

## ANNOTATED LIST OF FISHES OF THE CHIRCHIK RIVER, UZBEKISTAN

Quvatov Asqar Qoraqulovich<sup>1</sup>,

Mirzayev Ulugbek Turayevich<sup>2</sup>,

Atamuratova Mukhayyo Shavkatovna<sup>3</sup>

Institute of Zoology, Academy of Sciences of the Republic of Uzbekistan<sup>1,2,3</sup>

E-mail: [asqarquvatovxabb@mail.ru](mailto:asqarquvatovxabb@mail.ru)

**Abstract:** *A list of fish inhabiting the water bodies of the Chirchik river basin is given. The list contains 43 species belonging to 8 orders, 15 families, and 38 genera. Included are all currently registered species whose validity has been revised in the relevant systematic revisions. The results of ichthyological observations along the Chirchik River for 1996-2021 are presented. The list of species is provided using international ichthyological norms and international databases. Coordinate addresses were obtained and a Geo information system map was created.*

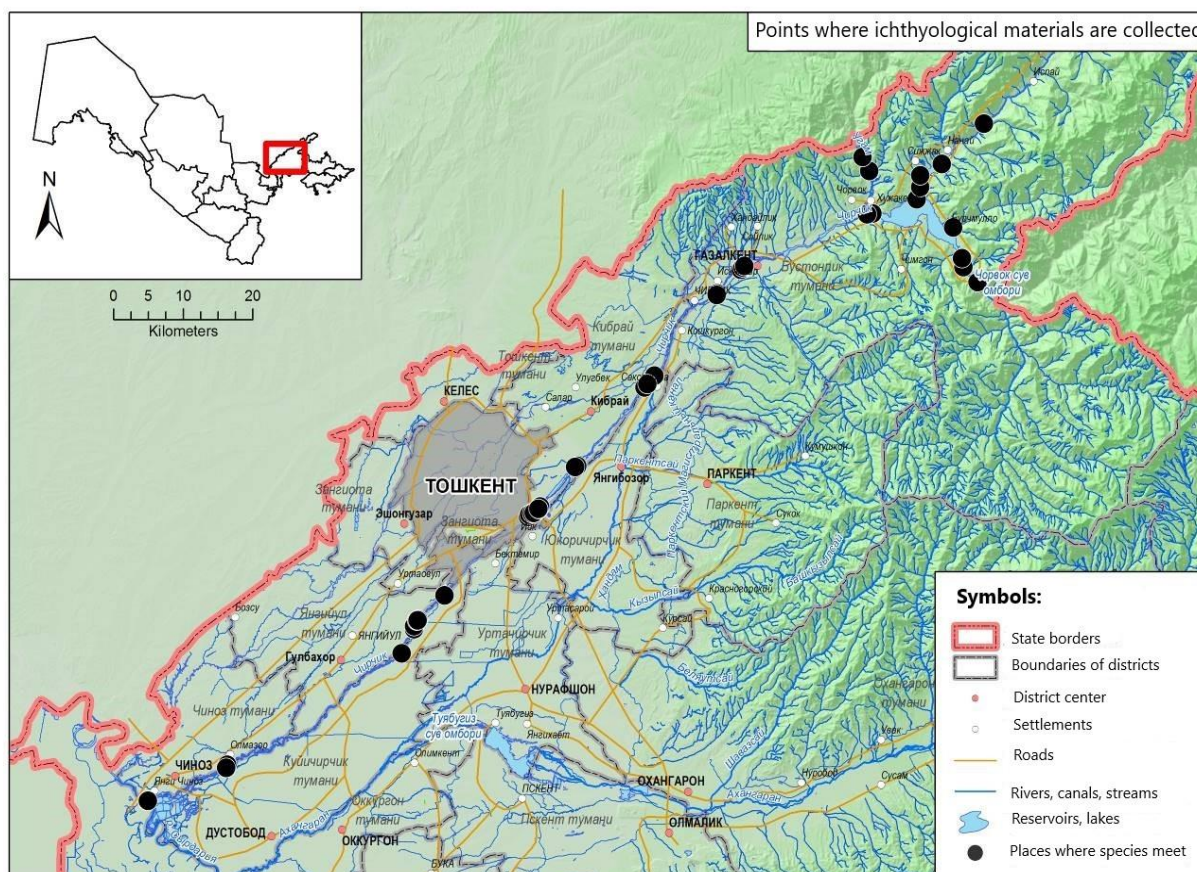
**Keywords:** *Uzbekistan, River Chirchik, Ichthyofauna, species composition, native species, Alien species, Climatised species, coordinates.*

