New Approach to use *Origanium Vulgare* Extract as Immunostimulant to Increase Resistance to *Pseudomonas aeruginosa* and *Pseudomonas flourscence*

El Araby DA[1] and El-Arabey AA[2]*

[1]*Fish Disease Department, Central Laboratory for Aquaculture Research, Abbassa, Abo-Hammad, Sharqia, Egypt*
[2]*Pharmacology and Toxicology Department, Faculty of Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt*

Abstract

The aim of the present study to assess the use of ethanol extracts of *Origanium vulgare* as a growth and immunity promoter for Nile tilapia (*Oreochromis niloticus* L) fngerlings. Fish (Average 12.27 g) were randomly distributed into four treatments; three replicates each at a rate of 20 fsh per 100– L aquarium. Fish were fed one of the tested diets containing similar crude protein (30%) and gross energy (4.40 kcal/g). In addition, 0.0, 0.5%, 1.0%, or 1.5% *Origanium vulgare* extract. Diets were given twice daily at a rate of 3% of live body weight, for six days a week during 10 weeks. After the feeding trial, fsh of each treatment were challenged by pathogenic *Pseudomonas aeruginosa* and *Pseudomonas fourscence*, which was given by intraperitoneal (I/P) injection and they were kept under observation for 10 days to follow up any abnormal clinical signs and the daily mortality rate. The growth promoting infuence of *Origanium vulgare* extract was observed on fsh. The maximum growth was observed at 0.5 % *Origanium vulgare* extract as compared to the control. No signifcant differences in fsh survival were reported among the experimental treatments, falling within the range of 93.3-100%. The control fsh consumed less diet and gave a higher Feed conversion ratio (FCR), while fsh fed diet supplemented with 0.5% *Origanium vulgare* extract demonstrated the highest protein effciency ratio (PER), apparent protein utilization (APU), and energy utilization (EU). The supplementation of *Origanium vulgare* extract had no signifcant effect on the fsh body composition (dry matter, crude protein, fat, and ash), mean which total protein, albumin, and globulin increased signifcantly to the highest values at 0.5% *Origanium vulgare* extract, as compared to the control. However, supplementation of *Origanium vulgare* extract did not signifcantly affect the albumin /globulin ratio (A/G). In conclusion, 0.5% *Origanium vulgare* extract in Nile tilapia diets increased the fsh resistance to *Pseudomonas aeruginosa* and *Pseudomonas fourscence,* indicating the effective role of *Origanium vulgare*% y ³ n cwlo ini · y icwlo ˢ

a a , a a a a (E) a a a a 7,8 .

a a a O a a e a a , a , , a a a a B e d a ae s a a B e d a , s ce ce .

Ma a a M

E a o igan m lga e

A a a a O a a e a a a a (95%) a a a . a a a , a a a a a , a D - - (D), a

a a a a a a a 10 , , a a a . a a a a 85 C a (GCA, 18 E , , C a , , A) a a a a . a a a a a a a (a C a K a a , , a A) a a a 6.25. a a a - a a a a (a - , ., a , , A) 16 a a a a a 550C 6 a a (C a , D , a, A). C a a a G a a [11 . G a a a a RC 9 .

G w a a

G a a a a a a a a a :

a = 2 1;

a (GR) =100 (2 1)/ ; 1 a 2 a a a a , , a a ;

F a (FCR) = a / a ;

F a (FER) = a / a ;

a (ER) = a / a ;

A a a (A ; %) =100 a ( ) / a ( ) .

E a (E ; %) =100 E a ( ) / a ( ) .

C a , .

a .

, a a / a

B . ae , s a a B . F , s ce ce

a a
. a , *O a ae* a a a
, a a , a a a a a
. a a
A aa a., 17 a aa a., 18 .

a *O a ae* a (*P*>0.05)
(a , , a a a)
(a 2). a A a a. 17 a
a a a. 18 .

R a a a *B. ae sa* a *B.*
, sce ce a a a a
O a ae a. a
a a (90% a 100%,
). a a
a a a *O a* a
( ) a a, a a a a a
7,8 . F , a a. 19 a a a

Items	0.00%	At *Origanum vulgare* extract % of the diets		
	(control)	1.50%	1%	0.50%
Moisture	74.64 ± 068[a]	73.77 ± 0.14[a]	73.75 ± 0.27[a]	73.84 ± 0.46[a]
Crude protein	60.00 ± 0.06[a]	60.79 ± 0.32[a]	60.59 ± 0.37[a]	60.68 ± 0.39[a]
Total lipids	19.72 ± 0.22[a]	19.79 ± 0.36[a]	19.67 ± 0.18[a]	19.97 ± 0.49[a]
Ash	19.81 ± 0.31[a]	19.24 ± 0.55[a]	19.11 ± 0.61[a]	1.31 ± 0.60[a]

a-no signifcant different in the same row from the table at *P*<0.05.Proximate chemical composition of fsh at start of this study was 75.22 ± 0.30% moisture; 59.04 ± 0.82% protein; 18.11 ± 0.76% lipid and 21.42 ± 0.57% ash.

