EVALUATION OF SOME HEAVY METAL RESIDUES IN FISH FROM MARKETS AT ALEXANDRIA PROVINCE

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Abstract

This study was conducted for monitoring the heavy metal residues level in Tilapia nilotica. Fresh fish samples of Tilapia nilotica were randomly collected from fish markets at Alexandria province. These samples were subjected to organoleptic examination and chemical evaluation to estimate pH, concentration of thiobarbituric acid(TBA) and histamine (Hm) as well as residues of Cadmium (Cd), Lead (Pb), Mercury (Hg) and Copper (Cu). The mean values of pH, (TBA) and (Hm) were 5.44, 0.024 and15.11. , while the mean levels of heavy metal residues were, 0.432, 0.122,0.0016 and 2.860 respectively The obtained data were evaluated according to maximum permissible limitsMPLof (ES, 2360/1993) issued by Egyptian Organization for Standardization and Quality Control (1993). The public health significance and suggested precautions for minimizing the level of such heavy metals in fish and protecting consumers' health were discussed.

INTRODUCTION

Fresh water fish, Tilapia nilotica (Bolty), isthe most common, eatable and cheapest source ofprotein in Egypt lives naturally in rivers and canals.In addition, nowadays there is an expansion in aquaculture of Tilapia nilotica in order to face the huge demand for protein of high nutritive value, palatableand good digestible. So it was considered as a good replacer of meat and poultry meals in the Egyptian diet. On the other hand, fishes have been recognized as a good accumulator of organic and inorganic pollutants (King and Jonathan, 2003).

The water in which fishes live may expose to several kinds of pollutants, either agricultural, industrial or sewage runoff (Daugomah et al.,1999). The deterioration effects of those compounds is especially acute on fish, and, eventually, on human health as a results of fishconsumption. (Fulton et al, 1999; Hyland et al, 2000 and Yuan et al, 2001).Heavy metals pollution has long been known and continues to be of Concern. The sources of heavy metal pollutions in environment may be of Natural processes and/ or human activities (Jordao et al., 2002).The human activities include 1- Agricultural sources as fungicides, herbicides, phosphate fertilizers, organic

manure and presence of decaying plant and animal residues. 2- Industrial sources as rubber and paint manufacture (Goel, 1997).

Fishes bio-accumulate heavy metals in their fleshes and organs, the rate of bioaccumulation depends on: The concentration of such metals in the river water and in the surrounding soil, the age of fish, the feeding habits, the ability of fish to digest metals and lipid content in the tissue of fish (Odoemelam et al., 1999).

Cadmium (Cd) is widely distributed in the earth crust; it is a non essential trace element which progressively accumulates inside the body, particularly in the kidney. Thus, incidence of renal stones, hypertension and anemia is increased in people affected with cadmium poisoning. (Watanabe et al., 2002).It is highly cumulative poison and may result in case called Itai-Itai disease causing severe pain, soft bones and death occurs as a result of renal failure (Peter,1993).

Lead (pb) is a well-known toxicant that has several deleterious effects even at very low concentrations. It accumulates in the body due to its low elimination rate and it is able to cross the placenta as early as the 12th and 14th week of gestation, so it will continue to accumulate mostly in fetal brain, kidneys, nervous system and red blood cells causing kidney damage, infertility, miscarriage and hypertension (Silbergrld, 1996 and Lars, 2003).Mercury (Hg) is a very important pollutant in our environment (Goyer, 1996). Global atmospheric changes carry the potential to disrupt the normal cycling of mercury and its compounds. Acid rain may increase mercury levels in freshwater fish (Fitzgerald and Clarkson, 1991). It is also used popularly in agriculture because of its ability to counteract fungi and mould; therefore, it has been widely used to prevent grain spoilage (Gossel and Bricker, 1990). The toxic effect of (Hg) caused redness of lips, throat and tongue; loss of teeth; swelling and redness of the skin with pink red finger tips. In addition it affects the nervous system causing irritability (Mert, 1987).

Copper (cu) is an essential trace element for animals and man, it is required for normal biological activity of many enzymes, hemoglobin formation and hair keratin (Prohaska and Gybina, 2004) .On the other hand, the excessive intake of copper (cu) may lead totoxicity which is manifested by nausea, vomiting, diarrhea and intestinal pain and the congenital inability to excrete copper and its accumulation in the body known as "Wilson S. disease". While copper deficiency results in anemia (Greenwood and Earnshaw, 1986). It is released into the environment primarily through

mining, sewage, treatment plant, solid waste disposal, welding and electroplating processes. In addition it is a common component of fungicides and algaecides, this agricultural use of copper can result in its presence in soil, ground, water and farm animals (ATSDR, 1990).

