The Replacement Effect of Soybeans by Potatoes and Eggplant Peels on Common Carp *Cyprinus carpio* L. Juveniles Growth

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Received: 12/06/2019 Accepted: 03/08/2019

Abstract

The replacement effect of soybeans by potatoes peels and eggplant peels was studied to feed the common carp *Cyprinus carpio* L. Juveniles under laboratory conditions in Marine Science Center, University of Basrah, with an initial length and weight of 2.2 ± 0.1405 cm and 1.819 ± 0.0753 g respectively, the experiment continued for a period of 60 days starting from April 2017. The aquariums were equipped with air pumps for 24 hours throughout the day, and the fishes were fed two meals daily. The environmental parameters within the limits appropriate for the growth of carp, the results showed a significant statistical difference in growth rates between fishes in experiment aquariums where the highest weight recorded at the end of the experiment for the Juveniles in the aquarium B which was 26.471 g, followed by Juveniles in the aquarium D was 21.453 g then the fishes in the aquarium C amounted to 18.186 g and finally the Juveniles in the aquarium A which recorded 16.984 g. The study showed that the replacement of soybeans by potatoes peels gave the best increase in weight at the end of the experiment as in the aquarium B which was 8.642 g/week compared with the aquarium D, C and A, that gave 7.371 and 5.731 and 5.367 g/week respectively, and with a daily weight increase during the experiment period amounted to 0.253, 0.409, 0.275 and 0.327g/day of experiment aquariums A, B, C and D respectively.

Key words: Soybeans, Potatoes peels, Eggplant peels, *C. carpio*.

Introduction:

Studies have shown that the crust which envelops the grain husks of eggplant is extremely rich and textured vehicles "the baseulen" a substance of the most important antioxidants (Rodriguez *et al*., 1998). The eggplant peels rich in many phenolic acids (Matsubara ,*et al*. 2004),it is one of the most important sources of fiber that helps non-injury constipated, as it is rich in a variety of vitamins "B" complex ,and also contain some of the important minerals such as potassium, copper, magnesium, manganese, phosphorus, folic acid and also contain amounts of acids such as oxalic, citric, succinic, and malic, also contain vitamin (K), carotene and iodine (Silverstone and Nelson 2005). Doctors advise to eat potatoes with peels where potatoes peels contain important minerals to reduce the body's immunity, also potatoes peels contain potassium, sodium, magnesium, calcium, phosphorus and chrome (Cook *et al*., 2009). Potatoes contains 14 - 14.5% crude protein and it`s peels almost contains 1.5 to 2.5 free protein, potatoes peels produced from the remnants of peeling potatoes in chips factories, hotels, restaurants and army campsites (Friedman, 1996; Das *et al*., 2007), potatoes contain a high proportion of energy about 2600

kcal/kg, potatoes peels used as a chickens diets after drying and grinding to feed chickens rates (Han *et al*., 2008).

This study was conducted to study the effect of using potatoes and eggplant peels as a replacement factor in the diets of fishes.

Materials and methods:

The experiment prepared using eight of plastic aquariums under a laboratory conditions in Marine Science Center, University of Basrah, with a capacity of 50 liters of water filled up to the volume of 30 liters of water**,** 30 juveniles of experiment fishes common carp *C. carpio* divided to the aquariums with stocking density of one juvenile/liter of water. The experiment continuing for 60 days, the aquariums divided according to the type of feed, the juveniles in aquariums 1A and A2 feed on control diet without replacement, juveniles in aquariums B1 and B2 feed on potatoes peels as a replacement of soybeans, juveniles in aquariums C1 and C2 feed on eggplant peels as a replacement of soybeans, juveniles in aquariums D1 and D2 were feed on potatoes peels and eggplant peels together as a replacement of soybeans, the aquariums were supplied with air pumps 24 hours throughout the day, the fishes were feed twice a day with 2% of total weight. Some biological factors were measured every 15 days and the averages of the lengths (cm) using a transparent ruler and weights (g) using a sensitive balance.

