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TAXONOMIC COMPOSITION, BIOECOLOGICAL CHARACTERISTICS OF TERRITORIAL MOLLUSKS DISTRIBUTED IN THE MOLGUZAR MOUNTAINS

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Annotation. The article comprehensively analyzes the taxonomic composition of terrestrial mollusks distributed in the territory of the Molguzar Mountains, determines their systematic distribution, and reveals the general characteristics of the region's malacofauna.

Keywords: Gastropoda, Pulmonata, Molguzar, Hygromiidae, Pupillidae, Cochlicopidae, mollusk, taxonomic, Hygrrobiont, Mesobiont, Xerobiont, Shell, biotope

Annotatsiya. Mazkur maqolada Molg‘uzor tog‘lari hududida tarqalgan quruqlik mollyuskalarining taksonomik tarkibi har tomonlama tahlil qilingan, ularning sistematik taqsimlanishi aniqlangan hamda hudud malakofaunasining umumiy xususiyatlari yoritib berilgan.

Kalit so‘zlar: Gastropoda, Pulmonata, Molg‘uzor, Hygromiidae, Pupillidae, Cochlicopidae, mollyuska, taksonomik, gigrobiont, mezobiont, kserobiont, chig‘anoq, biotop.

Аннотация.В данной статье проведён всесторонний анализ таксономического состава наземных моллюсков, распространённых на территории гор Молгузар, определено их систематическое распределение, а также раскрыты общие особенности малакофауны данного региона.

Ключевые слова: Gastropoda, Pulmonata, Молгузар, Hygromiidae, Pupillidae, Cochlicopidae, моллюск, таксономический, гигробионт, мезобионт, ксеробионт, раковина, биотоп.

Introduction. Land mollusks (Gastropoda: Pulmonata and some Prosobranchia groups) play an important role in the processes of metabolism, decomposition of organic residues, and soil formation in terrestrial ecosystems. Due to their high sensitivity to environmental changes, they also have great scientific significance as bioindicators.

Especially in mountainous regions, the taxonomic composition and ecological adaptation of terrestrial mollusks are formed under the influence of climatic, geomorphological, and biotic factors. The malacofauna of the mountain ranges of Central Asia, in particular, the North-Western Turkestan system, is among the regions that have not yet been fully studied. The Molguzar Mountains are an important orographic link of this system, distinguished by their unique geological structure, altitude, and humidity regime. Therefore, the taxonomic composition of terrestrial mollusks distributed in this area differs significantly from the fauna of other adjacent mountain ranges. As a result of the research, a comprehensive analysis of the taxonomic composition of terrestrial mollusks distributed in the territory of the Molguzar Mountains, the determination of their systematic location, and the general characteristics of the malacofauna of the territory were revealed.

As a result of field and laboratory studies, a total of 15 species of terrestrial mollusks were identified in the territory of the Molguzar Mountains. These species cover the main taxonomic groups belonging to 5 families and 9 genera. Analysis of the taxonomic composition showed that in the fauna of the territory, the families Hygromiidae, Enidae, Pupillidae, Cochlicopidae, and Parmacellidae are distinguished by a relatively large number of species. This is explained by the abundance of dry and semi-dry biotopes in the Molguzar Mountains, as well as the presence of humid micro-areas.

Representatives of the Hygromiidae family are the most widespread family in the Molguzar Mountains, mainly found in rocky and shrubby biotopes with moderate humidity. The peculiarities of terrestrial mollusks are characterized by the diversity of the shape and structure of the shell, which indicates their ecological plasticity.

Small terrestrial mollusks belonging to the families Pupillidae and Cochlicopidae live mainly in the soil layer, under stones, and among leaf debris. Their distribution is often related to moisture content and substrate composition.

Representatives of the Enidae family are more common in dry, open slopes and rocky mountains. Species belonging to this family are characterized by a narrow, thick-walled mouth, which indicates their adaptation to xerophytic conditions.

Taxonomic analysis of terrestrial mollusks distributed in the Molguzar Mountains showed that mollusks belonging to the genera Pseudonapaeus, Pupilla, Cochlicopa, Leucozonella. This situation shows that some biotopes of the Molguzar Mountains have created favorable ecological conditions for these genera.

The species Turanena starobogatova deserves special attention. This species was recorded only in the territory of the Molguzar Mountains, and its endemic nature once again confirms the uniqueness of the malacofauna of the region. The limited range of the species and its dependence on specific biotopes indicate the need for its protection.

The taxonomic composition of terrestrial mollusks of the Molguzar Mountains is characterized by the following features:

1. Relatively high diversity of species composition;

2. Dominance of xerophytic and mesophytic species;

3. The presence of local diversification processes within individual seeds;

4. Presence of endemic elements.

These features make it possible to assess the Molguzar Mountains as one of the important regional centers for the malacofauna of Central Asia.

