

ABSTRACT

The increasing use of plastic has led to a rise in microplastic pollution in coastal waters, which can accumulate in filter-feeding organism such as oysters (*Saccostrea* sp.) as well as in bottom sediments. This study aimed to identify the abundance and types of microplastics in oysters and sediments and to compare their abundance in the coastal waters of Lhokseumawe City. The research was conducted from May to June 2026 using a descriptive quantitative survey method with a purposive sampling approach at three stations representing a river estuary, a floating net cage aquaculture area, and a settlement/tourism area. Oysters samples were collected by direct sampling, while sediment samples were collected using an Ekman grab. Microplastics were identified through digestion with 30% H₂O₂ (for oysters) and density separation using saturated NaCl solution (for sediments), followed by microscopic observation. Differences in abundance between the two media were tested using the Mann-Whitney U test after the data were found to be non-normally distributed. Five types of microplastics were identified at all stations (fiber, fragmen, film, foam, and filamen) while pellets were not found. Microplastics abundance in oysters ranged from 1109,23 to 1.435,64 particles/g, significantly higher than in sediments, which ranged from 316.20 to 391.32 particles/g, a difference of about 3–4 times. The Mann-Whitney U test showed a significance value of $p < 0.001$, indicating a highly significant difference in microplastic abundance between oysters and sediments. Fiber and fragmen were the dominant types in both media, likely originating from domestic, fishery, and aquaculture activities around the study sites. These findings confirm that oysters have potential as bioindicators of microplastic pollution in coastal waters and highlight potential risks to seafood safety that warrant further investigation, such polymer identification using FTIR.

Keywords: Lhokseumawe, microplastics, oyster, *Saccostrea* sp., sediment

RINGKASAN

AFIFAH IKHWANI RITONGA. Perbandingan Kandungan Mikroplastik pada Tiram (*Saccostrea* sp.) dan Sedimen Di Perairan Kota Lhokseumawe. Dibimbing oleh ERNIATI dan YUDHO ANDIKA.

Peningkatan penggunaan plastik telah menyebabkan pencemaran mikroplastik di berbagai perairan pesisir, termasuk Perairan Kota Lhokseumawe yang dikelilingi aktivitas perikanan, budidaya, permukiman serta wisata. Mikroplastik dapat terakumulasi pada sedimen dasar perairan maupun organisme *filter feeder* seperti tiram (*Saccostrea* sp.), sehingga berpotensi masuk ke rantai makanan dan mempengaruhi keamanan pangan hasil laut. Penelitian ini bertujuan untuk mengidentifikasi kelimpahan mikroplastik pada tiram dan sedimen, serta menganalisis perbandingan kelimpahannya di Perairan Kota Lhokseumawe. Penelitian ini dilaksanakan Mei – Juni 2026 di tiga stasiun (muara sungai, kawasan budidaya keramba, dan kawasan permukiman-wisata) menggunakan metode deskriptif kuantitatif. Sampel tiram diambil secara *direct sampling* dan sedimen dengan *ekman grab*, kemudian diidentifikasi secara mikroskopis setelah digesti H_2O_2 (tiram) dan pemisahan densitas NaCl (sedimen). Perbedaan kelimpahan diuji dengan *Mann-Whitney U*. Ditemukan lima jenis mikroplastik (fiber, fragmen, film, foam, filamen) di seluruh stasiun, sedangkan pellet tidak ditemukan. Kelimpahan pada tiram (1.109,23-1.435,64 partikel/gr) jauh lebih tinggi dibandingkan sedimen (316,20-391,32 partikel/gr), sekitar 3-4 kali lipat, dengan perbedaan yang sangat signifikan ($p < 0,001$). Hasil ini menunjukkan tiram berpotensi baik sebagai bioindikator pencemaran mikroplastik, dan disarankan penelitian lanjutan menggunakan FTIR.

Kata kunci: *filter feeder*, Lhokseumawe, mikroplastik, *Saccostrea* sp. sedimen