**Introduction:** Research of the ichthyofauna of Central Asia, in particular Uzbekistan, began in the 18th-19th century by expeditions of travelers A.P. Fedchenko and N.M. Prezhevalsky. Below is a taxonomic list of 43 fish species found in the River Chirchik. Classification of taxa from class to genus is given according to the system of J. Nelson (Nelson, 2006; Nelson *et al.*, 2016) with minor changes (Eshmeyer, 1990; Annotated catalog, 1998; Atlas of Russian freshwater fish, 2002; Bogutskaya and Naseka, 2004; Kottelat, 2012; Prokofiev, 2017; Mirzaev, 2000, 2001, 2019; Mirzaev and Quvatov, 2020; Kamilov *et al.*, 2004), compared with data from the international fish database (Froese R. and Pauly D. 2022).

Studies on the study of biology, identification and description, morphometry, morphology of fish species were also given in the works of scientists from the countries of the Commonwealth of Independent States (CIS), G.V. Nikolsky (Nikolsky, 1971, 1974), F.A. Turdakov (Turdakov, 1963), V.P. Mitrafanov *et. all.* (Mitrafanov *et all.*, 1989), A.N. Reshetnikov (Reshetnikov, 2018), M.F. Wundzettel (Wundzettel, 2006), A.M. Prokofev (Prokofev, 2010).

Thanks to the work of G.K. Kamilov (Kamilov, 1973), T.V. Salikhov (Salikhov, 1990), U.T. Mirzaev (Mirzaev, 2000, 2001) information on the ichthyofauna of the River Chirchik has expanded significantly, but complete faunistic lists of fish species have not yet been published.

**Material and Methods:** Some data on the composition of the ichthyofauna are given with amendments and additions based on the study of the material by U.T. Mirzaev, collected in 1996-2018. In recent years (2019-2021) A.Q. Quvatov, ichthyological materials were collected (Fig. 1). Collections of which were processed and published by K.F. Kessler (Kessler, 1872, 1874, 1877) and S.M. Gertsenstein (Gertsenstein, 1888). The first, most complete information about the fish found in the River Chirchik is given in the works of L.S. Berg (Berg, 1905, 1948, 1949), G.V. Nikolsky (Nikolsky, 1938), F.A. Turdakov (Turdakov, 1963).



**Fig. 1.** As a result of ichthyological research conducted along the Chirchik River during 2019-2021, the meeting places of fish species collected are listed.

### **Results:**

The list of modern ichthyofauna of fish species distributed in the Chirchik River and its tributaries is presented in **Table 1**.

