

COMBINED INFLUENCE OF DIFFERENT FEED ON BODY DEVELOPMENT OF LARVAE, FRY AND YOUNG OF THE SPECIES *POECILIA RETICULATA* (GUPPY)

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Abstract

The purpose of this paper is to establish the effect of the use of the recipes obtained impinge the corporal development of the species *Poecilia reticulata*. The scientific researches have lasted three months, the fishes passing through three stages of development: larva, fry and juvenile. For each category of age were made three recipes of combined fodder (R1, R2 and R3), taking into account the nutritional requirements of the species and to the chemical composition of raw materials and the constitution of the final fodder. For carrying out the research have formed six lots of 15 fishes that have been fed differentiated as follows:

- lot R₁: R_{1larvae}, R_{1fry and juvenile};
- lot R₂: R_{2larvae}, R_{2fry and juvenile};
- lot R₃: R_{3larvae}, R_{3fry and juvenile};
- lot TG: Troco Grower;
- lot TP: Troco Prim;
- lot TD: Tetra Discus.

The follow parameters have been corporal length and body weight at the end of each month by experimentation. On the basis of these parameters were determined the indices of body development (the indices rise Fulton, the gain in weight and multiplication report of average weight). As a result of the researches it was found that the proposed combined fodder recipes have led to an increase in both length and weight with values close to those achieved through existing combined fodder on the market.

Key words: *Poecilia reticulata*, indices Fulton, larvae, fry, combined fodder

INTRODUCTION

Poecilia reticulata is one of the most frequent viviparous species from aquarium in the world, being a species with a reduced biological cycle (at three months reaches sexual maturity), is not sensitive to the conditions of growth and attracting with energetic movements and the colouring of the males [1, 2].

In order to have viable fishes with an appealing appearance an important role has the choice the fodder combined. On the aquaristic market there are many fodder quality but are less accessible as price. In the present paper we propose three recipes for three category of age group to ensure the supply of nutrients but which have a lower manufacturing price.

The final price to the fish is directly depends from the fodder used. Therefore using

a cheap fodder, but have the same nutritional value increases the profitability for exotic fish.

MATERIAL AND METHODS

The scientific researches were conducted in the Laboratory of Aquaculture of Iași USAMV over a period of three months, time in which he watched the bodily development evolution (the increase in body weight and length) for the specie *Poecilia reticulata* in the stages: larva, juvenile and youth.

In this respect they used two aquariums of the same capacity (15 litter) divided into three compartments each. Both Aquariums were equipped with installations lighting (fluorescent lamp), installations filtering (interior mechanic filter), installations of warming water (heater with thermostat) installation of ventilation (aeration pump with aeration stone), vegetal substrate (*Vallisneria* and plants of the *Elodea* genus), and mineral substrate (gravel).

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The two chambered aquariums were introduced in two larger aquariums both width and length. Heating was being achieved with one electric heater with thermostat mounted on the tank 50W. Temperature reading was done using mercury thermometers, one for each aquarium.

Parameters follow were the length of the body and body weight with which were calculated:

- Indices Fulton (the indices raise) is given by formula [6]:

$$L_f = \frac{g \times 100}{l^3}$$

Where:

L_f = the indices rise;

g = body weight [g];

l = body length [cm].

- Gain in weight is given by formula [3]:

$$S_p = G_f - G_i$$

Where:

S_p = gain in weight [mg / individuals fish]

G_f = final weight [mg / individuals fish]

G_i = initial weight [mg / individuals fish]

- Multiplication report of average weight is given by formula [4]:

$$R.M.G.M. = \frac{G_f}{G_i}$$

Where:

R.M.G.M. = multiplication report of average weight;

G_f = final weight [mg / individuals fish]

G_i = initial weight [mg / individuals fish]

Parameters have been determined at the end of each month throughout the duration of the experiment. The body length was determined with the help of electronic calliper, and the weight with the electronic analytical balance type Denver.

Recipes were established given the gross chemical composition of raw materials forming combined fodder, and taking into account the nutritional requirements for each age category.

