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Seasonal variations of heavy metal concentrations in tissues of Talang Queenfish (*Scomberoides commersonianus*) from Iraqi marine and coastal waters, Northwestern Arabian Gulf

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Abstract -This study was carried out during the period from Winter 2010 to Winter 2011 to evaluate the concentrations of heavy metals (Fe, Co, Ni, Cu and Pb) in tissues of commercially valuable coastal fishes (Talang Queenfish, *Scomberoides commersonianus*) from Iraqi coastal areas around the Faw Peninsula which receives petrochemical wastes. Thus, it is important to identify the extent of concentrations of heavy metals in fish and consider potential impacts on the food chain and risks to human health. Fe had the highest level of accumulation in the four tissues examined (gill, muscle, liver and gonad) of *S. commersonianus* whilst Pb had the lowest ($p < 0.05$). The order of the heavy metal concentrations in the gills, muscles, liver and gonad tissues of *S. commersonianus* across all the stations was Fe (198.27 μg/g) > Co (21.07 μg/g) > Cu (7.89 μg/g) > Ni (5.43 μg/g) > Pb (1.85 μg/g). This study suggests that additional measures must be taken to monitor waste and ambient water quality, and to prevent contamination of fish for human consumption.

Keywords: Arabian Gulf, Faw Peninsula, Heavy metals, Pollution, Fish and Bioaccumulation.

Introduction

Environmental pollution and its hazards are a worldwide crisis. Heavy metals are a dangerous type of pollution as they may accumulate in the tissues of fish (Rasheed, 2012) and be consumed by humans.

Levels of heavy metals in the environment are known to be linked with petroleum industry operations (de Mora *et al.*, 2010). Crude oil produced for export from the southern Iraqi oilfields is carried through pipelines to Al-Basrah Oil Terminal that lie approximately 50 km (31 mile) southeast of the Faw Peninsula in the northern Arabian Gulf. However, industrialization has led to increased discharge of pollutants into the natural environment.

It has been reported that industrial and domestic waste waters are important sources of heavy metals in aquatic environments, including water and sediments (Rasheed, 2012). Therefore, scientists should consider the fate of pollutants, and how to avoid or reduce the effects of pollution on the environment. Consequently, pollution sources, environmental effects and prevention methods should be assessed.

Metals tend to concentrate in water and move through the food chain in a process known as bioaccumulation. Fish are an important source of protein, omega-3 fatty acids, iron, zinc and calcium, and many Iraqis consume fish for their numerous nutritional and health benefits. Recent works have found that heavy metals bioaccumulate in different fish tissues such as gills, liver, tail, muscles, intestine and liver (Al-Khfaji, 2005; Olowu *et al*., 2010; Al-Saad and Al-Najare, 2011). Therefore, safe human consumption of fish is public health interest (WHO, 1999).

Marine and coastal waters around Fao include some of the most important aquatic systems in the northwestern Arabian Gulf (Fig. 1), but receive waste water discharges from petroleum operations, and surface water drainage from farms. Fish that grow in this area could be a potential source of heavy metals intake for human consumers, especially when if consumed frequently. Thus, a study of heavy metals in the environment and an assessment of levels that may be potentially harmful for human consumption are necessary.

In spite of the visible increase in industrial and domestic activities around the Fao region, little attention has been paid to levels of heavy metal in marine sediments and fish. Therefore, the objective of this work was to determine the seasonal variations and distribution of copper (Cu), cobalt (Co), Iron (Fe), nickel (Ni) and lead (Pb) in a popular fish for human consumption, Talang Queenfish (*Scomberoides commersonianus* Lacepede). Samples were collected from marine area around Fa0 region with the aim of providing data to scientists and to alert public authority on the need for environmental protection. This fish is an important and widely used species as salted and sun dried fish, and has high market price in Arabian Gulf and Indian Ocean. The species is widely distributed across the Indo-West Pacific, from eastern coast of Africa to Australia, and inhabits shallow coastal waters to offshore areas.

The study also provides useful data as a baseline for future monitoring studies concerning heavy metals contamination in fish and marine sediments.

Materials and Methods

The study was carried out in marine waters offshore from the Faw Peninsula, which located 100 km south Basrah City, at approximately 30°00'N and 48°30'E (Fig. 1). Heavy metals Cu, Co, Fe, Ni and Pb in *S. commersonianus* tissues were determined from fish collected at three sampling stations between December 2010 and December 2011. Heavy metal concentrations were assessed by graphite furnace atomic absorption spectrometry following the procedure given by ROPME (1982). Heavy metal concentrations were expressed as microgram per gram ($\mu g\ g^{-1}$) dry weight.

Fish samples:

A total of 72 *S. commersonianus* samples (20.7 to 38.2 cm length and 96.0-579.2 g weight) were collected with the assistance of local fishermen at the following locations: Al-Fao Station (48° 33.8' E and 29° 56.8' N); Crane (48 47.0' E and 29° 51.0' N) and Al-Ameeq (48° 48.0' E and 29° 46.0' E) (Fig. 1).

