



UDK: 502.7.(575.141)

Matnazar RAXIMOV,
O'zbekiston Milliy universiteti Zoologiya kafedrası mudiri
E-mail: raximov.matnazar@mail.ru
Suxrob BOYMURODOV,
O'zbekiston Milliy universiteti kabinet mudiri
E-mail: boymurodovsuhrob 1998@gmail.com

SamDU professori, b.f.d. Z.Izzatullaev taqrizi asosida

QUYI AMUDARYO SUV EKOTIZIMLARIDA UNIONIDAE, CORBICULIDAE, LYMNAEIDAE VA ASTACIDAE OILALARI GIDROBIONTLARI FAUNASI VA EKOLOGIYASI

Annotatsiya

Quyis Amudaryo xududidagi tadqiqotlarimiz natijasida Amudaryoning Xorazm viloyati xududidagi suv ekotizimlarida gidrobiontlarning 4 oila 6 urug'ga mansub bo'lgan 15 turi va 2 kenja turi va Amudaryoning Qoraqolpog'iston Respublikasi xududidagi gidrobiontlarning 4 oila 6 urug'ga kiruvchi 12 turi va 2 kenja turi tarqalganligini tadqiq qilindi. Toshloq biotoplarda 7 tur, qumloq biotoplarda 10 tur va 1 dkenja tur va loyli biotoplarda esa 4 tur va 1 kenja turning tarqalganligi aniqlandi. Qiyosiy taxlillar shuni ko'rsatadiki Amudaryoning Xorazm viloyati axududida gidrobiontlar turlar soni va zichligining katta ekanligi, Amudaryoning Qoraqolpog'iston Respublikasi xududida gidrobiontlar soni va zichligi kichik ekanligi aniqlandi.

Kalit so'zlar: Amudaryo, *Lymnaea truncatula*, *Lymnaea oblonga*, *Lymnaea subangulata*, *Lymnaea auricularia*.

FAUNA AND ECOLOGY OF HYDROBIOTICS OF THE FAMILIES UNIONIDAE, CORBICULIDAE, LYMNAEIDAE AND ASTACIDAE IN THE LOWER AMUDARYA AQUATIC ECOSYSTEMS

Annotation

As a result of our research in the Lower Amu Darya region, the distribution of 15 species and 2 subspecies of hydrobionts belonging to 4 families and 6 genera in the aquatic ecosystems of the Khorezm region of the Amu Darya and 12 species and 2 subspecies of hydrobionts belonging to 4 families and 6 genera in the territory of the Republic of Karakalpakstan of the Amu Darya was studied. It was found that 7 species were distributed in stony biotopes, 10 species and 1 subspecies in sandy biotopes, and 4 species and 1 subspecies in muddy biotopes. Comparative analyses show that the number and density of hydrobiont species in the Khorezm region of the Amu Darya is higher, while the number and density of hydrobionts in the Republic of Karakalpakstan of the Amu Darya are lower.

Keywords: Amu Darya, *Lymnaea truncatula*, *Lymnaea oblonga*, *Lymnaea subangulata*, *Lymnaea auricularia*.

ФАУНА И ЭКОЛОГИЯ ГИДРОБИОТИКОВ СЕМЕЙСТВ UNIONIDAE, CORBICULIDAE, LYMNAEIDAE И ASTACIDAE В ВОДНЫХ ЭКОСИСТЕМАХ НИЖНЕГО ТЕЧЕНИЯ АМУДАРЫИ

Аннотация

В результате проведенных нами исследований в Нижнем течении Амударьи изучено распространение 15 видов и 2 подвидов гидробионтов, относящихся к 4 семействам и 6 родам, в водных экосистемах Хорезмской области Амударьи и 12 видов и 2 подвидов гидробионтов, относящихся к 4 семействам и 6 родам, на территории Республики Каракалпакстан Амударьи. Установлено, что 7 видов распространены в каменистых биотопах, 10 видов и 1 подвид – в песчаных, а 4 вида и 1 подвид – в илистых. Сравнительный анализ показывает, что численность и плотность видов гидробионтов в Хорезмском районе Амударьи выше, а численность и плотность гидробионтов в Республике Каракалпакстан Амударьи ниже.

Ключевые слова: Амударья, *Lymnaea truncatula*, *Lymnaea oblonga*, *Lymnaea subangulata*, *Lymnaea auricularia*.

