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Growth response of *Clarias anguillaris* fingerlings fed larvae of *Musca domestica* and soyabean diet in the laboratory

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ABSTRACT: Fingerlings of *Clarias anguillaris* were fed frozen larvae of *Musca domestica*, soyabean diet and commercial feed for a period of 42 days in the laboratory. The results indicated that frozen larvae of *Musca domestica* (maggot) promoted highest specific growth rate (1.55) and best mean weight of 5.04g in fingerlings of *Clarias anguillaris* while fingerlings fed soyabean diet and commercial diet recorded specific growth of 0.70 and 0.82 respectively. The larvae of *Musca domestica* are being recommended for *Clarias anguillaris* production because it promoted fast growth rate in the fingerlings.

Key Words: Growth response; Pond fish; Aquaculture; *Clarias anguillaris*; House fly (*Musca domestica*); Soyabean.

Introduction

Nutrition of pond fish is one of the major problems of aquaculture in the developing countries. Provision of quality supplementary feed to cultured fish at appropriate level is an objective yet to be accomplished. This is largely due to the fact that there is competition for the feedstuff like soyabean, maize, groundnut cake and fish meal for poultry, livestock industry and man. There is need for an inexpensive feedstuff that will promote growth within a short period in fishes.

Some of the work reported in the area of replacement/substitution of fishmeal with cheaper sources of food materials include: Annune (1990) who replace fishmeal in feedstuff with toadmeal and observe that 40% inclusion of toadmeal promoted best growth in *C. lazera*. Atteh and Olugbenla (1993) used the larvae of *Musca domestica* to substitute fishmeal in poultry feed while Salami and Oyewole (1997) used visceral to substitute fishmeal for grower's pullets. Achionye-Nzeh (1997) recorded weight gain of 13.8% in *Sarotherodon galilaeus* that were fed after a period of food restriction. Otubusin and Ifili (2000) fed fry of *Clarias gariepinus* with frozen maggot of *Musca domestica*, plankton and pelleted feed (35% crude protein) and reported that frozen larvae of *Musca domestica* promoted best growth of 6.52g while plankton recorded 1.11g and pelleted feed was 2.75g after six weeks. Achionye-Nzeh et al., (in press) used *Cirina forda* to feed fry of *Clarias anguillaris* and observed that 30% inclusion promoted best growth. This paper reports the effects of frozen larvae of *Musca domestica* and soyabean diet on the growth of *Clarias anguillaris* reared in the laboratory.

Materials and Methods

Experimental Fish

Fingerlings of *C. anguillaris* were collected from National Institute of Freshwater Fisheries Research, New Bussa and transported to the Department of Biological Science Research Laboratory in well-aerated plastic drums. They were acclimatized for a period of fourteen days before the experiment commenced.

Five experimental plastic bowls containing about 30 litres of water were set in the laboratory and all were well aerated using aerators. The plastics bowls were covered with meal mesh screens to prevent fish from jumping out.

Three types of diets were used in the experiments: Larvae of *Musca domestica* (maggot, soyabean meal and commercial feed. Live maggots (larvae of *Musca domestica* were sieved-out from poultry droppings from Faculty of Agriculture Poultry, University of Ilorin. The maggot were washed with water and packed in polythene bags and preserved (frozen) in a deep freezer in the laboratory in the Department of Biological Sciences, University of Ilorin. The second diet was prepared from soyabean meals as shown in Table 1.

Starch was used as a binder, composition of vitamin and mineral premix vitamin A, 10, 000, 000 I.U., Vitamin D₃ 2, 000, 000 I.U., Vitamin E, 3, 500 I.U., Vitamin K, 1, 900mg, Vitamin B₂, 7, 000mg, Vitamin B, 2, 200mg, Vitamin B₆, 3, 300mg, Nicotinic acid 33,000mg, Calcium Pantothenate 11, 000mg, Folic acid 1, 400mg, Biotin 225mg, Manganese 64, 000mg, Zinc 40, 000mg, Iron 32, 000mg, Copper 8, 000mg, Iodine 800mg, Selenium 160mg, Chlorine Chloride 275, 000mg, Cobalt 400mg, DL methionine 50, 000mg.

