



An Attempt for Reduction of some mycotoxin (T2 toxin) in Sea bream (*Sparus auratus*) diet through adding two commercial anti-mycotoxins

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Abstract

This research was prepared to study the toxic effects of T2 toxin on sea bream fingerlings and to attempt releasing its toxic effects by using some commercial anti-toxic products, such as Agresol® and CAP T2® feed additives. T2 mycotoxin was added to the fingerlings diet by a dose of 1mg/Kg; And measuring the extent to the effect of these toxins on different sizes of sea bream between 30 – 32 gm and 18.9-29.6 gm., which were divided into six groups. Measurements were taken weekly for six weeks, Starting from the first week to the sixth week. The experimental fish were fed for 6 weeks at a rate of 3% of body weight daily. The mycotoxin (T2) diet has affected the growth rate, survival rate, feed consumption and protein utilization. Also the parameters of blood hematology and biochemistry, liver and kidney functions and the histopathological picture of the experimental fish. The most important results obtained from this research that the groups fed with diets containing (T2 toxin) were significantly affected compared to the control group (G1), then this effect was reduced by the addition of anti-mycotoxin to (G5 and G6) in fish diets.

Keywords: Sea bream- mycotoxin- T2 toxin- growth rate- survival rate- feed consumption and protein utilization- blood hematology and blood biochemistry- liver and kidney functions- histopathological effects.

INTRODUCTION

Mycotoxin are a secondary fungal metabolites produced from some fungi such as *Penicillium*, *Fusarium*, *Aspergillus flavus* and *Aspergillus parasiticus*. Mycotoxin are highly toxic, more carcinogenic, highly mutagenic and immunodepressive agents. Toxic fungi can invade a lot of foodstuffs and affect agricultural animals (**Abdelhamid and Saleh, 1996**) and humans (**Abdelhamid et al., 1999**). Toxic fungi can grow in moist area as in houses, Libraries, feed corns, earth dust, etc..(**Abdelhamid, 2008**).

Mycotoxin contamination is a serious problem to fish production, and lead to economic losses (**Iheshiulor et al., 2011**). It illustrated that 25% of the world's crops are affected by mycotoxins (**Hoof et al., 2010 and Iheshiulor et al., 2011**), and contamination can occur by more than one mycotoxins (**Santos et al., 2010**).

Mycotoxins can be hepatotoxic (**Manning 2001, Santos et al., 2010**), mutagenic (**Spring and Fegan 2005**), teratogenic (**Anonymous 2002**), carcinogenic (**D'Mello et al., 1999**) and lead to poor growth performance, increase mortality, decrease immune and reproductive functions (**Santacrocce et al., 2008 and Santos et al., 2010**).

Mycotoxins are of highly concern in aquaculture production because they accumulated in fish musculature and residues can be persist in fish products. *Fusarium* fungi are one of the widespread genera found in crops. Which can produce a lot of types of mycotoxins such as zearalenones, trichothecenes and T2, (**Santos et al., 2010 and El-Gohary and Barakat, 2015**). Mycotoxin contamination play a role in reducing fish productivity, blood anemia, liver function, weight loss and increase mortality through increase ability to secondary infections (**Marijan et al., 2017**).

Both T2 and HT2 toxins are produced from *Fusarium* species such as *F.Ocuminatum*, *F.Sporotrichiodes*, *F.Poaw*, and *F.Langsethiae* (**Kovac et al., 2022**), (**Janaviciene et al., 2022**), (**Hogaard et al., 2022**) and (**Prusova et al., 2023**).

T-2 toxin has adversely effect on feed consumption, growth rate, hematocrit and blood hemoglobin in fish. Where, mortality increased during secondary bacterial infection (**Santos et al., 2010**). Adequate processing and good selection of raw materials are the safety way to decrease mycotoxin contamination. Some chemicals such as zeolites, bentonites and aluminum silicates used effectively against aflatoxins (**Encarnação, 2011**).

The aim of this research is to record the T-2 toxin effects on the growth performance, liver and kidney enzymatic activities, biochemical parameters, hematological parameters, immune parameters and a histological picture of

selected organs of Sea bream , on the otherwise determining the preventive effect of adding two commercial anti mycotoxin to sea bream diet.

