Egyptian Journal of Aquatic Biology & Fisheries
Zoology Department, Faculty of Science,
Ain Shams University, Cairo, Egypt.
ISSN 1110 – 6131
Vol. 27(5): 1253 – 1261 (2023)
www.ejabf.journals.ekb.eg

Annotated List of Fishes of the Chirchik River, Uzbekistan

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ARTICLE INFO

Article History:
Received: Aug. 13, 2023
Accepted: Oct. 9, 2023
Online: Oct. 30, 2023

Keywords:
Uzbekistan,
River Chirchik,
Ichthyofauna,
Native species,
Alien species

ABSTRACT

The provided list encompasses 43 fish species inhabiting the water bodies of the Chirchik River basin. These species are categorized into 8 orders, 15 families, and 38 genera. This comprehensive list includes all currently registered species whose validity has been revised in recent systematic revisions. The observations, conducted between 1996 and 2021, shed light on the ichthyological diversity along the Chirchik River. The compilation of species adheres to international ichthyological norms and reputable databases. Additionally, geographic coordinates were meticulously gathered and utilized to create a detailed Geographic Information System (GIS) map.

INTRODUCTION

The research on the ichthyofauna of Central Asia, particularly in Uzbekistan, traces back to the 18th and 19th centuries through expeditions led by travelers A.P. Fedchenko and N.M. Prezhevalsky. Below is a taxonomic list of 43 fish species found in the Chirchik River. The classification of taxa, from class to genus, follows Nelson's system **(Nelson, 2006; Nelson *et al.*, 2016)**. This was done with minor adjustments **(Eshmeyer, 1990; Annotated catalog, 1998; Mirzaev, 2000, 2001, 2019; Atlas of Russian freshwater fish, 2002; Bogutskaya & Naseka, 2004; Kamilov *et al.*, 2004; Kottelat, 2012; Prokofev, 2017; Mirzaev & Quvatov, 2020; Quvatov *et al.*, 2022)**. This information has been cross-referenced with data from the international fish database **(Froese & Pauly, 2022)**.

Studies on the biology, identification, description, morphometry, and morphology of fish species have also been documented in works by scientists from the Commonwealth of Independent States (CIS) countries, including **Turdakov (1963)**, **Nikolsky (1971, 1974)**, **Mitrafanov and Dukravets (1989)**, **Wundzettel (2006)**, **Prokofev (2010)** and **Reshetnikov (2018)**. Thanks to the contributions of **Kamilov (1973)**, **Salikhov (1990)** and **Mirzaev (2000, 2001)**, the knowledge about the ichthyofauna of the Chirchik River has significantly expanded. However, comprehensive faunistic lists of fish species for the river have not yet been published.

MATERIALS AND METHODS

Some data on the composition of the ichthyofauna have been provided with amendments and additions, based on the materials studied by U.T. Mirzaev, collected between 1996 and 2018. In recent years (2019-2021), A.Q. Quvatov conducted ichthyological research, and the materials collected (Fig. 1) were processed and published by **Kessler (1872, 1874, 1877)** and **Gertsenstein (1888)**. The earliest and most comprehensive information about the fish species found in the Chirchik River can be found in the works of **Berg (1905, 1948, 1949)**, **Nikolsky (1938)** and **Turdakov (1963)**.

