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TECHNOLOGICAL ASPECTS REGARDING REARING OF THE *ACIPENSER RUTHENUS* SPECIES, ALBINO VARIETY TO SECOND SUMMER OLD, IN BRATES STURGEONS STATION

ASPECTE TEHNOLOGICE PRIVIND CREŞTEREA ÎN VARA II-A A SPECIEI *ACIPENSER RUTHENUS* VARIETATEA ALBINO, ÎN CADRUL STAȚIEI DE STURIONI BRATEŞ

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The Acipenser ruthenus (Linnaeus, 1758), albino variety, in the second summer rearing to Brates sturgeons station from Galati was experimented. A number of 513 one year old sterlet were stocked in three Ewos fibreglass tanks, at an individual mean weight of 40 g and total length of 20 cm, in the first day of June 2007. The experiment had extended on 165 days, until half of November. During experimental tries the fishes were monitoring permanently and the essential parameters of technological water (dissolved oxygen, pH and temperature evolution) were checked and recorded. Feeding was achieved with commercial granular food and the conversion coefficient recorded was 1,3. Final body mean weight of sterlet was 130 g/ex. and the average length of 30 cm; the specific growth rate was 0,55g/day., i.e. 90 g/ex, and the survival percent recorded was 89,08 %.

Key words: *Acipenser ruthenus*, albino sterlet, sturgeons.

Introduction

Currently, much attention is being focused on the rearing of the sturgeons. There is also interest in further diversification of sturgeons farming. The sterlet was identified as a leading candidate for aquaculture diversification in aquaculture. Sterlet (*Acipenser ruthenus* Linnaeus) is a valuable food fish, object of fresh-water aquaculture (Ponomareva, 2006).

Interest in the current paper stemmed mainly from examines the on growing performance in tanks, specifically the rearing conditions, growth, diet, feed conversion ratio (FCR), and survival of albino sterlet over a one-year, under Brates sturgeons station conditions.

Sterlet (*Acipenser ruthenus*) was used as the experimental model. Albinism in males was used as a phenotypic marker. Naturally-colored sterlet females fished from the Danube were also used (Urbanyi, 2001).

The colour of skin in fish is determined by the combination of colour pigments. There are several types of specialized pigment-containing cells (chromatophores) in fish skin. Each type of chromatophore contains a certain kind of pigment: *melanophores* contain the black pigment melanin; *erythrophores* and *xanthophores* accumulate red and yellow pigments, respectively. In fish, as in other animals, the hereditary variability in body colour results from mutations of genes controlling the synthesis of pigments or the structure and distribution of pigment cells. The absence decreased or increased amount of some pigment in the skin results in changes in body colour, i.e. appearance of colour morphs. For aquaculture species and fish inhabiting natural waters the information on colour variability is much scarcer. Colour modifications in fish are typical qualitative traits. They are inherited according to Mendel's principles. Colour modifications have been revealed only in a few species. The appearance of albino individuals in many fish species may be regarded as an exception.

Albino individuals have been described in many aquarium fish, several aquaculture species (including rainbow trout, channel catfish and grass carp), and among fish inhabiting natural waters. Albino mutants have been found among fish of very different systematic groups: lampreys, sharks, sturgeons and many teleostei fish. Albinism is the absence of black pigment, melanin, both in the skin and in the eyes. The albino animals have a yellowish body and pink eyes (photos below). The eyes look pink or red since the blood vessels and capillaries in the iris and retina become visible due to the absence of melanin.

The black pigment melanin has a photo protective effect. It absorbs ultraviolet irradiation and, as a result, protects skin, eyes and whole body from damage. The lack of melanin in albino animals makes them more sensitive to visible light. In natural waters albino fish become more available to predators due to their light colour. The growth rate and survival of albino fish are usually much less than those of normally pigmented fish. Therefore fish of this colour modification are not used for commercial rearing.

