NURSING OF AFRICAN CATFISH (*Clarias gariepinus*) FRY FED WITH VERMI MEAL AFRICAN NIGHT CRAWLER (*Eudrilus eugeniae*) AND FISH MEAL

By

MARK ANTHONY DUMALE DELA CRUZ

An Undergraduate Thesis Presented to the Faculty of the College of Fisheries in Partial Fulfillment of the Requirements of the Degree of

BACHELOR OF SCIENCE IN FISHERIES

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

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MARK ANTHONY DELA CRUZ

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ABSTRACT

The study was conducted to compare the performance of African catfish (*Clarias gariepinus*) fed with combinations vermi meal African night crawler *(Eudrilus eugeniae)*. The treatments evaluated were: T1- African catfish fry fed with 100% fish meal; T2- African catfish fry fed with 100% vermimeal; T3- African catfish fry fed with 25% fishmeal + 75% vermimeal; T4- African catfish fry fed with 50% fishmeal + 50% vermimeal + 20; T5- African catfish fry fed with 75% fishmeal + 25% vermimeal. Fishmeal served as the binder of the feed. Each treatment was replicated thrice.

Twelve circular tanks (1m diameter and 18 cm height) were used in the study. Each tank was stocked with 100 fifteen day-old African catfish fry acquired from Phil-Fishgen, Freshwater Aquaculture Center (FAC). The experiment was carried out for duration of 20 days.

Results showed that the fry in T4 had the best performance in term of final length, final weight, absolute and specific growth rates. For the survival rate the T1 had the best performance.

Statistical analysis revealed that the African catfish fry in T4 had significantly higher total length, final weight, absolute growth rate, and specific growth rate than the fry fed in T1, T2, T3 and T5.

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LITERATURE CITED

Adeyamo, O.K., O.F. Akano and B.O. Emikpe. 2012. Effect of formalin on spawning success and organ histology in *Clarias gariepinus*. Research Journal of Environmental Toxicology, 6(2): 42-50.

Amisa, S., M.A. Oteng and J.K. Ofori. 2009. Growth performance of the African catfish (*Clarias gariepinus*) fed varying inclusion levels of *Leucaena leucocephana* leaf meal. J. Appli. Sci. Environ. Manage., 13(1): 21-26.

Bag, M.P., S.C. Mahapatra, P.S. Rao and D. Chakrabarty. 2012. Evaluation of growth performance of tilapia (*oreochromis mossambicus)* using low cost fish feed. International Journal of Biochemistry and Biotechnology, 1(4): 150-155.

Chaves, R.C., R.Q. de Paula, B. Gucker, I.E. Marriel, A.O. Teixeira and I.G. Boechat. 2015. An alternative fish feed based on earthworm and fruit meals for tilapia and carp postlarvae. R. bras.Bioci., Porto Alegre, 13(1): 15-24.

Dada, A.A. and B.D. Olugbemi. 2013. Dietary effects of two commercial feed additives on growth performance and body composition of African catfish (*Clarias gariepinus*) fingerlings. African Journal of Food Science, 7(9): 325-328.

De La Cruz, P.M. 2011. Growth performance of African catfish *Clarias gariepinus* (Bruchelle, 1822) larvae fed with diets containing different levels of *Spirulina platensis*. MS thesis, Central Luzon State University.38 p.

Degani, G., Y. Ben-Zvi and D. Levanon. 1989. The effect of diffcerent protein levels and temperature on feed utilization, growth and body composition of *Clarias gariepinus* (Burchell 1822). Aquaculture, 76: 293-301.

Dube, K.G. 2011. Absolute growth rate, leaf area index, leaf:stemratio and harvest index influenced by organic manures, biofertilizers and growth regulators in *Stevia rebaudiana* Bertoni. Asiatic Journal of Biotechnology Resources, 2(5): 508-521.

Edwards C.A. and J.R. Lofty. 1972. Biology of Earthworms. Chapman and Hall, Ltd. London, 283 p.