Kirish. Qurg'oqchilv mintaqalardagi daryolarda shakllangan gidrobiontlar faunasining zamonaviy holatini baholash, tarqalishiga ekologik omillarning ta'sirini aniqlash va kamyobsturlarini saqlab qolish bo'yicha muhofaza choralari ishlab chiqish dolzarb bo'lib hisoblanadi. Hozirda respublikamizda suv havzalari biologik xilma-xilligini saqlab qolish va turg'unligini ta'minlashga katta e'tibor qaratilmoqda. Bu borada, jumladan, Ramsar konvensiyasi tarkibiga kirgan suv-botqoq havzalari biologik ob'ektlarini muhofazalash tizimli yo'lga qo'yildi, gidrobiontlari faunasi aniqlandi, gidrologik inqirozga moyil noturg'un suv havzalari gidrobiontlarini saqlab qolish choralari ishlab chiqildi [3,5,6,7,13, 15]. Bugungi kunda Quyis Amudaryo suv ekotizimlarida 5 Unionidae, Corbiculidae, Lymnaeidae va Astacidae oilalari 6 gidrobiontlari faunasi va ekologiyasini o'rganish dolzarb muammolardan biri bo'lib hisoblanadi.

Mavzuga oid adabiyotlar tahlili. Mollyuskalar va qisqichbaqalarni tabiiy, sun'iy va urbanizatsiyalashgan hududlardagi suv ekotizimlaridagi tur tarkibi, zichligi va ularga suv muxiti faktorlarining ta'siri bo'yicha tadqiqot ishlarini B.A.Gumus (2014, 2024), P.Yu.Dgebuadze (2015, 2023), I.V.Dovgal'va b. (2016, 2024), Sh.R. G'aniyev va b. (2017, 2024), M.Alix, (2018, 2023), A. J.Benedict (2015, 2024), N.I.Kislitsina (2019, 2024), N.V. Xolmogorova (2016, 2024), I. N.Bolotov, va b. (2018, 2024), Z.I.Izzatullaev (2020, 2024), Z.I.Izzatullaev, X.T. Boymurodov (2023), I.M.Mirabdullaev, X.T.Boymuratov va b. (2022, 2024),

X.T.Boymurodov, X.B. Yunusov va b.(2024), A.N.Egamqulov (2023, 2024), S.A.Suyarov (2028, 2024)lar amalga oshirganlar [1,2,4, 8,9,10, 11,12,14].

Tadqiqot metodologiyasi Daryolarda gidrobiontlarni tashlash, qumloq va loyli biotoplarda tarqalishini o'rganishda biz I. N.Bolotov, va b. (2018, 2024), Z.I.Izzatullaev (2020, 2024), Z.I.Izzatullaev, X.T.Boymurodov, (2024, 2025), I.M.Mirabdullaev, X.T.Boymurodov va b. (2023, 2024) usullari bilan amalga oshirdik [2,5,6]. Turlarning populyatsiyalarini o'rganishda A.L.Rijinashvili (2009,2023), V.V.Bogatov (2014, 2024), Z.I. Izzatullaev (2024) ishlarida keltirilgan usullardan foydalandik [8,4,12].

Tahlil va natijalar. Amudaryo – Markaziy Osiyodagi eng sersuv daryolardan biri bo'lib. Yunonlar Oksus, Sarablar Jayxun nomlari bilan atashganlar. Amudaryo tog'li xududdan boshlanib tekislikka tamon oqadi. Daryoning umumiy uzunligi 2539 km. dan ortiq bo'lib, havzasining maydoni 463 ming km² bo'lib, daryo 4951 m balandlikdagi muzliklardan boshlanadi. Tekislikda Amudaryo vodiysining eni 11 - 14 km bo'lib, ayrim joylarda 21 - 24 km. gacha yetishi ko'zatiladi. eAmudaryoda eng ko'p suv oqimi iyun-iyul oylariga, eng kam oqim dekabr-mart fojlarida ko'zatiladi. Amudaryoning yuqori qismida Vaxsh, Kofarnihon, Surxondaryo kabi irmoqlaridan kanallar chiqarilib Tojikistonda yerni sug'orishda foydalanilmoqda. Amudaryoning o'rtasida Qoraqum, Amu-Qorako'l, Amu-Buxoro, Qarshi kanallari qurilgan. uAmudaryo quyi qismida esa Toshsoqa, Shovot, Qilichniyozboy, Qizketken va boshqa kanallar barpo etilgan. Ishda Quyi Amudaryoning xududidagi Amudaryoning Xorazim viloyati va Amudaryoning Qoraqalpog'iston Respublikasi hududlaridagi suv ekotizimlarida Unionidae, Corbiculidae, Lymnaeidae va Astacidae oilalari gidrobiontlari faunasi va ekologiyasi o'rganildi.

