THE USE OF LIVE FOOD FOR FEEDING *CYPRINIDAE*

By

SUZAN HASSAN AHMED FADDA

B. Sc. Agric. Sc. (Animal Production), Ain Shams University, 2004

M. Sc. Agric. Sc. (Animal Nutrition), Ain Shams University, 2012

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This thesis for Ph.D. degree has been approved by:

Dr. Mohamed Ahmed Abd-Allah Zaki ……

Prof. of Fish Husbandry, Faculty of Agriculture, Alexandria University.

Dr. Salwa Mahmoud Hamdy ……

Prof. Emeritus of Animal Nutrition, Faculty of Agriculture, Ain Shams University.

Dr. Mohamed Fathy Osman ……

Prof. Emeritus of Fish Nutrition, Faculty of Agriculture, Ain Shams University.

Date of Examination: 2 /10 / 2017

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Under the supervision of:

Dr. Mohamed Fathy Mohamed Osman

Prof. Emeritus of Fish Nutrition, Department of Animal Production, Faculty of Agriculture, Ain Shams University

Dr. Mohamed Abdel- Baky Amer

Associate Prof. of Fish Physiology, Department of Animal Production, Faculty of Agriculture, Ain Shams University.

Dr. Raky Fakhry Attalla Rizk

Research Prof. Emeritus of Fish Nutrition, Aquaculture Branch, National Institute of Oceanography and Fisheries.

ABSTRACT

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The study was carried out in fish nutrition lab, fish research station, EL-Kanater El-Khayria, National Institute of Oceanography and fisheries (NIOF), Cairo, Egypt. The study included two experiments: The first experiment was conducted to investigate the effect of dried *Chlorella* powder as a growth promoter for Sliver carp *Hyperophthalmethis molitrix* fry reared in circular indoor fiberglass tanks to evaluate growth performance, survival rate and body composition of fish. The Second experiment was conducted to investigate the effect of dried *Chlorella* powder as a growth promoter for Sliver carp *Hyperophthalmethis molitrix* fingerlings reared in outdoor concrete rectangular basins to evaluate growth performance, body composition, and physiological parameters of fish. **Experiment I:** was conducted in 15 circular fiber glass tanks (60 L). Fish were cultured in triplicate groups of 70 Silver carp fries with an average initial body weight of 0.33 ± 0.008 g, for 8 weeks. Four experimental diets (40 % crude protein) were formulated containing 1, 2, 3, and 4% of dried *Chlorella* powder, compared with control diet. Results showed that average weight gain (AWG), specific growth rate (SGR), relative growth rate (RGR), and average daily gain (ADG) were not affected significantly ($P>0.05$) by the partially replacement of fish meal with C*hlorella*; except diet No. 5, which contained 4% of *Chlorella*, was significantly less than the other diets. Feed conversion ratio, FCR, and survival rate, SR (%) of Silver carp fry were insignificantly ($P>0.05$) affected by tested diets. Protein productive value (PPV) was increased by increasing *Chlorella* levels in fish diets, while energy retention (ER) didn't affected significantly by *Chlorella* level in diets. As the level of *Chlorella* increased in diets, body composition of fish revealed that moisture, protein, and ether extract were significantly ($p<0.05$) increased compared with the control diet. Only diet 5 showed less significant differences in body fat. Ash content was increased insignificantly ($P>0.05$) by

inclusion *Chlorella* in all experimental diets compared with the control. **Experiment II:** was conducted in outdoor 2 concrete ponds (4 m x 10 m x 1.5 m, WLD) each divided to 5 equal parts (4.0x 2.0x 1.5 m) using a net with mesh size of 65mm. Fish were cultured in duplicate groups of 60 Silver carp fingerlings with an average initial body weight of 1.7± 0.03 g and average initial length 5.8 ± 0.6 cm / fish, for 16 weeks. Four experimental diets were formulated containing 1, 2, 3, and 4% of dried *Chlorella* powder, compared with control diet. Results showed that FBW, WG, ADG, RGR, SGR, PPV, SR, and FL for experimented fish were significantly ($p<0.05$) affected by tested diets, while feed conversion for tested diets differ insignificantly ($P>0.05$). The best FCR and PER were recorded for the fish fed diets 4 and 5, hepato-somatic index (HIS) was significantly ($p<0.05$) affected by experimental diets, however, viscera somatic index (VSI) was insignificantly affected ($p>0.05$), the highest hepato-somatic index was recorded for fish fed diet 5. The fish chemical analysis revealed that moisture, ash, lipid, and crude protein were significantly ($p<0.05$) affected by the experimental diets. Blood analysis revealed that hematological parameters and serum biochemical parameters were significantly ($p<0.05$) affected by experimental diets. The best results were recorded for fish fed 4% *Chlorella*, where algae incorporation increased the immune response system of cultured fish. Saturated fatty acids (SFA), mono-unsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA), and high polyunsaturated fatty acids (HPUFA) were significantly affected with experimental diets ($P<0.05$). The total amino acids and individual amino acids were significantly affected with experimental diets ($P<0.05$), where Threonine, Valine, Lysine, Histidine and Arginine values were fluctuated by increasing *Chlorella* in the diets. While Leucine, Isoliucine and Phenylalanine values were decreased by increasing algae level when compared with control. At the same trend, values of total amino acids were decreased by increasing algae level. This study aimed to study the effect of use of dried *Chlorella* powder as feed additive on growth performance and immunity of different stages (fry and fingerling) of Silver carp.

Key words: Silver carp, feed additives, *Chlorella*.

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