4. RESULTS

4.1. Effect of *Origanum vulgare* and *Zingebare officinale* extract supplementation on physico-chemical water quality parameters:-

Analysis of water quality parameters revealed that water temperature ranged between 26 to 28 °C, dissolved oxygen concentrations ranged between 5.8 to 6.7 mg /l, pH 7.4 – 8.1, and unionized ammonia concentration range was 0.06 – 0.13 mg / L, The chemical water analysis showed no apparent fluctuation during the experimental period, however, water quality was found to be within the acceptable range for tilapia growth **Boyd, (1990).**

4.2- Effect of *Origanum vulgare* and *Zingebare officinale* extract supplementation on growth performance and survival rate

4.2.1 *Origanum vulgare* extract:

Results in Table (3) and fig (1) showed that growth performance of Nile tilapia. Initial body weights at all experimented groups did not differ significantly and its range were 12.27 – 12.33g for fish. Nile tilapia fed on treated diets actively and efficiently grew without any external signs of nutritional deficiency. Growth performance (final body weight, weight gain, weight gain % and specific growth rate) increased significantly ($P<0.05$) when diets were supplemented with different levels of extracted *Origanum vulgare* for Nile tilapia diets (Table 3). The highest average for previouse paranieters were; 36.00, 23.83 and 195.81g / fish respectively

were obtained with addition of 0.5 % extracted *Origanum vulgare* to diet, whereas the control diet (without *Origanum vulgare* extract) produced the lowest average body weight, weight gain and weight gain % (29.30, 17.03 and 183.79 g / fish respectively). The same trends were obtained in specific growth rates (SGR) which increased significantly with different levels of *Origanum vulgare* extract. The highest values were obtained with 0.5 % *Origanum vulgare* extract (1.55 %/day), while the lowest one was obtained with the control diet (1.24 %/day).

Also, no significant differences in fish survival rate among different treatments (P>0.05), and its range was 93.3 – 100 %.

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

Items (gm for fish)	**% of *Origanum vulgare* levels extract in the diets**			
	0.0	**0.5**	**1.0**	**1.5**
Initial weight	12.27±0.46a	12.17±0.15a	12.37 ±0.50a	12.23 ±0.36a
Final weight	29.30±0.67c	36.00±0.85a	34.40±0.55ab	32.37±0.74b
Weight Gain	17.03±0.52c	23.83±0.97a	22.03±0.33ab	20.14±0.87ab
Weight Gain %	138.79±7.03c	195.81±9.99a	178.09±9.13ab	164.68±6.02bc
SGR (% day)	1.24±0.03c	1.55±0.05a	1.46±0.05ab	1.39±0.03b
Survival rate (%)	93.30±3.85a	100±0.0a	100±0.0a	96.03±0.33ab

Mean the same letter in the same row is not significantly different at (P≤0.05).

4.2.2 *Zingebare officinale* extract.

Data in Table (4) and fig (2) showed that growth performance of Nile tilapia .The values of initial body weight were 12.27, 12.33, 12.29 and 12.33 g / fish for control, 0.5%, 1% and 1.5 % respectively. These values for all experimented groups did not differ significantly. Nile tilapia fed on treated diets actively and efficiently grew without any external signs of nutritional deficiency. Nile tilapia fed on treated diets actively and efficiently grew without any external signs of nutritional deficiency. Growth performance (final body weight, weight gain and weight gain %) increased significantly ($P<0.05$) when diets were supplemented with different levels of *Zingiber officinale* for Nile tilapia diet compared with control diet Table (4). The highest final body weight, weight gain and weight gain % (35.53, 23.24 and 189.10 g / fish respectively) was obtained with diet of 1.0 % *Zingiber officinale*, as compared to the control diet(29.3, 17.03 and 138.79 g / fish respectively). Also specific growth rates (SGR) increased significantly when diet supplemented with different levels of *Zingiber officinale* extract. The highest values were obtained with 1 % *Zingiber officinale* extract (1.52 %/day), while the lowest one was obtained with the control diet (1.24 %/day).

Survival rate in all treatments were slightly enhanced when supplemented diets with *Zingiber officinale* extract without significant differences ($P>0.05$) and its ranged from 93.3 - 100 %.

Table (4): Growth performance (means ± SE) of Nile tilapia (*O. niloticus*) fed diets containing different levels of *Zingebare officinale* extract.

Items g/ fish	% of *Zingebare officinale* in the diets			
	0.0	**0.5**	**1.0**	**1.5**
Initial weight	12.27±0.46a	12.33±0.23a	12.29 ±0.32a	12.33 ±0.27a
Final weight	29.30±0.60c	32.03 ±0.49a	35.53±0.69b	31.57±0.71b
Weight gain	17.03±0.52c	19.70±0.97a	23.24±0.33ab	19.24±0.68b
Weight gain (%)	138.79±7.03c	159.77±8.89b	189.10±11.3a	156.59±9.59b
SGR (% day)	1.24±0.05c	1.36±0.03b	1.52±0.03a	1.34±0.05ab
Survival rate (%)	93.30±3.8a	95.60±2.22a	100±0.0a	95.60±2.22a

Mean the same letter in the same row is not significantly different at P≤0.05.

