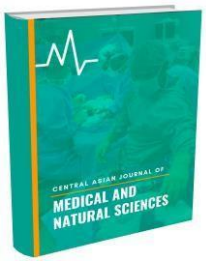

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Article

Ecological Classification and Diversity of Terrestrial Molluscs in Mount Karatepa, Uzbekistan

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Abstract: This study addresses the ecological classification and diversity of terrestrial molluscs in the Mount Karatepa region of the Zarafshan mountain range. While extensive research exists on molluscs, specific insights into their ecological groups and distribution in this area are lacking. To fill this gap, we employed the Pazilov and Azimov (2003) ecological classification method to analyze over 200 molluscs from 22 species, categorizing them into xerobionts, mesobionts, and psychrobionts. Our findings highlight a high diversity of molluscs, with mesobionts emerging as the most prevalent group. These results enhance our understanding of mollusc ecological adaptations and biodiversity in different biotopes, offering valuable information for conservation strategies in the region.

Keywords: Mount Karatepa, Gastropoda, Fauna, Ecology, Xerobiont, Mesobiont, Psychrobiont.

1. Introduction

The Karatepa mountains are the Western continuation of the Zarafshan mountain range, stretching from East to West for more than 50 km and from North to South for 35-40 km. It is separated from the Chakilkalon range in its eastern part by the Taxtakaracha pass. The average elevation is 1,000-1,500 m, with the highest point being the Kumgaza Peak (2,197 m) [1].

The slopes of the Karatepa mountains are cut by many deep soy grooves, in the north by Ilonsoy, Agalik, Oqsoy, Sazagonsoy and others, in the South by several right tributaries of the Kashkadarya (Makrid, Oyokchidarya, Taragai and others). In some areas of the hippopotamus, small flattened surfaces are found in the area. The climate is temperate in the High part and continental dry in the lower and western parts. The annual rainfall is 400-450 mm at the western end and 700-750 mm at the eastern end. Typical and dark gray and brown soils are distributed in the mountains. They grow conifers, blackberries, wheat, various shrubs (almonds, rosehip etc.), Junipers [2].

2. Materials and Methods

For the research work, over 2022-2024, more than 200 terrestrial molluscs were studied from different areas overlooking the Karatepa mountains, in particular, the area around the Kitab District: Taxtakoracha pass, the village of Ayakchi, the village of Taragai

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in the Chirokchi district, the Rivers Kashkadarya, the Kichikdjar River, the Oyokchidarya, scattered around as material [3].

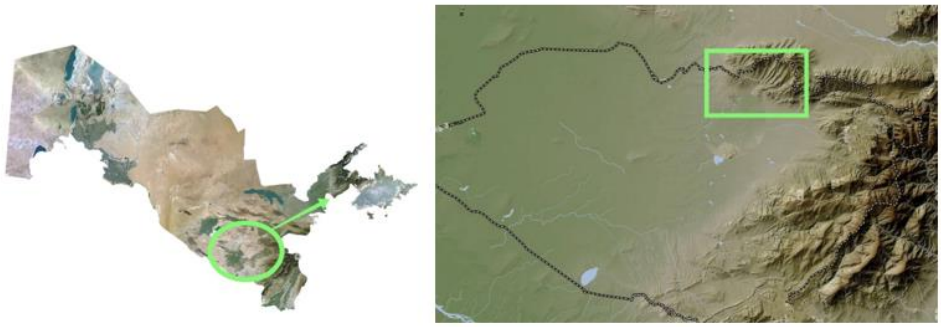

Figure 1. Map of the area under scientific research

When working with materials, the methods of Shileyko (1978,1984), Pazilov and Azimov (2003), Likharev and Rammaliers (1952) were used. Fixation used the Pazilov method, in some cases the Bratchik (1976) method. In the study of its anatomical structure, the styles Likharev and Shileyko were used. The Pazilov (2003) style has been used in ecological classification [4].

3. Results and Discussion

Various biotopes of the Karatepa dam have created ecological conditions that affect the diversity of molluscan fauna, with the area being dominated by the following species of molluscs: Cochlicopa nitens, C.lubricella, C.lubrica, Vallonia costata, V.pulchella, Pupilla muscorum, Gibbulinopsis signata, Pseudonapaeus albiplicatus, Ps.sogdianaus, Leucozonella mesoleuca, Xeropicta candacharica, Monacha carthusiana, Deroceras laeve, D.caucasicum, Candaharia rutellum, C.roseni, Macrochlamys turanica, M. sogdianum, Zonitoides nitidus, Succinea putris, Phenacomilax annularis, Ceciliodes acicula are found. The species has an uneven distribution across biotopes and regions [5].

