

TECHNOLOGICALLY CRITICAL ELEMENTS IN A SMALL COASTAL SHARK FROM SOUTHEASTERN BRAZIL

Simone Goulart Ribeiro¹; Amanda Pontes Lopes¹; Arthur dos Santos Costa², Rachel Ann Hauser-Davis¹

¹Laboratório de Avaliação e Promoção da Saúde Ambiental (LAPSA), Instituto Oswaldo Cruz, Fiocruz, Rio de Janeiro, RJ, Brazil

²Universidade Federal do Estado do Rio de Janeiro (UNIRIO), Departamento de Ciências Naturais, Rio de Janeiro, RJ, Brazil

INTRODUCTION: Titanium (Ti) and Rubidium (Rb) are metals of emerging concern, termed Technologically Critical Elements, due to their increasing use in advanced technologies. They display the capacity for bioaccumulation and biomagnification in aquatic food webs. Titanium can cause metabolic function impairment, cellular damage and genotoxicity, while Rubidium is associated with reduced spermatogenesis in fish and other reproductive system damage. Ecotoxicological studies on these contaminants are still scarce, especially in sharks and rays. The main shark species caught and consumed in the Cabo Frio region is Brazilian Sharpnose Shark (*Rhizoprionodon lalandii*), a small coastal species categorized as Vulnerable by the International Union for Conservation of Nature's Red List of Threatened Species (IUCN). **OBJECTIVE:** Assess Rb and Ti contamination in *Rhizoprionodon lalandii* incidentally captured by artisanal fishers at Tamoios, Cabo Frio, Rio de Janeiro. **MATERIAL AND METHODS:** Specimens were captured between April 2022 and March 2023, covering both the dry and wet seasons. Samples of several organs were obtained from 33 juvenile specimens, 17 females and 16 male. Metals were determined by ICP-MS following acid digestion with nitric acid and heating at 100°C for 6 hours. Certified reference materials DORM-5, BCR 668 and NIST 2976 were employed for quality assurance. Recovery values ranged from 80 to 120%, suitable for this type of analysis. **RESULTS AND CONCLUSION:** Total Ti values in muscle were $2.68 \pm 1.54 \text{ mg kg}^{-1}$ p.u., with no significant differences between males and females. Liver concentrations were $2.07 \pm 1.22 \text{ mg kg}^{-1}$ p.u., with similar means between males and females. Significant differences between organs were noted for Rb. Muscle concentration were $1.02 \pm 0.30 \text{ mg kg}^{-1}$ p.u. and liver concentration were $0.66 \pm 0.16 \text{ mg kg}^{-1}$ p.u.. Values are similar to previous studies on the same genus in the same area. High concentrations in muscle compared to the concentrations observed in the liver may indicate bioaccumulation. This is a concern, since the species is consumed by humans, and, although no limits have been established, Ti has been banned in foodstuffs in the European Union due to its carcinogenic potential, while scarce studies on Rb are available.

Keywords: Elasmobranchii; Metals; Ecotoxicology.