

## Sources of bacterial contamination of fresh fish harvested by multi-day boats

**P.H. Ginigaddarage\*, K.W.S. Ariyawansa and K.S. Hettiarachchi**

*Institute of Post Harvest Technology, National Aquatic Resources Research & Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka.*

High total bacterial count and presence of pathogenic bacteria in fish harvested by multi-day boats are indications of poor quality fish. Therefore, samples of fish harvested by multi-day boats, ice samples and swab samples collected from various points from multi-day boats to trucks that are used to transport the harvested tuna, were analyzed for total plate count and pathogenic bacteria (*Salmonella* spp., *Listeria monocytogenes*, faecal coliforms and *E. coli*). PCR (Polymerase Chain Reaction) technique was also used to confirm the presence of pathogenic bacteria. Sixty samples were collected (twelve from each sampling point) from the Beruwala fisheries harbour.

Results of the mean total plate count showed a highest value in fishholds ( $4.4 \times 10^5$  cfu/cm<sup>2</sup>). Mean total plate count of fish, truck, deck of the boat and ice in fishhold were  $1.8 \times 10^5$  cfu/g,  $2.8 \times 10^4$  cfu/cm<sup>2</sup>,  $1.8 \times 10^4$  cfu/cm<sup>2</sup> and  $1.1 \times 10^4$  cfu/ml respectively. According to the results obtained, the highest faecal coliform content was obtained from the swabs collected from trucks (1030 MPN/cm<sup>2</sup>) transporting fish. Swabs collected from deck of the boats gave a mean faecal coliform content of 712.5 MPN/cm<sup>2</sup>. Mean faecal coliform content of fish hold, ice in fish hold and fish were 395 MPN/cm<sup>2</sup>, 226.25 MPN/100ml and 7.4 MPN/g respectively. Highest mean *E. coli* content was obtained from ice of fish hold (122 MPN/100ml). Mean *E. coli* content of deck of the boat, fish hold, trucks and fish were 80 MPN/cm<sup>2</sup>, 74.5 MPN/cm<sup>2</sup>, 23.5 MPN/cm<sup>2</sup> and 0.3 MPN/g respectively. All the samples were negative for *Salmonella* spp. and *Listeria monocytogenes*. Presence of pathogenic bacteria was confirmed by the PCR technique. Target genes used to detect *Salmonella* spp., *Listeria monocytogenes*, and *E. coli* were InvA (284bp), hly – haemolysin (496bp) and uidA (147bp) respectively.

According to the results obtained, it can be seen that *E. coli* is present in all the sampling points and this indicates possible faecal contamination. Major source of *E. coli* was the ice in the fish holds. Further, the fish holds had the highest mean value of total plate count. Trucks (before loading fish) had the highest mean value of faecal coliform bacteria.

Therefore, to reduce the risk of bacterial contamination in tuna harvested by multi-day boats, it is essential to consider the factors that lead to bacterial contamination of ice, deck, fish hold and trucks.

**Keywords:** fish, multiday boats, pathogenic bacteria, *E. coli*, PCR

---

\*Corresponding author e-mail: [hasangi\\_g@yahoo.com](mailto:hasangi_g@yahoo.com)