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SOCIETÀ ITALIANA PATOLOGIA ITTICA

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# ATTI CONVEGNO

# SUSCEPTIBILITY OF RAINBOW TROUT EXPOSED TO WATER NATURALLY HARBORING *LACTOCOCCUS GARVIEAE*

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Rainbow trout (*Oncorhynchus mykiss*) is one of the most widely farmed freshwater species worldwide, representing over 90% of global trout production. In Italy, it is the main species cultivated, playing a central role in the national aquaculture sector. Nevertheless, the intensive farming conditions increase its susceptibility to different pathogens frequently leading to considerable economic losses. Among the bacterial diseases, lactococcosis is particularly widespread and poses a major health challenge in rainbow trout farms across Northern Italy. Lactococcosis is primarily induced by *Lactococcus garvieae*, which can cause high mortality rates in rainbow trout, ranging from 50% to 80%. Recent studies have also identified *Lactococcus petauri* and *Lactococcus formosensis* as emerging pathogens for lactococcosis with clinical signs similar to those caused by *L. garvieae*.

This study aimed to evaluate the susceptibility of rainbow trout introduced into aquaculture water naturally harboring *L. garvieae*. The research is part of RESILTROUT project, aiming to investigate the resilience of rainbow trout to various farming challenges, including lactococcosis.

A total of 1000 healthy rainbow trout of autochthonous genetic line, sourced from a *L. garvieae*-free farm in Piedmont, were introduced into a trout farm in Trentino-Alto Adige where *L. garvieae* was naturally present.

*Post-mortem* examinations of 240 specimens included necropsy and bacteriological sampling from the kidney and eye. Pure bacterial isolates were obtained and subsequently identified using MALDI-TOF. Molecular confirmation was performed to distinguish among the three lactococcus species causal agents of lactococcosis. Data analysis was carried out in R/RStudio.

*Lactococcus garvieae* was isolated in 26.8% of kidney and 31.5% of eye samples. Other bacterial species, including *Hafnia alvei*, *Carnobacterium maltaromaticum*, *C. divergens*, *Lactococcus lactis*, and *Acinetobacter* spp. were detected at lower frequencies. Notably, *L. petauri* was also identified in ocular samples, although at a very low percentage (0.5%). Spearman correlation analysis revealed a significant positive correlation between *L. garvieae* detection (in both kidney and eye) and typical clinical signs of lactococcosis, including exophthalmos, ocular enucleation, and hepatic petechiae. Conversely, *L. garvieae*-negative individuals showed a significant positive correlation with the absence of symptoms and a negative correlation with exophthalmos, indicating an overall normal condition.

These findings underscore the variable susceptibility and resilience of rainbow trout to *L. garvieae* under natural farming conditions, with clear clinical correlations. As part of the RESILTROUT project, this study contributes to a deeper understanding of host-pathogen interactions and supports the development of strategies to enhance trout resilience against lactococcosis.