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Nama : Prof. Dr. Mustofa Helmi Effendi, drh., DTAPH
NIP : 196201151988031002
Pangkat/Golongan : Pembina (Gol. IV/a)
Jabatan : Wakil Dekan III

Dengan ini menerangkan bahwa :

Nama : Dr. Erma Safitri, drh., M.Si
NIP : 196907231999032001
Pangkat/Golongan : Penata Tk. I (Gol. III/d)
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Telah melaksanakan penelitian dengan judul sebagai berikut :

No	Judul Karya Ilmiah	Tahun Pelaksanaan Penelitian
1	Growth Improvement of Gurame Fish (Osphronemus gouramy) Due to Insulin Like Growth Factor-I (IGF-I) from Local Pregnant Mare Serum.	2020
2	Diphyllobothriasis in Cats Fed Daily with Raw 'Mujair' fish in Surabaya, East Java, Indonesia	2019
3	The Combination Effect of Probiotic Prebiotic Lactic Acid Bacteria on Efficiency of Feed Usage on Broiler Chicken	2019
4	Effect of Green Tea Extract Supplementation in the Semen Extender on Post-Thaw Sperm Quality of Simmental Bulls	2018
5	Penambahan L-Arginin dalam Pengencer Susu Skim Kuning Telur Terhadap Viabilitas dan Motilitas Spermatozoa Sapi Limousin Post Thawing pada Semen Beku.	2016
6	Pengaruh Penambahan Glukosa Sebagai Sumber Energi Terhadap Viabilitas dan Motilitas Spermatozoa Sapi Madura dalam Pengencer Susu Skim Kuning Telur	2017
7	The Effectiveness of Honey in Physiological NACI to Maintain of Viability and Motility of Spermatozoa	2017

Adapun penelitian tersebut layak dilakukan, meskipun belum ada ***Ethical Clearence*** karena menggunakan hewan coba tapi tidak disakiti, yang minimal dan menghasilkan output yang sangat baik.

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Demikian surat keterangan ini kami buat untuk dapat dipergunakan sebagai persyaratan pengususlan Jabatan Fungsional **Guru Besar**

Surabaya, 3 April 2023
Wakil Dekan III,

Prof. Dr. Mustofa Helmi Effendi, drh., DTAPH
NIP 196201151988031002

VOL 97 No. 01 JANUARY, 2020

Print ISSN 0019 - 6479
E - ISSN 0974 - 9365

₹. 80

THE INDIAN VETERINARY JOURNAL

SINCE - 1924

Journal of the

INDIAN VETERINARY ASSOCIATION

ESTD - 1922

Regd. No. Sl. No. 96/1967 (CHENNAI)

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Tel. : +91 44 2435 1006
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Vol. 97 JANUARY 2020 No. 01

THE INDIAN VETERINARY JOURNAL

(Official Organ of the Indian Veterinary Association)

THE INDIAN VETERINARY JOURNAL

(Official organ of the Indian Veterinary Association)

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Indian Veterinary Journal **Vol. 97, No. 01, January 2020**

HAPPY NEW YEAR 2020

OUR NINETY SEVENTH (97th) VOLUME

We are proud and happy on our successful Journey of entry into the 97th year of uninterrupted publication of the 97th volume of The Indian Veterinary Journal in this new year 2020. We wholeheartedly acknowledge the support and patronage of all the contributors, subscribers, authors and advertisers with all our grace and gratitude. We are thankful to the Director of Animal Husbandry, Tamilnadu for continuing the sanction of IVJ subscription to all the working veterinarian in all the levels of the department in full. We are glad and greatly indebted to Dr Chirantan Kadian, The President of the newly organised The Indian Veterinary Association and his team of office bearers for their support and guidance to continue the working of The Indian Veterinary Journal.

When we are stepping into another new year, we are always trying to find out what should be the element of priority to IVJ to reach to next higher level.

We are proud to announce our IVJ Archives Digitization Process taking a huge leap forward. As we had updated before, in Phase I of digitization, the journals were digitized as images in various useful formats. Moving forward, we have further achieved larger milestones in the IVJ Archives Digitization on : ♦ **Map the portion of the digitized image file which has metadata information (like Journal Title, Authors, Place of work etc);** ♦ **OCR the mapped portions to get the text and validate its correctness;** ♦ **Place the text in the appropriate fields;** ♦ **Create table of contents and map with the page number as printed in the journals and** ♦ **Map other portion of the image file which has text (content) and OCR them to link the text with each article to get text-based search capabilities. The OCR mapping part is completed upto 1989 from 1924.**

On the subscribers and authors side, we have put our last touches on : ♦ **Payment integration from our IVJ website;** ♦ **IVJ Staff interface for uploading digital version of the IVJ every month.**

We haven't become complacent with the achieved milestones, but strenuously setting goals to move IVJ for the betterment of subscribers and authors to **1). Complete and launch the IVJ digital archive; 2). Bring in the workflow for subscriber article upload and revision process under the umbrella of new IVJ website workflows and 3). Upgrade staff interface for managing article workflow.**

The IVJ takes this opportunity to wish all the readers, subscribers, contributors and advertisers, A HAPPY PROSPEROUS AND PURPOSEFUL NEW YEAR, 2020.

