

# Kajian Spasial Komunitas Plankton di Jalur Barat Arus Lintas Indonesia = Spatial Study of Plankton Community in the Western Pathway of Indonesian Throughflow

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## Abstrak

Penelitian tentang komunitas plankton di jalur barat arlindo telah dilakukan. Plankton merupakan kelompok organisme yang memiliki peranan penting dalam ekosistem laut dan sensitif terhadap perubahan lingkungan. Plankton terdiri atas dua kelompok utama, yaitu fitoplankton dan zooplankton. Arlindo merupakan massa air yang bergerak dari perairan Samudera Pasifik ke Samudera Hindia melalui perairan Indonesia. Penelitian bertujuan untuk menganalisis sebaran komunitas fitoplankton dan zooplankton, serta faktor yang mempengaruhinya di jalur barat arus lintas Indonesia. Penelitian dilakukan pada bulan Februari hingga Maret 2021 dengan jumlah pengambilan sampel, yaitu 18 stasiun. Pengambilan sampel menggunakan jaring Plankton (80 $\mu$ m untuk fitoplankton dan 300 $\mu$ m untuk zooplankton). Pengambilan sampel dilakukan pada kedalaman hingga 300, kecuali stasiun ctd22 (100m) dan ctd31 (60m). Hasil penelitian menunjukkan bahwa terdapat 34 genera fitoplankton yang terdiri dari 28 genera Diatom, 5 genera Dinoflagellata dan 1 genus Cyanobacteria. Kisaran kelimpahan fitoplankton, yaitu 17.136 sel.m<sup>-3</sup> – 44.680.440 sel.m<sup>-3</sup>. Kelimpahan fitoplankton yang tinggi ditemukan pada bagian selatan Selat Makassar. Nilai indeks keanekaragaman dan keseragaman cenderung lebih tinggi pada bagian jalur keluar arlindo dibandingkan dengan Selat Makassar. Kisaran kelimpahan dan biovolume zooplankton masing-masing, yaitu 239,20 ind.m<sup>-3</sup>—2.470,06 ind.m<sup>-3</sup> dan 28,50—2.495,82 mm<sup>3</sup>.m<sup>-3</sup>. Copepoda, Chaetognatha, Appendicularia, Nauplius, Ostracoda dan Polychaeta merupakan kelompok zooplankton yang mendominasi dari segi kelimpahan, sedangkan berdasarkan biovolume didominasi oleh kelompok Chaetognatha, Copepoda, Siphonophora, Cnidaria, Euphausiacea. Berdasarkan nilai parameter NBSS menunjukkan bahwa komunitas zooplankton di lokasi penelitian memiliki efisiensi transfer energi yang tinggi dalam jaring-jaring makanan (-0.53— -0.85). Hasil analisis statistik menunjukkan bahwa parameter lingkungan seperti suhu, salinitas, nitrat dan fosfat mempengaruhi sebaran komunitas fitoplankton di jalur arlindo bagian barat. Suhu, salinitas dan oksigen terlarut merupakan parameter lingkungan yang memberikan pengaruh lebih besar terhadap komunitas zooplankton di jalur arlindo bagian barat.

.....The study about plankton community in the western pathway of Indonesian throughflow has been done. Plankton is a group of organisms that have an important role in marine ecosystems and are sensitive to environmental changes. Plankton consists of two main groups, namely phytoplankton and zooplankton. Arlindo is a mass of water that moves from the waters of the Pacific Ocean to the Indian Ocean through Indonesia sea. This study aims to analyze the spatial distribution of phytoplankton and zooplankton community and environmental factors influencing their distribution in the western pathway of the Indonesian throughflow. The research was conducted from February to March 2021 with a total of 18 sampling stations. Plankton samples were collected vertically using nets (80 $\mu$ m for phytoplankton and 300 $\mu$ m for zooplankton) from 300m up to the surface, except stations of the ctd22 (100m) and ctd31 (60m). 34 genera of phytoplankton were identified, consisting of 28 genera of Diatom, 5 genera of Cyanobacteria and 1 Dinoflagellate genus. Phytoplankton abundance ranged between 17,136 sel.m<sup>-3</sup> and 44,680,440 sel.m<sup>-3</sup>,

with the highest abundance was found in the southern of Makassar Strait. The phytoplankton diversity index ranged from 1.20 to 2.28, Meanwhile, the evenness uniformity index ranged between 0.34 and 0.65, and the dominance index ranged between 0.13 and 0.49. Overall, the diversity and evenness index values higher in the arlindo exit pathway then in the Makassar Strait. The range of zooplankton abundance was 239.20 ind.m<sup>-3</sup> and 2,470.06 ind.m<sup>-3</sup>, and the biovolume from 28.4995 to 2495.82 mm<sup>3</sup>.m<sup>-3</sup>. Copepoda, Chaetognatha, Appendicularia, nauplius, Ostracoda and Polychaeta dominated the zooplankton abundance, while based on the biovolume, the community was dominated by Chaetognatha, Copepoda, Siphonophora, Cnidaria, Euphausiacea. The NBSS analyses showed that the zooplankton community at the study site had a high efficiency of energy transfer in food webs (-0.53— -0.85). The results of statistical analysis show that environmental parameters such as temperature, salinity, nitrate, and phosphate regulated the distribution of plankton communities during the observation period. Meanwhile, environmental drivers such as temperature, salinity and dissolved oxygen and phytoplankton influenced the zooplankton distribution in the western of the Indonesia throughflow pathway.