Increase of weight was calculated according to Carlos equation (Carlos, 1988):

Weight increase (every 15 days) g/week = Final weight (g) - Initial weight (g)

Also, the daily rate of weight increase was calculated during the experiment according to Carlos equation (Carlos, 1988):

$$\text{Daily rate of weight increase} = \frac{\text{Final weight (g) - Initial weight (g)}}{\text{Period of time (days)}}$$

Specific growth rate (SGR) % g/day according to Jobling equation (Jopling, 1993):

$$SGR = \frac{\text{Natural log. of the final weight (g) - Natural log. of the initial weight (g)}}{\text{Period of time (days)}} \times 100$$

Relative growth rate (RGR) % according to Jobling equation (Jopling, 1993):

$$RGR = \frac{\text{Weight increase(g)}}{\text{Initial weight (g)}} \times 100$$

Survival % according to Carlos equation (Carlos, 1988):

$$\text{Survival} = \frac{\text{Number of fish at the end of the experiment}}{\text{Number of fish at the beginning of the experiment}} \times 100$$

Some environmental factors were measured included both temperature C°, salinity (ppt), the concentration of dissolved oxygen mg/liter and pH, using field environmental factors measurement (Loribond) Model 150 – Seuso-D, after calibrated with standard solutions.

Primary ingredients which were used to manufactured diet were mixed together consisting of (corn – barley, wheat bran, soybeans and fish meal) using a (potatoes peels and eggplant peels) as a replacement of soybeans depending on the diet.

Table 1. Percentage % of primary materials of components diet which used to feed the experiment fishes.

Aquariums / Diets ingredients		Aqua. A (Control)	Aqua. B	Aqua. C	Aqua. D
1	Corn	10	10	10	10
2	Barley	15	15	15	15
3	Wheat bran	15	15	15	15
4	Soybeans	25	-	-	-
5	Fish meal	33	33	33	33
6	Potatoes peels	-	25	-	-
7	Eggplant peels	-	-	25	-
8	Potatoes & eggplant peels	-	-	-	25
9	Vitamins	2	2	2	2
	Total	100	100	100	100

The compositions analysis to the content of the diets are in details (Table 2).

Table 2. Chemical analysis (%) of control diet and additives to the food of experiment fishes.

Chemical analysis / Diets	Proteins	Fats	moisture	Carbohydrate	Ash
(A) Control diet	31.480	7. 563	8.518	37.797	14.642
Peels potatoes only	26.361	7.129	8.611	42.894	15.005
(B) Diet content / Peels potatoes	37.562	6.428	7.020	36.683	12.307
Peels eggplant only	19.830	9.647	9.718	41.926	18.879
(C) Diet content / Peels eggplant	32.684	7.243	7.721	38.967	13.385
(D) Diet content both peel potatoes &peel eggplant	34.131	7.736	6.668	37.792	13.673

Statistical analysis:

Using the software of statistical (SPSS, 2000) to find a discrepancy between the values tested with less significant difference average (LSD) to find statistical differences at the level of significance ($P<0.05$).

Results:

The results of some environmental factors measurements to the experiment aquariums show that the lowest temperature recorded at the beginning of the experiment was 17 C˚ significantly higher compared with the end of the experiment that recorded temperature reached about 28 C˚, while the overall rate concentration of salinity ranged from1.54 to 2.12 ppt. The rate of total dissolved oxygen ranged from 4.28 to 5.78 mg/L and total rate of pH ranged from 6.38 to 7.64 (Fig.1).

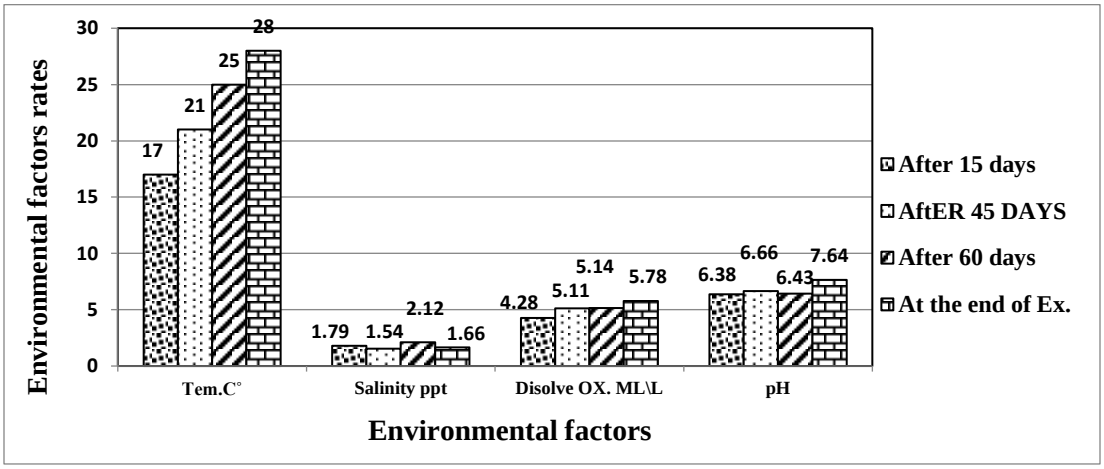

Fig. 1. Some environmental factors measured during the period of the experiment.

