Comparision hexachlorobenzene residues in placentas from Finland and Denmark (1997-2001)

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Introduction

Hexachlorobenzene (HCB) continues to be released in to the environment as an industry byproduct, although it has been banned as fungicide in most countries in the 1970s[1]. The high persistence and bioaccumulation along the food chain cause that humans are almost exclusively exposed through their diet. Here we present the fetus exposure as the first step to investigate the possible relationship between the male reproductive system toxicity and environmental exposure of this compound. The two-cohort male placenta samples originate from Denmark and Finland, which have different incidences of male urogenital disorders[1].

Material and Methods

The sample collection, preparation, cleanup procedures and HRGC-HRMS analysis conditions have been described elsewhere[2]. HCB was determined in the lipid phase of 112 homogenized whole placenta samples from Turku, Finland[2] and 168 samples from Copenhagen, Denmark. Statistical analyses and figure plotting were done by Microsoft Excel and Origin 6.0 (*Microsoft, USA*).

Results and Discussion

Statistical analysis shows that the lipid contents for both of Denmark and Finland samples have nearly normal distributions. The geometric means and the average values are the same for the two cohorts respectively. However, the Danish cohort

has slightly lower lipid content than the Finnish one (1.1 and 1.2 g/g 100%). The HCB concentrations for the two cohorts do not show normal distributions. This means that the HCB contents are not apparently fat correlated in the non-fatty placental tissue. Generally, the HCB level in the Danish samples are higher than in the Finnish samples. We calculated this difference on lipid base (ng/g lipid) and wet weight base (10 times of pg/g wet weight) to consider the possible effect of difference in lipid content. However, the average content in the Danish cohort is 1.5 times of that in the Finnish cohort on both lipid base and wet weight base; the difference in the geometric mean of the concentrations is 1.7 -fold with reference to both, lipid and fresh weight. It suggests that HCB exposure level in Danish fetuses is generally higher than in Finland. This geographic difference might suggest geographic difference of HCB sources. It is believed that food is the main source of general exposure[3]. This difference might reflect the different contaminant levels in diet, similar to the geographic difference of contamination in salmon, which has been described by Hites et al[4]. It is not clear if this difference reflects the higher incidence of male urogenital malformation in Denmark than in Finland. Analysis will be done on the causal relationships of male urogenital malformations with the exposure levels in the further work.

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References

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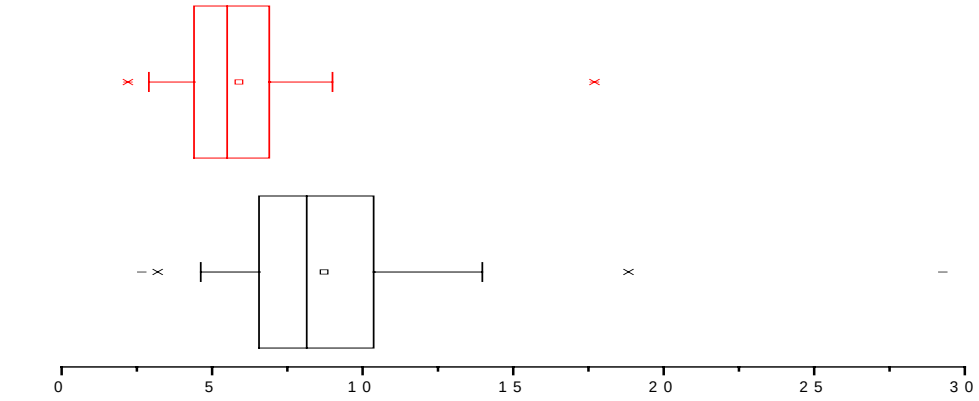
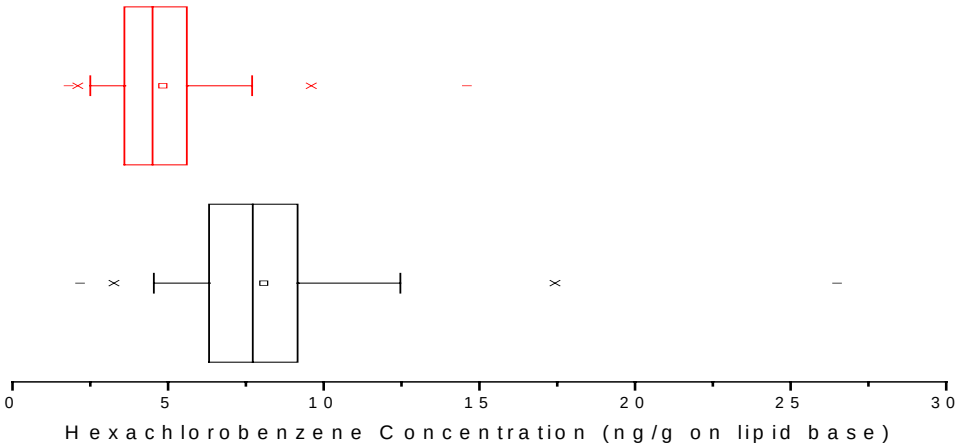

0
5
10
15
20
25
30
Hexachlorobenzene Concentration (10 * pg/g on wet weight base)


0
5
10
15
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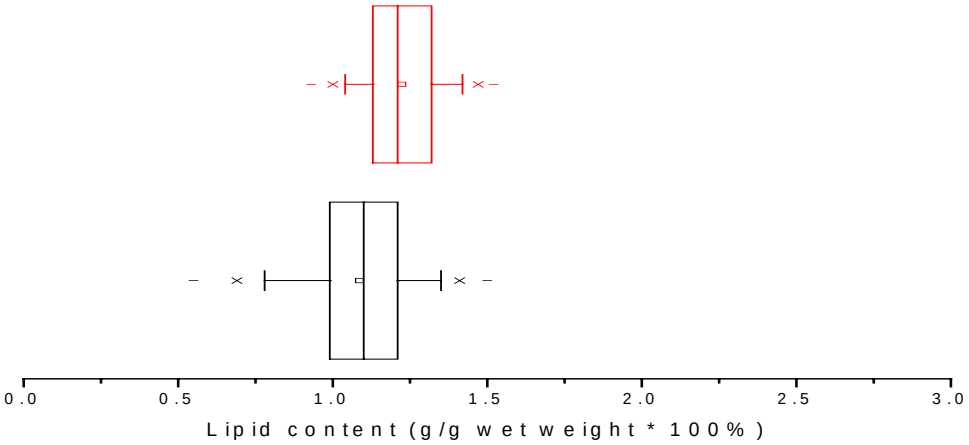
30
Hexachlorobenzene Concentration (ng/g on lipid base)


0.0
0.5
1.0
1.5
2.0
2.5
3.0
Lipid content (g/g wet weight * 100%)