

Impacts of Date Palm Seeds (*Phoenix Dactyliferous L.*) on Common Carpcyprinus Carpio L. Biological Indices and Blood Pictures

Lecturer Nasreen Mohi Alddin Abdulrahman

College of Veterinary Medicine, University of Sulaimani, Iraq

Abstract

This study was carried out to study the effect of using date palm seeds powder as feed ingredient in fish laboratory of Animal Production Department, College of Agricultural sciences of Sulaimani University, Iraq, Using 75 common carp fingerlings weight 62 ± 2 gm, to test the effect of three different levels of the date palm seed. The control treatment T1 with 0 gm date palm seed., (T2) with 2.5gm date palm seed, and (T3) with 5 gm date palm seed. At the end of experiment a dissection of all fish were done for study some blood parameters of tested fish showed that T1 has significant differences in Red blood cells count 2.113, hemoglobin values were high significantly in T1 and T3 with 11.575 and 11.000 respectively. Hematocrits was higher in T1 46.750 while no significant differences observed in Platelets. No significant differences were in monocytes, lymphocytes and granulocytes count among treatments. Some biological parameters studied such as Hepatosomatic index in which T2 was higher significantly 1.515, no significant ($P < 0.05$) differences obtained from Splenosomatic index, Intestine length and Condition factor, T3 was higher in Gill index and Kidney index with 3.874 and 0.576 respectively.

Keywords: *Date palm seed, Hepatosomato index, Spleen index, Intestine length index, Condition factor, Gill index, Kidney index, blood pictures, common carp*

Introduction

The proportion fish can exceed 50% of animal protein in the poorest countries, especially where other sources of animal protein are scarce or expensive⁽¹⁾. Like other meat protein, fish protein is easily digestible and complements dietary protein (amino acids) provided by cereals and legumes consumed in many developing countries, in combination with a vegetable-based diet, fish provides a complementary effect to the essential amino acids that are present in low quantities in vegetarian diets, the beneficial effect of improved

protein balance on health is obvious even when a small quantity of fish is consumed⁽²⁾.

The results of Cerezuela *et al.*, (2015) demonstrated the 35 significant alteration of the terminal carbohydrate abundance in skin mucus⁽³⁾. Carbohydrates more affected by experimental diets were N-acetyl-galactosamine, N-acetyl-glucosamine, galactose, mannose, glucose and fructose. IgM, peroxidase activity and protease were also significantly higher in fish fed enriched diets.

Fish fed diets contain up to 200 g kg⁻¹ DF had similar growth Parameters in the study of ⁽⁴⁾. Further increase in dietary DF to 300 g kg⁻¹ resulted in significant retardation in all parameters. Body fat was reduced while protein, ash and moisture were increased by increasing DF level. Increasing dietary DF level caused changes in tilapia's intestinal villi, reduced dietary microbial activity and bacterial population of selected species, and produced stronger pellets.

Corresponding Author:

Lecturer Nasreen Mohi Alddin Abdulrahman

College of Veterinary Medicine, University of Sulaimani, Iraq

e-mail: drnihadkhalawe@gmail.com

On contrast, Yousifet *al.*, 1996 (5) reported that the growth and feed efficiency of blue tilapia (*O. aureus*) fed dates -based diets were very poor. They suggested that those ingredients are not recommended as a carbohydrate source for tilapia because they are almost entirely simple sugars, whereas tilapia is known to assimilate complex sugars more efficiently than simple sugars (6).

Materials and Method

At the end of the experimental period, all fish samples were weighed individually.

The blood samples from each fish of the different groups were collected by suction of the caudal peduncle. Whole blood samples were collected in small plastic vials containing heparin for determination of hemoglobin (Hb). The hemoglobin (%) concentrations were determined by using the hematology analyzer BC-2800 is a compact, fully automatic hematology analyzer with 19 parameters for complete blood count (CBC) test.

RBC (Red Blood Cell; 10^{12} cells/l); WBC (White Blood Cell; 10^9 cells/l); Hb (Hemoglobin; g/l); MCH (Mean Corpuscular Hemoglobin; pg); MCHC (Mean Corpuscular Hemoglobin Concentration; g/l); MCV (Mean Corpuscular Volume; fl); GRAN (Granulocyte; %); Lymph (Lymphocyte; %); Mid (Monocyte; %); PLT (Platelet; 10^6 cells/l).

