Response of balady mandarin trees to foliar application with active yeast and some microelements

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The present study was carried out at the Laboratory of Fish Nutrition Faculty of Agriculture, Benha University. Two experiments were conducted in the present study. The first experiment aimed to study the effect of incorporation of increasing levels of FFS in tilapia fry diets while the second experiment aimed to study the effect of incorporation of the same increasing levels of FFS in tilapia fingerlings diets of Nile tilapia (Oreochromis niloticus). The most important results could be summarized as follow:1. First experiment(Tilapia fry).At the start of the experiment, the average BW of tilapia fry ranged between 1.71 to 1.72g. After 90 days, the highest average BW (27.38g) was recorded for the control group fed on the basal diet and replacing of 25% or 50% of FM by FFS (diets FFS25 and FFS50) reduced the final BW to 25.08 and 25.22 g but these weights were not significantly different from that of fish fed the basal (control) diet. The higher replacing levels of FM by FFS (75 or 100%) diets (FFS75 and FFS 100) significantly (P<0.05) decreased the BW of Nile tilapia fry to 20.77 and 13.50 g, respectively.The average initial BL ranged between 4.71 and 4.38 cm with insignificant differences. At the experimental termination, the highest average BL (11.57cm) was recorded for fish fed diet FFS50 followed in a descending order by those fed the control diet, FFSO (11.01 cm), FFS25 (10.43), FFS75(10.38), and FFS100 (8.95), respectively and the differences were significant.- The initial K for fish ranged between 1.70 and 1.99 with insignificant differences. At the end of the experimental the highest average K (2.08) was recorded for fish group fed diet FFS 100 (complete replacement of FM by FFS) followed in a descending order by those fed diets FFS75 (2.5), FFS50 (2.04), FFSO (1.02), and FFS25 (1.96) and the differences were significant (P<0.05).- The highest WG for Nile tilapia fry (25.05 g) was recorded for fish fed the control diet (FFSO) followed by those fed diets FFS50 (22.01 g), FFS25 (21.96 g), FFS75 (17.20 g) and FFS 100 (17.16 g), and the differences in WG among the different fry groups were significant (P<0.05). The same trend was observed for SGR values.- Feed intake (g/fish) of Nile tilapia fry was 72.65, 64.61, 59.74, 54.65 and 46.88g for fish groups fed diets FFSO, FFS25, FFS50, FFS75 and FFS 100, respectively. Feed intake of Nile tilapia fry was significantly (P<0.05) affected by the incorporation of FFS as a substitute of FM.-Values of FCR were found to be 2.90, 3.00, 2.77, 3.45 and 2.99 for fish groups fed diets, FFSO, FFS25, FFS50, FFS75 and FFS 100, respectively. Also, FCR of Nile tilapia fry was significantly affected by the inclusion levels of FFS as a substitute of FM.-The average PER for different dietary treatments ranged between 0.95 and 1.13 The highest value was observed for fish group fed diet FFS50 where 50% of FM was replaced by FFS, while the worst one was recorded for fish fed diet FFS75. However PER of Nile tilapia fry was not significantly (P>0.05) affected by the inclusion levels of FFS in tilapia diets.Dry mater of whole fish bodies ranged between 25.99 and 22.18 with insignificant differences. Crude protein ranged between 60.63 and 50.74, EE ranged between 22.85 and 17.97, ash ranged between 17.25 and 16.20 with significant differences in EE and CP contents of whole fish bodies.2. Second experiment(Tilapia fingerlings).The initial BW among the different fish groups ranged between 18.13 and 19.11 g with insignificant differences. At experiment termination, the highest average BW (40.14 g) was recorded for the control group fed diet FFSO followed in a descending order by those fed diets FFS25 (39.35

g), FFS75 (32.37 g), FFS50 (31.65 g), FFS100 (30.64 g). The final average BW of Nile tilapia fingerlings was significantly (P<0.001) affected by the different inoculation levels of FFS in tilapia diets.The initial BL for fish ranged between 9.79 and 9.92 cm with insignificant differences. At the experiment termination, the highest average BL (13.20 cm) was recorded for fish group fed diet FFS25 followed in a descending order by those fed diets FFSO (12.84 cm), FFS 100 (12.19 cm), and (12.18FFS75 cm) and FFS50 (12.07 cm). The final average BL of Nile tilapia fingerlings was significantly (P<0.05) affected by the replacing levels of FM by FF The initial K values for Nile tilapia fingerlings ranged between 1.93 and 1.99 with insignificant differences. At the end of the experiment, the highest average K value (1.90) was recorded for fish group fed the basal diet, FFSO and the lowest K value (1.70) was obtained by those fed diet FFS 100 where FM was completely replaced by FFS. The final K values of Nile tilapia fingerlings were significantly (P<0.05) affected by the substituting levels of FM by FFS.The averages of WG were found to be 21.04, 21.01, 13.03, 13.92 and 12.51 g for fish groups fed diets FFSO, FFS25, FFS50, FFS75 and FFS 100, respectively and the differences were significant (P<0.05).-Average values of SGR were 0.83, 0.85, 0.59, 0.63 and 0.59 for fish groups fed diets FFSO, FFS25, FFS50, FFS75 and FFS 100, respectively. The differences in SGR values among the different experimental treatments were significant (P<0.01).-The highest (35.92 g) average FI was recorded for fish group fed the basal diet FFSO followed by those fed diets FFS25 (34.34 g), FFS75 (32.50 g), FFS50 (29.83 g) and FFS100(29.21 g) and the differences were significant (P<0.05).-The highest (poorest) average FCR was recorded for fishgroup fed diet FFS100 (2.35) in which FM was completely replaced by FFS followed by those fed diets FFS75 (2.34), FFS50 (2.30), FFSO (1.72 FFSO) and FFS25 (1.64). The FCR of Nile tilapia fingerlings was significantly (P<0.05) affected by replacing levels of FM by FFS Protein efficiency ratio ranged from 1.31 for fish fed diets FFS75 to 1.84% for those fed diet FFS25. PER for fish group fed diet FFS25 released the highest value and the increasing inclusion level of FFS in tilapia diets followed almost by a significant decrease in PER values.- Fish group fed diet FFS 100 recorded the highest (28.32%, P<0.05). DM content of whole fish bodies, followed by those fed diets FFSO and FFS75 being 26.42 and 26.30%, respectively. The lowest (P<0.05) DM contents were recorded by fish groups fed diets FFS50 and FFS25 being 24.72 and 24.74% respectively. The complete substitution of FM by FFS realized the highest (76.25%) CP content of whole fish bodies followed in a descending order by those fed diets FFS25(66.13%), FFSO (62.49%), FFS75 (58.63%) and FFS50 (56.05%), and the differences between fish groups for CP were significant (P<0.05). Ether extract and ash contents of whole fish body were 10.46, 12.20, 17.14, 13.22 and 17.76% and 19.75, 18.19, 19.75, 20.33 and 19.03%, respectively and the differences in EE were only significant.- In conclusion, results of the present study indicated the possibility of replacing up to 50% of FM by FFS in Nile tilapia fry diets (first experiment) and up to 25% only in Nile tilapia fingerlings diets (second experiment). Moreover, replacing 50% of FM by FFS reduced feeding costs by 15.59% for tilapia fry while replacing 25% of FM by FFS reduced feed costs by 7.93% for tilapia fingerlings.