

## ABSTRACT

This study aimed to determine the effect of water quality on the growth of mud grouper (*Epinephelus tauvina*) cultured in Lhokseumawe City. The observed water quality parameters included temperature, pH, dissolved oxygen (DO), salinity, nitrate, and ammonia, while fish growth was evaluated based on absolute weight gain, absolute length gain, and survival rate (SR). The study was conducted from April to May 2026 at three aquaculture sites in Lhokseumawe City, namely Loskala, Pusong Lama, and Mon Geudong. A total of 75 mud grouper were used, consisting of 25 fish at each station, and were observed for four weeks. Water quality and fish growth data were analyzed descriptively, while the relationship between water quality and fish growth was evaluated using multiple linear regression analysis. The results showed that temperature (30.33–31.02°C), pH (7.81–8.00), dissolved oxygen (5.53–6.66 mg/L), and salinity (27.58–30.42 ppt) were within the suitable range for mud grouper culture. Nitrate concentrations (3.28–3.72 mg/L) complied with the aquaculture water quality guideline recommended by FAO and NACA (1989), whereas ammonia concentrations (1.68–1.89 mg/L) exceeded the water quality standard stipulated in Government Regulation of the Republic of Indonesia No. 22 of 2021. The highest absolute weight gain was recorded at Station 3 (9.88 g), while the highest absolute length gain was observed at Station 2 (6.46 cm). Survival rates reached 100% at Stations 2 and 3, and 80% at Station 1. Multiple linear regression analysis indicated that the observed water quality parameters had no significant effect on the absolute weight gain or absolute length gain of mud grouper (*Epinephelus tauvina*) ( $p > 0.05$ ). However, differences in environmental characteristics and water quality conditions among the culture sites were considered to contribute to variations in fish growth. Therefore, continuous monitoring and proper management of water quality are essential to support optimal growth and sustainable mud grouper aquaculture in Lhokseumawe City.

**Keywords:** aquaculture, *Epinephelus tauvina*, growth, mud grouper, water quality.