



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

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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* O157: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°C. A loop full of the positive colonies was sub cultured on EMB Agar and incubated for 24 hrs at 37°C a greenish metallic sheen on the surrounding medium were observed. These presumptive positive colonies were stored in nutrient Agar slant at 4°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 O157: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°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* O157: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 O157: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 O157:H7 can survive in faeces for extensive periods of 70-100 days at the temperature in the region of 45°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).