

ORL-AAQ-09**A Comparative Study on Effectiveness of Clove Oil, Salt, and Oral Rehydration Saline for Increasing Survival Rate on Generation 3 *Labeo rohita* Live Fry Transportation**

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The use of anesthetics (e.g., clove oil), food additives (e.g., salt), and oral rehydration solution (ORS) has become increasingly popular in the live fry transportation medium to reduce metabolic rates and mortality rates. Based on existing literature, few studies have examined the appropriate dose of clove oil, salt, and ORS; also, no previous research has directly compared the efficacy of clove oil, salt, and ORS in transporting live fish fry. This study aims to evaluate the optimal dose and relative efficiency of clove oil, salt, and ORS to enhance the survival of economically valuable Generation 3 (G3) *Labeo rohita* fry during transportation. A total of 2200 G3 (3.51±0.38 g, 4.57±0.35 cm) were used in this experiment. 200 fry were used in the dose fixation simulation trial, and 2000 were packed in 20 polythene bags and subjected to four different treatments (5µl/L of clove oil, 5g/L of salt, 1g/L of ORS, and a control with no treatment in a completely randomized design (CRD) with five replications each. The oxygenated bags then traveled from Jashore to Noakhali inside an air-conditioned passenger bus.

In a dose fixation simulation trial of clove oil, the doses of 3µl/L, 5µl/L, and 7µl/L were tested, where the 5µl/L dose exhibited the highest survival rate. Conversely, the 7µl/L dose resulted in the lowest survival rate due to potential over-anesthesia or toxicity. Water quality analysis reflected that the lowest amount of NH₃-N levels were observed at 5µl/L. Salt concentrations of 3 g/L, 5 g/L, and 8 g/L were assessed. The 5 g/L dose achieved the highest survival rate (100±0%) and significantly enhanced water quality measures, notably lower NH₃-N levels. The 5 g/L dosage showed effectiveness by keeping good pH and dissolved oxygen levels. The doses of 0.5 g/L, 1 g/L, and 2 g/L of ORS were examined. The maximum ultimate survival rate (95±7.071%) was achieved by the 1 g/L dosage, which had no significant effect on water quality indicators.

During the 14-hour transportation, the survival rate was significantly higher in the salt treatment (92.6±7.7%) compared to the control (52.8±18.14%), ORS (52.6±29.91%), and clove oil (1.2±1.78%) treatments at p<0.05. Post-transport water quality analysis revealed the lowest dissolved oxygen (1.96±0.28 mg/L) in the ORS treatment and the highest in the salt treatment (4.33±0.23 mg/L). The treatment with clove oil had the greatest ammonia level (>9.9 ppm), while the treatment with salt had the lowest level (4.18±1.55 ppm). The sequence of the pH result was ORS > salt > clove oil > control. The present findings indicate that salt (5 g/L) is good for use in oxygenated polythene bag transportation of G3 rohu fry, which ensures their health and reduces the mortality risks. So, it is preferred to use 5 g/L salt treatment for long-distance transportation of G3 rohu fry for significant survival rates and favorable water quality parameters. Future research should focus on more long-term effects of transportation and its relation with other water quality parameters and stress hormones, as well as further comparative analysis of clove oil and to develop robust guidelines for aquaculture practices.