Table (3) shows the highest average of lengths rates at the end of the experiment of the fishes in aquarium B which recorded 5.2 cm, followed by the lengths of the fishes in aquarium D which amounted to 4.9 cm, and the lengths of the fishes in the aquarium C was 4.7 cm and the lowest rate of length recorded of the fishes in the aquarium A as it stood at 4 cm, the results of the statistical analysis shows a significant statistical difference (P<0.05) between the lengths rates of the fishes at the end of the experiment depending on the diet .

Table 3. Lengths rates (cm) of the juvenile fishes *C. carpio* during the period of the experiment.

Length / Aquariums	Length rate at the beginning of Exp.	Length rate after 15 days of Exp.	Length rate after 30 days of Exp.	Length rate after 45 days of Exp.	Length rate after 60 days of Exp.
A	2.3±0.1233	2.6±0.1342	3.1±0.1442	3.8±0.1998	4.0±0.1082d
B	2.2±0.1283	2.8±0.1521	3.5±0.1264	4.3±0.1065	5.2±0.1582a
C	2.2± 0.1289	2.7±0. 1187	3.2±0.1188	3.9±0.1362	4.7±0.0522c
D	2.1±0.1446	2.7±0.1363	3.3±0.1472	4.1±0.1623	4.9±.1391b
Total length rate during Exp.	2.2±0.1405	2.7± 0.1333	3.2± 0.1456	4.03±0.1512	4.75±0.1446

Different letters indicate a significant difference between the rates of lengths values at the end of the experiment.

Table (4) shows a highest average of weights rates recorded at the end of the experiment with the fishes in aquarium B which recorded 26.471 g followed by the weights of the fishes in aquarium D amounting to 21.453 g, then the weights of the fishes in aquarium C was 18.186 g and the lowest rate of weight recorded with the fishes in aquarium A as it stood at 16.984 g , the results of the statistical analysis shows a significant statistical difference (P < 0.05) between the weights rates of the fishes at the end of the experiment depending on the diet .

Table 4. Weights rates (g) of the fishes *C. carpio* during the period of the experiment.

Weight / Aquariums	Weight rate at the beginning of Exp.	Weight rate after 15 days of Exp.	Weight rate after 30 days of Exp.	Weight rate after 45 days of Exp.	Weight rate after 60 days of Exp.
A	1.828 ±1.0632	3.937±1.041	7.338±1.024	11.617±1.041	16.984±1.053d
B	1.913 ±1.0741	4.325±1.060	9.654 ±1.052	17.829±1.050	26.471±1.142a
C	1.689 ± 1.085	4.051±1.055	8.073 ±1.044	12.455±1.049	18.186±1.060c
D	1.844 ±1.0787	4.163±1.042	8.215±1.036	14.083±1.043	21.453±1.056b
Total weight rate during Exp.	1.819 ±1.075	4.119±1.033	8.321±1.045	14.259±1.042	20.762±1.058

Different letters indicate a significant difference between the rates of the values of the weights at the end of the experiment.

Table (5) shows a weekly highest increase recorded at the end of the experiment for fish in the experiment aquarium B amounting to 8.642 g/week, while it was below the fishes in the experiment aquarium A feed on diet control as it reached 5.367 g/week, followed by the fish in the experiment aquarium D amounting to 7.371 g/week, then the fishes in the experiment aquarium C was stood at 5.731g / week, the results of the statistical analysis showed a significant differences (P< 0.05) between the values of weight gain at the end of the experiment according to the diets, and the results also shows that there were a significant statistical difference (P< 0.05) between weight rate increase of daily values during the probationary

period of the experiment amounting to 0.253 , 0.409 , 0.275 and 0.327 g\day of experiment aquariums A, B, C and D respectively.

