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MASS BREEDING OF SILVER CARP IN A CEMENT CISTERN WITH CRUDE H.C.G.

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ABSTRACT

The paper presents a resume on experiments carried on mass breeding of the Silver carp *Hypopthalmichthya molitrix* in a cement cistern through administration of crude human chorionic gonadotropin. The experiments proves that H.C.G. can be used for mass breeding of the fish in simple enclosures, with facilities of some input and output of water and a dose of 5 mg/kg and 18 mg/kg of body weight, for males and females respectively are required for the purpose. Observations were made by using pituitary glands in similar way. For successful breeding of about 80 kg female together, the expenditure towards cost of pituitary gland and H.C.G. are respectively 275 and 117 Rs.

INTRODUCTION

In aquaculture industry, fish seed is a very important component for fish culture. The Silver Carp *Hypophthalmichthys molitrix*,a rapid growing variety is of great demand for culture in Asia. In stagnant ponds, the fish maintains a very good growth rate and attains maturity. Use of crude human chorionic gonadotropin (H.C.G.) is becoming popular for large scale seed production of *H. molitrix* due to its easy availability and low price. With highly increased demand for pituitary glands during recent years and difficulties in their mass procurement, Russian workers felt the need of a substitute which could be procured commercially. Choriogin, (a trade name of CG) was first used in 1946 on Loach with great success. Among other possible substitute several preparations such as 'SZhK', prepared from pregnant mare serum, 'Estrovest' and 'Hypophysine Forte' were tried by the Bulgarian Fish culturists on carp and trouts (as cited by Gerbilskii, 1965). The authors concluded that these preparations reduce the duration of spawning process. Tang (1965) states that treatment with fish pitutaries in combination with chorionic gonadotropin increases the effectiveness and better success

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is achieved. Choudhury *et al.* (1966) states that with this improved method, the percentage of success was raised from 33 to 78%. The chorionic gonadotropins (CG) behave primarily as luteinizing hormone (Burrows 1949), since LH is responsible for the growth and maturation of gonads of fish. Ramaswamy and Lakshman (1959) injected a pond cutfish with 250 I.U. of chorionic gonadotropin (Physex) and obtained ripening of eggs. However, due to its high cost it was not tried extensively.

During July-August, 1985, experiments were conducted on natural breeding of silver carp by using crude H.C.G. (manufactured by INFAR(India) Ltd.) in Barsagar Dighi fish farm at Malda (West Bengal). The experiments were successfully conducted in a cement cistern for mass breeding of the fish.

MATERIAL AND METHODS

The required quantity of H.C.G. extract was prepared with a dilution of 1 mg/0.1 ml. of distilled water and homogenised for about 10 minutes. After centrifuging, only the supernatant solution was used for injections. For first injection to females, a dose of 6 mg/kg was used and the second injection was given at an interval of 7 hours with a dose of 12-14 mg/kg. After first injection females were kept in hapas fixed in nearby ponds. The single dose for the males at the time of second injection to females was 5 mg/kg of body weight.

A simple rectangular cement cistern of 14.2 x 6 M and 1.25 M of depth, provided with an overflow outlet at one end and a guarded bottom outlet was used for the experiments. For introduction of water in the cistern, a 5 H.P. diesel pump was used. After second injection, both males and females were released in the cistern and a water flow was maintained for 1-1/2 hrs., after about 2-3 hours of introduction.

RESULTS AND DISCUSSION

In all the experiments, conducted with use of H.C.G., 60 to 70% of fishes bred and 82.5 to 91.4% of fertilization was observed (Table I). In all experiments, the interval between the first and second injections and the first dose to the females were kept constant as about seven hours and 6 mg/kg. body weight respectively. However, the second dose varied from 12-14 mg/kg. body weight according to development of gonads. In case of males, only a single dose of 5 mg/

Table I. Details of experiments conducted on mass breeding of silver carp.

Expt. No.	Date	Female		Male		Dose & time of 1st inj. to females	Dose & time of second injection	Period of water flow	Temp.		Qty./ Nos. of eggs	Fertilization %
		Nos.	Total wt(kg)	Nos.	Total wt(kg)				Air ℃	Water ℃		
1.	23.7.85 24.7.85	16	17.2	25	23.2	6 mg/kg 14.55 hrs	♀ = 12 mg/kg ♂ = 5 mg/kg 22.40 hrs	01.30 to 03.00	27	29	71 lit 13.49 lakhs	91.4
2.	25.7.85 26.7.85	12	26	18	36	6 mg/kg 14.00 hrs	♀ = 12 mg/kg ♂ = 5 mg/kg 22.00 hrs.	01.00 to 02.00	27	29	135 lit 27.0 lakhs	82.5
3.	29.7.85 30.7.85	34	35.3	57	49.21	6 mg/kg 13.45 hrs	♀ = 14 mg/kg ♂ = 5 mg/kg 21.10 hrs.	01.00 to 02.25	27.5	31.5	110 lit. 22 lakhs	83.8.
4.*	2.8.85 3.8.85	13	27	21	34	4 mg/kg 16.40 hrs	♀ = 6 mg/kg ♂ = 2 mg/kg 23.00 hrs.	01.35 to 03.10	27	29	130 lit 26 lakhs	75

* Control with pitutiary glands.

kg body weight was given in all the experiments. The water flow was started after 2 1/2 hrs. to 3 1/2 hrs. of second injection and continued for 1 hour to 1 1/2 hours. Chasing of the females by males were observed after 4 1/2 hrs. to 8 hrs. of the second injection. From 3 experiments on mass breeding of *H. molitrix* with H.C.G., altogether 100 nos. of males (total weight 108.41 kg) and 62 females (total weight 78.5 kg) were utilised to produce 62,49,000 eggs with very high percentage of fertilization. This proves that H.C.G. can be commercially used for mass seed production of the fish. The experiments also evolve a simple and convenient technology for large scale production of fish seed by using simple cement cistern, involving minimum labour and expenditure.

In the fourth expriment (control), pituitary glands were used in place of H.C.G. to correlate the results. Considering the easy availability of H.C.G. and less cost, it is found to be economical than fish pituitary glands. For breeding 108.41 kg. of males and 78.5 kg of females, a total of about 1.96 g of H.C.G. and for breeding the same quantity of brood fishes, about 1.0 g of pituitary glands will be required. The total cost of required pituitary gland at the rate of Rs. 2.75 per 10 mg works out to be Rs. 275.50, where as the cost of required crude H.C.G. comes to only Rs.117.30 (60 p/10 mg).

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