CROISSAND (Sorting Sand without Microplastic): Rancangan Alat Pemilah Mikroplastik dari Pasir Pantai Berbasis Massa Jenis menggunakan Surface Acoustic Wave (SAW) sebagai Upaya Mereduksi Kandungan Mikroplastik pada Ikan Tongkol (Euthynnus affinis)

Fadhil Ahmad Husain, Aditya Septian Maulana
SMA N 1 Kudus, Jalan Pramuka 41, Kudus, Jawa Tengah
Email: sma1kds@yahoo.co.id

Plastik yang tidak terdaur ulang dengan baik dapat mencemari lingkungan terutama ketika plastik sudah terpecah menjadi partikel lebih kecil bernama mikroplastik. Pergerakan mikroplastik melalui air akan menuju laut, diperkirakan kuantitas mikroplastik di dalam lautan mencapai angka 14.5 juta ton. Mikroplastik yang tersebar di lautan berisiko tertelan ikan yang salah satunya adalah ikan tongkol yang banyak dikonsumsi masyarakat Jepara dimana mencapai produksi hingga 227.200 kg pada tahun 2020. Apabila mikroplastik dikonsumsi ikan dan sampai di tubuh manusia maka dapat membawa racun bahkan memicu penyakit. Oleh karena itu peneliti membuat penelitian dengan tujuan mereduksi mikroplastik dari pasir pantai berbasis massa jenis menggunakan *surface acoustic wave*.

Jenis penelitian yang dilakukan: eksperimental research melalui 4 tahap: 1. Pengambilan sampel air laut dan sampel ikan di 3 stasiun pantai jepara, 2. Pengujian FTIR sampel air laut dan ikan tongkol, 3. Pembuatan CROISSAND, 4. Uji efektivitas CROISSAND sebagai alat untuk mereduksi mikroplastik berbasis massa jenis menggunakan metode RAL. Dalam metode ini digunakan 5 kelompok perlakuan dan 3 kali pengulangan pada setiap masing-masing perlakuan, diantaranya: (K+), (K-), sedangkan (P1) dengan frekuensi 8.000 Hz, (P2) 11.000 Hz, (P3) dengan frekuensi 14.000 Hz,

Berdasarkan penelitian dapat disimpulkan bahwa hasil pengujian FTIR. dideteksi berbagai jenis mikroplastik yang tersebar di perairan maupun dalam ikan tongkol di pantai-pantai Jepara, jenis mikroplastik didominasi oleh bentuk film pada air sebanyak 178 buah dimana angka tersebut merupakan 43.1% dari keseluruhan mikroplastik pada sampel air serta bentuk fiber pada ikan tongkol sebanyak 36 buah dengan kekuatan gelombang sebesar 14.000 Hz (penggunaan CROISSAND lebih efektif dibanding penggunaan alat konvensional karena perbedaan waktu serta tenaga yang perlu dikeluarkan).

Kata kunci: Ikan Tongkol, Jepara, Mikroplastik, *Piezoelectric*, *Surface Acoustic Wave*

CROISSAND (Sorting Sand without Microplastic): Design of a Density-Based Tool for Sorting Microplastics from Beach Sand using Surface Acoustic Wave (SAW) as an Effort to Reduce Microplastic Content in Tongkol Fish (Euthynnus affinis)

Fadhil Ahmad Husain, Aditya Septian Maulana
SMA N 1 Kudus, Pramuka street 41, Kudus, Central Java
Email: sma1kds@yahoo.co.id

Plastic that is not recycled properly can pollute the environment, especially when the plastic is broken down into smaller particles called microplastics. The movement of microplastics through water will lead to the sea, it is estimated that the quantity of microplastics in the ocean reaches 14.5 million tons. Microplastics scattered in the ocean are at risk of being swallowed by fish, one of which is the tongkol fish. Tongkol fish is one of the fish that the people of Jepara like to consume, reaching production of up to 227,200 kg in 2020. If microplastics are consumed by fish and reach the human body, they can carry toxins and even trigger disease. Therefore, researchers conducted research intending to reduce microplastics from beach sand based on density using surface acoustic waves.

Type of research carried out: experimental research through 4 stages: 1. Taking sea water samples and fish samples at 3 Jepara beach stations, 2. FTIR testing of seawater and tongkol fish samples, 3. Making CROISSAND, 4. Testing the effectiveness of CROISSAND as a tool for reducing microplastics based on density using the RAL method. In this method, 5 treatment groups were used and 3 repetitions of each treatment, including: (K+), (K-), while (P1) with a frequency of 8,000 Hz, (P2) 11,000 Hz, (P3) with a frequency of 14,000 Hz,

Based on research, it can be concluded that the results of FTIR testing. various types of microplastics were detected in the waters and tongkol on Jepara beaches, it was concluded that it was contaminated with microplastics and was at risk if consumed by humans. The type of microplastics is dominated by 178 film forms in water, which is 43.1% of the total microplastics in water samples and 36 fiber forms in tongkol fish with a wave strength of 14,000 Hz (using CROISSAND is more effective than using conventional tools because of the difference in time and energy that needs to be spent).

Keywords: Tongkol fish, Jepara, Microplastics, Piezoelectric, Surface Acoustic Wave