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The Significance of Dicotyledonous Mollusks of the Unionidae Family in the Aquatic Ecosystems of Uzbekistan in Food and Economy

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Abstract
Chinese complex fish species - Oq Amur (Ctenopharyngodon idella) and oq Khumbosh (Hypophthalmichthys molitrix) spread in Uzbekistan water ecosystem were studied the spread as result of acclimatization of *Sinanodonta gibba, S. orbicularis* and *S. puerorum* bivalve molluscs togather with fish to the ecosystem of Syrdarya, Amudarya and Zarafshan rivers of Uzbekistan.This is because the larvae-gloxidia of the Chinese toothless *Sinanodonta* seed are parasitic in these fish. The distribution of *Sinanodonta gibba, S. orbicularis* and *S. ruerorum* bivalve molluscs in the aquatic ecosystems of Uzbekistan under human influence has led to an expansion of the range of these species. The role of *Sinanodonta* seeds in the distribution, distribution, ecology, increasing the productivity of water bodies, in food was analyzed for the first time in a comprehensive way.

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INTRODUCTION

The dramatic changes in the ecological situation observed today on Earth are mainly the result of anthropogenic forces that affect the bioecological characteristics of the animal world, including its distribution, which leads to the loss of their habitats, which, in turn, changes the population of common species and causes the extinction of rare species in the nature. Accordingly, the study of issues related to the taxonomic composition, ecology and biology of a particular generation or family is the great scientific and practical importance. Malacological research around the world is focused on assessing the current state of groups of molluscs in the natural and anthropogenic environment, determining their impact on the environment and biological systems, studying the factors affecting populations, and developing conservation measures. The study of the ecology of *Sinanodonta* seeds and the patterns of distribution of species in aquatic ecosystems, their importance in the economy is of theoretical and practical importance. One of the most pressing issues is the study of the nutritional and economic value of bivalve mollusks of the Unionidae family, common in aquatic ecosystems of Uzbekistan.

MATERIALS AND METHODS

Scientific materials for our research were collected in the rivers of Uzbekistan in 1997-2021: Amudarya, Syrdarya and Zarafshan, reservoirs: Kattakurgan and Dargam fisheries, as well as from the canals and ditches that flow into and out of them.

RESULTS AND DISCUSSION

Sinanodonta Modell, 1944 seed. Species of this genus are distributed from the Amur to Indochina region. In general, the representatives of Sinanodonta are typical for East Asia (Japan, Indochina).

Sinanodonta gibba, S. puerorum and S. orbicularis from Sinanodonta seeds extended in the aquatic ecosystems of the Syrdarya, Amudarya and Zarafshan rivers in Uzbekistan (Danilin, 2014).

These species are typical for the territory of China and are associated with the development of fisheries in our country for the reproduction of unconventional Chinese complex fish species infested with Sinanodonta gloxidia - white amur (Ctenopharyngodon idella) and whitefish (Hypophthalmichthys molitrix). It should be noted that as a result of acclimatization and reproduction of these fish species in fisheries near the Amudarya basin, the influx of white amur and khumbosh into the river led to the spread of Sinanodonta species in the Amudarya, Syrdarya and Zarafshan rivers [Boymurodov, 2011]. The information on these types of seeds is given bellow.

Sinanodonta (S.) gibba (Benson, 1855). The shells are characterized by size, extreme thickness, moderate convexity, and high posterior apex. The apex is broad, low-rise. The outer upper part of the shell, with clear growth lines, also shows a mantle line Sinanodonta (S.) gibba [Boymurodov, 2015a, 2015b].

The size of the shells of bivalve mollusks is given in the working text in L - the length of the shell, H - the height of the shell, W - the convexity of the shell in mm. The dimensions of the sinanodonta gibba were determined as follows: shell length L -164, shell height H-113, convexity of the two phases W -57.