Table-1

## Current modern ichthyofauna of Chirchik River water bodies

№	In the section of family and species	Mountain zone	Foothill zone	Plain zone	Lower zone
Cyprinidae					
1	<i>Rhodeus ocellatus</i>	-	-	AI	-
2	<i>Luciobarbus conocephalus</i>	-	-	E	E
3	<i>Ctenopharyngodon idella</i>	-	-	A	A
4	<i>Hemiculter leucisculus</i>	AI	AI	-	-
5	<i>Carassius gibelio</i>	-	-	A	A
6	<i>Cyprinus carpio</i>	N	N	N	N
7	<i>Abbottina rivularis</i>	-	-	AI	AI
8	<i>Gobio cynocephalus</i>	-	-	AI	-
9	<i>Gobio lepidolaemus</i>	-	E	E	-
10	<i>Pseudorasbora parva</i>	-	-	AI	-
11	<i>Abramis brama orientalis</i>	-	-	-	E
12	<i>Alburnoides taeniatus</i>	-	-	E	-
13	<i>Alburnus oblongus</i>	-	-	E	-
14	<i>Aristichthys nobilis</i>	-	-	A	A
15	<i>Hypophthalmichthys molitrix</i>	-	-	A	A
16	<i>Aspius aspius iblioides</i>	-	-	-	E
17	<i>Squalius squaliusculus</i>	-	-	-	E
18	<i>Rutilus aralensis</i>	-	-	E	E
19	<i>Pelecus cultratus</i>	-	-	A	A
20	<i>Opsariichthys bidens</i>	-	-	AI	-
21	<i>Gymnodiptychus kessleri</i>	N	-	-	-
22	<i>Schizothorax eurystomus</i>	E	E	E	E
Cobitidae					
23	<i>Sabanejewia aralensis</i>	-	-	E	-
Balitoridae					
24	<i>Iskandaria kuschakewitschi</i>	-	E	E	-
25	<i>Triplophysa coniptera salari</i>	-	-	E	E
26	<i>Triplophysa dorsalis</i>	-	E	-	-
27	<i>Triplophysa elegans</i>	-	E	E	-
28	<i>Triplophysa strauchi</i>	-	-	-	AI
Ictaluridae					
29	<i>Ictalurus punctatus</i>	-	-	-	A
Siluridae					
30	<i>Siluris glanis</i>	-	-	N	N
Sisoridae					
31	<i>Glyptosternon oschanini</i>	E	-	-	-

Esocidae					
32	<i>Esox Lucius</i>	-	-	N	N
Coregonidae					
33	<i>Coregonus peled</i>	A	-	-	-
Salmonidae					
34	<i>Parasalmo mykiss</i>	A	-	-	-
35	<i>Salmo ischchan</i>	A	-	-	-
Adrianichthyidae					
36	<i>Oryzias sinensis</i>	-	-	AI	AI
Poecilidae					
37	<i>Gambusia affinis</i>	-	-	A	A
38	<i>Gambusia holbrooki</i>	-	-	A	A
Cottidae					
39	<i>Cottus jaxartensis</i>	E	-	-	-
Percidae					
40	<i>Sander lucioperca</i>	-	-	-	A
Odontobutidae					
41	<i>Micropercops cinctus</i>	-	-	AI	AI
Gobiidae					
42	<i>Rhinogobius brunneus</i>	-	-	AI	AI
Channidae					
43	<i>Channa argus</i>	-	-	AI	AI
	<b>Total:</b>	<b>9</b>	<b>7</b>	<b>29</b>	<b>25</b>
	<b>Endemic species:</b>	<b>16</b>			
	<b>Native species:</b>	<b>4</b>			
	<b>Acclimatized species:</b>	<b>12</b>			
	<b>Alien introduced species:</b>	<b>11</b>			

Note: E – Endemic species, N – Native species, A – Acclimatized species, AI – Alien introduced species.

Below is a list of species recorded in Chirchik River water bodies based on modern systematics and taxonomic nomenclature.

## Chordata

### Vertebrata

#### Osteichthyes

##### Actinopterygii Klein, 1885

##### Neopterygii

##### Teleostei

##### Euteleostei

##### Ostariophysii

##### Cypriniformes

**Cyprinidae** Fleming, 1822**Acheilognathinae** Bleeker, 1863**Rhodeus** (Agassiz, 1832)

1. *Rhodeus ocellatus* (Kner, 1866)

**Barbinae** (Bleeker, 1859)**Luciobarbus** (Heckel, 1843)

2. *Luciobarbus conocephalus* (Kessler, 1872)

**Squaliobarbinae** (Rainboth, 1991)**Ctenopharyngodon** (Steindachner, 1866)

3. *Ctenopharyngodon idella* (Valenciennes, 1844)