MATERIAL & METHODS

This research was prepared to demonstrate the effect of some commercial anti-toxin feed additives namely Agresol® and CAP T2® at a levels of (1gm/kg feed) to decrease the harmful effects of T2 toxin at a level of (1mg/kg feed) according to **El-Gohary and Barakat, 2015** on the diet of seabream fish for 6 weeks.

1- Experimental design:

The present study was carried out in a private farm at Borg-El Arab region at Alexandria governorate, Egypt. For a total of 180, healthy sea bream fingerlings were divided into six groups, each group in 2 replicates each of 15 fish. An average body weight were of 30-32 gm and 18.9-29.6 gm. Before beginning of data collection, fish were acclimatized for 2 weeks to adjustment the physiological parameters,. Sea bream were consumed the feed adlibitum .

Table (1): Showing the experimental design for studying the effect of T2 toxins on sea bream fingerling (*Sparus auratus*) and reducing its toxic effect by adding Agresol® and CAP T2® :

Treatment		Replicates
G 1	fingerlings fed on basal diet	(2 replicates/ 15 fish / each)
G 2	fingerlings fed on diet treated with 1 gm/kg food containing Agresol®	(2 replicates/ 15 fish / each)
G 3	fingerlings fed on diet treated with 1 gm/kg food containing CAP T2®	(2 replicates/ 15 fish / each)
G 4	fingerlings fed on diet treated with 1 mg/kg food containing T-2 toxin	(2 replicates/ 15 fish / each)
G 5	fingerlings fed on diet treated with 1 gm/kg food containing Agresol® + 1mg/kg food of T-2 toxin	(2 replicates/ 15 fish / each)
G 6	fingerlings fed on diet treated with 1 gm/kg food containing CAP T2® + 1 mg/kg food of T-2 toxin	(2 replicates/ 15 fish / each)

2- Experimental fish:

Sea bream fingerling put in a glass aquaria (90 x 60 x 35 Cm) containing 40L of dechlorinated water that was supplied with well-aerated. Glass aquaria were stocked for holding the experimental fish during this work; the aeration was continuously done by an electric aerator compressors. Fish depress were syphoned daily during changed one 3rd of the whole volume of the glass aquarium's water, which was replaced by the stored water in the tank. Water temperature was kept at 27 ± 1 °C. Finger ling were fed on basal diet during acclimatization before the begging of the experiment at a rate of 3% of the body weight. At the beginning of the experiment period, Finger ling were distributed in the experimental glass aquaria at a rate of 15 fish per aquaria.

3- Experimental diets:

A basal diet (43% CP, 19% ether extract, 7.3 Crude fiber, 6.2 Ash, 24.5 NFE, and 420.3kcal/100g DM gross energy, and 110 Energy/protein ratio) was mixed from fish meal 19%, Soybean meal 41%, yellow corn 15%, wheat bran 12%, Cellulose 10%, premix mixture 3%, and 2% fish oil. These commercial ingredients were formulated by a pelletizing machine (size 1mm), They were mixed by adding T2 toxin in a dose of 1mg/kg feed according to **(El-Gohary and Barakat, 2015)** to the diets of G4,G5and G6. Anti-toxin Agresol® and CAP T2® were added at a concentration of 1gm/kg feed to the diets of G2,G3,G5 and G6.

A-T-2 Toxin:

Toxin is 99% of purity (MYCOLAB Co., Chesterfield, Missouri 63017, USA). All mycotoxins were imported by Sigma–Aldrich, Ltd.

B- Dimethylsulfoxid (DMSO)

Supplied by El-Gomoheria Company, Egypt.

C- Agresol® :

Is a toxin binder that contains *Saccharomyces cerevisiae*, beta-glucan content, and chitinase enzyme., Manufactured by Agropharma Vet.

D- CAP T2® :

Is a toxin binder that combines adsorptive and enzymatic activities against mycotoxins. Manufactured by Promo Vet.

