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FIRST REPORT OF PROLIFERATIVE KIDNEY DISEASE IN NORTHWESTERN ITALY: OCCURRENCE AND SEASONAL TRENDS

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Proliferative kidney disease (PKD), caused by the myxozoan parasite *Tetracapsuloides bryosalmonae*, is an important disease of salmonids and a growing concern for trout aquaculture, particularly under increasing environmental temperatures. Despite its occurrence in several Italian regions, the epidemiological distribution and seasonal dynamics of PKD in Italy remain poorly documented. This study aimed to investigate the occurrence and seasonal dynamics of PKD in a rainbow trout (*Oncorhynchus mykiss*) farm located in southwestern Piedmont, an area where the disease had not previously been documented. Between May and October 2024, 787 farmed rainbow trout were examined across three sampling periods: May-June (n = 270), July-August (n = 363), and September-October (n = 154). Water temperature was monitored daily, while fish underwent external and internal examination, parasitological and bacteriological analyses, and molecular detection of *T. bryosalmonae* by endpoint PCR targeting a 435-bp fragment of the SSU-rDNA gene. PKD prevalence showed marked seasonal variation, increasing from 23.0% in May-June to 73.0% in July-August and subsequently declining to 3.9% in September-October ($p < 0.001$), in association with a pronounced seasonal pattern in water temperature, which ranged from 12.4 to 20.3 °C. Interestingly, the highest molecular prevalence was observed during the summer period, when gross pathological findings were comparatively less frequent. In contrast, renal enlargement and splenomegaly were particularly prevalent during the first sampling period, reaching 78.9% and 42.2%, respectively. Multivariable logistic regression identified sampling period as the main predictor of PKD positivity, with significantly higher odds of infection during July-August (OR ≈ 8.9) and significantly lower odds during September-October (OR ≈ 0.14) compared with May-June. Moreover, PKD-positive fish showed a significantly lower probability of presenting macroscopic lesions (adjusted OR = 0.52, 95% CI: 0.36-0.75, $p < 0.001$). The observed temporal mismatch between molecular detection and gross pathological alterations highlights the complexity of PKD seasonal dynamics and suggests that these diagnostic approaches may reflect different aspects of the host-parasite interaction. Although the absence of histopathological examination and quantitative assessment of parasite burden prevents definitive interpretation of disease progression, the present findings provide the first confirmed evidence of PKD in southwestern Piedmont and extend the documented distribution of T. bryosalmonae in Italy. These results underline the importance of continued epidemiological surveillance and integrated diagnostic approaches for PKD in Italian trout farming, particularly in the context of changing environmental conditions and increasing water temperatures.

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