

**IDENTIFICATION OF POSSIBLE MICROBIAL
CONTAMINATION POINTS AND
PHYSIOCHEMICAL CHANGES IN *BOLLA* FISH
(*Selar crumenophthalmus*) DURING STORAGE AND
TRANSPORTATION FROM *KUDAWELLA* FISH
HARBOR TO *BADULLA* FISH MARKET**

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ABSTRACT

Improper storage and transportation conditions account for the quality deterioration of fish as it begins to spoil as soon as fish die. Spoiled fish may cause infections to the consumers. Objective of this study was to identify possible microbial contamination points and physiochemical changes in Bolla fish (*Selar crumenophthalmus*) during storage and transportation from Kudawella fish harbor to Badulla fish market. Randomly collected fish samples from three control points (before transportation, before unloading and after unloading) including ice samples of three replicates have been examined for the enumeration of total aerobic bacteria, *Salmonella* and *Escherichia coli*. Before transportation, the highest total aerobic bacterial count ($18.03 \pm 0.03 \log \text{CFU g}^{-1}$) was observed in the fish gill samples and the lowest count was observed in fish muscle samples ($17.93 \pm 0.02 \log \text{CFU g}^{-1}$). Total aerobic bacterial count was increased during first 6 hours after unloading, in Badulla market and after 12 hours bacterial count of fish gill and muscle samples were $18.56 \pm 0.01 \log \text{CFU g}^{-1}$ and $18.49 \pm 0.01 \log \text{CFU g}^{-1}$ respectively. Initial total aerobic bacterial count of skin swab samples was $18.07 \pm 0.01 \log \text{CFU g}^{-1}$ and the count increased at the fish market during last 12 hours to $18.58 \pm 0.01 \log \text{CFU g}^{-1}$. All fish gill and skin swab samples collected from the market after 6 and 12 hour intervals were positive for both *Escherichia coli* and *Salmonella* and fish muscle samples were positive only for *Escherichia coli*. Ice samples collected at Kudawella fish harbor and Badulla fish market were positive for *Escherichia coli*. Control point examination and presence of *Escherichia coli* revealed that fish arrived to the fishery harbor as primary contamination. Also, storage conditions of ice had positive effects on microbiological quality. The temperature of Bolla fish was changed significantly with the storage time ($p < 0.05$). Before transportation the initial temperature of fish was $6.37 \pm 0.17^\circ\text{C}$ and in first 6 hours the temperature was significantly reduced to $2.44 \pm 0.36^\circ\text{C}$ ($p < 0.05$). After fish received to the Badulla fish market the temperature was significantly increased with the storage time period ($p < 0.05$). After 18 hours the final temperature was $11.49 \pm 0.31^\circ\text{C}$. The changes in temperature can be happened due to the melting of ice in the ice boxes. The initial value of pH was 5.61 and it was increased progressively during the storage time. The TBA index remained low throughout the study, ranging between (0.038 and 0.073) mg MDA/kg of fish. In conclusion, there is a requirement to initiate sufficient sanitary applications to minimize cross contaminations in fish before reaching to consumer in both fishery harbor and Badulla fish market.

Keywords: Sanitary applications, Total aerobic bacteria, *Salmonella*, *Escherichia coli*