TITLE: “FIRST ISOLATION AND CHARACTERIZATION OF CLINICAL SIGNS OF POLYMICROBIAL INFECTION BY *Aeromonas jandiae, Aeromonas hydhophila* AND *Edwardsiella tarda* IN DISEASE OUTBREAK OF FINGERLINGS *Arapaima gigas* (PIRARUCU).”

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ABSTRACT:

The topic of bacterial polymicrobial infection, still little studied in fish farming, has been demonstrating to be an important cause of economic losses in aquiculture. The Brazilian national production of *Arapaima gigas,* Schinz 1822 (pirarucu) in 2014 was around 12 tons. In Brazil, there is little information on the diversity of bacteria in aquatic ecosystems, mainly on the pirarucu microbiota, as well as on the bacteria that cause diseases in this fish of great importance for Brazilian and Amazonian aquaculture. However, identification and characterization of diseases caused by bacteria are of great importance for the sustainability of productive chain of fish farming. The aim of this study was to report the first polymicrobial outbreak in newly acquired pirarucus from commercial fish farming, which resulted in significant financial losses, which resulted mortality of approximately 1,400 farmed fingerlings. Fish with and without external signs of bacteriosis were collected for bacteriological analyzes. The isolated bacterial strains were characterized according to traditional taxonomical analyses and were identified as *Aeromonas jandaei, Aeromonas hydrophila,* and *Edwardsiella tarda*. In the pirarucus tegument with aeromonose and edwardsielose, lesions that varied in shape, extension and size were observed, and such lesions occurred mainly in the tail and fins of the fish. Anorexia, loss of balance with erratic movement, reduction of respiratory movements, depigmentation along the body with hemorrhagic foci, necrotic hemorrhages in internal organs such as kidney, liver and modified swimming bladder were found. In addition, to splenomegaly and ascites containing mucous-yellow fluid, deposition of sanguineous fluid in the abdominal cavity, hyperemia, enlargement of the gallbladder, abdominal cavity with swelling and small areas of liver hemorrhage were observed. These characterization of clinical signs related with polymicrobial infections can help fish farmers in the early identification of diseases, allowing thus the appropriate management of treatment. Therefore, further studies are needed to better understand the immune response of these fish during mixed bacterial infections, because these may have a major impact on the development of new strategies for disease control and vaccination programs in this fish to mitigate the bacteriosis in fish farms.

Keywords: polymicrobial infection, *Aeromonas* spp., *Edwardsiella tarda*, clinical signs, *Arapaima gigas*.

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