4.3 - Effect of *Origanum vulgare* and *Zingebare officinale* extract supplementation on feed efficiency and protein utilization.

4.3.1 *Origanum vulgare* extract:

Table (5) and fig (3) showed feed intake, feed conversion ratio, protein and energy utilization. There were significant difference ($p<0.05$) in feed intake (FI) between diets containing different levels of *Origanum vulgare* extract and control diet. Nile tilapia fingerlings fed on diets contained 0.5% *Origanum vulgare* extract exhibited the highest FI (39.74 g / fish), while the lowest FI was observed for control group (34.10 g / fish). The best feed conversion ratio (FCR) was observed with 0.5 % *Origanum vulgare* extract (1.67), while fish fed on diet without extract (control) showed worse FCR (2.01). Results in Table (5) showed that PER, APU and Eu improved with supplemented diet with different levels of *Origanum vulgare* extract in Nile tilapia diets. The highest values of PER, APU and EU (2.17, 35.73 and 21.84 respectively) were obtained with diet contained 1.0 % *Origanum vulgare* extract as compared to the control diet(1.81, 28.37 and 17.32 respectively).

Table (5): Feed intake, feed conversion ratio, protein efficiency ratio, Apparent protein utilization and energy utilization of Nile tilapia fed diets containing different levels of *Origanum vulgare* extract.

Items(g /fish)	**% of *Origanum vulgare* extract in the diets**			
	0.0	**0.5**	**1.0**	**1.5**
Feed intake	34.10±0.34c	39.74±0.22a	38.75 ±0.36a	37.29 ±0.52b
FCR	2.01±0.05a	1.67 ±0.07b	1.72±0.06b	1.86±0.04ab
PER	1.81±0.05c	2.17±0.08a	2.05±0.05ab	1.94±0.04bc
APU %	28.37±0.28d	35.73±0.20a	34.08±0.32b	32.40±0.45c
EU %	17.32±0.17c	21.84±0.11a	20.63±0.22b	20.40±0.21b

Mean the same letter in the same row is not significantly different at $P \leq 0.05$.

4.3.2 *Zingebare officinale* extract.

Table (6) and fig (4) showed; feed intake, feed conversion ratio, protein efficiency ratio, protein utilization and energy utilization. There were significant difference ($p<0.05$) in feed intake (FI) between diets containing different levels of *Zingebare officinale* extract and control diet. Nile tilapia fingerlings fed diets contained 1% *Zingebare officinale* extract exhibited the highest FI (37.80 g / fish), while the lowest FI was observed for control group (34.10 g / fish). The best feed conversion ratio (FCR) was observed with 1% *Zingebare officinale* extract (1.64), while fish fed the control diet showed worse FCR (2.01). Data in Table (5) showed that PER, APU and Eu increased significantly ($P>0.05$) with supplemented diets with different levels of *Zingebare officinale* extract in Nile tilapia diets. The highest values of PER, APU and EU (2.16, 35.55 and 21.46 respectively) were obtained with diet contained 1.0 % *Zingebare officinale extract* as compared to the control diet (1.81, 28.37 and 17.32 respectively).

Table (6): Feed intake, feed conversion ratio (FCR), protein efficiency ratio (PER), apparent protein utilization (APU) and energy utilization (EU) of Nile tilapia (*oreochromis niloticus*) fed diets containing different levels of *Zingebare officinale* extract.

Items	% of *Zingebare officinale* extract in the diets			
	0.0	**0.5**	**1.0**	**1.5**
Feed intake (g /fish)	34.10±0.34c	35.80±0.35b	37.80±0.67a	35.63±0.5ab
FCR	2.01±0.05a	1.82±0.07ab	1.64±0.08b	1.86±0.11ab
PER	1.81±0.05b	1.79±0.07b	2.16±0.09a	1.85±0.06b
APU %	28.37±0.28c	31.43±0.35b	35.55±0.65a	31.89±0.44b
EU %	17.32±0.17c	19.19±0.19b	21.46±0.39a	19.20±0.26b

Mean the same letter in the same row is not significantly different at P≤0.05

4.4 - Effect of *Origanum vulgare* and *Zingebare officinale* extract supplementation on body composition.

4.4.1 *Origanum vulgare* extract:

Data, Table (7) and Fig (11) showed that the whole-body composition of Nile tilapia fingerlings at the end of the experiment. No significant difference (P≤0.05) were observed in whole body composition (moisture, protein, lipids, and ash contents) for Nile tilapia fed diets containing different levels (0, 0.5, 1, 1.5) of *Origanum vulgare* extract. Moisture content had No significant difference due to supplementation diets with *Origanum vulgare* extract (Fig. 11) and its range was 73.75 – 73.84 %. Protein content, fat content and ash content range were 60.0 – 60.79 %, 19.67 – 19.97 % and 19.11 – 19.81 % respectively.

Generally, the addit of *Origanum vulgare* extract with tested levels had not any significant effect on the previous parameter.