**Cultrinae** (Nikolsky, 1950)**Hemiculter** (Bleeker, 1859)

4. *Hemiculter leucisculus* (Basilewsky, 1855)

**Cyprininae** (Bonaparte, 1831)**Carassius** (Jarocki, 1822)

5. *Carassius gibelio* (Bloch, 1782)

**Cyprinus** (Linnaeus, 1758)

6. *Cyprinus carpio* (Linnaeus, 1759)

**Gobioninae** (Jordan et Fowler, 1803)**Abbottina** (Jordan et Fowler, 1903)

7. *Abbottina rivularis* (Basilewsky, 1855)

**Gobio** (Cuvier, 1816)

8. *Gobio cynocephalus* (Dybowski 1869)

9. *Gobio lepidolaemus* (Kessler, 1872)

**Pseudorasbora** (Bleeker, 1859)

10. *Pseudorasbora parva* (Temminck et Schlegel, 1846)

**Leuciscinae** (Bonaparte, 1837)**Abramidini** (Dybowski, 1862)**Abramis** (Cuvier, 1816)

11. *Abramis brama* (Linnaeus, 1758) *ssp. orientalis* (Berg, 1949)

**Alburnini** (Girard, 1859)**Alburnoides** (Jetteles, 1861)

12. *Alburnoides taeniatus* (Kessler, 1874)

**Alburnus** (Rafinesque, 1820)

13. *Alburnus oblongus* (Bulgakov, 1923)

**Hypophthalmichthyini** (Günther, 1868)**Aristichthys** (Oshima, 1919)

14. *Aristichthys nobilis* (Richardson, 1845)

*Hypophthalmichthys* (Bleeker, 1859)

15. *Hypophthalmichthys molitrix* (Valenciennes, 1844)

**Leuciscini** (Bonaparte, 1846)

*Aspius* (Agassiz, 1832)

16. *Aspius aspius* (Linnaeus, 1758) *ssp. iblioides* (Kessler, 1872)

**Squalius** (Bonaparte, 1837)

17. *Squalius squaliusculus* (Kessler, 1872)

**Rutilus** (Rafinesque, 1820)

18. *Rutilus aralensis* (Berg, 1916)

**Pelecinae** (Bogutskaya, 1990)

**Pelecus** (Agassiz, 1835)

19. *Pelecus cultratus* (Linnaeus, 1758)

**Rasborinae** (Günther, 1868)

**Opsariichthys** (Bleeker, 1863)

20. *Opsariichthys bidens* (Günther, 1873)

**Schizothoracinae**

**Gymnodiptychus** (Herzenstein, 1892)

21. *Gymnodiptychus kessleri* (Russky, 1888)

**Schizothorax** (Heckel, 1838)

22. *Schizothorax eurystomus* (Kessler, 1872)

**Cobitoidea** (Swainson, 1839) (emend. Sawada, 1982)

**Cobitidae** (Swainson, 1839)

**Sabanejewia** (Vladykov, 1929)

23. *Sabanejewia aralensis* (Kessler, 1877)

**Balitoridae** (Swainson, 1839)

**Nemacheilinae** (Regan, 1911)

**Nemacheilini** (Swainson, 1839) (emend. nov.)

**Iskandaria** (Prokofiev, 2009)

24. *Iskandaria kuschakewitschi* (Herzenstein, 1890)

**Triplophysini** (Prokofiev 2010)

**Triplophysa** (Rendahl, 1933)

25. *Triplophysa coniptera* (Turdakov, 1954) *ssp. salari* (Turdakov 1954)

26. *Triplophysa dorsalis* (Kessler, 1872)

27. *Triplophysa elegans* (Kessler, 1874)

28. *Triplophysa strauchi* (Kessler, 1874)

**Siluriformes**

**Ictaluridae** (Gill, 1861)

**Ictalurus** (Rafinesque, 1820)

28. *Ictalurus punctatus* (Rafinesque, 1818)