Ecology: Livesslow-flowing areas of rivers, reservoirs, fisheries and ponds at depths of 1 m to 3-3.5 m. Peloreophil. This species is egg-laying and gradually increases in March-June as the water temperature rises.

Spread: East Asian type. Intraduction of Chinese complex fish into Central Asian watersheds as a result of acclimatization is a resurrected species**.**

In Uzbekistan, the banks of the Amudarya, Syrdarya and Zarafshan rivers are spread in aquatic ecosystems, in the slow-flowing tributaries of rivers. The Akdarya and Kattakurgan reservoirs on the banks of the Zarafshan River were dug at a depth of 2.5-3 m in muddy areas, in Chelak and Dargam fisheries. This is the first time that the Amudarya and Zarafshan rivers have spread from aquatic ecosystems.

Sinanodonta puerorum (Heude, 1980). It is characterized by the shell size of the mollusk, uniform thickness, ovality, and slightly lower backs, as well as a weak mantle line. L - 162, H - 103, W - 108, the convexity of the two circuits is 63 mm. This species differs from the Sinanodonta gibba species in the length and roundness of its shell.

Ecology: Sinanodonta occurs in conjunction with gibba type. Peloreophil belongs to the ecological group. Quantitatively, it is more common than Sinanodonta orbicularis and less common than Sinanodonta gibba. This species is an egg-layer that lays its eggs between the leaves of the grasshopper. Egg-derived gloxidia parasitize and live in fish for some time. Reproduction begins in March and lasts until the end of May.

Spread: The East Asian species, along with the Sinanodonta gibba species, was introduced from the Yangtze Basin to the Akkurgan fishery in the Tashkent region along with Chinese complex fish. Registered for the first time in the fauna of the CIS.

Wide spreadin the aquatic ecosystems of the banks of the Amudarya and Zarafshan rivers: Kattakurgan and Akdarya water reservoirs, fisheries, canals.

Sinanodonta orbicularis (Heude, 1880). The shell differs from the others by its medium size, thinness, and very flatness, as well as by a narrow uneven apex. The peaks are located at a distance of 0.34 mm from the anterior edge of the shell, the mantle line is deepened. L - 99, H - 66, W - 68; convexity (two phases) 31 mm.

Ecology: Live in rivers, reservoirs, fish farms,

ponds with *Sinanodonta gibba* and *Sinanodonta puerorum* species. Peloreophil. It is less common than other species and increases in April-May with rising water temperatures.

Spread: East Asian type. Until now, it was known only in the Akkurgan fishery of the Tashkent region of Uzbekistan. The rivers of Uzbekistan are shown for the first time. The dicotyledonous mollusks of the Uzbek water basins are derived from the genus *Sinanodonta* of the Unionidae family: *Sinanodonta gibba, S. orbicularis, S. puerorum* species, such as white amur, khumbosh (tolstolobik).

Table 1: Age-related changes in the average weight of bivalve molluscs distributed in aquatic ecosystems (n=10, M±m, weight g.)

S.N.	Name of the type	The average flow of the Zarafshan river			Kattakurgan Water Reservoir			Dargam fishery		
		2-3 years old	4-5 years old	6-7 years old	2-3 years old	4-5 years old	6-7 years old	2-3 years old	4-5 years old	6-7 years old
1	*Sinanodonta orbicularis*	62±9	182±11	294±14	74±8	194±11	380±12	82±10	198±11	382±10
2	*Sinanodonta gibba*	54±8	173±12	285±13	63±9	181±9	334±10	65±11	184±10	339±11
3	*Sinanodonta puerorum*	46±6	161±11	221±12	49±6	172±8	242±9	47±8	173±9	247±12