Table (7): chemical analysis on dry matter basis (mean ± SE) of Nile tilapia fed diets containing different levels of *Origanum vulgare* extract.

Items	% of *Origanum vulgare* extract in the diets			
	0.0	0.5	1	1.5
Moisture %	74.64±068a	73.84±0.46a	73.75±0.27a	73.77±0.14a
Crude protein %	60.00±0.06a	60.68±0.39a	60.59±0.37a	60.79±0.32a
Ether extract %	19.72±0.22a	19.97±0.49a.	19.67±0.18a	19.79±0.36a
Ash %	19.81±0.31a	19.31±0.60a	19.11±0.61a	19.24±0.55a

Mean the same letter in the same row is not significantly different at P ≤ 0.05
chemical composition of fish at start of this study was 75.22±0.30 % moisture; 59.04±0.82 % protein; 18.11±0.76 % lipid and 21.42 ±.57 % ash.

4.4.2 *Zingebare officinale* extract.

Results in Table (8) and Fig. (12) showed that the whole-body composition of Nile tilapia fingerlings at the end of the experiment. No significant difference (P>0.05) were observed in whole body composition (Moisture, protein, lipids, and ash contents) for Nile tilapia fed diets containing different levels (0, 0.5, 1, 1.5) of *Zingebare officinale* extract. Moisture content had no significant difference due to supplementation diets with *Zingebare officinale* extract (Fig. 12) and its range was 74.06 – 74.64 %. Protein content, fat content and ash content range were 60.00 – 60.45 %, 19.17 – 19.81 % and 19.11 – 19.81 % respectively

Table (8): chemical analysis on dry matter basis (mean ± SE) of Nile tilapia *oreochromis niloticus*, fed diets containing different levels of *Zingebare officinale* extract.

Items	% of *Zingebare officinale* levels in the diets			
	0.0	0.5	1	1.5
Moisture %	74.64±0.78a	74.49±0.55a	74.27±0.20a	74.06±0.31a
Crude protein %	60.00±0.06a	60.45±0.30a	60.57±0.29a	60.70±0.30a
Ether extract %	19.72±0.22a	19.77±0.30a.	19.53±0.31a	19.25±0.51a
Ash %	19.81±0.31a	19.31±0.63a	19.18±0.52a	19.17±0.09a

Mean the same letter in the same row is not significantly different at P≤0.05

chemical composition of fish at start of this study was (means ± SE): 75.22±0.30 % moisture; 59.04±0.82 % protein; 18.11±0.76 % lipid and 21.42 ±.57 % ash

4.5 Economic evaluation:

4.5.1 *Origanum vulgare* extract:-

Table (9) showed that the economical evaluation of the experimental diets contained different ***Origanum vulgare*** extract levels; 0.0, 0.5 %, 1 % and 1.5 %.The highest reduction in feed cost compared with control diet showed to produce one kg fish gain was achived with treatment containing 0.5 % ***Origanum vulgare*** extract. The reduction in feed cost compared with control diet cost.

Table (9). **Economic efficiency for production of one Kg gain of fingerlings Nile tilapia *O. niloticus* fed diets containing different levels of *Origanum vulgare* extract**.

Items	**% of *Origanum vulgar*** extract in experimental diets			
	0.0	0.5	1	1.5
Price/ kg feed P.T	2.78	2.93	3.08	3.23
FCR (kg feed/kg gain)	2.01	1.67	1.72	1.86
Feed cost / kg gain P.T	5.59	4.89	5.30	6.01
Reduction cost in kg gain	100	12.52	5.19	- 7.51

4.5.2 *Zingebare officinale* extract:-

Table (10) showed that the economical evaluation of the experimental diets contained different ***Zingebare officinale*** **extract** levels 0.0, 0.5 %, 1 % and 1.5 %. The highest reduction in feed cost compared with control diet showed to produce one kg fish gain was achived with diet containing 1% ***Zingebare officinale*** **extract**. The reduction in feed cost compared with control diet cost.

Table (10): Economic efficiency for production of one Kg gain of fingerlings Nile tilapia *O. niloticus*, fed diets containing different levels of *Zingebare officinale* extract.

Items	% of *Zingebare officinale* extract in experimental diets			
	0.0	**0.5**	**1**	**1.5**
Price/ kg feed P.T	2.78	2.90	3.03	3.15
FCR (kg feed/kg gain)	2.01	1.82	1.64	1.86
Feed cost / kg gain P.T	5.59	5.28	4.97	5.86
Reduction cost in kg gain	100	5.55	11.09	- 4.83

4.6. Challenging test:

Fish challenging against *Ps. aurgonsia* injected for ten days represented in Table (11) and photos. (2 and 3).

No mortalities were observed in all diets containing different levels of *Origanium vulgare* extract; 0.0, 0.5, 1% and 1.5%. The highest overall fish mortality rate was observed in the control group (90%); without any addit of *Origanium vulgare* extract.