Amudaryoning Xorazim viloyati xududidagi suv ekotizimlarida gidrobiontlarning 4 oila 6 urug'ga mansub bo'lgan 15 turi va 2 kenja turi tarqalganligi aniqlandi (1-jadval). Daryoning loyli biotoplarida ikkipallali mollyuskalardan Unionidae oilasidan *Sinanodonta gibba* 1,1, *Sinanodonta orbicularis* 0,9, *Sinanodonta puerorum* 1,3, *Colletopterum bactrianum* 0,6, *Colletopterum cyreum sogdianum* 0,4, *Colletopterum ponderosum volgense* 0,9 tadan uchrashini aniqladik. Daryoning sekin oqar qismlari qumli biotoplarida Sorbiculidae oilasi turlaridan *Corbicula cor* 0,4, *Corbicula fluminalis* 0,6, *Corbicula purpurea* 0,5, *Corbiculina tibetensis* 1,6, *Corbiculina ferghanensis* 1,5 tadan tarqalgan bo'lib turlarning 1 bush chig'anoqlari ham uchraydi.

Qorinoyoqli suv mollyuskalaridan Lymnaeidae oilasi *Lymnaea* urug'idan *Lymnaea stagnalis* 0,6, *Lymnaea truncatula* 0,9, *Lymnaea oblonga* 0,7, *Lymnaea subangulata* 0,9, *Lymnaea auricularia* 0,8 tadan 2 uchradi. Qisqichbaqalardan Astacidae oilasidan *Pontastacus leptodactylus* 0,9 tadan tarqalganligi taxlil qilindi.

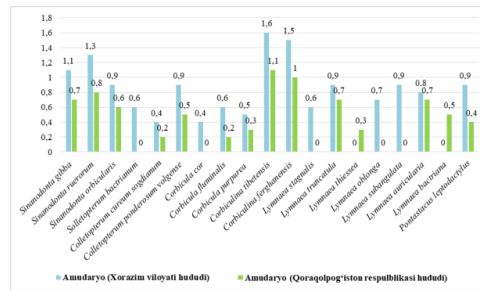
1-jadval

Quyi Amudaryo suv ekotizimlarida Unionidae, Corbiculidae, Lymnaeidae va Astacidae oilalari gidrobiontlari faunasi va ekologiyasi
(n= 10, m²/dona)

№	Turlar	Daryo		Biotoplar		
		Amudaryo (Xorazim viloyati xududi)	Amudaryo (Qoraqalpog'iston respublikasi xududi)	Toshloq yerlar	Qumloq yerlar	Loylar
Ikkipallali mollyuskalar Bivalvia (Linne 1758) sinfi Unionidae oilasi						
1	<i>Sinanodonta gibba</i>	1,1±0,1	0,7±0,1	-	-	+
2	<i>Sinanodonta ruorum</i>	1,3±0,1	0,8±0,1	-	-	+
3	<i>Sinanodonta orbicularis</i>	0,9±0,1	0,6±0,1	-	-	+
4	<i>Solletopterum bactrianum</i>	0,6±0,1	-	-	-	+
5	<i>Colletopterum cureum sogdianum</i>	0,4±0,1	0,2±0,1	-	-	+
6	<i>Colletopterum ponderosum volgense</i>	0,9±0,1	0,5±0,1	-	+	-
Corbiculidae oilasi						
7	<i>Corbicula cor</i>	0,4±0,1	-	-	+	-
8	<i>Corbicula fluminalis</i>	0,6±0,1	0,2±0,1	-	+	-
9	<i>Corbicula purpurea</i>	0,5±0,1	0,3±0,1	-	+	-
10	<i>Corbiculina tibetensis</i>	1,6±0,1	1,1±0,1	+	-	-
11	<i>Corbiculina ferghanensis</i>	1,5±0,1	1,0±0,1	-	+	-
Qorinoyoqli mollyuskalar Gastropoda (Guver, 1795) sinfi Lymnaeidae oilasi						
12	<i>Lymnaea stagnalis</i>	0,6±0,1	-	+	-	-
13	<i>Lymnaea truncatula</i>	0,9±0,1	0,7±0,1	+	-	-
14	<i>Lymnaea thiessea</i>	-	0,3±0,1	-	+	-
15	<i>Lymnaea oblonga</i>	0,7±0,1	-	-	+	-
16	<i>Lymnaea subangulata</i>	0,9±0,1	-	+	-	-
17	<i>Lymnaea auricularia</i>	0,8±0,1	0,7±0,1	+	-	-
18	<i>Lymnaea bactriana</i>	-	0,5±0,1	-	+	-
Yuksak qisqichbaqlar Malacostraca (Latreille, 1802) sinfi Astacidae oilasi						
19	<i>Pontastacus leptodactylus</i>	0,9±0,1	0,4±0,1	-	+	-
		17	14	7	11	5