**Siluridae** (Cuvier, 1816)

*Silurus* (Linnaeus, 1758)

30. *Silurus glanis* (Linnaeus, 1758)

**Sisoridae** (Regan, 1911)

**Glyptosterninae**

*Glyptosternon* (McClelland, 1842)

31. *Glyptosternon oschanini* (Herzenstein, 1889)

**Protacanthopterygii**

**Esociformes**

**Esocidae** (Cuvier, 1816)

*Esox* (Linnaeus, 1758)

32. *Esox lucius* (Linnaeus, 1758)

**Salmoniformes**

**Coregonidae** (Cope, 1872)

*Coregonus* (Linnaeus, 1758)

*Leucichthys* (Dybowski, 1874)

33. *Coregonus peled* (Gmelin, 1789)

**Salmonidae** (Cuvier, 1816)

*Parasalmo* (Vladykov, 1972)

34. *Parasalmo mykiss* (Walbaum, 1792)

*Salmo* (Linnaeus, 1758)

35. *Salmo ischchan* (Kessler, 1877)

**Acanthopterygii**

**Beloniformes**

**Adrianichthyidae**

*Oryzias* (Jordan et Snyder, 1907)

36. *Oryzias sinensis* (Chen, Uwa et Chu, 1989)

**Cyprinodontiformes**

**Cyprinodontoidei**

**Poeciliidae** (Swainson, 1839)

*Gambusia* (Poey, 1854)

37. *Gambusia affinis* (Baird and Girard, 1853)

38. *Gambusia holbrooki* (Girard, 1859)

**Scorpaeniformes**

**Cottoidei**

**Cottidae** (Bonaparte, 1831)

**Cottinae** (Bonaparte, 1831)

*Cottus* (Linnaeus, 1758)

39. *Cottus jaxartensis* (Berg, 1916)

**Perciformes**

**Percoidei**

**Percidae** (Cuvier, 1816)

*Sander* (Oken, 1817)

40. *Sander lucioperca* (Linnaeus, 1758)

**Gobioidei**

**Odontobutidae** (Hoesse et Gill, 1993)

*Micropercops* (Fowler et Bean, 1920)

41. *Micropercops cinctus* (Dabry de Thiersant, 1872)

**Gobiidae** (Fleming, 1822)

*Rhinogobius* (Gill, 1859)

42. *Rhinogobius brunneus* (Temminck et Schlegel, 1845)

**Channoidei**

**Channidae** (Fowler, 1934)

*Channa* (Scopoli, 1777)

43. *Channa argus* (Cantor, 1842)

**Conclusion:** thus, the modern ichthyofauna of the Chirchik River (including the Charvak reservoir) has 43 species belonging to 38 genera, 15 families, 8 orders. Of these, 25 are native, 18 are invasive (acclimatized and accidentally introduced).

In the data of Salikhov (**Salikhov, 1990**), 39 species were mentioned in the ichthyofauna of the Chirchik River, including: 11 acclimatized, 9 accidental and 19 local species.

According to Wundtsettel (**Wundzettel, 2006**), 37 species are listed in the modern ichthyofauna of the Chirchik River.

**Acknowledgments:** We express our gratitude to the leader and the team of the practical project of the research plan of the Zoological Institute No. PZ-20170920204 “Assessment of the current state of fish resources in the reservoirs of the North-Eastern zone of Uzbekistan, and development of evidence-based recommendations for their sustainable use” (2018-2020).

**List of used literature**

1. Annotated catalog of cyclostomes and fishes of the continental waters of Russia (**1998**). (Under the editorship of Y.S. Reshetnikov). – M.: Nauka, – 218 p.
2. Atlas of freshwater fish of Russia (**2002**). (Under the editorship of Y.S. Reshetnikov). – M.: Nauka, T.1. – 379 p.



