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MICROBIAL ASSESSMENT OF STREET VENDED PANIPURI FROM DIFFERENT ZONES OF BIDAR, KARNATAKA

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ABSTRACT : The street food market in India is expanding day by day and this growth is correlated with urbanization and the demand for food and employment among urban residents. Many people have been able to satiate their hunger with street foods at reasonable prices. The aim of the current study was to investigate both the risk factors and the bacteriological quality of street food. Eighty samples of panipuri (40 samples each of masala pani and solid masala) were aseptically collected from various locations in Bidar city, Karnataka, India. Analysis of the food samples revealed that among 80 samples, 73.75% samples were found to be contaminated by different pathogenic bacteria which contain 59.32% of *Escherichia coli*, 55.93% of *Staphylococcus* spp., 37.28% of *Klebsiella*, 33.89% of *Pseudomonas* spp., 25.42% of *Bacillus*, 23.72% of *Salmonella* spp. and 11.86% of *Streptococcus* were the common isolates. Among 80 of them, 35 samples from crowded areas and 45 samples from non-crowded areas were collected. The CFU/ml result shows that the total viable count of bacteria varied between 78-169×10^{-5}CFU and 62-131×10^{-5}CFU in all samples of masala pani in crowded and non-crowded places and 92-181×10^{-5}CFU and 48-128×10^{-5}CFU solid masala in crowded and non-crowded places, respectively. Antibiogram of the pathogens and their susceptibility and resistance to eight different antibiotics were performed. Vendors' awareness to improve their hygienic behaviour during the preparation, handling, serving, and storing of street foods is recommended.

Key words : Antibacterial activity, bacteriology, contamination, foodborne infections, hygiene, panipuri.

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INTRODUCTION

Street foods are prepared and sold by vendors as ready-to-eat foods and beverages, often on streets and other public areas. Panipuri is the most liked street food in India. People who depend on these foods are frequently more concerned with convenience than their quality, hygiene, and safety. Since these items are typically sold by vendors using carts, trays, tables and makeshift stalls, the risk of food contamination is increased (Ray and Mishra, 2014). The majority of street food vendors in India come from very rural origins and are illiterate, therefore they are frequently uninformed about food laws, untrained in food-related issues, and unaware of disease outbreaks. Nowadays, street foods are becoming a serious public health hazard, and governments and experts are focusing on it to increase public awareness (Sharma and Mazumdar, 2014). Poor sanitary standards, including poor personal hygiene of the sellers, unclean food handling, the use of dirty plates, and improperly washed raw vegetables, are linked to the contamination of street foods like panipuri (Das *et al*, 2012). Potentially fatal germs like *Salmonella typhimurium* and *Escherichia coli* are present in unhygienic panipuri (Garode and Waghode, 2012). The water used, while serving panipuri is found to be contaminated with different bacterial pathogens like *Klebsiella pneumonia, Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* and yeast. These bacterial pathogens are responsible for foodborne illnesses and diarrhoea (Tambekar *et al*, 2011). There have been numerous reports of foodborne illnesses linked to eating street food in India and other countries (Ghosh

Table 5 : Antibiotic sensitivity to different pathogens.

Antibiotic Discs	**Antibiotic resistance/sensitivity**						
	Escherichia coli	***Staphylococcus aureus***	***Klebsiella* spp.**	***Pseudomonas* spp.**	***Streptococcus* spp.**	***Bacillus* spp.**	***Salmonella* spp.**
Ampicillin	-	-	-	+	-	-	-
Azithromycin	+	+	+	-	+	+	+
Co-trimoxazole	+	-	+	+	+	+	-
Ciprofloxacin	+	+	-	+	-	+	-
Cefotaxime	+	-	-	+	+	-	+
Erythromycin	+	+	-	-	+	+	+
Gentamicin	+	+	+	+	+	+	+
Tetracycline	+	+	+	-	-	+	+

+ = Sensitivity, - = Resistance.

were found to be resistant to the above antibiotics.

The current research shows that *E. coli*, *S. aureus* and *Klebsiella* spp. bacteria are present within the panipuri samples collected from street vended panipuri in Bidar city in India. All pathogens showed resistance to Ampicillin except *Pseudomonas* spp. For Azithromycin, all bacteria showed susceptibility except *Pseudomonas* spp. For Cotrimoxazole, all bacteria showed susceptibility except *Salmonella* and *S. aureus*. For Ciprofloxacin, except *Klebsiella*, *Streptococcus*, and *Salmonella* spp., all bacteria showed susceptibility. For Cefotaxime, except *S. aureus*, *Klebsiella* spp., *Bacillus* spp., all bacteria showed susceptibility. For Erythromycin, except *Klebsiella* spp. and *Pseudomonas* spp., all bacteria showed susceptibility. For Tetracycline, except *Pseudomonas* spp. and *Streptococcus* spp., all bacteria showed susceptibility. Whereas for Gentamicin, all bacteria showed susceptibility (Table 5). The antibiogram pattern in the present study was almost similar to that of Das *et al* (2012).

CONCLUSION

According to the findings of the current investigation, Panipuri from bidar street food contains high levels of contamination across several locations. The main contaminants in panipuri were *Escherichia coli*, *Staphylococcus aureus* and *Klebsiella* species. According to the results of the current investigation, *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa* and *Salmonella spp.* were all discovered to be present in the water of Panipuri. These bacterial infections are all to blame for food- and diarrheal-related disorders. Government agencies must enforce regulations on sanitary practices during the preparation and selling of street foods (for instance, licensing of street vendors, etc.). Non-governmental organizations (NGOs) and the press could play key roles in educating the vendors on food and personal hygiene and educating the public so as to ensure the standard of safety of street-vended foods regular sanitary inspection followed by strict enforcement to improve sanitary conditions should be practiced.

Conflict of interest

The authors would hereby like to declare that there is no conflict of interests that could arise.

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