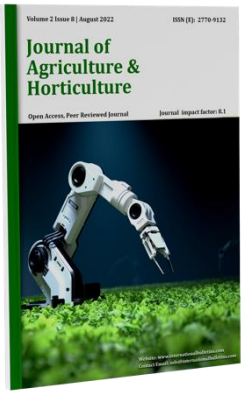

SPECIES COMPOSITION OF LAND MOLLUSCS IN THE KHOREZM OASIS AND THEIR CONSERVATION

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Abstract. This paper documents the current species composition and habitat distribution of terrestrial mollusks in the Khorezm oasis and outlines conservation priorities. Field surveys conducted in 2024–2025 across six districts recorded 19 species from 10 families and 12 genera. *Cochlicopa izzatullaevi*, *C. urgenchika*, and *Vallonia asiatica* are reported as new records for Uzbekistan. Cochlicopidae is the leading family (≈20% of the recorded pool), while Valloniidae, Agriolimacidae, and Succinidae are subdominant. Irrigation-ditch margins and orchard belts act as biodiversity refugia. The findings support conservation planning, green corridor design, and evidence-based reduction of pesticide pressure to protect terrestrial malacofauna.

Keywords: terrestrial mollusks, malacofauna, taxonomy, biotope, conchology, conservation, Khorezm oasis.

Introduction.

Conservation of biodiversity and sustainable management of natural ecosystems are a priority for the steppe landscapes of Central Asia. The role of terrestrial mollusks in the ecosystem - decomposing plant residues, improving the physical and chemical properties of the soil, and being an important link in food chains - makes them particularly important in the policy of fauna conservation. In the Khorezm oasis, irrigated agroecosystems, a network of canals, and anthropogenic landscape fragmentation have increased the mosaic of habitats; this directly affects the composition of the malacofauna. Although some species have been recorded in historical sources in the oasis and adjacent areas, in recent years, due to increased anthropogenic pressure and climatic factors, a modern inventory has become necessary. The aim of this work is to determine the updated species composition of terrestrial mollusks in various biotopes of the oasis in 2024–2025, document their distribution characteristics, and offer practical guidelines for conservation.[1,4]

Materials and methods. Area and period. Observations were conducted in the Khanka, Bogat, Urgench, Yangiarik, Khiva, and Khozarasp districts in 2024–2025. Biotopes: wetlands along ditches, orchards, undeveloped wastelands, cultivated fields, and desert edges.

Collection and identification. Shellfish species were collected using the A.A. Shileyko method, and slime worms were collected using the I.M. Likharev and A.Y. Viktor methods using manual picking, substrate sifting, and evening/morning inspections. Additional surveys were conducted during the post-wet “activity windows”. Diagnostics were based on morphological–conchological characters; comparisons were made with descriptors and regional literature.[2,3,5]

Analytical approach. The number of species, relative shares within families and genera were expressed in words; biotope-specific frequencies of occurrence and indicator features were noted.

Results. Overview of species composition

A total of 19 species were identified in the Khorezm oasis; they cover 10 families and 12 genera. The Cochlicopidae family was the leader in relative species richness, accounting for approximately one fifth of the total recorded species pool (≈20%). The Valloniidae, Agriolimacidae, and Succinidae families each accounted for around 12–15% of the total species pool and formed a subdominant group. Representatives of the Pupillidae, Vertiginidae, Hygromiidae, Helicidae, Vitrinidae, Gastrodontidae, and Helicarionidae are represented by less common, often narrowly specialized or biotope-demanding species.[3,6]

Important and noteworthy records

-New records (for Uzbekistan): Cochlicopa izzatullaevi, Cochlicopa urgenchika, Vallonia asiatica — confirmed by conchological characters, size ranges and biotope characteristics; they indicate that the biogeographical connections of the oasis are active.

-Wet indicators: Vallonia spp., Pupilla muscorum, Vertigo pygmaea, representatives of Succinidae (e.g. Novisuccinea evoluta, Oxyloma elegans, Succinea putris) — stably found along ditches, in wet meadows, and in orchard microbiotopes.

-Semi-arid indicators: Macrochlamys turanica, Xeropicta candacharica — recorded on desert edges and undeveloped clearings.

-Slime worms (Agriolimacidae): Deroceras laeve, D. reticulatum, D. caucasicum — active in areas with a lot of organic residues in agroecosystems, during wet seasonal phases.

Biotope and distribution range. Stream banks, wet meadows and orchard biotopes increase species richness as “refugium”: especially important for Vallonia spp. and Succinidae. Uncultivated glades provide suitable habitats for Cochlicopidae and some Helicidae. Species such as Macrochlamys and Xeropicta have formed adapted populations on the edges of deserts.

Discussion.

Conservation requirements and priorities

The results justify the following areas for the conservation of terrestrial mollusks in the Khorezm oasis:

1. Preservation and restoration of microbiotopes: meadows along ditches, wet patches, orchard-orchard pass-proximal zones; these areas are “hotbeds” of species richness.

2. Reduction of pesticide load: IPM (integrated pest management) in agroecosystems, selective preparations, shifting the treatment period to periods of low activity of beneficial fauna.

3. Planning at the landscape level: maintaining continuity between biotopes through green corridors and “semi-wild” border strips.

4. Institutionalization of monitoring: maintaining a database of spring-autumn seasonal transects, GPS-pointed photo documentation and conchological measurements; early detection of new records and signals of decline.

Bioindication and practical significance

The small clams Vallonia, Pupilla, Vertigo are proposed as bioindicators because they are sensitive to changes in moisture and substrate. The presence of Succinidae populations indicates the importance of irrigation regime and the quality of wet biotopes. These approaches help to assess the stability of ecosystems in near real time.[1,4]

Limitations and future work. This work has updated the faunal database; however, it is desirable to enrich it with multi-year monitoring and molecular identification (e.g., DNA barcoding) to reveal population density, genetic diversity, and sensitivity to microclimate–soil gradients.[1,6,8]

Conclusion

1. During the observations conducted in 2024–2025, 19 species (10 families, 12 genera) of terrestrial mollusks were recorded in the Khorezm oasis; Cochlicopidae is the dominant, and Valloniidae, Agriolimacidae, and Succinidae are subdominant groups.

2. Cochlicopa izzatullaevi, C. urgenchika, and Vallonia asiatica are new records for the fauna of Uzbekistan, indicating the biogeographical significance of the oasis.

3. Ariqboyi–bog biotopes require special protection as refugiums; It is necessary to reduce pesticide loads on a scientific basis, plan green corridors at the IPM and landscape level.

4. The results can be used as a basis for regional fauna conservation plans, red list criteria, and ecological expertise in national economic projects.

Practical recommendations

-Maintaining grass strips along ditches and using wild plant mixtures - strengthens habitats for Vallonia, Succinidae.

-IPM: beneficial non-disturbing, selective protection agents; adjust the processing time to periods of low insect activity.

-Monitoring protocol: twice a year (spring-autumn), standard transects, GPS-photo, conchological measurements.

Database: open, with records at the district level (for scientific cooperation).

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