Table (11): Mortality rate (%) of fingerlings Nile tilapia *O. Niloticus*, fed diets containing different levels of *Origanium vulgare* extract for 70 days and challenged by *Ps. aurgonsia* for 10 days.

% of *Origanum vulgare* extract in the diet	**No. of injection fish**	**Bacteria dose (4 x 10^6 CFU)**	**Mortality rate**	
			No	%
0.0	10	0.2 ml	9	90
0.5	10	0.2 ml	-	0
1	10	0.2 ml	-	0
1.5	10	0.2 ml	-	0

0.0 = infected fishes fed by control diets

Photo (2):Fish challenging against *PS. aurgonsia*

Photo (3) : Nile tilapia *O.Niloticus* fed diets containing 0.5% of *Origanium Vulagre* extract and challenged by *Ps.aurgonsia*

Fish challenging against of *Ps flourscence* for ten days are shown in Table (12).

No mortalities were observed in all diets containing different levels of *Origanium vulgare* extract; 0.0, 0.5, 1% and 1.5%. The highest overall fish mortality rate was observed in the control group (100%); without any addition of *Origanium vulgare* extract.

Table (12): Mortality rate (%) of fingerlings Nile tilapia *O. Niloticus*, fed diets containing different levels of *Origanium vulgare* extract for 70 days and challenged by *Ps. flourscence* for 10 days.

% of *Origanum vulgare* extract in the diet	No. of injection fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			No	%
0.0	10	0.2 ml	**10**	**100**
0.5	10	0.2 ml	-	**0**
1	10	0.2 ml	-	**0**
1.5	10	0.2 ml	-	**0**

Fish challenging against of *Ps. aurgonsia* for ten days are shown in Table (13) and photos (4 and 5).

10% mortalities were observed in 0.5% *Zingebare officiale* extract Level in the diet. But no mortalities was observed in (1% & 1.5%) *Zingebare officiale* extract levels in the diet. The highest overall fish mortality rate was observed in the control group (90%) without any addition of *Zingebare officiale* extract.

Table (13): Mortality rate (%) of fingerlings Nile tilapia *Oreochromis Niloticus* fed diets containing different levels of *Zingebare officiale* extract for 70 days and challenged by *Ps. aurgonsia* for 10 days.

% of *Zingebare officiale* extract in the diet	No. of injection fish	Bacteria dose (4×10^6 CFU)	Mortality rate	
			No	%
0.0	10	0.2 ml	9	90
0.5	10	0.2 ml	1	10
1	10	0.2 ml	-	0
1.5	10	0.2 ml	-	0

Photo (4):Fish challenging against *PS. aurgonsia.*

Photo (5): Nile tilapia *O.Niloticus* fed diets containing 1% of *Zingebare officinale* extraet and challenged by *Ps.aurgonsia*

Fish challenging against of *Ps. flourscence* for ten days are shown in Table (14).

20% mortalities were observed in 0.5% *Zingebare officiale* extract Level in the diet. But no mortalities was observed in (1% & 1.5%) *Zingebare officiale* extract levels in the diet. The highest overall fish mortality rate was observed in the control group (100%) without any addition of *Zingebare officiale* extract.

Table (14): Mortality rate (%) of fingerlings Nile tilapia *Oreochromis Niloticus*, fed diets containing different levels of *Zingebare official* extract for 70 days and challenged by *Ps flourscence* for 10 days.

% of *Zingebare officiale* extract in the diet	No. of injection fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			No	%
0.0	10	0.2 ml	10	100
0.5	10	0.2 ml	2	20%
1	10	0.2 ml	-	0
1.5	10	0.2 ml	-	0

4.7 Immunological and Physiological measurement:

4.7.1 *Origanum vulgare* extract:-

4.7.1.1 Total protein, albumin, and globulin values:-

Total protein, albumin, and globulin values increased significantly ($P \leq 0.05$) due to diet supplemented with *Origanum vulgare* extract ; the highest values were obtained at 0.5% while, the lowest value was obtained with untreated diet. *Origanum vulgare* Extract supplementation insignificantly affected the albumin / globulin (A/G) ratio. Table (15) and Fig. (7).

Table (15): The effects of *Origanum vulgare* extract (0.5 %) on serum protein (g/dl), *S.albumin* (g/dl) and A/G ratio (%) in comparing with control of *Oreochromis niloticus* in aquarium during the Laboratory experiment.

Treatment	Total protein	S. albumin g/dl	Globulin g/dl	A/G ratio %
0.0 %	4.32±0.17 b	1.33±0.06b	2.99±0.17b	0.44±0.02a
0.5 %	5.64±0.22a	1.74±0.05a	3.90±0.20a	0.45±0.02a