4- Growth parameters:

Average total gain (ATG), Average daily gain (ADG), Specific growth rate (SGR), Feed conversion ratio (FCR), Protein efficiency ratio (PER), Protein productive value (PPV), and Survival rate (SR) were recorded according to the following calculation:

- a- $ATG \text{ (g / fish)} = [\text{Average starting weight (g)} - \text{Average ending weight (g)}]$.
- b- $ADG \text{ (g / fish / day)} = [ATG(g) / \text{hall period (d)}]$.
- c- $SGR(\% \text{ day}) = [\text{ending weight} - \text{starting weight}] \times 100 / \text{hall period (d)}$.
- d- $FCR = \text{Feed Intake(g)} / \text{Live body gain}$.
- e- $PER = \text{Live body gain (g)} / \text{protein intake (g)}$.
- f- $PPV (\%) = 100 \times [\text{ending body protein (g)} - \text{starting body protein (g)}] / \text{C.P intake(g)}$.
- g- $SR = 100 \times [\text{hall number of fish at the end of the experimental period} / \text{hall number of fish at the start of the experimental period}]$.

5- Blood parameters determination:

Every week we take 4 fish from each aquarium randomly for collecting blood samples from caudal vein and adding anti-coagulant to blood samples for determination of :

- Hematological parameters:

For counting RBCs , WBCs , hemoglobin and Packed cell volume.

- Biochemical parameters:

For counting total plasma protein, albumin, globulin, AST , ALT, creatinine and urea.

- Differential leucocytic count:

For counting lymphocyte, monocyte, basophile, eosinophil and neutrophils.

6- Histopathological studies:

After T2 toxicity, Tissue specimens from spleen and gills were collected and fixed in formalin saline (10%), then dehydrated , after that embedded in paraffin blocks, Then make a cutting sections of 5 micron thickness, stained by h&e, and prepared for microscopical examination for detection of histopathological changes (*Curtis;1995*).

RESULTS

1- Growth performance, feed conversion ratio and survival rate parameters:

The data in table (2) shows that T2 toxin had a negative effects ($P \leq 0.05$) on the growth rate, body weight gain(BWG), average weight gain (ADG), feed conversion ratio (FCR), and survival rate (SR). And showed that there is no significant differences ($P \leq 0.05$) between the initial body weight in all treatments. While average daily gain (ADG) and survival rate were the best for

G1 (control). Otherwise, G3, to G6 (T2 toxin contaminated diet plus Agresol® and CAP T2® were better than G2 (T2 toxin without any anti-mycotoxin). These findings agree with **Abdelhamid (2008)** and **Salem *et al.*, (2010)**. This harmful effect might be due to decreased feed efficiency as a result of expelled feed from the fish's mouth (**Nguyer *et al.*, 2002**). And the measurements of feed conversion ratio (FCR) and survival rate (SR) of groups treated by T2, the table shows significant effects in group no. G2.

Table (2): Shows the mean standard error of the growth performance, feed conversion ratio, and survival rate of the sea bream fingerling fed for 6 weeks on a diet treated by T2 toxin:

Groups	Period Week	Initial weight	B.W.G* (gm)	A.D.G** g/day	F.C.R*** (%)	SR%****
G1	2 nd	3.30	48.60± 0.22a	0.70±0.23a	0.23± 0.22b	70a
	4 th	3.50	50.20± 0.22a	0.74± 0.23a	0.29± 0.22b	
	6 th	3.33	58.60± 0.23a	1.01± 0.22a	0.23± 0.22b	
G2	2 nd	3.40	35.20±0.22b	0.50± 0.22b	0.33± 0.23a	35c
	4 th	3.60	35.70± 0.22b	0.49±0.22b	0.35± 0.23a	
	6 th	3.30	56.50± 0.22b	0.26± 0.22b	0.39± 0.23a	
G3	2 nd	3.33	45.10± 0.22a	0.57± 0.23a	0.23± 0.22b	40b
	4 th	3.50	47.40±0.22a	0.70± 0.23a	0.25± 0.22b	
	6 th	3.70	56.90±0.23a	1.25± 0.22a	0.19±0.22b	
G4	2 nd	3.50	48.70±0.22a	0.71± 0.23a	0.23± 0.22b	80a
	4 th	3.40	47.50± 0.22a	0.70± 0.23a	0.24± 0.22b	
	6 th	3.20	58.20± 0.23a	1.77± 0.22a	0.27± 0.22b	
G5	2 nd	3.60	39.70±0.22a	0.62± 0.23a	0.23± 0.22b	50b
	4 th	4.00	49.90± 0.22a	0.58± 0.23a	0.22± 0.22b	
	6 th	3.20	57.90± 0.23a	1.75± 0.22a	0.24± 0.22b	
G6	2 nd	3.70	49.50± 0.22a	0.58± 0.23a	0.23± 0.22b	50b
	4 th	3.60	48.70± 0.22a	0.57± 0.23a	0.26± 0.22b	
	6 th	3.80	59.50± 0.23a	1.27± 0.22a	0.18± 0.22b	

