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Effect of Granting Ovaprim with Different Dosage to Ovulation and Eggs Quality of Knife Fish (*Notopterus notopterus*)

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Abstract

Research on the effect of ovaprim giving with different doses on ovulation and the eggs quality of knife fish (*Notopterus notopterus*) was conducted in January - April 2016 in the laboratory of Fish Hatchery and Breeding University of Riau with the aim to determine the effect of giving different ovaprim dose to ovulation And eggs quality of the knife fish and know the best *ovaprim* dose for ovulation and the eggs quality of the knife fish. The method used is the experimental method using a complete randomized design with four treatments and 3 repetitions. The treatment used was P0 (0.9% NaCl 1ml / kg body weight), P1 (*ovaprim* 0.5 ml / kg body weight), P2 (*ovaprim* 1 ml / kg body weight), and P3 (*ovaprim* 1.5 ml / Kg body weight). The results showed that *ovaprim* with dose of 1.5 ml / kg body weight gave the best result with latent time obtained 16,3 hour, number of eggs resulted 164 stripping, ovisomatic index value 1,473, egg diameter 2.5 mm, percentage of maturity Eggs 96,7% and degree of conception 42,20%.

Keywords: *Notopterus notopterus*, *ovaprim* dose, ovulation and egg quality.

BACKGROUND

Knife fish is a fish that inhabit fresh water. Knife fish have high economic value and favored by society to be consumed and made ornamental fish. Therefore this fishing in nature is so high and has over fishing that its existence has been hard to find and become one of the endangered and protected fish. As stated in the regulation of the Minister of Agriculture of the Republic of Indonesia No.716 / Kpts / UM / 10/1980 and Indonesian Government Regulation no. 7/1999 and included in the red list of International Union for Conservation of Nature and Natural Resources (IUCN) under the category of Least Concert (Ng. 2010).

To handle scarcity and protect from extinction, cultivation activities need to be done, one of which is the availability of seeds, while the availability of seeds of natural knife fish has been difficult to find. So to be able to provide seeds, artificial spawning efforts should be made. Artificial spawning can be performed by giving hormone stimulation to the parent that will in seed where one of them is ovaprim. The use of *ovaprim* has been successfully performed on many species of fish, *Mystus nemurus* (Sabar, 2010), *Mystus nigriceps* (Arisandy, 2015) and *Ompok Hypopthalmus* (Natalia, 2010). *Ovaprim* is a trademark for a hormone containing 20 μg analog salmon gonadotrophin releasing hormone (sGnRH-a), LHRH and 10 μg domperidone a type of anti-dopamine per milliliter (Naandesha et al., 1990).

The effect of *ovaprim* that has been successful in stimulating some species of fish for ovulation and having good egg quality is also expected to affect ovulation and quality of eggs belida (*Notopterus notopterus*). On the basis of that research about the effect of *ovaprim* administration with different doses of ovulation and the quality of eggs belida fish (*Notopterus notopterus*) is done.

This study aims to determine the effect of giving different doses of *ovaprim* and to know the best *ovaprim* dose for ovulation and the quality of eggs knife fish (*Notopterus notopterus*). So as to provide information about the effect of *ovaprim* administration with different doses of ovulation and quality of knife fish eggs and the best *ovaprim* dose for ovulation and quality of fish belida.

RESEARCH METHODS

This study was conducted in January - April 2017. Knife fish (*Notopterus notopterus*) used as a test fish measuring 14 - 50 cm obtained from fishermen around Kampar rivers, Sail and Siak rivers Riau Province matured in concrete basin with size 3 x 2 x 1.5 m at the Faculty of Fisheries and Marine University of Riau. Other materials used are small fish, worms, *ovaprim*, physiological solution NaCl 95%, transparent solution, tissue and napkin. The equipment used in this research is concrete tank size 3 x 2 x 1.5 m, fiber tub size 3 x 0.8 x 0.5 m, basin, analytical scale, Olympus CX 12, syringe, petridisk, glass, Thermometer , PH indicator, DO meter, aeration and percussion equipment.

The method used in this study is the experimental method using Completely Randomized Design (CRD) with one factor and four treatments and three repetitions. The treatment provided refers to Sarkar et al. Al., (2006) on *Chitala chitala* fish that is:

1. P0: Treatment of injection with 0.9% NaCl with a dose of 1 ml / kg body weight (control)
2. P1: Treatment of *ovaprim* injection with a dose of 0.5 ml / kg body weight
3. P2: Treatment of *ovaprim* injection with a dose of 1 ml / kg body weight
4. P3: Treatment of *ovaprim* injection with dose of 1.5 ml / kg body weight

Fish injected twice with distance of 6 hours. Each injection is given half the treatment dose. The first injection was done at 22.00 pm and the second injection at 04.00 pm. The injection of the knife fish can be seen in Figure 1. After 16 hours of the second injection, the fish is stripped to remove the eggs as shown in Figure 2. Stripping is stopped if the egg cannot get out or if the egg is mixed with blood and repeated every hour.

