DIFFERENT SIZES OF NET CAGES AND THE WEIGHT GAINS OF BULLFROG TADPOLES

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SUMMARY: The effect of different sizes of
net cages upon the weight gains of Bullfrog
tadpoles was studied in an outdoor
facility, with a constant stock density of
0.5 individual per liter of water. Small
baskets were found to be more effective for
the Bullfrog tadpoles cultivation.

UNITERMS: Bullfrog; Weight of tadpoles;
Housing, net-cages

INTRODUCTION

Much attention has always been
dedicated by researchers in the field of
livestock production to estimate both
the proper size of the enclosure and the
number of animals which should be kept
in it.

As far as the bullfrog larvae are
concerned, CULLEY et alii, 1 (1977)
proposed a rearing system for bullfrog
tadpoles in laboratory to diminish the
problems arisen with the cultivation of
large numbers of individuals within a
small space. This effort aimed to
contribute substantially to the
standartization of the management
techniques employed in many amphibian
larvae and even in fish and aquatic
invertebrate cultivations.

Basically those authors verified no
differences in growth, consume and feed
conversion when 8 to 13 tadpoles per
liter densities were compared, employing
rectangular baskets with capacity
ranging from 25 to 30 liter of water.
Yet some doubt remained whether increase
in density could lead to lesser weigth
gain. SOARES, et alii, 6 (1983) verified
in field conditions that the weight gain
falls as density increases.

If something is already known as
far as the density is concerned, it
seems to be altogether the contrary in
regard to the effect of the space
availability upon the weight gain of
Bullfrog tadpoles when the density is
kept constant.

The refered bibliography scarcely
informs on the volume of the tanks to be
employed in the tadpole culture of this
species both in laboratory and in field
conditions. It is an important question
to answer, as stated MARSCHALL, 4
(1978): "the question of the effect of
the space disponibility in the same
crowd conditions is still waiting for an
answer".

The present work intends to
contribute to the knowledge of the
effect of the size of the tank upon the
weight gain of Bullfrog tadpole aiming
the development of the commercial
frogculture in Brazil.

MATERIAL AND METHOD

The experiment was carried out at
the Experimental Frogculture Facility of
the Instituto de Pesca of the Secretaria

da Agricultura e Abastecimento do Estado de São Paulo, located in Parque Fernando Costa, São Paulo City, São Paulo State, Brazil.

The experiment ran from April, 4 th. through October, 1 st., 1985 and 90 Bullfrog tadpoles, belonging to the same spawn, at the stage 25 (GOSNER, 3, 1960) were utilized.

In a tank for fish culture, 20 rectangular parallelepiped screen-walled baskets were installed, being five of them 0.850 x 0.213 x 0.350 m (63.36 liters) (treatment A); five, 0.850 x 0.425 x 0.350 m (125.44 liters) (treatment B); five, 0.850 x 0.283 x 0.350m (84.19 liters) (treatment C); five, 0.850 x 0.850 x 0.350m (252.87 liters) (treatment D). All baskets were constructed with 6 meshes per centimeter nylon net. The water depth in all baskets was 0.200m. Also in all baskets the stocking rate was 0.5 tadpoles per liter.

The spring water flow was 50 liter per minute.

A commercial ration containing 36% of crude protein was offered ad libitum.

During experimental period, temperature was daily recorded at 10:00 a.m.

To estimate the weight gain during the period, the animals in each basket were weighed at the beginning and the end of the experiment with a scale of 0.1g sensibility.

The statistical design was the randomized bloks with four treatments (A, B, C and D) and five replicates. Each of the four treatments was represented by a basket dimension as above mentioned. The smallest experimental units, i.e. the baskets, were randomly distributed within the blocks. Weight gains were submitted to analysis of variance, followed by F and Tukey tests at 1% probability level (SNEDECOR & COCHRAN, 5, 1980). To show schematically weight gains comparisons among treatments, the Duncan bar representation was employed (GOMES, 2, 1982).

Data were processed in a PC 1500 RP - SHARP.

In order to follow the progressive performance of tadpoles in each treatment during the experimental period; five extra weight measures were taken between the first and last ones. Thus, with the dates on the abscissa and the mean weights on the ordinate a bar diagram was constructed.

RESULTS AND DISCUSSION

Fig. 1 shows variations in the bullfrog tadpole mean weights in each treatment during experimental period.

Analysis of variance, Tukey test value and Duncan bars are represented on Tab. 1.

Tukey test minimum significant difference (M.S.D.) value was 2.0024, revealing that only contrast between A and D differed significantly.

TABLE 1 - Summary table of one-way analysis of variance on the weight-gains of Bullfrog tadpoles cultivation. Tukey test and Ducan bars representation.