RESULTS AND DISCUSSIONS

Scientific researches have been carried out over a period of three months in which individuals fish of *Poecilia reticulata* were fed varied by age and their nutritional requirements.

Table 1 Recipes of compound feeds used

Fodder	R1 larvae	R2 larvae	R3 larvae	R1 fry and juvenile	R2 fry and juvenile	R3 fry and juvenile
Gelatine	6.5	6.5	6.5	2.0	0.0	0.0
<i>Spirulina platensis</i>	-	0.5	0.5	-	-	0.3
<i>Daucus carota</i>	3.0	3.0	3.0	10.0	20.0	20.0
Pangasius fillet	60.0	61.5	61.5	30.0	30.0	30.0
Fish flour	-	-	-	12.0	11.0	11.0
Soybean meal	10.0	-	5.0	15.0	10.2	10.0
<i>Daphnia pulex</i>	3.0	6.0	3.0	3.0	3.0	3.0
<i>Taraxacum officinales</i>	3.0	3.0	3.0	8.0	5.0	5.0
<i>Urtica dioica</i>	5.0	10.0	8.0	10.0	12.0	12.0
Full fat soy	-	5.0	3.0	-	4.5	4.4
Flour weath	5.0	-	-	5.0	-	-
Molasses	-	-	2.0	-	-	-
Fresh beer yeast	1.0	1.0	1.0	-	-	-
Dry beer yeast	-	-	-	0.3	0.3	0.3
Calcium carbonat	1.5	1.5	1.5	2.5	2.0	2.0
Monocalcium phosphate	1.0	1.0	1.0	1.2	1.0	1.0
Premix	1.0	1.0	1.0	1.0	1.0	1.0

Protein requirements for larvae are 45% higher than those for alevini and youth (38%) [8]. Therefore in recipes for larvae has been used gelatine which brings an extra protein.

Quantity of *Daucus carota* in the case of recipes for fry and juvenile was much greater than that used for the larvae to compensate

for the large quantity of protein which contains fish flour (72%) [7].

All other raw materials were used in equal amounts, except *Taraxacum officinales* and *Urtica dioica* whose quantity which amount had to be increased in order to ensure the necessary volume for combined fodder.

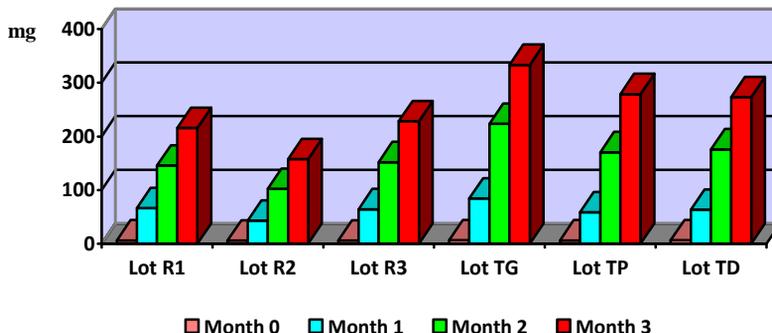


Fig. 1 The evolution of body weight to larvae, fry and juvenile

Starting from an initial weight around 6.2 - 6.9mg, it is noted that during the experiment individual fish fed with Troco Grover had had the highest increase in

weight, weight being in the third month at an average of 333.29mg.

The smallest increase in weight was recorded for the lot fed with recipes R₂ larvae and R₂ fry and juvenile-

Table 2 The evolution of body weight to larvae, fry and juvenile – statistical calculation

Month	Statistical differences	Fisher Test
0	Insignificant differences	$F = 1.5 < F_{\alpha 0.05} = 2.29$
1	Insignificant differences	$F = 2.22 < F_{\alpha 0.05} = 2.29$
2	Significant differences distinct	$F_{\alpha 0.001} = 4.76 < F = 5.47$
3	Significant differences distinct	$F_{\alpha 0.001} = 4.76 < F = 11.01$

As a result of the Fisher test we can conclude that in the first month the differences between the lots were

insignificant as regards the increase in weight, they have become distinct significant in the next two months.