After blood samples collection, all the fish samples were scarified and soon the abdominal cavity was opened to remove, gonads and liver and other organs to be weighed at once. The gonad and liver indices were calculated as follow according to (Lagler, 1956):

$$\text{Hepatosomatic index \%} = \frac{\text{liver weight (g)}}{\text{body weight (g)}} \times 100$$

$$\text{Gonadosomatic index (GSI) \%} = \frac{\text{Gonads weight (g)}}{\text{Body weight (g)}} \times 100$$

$$\text{Spleenosomatic index} = \frac{\text{Spleen weight}}{\text{body weight (g)}} \times 100$$

$$\text{Gill index} = \frac{\text{Gill weight}}{\text{body weight (g)}} \times 100$$

$$\text{Kidney index} = \frac{\text{kidney weight}}{\text{body weight (g)}} \times 100$$

$$\text{Condition factor} = \frac{\text{Fish weight}}{\text{Total length}^3}$$

$$\text{Intestine index \%} = \frac{\text{Intestine weight (g)}}{\text{body weight (g)}} \times 100$$

$$\text{Intestine length index} = \frac{\text{Intestine length weight}}{\text{body weight (g)}} \times 100$$

Analysis of variance was conducted using the general linear models (GLM) procedure of XLSTAT. Pro. 7.5 One way (ANOVA). Fisher's L.S.D test's was used to compare between means of the control and experiment treatments.

Finding: The results in table (1) showed that the adding of date seeds powder in common carp diets were significant differences than control, by altering the level of date seed powder, the counts of RBC was increased. The control and the third treatment with 5gm date seed/kg diet were higher significantly than the second treatments. The HCT was higher significantly in control than other treatments. No significant differences observed in MCV and platelets counts.

Table 1: Effect of adding date seeds in common carp diets on some blood parameters

N	RBC	HGB	HCT	MCV	Platelets
T1	2.113 ±0.096a	11.575 ±0.024 ^a	46.750 ±0.065 ^a	221.850 ±0.036 ^a	46.000 ±0.432 ^a
T2	1.773 ±0.064b	9.900 ±0.077 ^b	38.150 ±0.087 ^b	215.025 ±0.037 ^a	34.250 ±0.451 ^a
T3	1.855 ±0.054b	11.000 ±0.058 ^a	40.533 ±0.026 ^b	213.400 ±0.032 ^a	41.250 ±0.293 ^a

Mean values with different superscripts within a column differ significantly (P≤0.05).

No significant differences indicated in some differential WBC counts by adding date seeds in common carp diets that showed in table (2).

Table 2: Effect of adding date seeds in common carp diets on some differential WBC counts.

	WBC	Lymphocytes	Monocytes	Granulocytes
T1	103.300 ±0.028 ^a	73.400 ±0.039 ^a	13.225 ±0.058 ^a	13.375 ±0.158 ^a
T2	106.725 ±0.029 ^a	74.250 ±0.016 ^a	12.775 ±0.032 ^a	12.975 ±0.059 ^a
T3	102.525 ±0.030 ^a	74.200 ±0.060 ^a	12.550 ±0.077 ^a	13.250 ±0.266 ^a

Mean values with different superscripts within a column differ significantly ($P \leq 0.05$).

The percent results indicated a significant increase in intestine weight index in second treatment as compared with other treatments, no significant differences observed in both intestine length index and condition factor as shown in table (3).

Table 3: Effect of date seed on some biological parameters of common carp during 70 day of rearing

	Intestine index	Intestine length	Condition factor
T1	2.735 ±0.041 ^b	30.397 ±0.222 ^a	1.461 ±0.041 ^a
T2	3.167 ±0.166 ^a	31.346 ±0.096 ^a	1.390 ±0.063 ^a
T3	2.799 ±0.259 ^b	30.084 ±0.152 ^a	1.435 ±0.032 ^a

Mean values with different superscripts within a column differ significantly ($P \leq 0.05$).

Table (4) showed significant differences in Hepatosomatic, gill and kidney index in the additives treatments than the control, no significant observed in Splenosomatic index among the different treatments.

Table 4: Effect of adding date seeds in common carp diets on some biological parameters

	Hepatosomatic index	Spleenosomatic index	Gill index	Kidney index
T1	1.276 ±0.112 ^b	0.380 ±0.336 ^a	3.229 ±0.085 ^b	0.413 ±0.205 ^b
T2	1.658 ±0.143 ^a	0.358 ±0.178 ^a	3.570 ±0.105 ^{ab}	0.443 ±0.320 ^{ab}
T3	1.515 ±0.182 ^{ab}	0.470 ±0.361 ^a	3.874 ±0.172 ^a	0.576 ±0.217 ^a

Mean values with different superscripts within a column differ significantly ($P \leq 0.05$).

It has been suggested that the increased fiber content of date pits may reduce their quality for fish and decrease fish growth. In monogastric animals, the high fiber content of date pits was reported to cause decreased weight gain⁽⁷⁾. However, the low fiber content of the DP-based diets in the present study (4.3-5.7%) may exclude this assumption, since tilapias have been shown to grow extremely well at up to 5% supplemental fiber.