B.W.G* Body weight gain, F.C.R*** feed conversion ratio., A.D.G** average daily gain., SR**** Survival rate. (G1): CTR, Control; (G2): Agr; (G3): CAP T2; (G4): T-2 toxin; (G5): Agr. + T-2 and (G6): CAP T2 + T-2.

2- Blood analysis:

Hematological parameters and data are mentioned in tables (3),(4) and (5), which illustrated that there is significant ($P \leq 0.05$) differences between treated groups, in all criteria, except albumin. Yet, G1 (control) had higher ($P \leq 0.05$)

RBCs followed by treatments G3, G4, G5, and the second treatment G6. But G2 had a higher white blood cell count (WBCs) followed by G4 and G6. There were no significant ($P \leq 0.05$) differences between treated groups G1, G3, G4, G5, and G6 for the concentration of globulin and total protein. This may be due to the depressive effects of T2 toxin on the immune system. Since Agresol® and CAP T2® stimulate liver enzymes (Salem, 2010 and Cheng-chun chou *et al.*, 1999). Therefore, G2 lowered total protein, albumin and globulin.

Table (3): Shows the Mean standard error of some hematological and biochemical parameters of the sea bream fingerling fed for 6 weeks on diet treated by T2 toxin:

Groups	Periods (week)	WBCs ($\times 10^4/\text{UL}$)	RBCs Count ($\times 10^6/\text{UL}$)	Packed cell Volume (PCV) (%)	Hemoglobin (g/dL)
G 1	1 st	25.11b	1.61b	22.33b	8.31a
	2 nd	25.03b	1.47b	22.24b	8.27a
	3 rd	25.14b	1.53b	22.30b	8.29a
	4 th	25.33b	1.68b	22.54b	8.36a
	5 th	25.42b	1.63b	22.49b	8.34a
	6 th	25.43b	1.62b	22.47b	8.33a
G 2	1 st	26.71a	1.83a	23.23a	8.51a
	2 nd	26.64a	1.79a	23.17a	8.47a
	3 rd	26.65a	1.80a	23.21a	8.28a
	4 th	26.81a	1.86a	23.39a	8.61a
	5 th	26.78a	1.83a	23.35a	8.57a
	6 th	26.79a	1.81a	23.31a	8.54a
G 3	1 st	25.17b	1.55c	22.13b	8.14a
	2 nd	25.21b	1.54c	22.11b	8.12a
	3 rd	25.19b	1.50c	22.08b	8.05a
	4 th	25.14b	1.53c	22.11b	8.12a
	5 th	25.19b	1.52c	22.10b	8.10a
	6 th	25.17b	1.47c	22.07b	8.03a
G 4	1 st	16.14c	1.02d	19.31c	6.34c
	2 nd	17.23c	1.05d	19.38c	6.47c