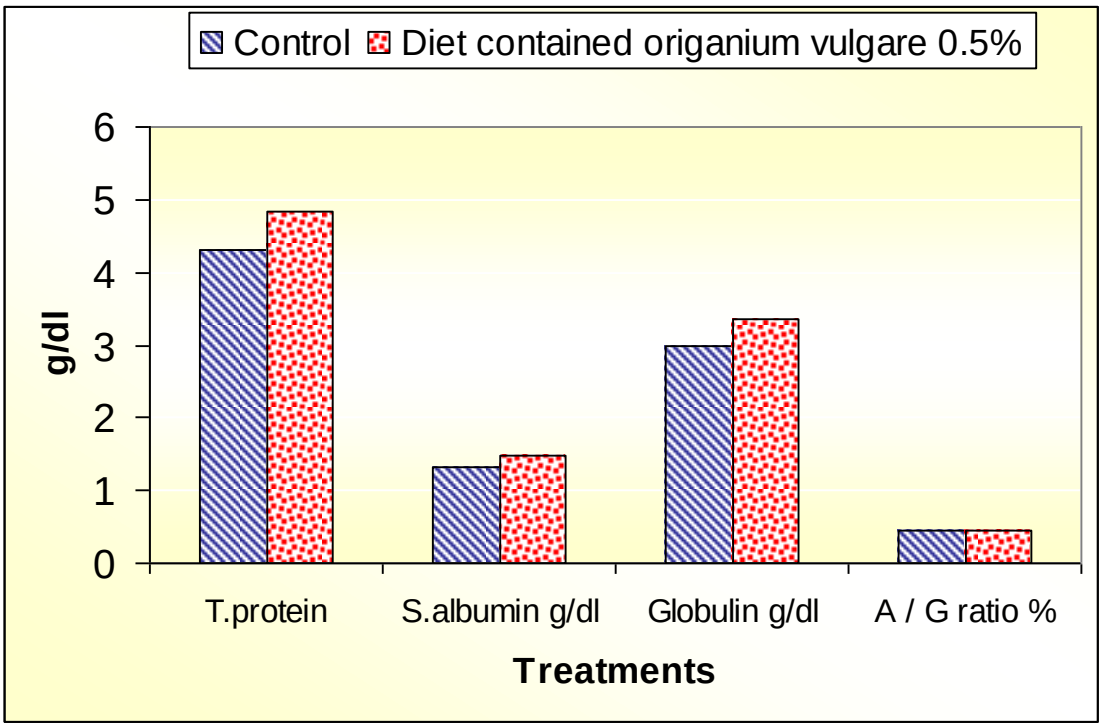

Fig. (7): The effects of *Origanium vulgare* extract (0.5 %) on s erum protein (g / dl), *S. albumin* (g/dl) and A/G ratio (%) in comparing with control of *O. niloticus* in aquarium during the Laboratory experiment

4.7.1.2 GOT and GPT values:-

GOT and GPT (u/l) or (u/ml) values decreased with the increase of diet supplemented with *Origanum vulgare* extract the highest values were obtained at the control diet. Table (16) and Fig (8).

Table (16): The effects of *Origanum vulgare* extract 0.5 % on transaminases enzyemes, comparing with control of *Oreochromis niloticus* in aquarium during the Laboratory experiments.

Treatments	AST / GOT U / l	ALT/ GPT U / l
0.0%	89 ± 3.78a	95 ± 3.58a
0.5 %	70 ± 7.52b	82 ± 3.56b

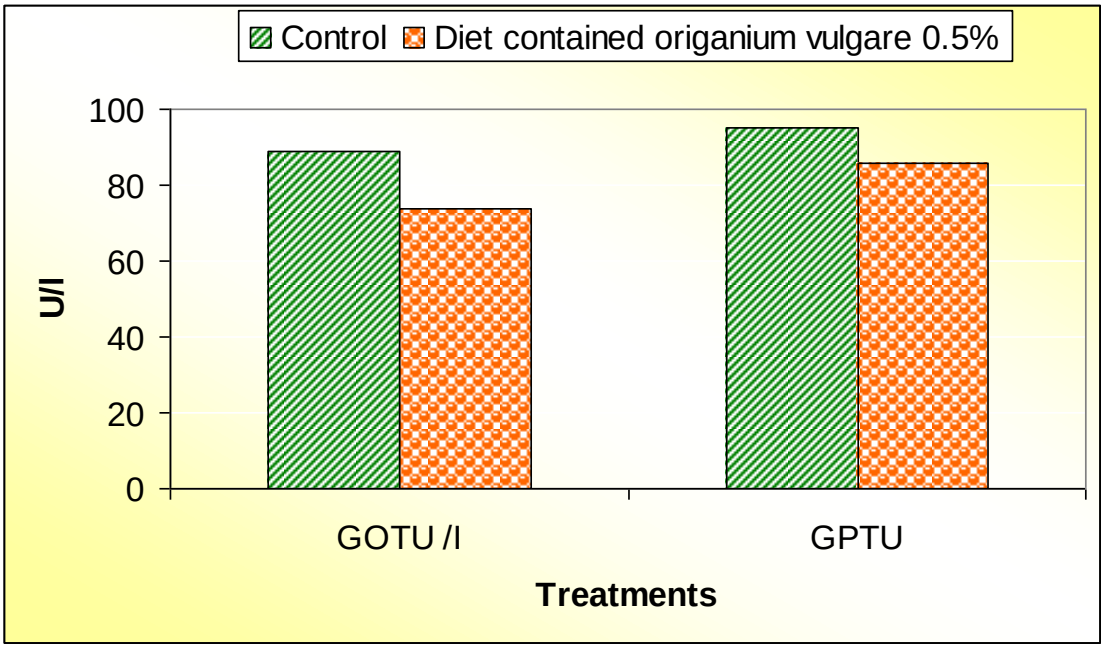

Fig. (8): The effect of 0.5 % *Origanium vulgare* extract on transaminases enzyemes in comparing with control of *O. niloticus* in aquarium during the laboratory experiment.