Freshly caught fish were dissected, and the gills, liver, muscles, and ovaries were separated. The samples were wrapped in plastic bags. The samples then were freeze-dried, ground and sieved prior the analyses. Concentrations of heavy metals (Cu, Co, Fe, Ni and Pb) were determined using Atomic Absorption Spectrometry following the methods which described by ROPME (1982).

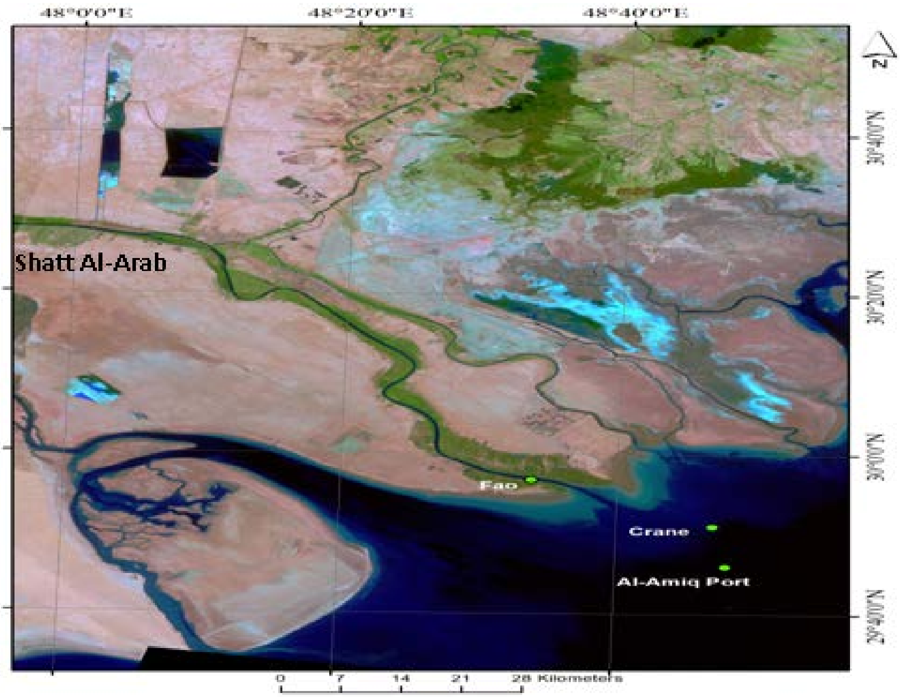

Figure 1. Showing sampling stations in northwestern part of the Arabian Gulf.

Statistical Analysis:

Data were tested for normal distribution first, and analyzed by one-way analysis of variance (ANOVA). Seasonal variations in heavy metal concentrations were examined using t-test. Significance was tested at the $p<0.05$ levels. The analysis was done using SPSS Statistics software (version 17).

Results

Heavy metals in fish samples:

The heavy metals Cu, Co, Fe, Ni and Pb were analyzed in gills, muscles, liver and gonad to assess the level of bioaccumulation during whole period of the study are given in Figure (2). The results indicated that the metals in highest concentrations in all tissues were Fe and Co (Fig. 2); the metal in lowest concentration was Pb. Thus, the order of metals concentrations in all tissues was Fe > Co > Cu>Ni > Pb. Concentrations of metals in gills and liver were significantly higher than in other tissues ($p < 0.05$), while muscle and gonads appear the least contaminated ($p < 0.05$) (Fig. 2). The lowest value of Pb across all tissues was found in gonads (ND to 0.01 μg/g).

Seasonal variation of heavy metals accumulation:

The seasonal differences for heavy metal accumulation in the gills, liver, muscle and ovaries are given in Figures (3a-3e). Accumulations displayed significant variation among different seasons ($p <0.05$). There was also a clear seasonal difference among concentration of Pb in the liver, muscle and gills and concentration of Co, Cu and Ni in the gills, except in the few cases (Figs. 3a-3e).

