

## PCR Based Detection of *Salmonella* in Chicken and Hand Washings of Workers in Retail Chicken Shops of Wayanad, Kerala



### Veterinary Science

KEYWORDS : Antibigram profile, Chicken, *Salmonella*

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### ABSTRACT

*Salmonellosis is one of the most frequently isolated bacterial pathogen from food-borne outbreaks. Poultry and poultry products are the important sources of Salmonella to man. The present study was under taken to evaluate the presence of Salmonella spp. in chicken meat and hand washings of meat shop workers collected from three areas namely kalpetta, chundale and vythiri of Wayanad district. A total of 180 samples including 90 meat samples and 90 hand wash samples were collected and analysed by PCR targeting ompC gene. Out of the samples analysed 12 samples (6.66 per cent) were found positive for Salmonella.*

### Introduction

*Salmonellosis* is considered as one of the important disease of public health significance and raises great concern in the food industry. Among livestock production systems, *Salmonella* spp. is more frequently isolated from poultry than from other animals (OIE, 2008). Non-typhoidal *Salmonellosis* is usually self limiting and does not require antibiotic therapy in healthy individuals. However, treatment is necessary in immunocompromised individuals and children. Rapid detection of the organism is therefore essential for fast diagnosis and treatment (Yang *et al.*, 2010).

### Materials and methods

**Collection and preparation of samples:** A total of 180 samples comprising of 90 raw broiler chicken meat and 90 hand washes were collected from various retail outlets of Wayanad district. The samples were collected aseptically in sterile sample collection bottle and transported to the laboratory under chilled condition in thermocol containers. Samples were processed and subjected to microbiological analysis on the same day of collection. A total of 25 gram of sample was aseptically transferred to 225 ml of Buffered peptone water, in a stomacher bag. The bags were homogenized in a stomacher for 2 min, sample were then transferred in to pre-enrichment media and incubated at 37°C for 18 hrs. One millilitre of pre-enriched broth was then transferred into Rappaport-vassiliadis soya peptone (RVS) broth and further incubated at 42°C for 24 hrs for enrichment. DNA isolated from the enriched sample was used for PCR analysis.

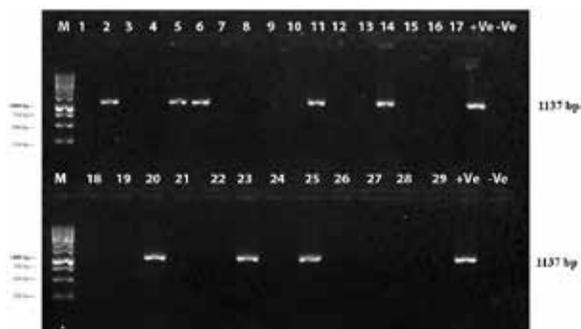
**DNA extraction:** The boiling and snap chilling technique was used for the preparation of DNA template for PCR analysis (Lee *et al.*, 2009). Two milliliter of aliquot from the enriched samples were taken in an eppendorf tube and centrifuged at 1000 × g for 10 min at 4°C. The supernatant was discarded and the pellet obtained at the bottom was washed twice in one milliliter of sterile milliQ water by re-centrifugation at 1000 × g for 10 min at 4°C. The pelleted cells obtained finally were resuspended in 100 µl of molecular grade water, kept in a boiling water bath for 10 min, and then immediately chilled on crushed ice for 5 min. Then the samples were centrifuged at 1000 × g for five minutes and supernatants were stored for further use at -20°C for further use as template for PCR.

**PCR analysis:** PCR analysis of was carried using the extracted DNA as template with primers targeting *ompC* gene. Set of primers designed for the study was F- 5'ATG AAA GTT AAA GTA CTG TCC CTC C -3' and R- 5'- TTA GAA CTG GTA AAC CAG ACC CAG -3' PCR profile used for the study was; 94°C for 3 min, followed by 34 cycles of (94°C

for 40 sec, 55°C for 50 sec, 72°C for 90 sec), the final extension for 5 min at 72°C in a thermal cycler (BioRad, USA).

### Results

Out of 90 meat samples analyzed, 8 samples (8.8 percent) confirmed the presence of *Salmonella* which on PCR yielded specific amplification of 1137 bp corresponding to *ompC* gene as shown in Fig 1. Out of 90 hand wash samples analysed 4 samples (4.4 percent) confirmed the presence of *Salmonella* by giving specific amplification of 1137 bp corresponding to *ompC* gene as shown in Fig 2. Hence, the overall occurrence of *Salmonella* in both samples are 6.6 percent.



**Fig. 1: *Salmonella* detection from Chicken. PCR image showing 1137 bp amplicon of *ompC* gene with +ve and -ve controls Lane M-1kb ladder, Lane 2,5,6,11,14,20,23,25 positive.**



**Fig. 2: *Salmonella* detection from Hand wash. PCR image showing 1137 bp amplicon of *ompC* gene with +ve and -ve controls. Lane M-1kb Ladder, Lane 5, 7,15 ,21 positive.**

### Discussion

The results clearly indicate high prevalence of *Salmonella* spp. in chicken (6.6percent) and need for greater awareness

of the risk associated with the production and handling of meat (Anju *et al.*, 2014). Chicken meat inspection for *Salmonella* spp. should be under the strict supervision of Public Health and Veterinary Authorities to ensure proper detection and to control the spread of Zoonosis and to improve preventive measures and decrease contamination of poultry products (Saeed *et al.*, 2013).

### Conclusion

The study confirmed the presence of *Salmonella* spp. in retail poultry meat and hand wash of workers across Wayanad district. The incidence of *Salmonellosis* outbreak cannot be neglected due to the overwhelming effects to human. The knowledge about *Salmonella* and its sources is important to ensure the safety and quality of food. Intervention strategies are hence important to control the transmission of *Salmonella* from farm to fork.

### References

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