

MERCURY IN FLOUNDER *Platichthys flesus* (L.) FROM FINNISH COASTAL WATERS

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ABSTRACT: Flounders from four different sites of the Finnish coast (Hangö, Eckerö, and two sites off the city of Björneborg) were analyzed for mercury content. The amounts of mercury in the muscle tissues of all fish specimens analyzed were far below the limit stipulated (1 ppm) for fish considered acceptable for human consumption in Finland.

INTRODUCTION

Although there is quite a lot of information available today on different aspects of the biology of flounder (*Platichthys flesus* (L.)) (Halme, 1962; Arntz, 1978; Koli, 1990), this fish species has been sparsely studied in the Baltic Sea as concerns the heavy metal content. This is surprising as flounder today is widely used as a target species for disease monitoring in many sea areas (Wiklund, 1994).

MATERIAL AND METHODS

A total of 66 specimens of flounder in the size classes 21-40 cm, were sampled from four different sites on the Finnish coast: the Hangö area in the Gulf of Finland, Eckerö on the west coast of the Åland Islands and two different sites (I and II) off the city of Björneborg. The Björneborg area is rather heavily affected by effluents from several industries, from agriculture and by sewage from the city of Björneborg. The distance between the two sampling sites is about 10 km.

Muscle samples from the fish specimens were analyzed for mercury content. The methods employed for mercury analyses were those presented by Greenwood and Burg (1984) and Lindqvist (1991).

RESULTS AND DISCUSSION

The mean concentrations of mercury in the fish material examined are shown in Table 1.

The mercury content in flounder from the Hangö area is lower than in those from the other two areas investigated. However the fish material is too small for a meaningful statistical consideration. There was no difference observed in mercury content between males and females in the Hangö and the Eckerö areas. In one of the sites in the Björneborg area (II) the concentration in males (n=7) is somewhat higher than in females (n=8).

Analysis performed on flounders from the North Sea and the Irish Sea showed a clear correlation between fish size and mercury concentration, i.e. increasing mercury content with increasing fish size (Luten *et al.*, 1987; Leah *et al.* 1992). A similar correlation was not seen in the present material. This could perhaps be explained by the fact that the variation in growth is high in Baltic flounder stocks (Halme, 1962) and there is little correlation between fish size and age.

Table I. Mean concentrations (ppm = mgkg⁻¹ fresh weight) of mercury in flounders from the four sites investigated on the Finnish coast.

	Males	Females	Both sexes
Hangö (SW coast)	0.14	0.15	0.15
Eckerö (W coast of Åland)	0.22	0.21	0.22
Bothnian Sea Group I	0.24	0.23	0.24
Bothnian Sea Group II	0.27	0.19	0.25

The results are somewhat surprising so far that the concentrations in fish from the Eckerö area are similar to those in fish from the Björneborg area. The first mentioned area is considered to be one of the least polluted on the Finnish coast, the latter one of the most heavily polluted (Nuorteva *et al.*, 1975; Oravainen, 1992).

Nuorteva *et al.* (1975) sampled flounder in an area (Bromarf) very close to the Hangö region and reported a mercury content of 0.09 ppm (n=12). The present results (0.15 ppm; n=20) indicate a slight rise in the mercury concentration of flounder in the region during the last two decades. It is generally considered that the mercury content in biota in Finnish waters has clearly decreased since the seventies (Enckell-Sarkola *et al.*, 1989).

The normal "background level" of mercury in carnivorous fish species in Finland is estimated at 0.25 ppm (Kokko *et al.*, 1988), i.e. about the level recorded in flounder in the present work. The limit stipulated for mercury content in fish considered acceptable for human consumption in Finland is 1 ppm. For fish containing 0.5 - 1 ppm mercury it is recommended that the weekly consumption should not exceed 0.5 kg.

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