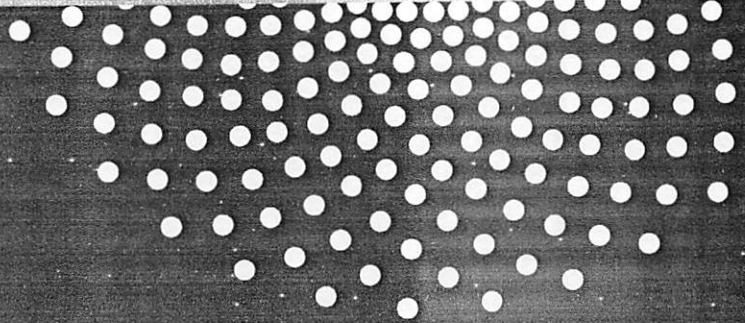


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Biotechnology and Food Science

Edited by Mr. Li Xuan

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Biotechnology and Food Science

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Mr. Li Xuan

PREFACE

Dear Distinguished Delegates and Guests,

The Organizing Committee warmly welcomes our distinguished delegates and guests to the 2012 4th International Conference on Biotechnology and Food Science (ICBFS 2012) held on April, 7-8, 2012 in Bangkok, Thailand.

ICBFS 2012 are sponsored by Asia-Pacific Chemical, Biological & Environmental Engineering Society (APCBEES), and supported by APCBEES Members and scholars from universities all round the world. If you have attended a conference sponsored by APCBEES before, you are aware that the conferences together report the results of research efforts in a broad range of Biotechnology and Food Science society. These conferences are aimed at discussing with all of you the wide range of problems encountered in present and future high technologies. ICBFS 2012 are organized to gather members of our international community scientists so that researchers from around the world can present their leading-edge work, expanding our community's knowledge and insight into the significant challenges currently being addressed in that research. The conference Program Committee is itself quite diverse and truly international, with membership from the Americas, Europe, Asia, Africa and Oceania.

This proceeding records the fully refereed papers presented at the conference. The main conference themes and tracks are Biotechnology and Food Science. The main goal of these events is to provide international scientific forums for exchange of new ideas in a number of fields that interact in-depth through discussions with their peers from around the world. Both inward research; core areas of Chemical, Biotechnology and Food Science and outward research; multi-disciplinary, inter-disciplinary, and applications will be covered during these events.

The conference has solicited and gathered technical research submissions related to all aspects of major conference themes and tracks. All the submitted papers in the proceeding have been peer reviewed by the reviewers drawn from the scientific committee, external reviewers and editorial board depending on the subject matter of the paper. Reviewing and initial selection were undertaken electronically. After the rigorous peer-review process, the submitted papers were selected on the basis of originality, significance, and clarity for the purpose of the conference. The selected papers and additional late-breaking contributions to be presented as lectures will make an exciting technical program. The conference program is extremely rich, featuring high-impact presentations.

The high quality of the program – guaranteed by the presence of an unparalleled number of internationally recognized top experts – can be assessed when reading the contents of the program. The conference will therefore be a unique event, where attendees will be able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other fields. The program has been structured to favor interactions among attendees coming from many diverse horizons, scientifically, geographically, from academia and from industry. Included in this will to favor interactions are social events at prestigious sites.

We would like to thank the program chairs, organization staff, and the members of the program committees for their work. Thanks also go to Editor Mr. Li Xuan, Asia-Pacific Chemical, Biological & Environmental Engineering Society, for their wonderful editorial service to this proceeding.

We are grateful to all those who have contributed to the success of ICBFS 2012. We hope that all participants and other interested readers benefit scientifically from the proceedings and also find it stimulating in the process. Finally, we would like to wish you success in your technical presentations and social networking.

We hope you have a unique, rewarding and enjoyable week at ICBFS 2012 in Bangkok, Thailand

With our warmest regards,

~~The Organizing Committees~~
April, 7-8, 2012
Bangkok, Thailand

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ICBFS 2012: April 7-8, 2012, Bangkok, Thailand

Influence of Fish Feed Containing Corn-Cob Was Fermented By *Trichoderma Sp*, *Aspergillus Sp*, *Rhizopus Oligosporus* To The Rate of Growth of Java Barb (*Puntius Gonionitus*)

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Abstract

The purpose of this research is to obtain the best formulation of corn-cob fermented by *Trichoderma viridae*, *Trichoderma reesei*, *Aspergillus oryzae*, *Rhizopus oligosporus* as material feed for java barb to enhance the growth rate of the fish.