	3 rd	17.67c	1.09d	19.47c	6.57c
	4 th	20.24c	1.02d	19.09c	7.01b
	5 th	20.22c	1.00d	19.07c	7.04b
	6 th	20.25c	1.03d	19.09c	7.05b
G 5	1 st	22.24cb	1.11d	20.13cd	7.68cb
	2 nd	22.34cb	1.17d	20.16cd	7.71cb
	3 rd	22.37cb	1.19d	20.21cd	7.77cb
	4 th	20.36c	1.04d	19.12c	7.04cb
	5 th	20.33c	1.02d	19.09c	7.06cb
	6 th	20.37c	1.06d	19.15c	7.09cb
G 6	1 st	21.03c	1.22cd	20.22cd	7.18cb
	2 nd	20.37c	1.25cd	20.27cd	7.23cb
	3 rd	21.21c	1.29d	20.34cd	7.33cb
	4 th	21.25c	1.17d	19.34c	7.12cb
	5 th	21.17c	1.14d	19.25c	7.08cb
	6 th	21.21c	1.16d	19.32c	7.10cb

(G1): CTR, Control; (G2): Agr; (G3): CAP T2; (G4): T-2 toxin; (G5): Agr. + T-2 and (G6): CAP T2 + T-2.

Table (4): Shows the mean standard error of some hematological parameters (Total proteins, Albumin, and Globulin) of the sea bream fingerling plasma fed on T-2 toxin diet for 6 weeks :

Groups	Periods(week)	Total protein(g/dl)	Albumin (g/dl)	Globulin (g/dl)
G 1	1 st	4.88b	2.20a	2.68a
	2 nd	4.66b	2.75a	1.90b
	3 rd	4.79b	2.69a	2.10a
	4 th	4.74b	2.63a	2.11a
	5 th	4.21b	2.11a	2.89a
	6 th	4.34b	2.23a	2.11a
G 2	1 st	4.10a	2.00a	2.10a
	2 nd	5.67a	2.15a	3.52a
	3 rd	5.73a	1.74b	3.99a

	4 th	5.82a	2.02a	3.80a
	5 th	5.83a	1.93a	3.90a
	6 th	5.93a	1.51b	4.42a
G 3	1 st	4.41b	2.48a	1.93b
	2 nd	5.33a	2.14a	3.19a
	3 rd	5.42a	2.12a	3.30a
	4 th	5.67a	2.17a	3.50a
	5 th	5.79a	1.93a	3.86a
	6 th	5.77a	1.93a	3.96a
G 4	1 st	4.47b	2.46a	2.01a
	2 nd	4.33b	2.50a	1.83b
	3 rd	4.27b	2.46a	1.81b
	4 th	3.96b	2.77a	1.19b
	5 th	3.94b	2.74a	1.20b
	6 th	3.92b	2.68a	1.24b
G 5	1 st	4.75a	2.47a	2.28a
	2 nd	4.70a	2.57a	2.13a
	3 rd	4.69a	2.54a	2.15a
	4 th	4.66a	2.47a	2.19a
	5 th	4.61a	2.57a	2.04a
	6 th	4.60a	2.54a	2.06a
G 6	1 st	4.93a	2.53a	1.60b
	2 nd	4.84a	2.24a	1.90b
	3 rd	4.81a	2.93a	1.88b
	4 th	4.68a	2.24a	2.44a
	5 th	4.53a	2.50a	2.03a
	6 th	4.21a	2.48a	1.73b

(G1): CTR, Control; (G2): Agr; (G3): CAP T2; (G4): T-2 toxin; (G5): Agr. + T-2 and (G6): CAP T2 + T-2.

Table (5): Shows the mean standard error of some hematological and biochemical parameters for liver and kidney enzymes activities of sea bream fingerling plasma fed on T-2 toxin diet for 6 weeks :