Table 5. Weight increment g/week (per 15 day) of the fishes *C. carpio* during the period of the experiment.

Aquariums	W2-W1	W3-W2	W4-W3	W5-W4
A	2.109± 0.187	3.401± 1.164	4.279± 1.104	5.367±1.121d
B	2.412± 0.162	5.329 ±1.172	8.175± 1.108	8.642±1.109a
C	2.362± 0.143	4.022± 1.178	4.382± 1.118	5.731±1.154c
D	2.319± 0.099	4.052± 0.108	5.858± 0.122	7.371±1.009b
Rate	2.301± 0.132	4.202± 0.124	5.671± 0.106	6.778±1.117
Daily rate of weight increase (g/day)	**d 0.253±0.132 aqua. A**	**a0.409±1.114 aqua. B**	**c0.275±1.117 aqua. C**	**b0.327±1.105 aqua. D**

Different letters indicate a significant difference between the rates of weight increase at the end of the experiment

Table (6) shows a relative growth of the fish values during the period of the experiment, the highest value recorded at the end of the experiment in aquarium B was 454.36 while the lowest growth relative record at the end of the experiment in aquarium A reaching 293.59 , the relative growth of the fish value in experiment aquarium C amount to 399.31, in the aquarium D the relative growth was 367.57, the results of statistical analysis shows that there were a significant differences (P <0.05) between the values of the relative growth of the fish at the end of the experiment.

Table 6. The relative growth rates (RGR%) of the fishes *C. carpio* during the period of the experiment.

Aquariums	After 15 days of Exp.	After 30 days of Exp.	After 45 days of Exp.	After 60 days of Exp.
A	115.37±1.032	186.11±1.073	234.10±1.098	d 293.59±1.014
B	126.10±1.086	278.56±1.058	427.34±1.102	454.36±1.023 a
C	139.85±1.039	238.13±1.043	740.12±1.056	399.31±1.079 c
D	124.78±1.064	227.87±1.033	307.54±0.999	b 367.57±1.026

Different letters indicate a significant difference between the values of relative growth at the end of experiment.

Table (7) shows a specific growth rate (SGR) g/day values of the fishes during the period of the experiment, the highest value recorded at the end of the experiment in aquarium B totaled to 2.901 g/day while less specific growth rate recorded at the end of the experiment in aquarium A amount to 0.614 g/day, specific growth rate valued of the fishes in aquarium C was 0.985 g/day, in the aquarium D the specific growth rate value of the fishes totaled to 1.776 g/day, the results of statistical analysis shows that there were a significant differences (P<0.05) between the specific growth rate of the fish values at the end of the experiment.

Table 7. Specific growth rate (SGR% g/day) of qualitative values of fishes *C. carpio* during the period of the experiment.

Aquariums	After 15 days of Exp.	After 30 days of Exp.	After 45 days of Exp.	After 60 days of Exp.
A	1.221 ± 0.122	2.012 ± 0.101	1.784 ± 0.109	0.614 ± 0.106 d
B	0.361 ± 0.098	1.352 ± 0.108	1.592± 0.117	2.901 ± 0.095 a
C	1.433 ± 0.108	0.265 ± 0.089	1.928 ± 1.097	0.985 ± 0.124 c
D	0.357 ± 0.087	2.169 ± 0.096	1.962 ± 0.082	b 1.776 ± 0.173

Different letters indicate significant differences between SGR values at the end of the experiment.

Table 8 shows a highest value of the survival rate recorded for fishes in aquarium B with 95%, followed by the fishes in aquarium D as it stood at 80%, then the fishes in aquarium C amounting to 75% and finally the fishes in aquarium A was 70%, the results of the statistical analysis shows there were a significant differences (p < 0.05) between the survival rates at the end of the experiment depending diet.

Table 8. Survival rate % at the end of the experiment.

Aquariums	A	B	C	D
Survival%	d70±0.513	a95±1.234	c75±0.798	b80±0.975

Different letters indicate a significant difference between the survival rates of the values at the end of the experiment

Figure (2) shows a superiority of experiment fishes in aquarium B comparison with the fishes in aquariums A, C and D when feed on a diet supplemented with potatoes peels as a substitute for soybeans as it shows also a superiority between some biological measurements of fish too at the end of the experiment depending on the diet (Fig 2).

