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Mejor Poster

Antimicrobianos y resistencia

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Antimicrobial-resistant bacteria represent a rising public health threat, especially in environmental reservoirs such as surface waters. These bodies receive contaminants from human activity and may serve as vehicles for the spread of antimicrobial-resistant microorganisms. This study investigated the presence of antibiotic-resistant enterobacteria (AMR-E) in surface waters of central Chile, focusing on the Mapocho and Maipo river basins.

A total of 240 water samples (1 L each) were collected quarterly across both basins during 2023–2024, covering all seasons. Land use classification was conducted using QGIS and the CONAF 2017 land use layer. Enterobacteria were isolated on two

MacConkey agar supplemented with ciprofloxacin (CIP) and ceftazidime (CAZ). Colonies were selected based on typical morphology and identified by MALDI-TOFF as *Escherichia coli, Klebsiella or Enterobacter spp*. Antimicrobial susceptibility was assessed using the Kirby-Bauer method, following CLSI and EUCAST standards.

Of all samples, 7.92% (19/240) showed growth of AMR-E isolates. Growth was more frequent in Mapocho (25/44) than in Maipo. Urban sites also showed greater recovery of AMR-E (27/44) compared to other land types. *Escherichia coli* was the most frequent species (35/44), followed by *Enterobacter spp* (5) and *Klebsiella pneumoniae* (3).

Resistance to third- or fourth-generation cephalosporins was found in 52.27% (23/44) of isolates, and carbapenem resistance in 10 isolates—predominantly from Mapocho and urban areas. Multidrug resistance (MDR) was identified in 70.45% (31/44) of isolates—20 from the Mapocho and 11 from Maipo. Urban land use had the highest MDR detection (18/31) compared to other land types.

Preliminary random forest analysis identified total dissolved solids (TDS), proximity to human settlements, and seasonality as key predictors of MDR enterobacteria, with 85.26% accuracy. Fisher's exact test preliminary showed significant associations between MDR and human settlements ($p < 0.05$).

The detection of MDR and last generation cephalosporin- and carbapenem-resistant enterobacteria in irrigation waters is alarming, as these antibiotics are last-resort treatments in clinical settings. These findings underscore the need to incorporate environmental indicators into AMR surveillance and improve control strategies in water used for agriculture

Palabras Clave

(1) Extended-spectrum β-lactamases, (2) Irrigation water, (3) Environmental risk factors, (4) Land use, (5) Random Forest.

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