PROPOSED RESEARCH: ECOTOXICOLOGY AND RISK ASSESSMENT OF MERCURY IN THE GRAND BAY NATIONAL ESTUARINE RESEARCH RESERVE

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Abstract: The element mercury is a dangerous pollutant of the environment. Mercury may be transported by air and water throughout the earth. Through accidents throughout the world, the adverse health effects have come to public attention. There are several manufactured uses of mercury. Everyone is exposed to small amounts of mercury. The release of mercury vapor from amalgam fillings are mainly exposed to inorganic mercury. Although mercury can occur naturally from the erosion of mineral deposits and volcanoes, human activities will lead to the pollution of the environment. Natural sources contribute two-thirds of the mercury in the environment and one-third were result of human activity. Human activities such as metal smelting, coal production, chemical synthesis and use, and waste disposal will contribute to the pollution. These mercury compounds will transfer between soil, the atmosphere, and surface waters during the life cycle of mercury in the environment. There are three physical states of mercury in the environment which are metallic, mercurous, and mercuric. The three main forms of mercury that exist in the environment are elemental mercury or quicksilver, inorganic mercury, and organic methyl-, ethyl-, and phenyl- mercury. Each form of mercury has a different solubility, reactivity, biological effects, and toxicity. Methylmercury is formed by microorganisms from elemental mercury. The most important route for mercury vapor is inhalation. Elimination will occur mainly through urinary and fecal excretion and also through exhalation and sweat. Skin contact with mercury can occur. The main route of exposure to methylmercury is fish consumption. There were significant differences in mercury concentrations in fish species. Methylmercury is demethylated to $\text{Hg}^{2+}$ within tissues. The toxicity is dependent on the specific compound, route of exposure, dose, and age of the person. Adults may be less sensitive than adults to mercury exposure. Plant tissue, fish tissue, and water systems are all affected by mercury pollution. Consumption advisories are based on consumption patterns and contaminant levels for lakes and rivers. The reference dose for mercury differs depending on the organization. Using available tests, mercury levels in the body can be measured.

Keywords: Mercury, ecotoxicology, risk assessment, grand bay national estuarine research reserve

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