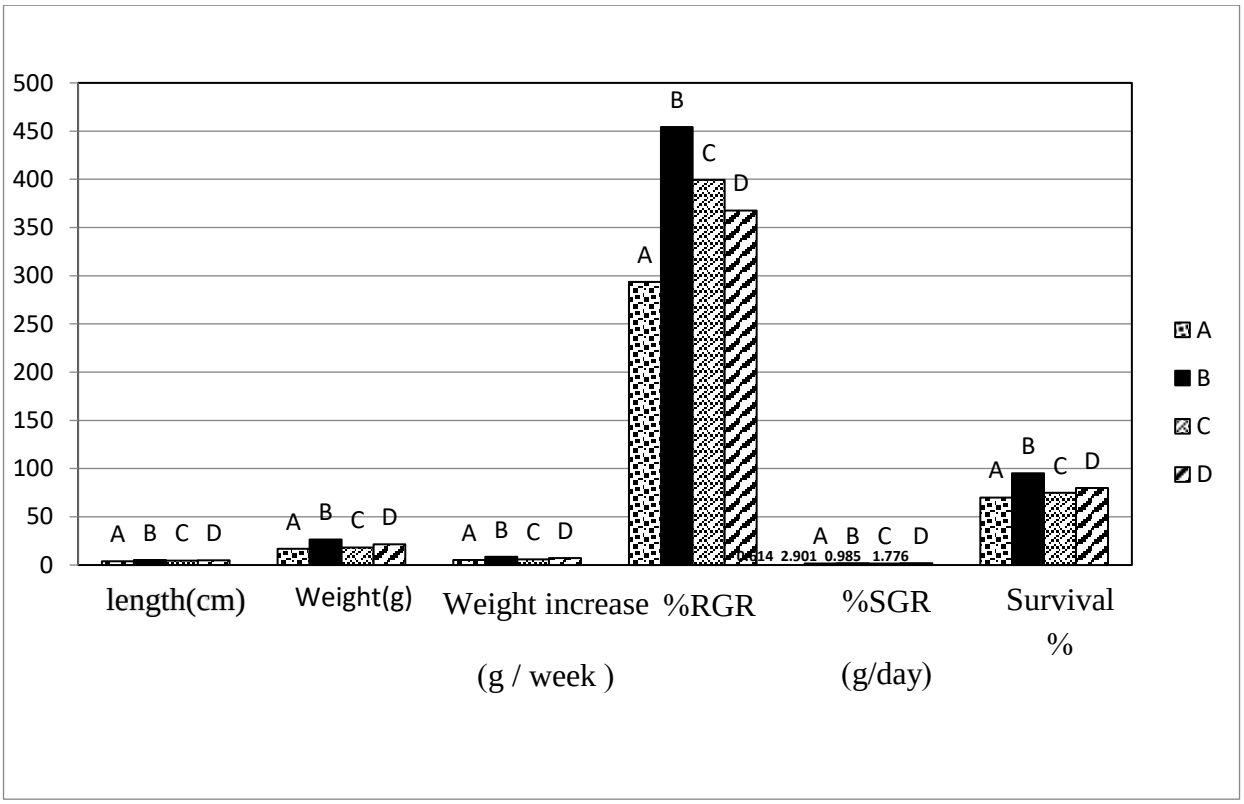

Fig. 2. Disparity between some biological measurements rates of the fishes in the aquariums A,B,C and D at the end of the experiment with an obvious distinction to the fishes in aquarium B.

Discussion:

Researches mentioned that potatoes peels contains vitamin B3, Vitamin C, fiber, calcium, iron and protein, and so it is as a best meal complementary (Artsaenko *et al*., 1998; Domingues *et al*., 2003), therefore, the experiment showed that fishes which feed on potato peels gave the best growth, and this corresponds to the effect of peel potatoes when used as an additives to feed young rats because they are important source of complex carbohydrates and high liberation of energy (Kruger *et al*., 2000; Liu *et al*., 2002). Nutritional value of potato so high because it contains 20-30% dry compound materials, 1.5 to 2.1% protein, 12 to 25% carbohydrate, 0.06-0.3% fat, 0.50-1.50% cellulose, 0.1% mg of thiamine, 0.4 mg% riboflavin, 1.5%mg niacin , 0.6% mg iron, 3% mg sodium7% mg calcium, 4.7% mg potassium, 22% mg magnesium and 20% mg ascorbic acid (vitamin C) (Silverstone and Nelson, 2005). The protein of potatoes peels in present experiment recorded 2.361 % mg that gave a high level of growth, but in terms of eggplant peels the color to the diet was the reason that make the fishes in this experiment not accepting the diet , and because a high level of cellulose compared to potatoes peels the juvenile fishes had lower growth compared to potatoes peels diets, and because of the digestive secretions of the fishes