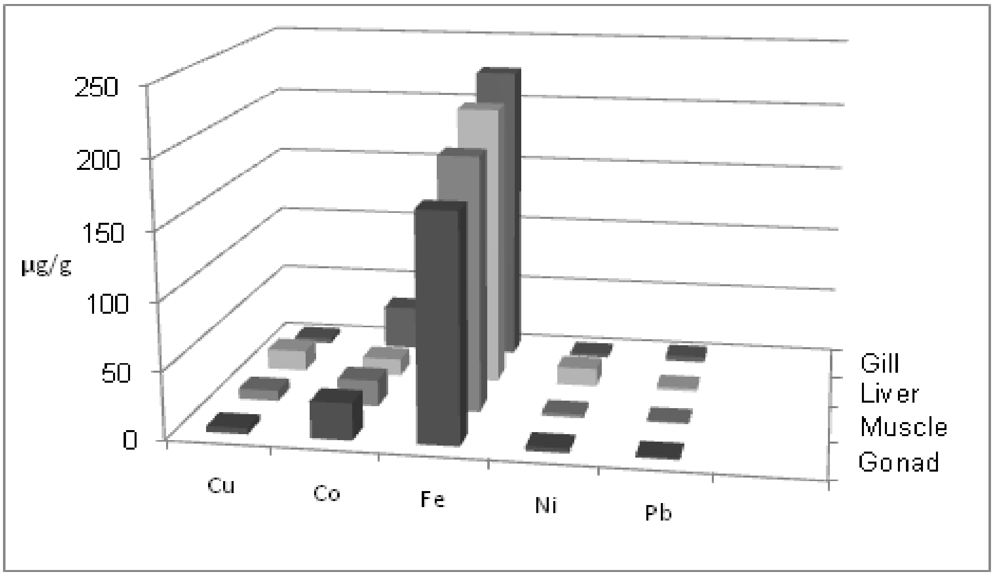

Figure 2. Mean concentration (μg/g) of heavy metals in fish tissue from Iraqi Marine water during the study period.

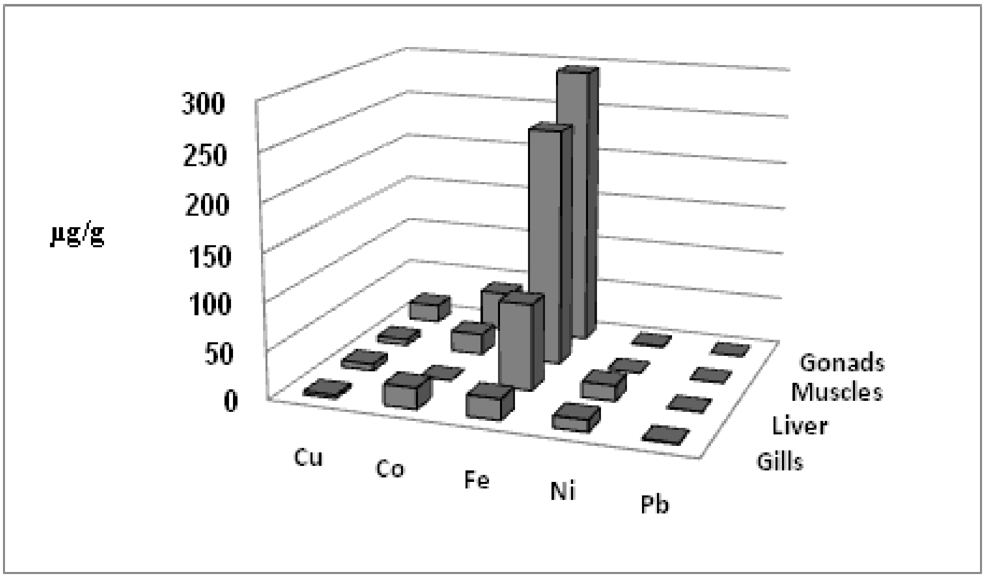

Figure 3a. Winter 2010 concentrations of heavy metals (μg/g) in different tissues of *Scomberoides commersonianus*.

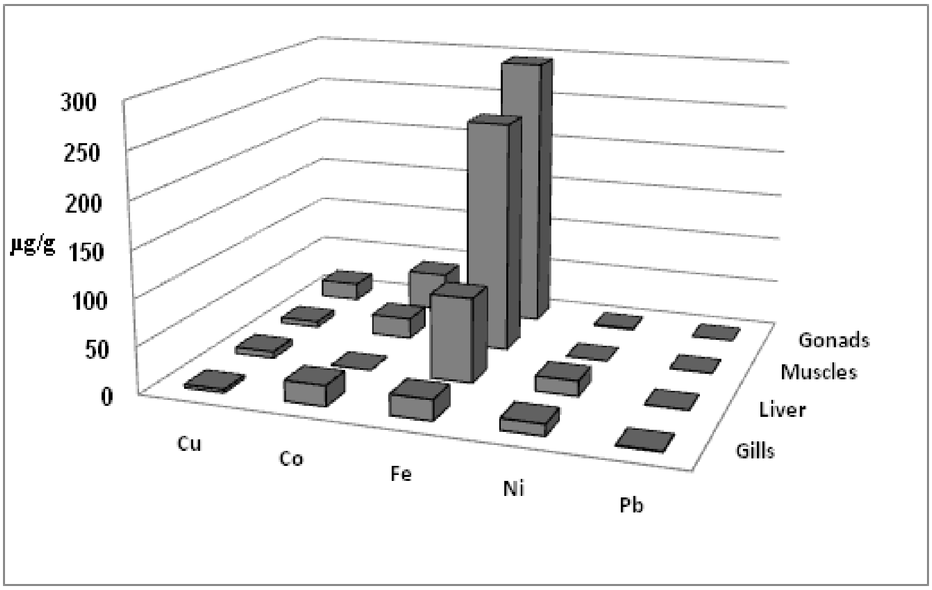

Figure 3b. Spring 2011 concentrations of heavy metals (µg/g) in different tissues of *Scomberoides commersonianus*.