-- THE IVJ EDITORIAL COMMITTEE

Table II. Water quality status of collected water samples in and around Namakkal, Tamil Nadu (Mean ± S.E.)

Parameters	Mean (± S.E.)	Range
Physico-chemical parameters		
pH	7.87 ± 0.12	6.90 – 8.16
TDS (mg/L)	423.30 ± 5.07	403.00 – 445.00
DO (mg/L)	6.40 ± 0.39	6.50 – 9.00
Calcium (mg/L)	41.30 ±2.62	40.00 – 45.00
Magnesium (mg/L)	53.72 ± 1.44	42.87 – 59.16
Salt as chloride (mg/L)	41.80 ± 5.39	26.00 – 74.00
Microbiological parameters		
Total bacteria (log_{10} cfu/ml)	5.67 ± 0.15	5.18 – 6.49
E.coli (log_{10} cfu/ml)	2.96 ± 0.83	4.00 – 6.08

Value given in each cell is the mean of 10 water samples collected from different sources

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Growth Improvement of Gurame Fish (*Osphronemus gouramy*) Due to Insulin Like Growth Factor-I (IGF-I) from Local Pregnant Mare Serum

Tjuk I. Restiadi, Woro H. Satyantini, Nusdianto Triakoso and Erma Safitri[1]

Faculty of Veterinary Medicine, Faculty of of Fisheries and Marine Science, Universitas Airlangga, Surabaya 60115, Indonesia.

(Received : July, 2019 **256/19** Accepted : September, 2019)

Abstract

Research aim was determine of IGF-I effect on gurame growth. 70 number of gurami, divided into 7 treatments, T0: without injection IGF-I (control), T1, T2, and T3: patented IGF-I recombinant mouse (RM) from Biolegend (San Diego CA-USA,) 10ng/mL, 20ng/mL, and 40ng/mL respectively, furthermore T4, T5 and T6: IGF-I from local pregnant mare serum (PMS) 10ng/mL, 20ng/mL, and 40ng/mL. The results indicated non significant differences ($p>0.05$) between the patented IGF-I (RM) with IGF-1 from local pregnant mare sera (PMS) effect on growth improvement in the weight and body length of gurame, but both were significantly better ($p<0.05$) than control.

Key words : Gurame fish, IGF-I, Pregnant mare serum, growth

[1]*Corresponding author* : Email : rma_fispro@yahoo.com

Gurame is a freshwater fish that has a lot of demand. The taste is delicious and the texture of the meat is not mushy makes gurame is very popular in Indonesia, but its growth is very slow (Fitriadi *et al*., 2014). Gurame consumption increases year by year however their production does not commensurate with demand. Efforts to increase production have been carried out, through the utilization of hormone like growth factor-I (Maggio *et al*., 2013) to increase the fish production.

Materials and Methods

Seventy gurami fishes were divided into 7 treatments, T0: without injection IGF-I (control), T1, T2, and T3: patented IGF-I recombinant mouse (RM) from Biolegend (Cat #591406, San Diego CA-USA,) 10ng/mL, 20ng/mL, and 40ng/mL respectively, the T4, T5 and T6: (IGF-I) were treated with local pregnant mare serum (PMS) @ 10ng/mL, 20ng/mL, and 40ng/mL. The parameters measured were body weight gain and body length. The weight gain was assessed in grams by substracting the initial weight from the final weight of the fishes at the end of the experiment in each treatment. The same procedure was followed to findout the body growth rate is centimeters (Lugert *et al*., 2016). The research data was analyzed with one-way Anova, if there are differences, further analysis is performed with Tuckey, Statistical data processing using program facilities: IBM SPSS Statistics Version 21

Results and Discussion

The results of weight and length growth of the gurame (*Osphronemus gouramy*) are presented in Table I

From Table I, the statistical analysis revealed significantly differences ($p<0.05$) between T0 and other treatments; T1, T2, T4, and T5 were significantly different ($p<0.05$) with T3 and T6; while T1, T2, T4, and T5 were not significantly different ($p>0.05$), also T3 and T5 did not differ significantly ($p>0.05$) in weight gain.

