POLYESTER MICROFIBERS AND ANTIBIOTICS RELEASED INTO THE AQUATIC ENVIRONMENT COMPROMISE THE INTESTINAL HEALTH OF FISH.

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INTRODUCTION: Laundry is the main source of polyester microfibers in aquatic environments. Their incorporation via the food chain can occur in isolation or accompanied by other emerging contaminants such as amoxicillin, one of the world's best-selling antibiotics. It is therefore essential to understand the effects of exposure to these substances on aquatic organisms. **OBJECTIVE:** Evaluate the isolated and synergistic effects of polyester microfibers and amoxicillin on the intestinal mucosa of *Poecilia reticulata*. **MATERIALS AND METHODS:** The animals were separated into four treatments (n=10): control (CG) with ultrapure water; polyester microfibers (GP) with an environmental concentration of 850 microfibers/L; amoxicillin (Gamox) with an environmental concentration of 4mg/L; and polyester + amoxicillin (GP+Amox) with a mixture of the two environmental concentrations. After 15 days, the animals were euthanized, the intestinal segments were collected for routine histology. The sections were stained with Periodic Acid Schiff and Alcian Blue to quantify AB+ and PAS+ goblet cells; and Hematoxylin and Eosin to measure villus height (μm). The results were analyzed using the One way ANOVA test. **RESULTS:** The experimental groups showed greater quantities of AB+ cells (GP:10.9±2.6; Gamox:12.2±2.5; GP+A:11.3±0.6) compared to the GC group (6.7±1.8). These cells secrete acid mucins, which speed up intestinal transit, so their increased production suggests that rapid evacuation of the luminal contents is occurring. Exposure to amoxicillin potentiates the change in mucin secretion, as greater quantities of PAS+ goblet cells were observed in Gamox (15.4±5.2) and GP+Amox (12.9±3.4) compared to the GP (6.6±1.5) and GC

(9.1±2.9) groups. These cells produce neutral mucins, which are more viscous and rich in immune regulators, essential for this first line of defense, which is being strengthened. Exposure to microfibers and amoxicillin alters the intestinal microbiota, selecting different groups of commensal bacteria that influence the greater proliferation and differentiation of multipotent goblet cells in the mucosa. This had repercussions on the thickness of this layer, as the villi showed greater heights (μm) in Gamox (137.8±39.7) and GP+Amox (125.5±6.9) compared to GC (101±8.2). **CONCLUSION:** Polyester microfibers and amoxicillin in environmental concentrations influence the increased production of mucins in the intestinal mucosa as a protective strategy.

Key words: goblet cells; mucins; emerging contaminants.

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