The ph value plays an important role in controlling the growth of micro-organisms, as enterobacteriacea and psycrotrophes. Their growth will be retarded or prevented under ph 5.4 (Kunz, 1994). The nutritional status of the fish and the amount of stress and exercise encountered before death will have a dramatic effect on the levels of stored glycogen consequently on the ultimate post mortem pH (Huss, 1995). So, ph value is considered as one of the most important factors reflecting fish quality.

Lipid oxidation is an important cause of quality deterioration in foods particularly fishes which contain high concentrations of lipid (8-20%fat). Tilapia nilotica is not considered as one of the fatty fishes, but its flesh contains high contente of the high content of highly polyunsaturated fatty acids which may oxidize leading to quality deterioration.Thiobarbituric acid (TBA) test is selected by many investigators for determining the oxidative rancidity because of its ability to be applied directly to the tissues without extracting the fat and the fat decomposition product responsible for test"malonaldehyde (MD)" (the fat decomposition product responsible for test) is obtained in much grater amounts from highly unsaturated fatty acids such as found in fish (Huss,1994). Fish will be in all probability smell and teste rancid when TBA value above 2 micromolesmalonaldehyde/ 1 g fish fat (Connell and Yu, 2008).

The endogenous enzymatic antioxidants, superoxide dismutase, glutathione peroxidase, and catalase are the first line of defense in inhibiting lipid peroxidation. Exogenous antioxidants such as vitamins A, E, C, selenium along with green tea, grape seed, and alpha lipoic acid is the second line of defense in inhibiting lipid peroxidation (Han et al., 2011).

Histamine (Hm) is biogenic amine that occurs, to varying degree, in many foods such as fishes and cheeses (Mayer et al, 2010). It has been proposed among the chemical indicators for determining fish quality and it is well known as a mediator of anaphylactic reactions (Haast et al., 2008).Its presence in food as a result of the action of extracellular histadine decarboxylases was biosynthesized by histamine-forming bacteria (Ben-Gigirey et al.,2000).Histamine (Hm) poisoning represents an important health risk for consumers, its presence in fish sometimes called scombrotoxin

because of the association of it with scombroid fish species as tuna and mackerel,however,it has also been linked to non scombroid fish with significant levels of histamine in their muscle tissue (Bjornsdottir et al., 2009).In healthy humans, dietary histamine can be rapidly detoxified by amino oxidase,individuals with low amine oxidase activity are at risk of Hm toxicity.Tthe resulting excess in Hm cause numerous symptoms that mimic an allergic reaction (Takashietal., 2011).

Egyptian Organization for Standardization and Quality Control (ES 2360/1993-1796/1996) stated that heavy metals residues in fish should not exceed the Maximum Permissible Limits (MPL) of 0.1, 0.1, 0.5 and 20 ppm for cadmium, lead, mercury and copper respectively. In addition the limits of pH value,thiobarbituric acid (TBA) and histamine (Hm) should not exceed 6.8, 4.5 mg MD/1000gm and100ppm respectively. The permissible residue level for mercury should not exceed 0.5ppm according to United States Environmental Protection Agency (USEPA). European legislation states that the mean value of histamine in fish should be < or = 100 ppm (McLauchlin, 2006).

The widespread of contamination with heavy metals in the last decades has raised public and scientific interest due to their dangerous effects on human health. This has led researchers all over the world to study the pollution with heavy metals; particularly these metals which pose serious health hazards to humans (e.g. Cd, Pb, and Hg) in air, water and food to avoid their harmful effects, to determine their permissibility for human consumption, to prevent biological deterioration and to identify the sources which threaten ecological equilibrium(Kinne,1984).

Therefore, the objectives ofthis study aremonitoring the hygienic quality of Tilapia nilotica fish retailed in different markets at Alexandria province throughOrganoleptic examination, determination of pH, thiobarbituric acid,histamine levels andcadmium, lead, mercury and copper residues in flesh of fish samples.Also,it suggested a protocol for prevention of this pollution to protect consumers.

