Concentrations of alkali elements in Lentinula-edodes mushrooms and tea-leaves evaluated using PIXE analysis

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Abstract

The concentrations and spatial distributions of potassium and rubidium in Lentinula edodes mushrooms contaminated with radioactive cesium were measured using Particle-induced X-ray emission (PIXE) analysis to study relationships in elemental concentration in the mushrooms between radioactive cesium and other alkali elements. Autoradiographic measurements using an imaging plated showed that radioactive cesium was concentrated in the peripheral region of pileus of the mushroom. We found that potassium and rubidium were highly accumulated in the same region as radioactive cesium from PIXE analysis.

The concentrations of alkali elements in Japanese green-tea leaves were also evaluated using PIXE analysis to investigate the elution of radioactive cesium into green tea using potassium and rubidium. The concentrations of potassium and rubidium of used tea-leaf samples were lower than those of unused samples, whereas no significant differences in the concentrations of the other elements were observed between them. In addition, we found a similarity in the relative concentrations between potassium and rubidium although the other elements showed different aspects. These results suggest that it is possible to investigate the elution of radioactive cesium into green tea using potassium and rubidium as substitutes of cesium.