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FREE-LIVING INFUSOR FAUNA OF THE ARAZ RESERVOIR OF THE NAKHCHIVAN AUTONOMOUS REPUBLIC

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ФАУНА ИНФУЗОРИЙ АРАЗСКОГО ВОДОХРАНИЛИЩА НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКИ

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Abstract. The article studies the fauna of free-living infusoria (Ciliophora) in the Araz reservoir of the Nakhchivan Autonomous Republic. As a result of seasonal studies during 2018–2022, 61 species of ciliated infusoria belonging to 29 families and 38 genera were identified. During the study, modern classification systems proposed by Lynn (2008) and Adl et al. (2005) were used, and the results obtained are of great importance in terms of studying the infusoria fauna of the reservoir and can be used as baseline data in future ecological monitoring and biodiversity conservation.

Аннотация. Рассматривается фауна свободноживущих инфузорий (Ciliophora) Аразского водохранилища Нахчыванской Автономной Республики. В результате сезонных исследований 2018–2022 гг. Выявлен 61 вид реснитчатых инфузорий, относящихся к 29 семействам и 38 родам. В ходе исследования использовались современные системы классификации, предложенные Линном (2008) и Адлом и др. (2005). Полученные результаты имеют важное значение для изучения фауны инфузорий водохранилища и могут быть использованы в качестве исходных данных в будущем экологическом мониторинге и сохранении биоразнообразия.

Keywords: infusoria, Araz, faunal diversity, freshwater basins, protozoology.

Ключевые слова: инфузории, Араз, фаунистическое разнообразие, пресноводные водоемы, протозоология.

Among the groups of protozoa, free-living infusoria play a major role in the processes of transformation of organic matter [3-5].

This group of free-living unicellular organisms actively participates in the processes of transformation of organic matter at the initial trophic levels and is known to be food objects for many small groups of hydrobionts [6].

Free-living infusoria have long been known for their rapid response to the slightest changes in environmental factors and are widely used in bioassays both at the cellular-organismal level and at the community level [7, 16].

Despite the importance of studying infuzors, unlike in Russia, this group has not been sufficiently studied in Azerbaijan, but has been intensively studied by a number of foreign specialists [1, 2, 14].

The first information about this group of protozoa in Azerbaijan is known from the works of Vaysig (1940) [15]. Summarizing the results of these authors, it can be noted that until the beginning of the modern research period, about 70 species of infuzors were known in the Azerbaijani fauna. In modern times, the infuzors fauna of the republic has been studied relatively satisfactorily [1-3].

It should be noted that, according to recent studies, a total of 757 species of infuzoans and amoebas have been recorded in the waters and soils of Azerbaijan [2].

Material and research methodology

Samples were collected from various reservoirs of the Autonomous Republic seasonally in 2018–2022. We conducted a comparative analysis of the species diversity of free-living infuzoans in the freshwaters of the autonomous republic, their spreading, and some ecological characteristics of these primitive groups. For free-living infuzoans, we used the classification system [7, 8]. The taxonomy of free-living infuzoans is given in accordance with the eukaryotic system proposed by an international group of experts [9].

Samples collected from the area were observed under binoculars, and infuzoans were collected with a microcapillary and studied alive under an Olympus microscope. Impregnation methods with silver nitrate and silver proteinate were used [1, 2].

Discussion

As a result of our research in the studied water basin of the Autonomous Republic, we identified 61 species of free-living ciliated infusoria belonging to 29 families and 38 genera [10-14]. The macrotaxonomic list of ciliated infusoria of the reservoirs of the Autonomous Republic we studied is as follows: to determine the taxonomic affiliation of the species.

Phylum. Ciliophora

1. Classis: Karyorelictea
Ordo. Loxodida (Jankowski, 1978)
Familia. Loxodidae (Bütschli, 1889)
2. Classis. Heterotrichea
Ordo. Heterotrichida (Stein, 1859)
Familia. Spirostomatidae
Familia. Stentoridae (Carus, 1863)
3. Classis. Spirotrichea (Bütschli, 1889)
Ordo. Stichotrichida (Faure-Fremiet, 1961)
Familia. Oxytrichida (Ehrenberg, 1838)
Ordo. Urostylida (Jankowski, 1980)
Familia. Pseudokeronopsidae (Borror et Wicklow, 1983)
Familia. Urostylidae (Bütschli, 1889)
Ordo. Euplotida (Jankowski, 1980)
Familia. Euplotidae (Ehrenberg, 1838)
Familia. Aspidiscidae (Ehrenberg, 1838)
Familia. Uronychiidae (Jankowski, 1979)
Ordo. Halteriida (Petz et Foissner, 1992)
Familia. Halteriidae (Claparede et Lachmann, 1858)
Ordo. Tintinnida (Kofoid et Campbell, 1929)
Familia. Tintinnidiidae (Kofoid et Campbell, 1929)

