UTILIZATION OF *PLEUROTUS SAJOR-CAJU* STALKS AS FEED SUPPLEMENT IN DIET OF JUVENILE *OREOCHROMIS NILOTICUS* (TILAPIA)

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2010

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DISSERTATION SUBMITTED IN FULFILLMENT
OF THE REQUIREMENTS FOR
MASTER OF BIOTECHNOLOGY

FACULTY OF SCIENCES
UNIVERSITY OF MALAYA
KUALA LUMPUR

2010

UNIVERSITI MALAYA
ORIGINAL LITERARY WORK DECLARATION

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Name of Degree : Master of Biotechnology
Title of Thesis : UTILIZATION OF *PLEUROTUS SAJOR-CAJU* STALKS AS FEED SUPPLEMENT IN DIET OF JUVENILE *OREOCHROMIS NILOTICUS* (TILAPIA)

Field of Study : Biotechnology

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ABSTRACT

In this study, the potential use of the powdered *Pleurotus sajor caju* (Oyster mushroom) stalks as a supplemented feed for juvenile *Oreochromis niloticus* was evaluated by observing the growth level (length, body weight and specific growth rate (SGR), survival and also by measuring the water quality parameters (pH, temperature, Ammonia, Nitrite, Nitrate and dissolved oxygen). Stalks of *P. sajor-caju* are a waste product from the mushroom industry which is known to be an economical, abundant and good protein source. Diets were incorporated with commercial feed in proportion of *P. sajor-caju* 25% (Diet 1), *P. sajor-caju* 50% (Diet 2) and control feed (Diet 3).

The survival of *O. niloticus* on the final week, for the fishes that were fed with Diet 1 showed higher value of 85.18±0.85% compared to Diet 3 with 79.63±0.64%. Meanwhile the growth performance (body length and weight) of the tilapia fed with Diet 1 (4.40 ± 0.03cm; 9.66 ± 0.48g) was higher on compared to Diet 2 (4.26 ± 0.04cm; 9.42 ± 0.27g) and Diet 3 (4.21 ± 0.01cm; 9.16 ± 0.18g). Moreover, Diet 1 is also higher in SGR (1.65 ± 0.01%) compared to other diets with a significant level of $P<0.05$.

P. sajor-caju supplemented diets (Diet 1 and Diet 2) were rich in protein and the moisture value is also high when compared to the control (Diet 3). On the other hand the contents of fat, carbohydrate and ash were higher than supplemented diet. Crude fiber was higher in Diet 1 and Diet 3 but low amount in Diet 2.

Water quality between groups of diet and within groups of triplicate tanks were almost similar for all the parameter studied except for the ammonia concentration. In this study, ammonia concentration was higher in tank fed with Diet 1 (5.95 ± 0.19mg/L) and Diet 2 (5.14 ± 0.17mg/L) supplemented diet compared to the Diet 3 (2.18 ± 0.07mg/L). However this higher ammonia concentration does not affect the growth and

survival of tilapia. Meanwhile, least nitrite concentration was found in the Diet 3 and Diet 1 with 0.02 ± 0.002mg/L and 0.22 ± 0.003mg/L respectively compared to Diet 2 sample with 0.03 ± 0.00mg/L. The nitrate concentration over eight weeks of feeding trial showed no significant value for all three diets. Besides that, the pH was maintained in the range of 7.26 ± 0.01 to 7.34 ± 0.08, where it was slightly alkaline and closer to neutral. The temperature for all tanks with the three diets showed significant difference between Diet 2 and Diet 3 as compared to Diet 1. The DO levels were 5.81 ± 0.13ppm, 5.70 ± 0.63ppm and 5.24 ± 0.15ppm for water tank fed with Diet 1, Diet 2 and Diet 3 respectively. Even though, tilapias consuming Diet 1 showed slightly higher DO concentration compared to other diets, yet there was a no significant difference ($P>0.05$) in DO measurement.

ABSTRAK

Dalam kajian ini, penggunaan serbuk tangkai *Pleurotus sajor caju* (Cendawan tiram) sebagai makanan suplimen untuk *Oreochromis niloticus* dikaji dengan memerhati tahap tumbesaran (panjang, berat badan dan kadar tumbesaran khusus (SGR), Jumlah peratusan hidup dan parameter kualiti air (pH, suhu, Ammonia, Nitrit, Nitrat dan oksigen terlarut) turut diukur. Tangkai *P. sajor-caju* merupakan sisa dari industri cendawan, yang dikenali sebagai sumber protein terbiar yang baik dan ekonomik. Diet diberikan dengan suplimen *P. sajor-caju* 25% (Diet 1), *P. sajor-caju* 50% (Diet 2) dan diet kawalan (Diet 3).