Materials and Methods

Fishes and rearing system

The experiment was conducted with 513 sterlets, *Acipenser ruthenus* (Linnaeus, 1758), *albino* variety, fry aged 1 year, in Brates sturgeons rearing station, in order to get more data about growth dynamics. In the beginning, the fishes were initially reared at the SC Raduta Sporting Tours SRL – Tamadau farm. Sterlet at begin of experiment weighing about 40 g and its total length mean 20 cm/ex. The fish quantity was distributed randomly by groups of 171 into three Ewos experimental fibreglass tanks (1.5 x 1.5 x 0.5 m). These tanks were supplied with filtered and well-oxygenated water (temperature: 5-29^{o}C). Water renewal (150 1/h) was maintained throughout the experiment. Fish had a mean weight of 130 g at half and five months after stocking and were harvested. Dead fish were removed from the tanks daily and reported as numbers of mortalities per month, and as a percentage of stock size.

Feeding regimes, monitoring

The sterlet was reared with granular food Nutra 2, a commercial recipe from Skretting; the average pellet size - 2mm. Food was applied by hand, four times daily, with a 6 hours frequency. Feeding rate as a percentage of body weight was around 0.5% until fish were 100 g mean weight, then declining to 0.3%.

There are collected samples of ten fish from each of the ewos tanks for examination. Decadal, the fishes were biometrical assayed; the body weight, length and circumference were measured. Two samples of 5 fishes from each tank at random were bulk weighed (above photo). Performance was expressed as increment in bodyweight (g); specific growth rate and food conversion rate. Growth rates and feed conversion ratios are the most important performance parameters impacting on the economy of fish. Colected data were definition and calculated the coefficients after Rónyai's methodology (2006) and formula from Skretting web site (2006).

Results and Discutions

Fish were stocked at a mean weight of 40 g in June 2007, 513 individuals. The sterlet had a mean weight of 130 g at 5 months after stocking. At the end of experiment were harvested 457 individuals. Mortality during the on-growing stage was 10.9 % of stock and was attributed to light sensibility and density stress. The temperature range was 6 to 29^{0}C and oxygen concentration was 4.5 to 11.5 mg /l, bigger in the cold period (Table 1, Fig. 1).

Sterlet was fed with commercially prepared pellet food Skretting. The composition of the feed was approximately follows:

- total protein – 54 %
- fat – 18%
- ash – 10%.

Table 1

The environmental conditions, feeding and growth in albino sterlet experiment from Brates sturgeons station

Data	Water temperature (^{0}C)	Oxygen content (mg O_2/l)	Granular food quantity (g/tank)	Body weigth Wmed (g/ex)		
				C1	C2	C3
10.06.07	25.4	6.47	50	43.0	42.2	42.0
20.06.07	26.3	6.60	100	47.0	45.2	46.5
30.06.07	27.5	6.50	120	56.0	49.0	54.0
10.07.07	27.9	5.82	130	60.0	54.0	62.0
20.07.07	28.1	5.40	140	64.0	59.0	71.0
30.07.07	28.7	4.53	150	68.2	64.0	79.0
09.08.07	26.2	6.25	160	72.6	70.0	86.5
19.08.07	24.1	6.50	160	78.0	75.4	89.5
29.08.07	23.0	6.70	200	84.8	85.0	94.0
08.09.07	21.0	6.95	160	88.2	96.2	100.0
18.09.07	18.2	7.42	120	95.2	102.4	110.0
28.09.07	18.4	8.15	100	107.0	116.0	118.0
07.10.07	16.8	8.30	80	120.0	126.0	120.0
17.10.07	13.5	8.74	80	130.0	135.0	125.0
27.10.07	12.4	9.10	60	135.0	130.0	127.0
06.11.07	10.7	10.00	50	140.0	129.0	124.0
12.11.07	6.5	11.32	30	137.8	126.0	125.8

Table 2

Sterlet growing parameters

Growing performance	Tank			
	C1	C2	C3	Total
Amount of feed given (g)	16,860	16,860	16,860	50,590
Biomass at the start (g)	6,840	6,840	6,840	20,520
Individual Weight at the start of the period -W_0 (g/fish)	40	40	40	Med. 40
Biomass at the end of period (g)	20,946	19,278	19,186	59,410
Weight at the end of the period - W_t (g/fish)	137.8	126.0	125.8	Med. 130
Specific growth rate (g/fish)	97.8	86.00	85.8	Med.89.86
Biomass gain (g)	14,106	12,438	12,346	38,890
Specific daily growth rate (g/d)	0.59	0.52	0.52	0.55
ln Wo	3.69	3.69	3.69	Med.3.69
ln Wt	4.93	4.84	4.83	Med.4.87
Body weight geometrical mean (BWg)	36.20	47.04	46.93	66.30
Specific growth rate SGR (% BW/d)	1.96	1.65	1.20	0.97
Relative growth rate RGR (g/g/d)	0.02	0.02	0.01	0.01
Feed conversion ratio - FCR (g/g)	1.19	1.35	1.51	1.3

