



Title: EFFECTS OF TEMPERATURE ON CONTAMINATION BY SETTLEABLE ATMOSPHERIC PARTICULATE MATTER FROM METALLURGICAL ACTIVITIES

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Keywords: SePM, Fish, Metabolism, Physiological Parameters

Processo FAPESP: 2024/15689-9

Abstract: INTRODUCTION: The deposition of metals poses a significant threat to ecosystems and wildlife. Settleable atmospheric particulate matter (SePM) leads to air-to-water cross-contamination, which environmental monitoring protocols usually overlook. This neglect is concerning because it results in the deposition of various metallic substances into waterbeds. Recently, we recognized the harmful effects of SePM on aquatic animals, which impact on essential physiological functions. The lack of comprehensive studies on this type of contamination is worrisome as it hinders our ability to understand its implications fully. Vitoria City harbor in Brazil (ES) is affected by ore processing, leading to SePM deposition in an estuarine zone exposed to significant temperature fluctuations: 15°C, 20°C, 25°C, and 30°C. OBJECTIVE: This investigation aims to evaluate the effect of temperature on SePM contamination in *Oreochromis niloticus*, temperature impact, metal solubility in water, integration of metallic substances, and fish aerobic metabolism. METODOLOGY: An integrative approach was used, associating physiological and swim performance bioindicators with chemical and histological analyses to assess variations in the deleterious effects of SePM and metal bioaccumulation in tissues. All procedures were approved by the Committee of Ethics in Animal Experimentation (CEUA-UFSCar). Each fish was placed in a respirometer and swam at a speed of 1.0 BL.s⁻¹, up to a maximum speed of 3.0 BL.s⁻¹. Following each swimming period, fish were euthanized with a 0.01% benzocaine solution, and a 1 mL blood sample was collected via caudal puncture using a heparinized syringe. RESULTS AND DISCUSSION: Preliminary results indicate that temperature significantly influences potassium and chloride



levels, while exposure to SePM notably alters sodium, magnesium, and potentially calcium concentrations, with these effects exhibited variably across the temperature range. These adaptive changes may signify shifts in plasma ion concentrations that result from the combined effects of temperature variations and SePM saturation.