Effects of dietary exposure of different copper nanoparticle levels on intestine histopathology in Siberian sturgeon (*Acipenser baerii*) juvenile

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Abstract:

Manufactured nanomaterials are the materials that have at least one dimension less than 100 nm. NPs absorption pathways in fish include absorption through the gill and intestinal epithelium as a result of exposure to diet and drink or through the skin. This study aimed to investigate the effect of different levels of copper nanoparticles (Cu-NPs) on the histopathology of the intestine of Siberian sturgeon. 240 Siberian sturgeon juvenile (with initial weight of 29.2 ± 3.1 g and initial length of 21.8 ± 1.4 cm) were randomly distributed in 12 fiberglass tanks at 4 different Cu-NPs treatments with 3 replicates. Cu-NPs concentration (0, 250, 500 and 1000 mg/kg) and time (0, 21, 42, 63 and 84 days) were considered. The experimental period were 84 days, 42 days exposure to copper nanoparticles and 42 days as recovery time. In order to find the histopathological changes, six fish tissues from each group (two fish of each replicate) were sampled at days 0, 21, 42, 63, and 84. Samples were dehydrated by routine methods and embedded in paraffin wax. They were sectioned by microtome and stained with H & E. Shortening and loss of intestinal villi, fusion of the villi, vacuolation, necrosis of the villi and fibrin necrotic lesions were the most obvious signs in the intestine of the examined fish.

Keywords: Nanoparticle, Copper, Siberian sturgeon, Histopathology, Vacuolation, Necrosis.