4.7.2 *Zingebare officinale* extract:

4.7.2.1 Total protein, albumin, and globulin values:-

Total protein, albumin, and globulin values increased significantly ($P \leq 0.05$) with *Zingebare officinale* extract supplementation and the highest values were obtained at 1% of the diet. The lowest value was obtained with untreated diet**,** while it was insignificantly affected the albumin / globulin (A/G) ratio. Table (17) and Fig. (9).

Table (17): The effect of *Zingebare officinale* extract (1 %) on serum protein (g/dl), S. albumin (g/dl) and A/G ratio (%), in comparing with control of *Oreochromis niloticus* in aquarium during the laboratory experiment.

Treatment	T. protein	S. albumin g/dl	Globulin g/dl	A/G ratio %
0.0%	4.32±0.17b	1.33±0.06b	2.99±0.17b	0.44±0.02a
1%	4.85±0.25a	1.49±0.07a	3.36 ±0.19a	0.44±0.01a

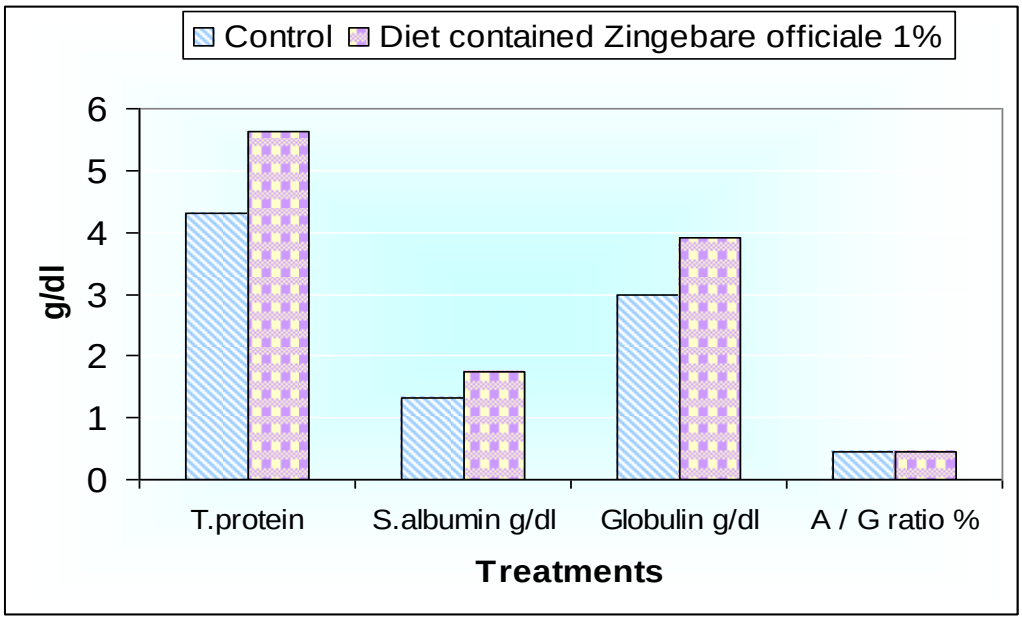

Fig. (9): The effects of *Zingebare officinale* extract (1%) on serum protein (g/dl), S. albumin (g/dl) and A/G ratio (%) in comparing with control of *O. niloticus* in aquarium during the laboratory experiment.

4.7.2.2 GOT and GPT values:-

GOT and GPT values (ALT- AST) decreased with the increased of supplementation by *Zingebare officinale* extract. The highest values were obtained at the control diet. Table (18) and Fig. (10).

Table (18): The effects of *Zingebare officinale* extract 1 % on transaminases enzyemes in comparing with control of *Oreochromis niloticus* in aquarium during the Laboratory experiment.