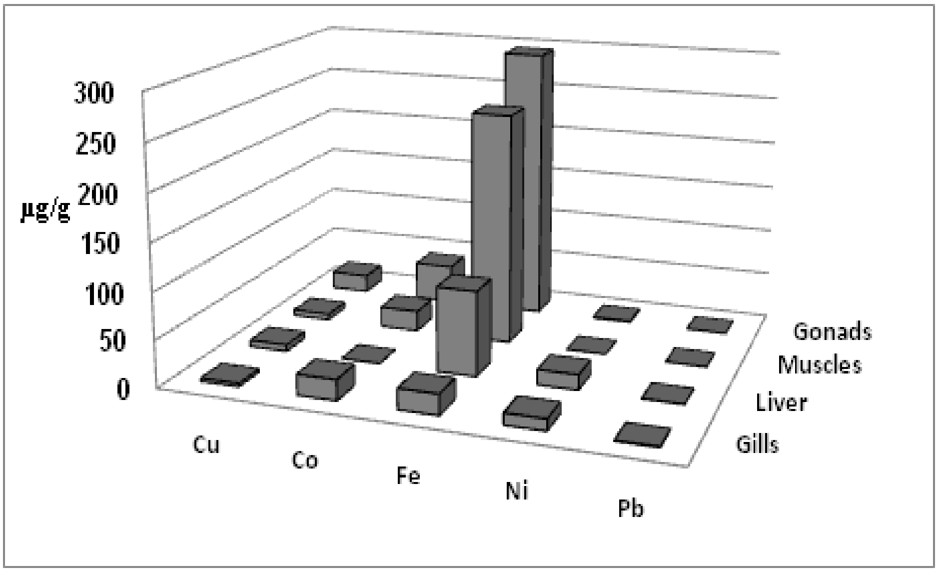

Figure 3c. Summer 2011 concentrations of heavy metals (µg/g) in different tissues of *Scomberoides commersonianus*.

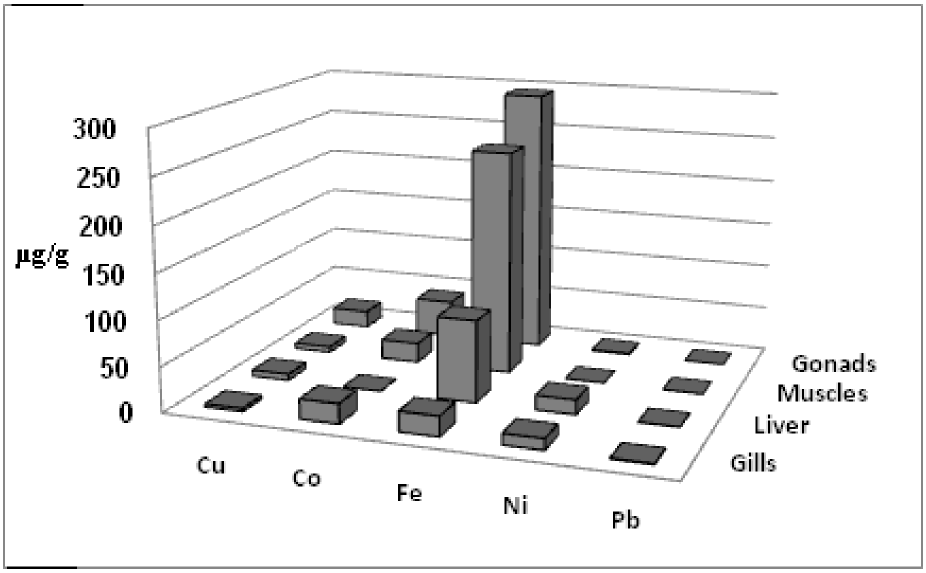

Figure 3d. Autumn 2011 concentrations of heavy metals (µg/g) in different tissues of *Scomberoides commersonianus*.