Experimental treatments, stocking and feeding, 10 fishes were stocked in a bowl, the fishes were fed 4% of their body weight (half of the diet between 7.00h and 8.00h and the other half between 17.00h and 18.00h.

The diets were broadcasted on the water. The experiment lasted for 42 days at the end of each week, the fish were weighed with a sensitive balance. There were thereafter returned to their respective bowls. The physico-chemical parameters were monitored weekly using Hannah set. The mean dissolved Oxygen was 3.5542mg/l while temperature was 24±2° (and the mean pH was 7.5 + 1.05).

Results and Discussion

Table 1: Composition of Soyabean Meal

Ingredients	Weight in grams
Soyabean	90
Maize	8
Groundnut oil	1
Vitamin and Mineral Premix	1/100g

The growth performance of the fishes fed larvae of *Musca domestica*, soyabean diet and commercial feed are shown in Table 2.

Table 2: Growth performance of fishes fed larvae of *Musca domestica*, soyabean diet and commercial feed.

Growth parameters	Frozen maggot	Soyabean diet	Commercial feed
Mean initial weight	5.50	5.80	4.90
Mean initial weight	10.54	7.78	6.90
Mean initial gain (g)	5.04	1.98	2.00
Percentage weight	91.64	34.14	40.82
Specific growth rate	1.55	0.70	0.82
Protein efficiency ratio	0.903	0.462	1.03
Feed conversion ratio	2.01	4.51	3.9
Food efficiency ratio(%)	45.81	22.17	25.4

The result indicated that frozen maggot promoted better growth than soyabean. A growth rate of 1.55 was recorded with maggot while soyabean recorded a growth of 0.7. Soyabean has high biological value and high concentration of cystine and it is rich in essential amino acid yet it promoted little growth in *C. anguillaris*. This result showed that maggot although larvae forms of animals promoted better growth than soyabean. Earlier studies indicated that fishes performed better with natural food than artificial diet (Dabrowki and Kozal, 1979).

Fingerlings of *C. anguillaris* fed compounded feed containing between 10% to 40% *Cirina forda* also showed less growth. The best specified growth rate was observed with *C. forda* was 0.57 (Nzeh et al., in press).

Plant source of protein like soyabean is not good for rearing of fingerlings of *C. anguillaris*.

Maggot larvae of *Musca domestica* has proved to be an effective alternative to catfish production when compared to expensive conventional feed ingredients. It contains 10 essential amino acids although they are available in small quantity. Storing larvae of *Musca domestica* in deep freezers can overcome the problem of seasonal availability of the larvae of *Musca domestica* during the period of abundance and using them when needed. Alternatively, intensive production of *C. anguillaris* should be carried out during the period of abundance of maggot.

References

- Achionye-Nzeh, C.G. (1997). Effects of feeding and starvation on the growth of *Sarotherodon galilaeus* (L). Journal of Aquaculture in the Tropics 12, 139 – 145.
- Achionye-Nzeh, C.G.; Ogidiolu and salami, S.S. (In Press), growth response of juveniles of *Clarias anguillaris* to diet formulated with *Cirina forda* larvae in the laboratory, accepted in Journal of Pure and Applied Science.
- Anunnu, P.A. (1990). Preliminary investigation on the suitability of Toad meal (*Bufo regularis* Reuss, 1834) in the diet of catfish *Clarias lazera* curvier and valenciennes. J. of Aquatic Science 5: 37-42.
- Atteh, J.O. and Olugbenla, F.D. (1993). Replacement of fish meal with maggots in Broiler diets effects of performance nutrient retention. Nig. J. Agric. Production 20(1) 44 – 49.
- Dabrowaki, K. and Kozak, B. (1979). The use of fish meal and soyabeans as a protein source in the diet of grass carp fry. Aquaculture 18, 107 – 114.
- Otubusin, S.O. and Fill, N.N. (2000). Growth performance of *Clarias gariepinus* fed on plankton, frozen maggot and pelleted feed in a floating hapa system. J. Fish Tech., vol. 2: 117 – 123.
- Salami, R.T. and Oyewole, S.O.O. (1997). Evaluation of poultry visceral offal meal as a substitute of fish meal in grower pullets' diet. Nig. J. Anim. Prod. 24(1): 20-23.