

## An Investigation on the Mercury Contamination of Persian Gulf Fish

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During the last two decades, the level of mercury found in fish grew rapidly into one of the most distressing problems in environmental health. Mercury in its inorganic form, as a metal or metallic salts, is only moderately toxic, but in the organic form as methyl mercury is highly toxic. Methyl mercury in nature is formed from inorganic mercury by the action of aerobic and anaerobic microorganisms (SKERFVING 1971, FRIBERG & JAROSLAV 1972, JGUNIN & BRADLEY 1975). The methylmercury compounds are almost completely absorbed from the gastro-intestinal tract and readily pass through the blood-brain barrier and result high mercury level in the brain. They damage nerve cells and accumulate in liver and kidney. (WHO Techn. Rep. Ser. No. 505, WHO Food Additives Series No. 4).

The first evidence of mercury poisoning affecting the nervous system, was found in 1953 in Minamata area in Japan due to the consumption of contaminated fish causing forty six deaths and about 100 cases of chronic poisoning. Another outbreak of mercury poisoning occurred in 1965 at Niigata in Japan, where six people died and forty one suffered from chronic poisoning.

In both outbreaks, mercury had been discharged to the sea from the factories in the area (HOLDEN 1973).

Although marine pollution with industrial discharge is considered less important, but because Persian Gulf is the most important source of fish in Iran, the present study was made to estimate the mercury content of Persian Gulf fish, either due to the natural geological condition or industrial discharges in the coastal area.

### MATERIAL AND METHODS

Random samples of four most important species of Persian Gulf fish, Cybiu comersonii, Cybiu guttatum, Lutjanus coccineus, Psettoodes erimeu as well as samples of canned Tuna fish (Euthynnus offinis) were taken. The analysis were carried out on the edible part of the fish. The samples were digested with sulphuric, nitric and perchloric acid under digestion apparatus (Official Methods of Analysis A.O.A.C. 1965), and the mercury content was determined by flameless atomic absorption spectrophotometry technique by a Varian-Techtron (Model 1000) instrument using standard addition method (Varian-Techtron, Analytical Methods for spectroscopy 1973).

## RESULTS AND DISCUSSION

The results of the analysis appeared in table 1. As it is shown , the level of mercury in the samples of fish ranged from 0.04-0.56 mg/kg. This variation could be due to the age and the food habit of fish (DIANARDI et al. 1974).

The mean value of mercury in Cybiu comersonii , Cybiu guttatum, Lutjanus coccineus, Psettodes erumei was 0.17 , 0.14, 0.19, 0.15 mg/kg , respectively . In Tuna fish (Euthynnus offinis ), the mercury content ranged from 0.20-0.44 mg/kg with the mean value of 0.30 mg/kg , which is much higher than the other species of fish examined. However the previous reports on the analysis of Tuna fish from Atlantic coast showed the mercury concentration up to 0.86 mg/kg , and 0.03-1 and 0.08-0.77 mg/kg in Netherland and Sweden, respectively (HOLDEN 1973). SUMINO (1968) found 0.36 mg/kg mercury in Tuna fish from Indian ocean. The Ministry of Agriculture, Fisheries and Food (1971) report showed the mercury concentration of the samples of imported tuna fish as 0.1-0.8 mg/kg. Comparing the results of the analysis with the other reports in this area, it is believed that , tuna fish is capable to accumulate mercury in higher concentration.

The previous work on the mercury content of Persian Gulf shrimp (PARVANEH 1977), showed the mean value of 0.24 mg/kg which ranged from 0.08-0.88 mg/kg.

Considering the results of this investigation and the previous work on crustacea (PARVANEH 1977) and compairing with the acceptable limit of mercury which is 0.5 mg/kg in most countries, it seems that , at the present time , mercury contamination is not a hygienic problem as far as the Persian Gulf fish and sea foods is concerned. But , to prevent any pollution in this area in the future, environmental health control is suggested.

TABLE 1 .

The Mercury Content of the Samples of the Persian Gulf Fish

Name	No. of Sample	Range mg/kg	Mean mg/kg
Cybiu comersonii	10	0.07-0.56	0.17
Cybiu guttatum	8	0.08-0.20	0.14
Lutjanus coccineus	8	0.08-0.48	0.19
Psettodes erumei	5	0.04-0.30	0.15
Canned Tuna Fish (Euthynnus offinis)	18	0.20-0.44	0.30

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