The weight gain of one of the bivalve molluscs of the Unionidae family Sinanodonta, spread in the aquatic ecosystems of Uzbekistan, was studied in the middle reaches of the Zarafshan River, Kattakurgan Reservoir and Dargom Fishery. The average weight of Sinanodonta orbicularis 2-3 years old in the middle flow of the Zarafshan River were clarified that 62±9g. 4-5 years old 182±11 g. 6-7 years old 294±14g., *Sinanodonta gibba* 2-3 years old 54±8g. 4-5 years old 173±12 g. 6-7 years old 285±13g., *Sinanodonta puerorum* 2-3years old 46±6 g. 4-5 years old 161±11 g. 6-7 years old 221±12 g. *Sinanodonta orbicularis* 2-3 years old 74±8 g. 4-5 years old 194±11 g. 6-7 years old 380±12 g., *Sinanodonta gibba* 2-3 years old 63±9g. 4-5 years old 181±9 g. 6-7 years old 334±10 g., *Sinanodonta puerorum* 2-3 years old 49±6 g. 4-5 years old 172±8 g. 6-7 years old 242±9 g. in Kattakurgan Reservoir and in Dargom fishery *Sinanodonta orbicularis* 2-3 years old 82±10 g. 4-5 years old 198±11 g. 6-7 years old 382±10 g., *Sinanodonta gibba* 2-3 years old 65±11 g. 4-5 years old 184±10 g. 6-7 years old 339±11 g. and *Sinanodonta puerorum* 2-3 years old 47±8 g. 4-5 years old 173±9g. 6-7 years old 247±12 g. were clarified. The weight of the species relative to the river was studied in the reservoir and in the fishery (Figures 1-3).