Treatment	GOT U / l	GPT U / l
0.0	89±3.78a	95±3.58a
1 %	74±5.52b	86±2.35b

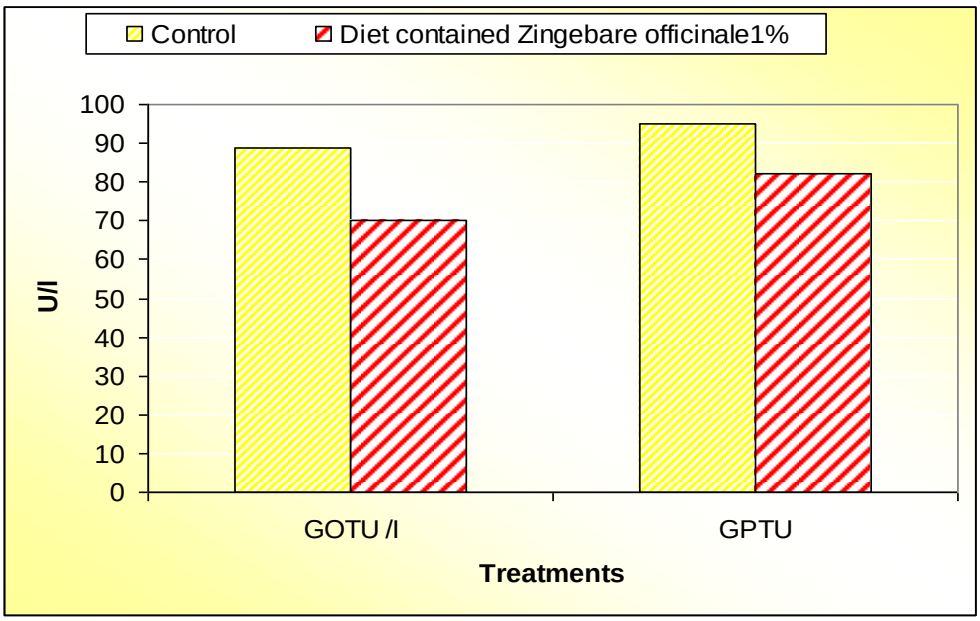

Fig. (10): The effects of *Zingebare officinale* extract 1% on transaminases enzyemes in comparing with control of *O. niloticus* in aquarium during the Laboratory experiment.

4.7.3 Efficiency of *Origanum vulgare* ethanolic extract against the pathogenic *Ps. aurgonsia* among *Orechromis niloticus*:

Table (19) and Photos (6 and 7) showed that the intrapretonial inoculation (I/P) by o.2 ml of *Ps. aurgonsia* (4 x 10^6) cells /ml caused mortality; 90 % among *Orechromis niloticus*, while the treated *Orechromis niloticus* with ethonalic extract turbines of *Origanum vulgare* had mortality (30%)**,** Photo (6 and 7)**.**

The other two groups did not show any mortalities or clinical sings. *Origanum vulgare* (natural disinfected) = *Chloramphenicol* (chemical antibiotic) **(Doaa A. El-Araby, 2006)** which Antibacterial sensitivity as well as minimum inhibatory concentrational (MIC) of the two compounds as compared with chloromphenecol were determined. The results inducate that the compound isolated from *Origanum vulgare* has the same MIC, value as chloromphenecol.

Table (19): Efficinecy of *Origanum vulgare* ethanollic extract against the pathogenic *Ps. aurgonsia* among *Orechromis niloticus*.

Treatments	No. of examined fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			NO	%
	20	0.2 ml	18	90
Origanum vulgare **(Ex**)	20	0.5 ml	-	0.0
Bact. + Ex.	20	0.2 ml from bact. + 0.5ml from Ex.	6	30
Control	20	0.2 ml saline	-	0.0

Bact. = Bacteria Ex. = Extract I/P = Intrapretonial injection

Photo (6): Fish challenging against of *Ps. aurgonsia*

Photo (7): Efficiency of *Origanum vulgare* ethanolic extract against the pathogenic *Ps. aurgonsia* among *Orechromis niloticus*

4.7.4. Efficiency of *Origanum vulgare* ethanolic extract against the pathogenic *Ps flourscence* among *Orechromis niloticus*:

Table (20) and Photos (8 and 9) showed that the intrapretonial injection (I/P) by 0.2 ml of *Ps. flourscence* (4 x 10^6 cells /ml) caused mortality (100 %) among *Orechromis niloticus*, while the treated *Orechromis niloticus* with ethonalic extract (turbines) of *Origanum vulgare* had mortality 40%**,** Photo (11)**.**

The other two groups did not show any mortalities or clinical sings. *Origanum vulgare* (natural disinfected) = *Chloramphenicol* (chemical antibiotic) **(Doaa A. El-Araby, 2006)**

Table (20): Efficinecy of *Origanum vulgare* ethanollic extract against the pathogenic *Pseudomonas flourscence* among *Orechromis niloticus*.

Treatments	No.of examined fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			NO	%
Ps flourscence	20	0.2 ml	20	100
***Origanum vulgare* (Ex)**	20	0.5 ml	-	0.0
Bact. + Ex.	20	0.2 ml from bact. + 0.5ml from Ex.	8	40
Control	20	0.2 ml saline	-	0.0

Bact. = Bacteria Ex. = Extract I/P = Intrapretonial injection

Photo (8): Fish challenging against of *Ps flourscence*

Photo (9): Efficiency of *Origanum vulgare* ethanolic extract against the pathogenic *Ps flourscence* among *Orechromis niloticus*

4.7.5. Efficiency of *Zingebare officinale* ethanolic extract against the pathogenic *Ps. aurgonsia* among *Orechromis niloticus*:

Table (21) and Photo showed that the intrapretonial injection (I/P) by 0.2 ml of *Ps. aurgonsia* (4 x 10^6 cells /ml) caused mortality (90 %) among *Orechromis niloticus*, while the treated *Orechromis niloticus* with ethonalic extract (turbines) of *Zingebare officinale* had mortality 40%**.**

Table (21): Efficinecy of *Zingebare officinale* ethanollic extract against the pathogenic *Ps. aurgonsia* among *Orechromis niloticus*.