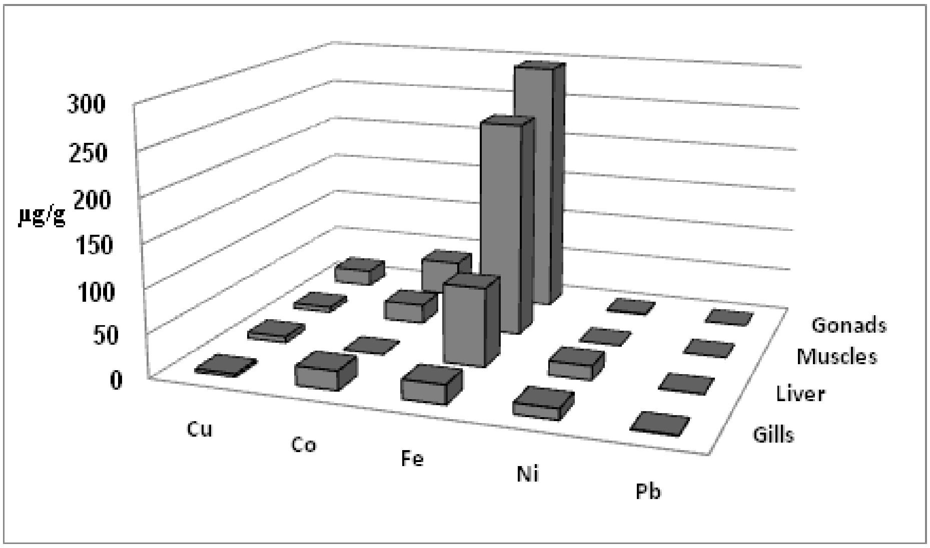

Figure 3e. Winter 2011 concentrations of heavy metals (µg/g) in different tissues of *Scomberoides commersonianus*.

Generally, the results indicated that the concentrations of Fe, Co, Cu and Pb in the gills and liver and Ni in the gonad during winter were lower than summer ($p < 0.01$).

On the other hand, Co, Cu and Ni concentration in the gills and gonad during winter was significantly higher than summer. With the exception of winter 2011, muscles appear to be the least contaminated with heavy metals during this investigation. The concentrations of Ni and Pb in most tissues and in most sampling seasons were below the detection limit (Figs. 3a-3e).

Discussion

This study has reported the levels of Cu, Co, Fe, Ni and Pb in *S. commersonianus,* which forms a part of the daily diet of the people in Basrah Province, Iraq. Bioaccumulation of metals in fish tissues may be dangerous to human health, therefore, an understanding of the concentration of metals in aquatic ecosystem is important (Ademoroti, 1983). Metals contribute to a range of adverse effects that can impact human health, and each may cause different behavioral and physiological changes in an exposed individual (Salehifar *et al*., 2008).

Most of the investigations of fish from estuaries and coastal waters associated with industrial and sewage discharges have found contamination with heavy metals (Tariq *et al*., 1993). However, metals may also accumulate in water (Daka *et al*., 2003), and may absorb by organisms under different physicochemical situations, and so move up through the food chain (Bryan and Langston, 1992; Shokrzadeh *et al*., 2008).

In addition, sediments are considered as the most significant reservoir or sink of metals and other pollutants in the aquatic environment (Gupta *et al.*, 2009). Fernandes *et al.* (2007) suggested that the heavy metal pollution in sediment can affect the water quality and bioaccumulation of metals in aquatic organisms, resulting in potential long-term detriment to human health and environment.

Heavy metal problems in the fish are serious, as reflect by the high metal concentrations found in the water and sediments (Wong *et al*., 2001). Olowu *et al.* (2010) reported that metals accumulate in the sediments of aquatic systems due to industrial and domestic effluents, and Fernandes *et al.* (2007) reported that heavy metal contamination in sediment can influence the water quality and bioaccumulation of metals in aquatic organisms. This results in potentially long-term negative implications on human health and the environment. Historically, a lack of attention to environmental safety has been associated with increased population in an area (Saeedi *et al*., 2009). Thus, industrialization often leads to the environmental pollution.

There are differences and similarities among the results of the present work and the results from studies in the region. Comparison of metals concentrations in the current study with environmental standards established across the region (Table 1), showed that Cu concentration in the fish tissues did not exceed the Turkish Environmental Guidelines (1988), FAO (1983) and Saudi Arabian Standards Organization, SASO (1977).

However, Cu measured from winter season samples did exceed the Turkish Environmental Guidelines (1988) and SASO (1977). Measured values of Fe and Ni in the fish tissues were higher than the recommended standard limits. The Pb concentration in gills and liver only from this study exceeded prescribed by all the values which mentioned in Table (1).

Comparing these levels of metals with other places (Table 2), it is noticed that values of Ni reported from this study were the least. Values of Co, Fe and Pb, which found in this study were higher than those recorded for the fishes in Arabian Gulf countries (Table 2).

Table 1. Heavy metal concentrations for fish tissues (μg/g) in guide line at different regions.

Standard	Cu	Ni	Fe	Pb	References
WHO (1999)		0.90	4.50	0.20	WHO, 1999
Saudi Arabia	-	-	-	2	Al-Saleh & Shinwari 2002
European Communities	-	-	-	0.5	Al-Saleh & Shinwari 2002
Turkish Environmental Guidelines (1988)	20	-	-	1	Demirak, 2006
FAO (1983)	30	-		0.5	Sankar *et al.*, 2006
The Saudi Arabian Standards Organization, SASO (1977)	20	-	-	2.0	Ali *et al.*, 2011

Table 2. Mean levels of heavy metals (μg/g) in fish species from the present and another Arabian Gulf Studies.