Terrestrial mollusks identified in the territory of the Molguzar Mountains are distinguished by their belonging to various ecological groups. According to the research results, species were conditionally divided into hygrobont, mesobiont, and xerobont groups depending on their relationship to moisture.

Calculations showed that:

• Hygrobont species - 45%

• Mesobiont species - 30%

• Xerbiont species - 25%

Species belonging to the hygrobont group were mainly recorded in the vicinity of springs, in shaded areas, and in adapted microdistricts with high soil moisture. Their shell wall is relatively thin and the surface is smooth, which is explained by the low risk of water loss in conditions of high humidity.

Mesobiont species have a wide ecological range and are found in shrublands, semi-shady slopes, and areas where leaf debris accumulates. Representatives of this group constitute a stable component in terms of the number of species in the Molguzar Mountains.

Xerobiont species are mainly distributed on open, rocky, and dry slopes. They have a thick-walled, narrow-mouthed shell, which is a morphological adaptation aimed at limiting water loss. Representatives of the genera Pseudonapaeus and Turanena are especially highly adapted to dry conditions.

The sharply continental nature of the climate in the Molguzar Mountains (high temperature in summer, low humidity) formed a number of adaptation mechanisms in terrestrial mollusks.

• Thickening of the cochlear wall;

• Development of a peristoma in the oral area;

• Increase in the number of turns.

• State of summer estivation;

• Living deep under stones and in the soil;

• Migration to humid microdistricts.

Population characteristics

In some biotopes (for example, on slopes with a calcareous substrate), the density of some species reached 60-80 individuals per 1 m2. This indicates their high degree of adaptation to local conditions.

The taxonomic and ecological composition of terrestrial mollusks of the Molguzar Mountains is inextricably linked with their geographical location and natural conditions. The distribution of species by ecological groups indicates the mosaic arrangement of humid and dry micro-areas in the territory.

A relatively high proportion of hygrobont species indicates the importance of fountains and shady valleys, while the presence of xerobont elements reflects the influence of the continental climate. The registration of endemic species allows us to assume that long-term isolation and local evolutionary processes have occurred in the territory.

These results make it possible to assess the Molguzar Mountains as one of the important local centers of the Central Asian malacofauna.

For a deeper disclosure of the bioecological characteristics of terrestrial mollusks, statistical analysis of the obtained data on species composition and ecological groups was used. In the analyses, the number of species, relative share (%), and density indicators in some biotopes were taken into account.

The ratio of species by ecological groups is distributed as follows:

• hygrobont - 45%;

• mesobiont - 30%

• xerobiont - 25%

These indicators show that humid micro-areas play an important role in the Molguzar Mountains. At the same time, the significant proportion of xerobiont species confirms the continental nature of the region's climate.

Statistically, species of the mesobiont group showed the lowest values for standard deviation (SD), which indicates their wide ecological amplitude. On the contrary, in the xerobiont group, the coefficient of variation (CV) is higher, which indicates their strong attachment to local biotopes.

It was established that some species have dominant or subdominant status in the biocenosis. For example, on limestone slopes, the species Pyramidula pusillas and Leucozonella mesoleuca were recorded with high density. This indicates the active participation of these species in the nutrient cycle in soil and rock ecosystems.

Comparison of density indicators by biotopes showed that an increase in the number of species does not always coincide with an increase in the density of individuals. This situation is related to the capacity of biotopes and the distribution of resources, reflecting the complexity of the ecology of mollusk populations.

When comparing the fauna of terrestrial mollusks of the Molguzar Mountains with the adjacent mountain ranges (Zarafshan, Nuratau, and Turkestan Mountains), a number of similarities and differences are revealed.

In terms of the total number of species, the Molguzar Mountains have an average indicator, but are distinguished by the proportion of endemic elements. This situation is

assessed as a result of the orographic isolation of the territory and local evolutionary processes.

In particular, species within the genus Turanena and Pseudonapaeus exhibit a number of morphological and ecological features in the Molguzar Mountains. This situation indicates the need to consider the region as a separate object of study for the malacofauna of Central Asia.

Conclusion

As a result of the conducted research, the following conclusions were made:

1. In the territory of the Molguzar Mountains, terrestrial mollusks are united into 8 families and 18 genera, which are the main taxonomic groups of the Pulmonata class.

2. Mezobiont and hygrobont groups predominate in the fauna composition, which indicates the importance of humid and semi-humid micro-areas in the region.

3. The presence of xerobiont species is associated with continental climatic features, adapted to dry slopes and open biotopes.

4. Some species have dominant status in the biocenosis and play an important role in the stability of the ecosystem.

5. The presence of endemic species (in particular, Turanena starobogatovi) indicates that local evolutionary processes took place in the Molguzar Mountains.

6. The obtained results serve as a scientific basis for the development of measures for the protection of the territory and the preservation of biodiversity.

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