

SETAC EUROPE 35TH ANNUAL MEETING

11-15 MAY 2025 | VIENNA, AUSTRIA | [SETAC.ORG/VIENNA](https://setac.org/vienna)

INNOVATION FOR TOMORROW: PROGRESS IN SAFE AND SUSTAINABLE CONCEPTS



ABSTRACT BOOK

AMR: upstream, city, and downstream. Most water quality and AMR indicators differed significantly between stretches and seasons ($p < 0.05$; PERMANOVA), although the relative distribution of ARGs between sediment and water column samples differed in the dry and wet seasons. Linear Discriminant Analysis showed that some water quality parameters, such as lower dissolved oxygen and elevated total nitrogen, can distinguish between AMR-polluted and less-polluted sites and might be good AMR proxies in river monitoring. Modelling showed that between 60 and 80% of water in the flowing river was untreated wastewater, suggesting wastewater releases dominate AMR in the river, not manufacturing sources.

The study proposes using DO and TN measurements as cost-effective proxies for wastewater pollution and AMR contamination in resource-limited settings, offering a practical alternative to qPCR-based monitoring. Also this work here highlights the urgent need for improved municipal wastewater management and treatment to make rivers like the Musi safer for use, such as irrigation, reducing AMR exposures across wider environments.

Disclaimer/Disclosure: This work was part of the project AMRflows: antimicrobials and resistance from manufacturing flows to people: joined up experiments, mathematical modelling and risk analysis supported by the Department of Biotechnology (DBT) in India (Computer No. 8981 || BT/IN/Indo-UK/AMR-Env/03/ST/2020-21 || AMRFlows) and the Natural Environment Research Council (NERC) in the UK (NE/T013222/1).

4.08.P-Tu346 Antibiotic Resistance in *Lactococcus garvieae* in Italy: Temporal Dynamics and Geographic Patterns

Paolo Pastorino, Silvia Colussi, Fabio Bondavalli, Giuseppe Esposito, Elena Bozzetta and Marino Prearo, The Veterinary Medical Research Institute for Piedmont, Italy

Piscine lactococcosis is a significant bacterial disease in aquaculture, particularly affecting rainbow trout (*Oncorhynchus mykiss*), and leads to considerable economic losses worldwide. The increasing antibiotic resistance in *Lactococcus garvieae* poses a growing challenge, reducing treatment efficacy and necessitating the monitoring of resistance patterns over time. This study analyzed 62 *L. garvieae* strains isolated in Italy between 1991 and 2021 during lactococcosis outbreaks in rainbow trout to evaluate temporal trends and explore geographical differences in resistance patterns between two river basins with documented histories of the disease.

Antibiotic susceptibility testing was conducted using the Kirby-Bauer disk diffusion method for the following antibiotics: amoxicillin, ampicillin, erythromycin, enrofloxacin, florfenicol, gentamicin, kanamycin, penicillin, spiramycin, streptomycin, oxytetracycline, tetracycline, and thiamphenicol. Inhibition zone diameters were classified as susceptible, intermediate, or resistant according to the Clinical and Laboratory Standards Institute (CLSI) guidelines for aquatic animal pathogens. These categories were converted into semi-quantitative values for statistical analysis. Temporal trends (1991 1999, 2000 2010, 2011 2019, and 2020 2021) were assessed using Principal Component Analysis (PCA), while cluster PCA was applied to identify differences between strains from trout farms in the Ticino and Sile river basins. Statistical analyses were performed using R software. The results revealed notable resistance to aminoglycosides, including kanamycin, spiramycin, streptomycin, and gentamicin. Temporal PCA indicated an almost consistent resistance trend over time, though the ellipse for 2020 2021 deviated slightly, reflecting greater variability. Cluster PCA showed overlapping resistance patterns between strains from the two river basins, suggesting similar trends in antibiotic resistance. The observed resistance aligns with global reports of increasing aminoglycoside resistance among Gram-positive cocci. The observed trends highlight the need for enhanced antibiotic stewardship and the implementation of alternative strategies, such as vaccination, and improved farm biosecurity. Additionally, breeding programs focused on enhancing the genetic resistance of rainbow trout to diseases like lactococcosis could play a pivotal role in mitigating the impact of bacterial infections.

4.08.P-Tu347 Speciation/Characterisation of Chemical of Concern in Livestock Farming Systems *Tolulope Lawrence¹, Ana Castro-Castellon², Sydney Enns², Penny Johnes² and Barbara Kasprzyk-Hordern¹, (1)University of Bath, United Kingdom, (2)University of Bristol, United Kingdom*

Research on the impact of chemicals of concern (CoCs) like pharmaceuticals, antibiotics, pesticides, and sewage pollutants on UK freshwater quality has increased. However, livestock-derived organic matter (LDOM), which includes manure, slurry, urine, and dung, which is an equally important driver of change in freshwater quality has received insufficient attention. LDOM acts as a reservoir for CoCs from