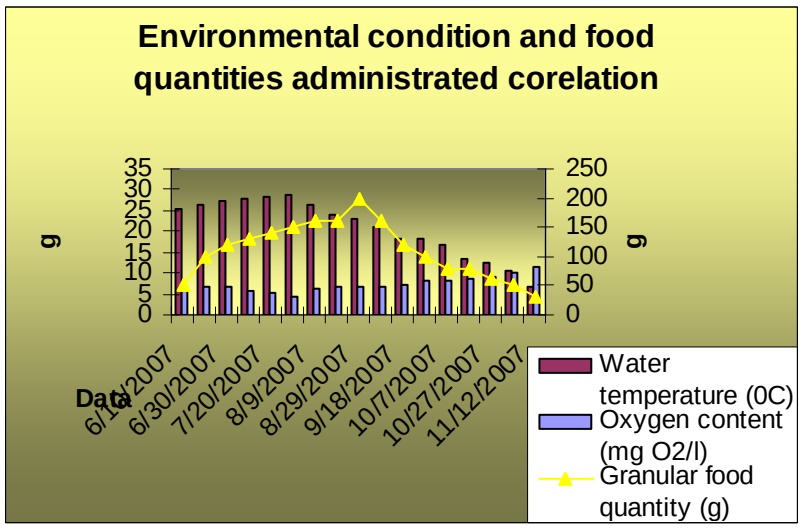

Fig. 1.

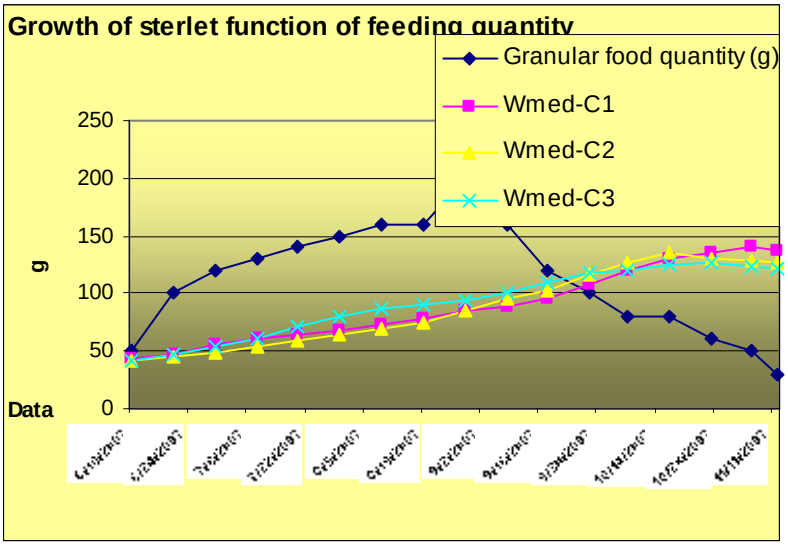

Fig. 2.

Body weight, the specific growth rate (SGR) and feed conversion ratio (FCR) of albino variety was mean half compared with same species normally pigmented fish, feeding with same pellets type in comparable quantities (Table 1 and 2, Fig.2).

Conclusions

The growth rate and survival of albino fish are usually much less than those of normally pigmented fish. Body weight, the specific growth rate (SGR) and feed conversion ratio (FCR) of albino variety was mean half compared with same species normally pigmented fish In conclusion, rearing of *Acipenser ruthenus* (Linnaeus, 1758), *albino* variety, in the second summer, is technically feasible but, therefore fish of this colour modification are not used for commercial rearing. Further improvements are required in station techniques and management, in feeding system, also. The albino fish must be daylight protected.

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