Treatments	No. of examined fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			NO	%
Ps aurgonsia	20	0.2 ml	18	90
***Zingebare officinale* (Ex)**	20	0.5 ml	-	0.0
Bact. + Ex.	20	0.2 ml from bact. + 0.5ml from Ex	8	40
Control	20	0.2 ml saline	-	0.0

Bact. = Bacteria Ex. = Extract I/P = Intrapretonial injection

4.7.6. Efficiency of *Zingebare officinale* ethanolic extract against the pathogenic *Ps flourscence* among *Orechromis niloticus*:

Table (22) and Photo (14) showed that the intrapretonial injection (I/P) by 0.2 ml of *Ps. flourscence* (4 x 10^6 cells /ml) caused mortality (100 %) among *Orechromis niloticus*, while the treated *Orechromis niloticus* with ethonalic extract (turbines) of *Zingebare officinale* had mortality 50%**,** Photo (15).

Table (22): Efficinecy of *Zingebare officinale* ethanollic extract against the pathogenic *Pseudomonas flourscence* among *Orechromis niloticus*.

Treatment	No. of examined fish	Bacteria dose (4 x 10^6 CFU)	Mortality rate	
			NO	%
Ps flourscence	20	0.2 ml	20	100
***Zingebare officinale* (Ex)**	20	0.5 ml	-	0.0
Bact. + Ex.	20	0.2 ml from bact. + 0.5ml from Ex	10	50
Control	20	00.2 ml saline	-	0.0

Bact. = Bacteria Ex. = Extract I/P = Intrapretonial injection

Photo (10): Fish challenging against of *Ps. flourscence*

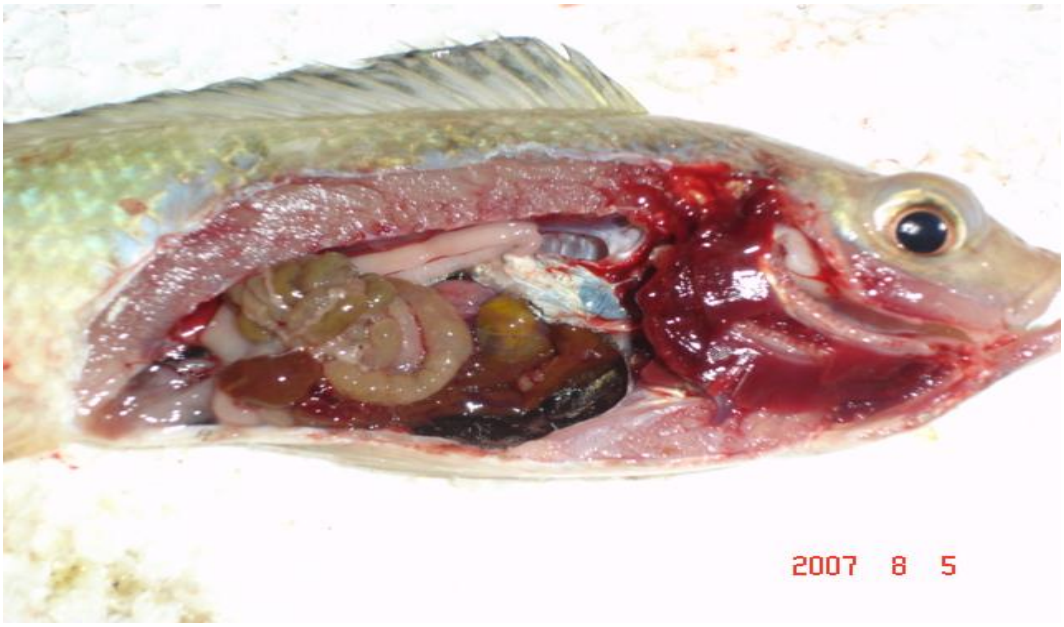

Photo (11): Efficiency of *Zingebare officinale* ethanolic extract against the pathogenic *Ps. Flourscence* among *Orechromis niloticus*.

Imge processing and hestographic analysis:

The results showed clearly that incarging data. Which revected a significant difference between infected fish with and without treatment by *Origanium vulgare* ($P \leq 0.001$) also infected fish with and without treatment by *Zingebare officinale* ($P \leq 0.001$).

1- The average mean of infected fish without treatment = 18.07
2- The average mean of infected fish with treated by *Origanium vulgare* extract = 63,27
3- The average mean of infected fish with treated by *Zingebare officinale* extract = 59,52. Look figures 11,12,13

It was also seen that the color variation in amount peaks and the location of each color was related to the structr content of the selected area i.e. red color peaks & blue color peaks and green color peaks in the histogram was clear and unike look figures 11,12 and13**.**