Endocrine Disrupting Effects of Dioixn-like compounds in school incinerator residues

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It is a well known fact that the most relevant toxic emissions such as polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), dioxin-like polychlorinated biphenyls (PCBs) are produced from incinerators. Induction of cytochrome P450IA1 catalyzed 7-ethoxyresorufin *O*-deethylase (EROD) activity in mammalian cell culture (EROD-microbioassay) is a selective and sensitive parameter used for the quantification of dioxin-like compounds.

The toxic emissions from several school waste incinerators were evaluated using EROD-microbioassay and its endocrine disrupting effect was investigated. 7 schools located in kyunggido was selected and fire residues were collected from semi-incinerators.

Fractions (fraction I : Aliphatic hydrocarbons, nonplanar aromatic compounds -most PCBs, fraction II : Planar aromatic compounds- PAHs, PCDDs and PCDFs, so-called TCDD-like compounds) could be obtained from the incinerator residues by soxhlet extract. The EROD activities of fraction II extracts in the H4IIE cells were from 0.044±0.002 ng-TEQ/g to 4.424±0.351 ng-TEQ/g of biochemical-TEQ value.

Dioxin-like compounds in school incinerator residues, such as planar aromatic compounds (PAHs, PCDDs and PCDFs) exhibited antiestrogenic activity in estrogen-dependent MCF7-BUS human breast cancer cells, and induced cytochromes P-450 in rat hepatoma H4IIE cancer cell line.

Strong correlation, showing a correlation coefficient of 0.869, between the induction of EROD activity and antiestrogenic activity of incinerator residues was observed.

These results indicate that potent toxic emission such as 2,3,7,8-Tetrachloro-dibenzo-p-dioxin(TCDD) could be highly produced from school waste incinerator.

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