The date pit carbohydrates may contain amylase inhibitors, or other anti-nutrients that would reduce their utilization by tilapia. For example, ⁽⁸⁾ El-Sayed *et al.* (2000) found that wheat bran contains protease inhibitor, the activity of which may negatively affect food digestibility. Therefore, proper processing of carbohydrate sources may improve their quality for tilapia. In support, El-Sayed (1991) found that cooking sugar cane bagasse slightly improved its utilization by *T. zillii*. More recently, fermented water hyacinth was better utilized than fresh water hyacinth when incorporated in Nile tilapia diets at 20% levels, while at 10% inclusion level both fermented and fresh hyacinth were utilized equally. These results suggest that proper processing of date pits may improve their quality for tilapia⁽⁹⁾.

A number of studies have considered the effects of processing of date pits on their quality for fish and land animals. Yet, the results have not been not encouraging. Al-Darmaki (2003) found that treating date pits with sulfuric acid, or supplementing date pits-based diets with exogenous enzymes did not improve their quality for Nile tilapia⁽¹⁰⁾. Similarly, acid treatment of date pits with sulfuric acid had no significant effect on growth performance and feed

utilization of broilers⁽¹¹⁾ or rats ⁽¹²⁾. It is evident that other treatment and processing method must be tested.

Conclusion

Hemoglobin values were high significantly in T1 and T3 with 11.575 and 11.000 respectively. Hematocrits was higher in T1 46.750 while no significant differences observed in Platelets. No significant differences were in monocytes, lymphocytes and granulocytes count among treatments. Some biological parameters studied such as Hepatosomatic index in which T2 was higher significantly 1.515, no significant ($P < 0.05$) differences obtained from Spleenosomatic index, Intestine length and Condition factor, T3 was higher in Gill index and Kidney index with 3.874 and 0.576 respectively.

Conflict of Interest: Non

Source of Findings: Self

Ethical Clearance: Nil

References

1. John, K. Centre for Development Studies Trivandrum, Kerala State, India. International Fish Trade and Food Security: Issues and Perspectives, DFID.FAO .2009.
2. Claire, A. People and the Coast: Health and Safety; Food Value of Fish. Food And Agriculture Organization of the United Nations, 2000. 64-69.
3. Cerezuela, R., Guardiola, F.A., Cuesta A., and Esteban, M.Á. Enrichment of Gilthead Seabream (*Sparus aurata* L.) Diet with Palm Fruit Extract and Probiotics: Effects On Skin Mucosal Immunity, Fish and Shellfish Immunology, 2016. Doi: 10.1016/J.Fsi.2015.12.028.
4. Belal, I.E.H., El-Tarabily, K.A., Kassab, A.A., El-Sayed, A.F.M., and Rasheed N.M. Evaluation of Date Fiber as a Feed Ingredient for Nile Tilapia *Oreochromis Niloticus* Fingerlings. J Aquac Res Development. 2015. 6: 320. Doi:10.4172/2155-9546.1000320
5. Yousif, O.M., Osman, M.F. and Alhadrami, G.A. Evaluation of Dates and Date Pits as Dietary Ingredients in Tilapia (*Oreochromis Aureus*) Diets Differing In Protein Sources. Bioresource Technology, 1996. 57: 81-85.
6. Shiau, S.Y. and Chuang, J.C. Utilization Of Disaccharides By Juvenile Tilapia, *Oreochromis Niloticus* X *Oreochromis Aureus*, Aquaculture, 1995. 133: 249-256.
7. Vandepopuliere, J.M., Al-Yousef, Y., and Lyons, J. Date and Date Pits as Ingredients in Broiler Starting and Coturnix Quail Breeder Diets. Poult. Sci., 1995. 74: 1134-1142.
8. El-Sayed, A.F.M., Moyano, F.J., and Martinez, I. Assessment of the effect Of Plant Inhibitors on Digestive Protease of Nile Tilapia Using In Vitro Assays. Aquacult. Intl., 2000. 8: 403-415.
9. El-Sayed, A.F.M. Evaluation of Sugarcane Bagasse as a Feed Ingredient for Young Tilapias *Oreochromis Niloticus* and *Tilapia Zillii*. Asian Fish. Sci. 1991. 4: 53-60.
10. Al-Darmaki, M.M.S. Use of Date Pits as an Energy Source for Nile Tilapia. Msc Thesis, United Arab Emirates University. 2003. 118pp.
11. Hussein, A.S., Alhadrami, G.A., and Khalil, Y.H. The Use of Dates and Date Pits in Broiler Starter and Finisher Diets. Biores. Technol. 1998. 66: 219-223.
12. Ali, B.H., Bashir, A. K. and Alhadrami, G. Reproductive Hormonal Status of Rats Treated With Date Pits. Food Chem., 1999. 66: 437-441.