EVALUATION OF *Moringa oleifera* YOUNG LEAVES AS FEED ADDITIVES TO NILE TILAPIA (*Oreochromis niloticus* L.) FRY

By

LESTER TABAJO PALAPOX

An Undergraduate Thesis submitted to the faculty of the College of Fisheries in partial fulfillment of the requirements for the degree of

BACHELOR OF SCIENCE IN FISHERIES

Department of Aquatic Resources, Ecology and Management
COLLEGE OF FISHERIES
CENTRAL LUZON STATE UNIVERSITY
Science City of Muñoz, Nueva Ecija
Philippines

2019

CF Thesis Form No. 8

COLLEGE OF FISHERIES
CENTRAL LUZON STATE UNIVERSITY
Science City of Muñoz, Nueva Ecija

EVALUATION OF *Moringa oleifera* YOUNG LEAVES AS FEED ADDITIVES TO NILE TILAPIA (*Oreochromis niloticus* L.) FRY

By

LESTER TABAJO PALAPOX

Undergraduate Thesis submitted to the Faculty of the
College of Fisheries in partial fulfillment of the
Requirements for the degree of

BACHELOR OF SCIENCE IN FISHERIES

APPROVED:

RAVELINA R. VELASCO — 01-16-19
Adviser — Date

JANET O. SATURNO — 01/16/19
Critic — Date

NOTED:

JOSE S. ABUCAY — 01/16/19
Department Chair — Date

RECORDED:

LORENZ J. FAJARDO
College Research Coordinator
1/16/19
Date

ACCEPTED:

RAVELINA R. VELASCO
Dean
1/16/19

BIOGRAPHICAL DATA

Personal Data

Name	Lester T. Palapox
Birthday	April 13, 1997
Birth Place	San Jose City, Nueva Ecija
Address	Culaylay, San Jose City, Nueva Ecija
Parents	June C. Palapox and Ligaya B. Tabajo

Educational Attainment

Elementary	Culaylay Elementary School San Jose City, Nueva Ecija
Secondary	Constancio Padilla National High School San Jose City, Nueva Ecija
Tertiary	Central Luzon State University Science City of Muñoz, Nueva Ecija

ACKNOWLEDGEMENT

First of all, to our ALMIGHTY GOD who is always there to give guidance, strength, support, love, knowledge and protection to do this work and also for the blessings every day of his life.

The author would like to thank and express his sincerest gratitude to all the people who helped him in making this paper, for their trust, support and guidance that gave him strength to overcome challenges that he encountered.

A sincere gratitude to his adviser, Dr. Ravelina R. Velasco, for giving the author encouragement, kindness, guidance, advices, sharing her knowledge, support and patience in finishing this paper.

To his critic, Prof. Janet O. Saturno, sincere thanks for her kindness, advice, patience, editing, correction, suggestion and comments that she had made that helped the author to improve this paper.

To Dr. Remedios B. Bolivar, the College Research Coordinator for the advice, comments and suggestions for improving and accomplishing this paper.

To all the mentors of the author in the College of Fisheries and Freshwater Aquaculture Center for exposing the author to the world of fisheries and have taught him the knowledge he needed to finish his degree.

To Mrs. Juliet Holasca and Mr. Ruel Gabales for the kindness, concern and for helping the author during his thesis conduct at the Wet Laboratory.

To his classmates and friends: Isagani W. Ganotice, Ar-jay M. Rafanan, Grichelle Duque, Maricar Carbonel, Alexsandra P. Oribio and Daniel Carpo, for the moral support and encouragement.

To his classmates, friends, brothers and sisters in the Ichthyological Society, for the support and encouragement to finish this paper.

To all my team mates in the Team Athletics, thank you for being good friends.

To our trainers and coaches, thanks for everything, for the trust and support to the Team Athletics.

To the author's family, namely; Mr. June C. Palapox and Mrs. Ligaya B. Tabajo, the author's sibling, Mc Kim T. Palapox and to the author's grandmother and grandfather; Mr. Sixto D. Tabajo and Mrs. Dionisia B. Tabajo for the love, moral support and care they have always provided,

Thank you very much and God bless you all.

To God be the glory!

LESTER TABAJO PALAPOX

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIX TABLES

EVALUATION OF *Moringa oleifera* YOUNG LEAVES AS FEED ADDITIVES TO NILE TILAPIA (*Oreochromis niloticus* L.) FRY[1/]

ABSTRACT

The study was conducted to evaluate the growth performance and survival rate of Nile tilapia (*Oreochromis niloticus* L.) fry reared at indoor aquarium and fed commercial feed with different concentration of pulverized *Moringa oleifera* young leaves. The experiment was conducted for a period of 45 days. The four different treatments were 0, 5, 10, and 15 g pulverized moringa young leaves per 100 g of feeds and each treatment was replicated three times.