MATERIALS AND METHODS

Collection of samples: a total of thirty fresh water fish, Tilapia nilotica, were collected from three different localities at Alexandria Governorate and divided into 3 groups 10" . samples for each". First group

(Group 1) was collected from different high class fish markets. The second one(Group٢) was collected from peddlers of fish. The third group (Group٣) were collected directly from fishermen at aquaculture places with average weight 300 grams for each sample in each group. All collected samples were transferred to laboratory without delay to be examined as following:

1-Organolyptic examination: All samples were examined organolepticaly in day light inside the laboratory according to the Quality Index Method (QIM) (Nielson and Hylding, 2004) as shown in Table (1) by six experienced panellists. Each assessor was giventhe scoring demerit points from 0 to a maximum of 3, where 0 represents best quality and any higher score indicated poorer quality. The panelists were asked whether the fish were acceptable or not.

Table (1): Quality Index Method scheme (QIM) for organoleptic examination of Tilabianilotica samples.

Quality parameter	Description	Score	Quality parameter	Description	Score
Appearance of skin	Very bright	0	Odor	Fresh	0
	Bright	1		Neutral	1
	Mat	2		Slight off odor	2
Texture	Hard	0		Strong off odor	3
	Firm	1	Eyes shape	Convex	0
	Soft	2		Flat	1
Gills color	Characteristic red	0		Sunken	2
	Somewhat pale	1	Average weight	300 g	
	Brown	2	Average length	23cm	
Gills odor	Fresh	0			
	Neutral	1			
	Some off odor	2			
	Strong off odor	3			

-Number of assessors=6 -Total demerit points (0-18)

2-Biochemical examination:

Preparation of samples:each fish sample was dissected and eviscerated. The muscle and skin tissue samples were taken from above the lateral line, at the beginning of the dorsal fin in each fish and as deep as the backbone. Gill filaments were removed from the cartilaginous gill arches. After dissection, the tissue samples were minced and homogenized separately. The samples were divided into two portions, first one was analyzed freshly for determination of pH, thiobarbituric acid (TBA) and histamine (Hm) and second portion was pleased on clean dry glass plates and dried in an oven at 105 C° for 48 hours. The dry sampleswere wrapped in aluminum foil and stored for analysis.The first portion of samples was subjected for:

A- Determination of pH: By using the pH meter Hanna instrument, 1990.The pH value was determined by using digital pH meter, the electrode was immersed in prepared meat extract (10 g fish flesh and 10 ml of distilled water) the results were record.

B- Determination of Thiobarbituric acid: (TBA) assay is well-established for screening and monitoring lipid peroxidation. MDA forms a 1:2 adduct with) TBA); the MDA-TBA adduct can then be measured. The method in this assay is designed to assay either MDA alone (in hydrochloric acid) or MDA in combination with HAE (in methanesulfonic acid.) The assay is based on the reaction of a chromogenic reagent, N-methyl-2-phenylindole (R1), with MDA and 4-hydroxyalkenals at 45°C. One molecule of either MDA or 4-hydroxyalkenal reacts with 2 molecules of reagent R1 to yield a stable chromophore with maximal absorbance at 586 nm. The determinations of TBA was conducted by methods (Huang et al., 2003).

C- Determination of Histamine: Enzyme-Linked Immuno-sorbent Assay used for the determination of histamine in Fish Samples. The amount of histamine was determined using Elisa kits, RIDASCREEN® histamine kit, R-Bipharm AG, Germany. The assay was performed according to the Manufacturer'srecommendation and according to principles the methods (Marcobal et al., 2005).

D- Determination of heavy metals: All laboratory equipment and containers were washed and soaked in 10%HNO3 and rinsed with deionized water prior to each use (Burger et al., 2001). One gram of dry sample of the muscle was digested separately in glass tubes with 10 ml of acid mixture (nitric acid/perchloric acid; 7:3 v/v). The digestion was facilitated by heating at 70 C, after cooling; all digests were filtrated through a Whatman 42 filter paper, and then diluted with deionized water to give a final volume of 25 ml.Aunicam 969 atomic absorption spectrometer with acetylene/air flame was used in accordance with the manufacture's specifications of cadmium, lead, mercury and copper within the digested samples (Wood and Van Vleet, 1996).

Statistical analysis:The results are expressed as mean ± standard deviation (SD). For statistical analysis we used Statistical software, version 9.0 (Stat Soft, Tulsa, OK, USA). N.B. samples with biogenic amines below the detection limit were given a value of half the detection limit. The value of $p<0.05$ was considered statistically significant unless indicated otherwise. Analysis of data using Analysis of variance (ANOVA) was carried out to test the significance of differences between the three groups in respect to different quality attributes in Tilapia nilotica through different localities (Snedecor and Cochran 1967).

