ATTI CONVEGNO

EVALUATING CORRELATION BETWEEN CLINICAL SIGNS AND POSITIVITY TO PROLIFERATIVE KIDNEY DESEASE (PKD) IN RAINBOW TROUT (*ONCORHYNCHUS MYKISS)*

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Proliferative Kidney Disease (PKD) is a major parasitic disease in salmonids, with serious economic and health impacts in aquaculture. It is caused by the myxozoan *Tetracapsuloides bryosalmonae*, which requires two hosts: freshwater bryozoans (invertebrates) and salmonid fish (vertebrates). Infective spores enter mainly through gills, spreading via circulation to kidney, spleen, and liver. In rainbow trout, the posterior kidney is the main replication site, combining excretory and immune functions. Although rainbow trout are "dead-end" hosts, they develop severe signs: gill anemia, kidney proliferation, splenomegaly, hepatomegaly, ascites, and lethargy. High water temperatures worsen disease, enhancing parasite replication, weakening immunity, and increasing vulnerability to secondary infections. Clinical signs appear late in disease, limiting the usefulness of macroscopic diagnosis in early stages. As part of the RESILTROUT project, this study investigated the prevalence and progression of PKD in a rainbow trout farm located in Cuneo (Piedmont, Italy), employing an integrated approach correlating *T. bryosalmonae* detection with clinical signs and opportunistic bacterial coinfections. Trout were sampled from three distinct sectors (1, 2, and 3), naturally exposed to parasite-contaminated water. Over 700 were analyzed using end-point PCR of kidney and spleen samples to detecting parasite, while histopathology exam identified associated lesions. In addition, a bacteriological examination was performed from kidney tissue to detect the presence of possible coinfections. In Sector 1, infection prevalence was 22.1%, with exclusive renal and splenic positivity at 7.5% and 15%, respectively. Most frequent clinical findings included proliferation of kidney tissue (84.74%), splenomegaly (45.8%), enteritis (45.7%), and hepatic hemorrhage (23.7%). Despite the kidney being the primary site of replication and damage, higher splenic PCR positivity reflects its lymphoid role and the disease stage, as parasite DNA can persist in the spleen during subclinical or remission phases. In Sector 2, combined kidney-spleen pools revealed 72.8% positivity, with proliferation of kidney tissue (9.9%), splenomegaly (7.4%), enteritis (4.4%), and hepatic anemia (1.4%). Most positives (69.4%) showed no macroscopic alterations, indicating subclinical or recovering infections. Sector 3 exhibited a lower prevalence (3.5%), but affected individuals displayed severe lesions including proliferation of kidney tissue (66.7%), gill hypermucosity (66.7%), hemorrhage (66.7%) and splenomegaly (33.3%), and suggesting advanced disease or strong immunopathological responses. Opportunistic bacterial coinfections were detected in 18.6% of positives in Sector 1 and 10.6% in Sector 2, while absent in Sector 3, highlighting PKD-induced immunosuppression and potential exacerbation of tissue damage. These results emphasize the necessity of an integrated diagnostic approach combining molecular and clinical-pathological assessments for effective PKD management and the development of preventive strategies in rainbow trout aquaculture.

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