Stations	Cu	Co	Fe	Ni	Pb	References
Qatar	-	-	0.28	2.23	0.93	Abdel-Moati & Nasir, 1997
Saudi Arabia	6.09	-	-	-	9.76	Ail *et al.*, 2011
Khor Al-Zubair	-	-	51.5	26.00	-	Al-Edanee *et al.*, 1991
Kuwait	-	2.40	148.00	20.60	-	Anderlini *et al.*, 1982
Saudi Arabia	3.96	1.75	-	1.69	-	Ashref, 2005
Kuwait	-	20.04	12.5	-	-	Fowler *et al.*, 1993
Bahrain	-	-	-	0.49	0.13	
UAE	-	-	-	0.18	0.08	
Oman	-	-	-	0.32	0.07	
Black Sea	0.03-7.77	-	-	-	0.02-0.28	Levent *et al.*, 2012
Baltic Sea	4.3-96.1	-	101-1190	0.1-1.2	0.1-1.1	Voigt, 1999
Present study	7.89	21.07	198.27	5.43	1.85	

A number of factors may contribute to variability of contamination of fish tissues by heavy metals. Seasonal differences could be related to the variation in local levels of pollution, bioavailability of metals (which is a function of variations among physiochemical factors) and fish metabolism (growth cycle, reproduction and feeding) (Aucoin *et al.*, 1999; Eastwood and Couture, 2002; Mendil *et al.*, 2005). Fernandes *et al.* (2007) stated that levels of heavy metals in fish tissues may depend on the size and age of the species. Other scientists have shown that the period of exposure of the fish to contaminants, their feeding habits (Canli and Kalay, 1998) and habitats (Canli and Atli, 2003) are also related to levels of heavy metals in fish.

Therefore, it is important to note in the present study that the spawning period of *S. commersonianus* takes place in spring and summer (Nasir, 2000), and a change in the feeding habits of marine fish is possible (Odukoya *et al*., 1987). This change in feeding behavior could explain some of the differences in metal concentrations between the seasons (Yilmaz, 2005; Oyewale and Musa, 2006). If most of the heavy metal concentrations reported by this project stay below than threshold values reported by WHO (1985), contamination of aquatic flora and fauna should be expected through bioaccumulation. At the least, the presence of these pollutants may disturb the stability of the aquatic ecosystem and accordingly develop into an ecological concern.

Consumption of this fish species is high, yet marine habitats of Iraq are far from suitable. The levels of heavy metals in different fish organs, especially in gills and liver are hazardous due to their possible health implications for the local populations who depend on fish to supplement their diet. It is clear from this study that bioaccumulation of heavy metals in fish tissues has occurred, and conditions may become worse.

The findings of this investigation include the recommendation that regular monitoring of heavy metal conditions in fishes be conducted, and that more actions be taken immediately to guarantee water quality and to control contamination of fish. Monitoring must account for different levels of contamination in various tissues, and for differences in apparent contamination across seasons.

Conclusions

Heavy metals accumulate at different concentrations in different tissues of *S. commersonianus*. Generally, metals accumulation in muscle was lower than gills and liver. Co and Fe mainly accumulated in gills while the Cu accumulation was highest in liver except in winter 2010. The results indicated that the levels of some metals exceed the legal limit designated by some environmental health organizations. The major finding of this work showed that seasons play a significant role in metals accumulation. Thus, risks from metal contamination via fish consumption may depend on season. It is evident that industrial pollution has led to food chain contamination, and it is essential to consider the results of this study in designing a pollution monitoring and control plan for this marine ecosystem. This study should also draw attention to requirements of environmental and human health protection authorities for the purpose of improving the regulatory framework for mitigation of pollution from industrial and domestic sources.

References

Abdel-Moati, M.A.R. and Nasir, N.A. 1997. Bioaccumulation of chromium, Nickel, lead, Vanadium in some economic fish and prawn from the Qatari Waters. Qatar University Sci. J., 17(1): 195-203.

Ademoroti, C.M.A. 1983. Optimization of heavy metal removal from municipal sewage by coagulation, Aman, University of Benin Press, Nigeria, 3: 145-152.

Al-Edanee T.E., Al-Kareem, A.A. and Kadum, Sh.A. 1991. An assessment of trace metals pollution in the Khor Al-Zubair environment, Iraq. Marina Mesopotamica, 6: 143-154.

Ali, A.A., Elazein, E.M. and Alian, M.A. 2011. Determination of heavy metals in four common fish, water and sediment collected from Red Sea coast at Jeddah Islamic port. J. Appl. Environ. Biol. Sci., 1(10): 453-459.

Al-Khfaji, B.Y. 2005. Metal content in sediment, water and fishes from the Vicinity of oil processing regions in Shatt Al-Arab. J. Univ. Thi-Gar, 1(2): 2-11.

Al-Saad, H.T. and Al-Najare, G.A. 2011. Estimation concentration of heavy metals in water, sediments and *Aspius vorax* fish, catching in southern Iraq marshes Eichler, W.d. (1993).Poisons in Our food. Mir Publishing house, Moscow.