RESULTS

Our obtained results were put in total collective tables to represent the parameters estimated in Alexandria province as the whole, then compared between the three regions.

Table (2): Results oforganoleptic evaluation were in the examinedTilapia nilotica fish samples according to (QIM) n=30.

Score	Number of sampleswithin the score	%	Judgment
0	23	76.66	Acceptable
6	5(G2)	16.66	Border line
16	2(G2)	6.66	Rejected

- Total demerit points(0-18)-Number of assessors=6-G2= group 2 samples collected from peddlers

Table (2)showed 23 (76.66 %) of examined fish samples scored (0) and their judgment Acceptable, 5 (16.66%) scored (6) at border line and2(6.66%) scored (16) and their judgment rejected. These results were recorded after each assessor was given simple descriptors, scoring demerit points from 0 to a maximum of 3andthey were asked whether the fish were acceptable or not.

Table (3): Results of pH values were in the examined Tilapia nilotica fish samples.

Item	Minimum	Maximum	Mean ± SE
pH	4.68	6.20	5.44+0.04

- ± SE = Standard Error of Mean -n=30 number of examinedsamples.

Data represented in (table3) showed that the pH values of the examined fish samples collected from Alexandria province ranges from 4.68 to 6.20 with Mean±SEM value of 5.44+0.04.

Table (4): Results of Thiobarbituric acid (u/M) and histamine values (ppm) were in the examined Tilapia nilotica fish samples.

Item	Minimum	Maximum	Mean ± SE	MPL	No. of samples over MPL
Thiobarbituric acid (U/m)	0.011	0.067	0.024 + 0.018	4.5	0
Histamine (ppm)	11.05	19.09	15.11 + 3.31	100	0

-±SE= Standard Error of Mean- MPL = maximum Permissible limits. n=30 number of examined samples.

Thiobarbituric acid values TBA (u/M) (table 4) were 0.011 to 0.067 with Mean± SE value of 0.024 + 0.018, while the histamine level was 11.05 to 19.09 with Mean± SE values of15.11 + 3.31.

Table (5): Results of Heavy metal residues (ppm) were in the examined Tilapia nilotica samples.

Item	Minimum	Maximum	Mean± SE	MPL
Cadmium (ppm)	0.203	0.679	0.432+ 0.052	0.1
Lead (ppm)	0.085	0.331	0.122+ 0.085	0.1
Mercury (ppm)	0.001	0.0033	0.0016+ 0.0007	0.5
Copper (ppm)	2.064	3.703	2.860+ 0.615	20

-± SE = Standard Error of Mean- MPL = maximum Permissible limits–n=number of examined samples

-n=30 number of examined samples.

Table (6): Thiobarbituric acid values (u/M) were in different groupsofthe examined Tilapia nilotica samples.

Group/ item	Mean ± SE	S D	MPL	Samples Above MPL	%
Group1	0.018 +0.005	A	4.5	0	0
Group2	0.026 +0.017	B		0	0
Group3	0.028 +0.018	B		0	0

- ± SE = Standard Error of Mean- S D = Significant Difference ($p < 0.05$) -n= 10 number of samples of each group.

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits.

Table (7): Histamine values (ppm)were in different groups ofthe examined Tilapia niloticasamples.

Group/ Item	Mean ± SE	S D	MPL	Samples Above MPL	%
Group1	13.45 ± 2.95	A	100	0	0
Group2	13.92 ± 3.69	A		0	0
Group3	18.46 ± 1.05	B		0	0

- ± SE = Standard Error of Mean - S D = Significant Difference (p< 0.05) -n= 10 number of samples of each group

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits

Table (8): Cadmiumvalues (ppm) were in different groupsof the examined Tilapia niloticasamples.

Group/ Item	Mean ± SE	S D	MPL	Samples Above MPL	%
Group1	0.271 ± 0.065	A	0.1	10	100
Group2	0.459 ± 0.019	B		10	100
Group3	0.649 ± 0.025	C		10	100

- ± SE = Standard Error of Mean - S D = Significant Difference (p< 0.05) -n= 10 number of samples of each group

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits

Table (9): The Lead residue values (ppm) were in different groupsof the examined Tilapia nilotica samples.