Groups	Periods (week)	S.AST (IU/L)	S.ALT (IU/L)	ALP (IU/L)	Creatinine (mg/dL)	Urea (mg/dL)
G 1	1 st	26.36b	24.55c	6.78ab	0.18d	4.25c
	2 nd	26.14b	24.27c	6.33ab	0.20d	4.43c
	3 rd	26.42b	24.43c	6.52ab	0.21d	4.41c
	4 th	26.15b	24.27c	6.41ab	0.22d	4.21c
	5 th	26.32b	24.24c	6.32ab	0.20d	4.17c
	6 th	26.41b	24.29c	6.39ab	0.21d	4.21c
G 2	1 st	26.23b	24.52c	6.34ab	0.23d	4.34c
	2 nd	25.19b	23.34c	6.19ab	0.22d	4.21c
	3 rd	24.21c	23.19c	5.67ab	0.20d	3.83c
	4 th	23.24c	21.17cd	5.12ab	0.18d	3.47c
	5 th	23.22c	20.32cd	4.84c	0.17d	3.32c
	6 th	22.39c	19.17cd	4.57c	0.15d	3.19c
G 3	1 st	26.52b	25.31c	7.17ab	0.23d	4.61c
	2 nd	25.86b	25.19c	6.89ab	0.21d	4.44c
	3 rd	25.39b	24.87c	6.64ab	0.20d	4.37c
	4 th	25.23b	24.58c	6.48ab	0.19d	4.23c
	5 th	25.14b	24.26c	6.11ab	0.18d	4.19c
	6 th	24.89b	23.71c	5.89c	0.17d	4.09c
G 4	1 st	25.39b	24.43c	7.15ab	0.22d	4.16c
	2 nd	33.14a	31.21b	11.13a	0.55b	9.13b
	3 rd	35.27a	34.33b	13.07a	0.76a	12.12a
	4 th	41.68a	38.84b	15.52a	0.91a	16.57a
	5 th	42.17a	41.37a	15.77a	0.95a	17.44a
	6 th	45.27a	44.21a	17.83a	0.98a	19.58a
G 5	1 st	25.33b	24.22c	7.28ab	0.23cd	4.19c
	2 nd	28.47b	27.53b	9.11ab	0.38c	6.33b
	3 rd	30.51ab	30.40b	9.82ab	0.46b	7.84b
	4 th	32.58ab	32.58b	11.34ab	0.57b	9.37b

	5 th	35.37a	34.66b	13.53a	0.69a	11.44a
	6 th	38.23a	35.68b	13.61a	0.78a	12.59a
G 6	1 st	25.17b	24.19c	7.24ab	0.24d	4.16c
	2 nd	28.53b	27.62b	9.18b	0.41c	6.41b
	3 rd	30.66a	30.52b	9.93b	0.49c	7.92b
	4 th	32.73a	32.64b	11.47ab	0.68b	9.62b
	5 th	35.54a	34.72b	13.87a	0.74a	11.53a
	6 th	38.41a	35.79b	13.84a	0.88a	12.68a

(G1): CTR, Control; (G2): Agr; (G3): CAP T2; (G4): T-2 toxin; (G5): Agr. + T-2 and (G6): CAP T2 + T-2.

Table (6): Shows the mean standard error of differential leucocytic count in the blood of sea bream fingerling fed on T-2 toxins diet for 6 weeks :

Group s	Periods(week)	Lymphocyte	Monocyte	Basophil	Eosinophil	Neutrophil
G 1	1 st	60b	2a	8b	12b	18b
	2 nd	61b	1b	9b	13b	16b
	3 rd	60b	2a	11a	12b	15b
	4 th	61b	2a	8b	11b	18b
	5 th	60b	1b	11a	13b	15b
	6 th	60b	2a	12a	12b	14b
G2	1 st	66a	1b	8b	10b	15b
	2 nd	64a	1b	8b	12b	15b
	3 rd	65a	1b	9b	12b	13b
	4 th	63a	1b	10a	11b	15b
	5 th	64a	2a	8b	12b	14b
	6 th	65a	2a	8b	10b	15b
G 3	1 st	58c	1b	11a	16a	14b
	2 nd	57c	1b	10a	17a	15b
	3 rd	59c	1b	11a	16a	13b
	4 th	54c	1b	12a	15a	18b
	5 th	53c	1b	11a	16a	19b