The highest mean final weight was obtained in Treatment 4 with a value of 8.30±0.80 g. On the other hand, fish in Treatment 1 obtained the second highest final weight with 7.65±0.42 g, followed by fish in Treatment 2 with a value of 7.32±0.32 g and Treatment 3 obtained the lowest final weight with 7.13±0.78 g. However, all treatments were not significant (P>0.05) from each other on the mean final weight.

Treatment 4 had highest mean final length with 6.32±0.22 cm, followed by Treatment 1 (6.04±0.10 cm), Treatment 3 (6.02±0.20 cm) and Treatment 2 (5.90±0.09 cm). However, all treatments were comparable.

Result of the study showed that tilapia fry fed with commercial feeds+15 g pulverized moringa young leaves (Treatment 4) had obtained the highest value in final weight, final length and gain in weight. Treatment 4 had lowest feed conversion ratio (FCR). All treatments have 100% survival.

The results of water quality parameters such as dissolved oxygen, temperature and pH were not significant among treatments.

Based from the results addition of moringa in feeds have no benefit on the growth of tilapia. More so, water quality was not affected.

Generally, to observe better result of growth performance it is suggested that duration of the experiment be extended up to 3 to 4 months.

1/ Undergraduate thesis submitted to the faculty of College of Fisheries, Central Luzon State University as a partial fulfillment of the requirements for the degree of Bachelor of Science in Fisheries. Prepared at the Department of Aquatic Resources, Ecology and Management under the supervision of Dr. Ravelina R. Velasco.

LITERATURE CITED

Agarwal, S.S. and V.K. Singh. 1999. Immunomodulators studies on Indian medicinal plants and synthetic peptides. Part 1: medicinal plants. Proc. Indian Natl. Sci. Acad., 65:179-204.

Amisha, S., M.A. Oteng and J.K. Ofori. 2009. Growth performance of the African catfish (*Clariasgariepinus*), fed varying inclusion levels of *Leucaena leucocephala* leaf meal. Journal of Applied Sciences and Environmental Management, 13(1):21-26.

AFCD. 2009. Fish feed management. Retrieved on August 13, 2018 from http://hkaffs.org/en/images/GAP1.pdf

Bennett, R.N., F.A. Mellon and N. Foidl. 2003. Profiling glucose inolates and phenolics in vegetative and reproductive tissues of the multi-purpose trees *Moringa oleifera* L. (Horse radish tree) and *Moringa stenopetala* L. J. Agric. Food Chem., 51:3546-3553.

Bitchi, A.H. and M.K. Ahmad. 2010. Growth performance and nutrient utilization of African catfish (*Clarias gariepinus*) fed varying dietary levels of processed cassava leaves. Bayero J. of Pure and Applied Sciences, 3(1):118-112.

Boyd, C.E. 1998. Water quality for ponds aquaculture. Birmingham Publishing Co.Birmingham, Alabama. p.37.

Carvalho, J.S.O., R.V. de Azevedo, A.P.S. Ramos and L.G.T. Branga. 2012. Agroindustrial byproducts in diets for Nile tilapia juveniles. R. Bras. Zootec., 41(3): 479-484.

Craig, S. 2009. Understanding fish nutrition, feeds, and feeding. Retrieved from www.ext.vt.edu on September 20, 2017.

Dada, A.A. 2015. Improvement of Nile tilapia (*Oreochromis niloticus* Linnaeus, 1758) growth performance fed three commercial feed additives in diets. J. Aquac. Res. Development, 6(4): 1-3.

Dangi, S.Y., C.I. Jolly and S. Narayana. 2002. Anti-hypertensive activity of the total alkaloids from the leaves of *Moringa oleifera*. Pharm. Biol., 40: 144-148.

Devi, P.A., P. Padmavathy, S. Aanand and K. Aruljothi. 2017. Review on water quality parameters in freshwater cage culture. International Journal of Applied Research 3(5): 114-120.

EL-Sayed, A.M. 2006.Tilapia Culture.CABI Publishing.U.K. 277 p.

Fahey, J.W. 2005.*Moringa oleifera:*a review of the medical evidence for its nutritional, therapeutic, and prophylactic properties. Part 1.Retrieved from https://www.tfljournal.org/article.php/20051201124931586 on September 20, 2017.

Farooq, A., L. Sajid, A. Muhammad and A.H. Gilani. 2007. *Moringa oleifera*: a food plant with multiple medicinal uses. Phytotherapy Research, 21: 17-25.

Gabriel, U.U.., O.A. Akinrotimi, D.O. Bikebele, D.N. Onunkwo and P.E. Anyanwu. 2007. Locally produced fish feed: potentials for aquaculture development in sub-Saharan Africa. African Journal of Agricultural Research, 2(7): 2-4.

