Annals of R.S.C.B., Vol. 24, Issue 1, 2020, pp. 609- 613
Received 18April2020; accepted 23June2020

Isolation And Identification Of Pathogenic Bacteria From Street Foods In Chennai

Anitha Akilan , K. Revathi*,K.Sundaravalli,R.Devi
CRL, Meenakshi Academy of Higher Education and Research Chennai India
*Corresponding author – K.Revathi
email: reva63@rediffmail.com

ABSTRACT
Food-borne infections are becoming a global health threat and are being viewed as a major public health concern. Contamination occurred as a result of the usage of contaminated raw food materials and particles, polluted water, unsanitary preparation techniques, and contaminated containers. A total of one hundred samples were obtained from twenty different street food vendors for this study. From the samples collected, food-borne pathogens are isolated and identified. Isolated samples are used to assess the prevalence of food-borne diseases. Salmonella spp. (15), E. coli (25), Staphylococcus aureus (10), Shigella spp. (5), Listeria monocytogenes (5), and other microorganisms (10) were found.

1. Introduction

Street fast food are prepared and sold by vendors in streets and other public places for direct human consumption, without need for further preparation (Tsang, 2002). In developing country like India, it is popular day by day due to cheap price and easily available and more convenient in urban places.. the rule of food safety and hygiene is not followed and the number of Street food vendors are increasing throughout Chennai (Ahmed et al., 2008).Street foods are prepared and served on the road side.

The present study was carried out to find the total bacterial load with special emphasis on Staphylococcus spp., Salmonella spp. and Escherichia coli in street foods sold in Chennai to evaluate the antibiotic resistance of isolates. A total of one hundred samples were obtained from twenty different street food vendors for this study. From the samples collected, food-borne pathogens are isolated and identified. Isolated samples are used to assess the prevalence of food-borne diseases. Salmonella spp. (15), E. coli (25), Staphylococcus aureus (10), Shigella spp. (5), Listeria monocytogenes (5), and other microorganisms (10) were found Among the 60 isolates, Staphylococcus spp. was most detected isolate (40%) followed by E. coli (33.3%) and Salmonella spp. (26.7%). Thus the study revealed that street food in this area is contaminated with foodborne bacteria that can pose a serious health problem. Most of the ingredients used in fast food are nutritious but they harbor various pathogenic organism including Escherichia coli, Enterobacter spp. Staphylococcus aureus, Salmonella spp. and Listeria monocytogens (Ahmed et al., 2014). Street fast foods contribute a significant role in foodborne illness to consumers.The food handlers and vendors lack education and knowledge about handling practice, sanitation and hygiene that leads to contamination (Tabashsum et al., 2013). There are several reason for contamination of street foods which include the utensils that enhance cross contamination, vending sites that are filthy in nature, tap water used in preparation of food, waste and garbage produced are discarded nearby that attract the rodents and insect which may carry foodborne pathogens, flies that land on food sporadically and finally handling of food by vendors with bare hands (Nicolas et al., 2007; Tambekar et al., 2009). Foodborne illness occurred after consumption of contaminated foods

containing microorganisms and their toxin (Clarence et al., 2009). It has become a great concern as it involves illness caused by bacterial, viral, parasitic and chemical contamination of food. It is stated that thousands of people in Chennai are getting infected from foodborne diseases (FAO, 2012). The incidence of foodborne illness is on the rise worldwide and becomes an alarming issue involving broad range of disease caused by the pathogenic organisms (De Vogli et al., 2014). Most of the bacteria present in foods are difficult to control them and sometimes it reaches a level that can cause death of an individual stated by Ahmed et al., (2008). Popularity of street foods is increasing day by day among all age groups. The population in Chennai is 1,491,293 which is densely populated area. So, there are chances of getting infection through consumption of Street food. Considering the facts, this study was carried out to assess the total bacterial load and also isolation, identification of common bacterial pathogen with special emphasis on Staphylococcus spp., Salmonella spp. and Escherichia coli in street foods.

2. MATERIALS AND METHODS

Sample Collection: A total of a hundred food samples were obtained from twenty different street food vendors. Then food samples were transferred to Central Laboratory of MAHER, Chennai. This research was conducted for a period of One year.