at this stage of life we find low metabolism which reduce the ability of fish to food conversion to a biomass, that caused a low degree of growth according to (Fernandez *et al*., 1999) that mention that the nutritional value of proteins in food is more effective when they came from different sources, and (Francis *et al*., 2001) mentioned that fish diets derives their impact from the plants when its used as additives or alternative in fish feed ,fishes feed on eggplant peels gave a high degree of growth than control because of the proportion of vegetable protein to the animal protein is higher, may be also because of a higher lipid content Compared with potatoes makes the diet unpalatable and this what Bell *et al*., (2004) mentioned, that increased fat in the diets of *Salmo salar* make its digesting hard. And low of growth of the fish when fed on diet containing both the eggplant peels and potatoes peels because they share together and rises content of starch and carbohydrates, and this what Bodinham *et al*., (2010) mentioneded that increase starch increase growth. The increase of fiber in potatoes makes the unloading process faster and increases the need for a largest amount of food which increases the consumption of diet and increases the growth as mention by Lim, (1997) who explained that shrimps (*penaeus vannamei*) need more food when they feed on diet with a high level of fiber, whenever the relative growth rate increased whenever the nutritional value of protein was large whenever growth increased and vice versa with a positive proportional with increasing temperature.

Conclusion:

The superiority of the relative growth rates and specific growth rate of fish refers that fishes at this stage of life need a vegetable protein for growth, so the use of plant residues as additives in the diets, so this study recommended to use potatoes peels as a replacement or an additives to the diet especially at the juvenile stage.

References:

Artsaenko, O.; B. Kettig; U. Fielder; U. Conrad; and K. During (1998). Potato tubers as a bio factory for recombinant antibodies. Molecular Breeding. 4:313-319.

Bell, J.; R. Henderson; R. Tocher; and J. Sargent (2004). Replacement of dietary fish oil with increasing level of linseed oil, modification of flesh fatty acid compositions in Atlantic salmon (*Salmo salar*) using a fish oil finishing diet .39:223-232.

Bodinham, L.; G. Frost, and M. Robertson (2010). Acute ingestion of resistant starch reduces food intake in health adults. Br. J. Nutr., 103:917-922.

Carlos, M. (1988). Growth and survival of bighead carp (*Aristicthys nobilis*) fry, deferent intake levels and feeding frequencies. Aquaculture, 68: 267-276.

Cook, R.; E. Obarzanek; J. Cutler; E. Buring; K. Rexrode; S. Kumanyika; L. Appel; and P. Whelton (2009). Joint effects of sodium and potassium intake on subsequent cardiovascular disease. Arch Intern Med.,169:32-40.

Das, S.; C. Gilhooly; and J. Golden (2007). Long-term effects of 2 energy-restricted diets differing in glycemic load on dietary adherence body composition, and metabolism in CALERIE: a one-year randomized controlled trial. Am J Cline Nutr.;85:1023-1030.**7**

Domingues, P.; N. Sykes; A. Sommerfield; and J. Andrade (2003). Effect of feeding live or frozen prey on growth, survival and the life cycle of the cuttlefish, Sipiaicinalis (Linnaeus,1758). Aquacult. Internat. J. Agric. and Environ. Sci., 12(4):449-455.

Fernandez, A.; E. Gomes; M. Reis; and J. Coimbra (1999). Replacement of fishmeal by plant proteins in the diet of nile tilapia digestibility and growth performance. Aquacult. Internat., 7:56-67.

Francis, G.; H. Makkar; and K. Becker (2001). Antinutritional factors present in plant derived alternate fish feed ingredients and their effects in fish. Aquacult., 199: 197-227.

Friedman, M. (1996). Nutritional value of proteins from different food sources. A Review. Journal of Agricultural and Food Chemistry. 44: 6-29.

Jopling, M. (1993). Bioenergetics feed intake and energy portioning. In Fish Eco physiology Rankin, J.C. and Jensen, B. (Eds).1-44 London: Chapman and Hall.