3. Bakhtiyar Kamilov, Bakhtiyor Karimov, Dietmar Keyser (2004). The modern state of fisheries in the Republic of Uzbekistan and its perspectives // World Aquaculture, See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/288839227>
4. Berg L.S. (1905). Fishes of Turkestan. Izv. Turkish department Russian geogr. society. – St. Petersburg, - 261-p.
5. Berg L.S. (1949, 2). Freshwater fishes of the USSR and neighboring countries. Part 2. – Moscow, - PP. 470-925.
6. Berg L.S. (1949, 3). Freshwater fishes of the USSR and neighboring countries. - M.-L.: Ed. Academy of Sciences of the USSR, 1948. Part 1. – PP. 1-466., Part 3. – PP. 927-1382.
7. Bogutskaya N.G., Naseka A.M. (2004). Catalog of jawless and fishes of fresh and brackish waters of Russia with nomenclature and taxonomic comments. – M.: Association of scientific publications of the KMK, - 389 p.
8. Eshmeyer WN (1990). Catalog of the genera of recent fishes. – San Francisco: Published by the California Academy of Sciences, – 697 p.
9. Froese R. and Pauly D. (2022). FishBase. World Wide Web electronic publication. [www.fishbase.de](http://www.fishbase.de), version (02/2022) <https://www.fishbase.de/summary/html>
10. Gertsenstein S.M. (1888). Scientific results of N.M. Prezhvalsky in Central Asia. // Fish: (Department of Zool. T. 3. Part 2). - SPb., Vol. 1. – PP. 1-91.
11. Kamilov G.K. (1973). Fish and biological bases of fishery development of reservoirs in Uzbekistan. – Tashkent: Fan, - 234 p.
12. Kessler K.F. (1872). News of the Imperial Society of Naturalists, Anthropology and Ethnography. Volume X, issue 1. – Moscow, - 168 p.
13. Kessler K.F. (1874). Journey of A.P. Fedchenko to Turkestan // Pisces. Izv. Gen.-and loves. natural Anthropology and Ethnography T. 2. Issue. 3. – Moscow: St. Petersburg, - 63 p.
14. Kessler K.F. (1877). Journey of A.P. Fedchenko to Turkestan. // Fish. Izv. Gen. and loves. natural Anthropology and Ethnography, T. 2. Issue. 3. Fish found and found in the Aral-Caspian-Pontic ichthyological region. – St.Petersburg, - 360 p.
15. Kottelat M. (2012). Conspectus Cobitidum: An inventory of the loaches of the World (Teleostei: Cypriniformes: Cobitoidei). // The Raffles Bulletin of Zoology, Supplement No. 26: 1-199.
16. Куватов, А. К. (2021). МОРФОМЕТРИЧЕСКИЕ И ДИАГНОСТИЧЕСКИЕ ПРИЗНАКИ GAMBUSIA HOLBROOKI (CYPRINODONTIFORMES: ROESILIIDAE), ОБИТАЮЩИЕ В РЕКЕ ЧИРЧИК. In *Экология родного края: проблемы и пути их решения* (pp. 324-327).