Isolation of organisms: Samples were taken and inoculated into nutrient broth. For isolated colonies, a loop of nutrient broth was spread onto nutrient agar and incubated at 37°C for 24 hours. Colonies were subcultured on Blood agar and MacConkey agar and incubated at 37°C for 24 hours. Blood agar was used to identify microbes caused by haemolysis, and MacConkey agar was used to differentiate microbes due to lactose fermentation, and then bacterial growth was investigated according to the standard procedure reported earlier.

Identification of isolated organisms: Grams staining was used to analyse the isolated bacteria microscopically to determine whether they were Gram-positive or Gram-negative bacteria. The colonies were collected from blood agar for gram positive bacteria and MacConkey agar for gram negative bacteria for biochemical identification. SS agar was used to identify the salmonella spp.The colonies were then tested for bacteria using biochemical tests such as IMViC-Indole, Methyl Red, VogesProskauer, Citrate, Urease, Triple Sugar Iron (TSI), Mannitol Motility Medium (MMM), Bile-esculin, and Coagulase. Biochemical features and colony morphology were used to identify the species.

Statistical Analysis:

The percentage was used to determine the level of microbial contamination. The most common organism was discovered using statistics book by Zar Biostatistical Analysis,2010.

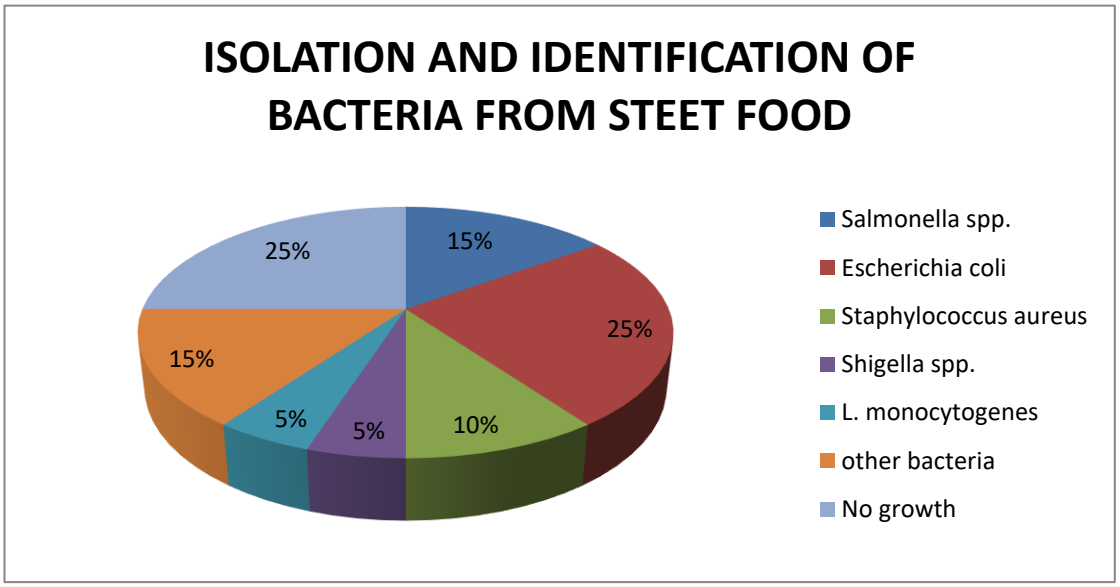
.

