

Evaluation of Microbiological Safety of Indian Chutneys: A Case Study of Chandrapur City, India

V S Wadhai and Kavita D Khobragade

Post Graduate Department of Microbiology, Sardar Patel Mahavidyalaya, Chandrapur-442402 (INDIA)
spmicro1747@redifmail.com

ABSTRACT

The present study was undertaken to evaluate the microbiological quality of Indian chutneys sold in Chandrapur city of Maharashtra. A total 16 samples were collected from four major areas which represented whole city and served at least 100 customers per day. All samples were collected from the vendors in sterilized polythene bags and transported to the laboratory on ice and analysed within 1 to 2 hours of procurement. Bacterial pathogens were isolated and identified by standard bacteriological techniques. Analysis of the chutney sample revealed prominent bacterial pathogen such as *Staphylococcus aureus*, *Bacillus spp.*, *Escherichia coli* and *Salmonella spp.* The study concluded that number of pathogenic bacteria due to various reasons and sometimes an important source of food borne illness to human.

Key words: Street vended chutney, pathogens in chutney, food safety, food borne illness

INTRODUCTION

Street foods are defined as “ready to eat foods and beverages prepared and or sold by vendors and hawkers especially in street and other similar public places. In India, chutney is traditional “Indian culinary aids”. Chutneys which are prepared at home are hygienic and safe but the street vendor’s chutneys that are unhygienic poor qualities, which possess large number of pathogens. The consumption of these roadside foods potentially increases the risk of food born diseases caused by a side different sources of microbial invasion of street vendor’s foods pathogens may invade the interior surface of the handling, trimming and other processer like packaging storing and marketing (Barro *et al*, 2007).

Chutneys are usually made from standard or seasonal fruits and vegetables, herbs, which are ground to a paste or to a pulpy mash, requisite consistency is obtained by addition of water, vinegar and lime or lamarind juice. The prevalence and growth of pathogens on the raw foods especially vegetables, salads, fruits and sprouts which are being used as the raw-material for the preparation of chutneys (Viswanathan *et al*, 2001). The microbiological qualities of chutney sold on the street in metropolitan cities are very poor (Karkar *et al*, 2000). Almost all samples on street.vended food possess pathogenic organisms like *Salmonella species*, *Shigella species*, *Campylobaeter species*, *E.coli*; can contaminate the food through contact with samples.

Food borne illness caused by eating microbial contaminated food is an important public

health problem and is known as to be major of diarrhea disease. Food is contaminated by various pathogenic microorganisms causing food infection or food intoxication. Food poisoning can be the result of either chemical or the ingestion of toxicant. Bacterial food intoxication therefore refers to food borne illness caused by the presence of a bacterial toxic formed in the food (Mensah *et al*, 1999). This may be an attempt to make aware common people regarding microbial contamination of street vended food and health hygienic. An attempt is made in present study to study street food sold in street in Chandrapur city of Maharashtra. Attempt here also made to isolate pathogenic microorganism present in various kinds of chutneys responsible for food infection in view of the demand and overcrowding of street vended shops in many areas in the Chandrapur city. A rapid review of the chutneys vended on the streets was undertaken during June-October 2011 with a view to assess their safety for human consumption and as possible sources of bacterial pathogens, this work is carried out in Chandrapur.

MATERIALS AND METHODS

Collection of Chutney Samples

The study has been carried out in local areas of Chandrapur city. Aseptic technique was observed when sample was collected. Food samples were collected using sterile bags and brought to the laboratory within hours of collection and immediately processed for analysis. Four different areas were selected for collecting chutney sample.

Microbiological Analysis of Chutney Samples

For the microbiological analysis food sample, each chutney sample was thoroughly mixed and 1g of it was homogenized with 9ml, of Butterfield's phosphate. Serial dilutions of homogenized samples were prepared for further analysis. After serial dilution pour plate technique was applied. After solidifying petri plates were incubated at 37°C for 24 hours in inverted position. After incubation the plates with maximum number of colonies was selected and the number of colonies were counted on the selected plates. The isolated colonies of organism were transferred to nutrient agar slant for maintenance and further identification.

Identification of Microorganism Isolated from Collected Chutney Samples

Isolates from chutney were studied for its morphology, cultural characteristics and biochemical properties. All isolates were identified as per Bergeys manual of determinative bacteriology.

RESULTS

Several types of chutany samples were examined in this study. The samples collected aseptically in sterilised polythene bags. Among the samples tested, majority of *Staphylococcus aureus* and *Bacillus species* were found and less quantity of *Escherichia coli* and *Salmonella typhi*. The results of identification are presented in table no.1

Table No.1: Morphological, cultural and biochemical characteristics of isolates.