Al-Saleh, I. and Shinwari, N. 2002. Preliminary report on the levels of elements in four fish species from the Arabian Gulf of Saudi Arabia. Chemosphere, 48(7): 749-755.

Anderlini, V.C., Mohammad, O.S., Zarba, M.A. and Omar, N. 1982. Assessment of trace metal pollution in Kuwait, Volume one of the final report of the trace element and bacterial pollution project: EEs-31A. Kuwait Institute for Scientific Research.

Ashraf, W. 2005. Accumulation of heavy metals in kidney and heart tissues of *Epinephelus microdon* fish from the Arabian Gulf. Environ Monit Assess., 101(1-3): 311-316.

Aucoin, J., Blanchard, R., Billiot, C., Partridge, C., Schultz, D., Mandhare, K., Beck, M.J. and Beck, J.N. 1999. Trace metals in fish and sediments from lake Boeuf, South-eastern Louisiana. Microchemical Journal, 62(2): 299-307.

Bryan, G.W. and Langston, W.J. 1992. Bioavailability, accumulation and effects of heavy metals in sediments with special reference to United Kingdom estuaries: A review. Environmental Pollution, 76(2):89-131.

Canli, M. and Atli, G.2003. The relationships between heavy metal (Cd, Cr, Cu, Fe, Pb, Zn) levels and the size of six Mediterranean fish species. Environmental Pollution, 121: 129-136.

Canli, M. and Kalay, M. 1998.Levels of heavy metals (Cd, Pb, Cu, Cr and Ni) in tissue of *Cyprinus carpio, Barbus capito* and *Chondrostoma regium* from the Seyhan River, Turkey. Turkish Journal of Zoology, 22: 149-157.

Daka, E.R., Allen, J.R. and Hawkins, S.J. 2003. Heavy metal contamination in sediment and biomonitors from sites around the Isle of Man. Mar. Pollut. Bull., 46: 784-794.

Demirak, A., Yilmaz, F., Tuna, l. and Ozdemir, N. 2006. Heavy metals in water, sediment and tissues of *Leuciscus cephalus* from a stream in Southwestern Turkey. Chemosphere, 63: 1451-1458.

de Mora, S., Tolosa, I., Fowler, S.W., Villeneuve, J.P., Cassi, R. and Cattini, C. 2010. Distribution of petroleum hydrocarbons and organochlorinated contaminants in marine biota and coastal sediments from the ROPME Sea Area during 2005. Mar. Pollut. Bull., 60(12): 2323-2349.

Eastwood, S. and Couture, P. 2002. Seasonal variations in condition and liver metal concentrations of yellow perch (Percaflaescens) from a metal contaminated environment. Aquatic Toxicology, 58(1): 43-56.

FAO, 1983. Guidelines: Land evaluation for rainfed agriculture, FAO Soils Bulletin 52.

Fowler, S.W., Readman, J.W., Oregioni, B., Villenenve, J.P. and Mckay, K. 1993. Petroleum hydrocarbon and trace metals in near shore Gulf sediments and Biota before and after 1991 war: an assessment of temporal and spatial ends. Mar. Pollut. Bull., 27: 171-182.

Fernandes, C., Fontainhas-Fernandes, A., Peixoto, F. and Salgado, M.A. 2007. Bioaccumulation of heavy metals in Liza saliens from the Esomriz-Paramos coastal lagoon, Portugal. Ecotoxic. Environ. Saf., 66: 426-431.

Gupta, A., Rai, D.K., Pandey, R.S. and Sharma, B. 2009. Analysis of some heavy metals in the riverine water, sediments and fish from river Ganges at Allahabad. Environ. Monit. Assess., 157: 449-458.

Levent, B., Murat, S., Funda, Ü. and Fatih, Ş. 2012. Heavy metal concentrations in ten species of fishes caught in Sinop coastal waters of the Black Sea, Turkey. Turkish Journal of Fisheries and Aquatic Sciences, 12: 371-376.

Mendil, D., Uluozlu, O. D., Hasdemir, E., Tuzen, M., Sari, H. and Suicmez, M. 2005. Determination oftrace metal levels in seven fish species in lakes in Tokat, Turkey. Food Chemistry, 90: 175-179.

Nasir, N.A. 2000. The food and feeding relationships of the fish community in the water of Khor Al-Zubair, North-west of Arabian Gulf. Cybium, 24(1): 89-99.

Odukoya, O.O. and Ajayi, S.O. 1987. Trace heavy metals in Nigerian Fishes 1. Copper and Zinc. Nigerian J. Nut.Sci., A, 8: 41-49.

Olowu, R.A., Ayejuyo, O.O., Adewuyi, G.O., Adejoro, I.A., Denloye, A.A.B, Babatunde, A.O. and Ogundajo, A.L. 2010. Determination of heavy metals in fish tissues, water and sediment from Epe and Badagry Lagoons, Lagos, Nigeria. Journal of Chemistry, 7(1): 215-221.