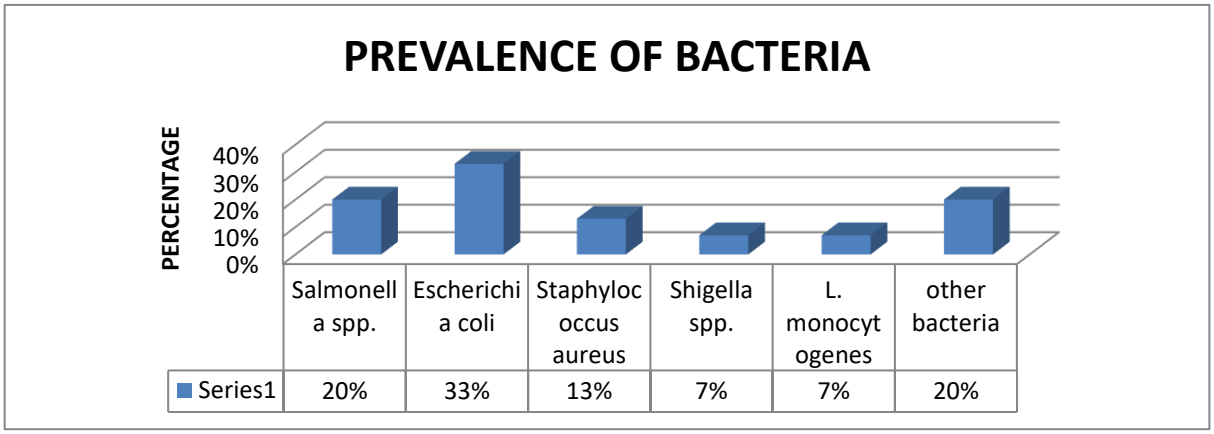
3. RESULTS AND DISCUSSION

The presence of microorganisms in gathered food samples was surprising during a study of street food samples. Food borne pathogens found in street food have been isolated and identified. In recent years, street cuisines have become increasingly popular. Improper personal hygiene can

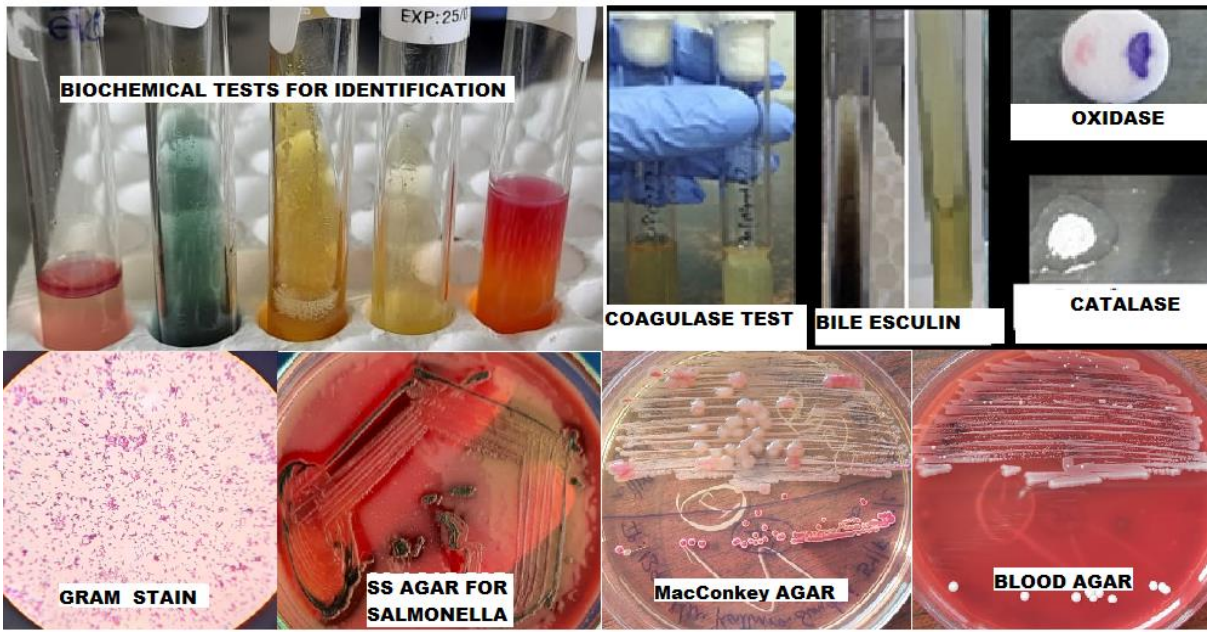
Annals of R.S.C.B., Vol. 24, Issue 1, 2020, pp. 609- 613
Received 18April2020; accepted 23June2020

