

THE ECOLOGICAL CHARACTERISTICS OF PIKE PERCH (*SANDER LUCIPERCA*) IN THE EAST ARNASAY WATER BASIN

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Abstract. *The article presents information about the characteristics of growth, fertility and reproduction of pike perch (*Sander lucioperca* (Linnaeus, 1758) in the East Arnasay water basin. The data on the relationship between the body weight of pike perch and the fecundity of Lake Tuzkan and the Talimarjan Reservoir were compared.*

Keywords: *fecundity, individual absolute fecundity (IAF), individual relative fecundity (IRF), diameter of eggs, growth, reproduction, length, weight, age, gonadal weight..*

Introduction

Increasing the volume of pike perch in the natural water bodies of our republic as well as studying the ichthyofauna of natural reservoirs is one of the most urgent problems in the field of fisheries. Due to the attention paid to fisheries in recent years, several research projects have been conducted. Studying the ichthyofauna of natural water bodies, studying the status of existing species, preventing the decrease in the number of fish species, and the ecology of valuable fish require a deeper and more complete study. *Sander lucioperca* L. is one of the most valuable commercial fishes. In foreign countries, pike perch (*Sander lucioperca* L.) has an acceptable growth rate for market size under intensive conditions. Also, pike perch is a valuable recreational fish species [1].

The pike perch has ecologically very plastic characteristics and can quickly adapt to the conditions of this place [2]. A large, fast-growing fish that can reach 1 m in length and weigh 15 kg or more lives in the open parts of rivers, lakes, and reservoirs. There are semi-transient and persistent forms. very demanding on the dissolved oxygen in water. He lived in the lower reaches of the Aral Sea, Amudarya, and Syrdarya Rivers. In 1963, it was brought from the Ural River to the water basins of the Syrdarya and Amudarya Rivers, as well as the Zarafshan River and Kashkadarya. Currently, it is distributed in all plain water bodies. [4] Pike perch is a valuable hunting object. In the 1990s, it made up 20–25% of the fish caught in Uzbekistan and took second–third place. It is used in fisheries to reduce the number of fish in artificial ponds.[4] Therefore, it is very important to study the biology and ecology of pike perch in the Aidar-Arnasoy lake system, especially the characteristics of reproduction.

Material methodology

On the basis of the materials obtained as a result of our scientific research hunts in the Eastern Arnasay water basin in 2020–2022, the reproductive characteristics of female pike perch caught directly from the Eastern Arnasay reservoirs of AALS were analyzed. It was found that pike perch reach sexual maturity in reservoirs at the age of 2 years. According to the literature, pike perch reach sexual maturity in 2–4 years of life in different water bodies when they reach different lengths from 29–31 to 38–40 cm. Spawning occurs in March and April when the water temperature reaches 8–17°C. It builds a simple nest in the form of a pit or lays its eggs in the roots of reeds and other plants at a depth of 0.5–1 m. Fish eggs stick to sticky plants. The male guards them. The fecundity is 80–8000 pieces. The diameter of the eggs is 0.7–1 mm. [4] Another characteristic feature of pike

perch in the southern water basins of Uzbekistan is its rapid growth compared to pike perch in the northern latitudes. In our southern bodies of water, a 2-year-old pike perch becomes sexually mature when its body is 30-35 cm. [2]

In our research, the length of the bodies of two young female pike perching in the reservoirs reached 34–36 (an average of 35) cm. The body length of 2-year-old female fish reached 34–46 (average 40) cm in February–March, and all of them were in the IV stage of sexual maturity. In the Eastern Arnasay water basin, it was found that pike perch spawn in early February. Samples of sexual products were taken for research. Collection, processing, and analysis of materials were carried out according to generally accepted ichthyological methods (Pravdin, 1966; Spanovskaya, 1976). [3] Determination of the richness of fish roe was carried out using the usual weight-measurement method. In this case, spawners were weighed as a whole, and then the amount of fish eggs in 1 g of sample was calculated and multiplied by the total mass of spawners to determine the individual absolute fecundity (IAF thousand fish eggs). From each sample of fish eggs, 100 pieces were drawn using Mikrofod PO-5 equipment, and their dimensions were determined in mm (Dryagin 1949). [5].

Results and Discussion

In the course of our research, we analyzed the reproduction characteristics of female pike perch in the Eastern Arnasay water bodies; the obtained data are presented in Table 1.

Table 1

Reproductive indicators of female pike perch in the water bodies of Uzbekistan

INDICATORS	Eastern Arnasay <i>N, pieces, 32</i>	Tuzkan <i>N, pieces, 30</i>	Talimarjon <i>N, pieces, 66</i> (U.Mirzayev's data 1994)
Length, l (cm)	<u>34-78,8</u> 56,4	<u>36-78</u> 57,1	<u>35,5-59,4</u> 44,5
Weight, w (g)	<u>300-6600</u> 2921	<u>290-6500</u> 2539	<u>454-2914</u> 1168
Weight of gonads, q (g)	<u>50-350</u> 200	<u>48-308</u> 178	<u>39-350</u> 118
IAF (thousand pieces, fish eggs)	<u>56,8-4646,4</u> 214,8	<u>50,4-1205,2</u> 627,8	<u>50,1-394,1</u> 142,9
IRF (fish eggs/g)	<u>45,9-240,3</u> 99	<u>50,8-253</u> 123	<u>91,3-199</u> 142,2
Diameter of fish eggs (mm)	<u>1,12-0,69</u> 0,9	<u>0,62-1,09</u> 0,88	<u>0,73-1,02</u> 0,89

