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Arsenic Speciation and Distribution in the Extracts from Salmon Egg Cell Cytoplasm and Cell Membrane by HPLC/ICP-MS

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Abstract:
Speciation of arsenic in the extracts from salmon egg cell cytoplasm and cell membrane was carried out by an HPLC/ICP-MS hyphenated system. The extraction of arsenic species from salmon egg cells was performed by using methanol/water (1:1, v/v) with the aid of sonication. The extracts were evaporated to dryness, and the residues were dissolved with the HPLC mobile phase solution. In the ^{75}As-detected chromatograms, arsenobetaine (AB), trimethylarsine oxide (TMAO), dimethylarsinic acid (DMA), and arsenate were found for egg cell cytoplasm, while arsenate, AB, DMA, and monomethyl-arsonic acid (MMA) were for egg cell membrane. The concentration of each arsenic species was determined by using the arsenic standard compounds. As a result, it was found that the total concentrations of arsenic species in the extracts from cell cytoplasm and cell membrane were 22.7 ng g^{-1} and 44.2 ng g^{-1}, respectively, which corresponded to ca. 12% and 35% of the total amounts of arsenic in cell cytoplasm and cell membrane, respectively. The percentage of methylated arsenic species (AB, DMA, and TMAO) in the extract from cell cytoplasm was 93% of the total extracted arsenic species, and that of inorganic arsenic (arsenate) was only 7%, in which AB was relatively the most abundant (*ca*. 80%). On the contrary, the abundance of arsenate in the extract from egg cell membrane was 35%, which was more abundant than that in egg cell cytoplasm.

Key words: arsenic, speciation, egg cell, cell cytoplasm, cell membrane

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