make it easier for dangerous germs prevalent in the environment and on people's hands to spread to humans via food. Street meals have a distinct flavour, are readily available, and are inexpensive. Personal hygiene is also very important for food safety because humans are the main source of infection. Hygiene while handling and cooking street foods is very crucial. This research shows that all of the samples are microbiologically unfit to ingest. From collected street food samples, Salmonella spp. (15), Escherichia coli (25), Staphylococcus aureus (10), Shigella spp. (5), L. Monocytogenes (5), and other bacteria (15) were isolated and identified organism. Salmonella spp. (20%), E. coli (33%), Staphylococcus aureus (13%) are the most prevalent organisms. To keep the issue under control, strict public health laws should be implemented. The upkeep of these street-vendor dishes should be closely supervised. During their nutrient intake, insects and rodents transport diseases from rubbish, wastewater, and overflowing drains. The government should take the required efforts to give regular training and raise awareness among street food vendors and consumers about food management and personal hygiene.





Annals of R.S.C.B., Vol. 24, Issue 1, 2020, pp. 609- 613
Received 18April2020; accepted 23June2020



Red, green, photo, ash , pie chart, pink

4. Conclusion

The results of the current study clearly demonstrated that street vended foods sold in Chennai are contaminated with Staphylococcus spp., Salmonella spp. and E. coli. The existence of these bacteria in foods causes potential public health problems for consumers. Poor personal hygiene, improper handling practices, prolong storage of foods in ambient temperature and lack of knowledge of Street vendors towards food safety and food borne infections are the associated factors to contamination of Street foods. Furthermore, vendors did not have any food safety training. Moreover, multiple drug resistant bacteria from fast foods might act as a vector in the spread of antibiotic resistant strains in the community and environment. So, necessary information, education facilities and food safety training program should be ensured for all the vendors that helps to reduce the chance of infection and at the sametime provide safe and good quality foods to consumers. Therefore, consumers should be aware of harmful effect of consumption of street foods. Regular inspection of foods in the streets should be ensured by public health authority to improve the quality of street foods as well as to avoid food borne disease outbreaks in community. Though legislation exists it lacks its position .

References

1.Adimasu, A., Mekonmen, B., Guadu T., Gizaw Z., Adane T. 2016. Bacteriological quality assessment of selected street foods and their public health importance in Gondar Town, North West Ethiopia. Glob Vet., 17:255- 264. Ahmed, J., Hossain, M. L., Malek, M. A., Begum, F. 2008. Assessment of bacteriological quality of fast foods and soft drinks in relation to safety and hygiene. Bangla. J. Microbiol., 25:73- 75.

2.Aruna, N., Rajan, V. 2017. Microbial analysis of street foods of different locations at Chennai city, India. Innovat Int. J. Med. Pharma. Sci., 2: 21-23.

3.Clarence, S. Y., Obinna, C. N., Shalom, N. C. 2009. Assessment of bacteriological quality of ready to eat food (Meat pie) in Benin City metropolis, Nigeria. Afr.J. Microbiol Res., 3: 390-395
4.De Vogli, R., Kouvonen, A., Gimeno, D. 2014. The influence of market deregulation on fast food consumption and body mass index: a cross-national time series analysis. Bull. World Health Organ, 92: 99-107
5.FAO, 2012. The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition. Rome, FAO
6.Nicolas, B., Razack, B. A., Yollande, I., Aly, S., Tidiane, O. C. A., Philippe, N. A., Comlan, D.S., Sababénédjo, T. A. 2007. Street-vended foods improvement: Contamination mechanisms and application of Food Safety Objective Strategy: Critical review. Pak. J. Nutr., 6: 1-10.
7.Tabashsum, Z., Khalil, I., Nazimuddin, M. D., Mollah, A. K. M., Inatsu, Y., Bari, M. L. 2013. Prevalence of foodborne pathogens and spoilage microorganisms and their drug resistant status in different street foods of Dhaka city. Agric. Food Anal.Bacteriol. J., 3: 281-292.
8.Tambekar, D. H., Jaiswal, V. J., Dhanorkar, D. V., Gulhane, P. B., Dudhane, M. N. 2009. Microbial quality and safety of street vended fruit juices: a case study of Amravati city. Internet J. Food Safety, 10: 72-76.
9.Tsang, D. 2002. Microbiological guidelines for ready to eat food. Road and Environmental Hygiene Department, Hongkong, 115-116
10.Zar Biostatistical Analysis,5th EditionJerrold H. Zar, Northern Illinois University©2010 |Pearson