4. Classis. Armophorea
 - Ordo. Apmophorida (Jankowski, 1964)
 - Familia. Caenomorphidae (Poche, 1913)
 - Ordo. Odontostomatida (Sawaya, 1940)
 - Familia. Mylestomatidae (Kahl in Doflein und Reichenow, 1929)
5. Classis. Litostomatea
 - Ordo. Haptorida (Corliss, 1974)
 - Familia. Lacrymariidae (Fromentel, 1876)
 - Familia. Didiniidae (Poche, 1913)
 - Familia. Tracheliidae (Ehrenberg, 1838)
 - Ordo. Pleurostomatida (Schewiakoff, 1896)
 - Familia. Amphileptidae (Bütschli, 1889)
 - Familia. Litonotidae (Kent, 1882)
6. Classis. Prostomatea
 - Ordo. Prorodontida (Corliss, 1974)
 - Familia. Holophryidae (Perty, 1852)
 - Familia. Colepidae (Ehrenberg, 1838)
7. Classis. Phyllopharyngea
 - Ordo. Chlamydodontida (Deroux, 1976)
 - Familia. Chilodonellidae (Deroux, 1970)
8. Classis. Colpodea
 - Ordo. Colpodida (Puytorac et al., 1974)
 - Familia. Colpodidae (Bory de St. Vincent, 1826)
9. Classis. Oligohymenophorea
 - Ordo. Sessilida (Kahl, 1933)
 - Familia. Vorticellidae (Ehrenberg, 1838)
 - Familia. Zoothamniidae (Sommer, 1951)
 - Familia. Vaginicolidae (Fromentel, 1874)
 - Familia. Epistylididae (Kahl, 1933)
 - Ordo. Tetrahymenida (Faure-Fremiet in Corliss, 1956)
 - Familia. Turaniellidae (Didier, 1971)
 - Familia. Tetrahymenidae (Corliss, 1952)
 - Ordo. Peniculida (Faure-Fremiet in Corliss, 1956)
 - Familia. Parameciidae (Dujardin, 1840)

Thus, the discovered species belong to 9 classis (currently the Ciliophora type includes 11 classes), 17 orders and 29 families. The species diversity of the noted infusorian genera in different studied water bodies varies. Only 4 genera are represented in the most diverse way: Vorticella — 7 species or 11.5% of the total number of species found; Stentor — 4 species or 6.5%; Holophrya and Paramecium — 3 species or 4.9% each. The remaining genera are represented by one or two species (Table).

Thus, the dominant species in terms of occurrence in the water and samples are Coleps hirtus, Dileptus anser, Loxodes rostrum, Colpodacu cullus, Stylonychia mytilis, Vorticella convallaria, V. picta, Paramecium aurelia, Tetrahymena pyriformis.

Table

SEASONAL DYNAMICS OF OCCURRENCE OF INFUSORS IN ARAZ RESERVOIR

Type	Months					
	V	VI	VII	VIII	IX	X
<i>Stentor pyriformis</i>		+	++	+++	+++	++
<i>Stentor roeseli</i>			+	++	++	+
<i>Stentor coeruleus</i>		+	++	+++	++	+
<i>Stentor fuliginosus</i>			+	+		
<i>Prorodon ovum</i>			+	++	+	
<i>Prorodon teres</i>		+	++	++	++	+
<i>Coleps hirtus</i>	+	+	++	+++	++	+
<i>Coleps elongatus</i>			+	+		
<i>Dileptus anser</i>	+	++	++	+++	++	+
<i>Loxodes rostrum</i>	+	++	+++	+++	++	+
<i>Chilodonella cucullulus</i>		+	++	++	+	+
<i>Chilodonella uncinata</i>		+	++	+++	++	+
<i>Colpoda cucullus</i>	+	++	+++	+++	++	+
<i>Lacrumaria olor</i>			+	++	+	
<i>Caenomorpha sapropelica</i>				+		
<i>Oxytricha lanceolata</i>		+	++	+++	++	++
<i>Stylonychia pustulata</i>		+	++	+++	++	+
<i>Stylonychia putrina</i>			+	++	+	
<i>Stylonychia mytilis</i>	+	+	++	+++	++	+
<i>Euplotes mutabilis</i>		+	+	++	+	
<i>Euplotes moebiusif quadricirratu</i>		+	+	+	+	
<i>Aspidisca costata</i>		+	+	++	++	+
<i>Aspidisca lynceus</i>			+	+		
<i>Uroleptus musculus</i>		+	+	++	++	+
<i>V. convallaria</i>	+	++	++	+++	++	+
<i>V. campanula</i>		+	++	+++	++	+
<i>V. picta</i>	+	++	+++	+++	++	+
<i>Rhabdostyla ovum</i>			+	+		
<i>Coturnia annulata</i>				+		
<i>Coturnia oblonga</i>			+	+		
<i>Tintinnidium semiciliatum</i>				+		
<i>Paramecium aurelia</i>	+	++	+++	+++	++	+
<i>Paramecium caudatum</i>			+	++	+	
<i>Paramecium bursaria</i>		+	++	++	+	
<i>Paruroleptus musculus</i>						
<i>Amphileptus pleurosigma</i>						
<i>Zoothamnium parasiticum</i>		+	+	++	+	
<i>Spiristomum minus</i>		+	++	+++	++	+
<i>Spiristomum ambigium</i>		+	++	+++	++	+
<i>Hemiophrys procera</i>				+	+	
<i>Carchesium polypinum</i>			+	++	+	
<i>Tetrahymena pyriformis</i>	+	+	++	+++	++	+
<i>Loxophyllum meleagris</i>				+		
<i>Pseudokeronopsis rubra</i>			+	++	+	

Conclusion

As a result of our studies in the studied water body, 61 species of free-living ciliated infuzors belonging to 29 families and 38 genera were identified.

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