Group/ Item	Mean ± SE	S D	MPL	Samples Above MPL	%
Group1	0.148 ± 0.036	A	0.1	10	100
Group2	0.122 ± 0.084	B		10	100
Group3	0.101 ± 0.028	C		10	100

- ± SEM = Standard Error of Mean - S D = Significant Difference (p< 0.05) -n= 10 number of samples of each group

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits

Table (10): The Mercury residue values (ppm) were in different groups of the examined Tilapia nilotica samples.

Group/ Item	Mean ± SEM	S D	MPL	Samples Above MPL	%
Group1	0.002 ± 0.001	A	0.5	0	0
Group2	0.001 ± 0.0004	B		0	0
Group3	0.001 ± 0.0004	B		0	0

- ± SEM = Standard Error of Mean - S D = Significant Difference ($p < 0.05$) -n= 10 number of samples of each group

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits

Table (11): Copper residue values (ppm) were in different groups of the examined Tilapia nilotica samples.

Item Group	Mean ± SE	S D	MPL	Samples Above MPL	%
Group1	2.75 ± 0.77	A	20	0	0
Group2	3.22 ± 0.44	B		0	0
Group3	2.66 ± 0.72	A		0	0

- ± SE = Standard Error of Mean - S D = Significant Difference ($p < 0.05$) -n= 10 number of samples of each group

- The same letter means no significant differences using ANOVA test at 0.5% - MPL=maximum Permissible limits

DISCUSSION

Environmental pollution is one of the most deleterious agents to biological life. Heavy metals occur naturally in aquatic systems and accumulate in the tissues of aquatic organisms. The increase of population comes from industrialization and agricultural activities offered additional hazards to environment where more and more wastes entering the river Nile (Raghib et al, 2003).As a result,Tilapia nilotica which naturally live or/and aqua cultured by Nile water accumulate metal pollutant in its muscle tissue. Fish are very perishable food due to it incorporate the viscera which spoil very quickly and also its moisture-rich meat are fragile.

The present study revealed that76.66%(23) of the examined samples was organolipticaly accepted,16.66%(5)at border line and6.66%(2)was rejectedaccording

to QIM (table2).The last tworesultsindicate inadequate preservative measure and bad manipulation after harvesting.

Data represented in (table3) showed the pH values of the examined fish samples ranges from4.68to6.20 with meanof 5.44 ±0.04; (Table4)Thiobarbituric acid values TBAwere 0.011 to 0.067 with mean of0.024 + 0.018. The histamine level was ranged 11.05 to 19.09with mean of15.11+ 3.31.There wasa significant difference found between samples of group1 which collected from high class fish markets and each of group2 and 3(Table 6). Regarding to the histamine values (Table 6).Therewas a significant difference between samples of group 3 which collected from aquaculture places and each of group 1and2 (Table 7).

Thiobarbituric acid and histamine values in all examined samples were agreed with the MPL of TBA and Hmstated byEgyptian Organization for Standardization and Quality Control ES(ES, 2360/1993) and European legislation (McLauchlin, 2006) ,respectively..On the other hand two of examined samples recordedwith high pH values. These results met the organoleptic results recorded with score 16 according to QIM and their judgment were rejected. So the pH value of fish flesh reflects its quality and freshness.The maximum levels ofTBA and Hmwere 0.067(u/M) and19.09ppm, respectively, which were considered low compared to MPL stated by ES (ES, 2360/1993)may be return to the fact that Tilapia nilotica is nota kind fromeach of fatty or scombroid fish kinds. Our results ofhistamine levelswere lower than those obtained by (Takashi et al., 2011). Who alsostudied the correlation between Hm content and microbial count at deferent pH value in samples of Sardine and Mackerel and they found high counts of bacteria (genuslactococci and staphylococci) in samples with high Hm and pH values.

Cadmium is a cumulative toxic metal with biological half life ranging from 20-40years (Shibamoto and Bjeldanes, 1993). While the time of accumulation continues, the quantities of metal in organs also increase. These properties of cadmium make it especially dangerous.Mean cadmium (Cd) level of examined fish samples (Table5) was0.432+ 0.052ppm.There was a significant difference found between samples of each group (Table8). According to ES(ES, 2360/1993), our results exceed MPL in all examined samples (100%). Nearly similar cadmium levels were reported byMohammadi et al (2011) and Noha and Ghada (2007) in fresh-water fish. Slight higher results were recorded by Essa and Rateb(2008) and Hashim et al.,(2007) in Tilapia nilotica and Uysal et al., (2012)in fresh water fish. Much higher levels were reported by Salah et al., (2009) incatfish as well asAskary and Beheshti (2012) andMalhat(2011) in fresh water fish.

