



EFFECT OF ADDITION OF *GLYCYRRHIZA GLABRA* ROOTS IN FEEDING OF *CYPRINUS CARPIO*

Ban Salman Kadhim AL-Mafragi

Departments of Animal production, College of Agriculture, Sumer university, Iraq.

Abstract

Fish experiment is conducted for estimation of the efficiency of addition of *Glycyrrhiza glabra* to the diets of *Cyprinus carpio* fishes and for this (3) three diets made the first represented by control without any add dative, second with *G. glabra* at concentration (2gm \ kg) and third with (6gm\kg) for (60) sixty days in aquarium provided with oxygen pump, the results showed significant differences to T2 and T3 compared with control group in total weight and daily weight respectively (45 ± 2.8 , 46 ± 2.2) (0.766 ± 0.10 , 0.749 ± 0.09) and there wasn't any significant differences between to diets T2, T3 also incase of RGR there was significant differences to both T2, T3 compared with control one T1 (10.17 ± 0.66) (10.13 ± 0.52) (8.22 ± 0.57) and SGR (0.04 ± 0.1608 , 0.03 ± 0.1615) (0.02 ± 1316) and there was any sig. differences among control and others in amount of consumed food or food conversion ratio (0.05 ± 1.354) (0.07 ± 1.313 , 0.05 ± 1.271) respectively-concluded addition of 2gm \ kg of *G. glabra* to diets of *Cyprinus carpio* fishes for improvement of growth and decrease the cost of diets used.

Key words: Addition, *Glycyrrhiza glabra*, *Cyprinus carpio* L., Feeding.

Introduction

Glycyrrhiza glabra plant consider as one of more important medical seeds distributed in the word, its permanent vegetative plant return to the *Leguminous* family (Chakaravarty, 1976), its growth along year as wild plant specially in the southern and western of Europe and middle of AL- sham, Syria, Iraq and Egypt (FAO, 1988). It is consist of high percentage of starches, carbohydrates, adhesives, salts eats. and its taste (sweetness, bitter) (AL-Ajeeli, 2005) it's used in the eastern and western and the researchers found plates with old writings extended to 3000 A.C also, some plants go back to the Ashurian people at 2500A.C. (Lafta, 2009). This plant used in many medical prescriptions (Muthana, 2015) because it has several advantages as thirst inhibitor if mixed with honey, treatment of Gastritis and improved of wet and dry cough (Tyler *et al.*, 1988), expectorant and has importance as analgesic, skin Itching, because of its ability to stimulate of adrenal gland which necessary for cortisol excretion in the blood (Quaschnig *et al.*, 2001), toothache, liver functions and consider as one of important plants which make washing of internal organs, decrease the susceptibility to cancer strong stimulating Factor for immunity, Appetizer and improving of digestion.

*Author for correspondence : E-mail: dr.ali.ali52@gmail.com

Root is considered as active part of this plant due to its active ingredient Glycerose which form 19% of *G. glabra* alcoholic extraction and for this part taste of sweetness for extraction and this sweetness exceed 50 times more than sugar cane (Hegazi, 2004). Food rational value of this plant resulted from the ability of its roots to obtained food stuff from deep layer of soil about 3-4 m depth not obtained by other plants (Mussa *et al.*, 2003) *G. glabra* roots consider as important traditional source of drugs and medicals and additives, therefore many researchers found that proved addition of *G. glabra* to diets of livestock animals as poultry which gave good results in improvement of growth characteristics (weight, sexual efficacy) (AL-Duraji *et al.*, 2005) while addition of this plant to the diets of fishes *Tilapia* lead to significant improvement in all growth parameters and food conversion ratio (El-msallamy *et al.*, 2015), also, addition of *G. glabra* residues to diets of lambs lead to improvement of food conversion and increasing of weights.

Aim of study

Increasing of food conversion ratio of diets because of its important factor in decreasing of economic cost by decreasing of feeding waste.



Fig. 1: Daily Weight Gain.

Materials and Methods

(40) forty of small *Cyprinus carpio* fishes with different weights range of (452± 2) to AL-Refaie district University of Sumer-Agriculture college Laboratory, then cultured at (10) ten fishes in each glass box with distention's (30×40×70) cm, after treatment with salty solution at 5% concentration for 30-40 seconds (Herwing *et al.*, 1979) for disinfect of fishes from external parasites after that taken of weights of fishes for 15 days interval and put of fishes diet.

Results

The results explained in general significant increasing in case of treatment with *Glycyrrhiza glabra* as following:

1. Daily Weight Gain (D.W.G.):

The results showed increasing of weight daily more than treatments which had *G. glabra* (T2, T3) on the control group (T1) as in fig. 1.

2. Total Weight Gain (T.W.G.):

Results showed two treated groups with *G. glabra* T2, T3 (46±2.2, 47±2.8) respectively compared to control group T1 (37±1.5) as showed in fig. 2.

3. The specific and relative growth rate:

The results in the control group significantly decreased compared with T2, T3 but did not record any significant differences between tow treated groups T2, T3 as in fig. 3.