Oyewale, A.O. and Musa, I. 2006. Pollution assessment of the lower basin of Lakes Kainji/Jebba, Nigeria: heavy metal status of the waters, sediments and fishes. Environ Geochem Health., 28(3): 273-281.

Rasheed, R.O. 2012. Assessment of some heavy metals in muscle tissue of *Silurus triostegus* from Derbendikhan Reservoir, Kurdistan Region-Iraq. Raf. J. Sci., 23(1): 11-18.

ROPME 1982. Manual of oceanographic observation and pollution analyses methods ROPME/ P.O Box 16388.Blzusafa, Kuwait.

Saeedi, S.S., Karami, S., Karami, B. and Shokrzadeh, M. 2009. Toxic effects of cobalt chloride on hematological factors of common Carp (*Cyprinuscarpio*). Trace Element Research, 132: 144-152.

Salehifar, E., Shokrzadeh, M. and Ghaemian, A. 2008. The study of Cu and Zn serum levels in idiopathic dilated cardiomyopathy (IDCMP) patients and its comparison with healthy volunteers. Biol. Trace Elm. Res., 125(2): 97-108.

Sankar, T.V., Zynudheen, A.A., Anandan, R.P. and Nair, V.G.2006. Distribution of organochlorine pesticides and heavy metal residues in fish and shellfish from Calicut region, Kerala, India.Chemosphere, 65(4): 583-590.

Shokrzadeh, M., Saberyan, M. and Saeedi, S.S.S. 2008. Assessment of lead (Pb) and cadmium (Cd) in 10 samples of Iranian and foreign consumed tea leaves and dissolved. Toxicological & Environmental Chemistry, 90(5): 879-883.

Tariq, J., Jafaar, M., Asharaf, M. and Moazzam, M. 1993.Heavy metal concentrations in fish, shrimp, seaweed, sediment and water from the Arabian Sea, Pakistan. Mar. Pollut. Bull., 26: 644-647.

Turkish Environmental Guidelines, Publications of Turkish Foundation of Environment, 1988.

Voigt, H.R. 1999. Concentrations of heavy metals in fish from coastal waters around the Baltic Sea (Extended abstract). ICES Journal of Marine Science, 56 Supplement, pp: 140-141.

WHO, 1985. Guidelines for Drinking Water Qualit (Recommendations).WHO, Geneva.

WHO, 1999. Food safety issues associated with products from aquaculture. Report of a Joint FAO / NACA / WHO Study Group. World Health Organization

Technical Report Series, 883: i-vii, 1-55.

Wong, C.K., Wong, P.P. and Chu, L.M. 2001. Heavy metal concentrations in marine fish collected from fish culture sites in Hong Kong. Archives of Environmental Contamination and Toxicology, 40: 60-69.

Yilmaz, B.A. 2005. Comparison of heavy metal levels of grey Mullet (*Mugilcephalus*) and sea Bream (*Sparusaurata*) caught in Iskenderun Bay (Turkey), Turk. J. Vet. Anim. Sci., 29: 257-262.

تأثير التغيرات الفصلية على تراكم بعض العناصر الثقيلة في أنسجة أسماك الخباط *Scomberoides commersonianus* المصطادة من المياه البحرية العراقية والمياه الساحلية، شمال الغرب الخليج العربي

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المستخلص - أجريت هذه دراسة خلال الفترة من شتاءعام 2010 الشتاء 2011 لتقييم تركيزات العناصرالثقيلة (الحديد، كوبلت، النيكل، النحاس والرصاص) في أنسجة الأسماك الساحلية ذات القيمة التجارية (الخباط ، *Scomberoide scommersonianus*) من السواحل العراقية المحيطة بشبه جزيرة الفاو التي تتلقى مخلفات البتروكيماويات، فمن المهم تحديد مدى تراكيز المعادن الثقيلة في الأسماك والنظر في الآثار المحتملة على السلسلة الغذائية والمخاطر على صحة الإنسان. سجل الحديد أعلى مستوى من التراكم في أربعة أنسجة سمكة الخباط وهي (الغلاصم، والعضلات والكبد والغدد التناسلية) بينما كان الرصاص قد سجل ادنى مستوى احتمال ($p < 0.05$). بلغت تراكيز العناصر الثقيلة في الأنسجة الاربعة لسمكة الخباط في جميع المحطات (الحديد 198.27 ميكروغرام/ غرام) > (الكوبلت 21.07 ميكروغرام / غرام) > (النحاس 7.89 ميكروغرام / غرام) > (النيكل 5.43 ميكروغرام / غرام) > (الرصاص 1.85 ميكروغرام / غرام). تقترح هذه الدراسة إلى اتخاذ تدابير إضافية كمراقبة النفايات ونوعية المياه المحيطة لمنع تلوث الأسماك المستخدمة للاستهلاك البشري.