	6 th	55c	1b	10a	15a	19b
G 4	1 st	49d	1b	11a	15a	24a
	2 nd	48d	1b	10a	15a	26a
	3 rd	50d	1b	11a	17a	21a
	4 th	37e	1b	11a	18a	33a
	5 th	38e	1b	10a	17a	35a
	6 th	35e	1b	13a	18a	33a
G5	1 st	54c	1b	12a	16a	17b
	2 nd	53d	1b	11a	16a	19b
	3 rd	54d	1b	10a	17a	18b
	4 th	49d	1b	11a	15a	24a
	5 th	50d	1b	10a	15a	24a
	6 th	49d	1b	10a	15a	25a
G 6	1 st	59c	1b	11a	16a	13c
	2 nd	58c	1b	12a	15a	14c
	3 rd	59c	1b	10a	15a	15c
	4 th	54c	1b	12a	16a	17b
	5 th	53c	1b	11a	16a	19b
	6 th	54c	1b	10a	17a	18b

(G1): CTR, Control; (G2): Agr; (G3): CAP T2; (G4): T-2 toxin; (G5): Agr. + T-2 and (G6): CAP T2 + T-2.

The present results concerning, AST, ALT, ALP, Creatinine, and urea activity had widely differences among the different treatment table (5) and table (6) indicating a damage in the liver function enzymes (AST, ALT) and kidney function (creatinine and urea) increased significantly ($P \leq 0.05$) in the group fed on T2 toxin treated diet. This finding appeared during acute T2 toxin nephrotoxicity and gall bladder distention due to osmoregulation disturbance (i.e. water retention) as mentioned by (**Abdel Hamid *et al.*, 2006**).

Some mycotoxins do not cause a significant decrease in the count of RBCs and cause a significant increase in WBCs count and treatment activity of mycotoxin for some fish, as mentioned by **Cheng-chun chou *et al.*, 1999**). Otherwise, the positive effects of some commercial anti-mycotoxins used in this research, namely Agresol® and CAP T2® may be due to increasing the

immunity and decrease its negative effects on the blood parameters of sea bream finger ling.

3-Histopathological finding

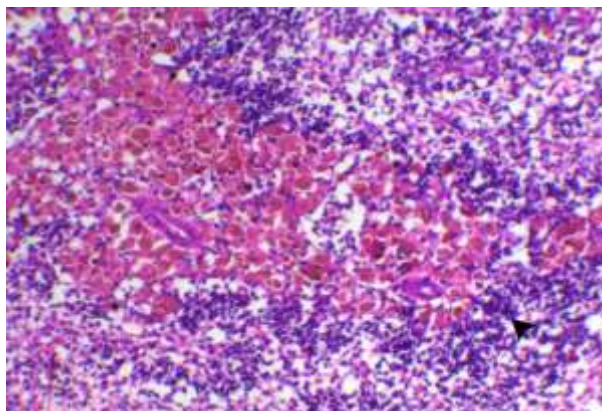


Fig. (1): Spleen of normal sea bream fingerling showing melanomacrophages surrounded by lymphocytes (arrowhead). H&E, X200.

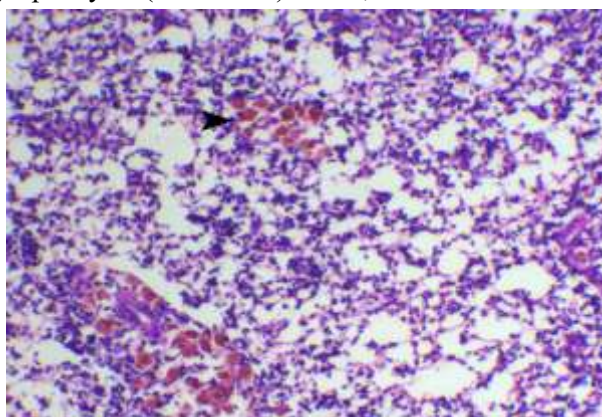


Fig. (2): Spleen of sea bream fingerling treated with T2 toxin showing marked lymphoid degeneration(depletion)and loss of melano macrophages centers (arrowhead). H&E, X200.