The data in the table show that the pike perch living in the Eastern Arnasay water bodies are larger than the pike perch living in the Tuzkan lake and the Talimarjan reservoir (U. Mirzayev, 1994). Also, the gonad weight and individual absolute fecundity indicators of pike perch found in the Eastern Arnasay are relatively high. It was found that the minimum, maximum, and average sizes of the diameter of the sexed pikeperch eggs in the Eastern Arnasay water bodies are slightly higher than the size of the pikeperch eggs in the Tuzkan and Talimarjon water bodies (U. Mirzayev, 1994). Also, if we analyze the scientific studies conducted on the reproduction of pike perch, according to the literature data on reproductive characteristics (in the research of

U. Mirzayev), among others, pike perch of Talimarjon Reservoir in 1966–1969, it was determined that the individual fertility of 33,5–59,4 cm reaching sexual maturity was 50–394 thousand pieces [2]. When we compared these data with our results, it was found that they are close to the indicators of pike perch in Tuzkan and Eastern Arnasay in the AALS. (Table 1)

We present the following data on the sizes of the fish eggs studied: (Table 2).

Table 2

Diameter indicators of fish eggs studied in the Eastern Arnasay (optional 100 drawings, Dryagin method)																
№	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
max	1,12	1,12	1,03	1,06	1,12	1,12	1,03	1,09	1,12	1	1,03	1,12	1,12	1,12	1	1,12
min	0,68	0,81	0,78	0,68	0,75	0,78	0,75	0,71	0,75	0,68	0,68	0,75	0,62	0,62	0,71	0,68
medium	1,46	0,97	0,89	0,88	0,96	0,96	0,85	0,84	0,96	0,85	0,89	0,91	0,87	0,87	0,82	0,94

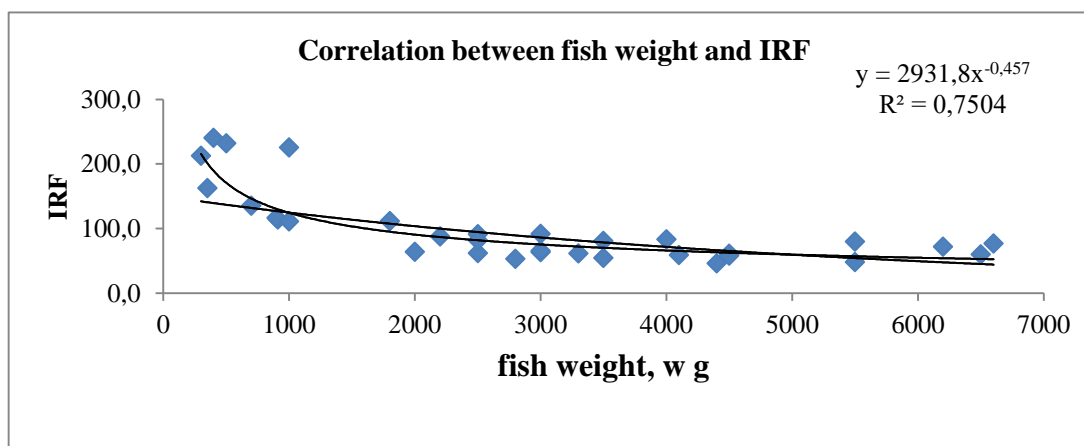
№	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
max	1,09	0,93	0,93	0,93	0,93	1	0,97	1	1	0,93	1	0,93	0,97	1	0,93	0,93	1,12
min	0,68	0,62	0,62	0,78	0,75	0,78	0,75	0,68	0,75	0,78	0,78	0,75	0,78	0,78	0,75	0,75	0,68
medium	0,92	0,85	0,85	0,84	0,82	0,90	0,86	0,87	0,86	0,87	0,89	0,86	0,87	0,86	0,84	0,85	0,9

In the course of research, it was found that the average indicator of female pike perch eggs in the Eastern Arnasay water basin is 0.9 +. This indicator shows that it is higher compared to the diameter indicators of pike perch fish eggs in Tuzkon and Talimarjon reservoirs (Mirzayev, 1994). (Table 1)

As a result of the conducted research, it was found that there is an average correlation ($r = 0,7504$; $va y = 931,8x - 0,457$) between fish weight and the individual relative fecundity (IRF) indicator (Fig. 1).

Figure 1.

Correlation between body weight and IRF indicators of pike perch in the Eastern Arnasay water basin (correlation is significant at $P < 0.01$ level).



Summary. According to the results of our scientific research, it was observed that the pike perch reaches sexual maturity at the age of 2–3 years when the body length is 34–36 cm and the body weight is 300–400 g. Body length and weight, gonad weight, and individual absolute fecundity indicators, as well as the diameter of caviar, are slightly higher than those of pike perch found in Lake Tuzkan and Talimarjan reservoirs (Mirzayev, U. 1994). Also, it was found that there is an average correlation ($r = 0.7504$ and $y = 931.8x - 0.457$) between the weight of pike perch and the individual relative fecundity (IRF) indicator studied in the East Arnasay water basin.

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