RESEARCH ON THE TROPHIC ROLE OF AQUATIC PLANTS ON THE FISH FROM FISH PONDS

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Abstract

Research has been aimed at identifying the role of aquatic organisms feed on freshwater fish species, summer II, under non-fodder, based on existing natural food ponds. Experiments were conducted at the farm Dracşani-Botosani, from June 15 to August 16, 2009. During the conduct of research data were recorded on planktonic biomass values and its role on the evolution of fish from fish ponds investigated. Were used for this purpose four ponds with identical surfaces and volumes of water (2500 square meters area and 4000 cubic meters of water volume per pond). Natural food was represented by phytoplankton (Chlorophylls, cianofite, euglenofite, bacilariofite, crisofite), zooplankton (cladocere, copepode, rotifere), Bent (molluscs, annelids, polichete, oligochete, crustaceans, aquatic macrophytes, larvae of insects). All three formulas, content from fish: C. carpio, H. molitrix, A. nobilis, Ictiobus cyprinellus, Ct. idella, Silurus glanis) which are non or partially food competitors in the best position to capitalize on natural food resources. Regarding densities, we used a minimum density, a maximum and two identical and best formulas. Fishery production undertaken by the experimental formulas varied between 359.3 and 634.2 kilograms / hectare without administration of conventional feed. The analysis of data concerning of production by the species was observed that densities is inversely proportional to individual growth, but without influence on the production gain realized.

Key words: fish, plants, food, pools, production

INTRODUCTION

Research has been aimed to identify the role of aquatic organisms feed on some species of freshwater fish.

Phytoplankton has, at a primary role in the synthesis of organic substances, being the points of initiation of the food chain in aquatic ecosystems. Algae's flora reflect the qualitative and quantitative status of the whole ecosystem, how and degree of organization.

The exploitation of fish in the intensive systems can produce changes in the structure of phytoplankton's associations, which propagates in the food chains.

Experiments were conducted at the farm Dracşani-Botosani, from June 15 to August 16, 2009. The results presented in this paper were obtained after the 62 days of research.

During the conduct of research data were recorded on planktonic biomass values and its role on the evolution of fish in water basins studied.

MATERIAL AND METHOD

The research was conducted at the farm Drăcşani-Botosani, aiming at increasing many fish species, summer II, under non-fodder, based on existing natural food ponds for a period of 62 days (15.06-16.08.-2009).

Were used for this purpose four ponds (A, B, C, D) with identical surfaces and volumes of water (2500 square meters area and 4000 cubic meters of water volume per pond).

Natural food: was represented by phytoplankton (Chlorophylls, cianofite, euglenofite, bacilariofite, crisofite), zooplankton (cladocere, copepode, rotifere), Bent (molluscs, annelids, polichete, oligochete, crustaceans, aquatic macrophytes, larvae of insects).

In the fish ponds introduced fish of one year old, using three formulas, differentiated in function of densities.

All three formulas, were made up of fish of family Cyprinidae and Siluridae (C. carpio, H. Molitrix, A. Nobilis, Ictiobus cyprinellus, Ct. Idella, Silurus glanis) which are non or partially food competitors in the best position to capitalize on natural food resources.

Regarding densities, we used a minimum density in ponds A, maximum in ponds B and two identical and best formulas in ponds C and D.

Basic criterion considered was to establis of the growth potential of fish depending on natural food, density, species and production capacity of ponds.

THE RESULTS AND THEIR INTERPRETATION

Main results of taken research were the following:

• The thermal water was favorable for growth of fish, registering temperature values between 20.2ºC in the second decade of June and 26.1ºC in the second decade of August.

• The highest monthly average temperature was in August (24.8ºC), the average temperature during the growth period being 19.4°C.

Table 1

Decade and monthly average temperature

Month	Decade			Monthly average (ºC)	Average period of growth(ºC)
	I	II	III		
June	24,4	20,2	22,1	21,6	19,4
July	22,5	23,4	25,2	25,0	
August	23,7	26,1	24,7	24,8	

• Transparency, which is a criterion of biogenic capacity of water, recorded at between 10-15 cm and 30-50 cm from beginning to end of period, decrease was probably caused by the reduction potential of feed water, mostly due to consumption of natural food by fish in these ponds.

• Solvit oxygen water remained at the saturation limit (7,0-8,0 mg/l).

• pH value of the water fluctuated around 7.0 (6,7-7,3).

• organic matter solvit in water recorded at between 27 mg / l in the early period and 35 mg / l at the end, values which can be regarded as particularly favorable for growth cyprinidaes.

• Total hardness of water was maintained within the limits 14-17 DH (German degrees).

