valley showed that the distribution of species is directly related to natural geographical factors, climatic conditions and ecological environment. The uneven distribution of Water Resources in the area was also reflected in the population density of molluscs. In areas close to the water, the breeding rate of molluscs was high, and biodiversity was also high due to living conditions matching them.he results of the study of the biology of crustacean molluscs in the Fergana Valley showed that the distribution of species is directly related to natural geographical factors, climatic conditions and ecological environment. The uneven distribution of Water Resources in the area was also reflected in the population density of molluscs. In areas close to the water, the breeding rate of molluscs was high, and biodiversity was also high due to living conditions matching them. On the contrary, in dry regions, the number of species decreased due to water shortages and sparse vegetation cover. These results confirm that crustacean molluscs are bioindicator organisms sensitive to environmental conditions.

Micromorphological analysis has shown that differences in shell structure and pigmentation of molluscs are the result of environmental adaptation processes. The chemical composition of water, the presence of organic matter in the soil and the density of plants play an important role in the biology of their development. In particular, it was found that the pH level and mineral composition of water significantly affect the process of shell formation.icromorphological analysis has shown that differences in shell structure and pigmentation of molluscs are the result of environmental adaptation processes. The chemical composition of water, the presence of organic matter in the soil and the density of plants play an important role in the biology of their development. In particular, it was found that the pH level and mineral composition of water significantly affect the process of shell formation.

This situation indicates the need for regular monitoring of the population of molluscs, taking into account the variability of the hydroecological environment in the conditions of the Fergana Valley.

Region-by-region comparisons have shown high levels of species diversity in Fergana province, moderate in Namangan and relatively low in Andijan. The main factors in this were the development of irrigation systems, the presence of natural water bodies, differences in soil moisture and anthropogenic loading. It has also been observed that human activities, in particular the expansion of agricultural arable land and the use of chemical preparations, negatively affect the habitat of molluscs.

The results obtained show that in the Fergana Valley ecosystem, crustacean molluscs are important not only for Biological stability, but also for the ecological monitoring system. This will expand the possibility of using them as an indicator in assessing the environmental safety of the territory in the future. The results of this study serve as an important resource in the development of scientifically based approaches to biodiversity conservation, water resource management and conservation of natural ecosystems in the region.

Conclusion:

Research on the biology of crustacean molluscs in the Fergana Valley has shown that their distribution and population density directly depend on the natural conditions of the area, water resources, soil moisture and anthropogenic influences. Species diversity varies with the degree of contamination of water bodies and the density of vegetation.onclusion

Research on the biology of crustacean molluscs in the Fergana Valley has shown that their distribution and population density directly depend on the natural conditions of the area, water resources, soil moisture and anthropogenic influences. Species diversity varies with the degree of contamination of water bodies and the density of vegetation. In natural, humid and plant-rich areas, mollusc activity is high and biodiversity is kept stable. In areas with strong anthropogenic loading, sensitive species are reduced, durable species prevail.

The results obtained confirm the possible use of crustacean molluscs as bioindicators of the Fergana Valley ecosystem. These species play an important role in water quality monitoring, organic matter degradation, and population stability assessment. In the future, it is recommended to carry out research on the basis of molecular diagnostics, genetic monitoring and an ecological model, prevent the spread of Parasitic Diseases and use them effectively in the management of Water Resources.

In the Fergana Valley ecosystem, crustacean molluscs are the main group providing ecological stability, and an in-depth study of their population and ecological characteristics is important for the ecological safety of the area and effective management of Water Resources.

Literature:

1. Brown, D.S. (1994). Freshwater Snails of Africa and their Medical Importance. London: Taylor & Francis.
2. Kabat, A.R., & Hershler, R. (1993). The Prosobranch Snails of North America. Smithsonian Institution Press.

3. Starobogatov, Y.I., et al. (2004). Fauna of Mollusks in Central Asia. Moscow: KMK Scientific Press.
4. Glöer, P., & Meier-Brook, C. (2003). Freshwater Mollusks: Biology and Ecology. Hamburg: ConchBooks.
5. Farg‘ona viloyati ekologik ma’lumotnomasi (2022). Toshkent: Ekologiya bo‘limi nashriyoti.
6. Vinogradov, B. G. (2007). Molluscs of inland waters of Uzbekistan. *Uzbekistan Journal of Zoology, 3*(2), 45–57.
7. Khudoyberdiyev, M., & Egamberdieva, L. (2015). Freshwater gastropods of Fergana Valley and their ecological roles. *Central Asian Journal of Ecology, 12*(1), 12–21.
8. Ponder, W. F., & Lindberg, D. R. (2008). *Phylogeny and evolution of the Mollusca*. Berkeley: University of California Press.
9. Siddiqui, A. Q., & Ali, S. (2010). Bioindicator potential of freshwater molluscs in polluted rivers. *Environmental Monitoring and Assessment, 165*, 513–523.