Note

Evaluation of human chorionic gonadotropin (HCG) dose and latency period combinations on the weight of stripped eggs during induced spawning of *Clarias batrachus* (Linn.)

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ABSTRACT

The weight of stripped eggs was evaluated as breeding performance of *Clarias batrachus*, administered with five doses of human chorionic gonadotropin (HCG) (1000, 2000, 3000, 4000 and 5000 IU kg⁻¹ body weight of female) in combination with five latency periods (11, 14, 17, 20 and 23 h). The females did not respond to stripping at 1000-3000 IU dose in combination with 11 h latency. The weight of stripped eggs significantly (p<0.05) increased while prolonging the latency period to 20 or 23 h at 1000 IU dose compared to other latencies. The females were stripped and free flow of eggs was observed at 3000 and 4000 IU dose with 14-23 h latency combinations. The stripped egg weight at those combinations was significantly (p<0.05) higher compared to other dose and latency combinations. It was also observed that lower weight of eggs could be collected at 5000 IU dose in combination with 17-23 h post-injection. So it is wise to strip *C. batrachus* female while injecting 3000-4000 IU kg⁻¹ body weight and latency period of 14-23 h to get highest weight of stripped eggs.

Keywords: *Clarias batrachus*, HCG dose, Latency period, Stripped egg weight

*Clarias batrachus* is well accepted as a valuable catfish in Indian sub-continent. Its production potentiality as a commercial species has been documented (Thakur and Das, 1986; Areerat, 1987). The non-availability of seed is felt as a major constraint for widespread aquaculture. Natural collection is not a dependable seed resource for its intensive culture. Hatchery production of seed may be a suitable and dependable alternative source for stocking material. Successful induced breeding of fishes has been reported by the use of different inducing agents (Lin and Peter, 1996). Several researchers have verified the effectiveness of human chorionic gonadotropin (HCG) in induced spawning of clariids (Mollah and Tan, 1983; Zonneveld *et al*., 1990; Inyang and Hettiarachchi, 1994). The success of induced breeding depends on the type of hormone used and its potency, dose of hormone and maturity status of the fish. The success of induced breeding due to latency period has also been reported in catfishes (Hogendoorn and Vismanas, 1980; Legendre and Oteme, 1995; Legendre *et al*., 2000). It is suggested that optimum hormone dose in combination with latency period is desirable for getting best breeding performance in fish. The total output of egg is considered as one of the parameters for evaluating the breeding performance. The effect due to different dose and latency combinations on stripped egg weight has not been evaluated properly in the induced breeding of *C. batrachus*. This study reports the variations in stripped egg weight due to hormone dose and latency combination in the hatchery breeding of *C. batrachus*.

Brood fishes of *C. batrachus* were raised in earthen pond and were daily fed at 2% of their body weight with pelleted feed containing 30% crude protein and 3.5 M cal gross energy per kg feed. Prospective females of 120-138 g weight range were selected for induced breeding during monsoon. Suitable female broods were selected on the basis of presence of soft distended belly and uniform shiny intra-ovarian oocytes. HCG was purchased from the market and diluted with normal saline solution (NSS). The resultant solution was further diluted with NSS as per the requirement to get the injectable concentration of HCG. Five different dose levels of HCG (1000, 2000, 3000, 4000 and 5000 IU kg⁻¹ body weight) and five latency periods (11, 14, 17, 20 and 23 h) were considered for induced breeding experiment. The five doses of HCG and five latency periods were considered in twenty-five (5x5) different combinations. Five females were used for each combination. The body weight of each female was recorded before injecting HCG. They were marked with coloured chips tied to their dorsal fin to record the breeding performance (weight of stripped eggs) for each female. The females were released in tubs (100 l) with flow-through water facility after injecting with selected dose of HCG.

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and waited till the desired latency period for hand stripping. The eggs were collected individually in pre-weighed plastic petriplates and weight was recorded. The stripped egg weights of five females were pooled to know the average weight for a particular dose and latency period treatment.

The data was analysed using two way ANOVA (Snedecor and Cochran, 1967) and the treatment effect was considered significant at p<0.05.

The stripped egg weight (g) at various HCG dose and latency period combinations is depicted in Table 1. The females could not be stripped at 1000-3000 IU dose and 11 h latency combinations. Further increase of dose to 4000 or 5000 IU, the female broods could be stripped to some extent and little egg could be collected at short latency period of 11 h. This non-response or partial response to stripping could be due to the ovulation failure for insufficient gonadotropin release at short latency period. Tan-Fermin et al. (1997) also reported ovulation failure due to insufficient gonadotropin level, while working on induced breeding of *C. macrocephalus*. Significantly (p<0.05) higher egg output was observed while increasing the latency period beyond 17 h at the lowest dose of 1000 IU compared to lower latency. These longer latencies might be responsible for more gonadotropin secretion resulting in higher ovulation rate. It was reported in *Macquaria ambigua* that longer latency period is required at sub-threshold doses compared to threshold dose during induced breeding (Rowland, 1983). The stripping of females was easy and free flowing of eggs was observed at 3000-4000 IU dose in combination with 14-23 h latency. The weight of stripped eggs in these combinations was significantly (p<0.05) higher compared to those of 1000 or 2000 IU dose level in combination with 14-23 h latency period. This was due to the higher quantity of releasing hormone present in higher dose. Hence it is suggested that these dose and latency period combinations are ideal for getting more strippable eggs in *C. batrachus*. Hogendoorn and Vismanas (1980), and Zonneveld et al. (1988) were also of the opinion that right combination of inducing agent with latency period yields more eggs while working on different Clariids. The output of egg was reduced significantly (p<0.05) at 5000 IU kg⁻¹ dose and when stripped during 17-23 h latency period. This reduced output of egg was due to plugging of genital aperture by egg bunches during stripping the females, which agrees with the reports of Billard and Marcel (1980) in *Esox lucius* in a similar line of work. This is believed as an overdose effect from the gonadotropic agent.

The study suggested that best breeding performance in *C. batrachus* was obtained at 14-23 h latency in combination with 3000-4000 IU kg⁻¹ body weight. The lower or higher doses reduced the egg output during breeding operation. This information is of value for a commercial hatchery to get maximum quantity of egg during induced spawning of this catfish. However, the results of the study need to be verified by measuring the quality of ovulated eggs through fertilization and hatching.

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**References**


