

## MORE THAN A PRESCRIPTION: AZITHROMYCIN TRIGGERS LASTING DAMAGE IN FISH GILLS

MANUELA AGULLÓ TAGLIAMENTO<sup>1</sup>; RENATA DE BRITTO MARI<sup>1</sup>; GABRIELA PUSTIGLIONE MARINSEK<sup>2</sup>. <sup>1</sup>UNESP- Institute of Biosciences, Coastal Campus; <sup>2</sup>Santa Cecília University – UNISANTA.

**INTRODUCTION:** With increasing concern about emerging contaminants in aquatic environments, it is essential to study their effects and potential harm to ecosystems and the trophic chain. Azithromycin, mainly due to bioelimination and improper disposal, poses a threat to aquatic organisms, especially the gills, which are in direct contact with the environment. The observed damages include functional, morphological, and tissue alterations, which, when assessed together, provide a broader understanding of the contaminant's impact. **OBJECTIVES:** This study aims to evaluate the effects of azithromycin on the gills of *Poecilia reticulata* by integrating morphometric and histopathological biomarkers. Using the Integrated Biomarker Response (IBR), the goal is to identify patterns and correlations among these variables to assess the impact of different azithromycin concentrations, including the persistence of effects after depuration on gill health and function. **METHODS:** Adult *P. reticulata* were exposed for 15 days to azithromycin at concentrations of 2, 4, 16, and 32 µg/L, along with control and depuration groups. Gill tissues were collected and analyzed through morphometric (density of mucus-producing cells stained with PAS and AB, and gas exchange index—PAGE) and histopathological methods (lesions classified according to Bernet et al., 1999). Data were compiled into a metadata matrix, normalized, and analyzed using IBR in GraphPad Prism to detect alteration patterns among treatments. **RESULTS AND CONCLUSION:** Exposure resulted in changes across multiple biomarkers, with effects that were concentration-dependent and persistent. The 32 µg/L and depuration groups showed the most pronounced alterations, including increased densities of PAS- and AB-positive mucus cells, structural lesions, aneurysms, and elevated histopathological indices. Even the lowest concentration (2 µg/L) triggered significant effects, such as necrosis and hyperplasia, indicating that low levels are not biologically inert. Intermediate concentrations (4 and 16 µg/L) showed selective alterations, suggesting a non-linear biomarker response. The depuration group exhibited a high frequency of changes across nearly all parameters, many likely chronic or irreversible, indicating limited recovery. These findings highlight the ecotoxicological risk of azithromycin, emphasizing both its acute and persistent impacts even after environmental removal.

**KEY-WORDS:** azithromycin; gills; IBR.

**ACKNOWLEDGEMENTS:** Fapesp (grant: 07550-0 and 2023/02394-8).