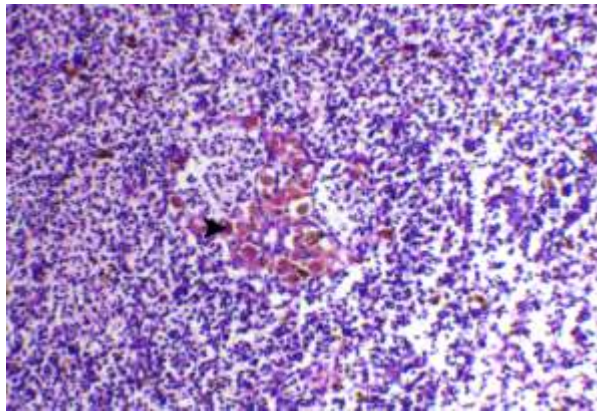


Fig. (3): Spleen showing congestion and lymphoid depletion in sea bream fingerling treated with T2 toxin and Cap t2 (arrowhead).H&E, X200.

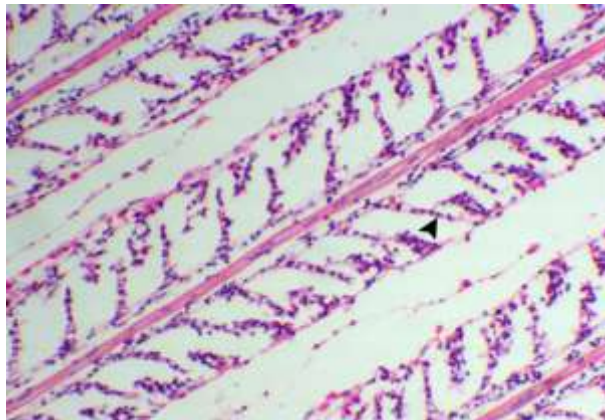


Fig. (4): Gills showing normal gill lamellae of sea bream finger ling (arrowhead). H&E, X200.

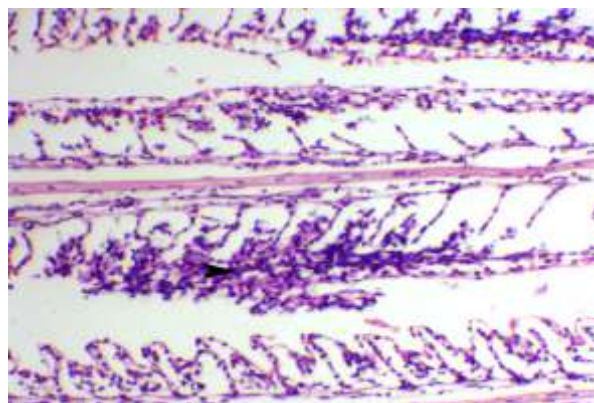


Fig. (5): Gills of sea bream fingerling showing gill lamellar adhesions treated with T2 toxin (arrowhead). H&E, X200.

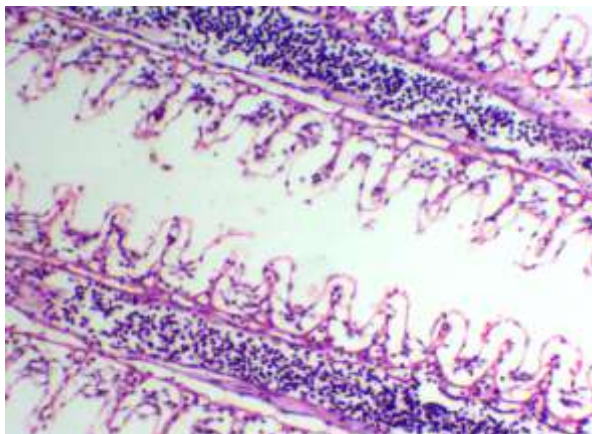


Fig. (6): Gills showing diffuse telangiectasis of gill lamellae in sea bream fingerling treated with T2 toxin and Cap t2 . H&E, X20

CONCLUSIONS

The forgoing research showed that adding of T2 mycotoxin in the diets of sea bream fish caused a bad effects and harmful signs in all treated groups, From another point of view T2 toxicity had a dangerous effect on the human consumption and fish production. So we recommended for adding (Agresol® and CAP T2®) anti-mycotoxin to contaminated diets. Also, from the above results, it is preferd to make a lot efforts and scientific researches to study how to use a natural products, plant, medical and aromatic chemicals to produce a commercial that have ability to detoxify and release the toxic effects of mycotoxins in fish diets and also other animals diets.

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