17. Куватов, А. К. МОРФОМЕТРИЧЕСКИЕ И ДИАГНОСТИЧЕСКИЕ ПРИЗНАКИ *GAMBUSIA HOLBROOKI* (CYPRINODONTIFORMES: POECILIIDAE), ОБИТАЮЩИЕ В РЕКЕ ЧИРЧИК. *Ответственный редактор*, 324.
18. Mirzaev U.T. (2000, 2001, 2019). Biodiversity of fish in Uzbekistan: species richness and degree of endemism // Reports of the Academy of Sciences of the Republic of Uzbekistan, no. 8. – PP. 49-52.; Biodiversity of fish in Uzbekistan: a strategy for conservation of species diversity. Uzb. biol. magazine, no. 3. - PP. 40-44.; *Baliklar. Uzbekiston Republicasi Qizil kitobi*. – Toshkent: “Chinor ENK”, II zild. Hayvonlar. – PP. 106-126.
19. Mirzaev U.T., Kuvatov A.K. (2020). Annotated list of fish of the Chirchik River // Zoological science of Uzbekistan: modern problems and development prospects: Materials of the republican scientific-practical conference. – Tashkent, - PP. 184-188.
20. Mitrofanov V.P., Dukravets G.M. et. all. (1989). *Fishes of Kazakhstan T.4.* - Alma-Ata, Kazakh SSR. – 34 p.
21. Nelson JS (2006). *fishes of the world*. – New York: John Wiley & Sons, Inc., 4th ed. – XX-601 p.
22. Nelson JS, Grande TC, Wilson MVH (2016). *fishes of the world*. – New York: John Wiley & Sons, Inc., 5th ed. – XLI-707 p.
23. Nikolsky G.V. (1938). *Fish of Tajikistan*. - M.-L.: Ed. Academy of Sciences of the USSR, - 228 p.
24. Nikolsky G.V. (1971). *Private ichthyology Higher school*. – Moscow, - 471 p.
25. Nikolsky G.V. (1974). *Ecology of fish. Higher School, Moscow*, - 367 p.
26. Prokofev A.M. (2010). Morphological classification of loaches (*Nemacheilinae*) // *Journal of Ichthyology*, Vol-50, №-10. Pleiades Publishing, Ltd. – Москва. – P. 827-913.
27. Prokofiev A.M. (2017). *Charrs of the subfamily Nemacheilinae of the world fauna*. – Yaroslavl: Filigree, - 315 p.
28. Quvatov A.Q., Atamuratova M.Sh., Mirzayev U.T. (2022). Morphometric Characteristics of *Gambusia holbrooki* and *Gambusia affinis* (Cyprinodontiformes: Poeciliidae) Distributed on the Plains of the Chirchik River, Uzbekistan // *Egyptian Journal of Aquatic Biology & Fisheries*. ISSN 1110-6131. Vol. 26(1): 341-350. DOI: [10.21608/EJABF.2022.217574](https://doi.org/10.21608/EJABF.2022.217574).
29. Quvatov, A. Q., & Atamuratova, M. S. (2014). MORPHOMETRIC CHARACTERISTICS OF *GAMBUSIA HOLBROOKI* AND *GAMBUSIA AFFINIS* (CYPRINODONTIFORMES: POECILIIDAE) LIVING ON THE PLAINS OF THE CHIRCHIK RIVER, UZBEKISTAN. *The Way of Science*, 20.

30. Quvatov, A. Q., & Atamuratova, M. S. (2014). MORPHOMETRIC CHARACTERISTICS OF GAMBUSIA HOLBROOKI AND GAMBUSIA AFFINIS (CYPRINODONTIFORMES: POECILIIDAE) LIVING ON THE PLAINS OF THE CHIRCHIK RIVER, UZBEKISTAN. *The Way of Science*, 20.
31. Quvatov, A. Q., Atamuratova, M. S., & Mirzaev, U. T. ARTICLE INFO ABSTRACT.
32. Quvatov Et Al, A. Q. (2022). Morphological characteristics of *Paracobitis longicauda* (Cypriniformes: Cobitidae) in the Sherabad River and its tributaries. *Egyptian Journal of Aquatic Biology and Fisheries*, 26(4), 1413-1419.
33. Reshetnikov A.N. (2018). *Gambusia Holbrook // The most dangerous invasive species of Russia (Top-100). – Moscow. - 538 p.*
34. Salikhov T.V. (1990). *The ichthyofauna of the river basin. The Syr Darya under the conditions of anthropogenic impact: Abstract of the thesis. dis. ... cand. biol. Sciences. – Tashkent, - 22 p.*
35. Turdakov F.A. (1963). *Fishes of Kyrgyzstan. - Frunze: Academy of Sciences of the KirgSSR, - 283 p.*
36. Wundzettel M.F. (2006). *Ichthyofauna of the Syrdarya river basin. – Moscow. - P. 127-128.*