IGF-I is a hormone which has 70 amino acids which is structurally related to proinsulin. Among the other functions, IGF-I is involved in the regulation of proteins, lipids, carbohydrates, mineral metabolism in cells, cell differentiation and proliferation, and body growth (Klement and Fink 2016). IGF-I itself can increase somatic growth which was demonstrated in goldfish and salmon (Hevroy *et al*., 2015). Fish grow faster due to high IGF-I levels. Increasing plasma IGF-I levels with growth hormone treatment in vertebrates, including teleost, and in channel catfish has shown favourable results (Franz *et al*., 2016). Exogenous treatment with IGF-I can also stimulate growth rate (Opazo *et al*., 2017). The hormone treatment has improved the external appearance of fish i.e skin tones look better, brighter eye and more active movements.

Axis growth hormone (GH-IGF) has an effect in regulating somatic growth and metabolism in teleost fish. Axis GH-IGF secreted in the anterior pituitary gland which is controlled by hypothalamus hormone, including growth hormone releasing hormone (GHRH) (Peterson *et al*., 2005). Insulin-like growth factor binding protein (IGFBP) plays a significant role in extending the half-life of IGF,also coordinates the transfers of IGF in to the circulation (Kement *et al*., 2016). The extended IGFBP includes an IGFBP related protein (IGFBP-rP) which also

Table I. Weight Gain and Body Length Increment in Gurame Fish Treated with IGF-I RM and IGF-I PMS (Mean ± SD) g

Treatment	Weight gain mean ± SD (g)	Length Increment mean ± SD (cm)
T0 (Control) 0 ng/mL	7.23^{a} ± 0.37	5.76^{a} ± 0.38
T1: IGF-I RM 10 ng/mL	17.01^{b} ± 0.42	5.88^{a} ± 0.17
T2: IGF-I RM 20 ng/mL	18.22^{b} ± 0.35	6.42^{b} ± 0.08
T3: IGF-I RM 40 ng/mL	26.35^{c} ± 1.89	7.93^{c} ± 0.07
T4: IGF-I PMS10 ng/mL	15.23^{b} ± 0.44	5.18^{a} ± 0.25
T5: IGF-I PMS 20 ng/mL	19.82^{b} ± 1.35	7.12^{b} ± 0.48
T6: IGF-I PMS 40 ng/Ml	28.62^{c} ± 0.75	8.90^{c} ± 1.47

Different superscript in column was showed significant differences ($p<0.05$)

plays a role in regulating IGF activity. IGF evokes its biological response through receptors on the target tissue which results in the increased growth (Peterson *et al*., *loc cit*). The serum concentration of IGF-I stimulates or suppresses GH release from the anterior pituitary through feedback in mamals and lower vertebrates, as has been shown primarily in bony fish. In mammals and bony fish, the pituitary GH shaft / IGF-I liver involvement in endocrine regulation of important physiological processes seems to exist (Eppler, 2011).

Like other vertebrates, ingestion and energy accumulation in fishes are the key to survival, growth and reproduction, with normal fat which act as an important energy reserve. Growth hormone (GH) displays pluripotention covering a wide range of effects of growth stimulation both in mammals and fish. However, most of the GH action acts through the production and stimulation of IGF-I expenditure (Kling *et al*., 2012).

Insulin-like growth factor-I is structurally and functionally associated with insulin and its biological actions in fish, including growth regulation, tissue differentiation, reproduction and osmoregulation. IGF-I is more effective than insulin in stimulating the absorption of glucose and amino acid in muscle cells in rainbow trout (*Oncorhynchus mykiss*). It indicates that this hormone is also involved in carbohydrate metabolism and even beyond the relevance of insulin (Enes *et al*., 2011).

In this research IGF-1 PMS from pregnant mare serum. Insulin-like growth factor-I in mamals is one of the important things in IGF signaling, and is involved in regulating the growth and skeletal muscle development. In most fish species, IGF-I in blood or in tissue, at a positive mRNA level correlates with dietary ration, protein content, and growth rate. Injecting IGF-I implants accelerates fish growth. In many fish species, IGF-I levels of blood or tissue from mRNA are positively correlated with dietary ration, dietary protein content, and body growth rate (Yan *et al*., 2012).

Summary

The intramedullary injection of 40 ng/ml of either IGF-I recombinant mouse or IGF-I pregnant mare serum has given a better growth in Gurame fish.

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