Regarding lead residues, the obtained results revealed that the mean level of this metal in Tilapia nilotica samples was 0.122 ± 0.085 (Table5).The statistical analytical results showedsignificant difference between lead residues in deferent examined groups (Table9). All examined samples slightly exceed MPL stated by ES (ES, 2360/1993). Lead is a very important heavy metal because it shows toxic effect on living systems. Human absorbs lead in small amounts from food, water or/ and air. About 15-18 million children in the developing countries have permanent suffering from brain damage as a result of lead poisoning (Tong et al., 2000). Lead levels in our study were in accordance with those reported by Essa and Rateb, (2008) and Hashim et al., (2007)in Tilapia nilotica in Assuit and Luxor cities, respectively and Mohammadi et al., (2011) in fishof Karoon and DezRivers.Higher levels reported by Noha and Ghada, (2007), Salah et al., (2009), Askary and Beheshti, (2012) andMalhat, (2011).

Results illustrated in (table5) showed that the mean level of mercury in examined samples was 0.0016 ± 0.0007. There was a significant difference between mercury residues in group1 and the other two groups (table 10). Meanwhile, our results of mercury levels in all examined sampleswere very low in the comparison to MPL stated by ES (ES, 2360/1993-2004).Inaddition higher results were obtained byAskary and Beheshti (2012)Mohammadi et al (2011) and Salah et al (2009) in different fish samples. Much higher results were recorded by Noha and Ghada (2007) and Essa and Rateb (2008).

Mean copper levels in the examined fish sampleswas 2.860+ 0.615(Table6). There was a significant difference between copper residues in examined samples of group2 and the other two groups (table10). All our results of copper levels were within the MPL stated by ES (ES, 2360/1993). Copper level in the present work nearly similar to the result recorded by Uysal et al (2012) in fresh water fish. On the other hand, higher results of copper residues reported by Malhat (2011) and Hashim et al (2007) in fresh water fish and much higher results reported by Salah et al (2009) in catfish. Clark (1989) reported that copper does not bio-accumulate or bio-magnify inside the fish tissue.

CONCLUSION AND RECOMMENDATIONS

The results of the present study concluded that examined Tilapianilotica samples polluted with toxiclevels of heavy metals (Cadmium& lead) although, these samples organolepticallyaccepted. The obtained high levels of Cadmium and leadin allTilapianilotia samples either collected from deferent markets or aquaculture places may reflect the elevated pollutionof

Nile River. Sensoryrejected and border line judged samples may be may reflect improper preservative measures in fish market.

We recommend that Government should prohibit the industrial companies to discharge their effluents intoNile River before application of effective hygienic treatment and/or safe disposal of hazard waste. Agricultural runoff water should not used for aquaculture. Fishes, in general, should be cooled as soon as possible after harvesting to reduce the amount the contaminated heavy metals contaminations.

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تقييم بعض المعادن الثقيلة فى أسماك اسواق محافظةالاسكندرية

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فى الآونة الأخيرة أصبحت مشكلة التلوث بالمعادن الثقيلة خطرا كبيرا يهدد صحة الانسان والكائنات الحية. وأسماك البلطى من ضمن الأسماك واسعة الاستهلاك بجمهور عريض داخل القطر المصرى وعليه اجريت هذه الدراسة فقد تم تجميع عدد ٣٠ عينه من أسماك البلطى من كل من الباعة الجائلين والأسواق المغلقه ومن المزارع السمكية فى محافظة الاسكندرية وتم عمل الكشف الظاهرى والتحليل الكيميائى للعينات وتم تحديد الاس الهيدروجينى، حمض الثايوباربيتيورك، الهستامين وقد كان متوسط النتائج ٥.٤٤ ، ٠.٠٢٤، ١٥.١١ على التوالى الى جانب تحديد مستوى بقايا عناصر الكادميوم، الرصاص، الزئبق والنحاس وكانت النتائج ٠.٤٣٢، ٠.١٢٢، ٠.٠٠١٦ و ٢.٨٦٠ على التوالى. وتم تقييم النتائج مقارنة بالحدود المسموح بها بالمواصفات القياسية المصرية. وكذلك قد تم مناقشة الاهمية الصحية و التأثيرات السامة بهذه المعادن الثقيلة وكيفية التحكم أو منع وصول هذه العناصر الى أسماك البلطى وحماية المستهلكين .