Jumlah peratusan hidup bagi *O. niloticus* pada minggu terakhir, untuk ikan yang diberi diet dengan Diet 1 menunjukkan peningkatan sebanyak 85.18 ± 0.85% berbanding dengan Diet 3 iaitu 79.63 ± 0,64% sedangkan tahap pertumbuhan (panjang tubuh dan berat) bagi ikan yang diberi Diet 1 (4.40 ± 0.03cm; 9.66 ± 0.48g) telah meningkat dibandingkan dengan Diet 2 (4.26 ± 0.04cm ; 9.42 ± 0.27g) dan Diet 3 (4.21 ± 0.01cm; 9.16 ± 0.18g). Selain itu, kadar tumbesaran khusus bagi Diet 1 juga lebih tinggi (1.65 ± 0.01%) berbanding dengan diet lain dengan signifikasi $P < 0.05$.

P. sajor-caju diet (Diet 1 dan Diet 2) kaya dengan protein dan tahap kelembapan juga tinggi apabila dibandingkan dengan Diet 3. Selain itu kandungan lemak, karbohidrat dan abu juga lebih tinggi pada diet yang mengandungi *P. sajor-caju*. Kandungan serat mentah adalah lebih tinggi dalam diet Diet 1 dan Diet 3 tetapi ianya rendah pada Diet 2.

Kualiti air antara tiga diet dan tiga replikat hampir serupa untuk semua parameter kecuali kandungan ammonia. Dalam kajian ini, kepekatan ammonia lebih tinggi pada Diet 1 (5.95 ± 0.19mg/L) dan Diet 2 (5.14 ± 0.17mg/L) dibandingkan dengan Diet 3

(2.18 ± 0.07mg/L). Namun kepekatan ammonia berlebihan tidak menjejaskan tumbesarn dan jumlah peratusan hidup. Sementara itu, nilai kepekatan nitrit paling kurang diperhatikan dalam Diet 3 dan diet Diet 1 dengan 0.02 ± 0.002mg/L dan 0.22 ± 0.003mg/L masing-masing berbanding dengan diet Diet 2 dengan 0.03 ± 0.00 mg/L. Disamping itu, kepekatan nitrat dalam kajian selama lapan minggu tidak menunjukkan nilai yang signifikan antara semua kumpulan diet. Selain itu, pH adalah stabil dengan julat antara 7.26 ± 0.01 hingga 7.34 ± 0.08, di mana ia sedikit alkali dan lebih kepada neutral. Suhu bagi semua tangki dengan tiga diet menunjukkan perbezaan yang signifikan antara Diet 2 dan Diet 3 terhadap Diet 1. Kepekatan oksigen terlarut (DO) dalam tangki adalah 5.81 ± 0.13ppm, 5.70 ± 0.63ppm dan 5.24 ± 0.15ppm bagi diet Diet 1, Diet 2 dan Diet 3 masing-masing. Walaupun, tilapia yang diberikan diet Diet 1 menunjukkan kepekatan DO yang tinggi berbanding dengan diet lain, namun perbezaan itu tidak signifikan ($P > 0.05$).

ACKNOWLEDGEMENTS

First and foremost, my sincere gratitude to my supervisor, Dr. Shaharudin Bin Ab. Razak and my co-supervisor Prof. Vikineswary Sabaratnam for their guidance and advice during my research study. Absence in their guidance and their valuable advice wouldn't lead in the success of my research study. I would also like to thank University of Malaya for their financial support under the research fund.

The most important, not to forget my dearest parents Mr. M. Muniandy and Mrs. S.P. Umbravathy, who have supported me by giving me so much of moral supports, I'm gifted and blessed to get them as my guardian angels. I would like to thank them by presenting my research work and hope I can make them proud of me as their daughter.

Besides that, not forgetting my dearest friends for being there for me throughout my research, the supports and never ending helping hands I received from friends like Mr. Neelendran, Mr. Frank, Mr. Fairuz, Ms. Lawania, and Mr. Loo and others are definitely much appreciated.

Lastly I would like to thank to all the Research assistants and Master students whom have guided me in my research study as well as Mr. Raymond from the hatchery in Rimba Ilmu, University of Malaya. Thank you all for being there for me.

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