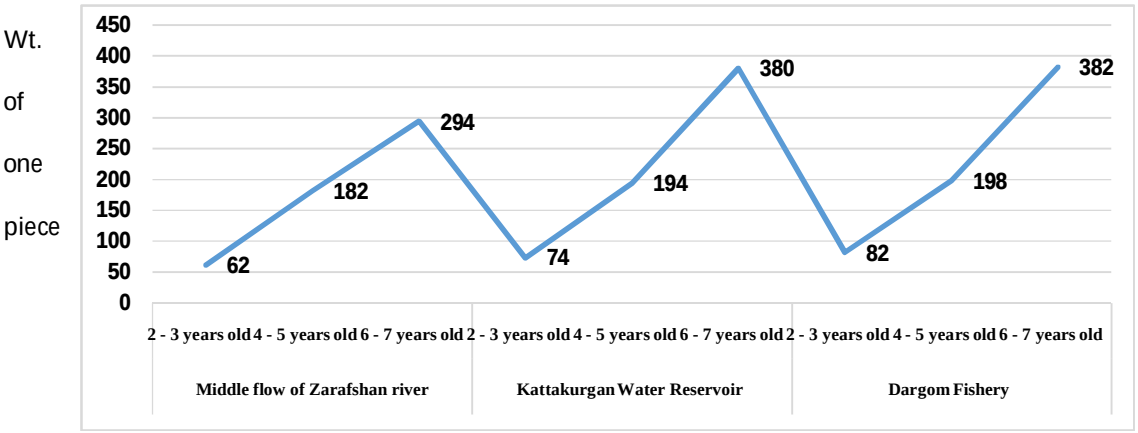

Figure 1: Correlation of age and weight of Sinadonta orbicularis

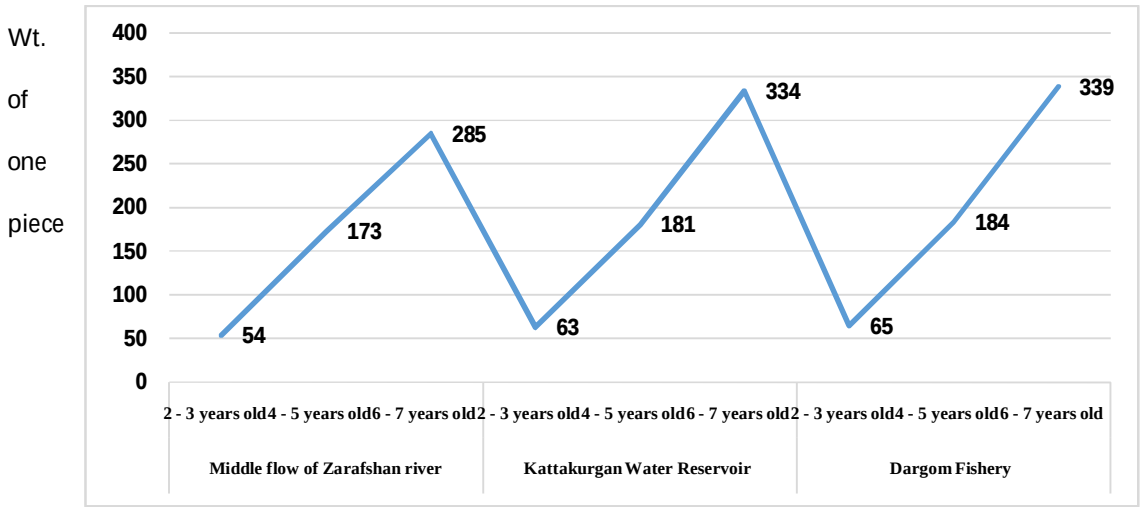

Figure 2: Correlation between age and weight of Sinadonta gibba

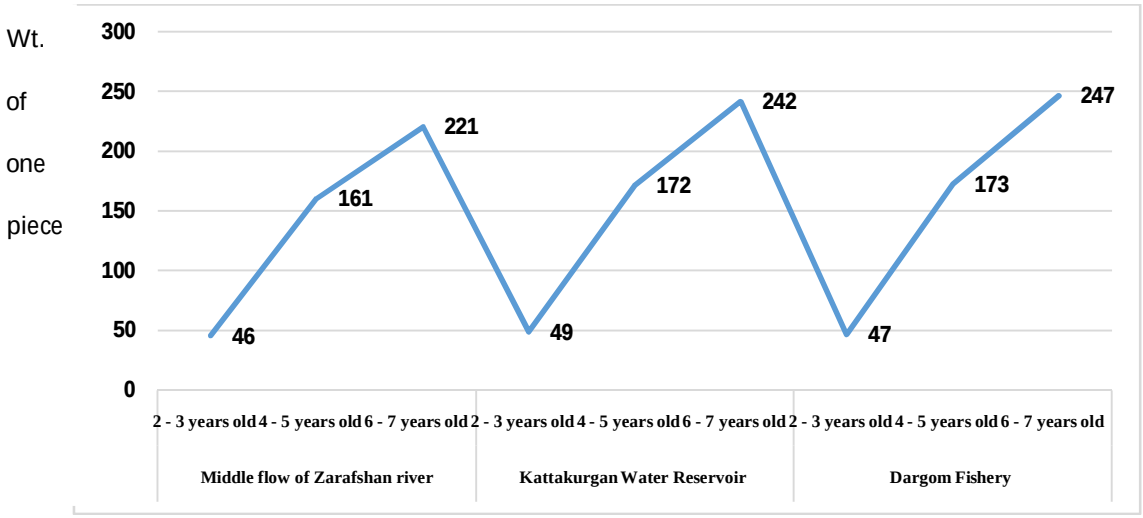

Figure 3: Correlation of age and weight of Sinadonta puerorum

Unionane family Sinanodonta seed bivalve mollusks can be widely used as food. It is recommended to separate their bodies from the shells and cook them as meat or use them as smoked and dried. In addition, all bivalve mollusks are important in the treatment of contaminated water as good filters. The shells of aquatic mollusks are well preserved in the ancient earth's crust and are also of great importance in solving various theoretical problems of sciences such as stratigraphy, paleogeography. On the one hand, the diversity of their shells and their sequence over time serve as an important tool in studying some of the problems of animal evolution, and on the other hand, they create the conditions for the search for certain minerals (oil, gas, etc.).

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