

world. Sewage mixed with industrial effluents severely perturbs the water quality of rivers, ponds, lakes and other water bodies. Fish and shellfish can be a source of commensal bacteria that can be pathogenic to shellfish, as well as those pathogenic to humans. Some of these bacteria include *Salmonella*, *E. coli*, *Campylobacter*, and *Vibrio*, and these have been isolated from shellfish and/or the water where the shellfish is found. There are many bacteria which are pathogenic, but there are some which are more commonly reported. The faecal coliforms are used as an indicator of human enteric pathogen for many years. Human activities and sewage overflows may be the main reason behind higher faecal contamination in rivers. Researchers have also examined the presence of faecal coliforms as indicators of faecal pollution in various water bodies. In the present study, the bacteriological quality fish harvested from river Ganga at Allahabad zone and river Mandakini at Chitrakoot zone was studied. Different bacteriological parameters like Total bacterial count (TPC), total vibrio count (TVC), Total Aeromonas Count (TAC) and total *E. coli* (TEC) or faecal coli (TFC) count were estimated. Bacteria were isolated and identified using microbiological techniques followed by PCR detection methods. High level of TPC, TVC and TEC were recorded in most samples indicating microbial contamination of fish. Molecular typing methods like RAPD and ERIC PCR was used for characterization of pathogens. The details of the research findings have been elaborated in the present paper.

Prevalence of *Clostridium botulinum* in seafood from retail outlets and supermarkets in India

V. ATHIRA, P.V. ARUN JYOTHI, A. BASIL,
K.V. LALITHA, C.J. TOMS*

ICAR-Central Institute of Fisheries Technology, Matsyapuri P.O.,
Willingdon Island, Kochi, Kerala, India;
*tomscjoseph@gmail.com

Through the mist of time, food-borne botulism has accompanied mankind. Botulism, the often fatal neuroparalytic disease is caused by the bacterial pathogen *Clostridium botulinum*. *C. botulinum* is an environmental bacterium which is present in soil and marine sediments. Many studies have indicated the role of fishery products to botulism. With the best of our knowledge, studies related to presence of *Clostridium botulinum* in fish and fishery products and botulism are not reported in India. The present study was carried out to detect the presence of *C. botulinum* in various fish and fish products sold in retail outlets and supermarkets of 7 cities in India. Two hundred products were screened by enrichment in cooked meat media followed by plating on egg yolk media. Colonies with lipase activity were further analyzed by toxin assay. Mouse bioassay with type specific antitoxins and PCR amplification of botulinum neurotoxin genes (*BoNTs*) confirmed that 11% of the products possessed *C. botulinum*. *C. botulinum* type A, type B, type E and subtype AB were the predominant toxin types. This study demonstrated the first ever report of *C. botulinum* type E and *C. botulinum* subtype AB from the Indian subcontinent in ready to eat fish product. The presence of pathogenic *C. botulinum* in ready to eat food products raises concern regarding the safety of

convenient foods and it is highly recommended to screen the presence of *C. botulinum* in fish and fish products.

SF PO 36

Biopreservative effect of *Lactobacillus plantarum* for shelf-life extension of *Nemipterus japonicus* mince during chilled storage

V.A. MINIMOL*, PANKAJ KISHORE, C.O. MOHAN, K.R. SREELEKSHMI, S.K. PANDA, G. NINAN

ICAR-Central Institute of Fisheries Technology, Matsyapuri P.O., Willingdon Island, Kochi, Kerala, India; *minimattath@gmail.com

Biopreservation is a natural preservation technique where controlled microbiota of certain Lactic acid producing bacteria and /or its antimicrobial peptides is used for the extension of shelf life as well as enhancement of food safety. In this study, biopreservative effect of *Lactobacillus plantarum* (ATCC 8014) on biochemical and microbiological parameters of *Nemipterus japonicus* (Japanese threadfin bream) mince was assessed. Fish mince was added with 1% glucose. Fish mince (100 g) was packed in sterile polyethylene bags and inoculated with *L. plantarum* of 10⁴ CFU/ml. Samples were stored in chilled condition (2°C). No significant changes were observed for TVBN between control and inoculated samples upto 11th day. Thereafter, a significantly higher TVBN (28 mg%) was observed for control samples compared to only 21 mg% for inoculated samples on 15th day indicating a sign of spoilage for control samples. PV and TBARS values were in the permissible limit in both cases during the entire storage period. There was a decrease of one log CFU/g and 02 log CFU/g in the count of Aerobic Plate Count (APC) and *Pseudomonas* count respectively, and increase of LAB count was found after 3rd

day of storage for inoculated samples. The APC count reached to rejection level on 15th day in the inoculated samples whereas the control became unacceptable on 11th day of storage. Results suggest that *L. plantarum* can be considered as a preservative agent during chilled storage of *N. japonicus* mince to enhance its shelf-life.

SF PO 37

Freshness assessment and grading of commercially important finfishes (*Scomberomorus commerson*, *Etroplus suratensis* and *Sardinella longiceps*) based on pictorial, sensory, biochemical and microbiological evaluation in chilled storage

B. SUTAPA¹, K.K. AJEESHKUMAR¹, R.N. VISHNU¹, PANKAJ KISHORE¹, T.V. SANKAR², S.K. PANDA^{1*}

¹ICAR-Central Institute of Fisheries Technology, Matsyapuri P.O., Willingdon Island, Kochi, Kerala, India; ²Kerala University of Fisheries & Ocean Studies, Panangad P.O., Kochi, Kerala, India; *satyenpanda@gmail.com

European Union insists on sensory grading of fish species prior to export and competent authority of each exporting nation need to have a sensory scheme for grading aquatic species based on freshness. The objective of the study was to evaluate the quality based on sensory grading of three species namely, *Scomberomorus commerson*, *Etroplus suratensis* and *Sardinella longiceps* during chilled storage as per EU scheme (EC Regulation 2406/96). Photographic evidence during the stages of progressive loss of freshness was documented, which was supported by evaluation of incremental changes in biochemical (TVBN, TMA & TBA content), microbiological (mesophilic bacterial count, psychrophilic bacterial count, *Pseudomonas* and H₂S producers count) and gradual loss