

RINGKASAN

Perairan pesisir Cilacap mengalami pencemaran mikroplastik, sehingga diperlukan pemantauan ekosistemnya melalui organisme bioindikator seperti teritip. Teritip *Amphibalanus amphitrite* sebagai organisme *filter-feeder* mampu untuk mengakumulasi mikroplastik. Penelitian bertujuan untuk mengetahui jumlah, karakteristik fisik dan kimia mikroplastik, menilai tingkat bioakumulasi *A. amphitrite* sebagai bioindikator mikroplastik, serta untuk mengetahui hubungan antara konsentrasi mikroplastik pada teritip, air laut, dan sedimen di perairan pesisir Cilacap.

Penelitian dilaksanakan dari bulan Maret 2024 hingga Januari 2025 menggunakan metode survei dan teknik *purposive sampling*. Variabel yang diamati mencakup jumlah, karakteristik fisik dan kimia mikroplastik, serta tingkat bioakumulasi *A. amphitrite*. Parameter yang diamati mencakup jumlah, ukuran, bentuk, warna, jenis polimer mikroplastik, serta nilai Faktor Biokonsentrasi (BCF). Analisis data dilakukan secara deskriptif untuk menggambarkan distribusi dan karakteristik mikroplastik. Data yang diperoleh dianalisis korelasi untuk mengetahui hubungan konsentrasi mikroplastik pada teritip, air laut, dan sedimen. Uji normalitas data dilakukan dengan Uji Shapiro-Wilk, kemudian dilanjutkan dengan Uji Korelasi Pearson.

Hasil penelitian menunjukkan bahwa *A. amphitrite* berpotensi sebagai bioindikator dengan akumulasi mikroplastik tertinggi (493 partikel di teritip, 39 partikel di air laut, dan 190 partikel di sedimen). Ukuran mikroplastik bervariasi dari <100 μm hingga 4500–5000 μm , dengan bentuk serat, fragmen, dan film. Warna mikroplastik antara lain, yaitu biru, hitam, merah, coklat, ungu, dan transparan. Polimer kimia yang ditemukan meliputi Polipropilena (PP), Polietilena Tereftalat (PET), Polietilena (PE), Polivinil Klorida (PVC), Polistirena (PS), Poliuretan (PU), Poliamida (PA), Polietilena Vinil Asetat (PEVA), Polimetil Metakrilat (PMMA), Akrilonitril Butadiena Stirena (ABS), dan Polikarbonat (PC). *A. amphitrite* memiliki bioakumulasi mikroplastik tingkat rendah terhadap air laut dan sedimen. Terdapat hubungan negatif signifikan antara konsentrasi mikroplastik di air laut dan *A. amphitrite*. Hal tersebut mengindikasikan bahwa *A. amphitrite* sebagai *filter-feeder* selektif lebih dipengaruhi oleh mikroplastik di air laut dibandingkan sedimen.

Kata kunci: *Amphibalanus amphitrite*, bioindikator, Cilacap, mikroplastik, teritip

SUMMARY

The coastal waters of Cilacap are polluted by microplastics, so monitoring of its ecosystem is needed through bioindicator organisms such as barnacles. The barnacle *Amphibalanus amphitrite* as a *filter-feeder* organism is able to accumulate microplastics. The study aims to determine the amount, physical and chemical characteristics of microplastics, assess the level of bioaccumulation of *A. amphitrite* as a bioindicator of microplastics, and to determine the relationship between microplastic concentrations in barnacles, seawater, and sediments in the coastal waters of Cilacap.

The study was conducted from March 2024 to January 2025 using a survey method and purposive sampling technique. The variables observed included the amount, physical and chemical characteristics of microplastics, and the level of bioaccumulation of *A. amphitrite*. The parameters observed included the amount, size, shape, color, type of microplastic polymer, and the Bioconcentration Factor (BCF) value. Data analysis was carried out descriptively to describe the distribution and characteristics of microplastics. The data obtained were analyzed for correlation to determine the relationship between microplastic concentrations in barnacles, seawater, and sediments. Data normality test was conducted using the Shapiro-Wilk Test, followed by the Pearson Correlation Test.

The results showed that *A. amphitrite* has the potential to be a bioindicator with the highest microplastic accumulation (493 particles in barnacles, 39 particles in seawater, and 190 particles in sediment). The size of microplastics varies from <100 μm to 4500–5000 μm , in the form of fibers, fragments, and films. The colors of microplastics include blue, black, red, brown, purple, and transparent. The chemical polymers found include Polypropylene (PP), Polyethylene Terephthalate (PET), Polyethylene (PE), Polyvinyl Chloride (PVC), Polystyrene (PS), Polyurethane (PU), Polyamide (PA), Polyethylene Vinyl Acetate (PEVA), Polymethyl Methacrylate (PMMA), Acrylonitrile Butadiene Styrene (ABS), and Polycarbonate (PC). *A. amphitrite* has low levels of microplastic bioaccumulation in seawater and sediment. There is a significant negative relationship between microplastic concentrations in seawater and *A. amphitrite*. This indicates that *A. amphitrite* as a selective *filter-feeder* is more affected by microplastics in seawater than sediment.

Keywords: *Amphibalanus amphitrite*, barnacle, bioindicator, Cilacap, microplastic