Antimicrobial residues, non-typhoidal Salmonella, Vibrio spp. and associated microbiological hazards in retail shrimps purchased in Ho Chi Minh City

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Introduction
- In Vietnam, a large number of antimicrobials are used in aquaculture production
- Most shrimp production in Vietnam (683,000 metric tons in 2017) is targeted at the exported market
- Lack of data on foodborne hazards (antimicrobial residues, non-typhoidal Salmonella and Vibrio spp.) in shrimp products purchased locally

Aims and Objectives
- To estimate the prevalence of antimicrobial residues in shrimp
- To investigate the prevalence of non-typhoidal Salmonella (NTS), Vibrio spp. and their antimicrobial susceptibility profiles

Materials and Methods

Sample collection
Random collection at 30 traditional markets & 10 supermarkets in HCMC

Detection of antimicrobial residues
Antimicrobial class
Shrimp muscle
Screening
PremiTest
Antimicrobial class
Charm II
Antimicrobial susceptibility testing

Results

Bacteria: a total of 133 Vibrio spp. (100%) and 90 NTS (75%) isolates were recovered from 40 shrimp samples. All Vibrio spp. and NTS isolates were tested for their antimicrobial susceptibility

Antimicrobial susceptibility of Vibrio spp. isolates

Antimicrobial susceptibility of NTS isolates

Antimicrobial residues were found in 9/40 (22.5%) samples by PremiTest. Four of the nine PremiTest-positive samples were positive by Charm II. Tetracyclines, sulfonamides, and macrolides were detected by Charm II in 7.5%, 2.5%, and 2.5% of total samples, respectively

Concentration of antimicrobial residue in shrimp samples

Vibrio spp.
- High susceptibility to all antimicrobials, except for ampicillin (82.7%)
- V. parahaemolyticus isolates were high resistance toward the third generation cephalosporins. ESBLs (28.1%)
- Multidrug resistance (28.1%)

Non-typhoidal Salmonella
- High susceptibility to penems, polymycins and cephalosporins (3rd & 4th gen.). ESBLs (7.8%)
- High resistance toward the quinolones, and penicillins
- Multidrug resistance (58.9%)

Legends
- Phenotypic resistance of Vibrio spp. and NTS isolates. Bold bars indicate the percent of isolates showing intermediate resistance. Dark bars indicates percent of isolates with full resistance. % binomial confidence interval has been drawn around the percentage of resistant plus intermediate resistant isolates
- Vibrio spp.
  - V. parahaemolyticus (n=44 isolates), V. vulnificus (32), V. alginolyticus (25) and other (20)
- Salmonella serotypes
  - Group B (n=2 isolates): Serpns, Derby, Parcent S, Typhimurium, Agona, Stanley
  - Group C (27): Braenderup, Roscoff, Bovismorbificans, Infantis, Kentucky, Litchfield, Ohio, Allens, Bovine, Paratyphi
  - Other (11): Anatum, Braenderup, Kedougou, Urbana

Conclusions
- 22.5%, 75% and 100% of samples contaminated with residual antimicrobial, NTS and Vibrio spp.
- Appropriate withdrawal periods should be strictly enforced after the administration of antimicrobials
- Consumers must ensure food hygiene and safety when processing meat products

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