Amudaryoning 45 Qoraqalpog'iston Respublikasi xududidagi qismida gidrobiontlarning 4 oila 6 urug'ga kiruvchi 12 turi va 2 kenja turi tarqalganligi aniqlandi (1-jadval, 1-rasm). Bu xuddagi 7 suv ekotizimlarida ikkipallali mollyuskalarning Unionidae va Sorbiculidae oilalari turlari zichligi yuqori qismiga qaraganda 1 m² uchrash nisbatan kamligi o'rganildi. Masalan Unionidae oilasi *Sinanodonta* urug'idan *Sinanodonta gibba* 0,7, *Sinanodonta orbicularis* 0,6, *Sinanodonta puerorum* 0,8, *Colletopterum cyreum sogdianum* 0,2, *Colletopterum ponderosum volgense* 0,5 tadan aniqlandi.

Sorbiculidae oilasi turlari zichligi haqidagi ma'lumotlar 1-jadvalda keltirilgan. Daryoning 9 toshloq va qumli biotoplarida Lymnaeidae oilasidan *Lymnaea truncatula* 0,7, *Lymnaea thiessea* 0,3, *Lymnaea auricularia* 0,7, *Lymnaea bactriana* 0,5, *Pontastacus leptodactylus* 0,4 tadan uchrashini aniqladik.



1-rasm. Quyi Amudaryo suv ekotizimlarida Unionidae, Corbiculidae, Lymnaeidae va Astacidae oilalari turlarining qiyosiy taxlili.

Xulosa va takliflar. Amudaryoning Xorazim viloyati hududidagi suv ekotizimlarida gidrobiontlarning 4 oila 6 urug'ga mansub bo'lgan 15 turi va 872 kenja turi va Amudaryoning Qoraqalpog'iston Respublikasi hududidagi qismida esa gidrobiontlarning 4 oila 6 urug'ga kiruvchi 12 turi va 2 kenja turi tarqalganligini birinchi bor aniqladik. Turlarning biotoplarda tarqalishi taxlil qilinganda toshloq biotoplarda 7 tur, qumloq biotoplarda 10 tur va 1 kenja tur va loyli biotoplarda esa 4 tur va 1 kenja turning tarqalganligini o'rgandik. Daryoda tarqalgan turlar reofil, pelolimnofil, peloreofil, fitofil, telmotofil va 4 fetoreofil ekologik guruhlarga kirishi aniqlandi. Qiyosiy taxlillar shuni ko'rsatadiki Amudaryoning Xorazim viloyati hududida gidrobiontlar turlar soni va zichligining katta ekanligi, Amudaryoning Qoraqalpog'iston Respublikasi 4 xududida gidrobiontlar soni va zichligi kichik ekanligini aniqladik, bo'nga sabab suv satxining o'zgaruvchanligi va suv gidrokimyoviy tarkibining farq qilishi o'z ta'sirini ko'rsatgan.