Ibidunni, A.S., O.S. Olubodun, A. Ikililu. 2017 Metabolic activities and health indices of African catfish (*Clarias gariepinus*) fed varying levels of *Zingiber officinale* root.Journal of Applied Biology & Biotechnology, 5(04): 021-028.

Li, P., D.H. Lewis and D.M. Galtin. 2004. Dietary oligonucleotides from yeast RNA influence immune responses and resistance of hybrid striped bass (*Morone chrysops x Morone saxatilis*) to streptococcus infection. Fish Shellfish Immunol., 16: 561-569.

Metwally, M.A.A. 2009.Effects of moringa on some antioxidant activities in tilapia nilotica (*Oreochromis niloticus*). World Journal of Fish and Marine Sciences,1(1):56-64.

Millamena, O.M. 2002. Introduction to nutrition in tropical aquaculture.p. 1-5. *In*: Millamena, O.M., R.M. Coloso and F.P. Pascual (eds.). Nutrition in Tropical Aquatic Species.Training and Information Division.Southeast Asia Fisheries Development Center Aquaculture Department.Tigbauan, Iloilo, Philippines.232 p.

Moyle, P.B. and J.J. Cech, Jr. 2004. Fishes: An Introduction to Ichthyology, Chapter 8. Growth.Fifth.Pearson Prentice Hall. Upper Saddle River, New Jersey, USA. p. 127-139.

Omoregie, E., L. Igoche, T.O. Ojobe, K.V. Absalom and B.C. Onusiriuka. 2009. Effect of varying levels of sweet potato (*Ipomoea batatas*) peels on growth, feed utilization and some biochemical responses of the cichlid (*Oreochromis niloticus*). African Journal of Food Agriculture Nutrition and Development, 9(2): 701-709.

Poe, K.F. 2000.Water quality and monitoring.Retrieved on April 21, 2018 from http://cals.arizona.edu/watershedsteward/resources/docs/guide/(10)Water%20Quality.pdf.

Popma, T. and M. Masser. 1999. Tilapia life History and Biology. SRAC Publication No. 283.Southern Regional Aquaculture Center.Mississippi, U.S.A. p. 1-4.

Price, M.L. 1985. The moringatree.Retrieved from https://www.echonet.org/ on February 19, 2018.

Phuc, B.H.N. and B. Ogle. 2005. Effects of inclusion of different levels of cassava leaf meal in the diet on the performance of growing-finishing feeds. Retrieved from http://mekarn.org/workshops/proctu/phuc46.htmon June 20, 2017

Ramach and Ran, C., K.V. Peter and P.K. Gopalakrishnan. 1980. Drumstik (*Moringa oleifera*): a multipurpose Indian vegetable. Econ. Bot., 34: 276-283.

Royes, J.B. and F. Chapman. 2003. Preparing your own fish feeds. Retrieved from http://edis.ifas.ufl.edu on September 20, 2017.

Schreck, C.B. and P.B. Moyle. 1990. Methods for Fish Biology. American Fisheries Society. Bethesda, Maryland. 363 p.

Siddhuraju, P. and K. Becker. 2003. Antioxidant properties of various solvent extracts of total phenolic constituents from three different agro-climatic origins of drumstick tree (*Moringa oleifera* Lam.). J Agric. Food Chem., 15: 2144-2155.

Sivaram, V., M.M. Babu, T. Citarasu, G. Immanuel, S. Murugadass and M.P. Marian. 2004. Growth and immune response of juvenile greasy groupers (*Epinephelu stauvina*) fed with herbal antibacterial active principle supplemented diets against *Vibrio harveyi* infections. Aquaculture, 237: 9-20.

Shipton, T.A. and T. Hecht. 2013. Economic, regulatory and legal review of feed management practices. p. 565-585. *In*: M.R. Hasan and M.B. New (eds.). On-farm feeding and feed management in aquaculture. FAO Fisheries and Aquaculture Technical Paper No. 583. Rome, Italy. 21 p.

Tahiliani, P. and A. Kar. 2000. Role of *Moringa oleifera* leaf extracts in the regulation of thyroid hormone status in adult male and female rays. Pharmacol. Res., 41: 319-323.

Vera Cruz, E.M., J.S. Abucay, R.A. Delos Trinos, J.O. Saturno, F.L. Porciuncula, M.S. Recto, P.J. Rafael and G.Z. Laggui. 2011. Tilapia production and entrepreneurship training manual. Central Luzon Agriculture and Resources Research and Development Consortium (CLAARDEC), Cagayan Valley Agriculture and Resources Research and Development (CVARRD) and

Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development – Department of Science and Technology (PCARRD-DOST). Central Luzon State University, Science City of Muñoz, Nueva Ecija.196 p.

Verastegani, A. and J. Dahlan. 2014. Influence of dietary fiber levels on feed utilization and growth performance in poultry. Journal of Animal Production Advances, 4(6): 422-429.

https://www.sdstate.edu