C. carpio recorded the highest daily gain (3.87 g piece/day) in variant A, with the lowest density of fish (200 pcs./ha) and lowest average daily gain in variant B (0.46 g/piece/day) with maximum density of fish (2000 pcs./ha). The average density of fish (400 pieces/ha) achieved good daily increase, to 1.65 g/piece/day in variant C, respectively 2.25 g/piece/day in variant D.

H. molitrix achieved the highest growth in average daily gain at variant A with the lowest density of fish (2.92 g/piece/day at a density of 800 pieces/ha). The double density reduced the increase daily gain (2.06 g/piece/) in variant C, respectively 2.15 g/piece/day in variant D.

A. nobilis registered the highest daily growth increases. Thus the variant has the lowest density of 160 pieces/ha made an average gain of 5.22 g daily, achieving a good average weight (329 g/pcs.). While the variant B, the highest density (360 pcs./ha) recorded the lowest growth (3.03 g/piece/day), and variants C and D the average density of 320 pieces/ha, increasing daily gain was 3,52-3,88 g/pcs.

Table 2

The dynamic of growth rate

Variant	Duration of growth days	Age/ Species	Density	Average weight at begining g/pcs	Increase the average individual g/pcs	Increase the average daily gain g/pcs/day	Average weight final g/pcs	Total Production .period kg
A	62	C1+	200	190	240	3,87	430	86
		H1+	800	30	181	2,92	211	168,8
		A1+	160	5	324	5,22	329	52,64
		B1+	100	40	133	2,14	173	17,3
		Ct1+	640	10	35	0,56	45	28,8
		S1+	100	40	77	1,24	117	11,7
B	62	C1+	2000	159	29	0,46	188	376
		H1+	1800	30	107	1,73	137	246,6
		A1+	360	5	188	3,03	193	69,48
		B1+	200	40	51	0,82	91	18,2
		Ct1+	1440	10	20	0,32	30	43,2
		S1+	200	40	41	0,66	81	16,2
C	62	C1+	400	120	102	1,65	222	88,8
		H1+	1600	30	128	2,06	158	252,8
		A1+	320	5	218	3,52	223	71,36
		B1+	200	40	84	1,35	124	24,8
		Ct1+	1280	10	29	0,46	39	49,92
		S1+	200	40	15	0,24	55	11
D	62	C1+	400	150	140	2,25	290	116
		H1+	1600	30	133	2,15	163	260,8
		A1+	320	5	241	3,88	246	78,72
		B1+	200	40	99	1,6	139	27,8
		Ct1+	1280	10	42	0,67	52	66,56
		S1+	200	40	44	0,71	84	16,8

C1- ***Cyprinus carpio;*** **H1-** ***Hypophthalmichthys molitrix;*** **A1-** ***Aristichtys nobilis;***
B1- ***Ictiobus cyprinellus ;*** **Ct1-** ***Ctenopharyngodon idella ;*** **S1-** ***Silurus glanis;***

Ictiobus cyprinellus, realized a less growth than planktonofag's fishes. The increase was the lowest in varint B, with the maximum density (0.82 g/piece/day). The largest increase was observed in variant A (2.14 g/piece/day) with the lowest density (100 pieces/ha).

Ct. idella, has registered a growth rate which decreased in all four variants (0,32-0,67 g/piece/day). They also observed differences in growth according to density: 0.56 g/piece/day ata density of 640 pcs./ha and 0.46-0.67 g/piece/day at a density of 1280 pcs./ha. This reduced growth is due to the lack of specific food for fish consisting of macrophytes and small size of fish at the begining.

Silurus glanis, the sixth species from experiment, recorded a low growth rate of 0.24-1.24 g/piece/day, explained by lack of food specific to this predator's fish. In this case present interest only as a sanitary fish, to destroy unwanted or competing animal's organisms (fish without economic value, tadpoles of frogs, etc.).

Health of the fish was good, except Ictiobus cyprinellus species, which proved very vulnerable to invasion by the parasite Lerna cyprinacaea, leading to mortality of 30-40% encouraging and infestation of other fish, especially Ct. Idella

CONCLUSIONS

- Fishery production achieved by the experimental formulas varied between 359.3 and 634.2 kg/ha, without administration of conventional feed.
- The best technical and economic results were obtained in the basin B, where the total production was 634.2 kilograms/hectare, at the highest density of fish.

- The variant A where the fish density was lowest (200 pcs./ha) recorded an increase average daily of 8.4 times higher (3.87 g/pcs.) compared to the variant B, where the density of fish was 2000 pieces/ha and average daily growth of 0.46 g/piece/day.
- The analysis of data concerning the production realized by the species was observed that the density is inversely proportional to individual growth, without impacting about total growth produced.

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