Effects of formalin-preservation on element concentrations in animal tissues

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Abstract

Determination of the exposure level of environmental pollutants is essential in the studies on environmental toxicology. If the concentrations of exposed pollutants in tissues are not affected by the formalin-preservation, the preserved specimen will provide not only the histopathological information but also the exposure level of environmental pollutants. In the present study, concentrations of 9 elements in the liver and kidney were compared between fresh and formalin- or neutral formalin-preserved specimens to validate the ultimate analysis of the preserved specimens. After one year preservation, various elements had diffused from the specimens into the solutions. The concentrations of iron, copper, zinc (in the case of neutral formalin), and selenium in the central region of the specimens showed no alterations suggesting that the diffusions of these elements were limited to the surface of the specimens. Therefore, preserved specimens may be available for the determination of these elements if the specimens are large enough to remove their surface. The concentrations of other elements in the preserved specimens were different from original ones, because the diffusion or infiltration also occurred in the deep region of the specimens.