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Prevalence and Antimicrobial Resistance of *Staphylococcus aureus* in Fish of Rupandehi District Nepal

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Staphylococcus aureus is not a common fish pathogen but it is one of the major etiological agents of foodborne illness in humans. *S. aureus* in fish is evidence of contamination of fish through unhygienic production, transportation, distribution, handling, and storage. The increasing resistance of *S. aureus* to different groups of antimicrobials has become a troublesome phenomenon and thus possesses a great public health concern. A cross-sectional study was conducted to assess the antimicrobial resistance (AMR) of *S. aureus* isolated from the ready-to-sale fish from fish markets of Rupandehi District, Nepal. A total of 125 fish samples were collected from all the registered live fish shops and hatbazars of Rupandehi district. The microbiological analysis of the fish samples was carried out at the laboratory of the Department of Aquaculture, Paklihawa campus, Rupandehi District.

The overall prevalence of *S. aureus* was found to be 9.60 % (12/125). Out of 14 antibiotics tested, *S. aureus* was 100.00 % sensitive to Gentamicin, Amikacin, and Chloramphenicol and most resistant to Methicilin (58.3 %) followed by Linezolid (50 %) and Cefoxitin (41.70 %). Out of 12 *S. aureus* isolates, five (41.70 %) were found to be Methicillin-Resistant *S. aureus* (MRSA), seven (58.30 %) were multidrug-resistant (MDR) and eight isolates (66.70 %) were having MAR ≥ 0.2. Among five isolates of MRSA, two (40.00 %) were found to be Vancomycin-Resistant *S. aureus* (VRSA). The antimicrobial test showed the maximum resistance to the beta-lactam group of antibiotics suggesting to decrease in their use. The association of occurrence of *S. aureus* was statistically significant ($p < 0.05$) with the hygiene indicating its importance right from the farm to fork.

There is a need for regular supervision of fish markets, their production, and transportation. Precautions must be taken in every step of production and consumption. Apart, the judicial use of antibiotics in aquaculture, livestock, poultry, and agriculture is highly essential.

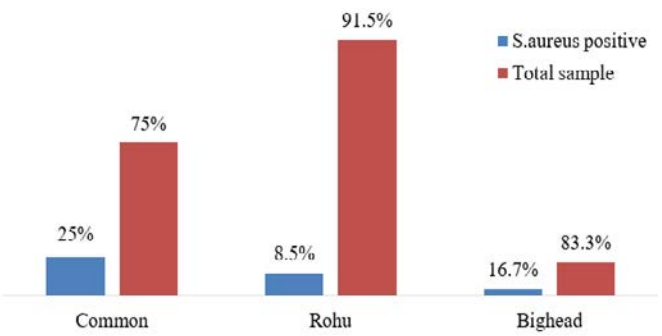

Figure 1: Diagram showing prevalence of *S. aureus* in different carp fish species

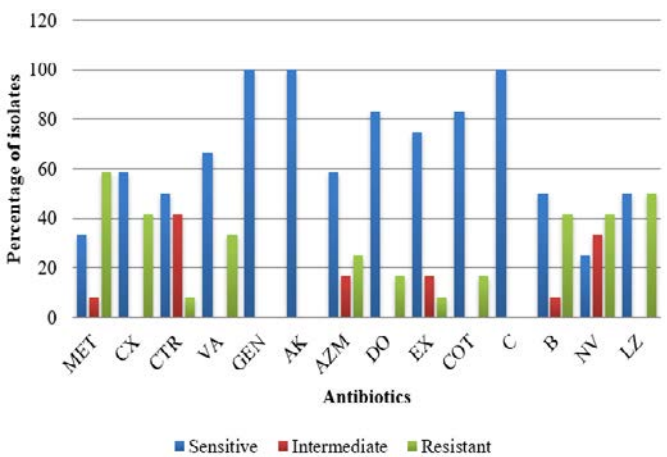

Figure 2: Antibiogram of isolates of *S. aureus*