Han, K.; N. Hayashi; and N. Hashimoto (2008). Feeding potato flakes effects cercal short-chain fatty acids, Micro flora and fecal bile acids in Rats. Ann. Nutr. Metab., 52:1-7.

Kruger, E.; P. Duray; M. Tsokos; D. Venzon; S. Libutti; S. Dixon; M.A. Rudek; J. Pluda; C. Allerga; and W. Figg (2000). Endostatin inhibits micro vessel formation in the rat aortic ring angiogenesis assay. Biochem. Biophys Res. Commun., 268: 183-191.

Lim, C.; R. Beames; M. Eales; J. Prendergast; A. Mcleese; J. Shearer; and D. Higgs (1997). Nutritive values of low and high fibre canola meals for shrimps (*penaeus vannamei*). Aquacult. Nutr.; 3: 269 – 279.

Liu, E.; E. Kohn; and S. Libutti (2002). Microarray gene expression profiling of angiogenesis inhibitors using the rat aortic ring assay. Biotechniques. 33: 664- 670.

Matsubara, K.; M. Mori; and Y. Mizushina (2004). Petasiphenol which- inhibits DNA polymerase ì is an inhibitor of in vitro angiogenesis. Oncol. Rep., 11: 447-451.

Rodriguez, D; D. Sotillo; M. Hadley; and C. Wolf-Hall (1998). Potato peel extract a no mutagenic antioxidant with potential antimicrobial activity. Journal of Food Science. 63: 907-910.

Silverstone, E.; and M. Nelson (2005). Food production and nutrition in Biosphere 2: Results from the first mission September 1991 to September 1993, J. Agric. Food Chem., 53 (16): 6272–6275.

SPSS, (2000). SPSS for windows base system users guide, release 10.0 Chicago, USA.

Szlaminska, M. (1987). Survival, growth and structure of carp (*Cyprinus carpio*) larvae population fed fry feeding C-10 or zooplankton or else starved. Pol. Arch. Hydrobiol., 34(3):331-346.

أثر استبدال كسبة فول الصويا ببعض قشور البطاطا والباذنجان في نمو يافعات اسماك الكارب الشائع *Cyprinus carpio* L.

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تاريخ الاستلام: 2019/06/12 تاريخ القبول: 2019/08/03

الملخص

درس أثر استخدام علائق اصطناعية مضاف إليها قشور البطاطا وقشور الباذنجان كبدائل عن كسبة فول الصويا لتغذية يافعات أسماك الكارب الشائع *Cyprinus carpio* L. بالأحواض البلاستيكية، تحت ظروف المختبر في مركز علوم البحار، بجامعة البصرة، بمعدل طول ووزن أوليين قدرهما 2.2 ±0.1405 سم و1.819 ±0.0753 غ على التوالي. استمرت التجربة لمدة 60 يوماً اعتباراً من شهر نيسان 2017، جهّزت الأحواض بمضخات الهواء 24 ساعة على مدار اليوم، وغذّيت الأسماك يومياً وبواقع وجبتين. كانت القياسات البيئية ضمن الحدود الملائمة لنمو أسماك الكارب. بيّنت النتائج وجود فروقات في معدلات النمو مابين اليافعات في أحواض التجربة، حيث سجل أعلى معدل وزن عند انتهاء التجربة لليافعات في حوض التربية B إذ بلغ 26.471 غ، تلتها اليافعات في الحوض D التي سجلت 21.453 غ، ثم اليافعات في الحوض C إذ بلغت 18.186 غ، وأخيراً اليافعات في الحوض A التي سجلت 16.984 غ. بينت نتائج الدراسة الحالية بأن استبدال كسبة فول الصويا بقشور البطاطا أعطت أفضل زيادة وزنية عند انتهاء التجربة، إذ بلغت في حوض التربية B بمقدار 8.642 غ/أسبوع مقارنةً بالأحواض D وC وA إذ بلغت 7.371 و 5.731 و5.367 غ/أسبوع على التوالي، وبزيادة وزنية يومية خلال فترة التجربة بلغت 0.253 و0.409 و0.275 و0.327 غ/يوم للأحواض A وB وC وD على التوالي.

الكلمات المفتاحية: فول الصويا، قشور البطاطا، قشور الباذنجان، الكارب الشائع.