This research had been conducted in the Laboratory of Nutrition and Feed, Faculty of Ilusbandry, and Wet Laboratorium, Faculty of Fisheries and Marine Science, all of Padjadjaran University. Research design applied use Completely Randomized Design, 6 treatments and 3 times replication.

The conclusion of feeding trial to java barb shown that the highest growth is found at 5 % corncob fermentation fish feed, while the highest growth rate and the lowest fish feed conversion were found in more than 5 %.

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Keywords: corncob, fermentation, protein level, fiber level, growth rate of java barb

1. Introduction

In Indonesia, corn-cob (agriculture waste) estimated to reaching 2 million tons per year, but its exploiting still a rare, only as component of feed cow and sheep. As component of feed, need to be added other material

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so that content of nutrient and palatability level more higher (Directorate General of Field crop and Horticulture, 2006).

Usage of corn-cob still a lack, because the crude fiber are high (40 %). Nutrient contain of corn-cob are crude protein 3,96 %, crude fiber 2,08 %, crude fiber 40.9 %, celullosa 12,05 %, hemicelulose 28,06 %, Non Nitrogen Ekstract Matter 52,5 %, lignin 20,98 %, Ash 1,17 %, water 7,08 % (Tangenjaya dan Wina, 2008)

Feed with high fibre for livestock can drop the digest, feed efficiency and performance. Feeding stuff with high crude fiber of example is corn-cob, need processing before given to livestock or fish.

For corn-cob, microbes which can stand as selulolitik for example *Trichoderma sp*, *Aspergillus sp*, *Rhizopus oligosporus* to increase the nutritional value, so able to become source carbohydrate as feeding

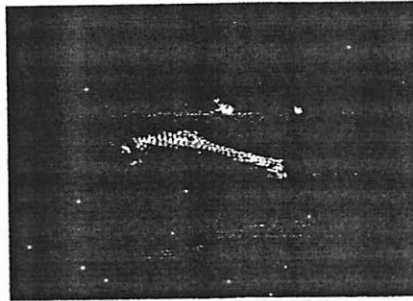
In West Java Indonesia has the major commodity is Java barb (*Puntius gonionitus*).

The objective of this research was to obtain the best formulation of corn-cob fermented with *Trichoderma viridae*, *Trichoderma reesei*, *Aspergillus oryzae*, *Rhizopus oligosporus* as feed for silver barb to enhance the performance of the fish.

2. Material and Methods

Equipment which is used is grinder, double sieve, big plastic cup, wood spoon, electrical scale, blender, palette machine, bamboo plate.

Material which used is Glass aquarium, heater, aerator, scale, serok, conical fiber, plastic pail, plastic pipe, sticker paper, Chlorox, feed test, java barb seed with size ± 15 g, aeration system.



Graphic 1. Java Barb Seed Size

Table 1. Feed Formulation in Every Treatment and Nutritional Value of Java Barb Seed What Contains Result Fermentation Cob Flour

No	Material	R0	R1	R2	R3	R4	R5
1	Fish meal	9.00	9.00	9.00	9.00	9.00	9.00
2	Soybean meal	23.50	23.00	23.00	23.00	23.00	23.00
3	Fermented Corn cob	0.00	5.00	10.00	15.00	20.00	25.00
4	Rice bran	19.50	16.00	14.50	12.50	11.00	9.00
5	Pollard	37.50	37.00	33.50	30.50	27.00	24.00
6	Cassava meal	4.00	4.00	4.00	4.00	4.00	4.00

7	Palm oil	2.50	2.00	2.00	2.00	2.00	2.00
8	Premix	2.00	2.00	2.00	2.00	2.00	2.00
9	Decalcium Pospbat	2.00	2.00	2.00	2.00	2.00	2.00
Presentation of raw matterial in feed		100.00	100.00	100.00	100.00	100.00	100.00

Description :

- R0: feed of test contains fermentation cob 0 %
 R1: feed of test contains fermentation cob 5 %
 R2: feed of test contains fermentation cob 10 %
 R3: feed of test contains fermentation cob 15 %
 R4: feed of test contains fermentation cob 20 %
 R5: feed of test contains fermentation cob 25 %

3. Preparation

Test fish has uniform size and come from one parents stock, after a week acclimatitation in conicel tank, fish starts disseminated in a number of aquariums. Test feed there given 5 % one day. Counting the number of fish and balance biomas of fish there performed every week.

