Analisis kelimpahan mikroplastik pada air, sedimen, dan ikan cere gambusia affinis (Baird & Girard, 1853) di Situ Rawa Besar, Depok, Jawa Barat = Analysis of microplastic abundance in water, sediment, and mosquitofish gambusia affinis (Baird & Girard, 1853) in Situ Rawa Besar, Depok, West Java

Salwa Allyah Zahrah, author

Abstrak

Peningkatan jumlah limbah plastik yang dibuang ke Situ Rawa Besar mengancam habitat ikan cere. Limbah plastik akan terdegradasi menjadi partikel kecil yang disebut dengan mikroplastik. Mikroplastik dapat terkonsumsi oleh ikan cere karena ukurannya yang mirip dengan sumber makanannya. Penelitian ini bertujuan untuk mengetahui adanya keberadaan mikroplastik dan menganalisis berbagai macam bentuk mikroplastik pada air, sedimen dan ikan cere Gambusia affinis (Baird & Girard, 1853) di Situ Rawa Besar pada musim kemarau 2022 dan musim hujan 2023. Seluruh sampel diambil di 3 stasiun yaitu inlet, midlet, dan outlet. Sampel air 20 L disaring menggunakan plankton net 350 mesh, sampel sedimen diambil 250 mL menggunakan Ekman grab, ikan cere diambil secara acak menggunakan dip net sebanyak 15 individu. Sampel ikan diawetkan dengan alkohol 70% dan diekstraksi menggunakan 5mL HNO3 1 M. Sedimen dikeringkan pada oven 65C dan dihaluskan. Seluruh sampel dilarutkan dengan NaCl jenuh. Larutan dihomogenisasi sebanyak 20 mL dan 1 mL diteteskan pada Sedgewick Rafter Chamber untuk diamati di bawah mikroskop cahaya. Hasil pengamatan pada musim kemarau 2022 menunjukkan total rata-rata kelimpahan mikroplastik pada air sejumlah 46,33 ± 4,67 partikel L-1, pada sedimen sejumlah 31.777,78 ± 16.344,67 partikel kg-1, pada ikan cere sejumlah 291,11 ± 73,10 partikel ind-1 atau 93,52 ± 14,33 partikel cm-1. Sementara itu, pada musim hujan 2023 menunjukkan total rata-rata kelimpahan mikroplastik pada air sejumlah 64,67 ± 8,70 partikel L-1 , pada sedimen sejumlah 34.222,22 ± 17.493,91 partikel kg-1, dan pada ikan cere sejumlah 254,00 ± 40,28 partikel ind-1 atau 89,71 ± 12,15 partikel cm-1. Hasil Uji Korelasi Spearman menunjukkan terdapat korelasi positif sangat kuat antara kelimpahan mikroplastik pada air dengan sedimen, serta antara panjang ikan cere dengan kelimpahan mikroplastik pada ikan cere. Hasil analisis Uji T Dua Sampel menunjukkan tidak terdapat perbedaan nyata pada seluruh sampel.
.....The increasing amount of plastic waste dumped into Situ Rawa Besar threatens the mosquitofish habitat. Plastic waste degrades into small particles called microplastics. Microplastics can be consumed by mosquitofish because their size is similar to that of their food source. This research aims to determine the presence of microplastics and analyze various forms of microplastics in water, sediment, and the mosquitofish Gambusia affinis (Baird & Girard, 1853) in Situ Rawa Besar during the 2022 dry season and the 2023 wet season. All samples were taken at three stations, namely inlet, midlet, and outlet. A 20 L water sample was filtered using a 350 mesh plankton net, 250 mL sediment samples were taken using an Ekman grab, and 15 mosquitofish were randomly captured using a dip net. Fish samples were preserved with 70% alcohol and extracted using 5 mL of 1 M HNO3. The sediment was dried in an oven at 65°C and ground. All samples were dissolved with saturated NaCl. The solution was homogenized to 20 mL, and 1 mL was dropped into the Sedgewick Rafter Chamber to be observed under a light microscope. The results of observations in the 2022 dry season showed that the total average abundance of microplastics in the water

was 46.33 ± 4.67 particles L-1, in sediment was 31,777.78 ± 16,344.67 particles kg-1, and in mosquitofish was 291.11 ± 73.10 particles ind-1 or 93.52 ± 14.33 particles cm-1. Meanwhile, in the 2023 wet season, the total average abundance of microplastics in the water was 64.67 ± 8.70 particles L-1, in the sediment was 34,222.22 ± 17,493.91 particles kg-1, and in mosquitofish was 254.00 ± 40.28 particles ind-1 or 89.71 ± 12.15 particles cm-1. The results of the Spearman Correlation Test showed that there was a very strong positive correlation between the abundance of microplastics in water and sediment, as well as between the length of mosquitofish and the abundance of microplastics in mosquitofish. The results of the Two Sample T Test analysis show that there are no significant differences in all samples.