Guerrero, R.D. 1983. The culture and use of *Perionyx excavatus* as a protein resource in the Phillippines. p. 309 – 313 *In*: J.E. Satchell (ed.). Earthworm Ecology. Chapman and Hall Ltd. U.K. 561 p.

Guerrero III, R.D. 2009. Earthworm Culture for Vermicompost and Vermimeal Production and for Vermiceutical Application in the Philippines (1978-2008) – A Review. Retrieve from https:// ww.globalsciencebooks on September 2017.

Hilton, J.W. 1983. Potential of freeze-dried worm meal as a replacement for fishmeal in trout diet formulations. Aquaculture, 32: 227-283.

Jimoh, W.A., O.A. Fagbenro and E.O. Adeparusi. 2014. Response of African catfish, *Clarias gariepinus* (Burchell 1822) fingerlings fed diets containing differently timed wet-heat-treated sesame *(Sesamum indicum*) seedmeal. Agricultural Sciences, 5: 1159-1171.

Kale, R.D. 1994. The Use of Earthworms: Nature's Gift for Utilization of Organic Wastes in Asia. p. 381-399. *In:* Edwards, C.A. (Ed.). Earthworm Ecology. 2nd Edition, CRC Press. New York. 441 p

Nahar, Z., A.K.M. Azad Shah, R.K. Bhandari, M.H. Ali and S. Dewan. 1987. Effect of different feeds on growth, survival and production of African catfish (*Clarias gariepinus* Burchell). Bangladesh Journal Fisheries Research, 4(2), 121-126

Oluyinka, A.A., F. Funmilola and F.O. Richards. 2015. Nutritional utilization and growth of *Clarias gariepinus* fed four different commercial feeds. International Journal of Fisheries and Aquaculture, 7(7): 107-110.

Omeru, E.D. and R.J. Solomon. 2016. Comparative analysis on the growth performance of catfish (*Clarias gariepinus*) fed with earthworm as a replacement of fish meal. American Journal of Research Communication, 4(6): 89-125.

Paripuranam, T.D. V.V. Divya, P. Ulaganathan, V. Balamurugan and S. Umamaheswari. 2011. Replacing fishmeal with earthworm and mushroom meals in practical diets of *Labeo rohita* and *Hemigrammus caudo vittatus* fingerlings. Indian J. Ani. Res., 45(2): 115-119.

Rad, F., G.I. Kurt and A.S. Bozaoûlu. 2003. Effects of spatially localized and dispersed patterns of feed distribution on the growth, size dispersion and feed conversion ratio of the African catfish (*Clarias gariepinus*). Turk. J. Vet. Anim. Sci., 28: 851-856.

Ratafia, M. and T.Puriton. 1989. Emerging aquaculture markets. Aquaculture Magazine 15(4): 32-44.

Sabine, J.R. 1988. Earthworms as animal feed. p. 165-168. *In:* Edwards, C.A., Neuhauser, E.F. (Eds.). Earthworms in Waste and Environmental Management. SPB Academic Publishing. Hague, The Netherlands. 391 p.

Sakthika, T., J. Ronald, V. Swakumar and J. Felicitta. 2014. Growth of *Mystus montanus* fed with two different earthworm meal. International Journal of Environmental Science, 4(4): 1-7.

Sogbesan, O.A., A.A.A. Ugwumba, C.T. Madu, S.S. Eze and J. Isa. 2007. Culture and utilization of earthworm as animal protein supplement in the diet of *Heterobranchus longifilis* fingerlings. Journal of Fisheries and Aquatic Science, 2: 375-386.

Tacon, A.G.J., J.V. Haaster, P.B. Featherstone, K. Kerr and A.J. Jackson. 1983. Studies on the utilisation of full-fat soybean and solvent extracted soybean meal in a complete diet for rainbow trout. Bulletin of the Japanese Society of Scientific Fisheries, 49(9): 1437-1443.

Tan-Fermin, J.D. 2003. Catfish aquaculture. SEAFDEC Asian Aquaculture, 25(4): 1-3.

Thongkheaw, M. 2010. The determination of protein and certain of essential elements in earthworm fed with different kinds of organic litters. M.S. Thesis. Suranaree University of Technology. Thailand, 107 p.