

Antimicrobial Resistance Profiles of *Escherichia coli* Isolated from Local Salads

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Structured Abstract

Background: *Escherichia coli* is a common foodborne pathogen often found contaminating raw vegetables, posing a significant public health risk especially when antibiotic-resistant strains are involved. Though many studies have been conducted, there are limited study on local data or research on *E. coli* in locally sold vegetable salads, with focus on round cabbages. Hence, this study aimed to investigate the presence and antimicrobial resistance profiles of *E. coli* isolated from cabbage samples obtained from different markets in Selangor, Malaysia.

Methods: Bacterial isolation was conducted using MacConkey and Eosin Methylene Blue (EMB) agars. Presumptive *E. coli* colonies were further characterized by Gram staining, catalase, and coagulase tests. Antibiotic susceptibility testing was performed using six antibiotics – Ampicillin (10 µg/disc), Ciprofloxacin (5 µg/disc), Gentamicin (10 µg/disc), Kanamycin (30 µg/disc), Tetracycline (30 µg/disc), and Vancomycin (30 µg/disc). Molecular identification was carried out through 16S rRNA gene sequencing.

Results: Out of fifteen initial isolates grown on MacConkey agar, four isolates displayed morphological characteristics of pink and non-mucoid colonies similar to *E. coli* ATCC 25922 which served as a control. These isolates were confirmed through characteristic metallic green sheen of *E. coli* on EMB agar followed by pink, rod-shaped bacilli with Gram negative stained, positive catalase, and negative coagulase. All the isolates were resistant against ampicillin, gentamicin, tetracycline, and vancomycin while three isolates (EC1, EC2, EC3) were sensitive against ciprofloxacin. However, 16S rRNA gene sequencing and BLAST analysis revealed discrepancies that EC1 and EC8 were not *E. coli*. EC1 was 70.76% identical to *Enterobacter* spp. while EC8 was 95.42% identical to *Klebsiella pneumoniae*.

Conclusion: These findings underscore the prevalence of antibiotic-resistant bacteria in raw salads and the potential public health risks associated with their consumption. The study also highlights the importance of improved molecular techniques and stricter food safety measures to mitigate the spread of resistant strains in fresh produce.

Keywords: *Escherichia coli*, Cabbage, Antibiotic Resistance, 16S rRNA Sequencing, Food Safety

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