SV	d.f.	S.Sqs	M.S.	F
Treatment	3	15.5518	5.1839	7.8212**
Block	4	3.7033	0.9255	1.3963
Error	12	7.9540	0.6638	
Total	19	27.2080		

M.S.D. Tukey 1% = 2.0024   C.V = 10.41%

m A = 9.0155   m B = 8.0291   m C = 7.6957   m D = 6.5465

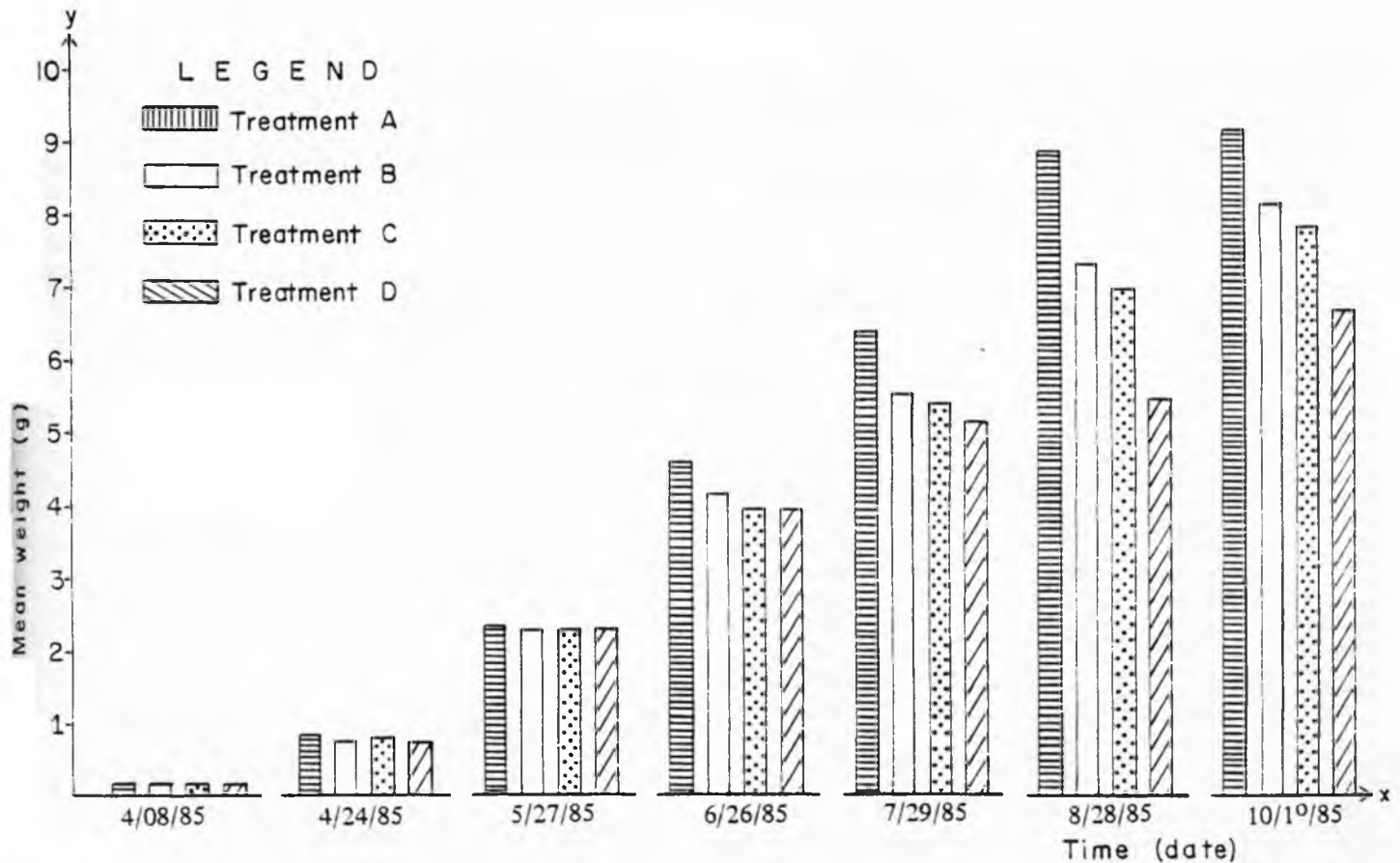|		
(**) = P < 0.01	SV	= Source of variation
m A = 9.0156g	d.f.	= degree of freedom
m B = 8.0291g	S.Sgs.	= Sum of Squares
m C = 7.6957g	M.S..	= Mean Square
m D = 6.5465g	C.V.	= Coefficient of variability
m = treat. mean weight gain	F	= F test values

FIGURE 1 - Variations in mean weights in bullfrog tadpoles in
          each treatment during the experimental period.

Average water temperature during experimental period was 18.77 C ± 2.09 C.

From the results (Tab.1 and Fig.1) very trustful inferences can be drawn on the effect of the basket volume upon Bullfrog tadpole weight gains.

Statistical analysis of data showed that, as the volume of the basket grew bigger, the weight gain decreased. This phenomenon should not be attributable to possible differences in the quantities of rations which were offered to the animals along the experimental period, since all care was taken to offer excessive feed to the animals. Fig. 1 shows that in all weight measures from the second on the profile gotten kept constant and always favouring the smaller baskets.

At least for the time being, it would be advisable to use small, loosely crowded tanks in intensive cultures. Yet much remain to be done until conclusive answers can be reached in this field.

CONCLUSION

The small parallelepiped baskets seem to enhance better weight gains than the larger ones in Bullfrog tadpole intensive culture.

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RESUMO: Estudou-se, a céu aberto, o efeito de diferentes tamanhos de tanque-rede, em forma de paralelepípedo reto, sobre o ganho de peso em girinos de rã-touro, mantendo-se a densidade constante de 0,5 girinos por litro de água. Os resultados permitiram inferir que tanques pequenos são mais favoráveis à criação de girinos de rã-touro.

UNITERMOS: Rãs-touro; Peso, girinos; Instalações, tanques-rede

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