Test for isolates	Isolates number			
	S1	S2	S3	S4
Gram character	+	+	-	-
Motility	Non motile	Motile	Motile	Motile
Shape	Cocci	Short rod	Rod	Rod
Biochemical Characteristic				
Indol	-	-	+	-
2)MR	+	-	+	+
3)VP	+	+	-	-
4)Citrate	-	-	-	+
Sugar set				
1)Glucose	A	-	A+G	A
2)Lactose	A	-	A+G	A
3)Mannitol	A	-	A+G	A
4)Sucrose	A	-	A+G	A
Enzyme test				
1)Urease test	+	-	-	-
2)Catalase test	+	+	+	+
3)Oxidase test	-	-	-	-
Cultural characteristic				
Baired parker agar plate	Black color colonies	-	-	-
2)Mannitol salt agar plate	Yellow color colonies	-	-	-
3)Bacillus cereas agar plate	-	Blue color appear	-	-
4)EMB agar plate	-	-	Pink color colonies with green metallic sheen	-
5)XLD agar plate	-	-	-	Black color colonies

Key: += Positive, - = Negative, A= Acid, G= Gas

DISCUSSION

Pathogenic bacteria are the most common known cause of food contamination and food borne illness. The presence of these microbes in food can be linked to a number of factors such as handling and processing use of contaminated water during the washing and preparation of foods, use of dirty utensils (Bryon *et al*, 1997). Anonymous (2008) analysed 27 food samples collected from 10 different places. In this analysis he isolated *Staphylococcus aureus*, *Salmonella species*, *Shigella species*, *Escherichia coli* and *klebsiella species* from the different food samples from different places. These isolates are cause of disease such as gastroenteritis, diarrhea and dysentery.

During the present work, various types of chutney were collected from four different selected areas. The selected areas were Jatpura gate area, Babupeth area, Azad park area and Padoli area of Chandrapur city. From these different chutney samples 60 isolates were isolated. The study revealed that of the chutney samples showed presence of the *Escherichia coli*, *Staphylococcus aureus*, *Bacillus species* and *Salmonella spp*. Most of the isolates were found to be highest rate of incidence of *Staphylococcus aureus* and *Bacillus* species while some isolates were found to be less *Salmonella sp* and *Escherichia coli*.

The present study also confirmed the presence of *Salmonella typhi* but being potent

pathogen it should be take considerably. Contamination with its presence has been the cause of several outbreaks. The results of the present study are in agreement with those reported by sheath and coworkers (Sheath *et al*, 2005) which revealed the presence of the high aerobic mesophilic colony count and *Escherichia coli* in bhelpuri samples.

CONCLUSION

From the present study, it is concluded that from 60 isolates isolated from four different areas of Chandrapur city. The study revealed that different chutney samples shows presence of *Escherichia coli*, *Staphylococcus aureus*, *Bacillus species* and *Salmonella typhi*. Among the samples highest rate of incidence of *Staphylococcus aureus* and *Bacillus species*. Where some isolates were found to be less *Salmonella sp* and *Escherichia coli*. The highest bacterial contamination were observed in chutney samples of Jatpura gate area of Chandrapur city.

Health education of the street food vendors and implementation of the standard hygienic practices should be enhanced to reduced contamination of foods. Regular monitoring of the condition of street food and better surveillance on the activities of street food vendors must be introduced to minimize the risk of diseases outbreaks associated with consumption of street foods.

LITERATURE CITED

- Anomynous, 2008.** Guidelines for determining the microbiological quality of foods, **15**:362-372.
- Barro N, AR Bello, 2007.** Street – vended foods improvement and application of foods safety objective strategy critical review. *Pak. J. Nutr*, **6**:01-10.
- Bryon FL, Jermini M, Schmit R, Chilufya EN, Mwanza M, Mahba A, Mfume E and Chibiya H, 1997.** Hazards associated with holding and reheating foods at vending sites in a small town in a Zambia. *J. Food. Prof*, **60**:391-398.
- Kakar DA and Udipi SA, 2000.** Microbiological qualities of different varieties of chutneys sold in Mumbai city. *J. Food. Sci. Technol*, **87**(5):.509-51.
- Mensah P, Owoso DK, Yeboab MD, Ablordey A, Nicrumah FK and Kamiya H, 1999.** The role street food vendors in the transmission of enteric pathogen. *Ghana Med. Journal*, **33**: 19-29.
- Sheth MR, Gurudasani and Mudbidri R, 2005.** Screening for pathogenic microorganism in street-vended bhel approach. *J.food sci. Technol*, **42**:395-399.
- Viswanathan P and Kaur R, 2001.** Prevalence and growth of pathogens on salad vegetables, fruits and sprouts. *Int.J. Hyg. Environ. Health*, **20**: 205-213.