Table 2: Proximate chemical analysis on dry matter basis (mean ± SE) of Nile tilapia fed diets containing different levels of *Origanum vulgare* extract.

Items	0.0 % (control)	At *Origanum vulgare* extract % in the diets		
		0.50%	1.00%	1.50%
Initial weight (g)	12.27 ± 0.46[a]	12.17 ± 0.15[a]	12.37 ± 0.50[a]	12.23 ± 0.36[a]
Final weight (g)	29.30 ± 0.67[c]	36.00 ± 0.85[a]	34.40 ± 0.55[ab]	32.37 ± 0.74[b]
Weight Gain (g)	17.03 ± 0.52[c]	23.83 ± 0.97[a]	22.03 ± 0.33[ab]	20.14 ± 0.87[ab]
Weight Gain %	138.79 ± 7.03[c]	195.81 ± 9.99[a]	178.09 ± 9.13[ab]	164.68 ± 6.02[bc]
SGR (% day)	1.24 ± 0.03[c]	1.55 ± 0.05[a]	1.46 ± 0.05[ab]	1.39 ± 0.03[b]
Survival rate (%)	93.30 ± 3.85[a]	100 ± 0.0[a]	100 ± 0.0[a]	96.03 ± 0.33[ab]

Means the same letter (a/b/c) in the same row is not signifcantly different at *P*<0.05.

Table 3: Growth performance (means ± SE) of Nile tilapia fed diets containing different levels of *Origanum vulgare* extract.

Items	0.0 % (control)	At *Origanum vulgare* extract % in the diet		
		0.50%	1.00%	1.50%
Feed intake (g feed/fsh)	34.10 ± 0.34[c]	39.74 ± 0.22[a]	38.75 ± 0.36[a]	37.29 ± 0.52[b]
FCR	2.01 ± 0.05[a]	1.67 ± 0.07[b]	1.72 ± 0.06[b]	1.86 ± 0.04[ab]
PER	1.81 ± 0.05[c]	2.17 ± 0.08[a]	2.05 ± 0.05[ab]	1.94 ± 0.04[bc]
APU %	28.37 ± 0.28[d]	35.73 ± 0.20[a]	34.08 ± 0.32[b]	32.40 ± 0.45[c]
AFU %	41.36 ± 0.40[d]	50.76 ± 0.28[a]	46.56 ± 0.42[b]	44.14 ± 0.60[c]
EU %	17.32 ± 0.17[c]	21.84 ± 0.11[a]	20.63 ± 0.22[b]	20.40 ± 0.21[b]

Feed intake, feed conversion ratio (FCR), protein effciency ratio (PER), apparent protein utilization (APU), apparent fat utilization (AFU) and energy utilization (EU) of Nile tilapia fed diets containing different levels of *Origanum vulgare* extract. Means the same let l m t l m f ili

a a *O a* a a a
Bc e c a c , E e bac e s ., Bac s s ., Sa e as ., Sa , c cc s a e s , Kebs e a e ae, Ls e a c e s a *Ca , bac e e* . a , a , a a
a a (*P* 0.5) *O a ae* a , a
a a 0.5% , a a (a
5). a , *O a ae* E a
a a / (A/G) a (a 5).
G a a a a a (G) a G a a
a a a (G) a a a , a
ae a a a a a a
(a 5). a a a a
a *O a ae* a . ,
a a , a a
a a a a a , a a
a a a a a a a
a 12 .

a a a a a
a *O a ae* 0.0, 0.5%, 1% a 1.5%
a (a 6). a
a a
0.5% a *O a ae*.
a 12.52%
a a 0.5% a
O a ae . a
a a a a
18 .

C

a *O a ae* a
a a a a a
a *B. a, sa a B., sce ce* . ,
O a ae a a 0.5%
a a a a .

References

1. El-Sayed AFM (2006) Tilapia Culture. CABI publishing, CABI International Willingford, Oxfordshire, UK.

2. Ibrahim M, Abd El-Latif SA, EL-Yamany AT (1998) Effects of some natural

growth promoters to broiler chickens diets on growth plants grown wild in Greece. Z. Lebensm Uters Forsch 97: 20-23.

3. Gonzáles-Tejero MR, Casares-Porcel M, Sánchez-Rojas CP, Ramiro-Gutiérrez JM, Molero-Mesa J, et al. (2008) Medicinal plants in the Mediterranean area: Synthesis of the results of the project RUBIA. J Ethnopharmacol 116: 341-357.
4. Hadjichambis AC, Paraskeva-Hadjichambi D, Della A, Giusti ME, de Pasquale C, et al. (2008) Wild and semi-domesticated food plant consumption in seven circum-Mediterranean areas. Int J Food Sci Nutr 59: 383-414.
5. Craig WJ (1999) Health promoting properties of common herbs. Am J Clin Nutr 70: 491.
6. Jirawan O, Tomoko S, Piyawan G, Griangsak E (2005) "Antimicrobial properties and action of galangal (Alpinia galangal Linn.) On Staphylococcus aureus" LWT-Food Sci Technol 39: 1214-1220.
7. Aligiannis N, Kalpoutzakis E, Mitaku S, Chinou ? Ấ Ò ' (1999