(Short communication)

Homoplastic hypophysation of African catfish, *Clarias gariepinus*

¹Fafioye O.O. and ²Adeogun, O.A.

¹Department of Biological Sciences, Ogun State University, Ago-Iwoye, Nigeria.

²Department of Zoology, University of Ibadan, Ibadan, Nigeria.

Abstract

Clarias gariepinus brood stocks (157.0 ± 6.0 g) were hypophysised for maturation and ovulation with *Clarias* crude pituitary extract (CCPE) at 7 mg/kg body weight of female fish. Fertilization was done by mixing egg and milt together in a dry bowl with feather. Physico-chemical parameters of water were maintained at 6.0 ± 0.2 mg/l (dissolved oxygen), 28.0 ± 0.5 °C (temperature) and 7.2 ± 0.1 (pH). The latency period recorded for optimal egg was 10-12 hours. While hatching started at 24 hours to 36 hours. The total number of eggs stripped was 618.8×10^3 , the total fertilized was 332.8×10^3 , the total fry hatched was 280.6×10^3 . It is concluded that *C. gariepinus* can be induced with CCPE to reduce the cost of carp pituitary and problem of its procurement due to scarcity.

Key Words: Homoplastic, Hypophysation, Latency, *Clarias gariepinus*,

Introduction

The procurement of juvenile fish of cultivable species for stocking ponds and fish farms has been a major set back in the development of fish culture. This is because juveniles of such cultivable fish species are not easily obtained from the wild and the cost of commercial pituitary in the tropics and developing world is high. Induced spawning of such fish species has been undertaken using various hormones such as Human chorionic gonadotropins, deoxycorticosterone acetate, dry carp pituitary extract and *Clarias* pituitary extract ((Pickford and Atz, 1959; Pullin and Kuo, 1980; Adigun, 1983; Ufodike *et al.*, 1986; Omoregie *et al.*, 1998).

Dry carp pituitary extract is scarce in Nigeria and it is costly to buy for artisanal fisher folks who are more vulnerable to scarcity of fingerlings than government farms.

This study was aimed at evaluating the prospect of induced spawning of African catfish, *C. gariepinus* using only crude pituitary extract of *Clarias*.

Material and Methods

Thirty gravid male and female *Clarias gariepinus* (157.0 ± 6.0 g) obtained from Tropical Fish Farm, Moniya, Nigeria were stocked in two aerated 50 - litre rectangular concrete tanks in the laboratory. The tanks were filled to half their capacities with dechlorinated tap water and the physico-

chemical parameters of 6.0 ± 0.2 mg/l (dissolved oxygen), 28.0 ± 0.5 °C (temperature) and 7.2 ± 0.1 (pH) were maintained. Fish were fed with 40% crude protein diet at 3 % body weight twice daily for two weeks (March 14-28, 2000) acclimation.

The method of hypophysation according to Viveen *et al.* (1985) was employed. Fifteen males and five females were used in the ratio of three males to one female. Experimental fish were starved overnight prior to hypophysation exercise, while in the morning, they were hypophysised with *Clarias* crude pituitary extract (CCPE) injected at 7mg/kg body weight of the female breeder. Both female and male fish were stripped of eggs and milt, respectively and thereafter mixed thoroughly for one minute with feather pre-washed in ethanol. A fertilizing solution (1% salt solution) was added and the eggs swirled gently for one minute and later rinsed five times in dechlorinated tap water. The eggs were later incubated at $27 \text{ }^{\circ}\text{C} \pm 0.5 \text{ }^{\circ}\text{C}$ in a water-flow trough after it had been spread homogenously in a single layer on the Kakaban made from polythene shreds.

Estimation of the number of eggs fertilised and percentage fertilisation were determined according to methods described by Nikolski (1969). Fertilized eggs which were light brown coloured and translucent were readily differentiated from the unfertilised eggs which are white and opaque. All results were subjected to statistical analysis of variance (ANOVA).

Results

All treated fish responded positively when stripped, while the ease of flow increased with latency period. The number of eggs stripped, fertilised and hatched are shown in Table 1. The highest number of eggs stripped was 62.7 thousand at 12th hour, while the lowest was 29.8

thousand at 8th hour latency period. Egg fertility increased until an optimal percentage fertility of 84% was obtained at 10, 11 and 12 hour latency period. The maximum number of hatched eggs (between 35.6 and 46.6 thousand) and optimal percentage fecundity (73.6 and 74.3%) were obtained at 10, 11 and 12 hour latency period. There was no significant difference ($P>0.05$) between the fertility at 12 hours (84.2%) and that at 10 or 11 hours (Fig 1, Table 1) and also between hatchability of eggs and latency period (Fig 1).

Discussion

Clarias crude pituitary extract (CCPE) induced spawning in the African catfish, as carp pituitary extract alone induced spawning in the common carp (Omoregie, *et al.*, 1989). This positive result could probably be attributed to non-inhibitory factors, which promoted positive feedback mechanism based on the phylogenetic similarities of the inducer and the induced specimen and species specificity (Shehadah, 1975; Hogendoorn and Visman, 1980; Woynarovich and Horvath, 1980). Ufodike and Amadi (1991) reported high doses of CCPE for an effective inducement of common carp. The very good result encountered with CCPE in this study could be asserted to the high dose level used.

The disparity between optimal latency period of 10-12 hours obtained and 8-10 hours documented by Viveen *et al.* (1985) for *C. gariepinus* might be due to different pituitary extracts (carp) used. This study shows that fertilized eggs may have equal chance of hatching since there was no significant difference ($P>0.05$) in the mean number of eggs fertilized and

Table 1: Total number of eggs ($\times 10^3$) stripped, fertilised and hatched in *clarias gariepinus* at different hypophysised latency periods.

Latency time (hours)	Mean number of eggs stripped (10^3)	Mean number of eggs fertilized (10^3)	Mean number of hatchlings (10^3)	Percentage hatched
8	29.8	16.3	13.0	79.8
9	41.4	30.1	23.3	77.4
10	48.4	40.7	35.6	87.5
11	58.5	49.3	43.0	87.2
12	62.7	52.8	46.6	88.3
13	44.7	31.0	26.6	85.8
14	36.4	27.3	24.1	88.3
15	53.2	33.6	27.4	81.8
16	42.4	24.7	20.2	81.8
17	49.3	14.3	12.8	89.5
18	40.0	6.4	4.9	76.6
19	44.7	1.3	0.9	69.2
20	57.3	0.0	0.0	0.0
Total	618.8	332.8	280.6	-

Figure 1: Broodstock fecundity and egg fertility in *Clarias gariepinus* at different latency period

between hatchability of eggs and latency period. However, this observation is based on the quality of breeders and the probability of milt penetration of the eggs (Ufodike and Madu, 1998).

Conclusion

This work has revealed that artificial reproduction and mass rearing of *C. gariepinus* during dry season is technically possible under tropical conditions by using "low-cost" (CCPE) adapted method.

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