4. Food conversion ratio (F.C.R.) and food conversion efficiency (F.C.E.):

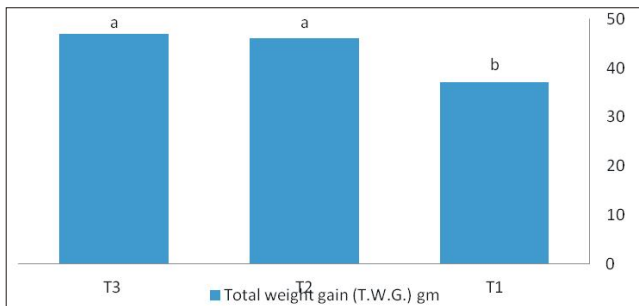


Fig. 2: Total Weight Gain.

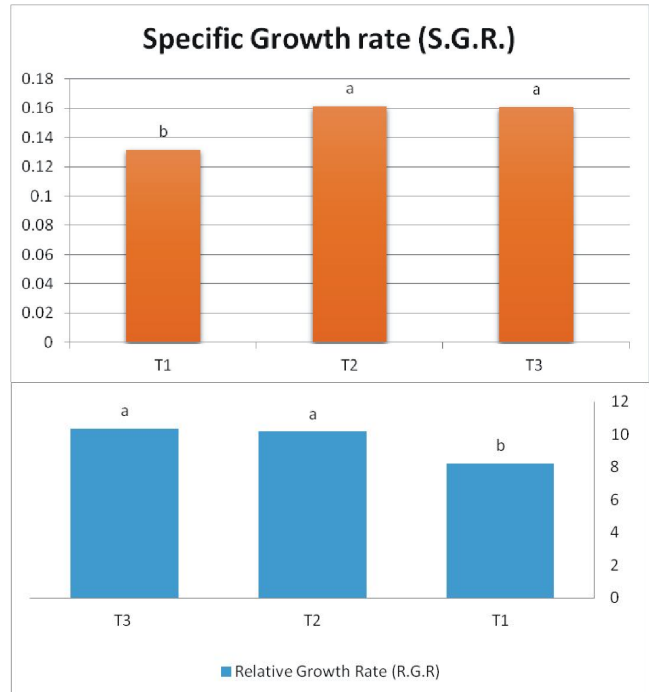


Fig. 3: Specific and relative growth rate.

The results of food conversion ratio showed there was no significant differences between all groups T1, T2, T3 as in fig. 4, while the food conversion efficiency showed significant decreasing between T1 and T2 and there was not any significant differences between T3 and each of T1 and T2 as explained in fig. 4.

5. Protein Productive Value (P.P.V.):

The results showed there was any significant differences in protein amount consumed in diet for growth in each of T2 and T3 while there was significant decreasing between control group T1 and other T2, T3 as in fig. 5.

Discussion

The previously explained results showed that the parameters of growth to the diets included *G. glabra*

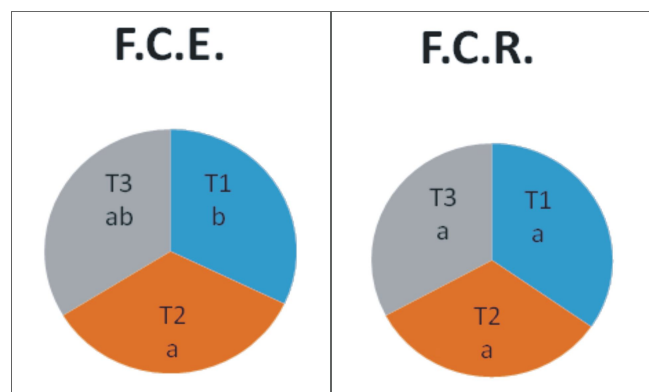


Fig. 4: Food conversion ratio (F.C.R.) and food conversion efficiency (F.C.E.).

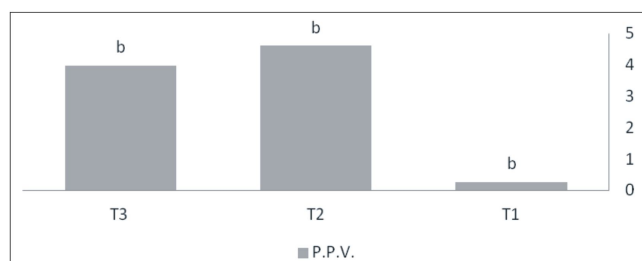


Fig. 5: Protein Productive Value (P.P.V.).

showed significant increasing in recorded parameters compared with control diet (T1) and this increasing may be due to effect of *G. glabra* on the improvement work of digestive system and its therapeutic effects to many problems as increased appetite to diets and increase the efficacy of its benefit and these results agreed with AL-Duraji *et al.*, (2003) and Abdel Hakeem, (2009) who observed that the addition of *G. glabra* to diets of poultry improved the growth parameters and productivity status to these poultry and agreed with El-msallamy *et al.*, (2015) when added of this plant to the diets of fishes *Tilapia* lead to significant improvement in all growth parameters and food conversion ratio and agreed with Lafta, (2009) in typical consumption of the constituents of diet and elevate growth level for these industries. Many studies proved that the addition of extraction of *G. glabra* to drinking water of poultry with different concentrations had positive effect in production of birds (broiler) be $p < 0.01$ in increasing of weight rates, food conversion rate, the range of ended weight, production index, significant decreasing in food consumption and mortality rate affected poultry, so that concluded that the *G. glabra* as active ingredient in improvement of feeding program and increase the range of *Cyprinus carpio* weights.

