



INDUCED SPAWNING OF NATIVE THREATENED SPOTTED SNAKEHEAD FISH *CHANNA PUNCTATUS* WITH OVAPRIM

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Introduction:

In aquaculture the most important constraint for large scale cultivation of several fish species is the non-availability of quality seed of uniform size, and free of diseases, parasites and pests at the time of stocking in culture ponds. These strict requirements are seldom fulfilled where the fingerlings are collected from the wild conditions for culture. Further, the wild collected broodstock are reared in captive conditions may not receive appropriate environmental cues for gonad maturation and spawning and these can cause reproductive development to be arrested in late vitellogenesis. For this reason hormonal administration has been attempted for stimulating gamete maturation [1]. Several synthetic ovulating agents in ready made form containing GnRH α and dopamine antagonist such as Ovatide, Ovopel, Dagin and Aquaspawn are becoming very popular nowadays and found to be efficient and successful spawning agents in different fish species [2-6].

The spotted snakehead, *Channa punctatus* (Bloch, 1793), locally known as spotted murrel, is one among the highly priced freshwater food fish species in India. Over the last 10 years, its wild population has undergone a steady decline due to fishing, loss of habitat, introduction of alien species, disease, pollution, siltation, poisoning, dynamite and destructive fishing. These factors not only destroyed the breeding and feeding grounds but also caused havoc to the biodiversity of this important fishery. As a result, according to IUCN status it has been listed among the 66 low-risk near-threatened fish species in India [7]. The fish is well known for its good taste, high protein content and fewer intramuscular spines, high nutritive value, recuperative and medicinal qualities, and is recommended as a diet during convalescence [8]. The lack of monsoons also often limits the breeding and seed production. Hence to overcome these problems, induced spawning is thought to be the only alternative method for quality seed production/supply. Therefore, the present study was conducted to investigate the efficacy of a synthetic GnRH, with a dopamine antagonist for the induction of ovulation and the initiation of spawning in *C. punctatus*,

and to determine the minimum effective dose of Ovaprim that could be used to spawn and produce seed of the candidate fish species under a controlled captive condition.

Methods:

In total 9 matured female and 18 male fish weight ranging from 63 to 80g, were randomly selected for three hormone dosages. Both male and female fishes in each hormone dosage were administered a dose of 0.2, 0.4, and 0.6 mL of Ovaprim/kg body weight (BW) respectively. Each breeding set consisted of two males and one female. The hormone-administered fishes were then placed in concrete cement tanks for spawning. After spawning, eggs were collected from the breeding tank, and the number of eggs spawned (spawning fecundity) and rate of fertilization were calculated. Two hours post-spawning, a total of 500 fertilized eggs from each breeding set were collected and incubated in glass aquaria to determine the incubation period and hatching rate. The data obtained for mean number of eggs spawned, fertilization rate, latency period, and hatching rate from each hormone dose were analyzed using one-way analysis of variance (ANOVA) to find significant difference among the hormone doses and each treatment mean were analysed by Duncan's multiple range tests ($P = 0.05$) using SPSS package Version.11.

Results and Discussion:

The spawning performance of *C. punctatus* induced at different Ovaprim dosages are presented in Table 1. Partial spawning was observed with a dose of 0.2 ml Ovaprim/kg BW, and complete spawning was noticed in the medium dose (0.4 ml of Ovaprim/kg BW) and high dose (0.6 ml of Ovaprim /kg BW) administered fishes. The latency period of *C. punctatus* ranged from 23.5 to 31.0 hrs at $29 \pm 1.5^{\circ}$ C in the three doses tested. The latency period was longer than those reported in *H. fossilis* administered with Ovaprim [9] but it was similar to those in *C. striatus* using Ovaprim [10] and in *C. striatus* using Ovatide [11]. The highest number of eggs spawned ($p < 0.05$) was recorded when the females were injected with 0.4 ml of Ovaprim/kg body weight than those injected with other doses. The highest fertilization (97.6%) and hatching rates (96.3%) were also observed



at the medium dose ($P < 0.05$). With regard to hatching rates, no significant difference was noticed between the medium and low doses of Ovaprim administered groups.

Values in each column followed the same superscript are not statistically different ($P > 0.05$).

Conclusion:

From the study, it is evidenced that the synthetic gonadotropin-releasing hormone with a dopamine antagonist at the dose of 0.4 ml /kg BW could be used as an appropriate spawning agent for successful breeding and seed production of *C. punctatus* under captive conditions.

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Table 1: Induced spawning of *Channa punctatus* using a synthetic hormone Ovaprim

Hormone dose mL/kg BW	Fish weight (g)	Latency period (hours)	Total spawning fecundity	Fertilization rate s(%)	Hatching rate (%)
0.2	72.41±13.58 ^a	29.10 ±1.0 ^b	2164±168 ^a	83.3 ±2.0 ^a	91.3±2.5 ^b
0.4	63.36±11.40 ^a	24.5±0.5 ^a	6538±154 ^c	97.6±1.5 ^b	96.3±1.5 ^b
0.6	76.82±18.50 ^a	26.0±2.5 ^a	4318±214 ^b	78.3±6.6 ^a	84.3±5 ^a

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