Detection of *Escherichia Coli* in Freshly Harvested Spinach Samples Collected from Five different markets in Zaria

Karaye GP\textsuperscript{1*}, Karaye KK\textsuperscript{2} and Kaze PD\textsuperscript{1}

\textsuperscript{1}Department of Veterinary Parasitology and Entomology, University of Jos, Jos, PMB 2084, Plateau State, Nigeria.
\textsuperscript{2}Central Diagnostic Laboratory, National Veterinary Research Institute, Vom Plateau State, Nigeria.

\*Corresponding Author: Karaye GP, Department of Veterinary Parasitology and Entomology, University of Jos, Jos, PMB 2084 E-mail: Pishluv2@yahoo.com, Ph:+2348060926642, Plateau State, Nigeria.

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Abstract

*Escherichia coli*, though, normal flora of the digestive tract of human and animals have over the years evolved the ability to cause a wide range of disease. A total of 100 freshly harvested and ready to sale spinach samples in five selected market in Zaria, Kaduna State were collected and analysed for *E.coli* 0157:H7. Twenty (20) samples each were collected from Sabon Gari, Palladan, Samaru, Hayin Dogo and PZ. Isolates were screened using the conventional biochemical characterization for *E. coli* O157: H7. Twelve (12) gram of spinach leaves each was washed with sterile distilled water. Five (5) mls of each washing was inoculated into 5 mls of double strength MacConkey broth and inoculated for 24 hours at 37\degree C. A loop full of the positive colonies was sub cultured on EMB Agar and incubated for 24 hrs at 37\degree C a greenish metallic sheen on the surrounding medium were observed. These presumptive positive colonies were stored in nutrient Agar slant at 4\degree C until it was required for biochemical test. *E.coli* was confirmed by biochemical test and the growth on EMB Agar. Out of the 100 samples collected, Isolates were screened using the conventional biochemical characterization for *E. coli* O157: H7. A total of 119 (47.6\%) *E. coli* O157: H7 and 16 (6.4\%) *E. coli* O157 was isolated respectively. Therefore, there is need to characterize the *E.coli* from spinach in local markets in Zaria, so as to checkmate and create awareness on the spread of *E.coli* especially 0157:H7 infection in livestock and humans in Zaria and Kaduna State.

Keywords: *Escherichia Coli*; Spinach; Zaria; Biochemical test; EMB Agar

Introduction

*Escherichia coli* are natural predominant facultative anaerobes common in the lower intestines of endothermic animals and it grows in most laboratory media at an incubation temperature of (37\degree C) optimum (Feng *et al*., 2011). They colonize the gastro intestinal tract hours after birth or days after (Lans *et al*., 2002). Nevertheless, some strains have evolved the capability to cause both intestinal and extra intestinal illnesses (Nataro *et al*., 2011; Quinn *et al*., 2011). Not all the strains are harmless, as some can cause debilitating and sometimes fatal diseases in humans as well as mammals and birds (Belanger *et al*., 2012). Faecal–oral transmission is the major route through which pathogenic strains of the bacterium cause disease. Cells of the bacteria can survive outside the body for a limited amount of time, which makes them potential indicator organisms to test environmental samples for faecal contamination. (Feng, 2002; Thompson *et al*., 2007 ). In Zaria, Tijani *et al*., (2006); Kabiru *et al*., (2015) reported the prevalence of *Escherichia coli* 0157:H7 in spinach grown around abattoir waste dumpsite, manure farm and soil, irrigated with raw abattoir waste water. This suggests that spinach are vegetables that can potentially harbor *Escherichia coli* when manured with contaminated faeces. The use of raw manure or slurry (liquid manure) on or near fruit and vegetable crops, particularly those to be eaten raw is a potential hazard for *Escherichia coli* especially 0157:H7 (Tijani *et al*., 2006) and hence the need for work to be done on the prevalence of *E.coli* in spinach meant for human consumption in Zaria and its environs. Studies have shown that *Escherichia coli* especially 0157:H7 can survive in faeces for extensive periods of 70-100 days at the temperature in the region of 45\degree C, (Dahiru *et al*., 2008). Thereby establishing that faeces serving as manure to most subsistence and commercial farmers growing spinach at backyard or irrigational farms at dry season may be a potential vehicle for transmission of the organism into the environment (Wang *et al*., 1999).