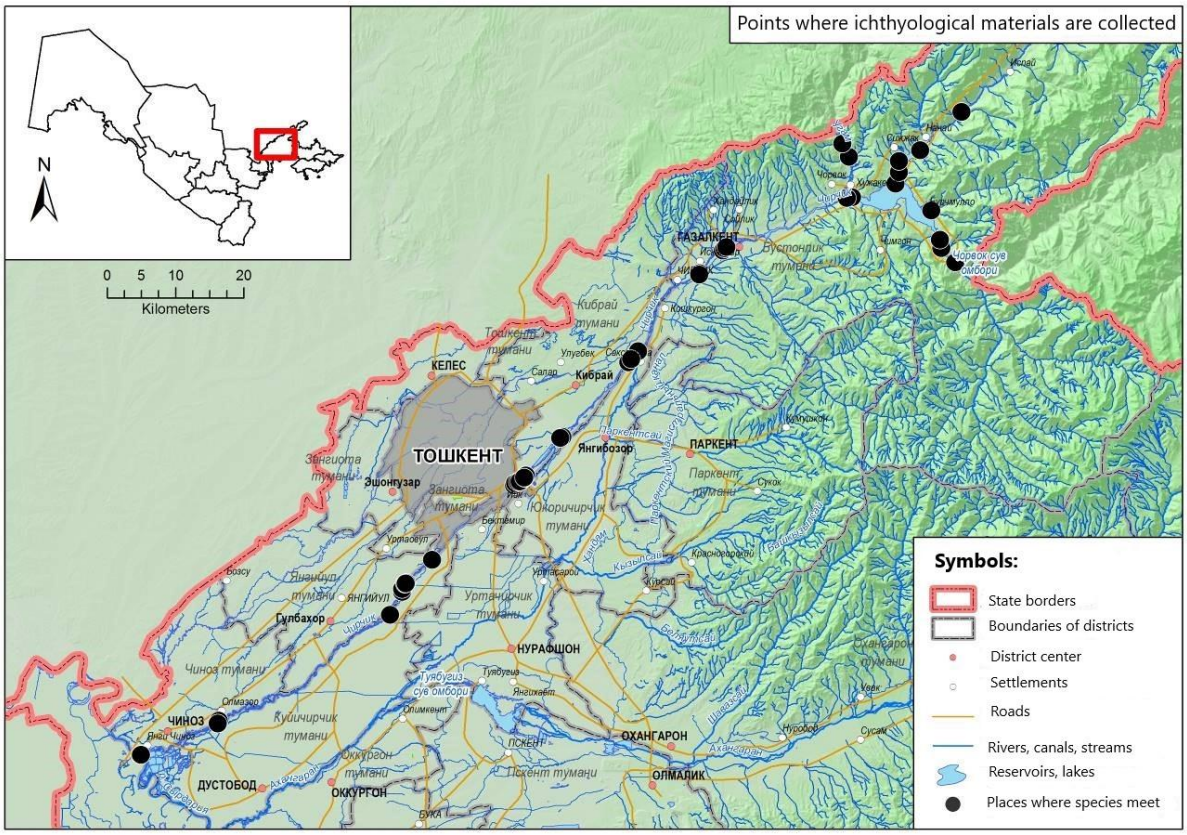

Fig. 1. Meeting places of fish species collected along the Chirchik River (2019-2021)

RESULTS AND DISCUSSION

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

№	Family and species	Mountain zone	Foothill zone	Plain zone	Lower zone
	Cyprinidae				
1	*Rhodeus ocellatus*	-	-	AI	-
2	*Luciobarbus conocephalus*	-	-	E	E
3	*Ctenopharyngodon idella*	-	-	A	A
4	*Hemiculter leucisculus*	AI	AI	-	-

5	*Carassius gibelio*	-	-	A	A
6	*Cyprinus carpio*	N	N	N	N
7	*Abbottina rivularis*	-	-	AI	AI
8	*Gobio cynocephalus*	-	-	AI	-
9	*Gobio lepidolaemus*	-	E	E	-
10	*Pseudorasbora parva*	-	-	AI	-
11	*Abramis brama orientalis*	-	-	-	E
12	*Alburnoides taeniatus*	-	-	E	-
13	*Alburnus oblongus*	-	-	E	-
14	*Aristichthys nobilis*	-	-	A	A
15	*Hypophthalmichthys molitrix*	-	-	A	A
16	*Aspius aspius iblioides*	-	-	-	E
17	*Squalius squaliusculus*	-	-	-	E
18	*Rutilus aralensis*	-	-	E	E
19	*Pelecus cultratus*	-	-	A	A
20	*Opsariichthys bidens*	-	-	AI	-
21	*Gymnodiptychus kessleri*	N	-	-	-
22	*Schizothorax eurystomus*	E	E	E	E
Cobitidae					
23	*Sabanejewia aralensis*	-	-	E	-
Balitoridae					
24	*Iskandaria kuschakewitschi*	-	E	E	-
25	*Triplophysa coniptera salari*	-	-	E	E
26	*Triplophysa dorsalis*	-	E	-	-
27	*Triplophysa elegans*	-	E	E	-
28	*Triplophysa strauchi*	-	-	-	AI
Ictaluridae					
29	*Ictalurus punctatus*	-	-	-	A
Siluridae					
30	*Siluris glanis*	-	-	N	N
Sisoridae					
31	*Glyptosternon oschanini*	E	-	-	-
Esocidae					
32	*Esox Lucius*	-	-	N	N
Coregonidae					
33	*Coregonus peled*	A	-	-	-
Salmonidae					
34	*Parasalmo mykiss*	A	-	-	-
35	*Salmo ischchan*	A	-	-	-
Adrianichthyidae					
36	*Oryzias sinensis*	-	-	AI	AI
Poecilidae					
37	*Gambusia affinis*	-	-	A	A
38	*Gambusia holbrooki*	-	-	A	A
Cottidae					
39	*Cottus jaxartensis*	E	-	-	-
Percidae					
40	*Sander lucioperca*	-	-	-	A

Odontobutidae					
41	*Micropercops cinctus*	-	-	AI	AI
Gobiidae					
42	*Rhinogobius brunneus*	-	-	AI	AI
Channidae					
43	*Channa argus*	-	-	AI	AI
	Total:	**9**	**7**	**29**	**25**
	Endemic species:	**16**			
	Native species:	**4**			
	Acclimatized species:	**12**			
	Alien introduced species:	**11**			

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
Actinopterigii Klein, 1885
Neopterygii
Teleostei
Euteleostei
Ostariophysi
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 (Jeitteles, 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 Snyber, 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 (Hoese 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 Schlegek, 1845)
Channoidei
Channidae (Fowler, 1934)
Channa (Scopoli, 1777)
43. *Channa argus* (Cantor, 1842)

CONCLUSION

The modern ichthyofauna of the Chirchik River, including the Charvak reservoir, comprises 43 species belonging to 38 genera, 15 families, and 8 orders. Among these, 25 species are native, and 18 species are invasive, comprising both acclimatized and accidentally introduced species. In the data acquired by **Salikhov (1990)**, 39 species were mentioned in the ichthyofauna of the Chirchik River, including 11 acclimatized, 9 accidental, and 19 local species. According to the results of **Wundzettel (2006)**, 37 species are listed in the modern ichthyofauna of the Chirchik River.

ACKNOWLEDGEMENTS

We extend our gratitude to the leader and the team of the practical project from the research plan of the Zoological Institute (Project No. PZ-20170920204) titled "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).

CONTRIBUTION OF AUTHORS IN THE ARTICLE

Materials collection, fixation works, cameral processing, calculation, and article formation were done by A. Quvatov, while organizational work was carried out by other authors.

CONFLICT OF INTEREST

There were no conflicts between the authors on the collection, sorting, cameral processing, and distribution of the materials.

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