

**Title of Research:**

**Ecotoxicological risk assessment of microplastics -as a model case of Osaka Bay-**

**Principal Investigator:**

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**Summary of Research:**

In the second year of the study, fine particles (including microplastics) collected from the surface layer of Osaka Bay were chronically exposed to medaka to assess their toxicity. First, an investigation was conducted to determine the extent of microplastic contamination in tap water across Japan. A total of 43 samples were collected from 23 prefectures, including households, parks, hotels, coastal facilities, universities, and hospitals. To clarify differences in residual concentrations, samples were taken from various locations and water sources; however, no significant differences in microplastic concentrations were observed. The detected microplastic concentrations ranged from 1 to 18 particles per liter, with an average of  $6 \pm 4$  particles per liter. In total, 255 microplastic particles were detected across all 43 analyzed samples.

Next, in 2023, fine particles (including microplastics) collected from the surface layer of Osaka Bay were chronically exposed to medaka to evaluate their toxicity. Specifically, exposure experiments were conducted on both the F0 generation (from immediately after fertilization to 14 weeks of age) and the F1 generation (up to the second week after fertilization). Seven observational parameters were set: (1) embryonic development, (2) growth, (3) secondary sexual characteristics, (4) histological analysis of the gonads, (5) residual microplastics in the digestive tract, (6) reproduction, and (7) survival.

As a result, no statistically significant differences were observed between the exposed group and the control group in terms of embryonic development, growth, secondary sexual characteristics, histological analysis of the gonads, reproduction, and survival. Based on these findings, it was concluded that chronic exposure of medaka to fine particles (including microplastics) collected from the surface layer of Osaka Bay did not exhibit any detectable toxicity at present.

**Timeline:**

March 1, 2024

**Topics:**

2024 年度 日化協 LRI 研究報告会にて発表「閉鎖性海域 大阪湾をモデルケースにした MP の生態リスク評価」

**Publications:**