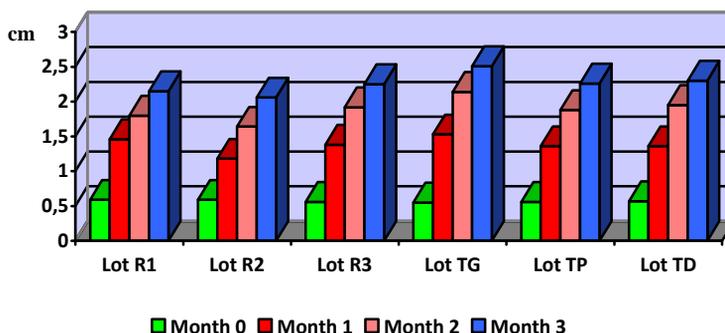


Fig. 2 The evolution of body length to larvae, fry and juvenile

The increase in the length largest was determined for individual fish fed with Troco-Grower (2.51cm), at the opposite pole

to falling the lots was fed with recipes R₂ larvae and R₂ fry and juvenile.

Table 3 The evolution of body weight to larvae, fry and juvenile – statistical calculation

Month	Statistical differences	Fisher Test
0	Insignificant differences	$F = 0.1 < F_{\alpha 0.05} = 2.29$
1	Significant differences distinct	$F_{\alpha 0.01} = 3.34 < F = 3.68 < F_{\alpha 0.001} = 4.76$
2	Significant differences distinct	$F_{\alpha 0.01} = 3.34 < F = 4.34 < F_{\alpha 0.001} = 4.76$
3	Significant differences distinct	$F_{\alpha 0.01} = 3.34 < F = 3.38 < F_{\alpha 0.001} = 4.76$

Starting from insignificant differences at the beginning of the experiment, they became distinct significant to throughout the duration of the scientific research.

The fishes it was developed fastest in the first month after hatching, that along with the advancement of the age, increasing both in length and in weight to be reduced.

Table 4 The evolution of body indice to larvae, fry and juvenile

Body indices	Month	R1	R2	R3	TG	TP	TD
Indice Fulton (the indices rise)	1	2.0	2.5	2.3	2.5	2.1	1.9
	2	2.5	2.5	2.2	2.4	2.5	2.5
	3	2.0	1.7	1.9	2.1	2.3	2.2
Gain in weight [mg / individuals fish]	1	66.1	42.5	63.7	83.7	58.0	62.7
	2	79.1	59.2	88.0	139.3	112.2	112.7
	3	70.2	55.5	76.2	109.7	10.8	97.1
Multiplication report of average weight	1	10.4	7.0	10.2	12.3	9.0	9.3
	2	2.2	2.4	2.4	2.6	2.9	2.8
	3	1.5	1.5	1.5	1.5	1.6	1.6

Index of maintenance had values around 2 or over for all consignments witch denoted a good state of health and increase on all period of experiment [5].

Gain in weight has increased from one month to the next, for each consignment, with maximum values in the second month. In the third month the average values of gain in weight fell slightly, they was largest than those identified within the first month.

Multiplication report of average weight had maximum values in the first month because during the second and third month it was five times less than. This is explicable as the difference between the initial and the final weight of the respective months was lower.

CONCLUSIONS

The increase in the length of the fish *Poecilia reticulata* depends directly of used combined fodders, the nutritive value of its but also and the degree of assimilation which differ from a fish to another.

The increase in weight is correlated with the increase in length, specimens that were fed with the Troco-grower having the greatest growth both in weight and in length.

The fishes have a high plasticity, the copies of the same lot having a diversified increase in weight and length, and different body development.

Values of Fulton indices (maintenance indices) were more than 2 which indicate a good maintenance for all specimens.

Once what the fish advanced in the life, values of the gain in weight come down, but

value of multiplication report of average weight increase.

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