ADABIYOTLAR

- Aldridge, D. C., Ollard, I. S., Beshpalaya, Y. V., Bolotov, I. N., Douda, K., Geist, J., Zieritz, A. (2023). Freshwater mussel conservation: A global horizon scan of emerging threats and opportunities. *Global Dust Biology*, 29(3), 575–589. <https://doi.org/10.1111/gcb.16510>
- Beshpalaya, Y. V., Aksenova, O. V., Gofarov, M. Y., Kondakov, A. V., Kropotin, A. V., Kononov, O. D., & Bolotov, I. N. (2021a). Who inhabits the world's deepest crater lake? A taxonomic review of Corbicula (Bivalvia: Cyrenidae) clams from Lake Toba, North Sumatra, Indonesia. *Journal of Zoological Systematics and Evolutionary Research*, 59, 400–410. <https://doi.org/10.1111/jzs.12428>
- Beshpalaya, Y. V., Aksenova, O. V., Kropotin, A. V., Shevchenko, A. R., & Travina, O. V. (2021). Reproduction of the androgenetic population of the Asian Corbicula clam (Bivalvia: Cyrenidae) in the Northern Dvina River basin, Russia. *Diversity*, 13, 316. <https://doi.org/10.3390/d13070316>
- Boymurodov, H. Reliability: Theory and Applications, 4 (70), 562-566 (2022) 13
- <https://doi.org/10.1051/e3sconf/202340701003>
- Boymurodov, Kh., Khodjaeva, N., Rakhimov, M., Bobonazarov, G., Boymurodov, S., Khurazov, S., Davronov, B. E3S Web of Conferences 555, 02002 (2024) <https://doi.org/10.1051/e3sconf/202455502002>
- Khusniddin Baymuradov, Tozagul Zhabborova, Iroda Tuinazarova, Bekzod Otakulov and Azamat Egamkulov. Aquatic ecosystems of the lower reaches of the Zarafshan River. Diversity and ecological groups of molluscs . E3S Web Conf. **Volume** 262, 2021. 1st International Scientific and Practical Conference "Innovative Technologies in Environmental Engineering and Agroecosystems" (ITEEA 2021). <https://doi.org/10.1051/e3sconf/202126204009> .
- K Boymurodov, S Suyarov. Bivalve mollusk fauna and ecological groups of Unionidae and Corbiculidae families in natural and artificial reservoirs of Uzbekistan . E3S Web Conf. **Volume** 265, 2021. Actual Problems of Ecology and Environmental Management (APEEM 2021). <https://doi.org/10.1051/e3sconf/202126501014>
- Khusniddin T. Boymurodov,*, Khudainazar B. Yunusov, Azamat N. Egamkulov, and Umidjon R. Fayzullayev . Saprobic index of bivalve mollusks of families Unionidae and Sorbiculidae distributed in the aquatic ecosystems of Uzbekistan. E3S Web Conf. **Volume** 407, 2023. Actual Problems of Ecology and Environmental Management (APEEM 2023). <https://doi.org/10.1051/e3sconf/202340701003>
- Bolotov, I.N., Konopleva, E.S., Chan, N., Lunn, Z., Win, T., Gofarov, M.Y. et al. (2022). A riverine biodiversity hotspot in northern Myanmar supports three new and narrowly endemic freshwater mussel species. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 32(9), 1490–1508. <https://doi.org/10.1002/aqc.3850>
- Bolotov, I.N., Konopleva, E.S., Vikhrev, I.V., Gofarov, M.Y., Kondakov, A.V.,
- Lyubas, A.A. et al. (2023). Integrative taxonomic reappraisal and evolutionary biogeography of the most diverse freshwater mussel clade from Southeast Asia (Pseudodontini). *Water*, 15(17), 3117. <https://doi.org/10.3390/w15173117>
- Vikhrev I.V., Bolotov I.N., Gofarov M.Yu., Kondakov A.V., Konopleva E.S., Kryuk D.V. Modelirovanie klimaticheskoy nishi invazionnyx populatsiy kitayskoy bezzubki v Evrope v usloviyax scenariy izmeneniya klimat/ "Molluski: biology, ecology, evolution and formation of malakofaun" Materialy dokladov. g. Arkhangelsk, 2024. P.43-46
- Graf, D. L., & Cummings, K. S. The Freshwater Mussels (Unionoida) of the World (and Other Less Consequential Bivalves), updated 10 October 2024, MUSSEL Project Web Site. <http://www.musselproject.net>
- Izzatullaev Z.I. Molluscan fauna of aquatic ecosystems of Central Asia and adjacent territories (LESSON PRESS, Tashkent, 2019)
- Izzatullaev, Z. I., Boymurodov, Kh.T., Olimova, D.A., Izzatullaev. Kh.Z E3S Web of Conferences 555, 02006 (2024)
- <https://doi.org/10.1051/e3sconf/202455502006>
- Yunusov1, Kh., Boymurodov, Kh., Egamkulov, A., Dilmurodov, G., Djalilov, F. E3S Web of Conferences 539 010 (2024)
- <https://doi.org/10.1051/e3sconf/202453901012>