ABSTRACT

Oysters (*Saccostrea* sp.) are bivalve organisms that inhabit coastal waters and contain antioxidants. This study aimed to evaluate the antioxidant activity of oysters (Saccostrea sp.) collected from the waters of Lhokseumawe City and to describe its relationship with water quality conditions. Sampling was conducted at four stations: Loskala, Panggoi, Mon Geudong, and Pusong. Water quality parameters measured included temperature, salinity, pH, and dissolved oxygen (DO). Antioxidant activity was determined using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method and measured with a UV-Vis spectrophotometer. Data were analyzed using the *Kruskal-Wallis* test. The results showed that the antioxidant inhibition values at Stations 1, 2, 3, and 4 were 61.17 ± 9.27%, 66.67
± 8.38%, 72.56 ± 7.23%, and 79.39 ± 9.38%, respectively. The highest inhibition was recorded at Station 4 (Pusong), while the lowest was found at Station 1 (Loskala). However, the *Kruskal-Wallis* test indicated that antioxidant activity did not differ significantly among stations ($p = 0.157$). In contrast, differences in temperature ($p = 0.015$), salinity ($p = 0.019$), pH ($p = 0.025$), and DO ($p = 0.039$) among stations were statistically significant. Water temperature ranged from 29.6 to 33.5°C, salinity from 27 to 30 ppt, and pH from 7.60 to 8.42. In conclusion, oyster samples from Pusong showed the highest mean antioxidant inhibition, although the differences in antioxidant activity among the four stations were not statistically significant. Water quality conditions varied among sampling stations, particularly in temperature, salinity, pH, and DO. These findings provide baseline information on oyster antioxidant activity and water quality in the waters of Lhokseumawe City.

Keywords: Antioxidant activity, DPPH, Lhokseumawe waters, *Saccostrea* sp., Water quality