Figure 1. Hormonal inoculation in knife fish (*Notopterus notopterus*)

Figure 2. Stripping on the knife fish fish (*Notopterus notopterus*)

Parameters measured from this study were latent time, number of eggs stripping, parent ovisomatic index value, egg diameter, egg maturity, degree of fertilization and water quality i.e. temperature, dissolved oxygen (DO), and pH.

RESULTS AND DISCUSSION

Latent mean time, number of eggs stripping, ovisomatic index value, egg maturity diameter and fertilization degree obtained from this study can be seen in Tabel 1.

Table 1. Average latent time, number of eggs stripping, ovisomatic index value, egg diameter and maturation of eggs belida (*Notopterus notopterus*) obtained from the results of research

Treatment	Latent time (hr) X ± Std	Σ THS (item) X ± Std	Value of Ovisomatic Index (%) X ± Std	Egg Diameter X ± Std	Maturity Egg (%) X ± Std	Conception (%) X ± Std
P0	$19 \pm 0{,}00^b$	85 ± 0,00	0,392 ± 0,00	$1{,}6 \pm 0{,}00^a$	$60 \pm 0{,}00^a$	$0{,}00 \pm 0{,}00^a$
P1	$17{,}5 \pm 0{,}50^a$	28 ± 0,65	0,332 ± 0,12	$2 \pm 0{,}00^b$	$70 \pm 0{,}00^b$	$37{,}95 \pm 14{,}42^b$
P2	$17 \pm 1{,}00^a$	65 ± 42,1	1,192 ± 0,94	$2{,}3 \pm 0{,}11^c$	$93{,}3 \pm 5{,}77^c$	$44{,}15 \pm 15{,}84^b$
P3	$16{,}3 \pm 0{,}57^a$	164 ± 93,9	1,473 ± 0,72	$2{,}5 \pm 0{,}05^d$	$96{,}7 \pm 5{,}77^c$	$42{,}20 \pm 16{,}14^b$

Description: the average value followed by the same letter states no significant difference ($p > 0.05$)

P0 = NaCl 0.9% with a dose of 1 ml / kg body weigh

P1 = *Ovaprim* 0.5 ml / kg body weigh

P2 = *Ovaprim* 1 ml / kg body weight

P3 = *Ovaprim* 1.5 ml / kg body weight

Latent Time

Latency time is determined by calculating the distance between the second injections with the time of ovulation expressed in hours. The latent time data obtained from each treatment can be seen in Table 1.Based on the results of further tests (Table 1), the treatment of P3, P2 and P1 was not significantly different (P> 0.05) but P3, P2 and P1 were significantly different from P0 (P <0.05).

Successive sequential latent mean times were found in P3 treatment (*ovaprim* dose 1.5 ml / kg fish body weight) with a mean time of 16.3 hours latent, followed by P2 treatment (*ovaprim* dose 1ml / kg body weight of fish) With an average latency time of 17 hours, P1 treatment (*ovaprim* dose 0.5 ml / kg fish body weight) with an average latency time of 17.5 hours and treatment of P0 (0.9% NaCl dose 1 ml / kg weight Fish body) with an average latent time of 19 hours. For more details the average latent time based on the treatment can be seen in Figure 3.

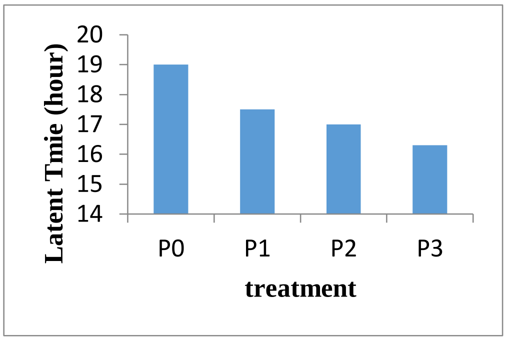

Figure 3. Histogram average length of time latent knife fish (*Notopterus notopterus*)

From Figure 3. it is seen that treatment 3 with *ovaprim* dosage of 1.5 ml / kg fish body weight gave the shortest latent time in the knife fish (*Notopterus notopterus*). This shows that the treatment of *ovaprim* with dose of 1.5 ml / kg body weight is the best dose of its contribution to the time of latent knife fish (*Notopterus notopterus*). Sukendi (1995) states the use of *ovaprim* with a certain dose basically aims to accelerate the process of maturation and ovulation.