Conclusions

Licorice is one of the substances that works to initialization of the digestive system, thus increasing of benefit from food intake, addition of 2gm/kg of *G. glabra* to diets of *Cyprinus carpio* fishes for improvement of growth parameters, decrease the cost of diets used 2 gm/kg of *G. glabra* Because of the improved food conversion rate (FCR of these diets and the optimal utilization of their ingredients.

References

- Abdel Hakeem Saad Abdel Hakeem, Abdel Maged, Himat Abdel-Aal (2009). Addition of *Glycyrrhiza glabra* to poultry diets through different system during the Summer season. poultry Nutrition Research Department, Animal production Research center -Dokki - Egypt.
- Al-Ajeeli, Thamer Abdullah Zahwan (2005). Effect of Gibberelin GA3 and some nutrients on Glycyrrhizin production and some other ingredients in *Glycyrrhiza glabra*. Ph.D. thesis College of Agriculture University of Baghdad. Republic of Iraq.
- Al-Duraj, Hazim Jabar and Ameen and Mahmud Hassan Mohamed (2007). The effect of adding licorice extract to the diet on some specific characteristics of leghorn white eggs, *Iraqi Journal of poultry Science.*, **2(2)**: 32-45.
- Al-Duraji, Hazim Jabar, Alani, Emad Abas, Mnaty, Jasim Kasim, Taha and Sadik Ali (2003). The effects of addition of different concentrations of *G. glabra* in some of parameters of poultry (broiler), *Science J. for Iraqi agriculture.*, **(34)**.
- AL-Khazraji, Abdul-jabar Abdul-Hameed *et al.*, (2002). Benefit of *G. glabra* residue in feeding of friesian calves and its effects by different levels organization in Iraq. *Agricultural office*.
- Chakaravarty, H.L. (1976). Plant Wealth of Iraq, Ministry of Agriculture and Agrarian Reform. Baghdad, Iraq. 259.
- Elmesallamy, M.D. Amani, Elmarakby, L. Hani, M.A. Ahmed, Sauleman, Abd El-naby and S. Fatma (2015). Evaluation of phenolic extract of licorice roots in diets of Nil tilapia (*Oreochromis niloticus*).
- FAO (1988). Medicinal, aromatic poisonous plants at home. Sudan, Al-kartom.
- Hegazy, Ahmad Tawfiq (2004). Encyclopedia of Herbs and plants. first edition, House the world of culture for Publishing and Distribution, Amman. The Hashemite Kingdom of Jordan.
- Herwing, N., L. Garibaldi and R.E. Walke (1979). Handbook of drugs and chemicals used in the treatment of fish disease. Charles, C. Thomas publisher, Illionis., 272.
- Ibrahim, Muthanna Mohamed (2015). Response of Chrysanthemum plant *Calendula officinalis* to spray with *Glycyrrhiza glabra* and Organic fertilizer for poultry waste. *Diyala Journal for Agricultural Sciences*.
- Lafta, Fatima mshib (2009). The economic benefit for using of *G. glabra* extraction in feeding of poultry. Al-ghari for economic sciences, 99-101.
- Mussa, Tariq Naser, Al-Hadithi, Abd Al-gabar Whaib and Kalboi Abdalhamed Naser (2003). Estimation of the level of some nutritional components and mineral elements of the local *Glycyrrhiza glabra* roots powder. *Journal of Agricultural Sciences.*, **34(4)**: 30-38.
- Quaschnig, T., F. Ruschitzka, B. Niggli, C.M.B. Lunt, S. Shaw, M. Christ and T. Luscher (2001). Influence of Aldosterone vs Endothelin receptor Antagonism on Renovascular Function in Licorice-induced Hypertension. *Nephrol Dial Transplant.*, **16**: 2146-2151.
- SAS (2012). Statistical Analysis System, User's Guide. Statistical. Version 9.1ed. SAS. Inst. Inc. Cary. N.C. USA.
- Tyler, V.E., L.R. Brady and J.K. Riobbers (1988). *Pharmacognosy*. 9th edn. Lea and Febiger, Philadelphia. Wood, A.S., Reinhart, B.S. Rajaratham G. and Summers, J.D. 1971. A Comparison of Blood constituents of Dwarf Versus Non dwarf Birds. *Poultry Sci.*, **50(6)**: 804-807.