In the upper parts of the mountain region, mowed mosses can be found on rocks along the soybeans, forming thick grass under various trees and shrubs [6,7]. Although molluscs do not feed on mosses, the grass they produce is the most favorable ecological environment for small molluscs. Mosses are not consumed by most animals, are poorly damaged by bacteria and fungi, and retain moisture for long periods has the property of being fluttering [8,9]. For this reason, mosses create a stagnant ecological environment for molluscs. Soy dye is found under grasses and among various rock heaps in Cochlicopa nitens, C.lubricella, C.lubrica, Vallonia costata, V.pulchella, Pupilla muscorum, Gibbulinopsis signata, Pseudonapaeus albiplicatus, Ps.sogdianaus Leucozonella mesoleuca, M. Sogdianum, Zonitoides nitidus are found [10].

From the base of herbaceous plants under shrubs and woody plants, Vallonia costata, V.pulchella, Pupilla muscorum, Xeropicta candacharica, Phenacomilax annularis are distributed [11,12]. From under the large hearth stones, under the Leaf beds of the large-leaved plant D.caucasicum, Candaharia rutellum, C.roseni, Macrochlamys turanica, M. sogdianum, Zonitoides nitidus, Succinea putris are distributed [13]. Pupilla muscorum, Gibbulinopsis signata, Ceciliodes acicula are scattered among the sand heaps around the river [14].

Abiotic (temperature, humidity, wind) as well as biotic (plant, animal, microorganisms) factors are important in the formation of different ecological groups of terrestrial molluscs and the survival of different biotopes [15].

Table 1. The above molluscs were classified into 3 groups according to the classification of Pazilov and Azimov(2013): xerobiont, mesobiont, psychrobiont

№	Species name	Xerebiont	Mesobiont	Psychrobiont
1	*Cochlicopa nitens*	-	-	+
2	*C.lubricella*	-	-	+
3	*C.lubrica*	-	-	+
4	*Vallonia costata*	-	+	-
5	*V.pulchella*	-	+	-
6	*Pupilla muscorum*	-	-	+
7	*Gibbulinopsis signata*	+	-	-
8	*Pseudonapaeus albiplicatus*	-	-	-
9	*Ps.sogdianaus*	+	-	-
10	*Leucozonella mesoleuca*	+	-	-
11	*Xeropicta candacharica*	-	+	-
12	*Monacha carthusiana*	-	-	+
13	*Deroceras laeve*	-	-	+
14	*D.caucasicum*	-	-	+
15	*Candaharia rutellum*	-	+	-
16	*C.roseni*	-	+	-
17	*Macrochlamys turanica*	-	+	-
18	*M. sogdianum*	-	+	-
19	*Zonitoides nitidus*	-	-	+
20	*Succinea putris*	-	-	+
21	*Phenacomilax annularis*	-	+	-
22	*Ceciliodes acicula*	-	+	-

As can be seen from the data in this table, the largest amount belongs to ga, xerobionts include 3 (13.6%) species, mesobionts include 10 (45.4%) species, and psychrobionts include 9 (41%) species of molluscs [16].

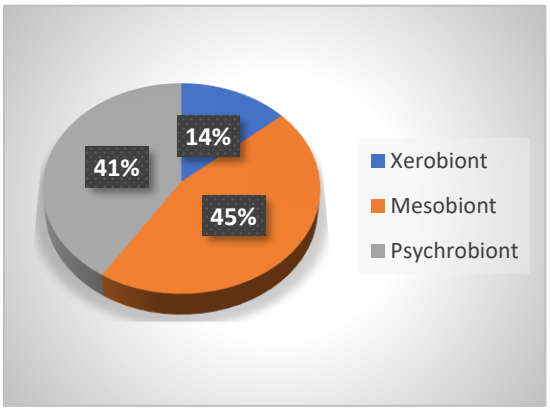

Figure 2. Ecological grouping of gastropods.

4. Conclusion

The study of terrestrial molluscs in the Mount Karatepa region revealed a significant diversity, with 22 species distributed across three ecological groups: xerobionts, mesobionts, and psychrobionts. Mesobionts were the most dominant, comprising 45.4% of the species, followed by psychrobionts and xerobionts. These findings underscore the importance of ecological diversity in mollusc populations and their adaptation to varying biotopes. The study's results provide valuable insights into the ecological dynamics of the region, with implications for biodiversity conservation strategies. Further research is recommended to explore the long-term impacts of environmental changes on these species and their ecological niches, contributing to more effective conservation efforts.

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