Number of Eggs Stripping Results

The average data on the number of stripping eggs seen in Table 1 shows that the highest number of eggs of stripping was found in P3 treatment with an average of 164 eggs, followed by P0 treatment with an average of 85 eggs, P2 with 65 eggs, and P1 treatment with average number of eggs 28 grains.

Based on statistical test showed that the treatment given did not significantly affect the number of eggs stripping of the knife fish. However, the highest number of eggs was obtained on treatment 3 with an average of 164 eggs. For more details can be seen in Figure 4.

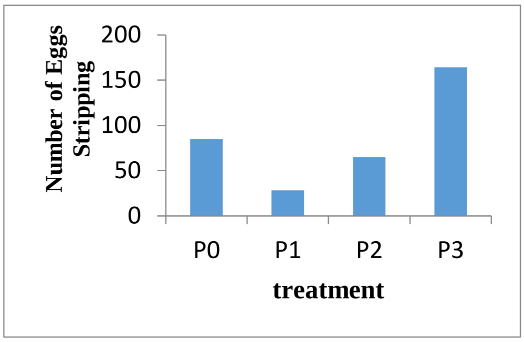

Figure 4. The average histogram of the number of eggs from the stripping of the knife fish (*Notopterus notopterus*)

Gusrina (2008) states that the number of eggs depended depends on the number of mature eggs, the higher the volume of *ovaprim* given causes the shorter the achievement of core migration.

Ovisomatic Index Value

The parent ovisomatic index value is the ratio of the egg weight to the weight of the parent expressed in%. Based on this research, the highest value of ovisomatic index was obtained at treatment P3 with value of 1,473%, followed by P2 treatment with value 1, 192%, and P0 with value 0,392% and lowest was P1 treatment with value 0,332%.

From Table 1 it is known that P3 treatment can give the highest ovisomatic index value with value of 1, 473%, although based on the analysis of variance (anova) showed that the treatment given did not affect (P> 0,05) to the value of ovicomatik indices obtained. For more details the value of ovisomatic index obtained can be seen in Figure 5.

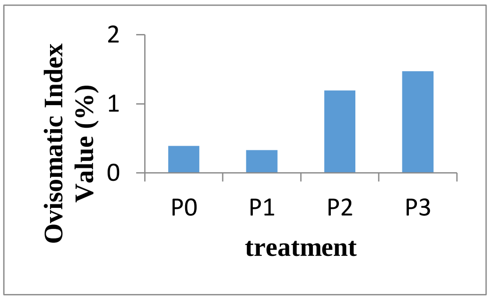

Figure 5. Histogram Value Ovisomatic Index (%) knife fish (*Notopterus notopterus*)

From Figure 5. It can be seen that different doses of *ovaprim* give different effects to ovisomatic index values. Then Suhenda (2009), states the value of Ovisomatic Index related to the process of vitelogenesis during the process of vitelogenesis yolk egg granules will increase in number and size so that oocyte volume is enlarged.

Higher ovisomatic index values in P3 treatment than other treatments were due to the greater eggshell weight of stripping results obtained compared to other treatments. Therefore, P3 treatment is the best treatment for ovisomatic parent index value.

From this study obtained the value of ovisomatic index is lower than the Value Ovisomatic Index knife fish (*Notopterus notopterus*). This is caused by the knife fish is a fish that gradually release eggs in the spawning process (Gustomi et al., 2016).

Egg Diameter

From Table 1 The highest egg diameter of knife fish(*Notopterus notopterus*) was obtained in P3 treatment with 2.5 mm egg diameter, followed by P2 treatment with egg diameter of 2.3 mm, P1 with egg diameter of 2 mm, and the smallest diameter Obtained at treatment P0 with egg diameter 1,6 mm.

Based on further test results with Newman keuls study it was found that P0 was significantly different ($P < 0.05$) with P1 and significantly different ($P < 0.01$) with P2 and P3. For more details can be seen in Figure 5.

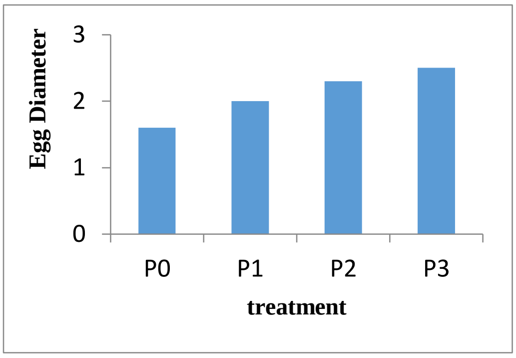

Figure 6. Average histogram of egg diameter of knife fish (*Notopterus notopterus*)

Based on the picture above shows that the treatment of P3 is the best treatment of the effect on the diameter of eggs knife fish (*Notopterus notopterus*). Nadeesha et. Al. (1990) suggests that single ovaxt would be able to produce eggs of a larger diameter, this corresponds to the role of the hormones contained in the *ovaprim* itself.

