

## Bioaccumulation of dioxins in the liver of wild Large Japanese field mice

### (*Apodemus speciosus*)

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**【Introduction】** Wild animals are exposed to various chemicals and accumulate persistent organic pollutants (POPs). Among them, significant amounts of dioxins have been reported to be released from waste incineration processes. Little information is available how and to what extent wild animals, particularly terrestrial animals are exposed to dioxins. In the present study, we performed a feasibility study to examine whether Large Japanese field mice (*Apodemus speciosus*) can be used as an indicator animal for environmental contamination of dioxins.

**【Methods】** Mice were captured around an incinerator area (*exposure group*) and in a forest of reference area (*reference group*) in April and October 2001 in Japan. The total numbers of mice were 15 (male, 7; female, 8) in the *exposure group* and 10 (male, 5; female, 5) in the *reference group*. The body weight of mice were heavier than 20.0g. Results were expressed in terms of relative weights of heart, lung, liver, kidney and spleen. To determine dioxins, a part of the liver was weighed and spiked with <sup>13</sup>C-PCDDs/PCDFs/Co-PCBs as an internal standard. Then it was extracted with n-hexane/acetone (50/50) by an accelerated solvent extractor (ASE200). The extract was digested in 2M potassium hydroxide solution. The digested material was extracted with n-hexane, and cleaned up by multi-layer silica gel column and active carbon impregnated silica gel column. Concentrations of dioxins were measured by HRGC/HRMS (JMS-700/HP-6890).

**【Results and Discussion】** The total amounts of dioxins (PCDDs + PCDFs + Co-PCBs) in the liver of the *exposure group* was significantly higher than that of the *reference group*. Ratio of each of the following congeners, *i.e.*, 2,3,4,6,7,8-HxCDF, HpCDFs, OCDF, PCB126, PCB169 and PCB 189, to the total amounts of dioxins in the *exposure group* was significantly higher than that in the *reference group*. PCDFs were found to contribute 39-70% of the total TEQs in the both groups. This congener profile suggested that the source of dioxins in these mice was mainly waste incineration. The female/male ratio of the amount of dioxins in the liver was 0.63 in the *exposure group* though it was not significant. The relative weights of the spleens and the kidney of the *exposure group* were significantly larger than those of the *reference group*. The relative weights of heart, liver and lung were not significantly different between the two groups. 1,2,3,4,6,7,8-HpCDD, OCDF, PCB167 and PCB189 showed high multiple correlation coefficients with spleen weight. The present results suggest that Large Japanese field mice can be used as an indicator of dioxins in the environment derived from incinerators.