4. Parameter (Growth Rate)

Growth rate count with the formula

$$g = \frac{\ln Wt - \ln Wo}{t} \times 100 \%$$

description : g : Growth Rate (%)
 Wt : weight at Tt
 Wo : weight at To
 t : time (day)

5. Research Design

Research design applied use Completely Randomized Design, 6 treatments and 3 times replication, and the treatment are :

Difference between treatment for every test parameter there seen through F test at trust level 95%. Continuation test there used if F test gives real different result by using doubled distance test Duncan.

6. Result and Discusion

Result of research shows feed given tawes fish seed growth rate which contains fermentation cob flour (R1, R2, R3, R4 and R5) far better (value successively 2,01 ; 1,86 ; 1,80 ; 1,92 ; 1,84) compared to feed given barb seed do not contain fermentation corn cob flour (R0) namely 1,24. Feed given fish growth rate without any fermentation corn cob flour (R0) real different with feed given fish growth rate with fermentation cob (R1, R2, R3, R4 and R5).

One of the nutrition which has important role in process of growth of fish is protein. Fish seed requires well-balanced combination of 20 essential amino acid types and non essential which compiles protein. Test feed which is used at research source of its protein comes from animal that is fish meal, and vegetable that is soybean meal, fermentation corn cob flour and pollard.

This test feed contains uniform nutrient (proximate analysis), with uniform crude fiber $\pm 9,20\%$, but content of feed owned simple sugar which contains higher fermentation cob flour, compared to feed of test do not contain fermentation corn cob flour. Consortium 4 fungi species which is used as fermentor for corn cob flour, represent highest reducing sugar former consortium, and most effective if compared to other consortium or single fungi.

Table 2. Average of Growth Rate of Java Barb Seed

Treatment	R0	R1	R2	R3	R4	R5
Growth Rate	1.24	2.01	1.86	1.80	1.92	1.84
(%)	(a)	(b)	(b)	(b)	(b)	(b)

Description : Numerical from left to right shows average value every treatments, letter from left to right shows difference of based on Duncan test

Alteration which is performed by consortium 4 fungi types to corn cob substrate (rich of cellulose) will be produced the glucose which represents small molecule weighing carbohydrate and in more simple structure so that easier to digested by java barb seed. Research of Odugawa, dkk., (2008) refinements of nutrient as result of fermentation is degradation of crude fiber, degradation of crude fat and improvement of crude protein, also improvement digests feed.

Result of research Oke, dkk.,(2007) what gives fermentation corn cob for broiler, there is addition of body weight and protein efficiency ratio increases significantly.

Research Mukhopadhyay and Ray (2005) mention linseed fermentation by *Lactobacillus acidophilus* as feed of seed carp, happened improvement digests and degradation of tannin significantly at all levels dose inoculan. Fermentation process is able to degrade difficult feeding stuff to digested like carbohydrate at corn cob.

Fermentation with fungi consortium *Trichoderma viride*, *Trichoderma reesei*, *Aspergillus oryzae* and *Rhizopus oligosporus* at corn cob contributes amino acids organic acid namely citrate, pentotenic acids, acetic acid, lactic acid (Miura, dkk., 2004 and Bai, dkk., 2008), fatty acids, glucose (Odugawa, dkk., 2008; Adeyemi and Familade 2003, antibiotic (Son, 2009), vitamins, mineral and various enzymes namely lipase, protease and cellulase (Aachary and Prapulla 2008A and 2008B ; Xia and Shen, 2004).

Digestibility fermented corn hay cellulose uses *Trichoderma viridae* at cow, increases 34 %, while digest fermented corn cob uses *Trichoderma viridae* at sheep increases 60 % (Ward and Perry, 1980).

Improvement of enzyme at feed will increase speed of the hydrolysis (Piliang and Djojsubagio, 2006). Absorptions of food matter passes diffusion process, endo and exocytosis and feed absorption contains cob fermentation increases with existence of vitamin and mineral (Roos, dkk., 2003). Pantothenic acid or Vitamin B is vitamin essential for fish metabolisme is including process of fish body protein deposition, while amino acid is body protein precursor (Halver, 1985). Enzyme found on feed contains fermentation corn cob, believed is able to degrade crude fiber, protein, and feed fat.

7. Conclusion

Fish feed containing corn cob fermented about 5 %, gave the highest growth rate of java barb which are

2,01 %.

Aknowledgement

I would like to thanks to Professor Soeharsono (RIP) and Dr.Sutandar Zainal (RIP) as my promotors

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