Egg Maturity (%)

Egg maturity obtained from this study as shown in Table 1. Where the highest percentage of egg maturity is found in treatment P3 (*ovaprim* injection 1.5 ml / kg body weight) with a percentage of maturity 96.7% followed by treatment P2 with percentage of maturity 93,3%, treatment of P1 with 70% maturity percentage and lowest is in treatment of P0 with percentage of maturity 60%.

Based on the results of further tests with the Newman Keuls study, P0 was significantly different (P <0.05) with P1 and significantly different (P <0.01) with P2 and P3. For more details can be seen in Figure 6.

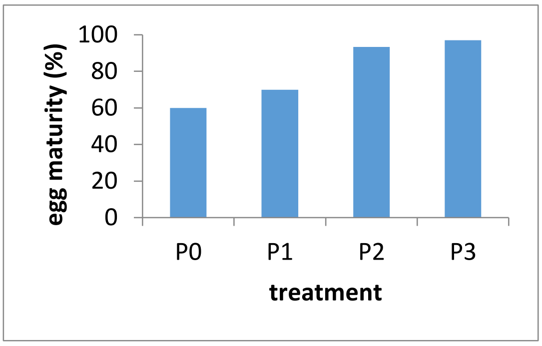

Figure 7. Histogram egg maturity of knife fish eggs (*Notopterus notopterus*)

Based on Figure 7. Above it can be seen that P3 treatment is the best treatment of fish egg maturity. In accordance with its function *ovaprim* is instrumental in spurring gonad maturation where sGnRH analogs contained in *ovaprim* role stimulates the pituitary to release gonadrotropin (Lam, 1985).

Degree of Conception

The degree of conception obtained from this study can be seen in Table 1 and it can be seen that the percentage of conception sequentially from the highest is P2 with the degree of conception 44.15%, P3 with the degree of fertilization of 42.20%, P1 with the degree of conception of 37.95% and P0 with 0% degree of fertilization. For more details can be seen in Figure 8.

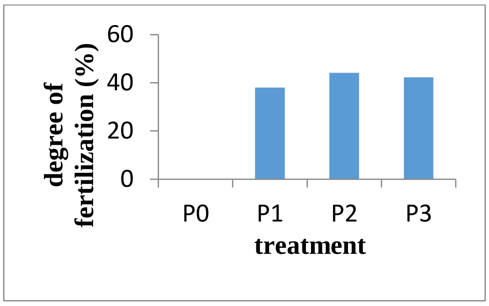

Figure 8. Histogram of degree of fertilization

Based on Figure 8 above shows that the best treatment for the fertilization of knife fish eggs is P2 treatment with the degree of conception 44.15%. Based on the statistical test of variance analysis (ANOVA) showed that the treatment given had an effect on the fertilization of knife fish eggs and based on the advanced test using the Newman Keuls study showed that the treatment given P2, P3, and P1 was significantly different with P0 ($P < 0.05$).Sukendi (2014) states that in the process of spawning fish, the eggs to be fertilized are eggs that have good quality, especially the size of egg diameter and maturity.

Water quality

The results of water quality parameter measurements during the study are presented in Table 2.

Table 2. Water Quality Measurement Results During Research

NO	Parameter	Hasil
1.	Suhu	26,7-26,9°C
2.	pH	6
3	DO	6,3-7,3 ppm

Based on the data in Table 2. It can be seen that the water quality for spawning fish is still in good condition. Syafriadiman et. al., (2005) states that a good pH for fish is 5.0-9.0. While for spawning fish in the river temperature 20-30oC, pH ranged from 7-8.

CONCLUSIONS AND RECOMMENDATIONS

From the results of this study can be concluded that giving *ovaprim* effect on ovulation and egg quality knife fish (*Notopterus notopterus*). The best dosage for ovulation and the quality of knife fish eggs is 1.5 ml / kg body weight with latent time obtained 16.3 hours, the number of eggs stripping 164 eggs, ovisomatic index value of 1.473, egg diameter 2.5 mm, percentage of maturity 96,7% and degree of conception 42,20%. Need for further research using *ovaprim* dose 1.5 ml / kg body weight to the value of fertilization, hatchability, growth and survival of knife fish larvae, so that in the cultivation of seeds later can be done through artificial spawning.

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