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Kokichi Ito and Hirokazu Zhao

Fisheries Technology Institute,
Fisheries Research and
Education Agency, 2-12-4,
Fukuura, Kanazawa-ku,
Yokohama, Kanagawa, Japan

Comparing carp pituitary gland extract and ovaprim in induced breeding of stinging Catfish

Kokichi Ito and Hirokazu Zhao

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Abstract

This study evaluates the efficacy of Carp Pituitary Gland (PG) Extract and the synthetic hormone Ovaprim in the induced breeding of Stinging Catfish (*Heteropneustes fossilis*). We compared the effects of these hormones on spawning success rates, fertilization rates, and hatching outcomes under controlled conditions.

Keywords: Psychiatric disorders, suicide, suicide attempt; first admission; recurrent admission

Introductions

Induced breeding techniques have revolutionized aquaculture, offering solutions for the propagation of fish species that exhibit reproductive challenges under captive conditions. Among such species, the Stinging Catfish (*Heteropneustes fossilis*) is particularly valued for its nutritional and commercial importance across various regions. However, its breeding in captivity is complicated due to its unique reproductive behaviors and environmental requirements. Typically, the controlled propagation of fish involves hormonal induction to simulate natural conditions that trigger spawning. Two of the most common agents used for this purpose are Carp Pituitary Gland (PG) Extract, a traditional hormone derivative, and Ovaprim, a synthetic hormone widely acclaimed for its effectiveness and consistency.

The Carp PG Extract, derived from the pituitary glands of carp, has been traditionally used in aquaculture due to its availability and broad spectrum of effectiveness across various species. It contains gonadotropins that naturally stimulate the reproductive process in fish. On the other hand, Ovaprim, a synthetic analogue of gonadotropin-releasing hormone (GnRH) and dopamine antagonist, is favored for its predictable and potent effects, leading to high rates of ovulation and spawning in many fish species.

The effectiveness of these hormonal treatments varies based on species-specific responses, which necessitates comparative studies to ascertain the most effective protocol for each species. This study focuses on evaluating the relative efficacy of Carp PG Extract and Ovaprim in the induced breeding of Stinging Catfish. By analyzing spawning success, fertilization, and hatching rates, the research aims to provide insights that could help optimize breeding protocols and enhance production rates in aquaculture. The outcome of such studies not only contributes to the sustainability of fish farming practices but also supports biodiversity conservation by reducing the pressure on wild populations.

Materials and Methods

Study Site and Fish Handling: The experiment was conducted at the Aquaculture Research site. Mature Stinging Catfish of both sexes, averaging 500 grams, were used for the study. Fish were acclimatized in 1,000-liter tanks under controlled conditions of temperature (28°C), pH (7.0), and oxygen (6 mg/L).

Hormonal Treatments: Fish were divided into two groups, each containing 30 females and 15 males. One group was injected with Carp PG Extract and the other with Ovaprim. Doses were administered as follows:

PG Extract: 2 mg/kg for females, 0.5 mg/kg for males.

Ovaprim: 0.5 ml/kg for females, 0.2 ml/kg for males.

Corresponding Author:

Kokichi Ito and Hirokazu Zhao

Fisheries Technology Institute,
Fisheries Research and
Education Agency, 2-12-4,
Fukuura, Kanazawa-ku,
Yokohama, Kanagawa, Japan

Breeding and Data Collection: Injected fish were placed in spawning tanks. Observations were made every hour to record spawning activity. Eggs were collected, counted, and incubated in separate tanks. Data on fertilization and hatching rates were collected and recorded.

Statistical Analysis: Data were analyzed using SPSS software. Independent t-tests determined the significance of differences between the two groups with a confidence level set at 95%.

Results

The results are as follows

Table 1: Spawning Success Rate

Treatment	Number of Trials	Successful Spawns	Success Rate (%)
Carp PG Extract	30	27	90
Ovaprim	30	28	93.3

Table 2: Fertilization and Hatching Rates

Treatment	Fertilization Rate (%)	Hatching Rate (%)
Carp PG Extract	85	75
Ovaprim	88	80

Discussion and Analysis

The table presents data on fertilization and hatching rates for both treatments. Carp PG Extract yielded a fertilization rate of 85% and a hatching rate of 75%, while Ovaprim demonstrated slightly higher rates with 88% fertilization and 80% hatching.

Firstly, the fertilization rates of both treatments are relatively high, indicating that both Carp PG Extract and Ovaprim are effective in inducing spawning in Stinging Catfish. However, Ovaprim shows a slight advantage with a 3% higher fertilization rate compared to Carp PG Extract. This suggests that Ovaprim may stimulate a more robust reproductive response in the fish, leading to a higher rate of successful fertilization.

Similarly, when considering hatching rates, Ovaprim again exhibits a slight advantage over Carp PG Extract, with a 5% higher hatching rate. This indicates that a higher proportion of fertilized eggs treated with Ovaprim successfully hatch compared to those treated with Carp PG Extract.

The higher fertilization and hatching rates observed with Ovaprim suggest that it may be a more reliable and effective inducer of breeding in Stinging Catfish compared to Carp PG Extract. This has practical implications for fish hatcheries and aquaculture operations where successful breeding is crucial for maintaining stocks and production levels.

Furthermore, the synthetic formulation of Ovaprim may contribute to its superior performance compared to Carp PG Extract. Synthetic hormones often offer greater consistency and control over the breeding process, which could explain the slightly higher success rates observed with Ovaprim.

In conclusion, based on the data presented in the table, Ovaprim appears to be a more effective inducer of spawning in Stinging Catfish compared to Carp PG Extract, as evidenced by its higher fertilization and hatching rates. Further studies could delve deeper into the underlying mechanisms behind these differences and explore additional factors that may influence the success of induced breeding in this species.

Conclusion

In conclusion, the comparison between Carp Pituitary Gland Extract and Ovaprim in induced breeding of Stinging Catfish demonstrates that both treatments are effective in stimulating spawning. However, Ovaprim shows a slight advantage over Carp PG Extract, with higher fertilization and hatching rates. This suggests that Ovaprim may be a more reliable and efficient inducer of breeding in Stinging Catfish, potentially due to its synthetic formulation offering greater consistency in results. These findings have significant implications for fish hatcheries and aquaculture operations, where successful breeding is essential for maintaining stocks and production levels. Further research could explore the underlying mechanisms behind these differences and optimize breeding protocols for Stinging Catfish.

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