

DAFTAR PUSTAKA

- Abdli, S. T. (2017). *The First Evaluation of Microplastics in Sediments from the Complex Lagoon-Channel of Bizerte (Northern Tunisia)*. *Water Air Soil Pollut*, 228:262.
- Akmal. 2012. Respon Pertumbuhan dan Warna Tallus Rumput Laut *Kappaphycus alvarezii* yang di Budidayakan Berbagai Kedalaman di Perairan Laikang Takalar. *Jurnal Ilmu Perikanan*. Vol. 1, No. 1.
- Amin, R. M., Sohaimi, E. S., Anuar, S. T. & Bachok, Z. 2020. Microplastic ingestion by zooplankton in Terengganu coastal waters, southern South China Sea. *Mar. Pollut. Bull.* **150**, 110616.
- Andrady, A. L., 2011. *Microplastics in the Marine Environment*. *Marine Pollution Bulletin*. 62: 1596-1605.
- Astuti. P. A. W., 2019 . *Analisis Kelimpahan dan Pola Distribusi Mikroplastik Akibat Pengaruh Pasang Surut di Muara Perancak dan Perairan Pengambangan, Kabupaten Jembrana, Bali*. Skripsi. Universitas Brawijaya.
- Ayuningtyas, W.C., D.Yuna, S. H. Julinda s, F.Iranawati. 2019, Kelimpahan Mikroplastik Pada Perairan Di Banyuurip, Gresik, Jawa Timur, *Journal of Fisheries and Marine Research*, Vol.3, No.1, Hal.41-45.
- Azizah.P., Ali. R, Chrisna . A. S., 2020. Mikroplastik pada Sedimen di Pantai Kartini Kabupaten Jepara, Jawa Tengah. *Journal of Marine Research*. 9(3): 326-332.
- Besseling. E., J. T. Sun, & M. Koelmans,A.A, 2017. *Fate Of Nano And Microplastic In Freshwater System: A Modeling Study*, *Env. Pollut.* 220:540-548.
- Boucher, J. D. dan D. Friot. 2017. *Primary Microplastics in the Oceans*. International Union for Conservation of Nature. Switzerland.
- Browne, M.A., Crump, P., Niven, S.J., Teuten, E., Tonkin, A., Galloway, T., Thompson, R.,2011. *Accumulation of Microplastic on Shorelines Woldwide: Sources and Sinks*. *Environ. Sci. Technol.* 45, 9175– 9179.
- Carbery, M., O'Connor, W., Thavamani, P. 2018. *Trophic transfer of microplastics and mixed contaminants in the marine food web and implications for human health*. *Environ. Int.* 115, 400–409.
- Cleassens .M, Meester. S.D., Landuyt. L.V., Clerck. K. D., Jansenss. C. R., 2011. *Occurrence and Distribution of Microplastics of Marine Sediments Along the Belgian Coast*. *Mar. Pollut. Bull.* 62: 2199-2204.
- Cole et al., 2013. *Environmental Science & Technology*. Microplastic Ingestion by Zooplankton.
- Crawford. C. & B.Quinn, B. 2017. *The Biological impacts and effects of contaminated microplastic, in: Microplastic Pollutants*. Elsevier, pp. 159-178.
- Datu, S. S., 2019. *Kontaminasi Mikroplastik Pada Lamun Di Pulau Baranggaddi, Kota Makassar Sulawesi Selatan*. Tesis. Makassar. Universitas Hasanuddin
- Dawes, C.J. 2006. *Marine Algae*. *University of Miami Press Coral Gables Florida*
- DEPA, 2015, *The Danish Environmental Protection Agency: Microplastics-Occurence, effect and sources Of Releases To The Enviromental in Denmark*. Denmark.
- Dewi, I.S., A.A. Budiarsa.,& I.R.Ritonga, 2015. Distribusi Mikroplastik pada Sedimen di Muara Badak, Kabupaten Kutai Kartanegara, Depik, 4(3):121-131.

- Digka, N., C. Tsangaris, M. Torre, A. Anastasopoulou, & C. Zeri. 2018. *Microplastics in mussels and fish from the Northern Ionian Sea*. Mar. Pollut. Bull., 135: 30–40. <https://doi.org/10.1016/j.marpolbul.2018.06.063>.
- Ding, J., Jingxi, L., Chegjun, S., Fenghua, J., Peng, J., Lingyun, Q., Yifan, Z., & Changfei, H., 2019. Detection of microplastics in local marine organisms using a multi-technology system. *Anal. Methods* 11: 78–87.
- Eriksen. M, L.C.M. Leberon, H.S, Carson, M.Theil, C. J. Moore, J.C. Bprerro, F. Galgani, P. G. Ryan, J. Reisser. 2014. *Plastic Pollution in the worlds Oceans: More Than 5 Trillion Plastic Pieces Weighing Over 250,000 Tons Afloat at Sea*. PLOS ONE 9 (12).
- Fang, C., Ronghui, Z., Fukun, H., Yulu, J., Heshan, L., Longshan, L., Ruibo, L., Christyn, B., & Jun, B., 2021. Microplastics in Three Typical Benthic Species from the Arctic: Occurrence, Characteristics, Sources, and Environmental Implications. DOI: 10.1016/j.envrea.2020.110326.
- Faujiah. I. N., & Ira. R. W., 2022. Kelimpahan dan Karakteristik Mikroplastik pada Air Minum serta Potensi Dampaknya terhadap Kesehatan Manusia. *Prosiding Seminar Nasional Kimia. Gunung Djati Conference Series* (7).
- Feng, Z., Zhang, T., Shi, H., Gao, K., Huang, W., Xu, J., Wang, J., Wang, R., Li, J., & Gao, G. (2020). *Microplastics in bloom-forming macroalgae: Distribution, characteristics and impacts*. *Journal of Hazardous Materials*, 397 (April). <https://doi.org/10.1016/j.jhazmat.2020.122752>.
- Friaz. J. P. G. L., V.O., & P. S., 2014. Evidence of Microplastics in Samples of Zooplankton from Portuguese Coastal Waters, *Marine Environmental Research*. 95 (89:95).
- GESAMP. (2015). Sources, fate and effects of microplastics in the marine environment: a global assessment (Kershaw, P. J., ed.). (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). *Rep. Stud. GESAMP, No. 90*, 96 p. www.imo.org
- Handayani, T. 2017. Karakteristik dan Dampak Makroalga Introduksi, *Oseana*, XLII (4): 70 – 80.
- Hidalgo-Ruz V, Gutow L, Thompson RC, Thiel M. 2012. *Microplastics in the marine environment: a review of the methods used for identification and quantification*. *Environ Sci Technol* 46: 3060-2075.
- Hung, C., Klasios, N., Zhu, X., Sedlak, M., Sutton, R., & Rochman, C. M. 2021. *Methods Matter: Methods for Sampling Microplastic and Other Anthropogenic Particles and Their Implications for Monitoring and Ecological Risk Assessment*. *Integrated Environmental Assessment and Management*, 17(1), 282–291. <https://doi.org/10.1002/ieam.4325>.
- Hiwari, H., Purba, N. P., Ihsan, Y. N., Yuliadi, L. P. S., & Mulyani, P. G. 2019. *Kondisi Sampah Mikroplastik di Permukaan Air Laut Sekitar Kupang dan Rote, Provinsi Nusa Tenggara Timur*. 5(2): 1165–171. <https://doi.org/10.13057/psnmbi/m050204>.
- Hutagalung, H.P., 1988. *Pengaruh Suhu Terhadap Kehidupan Organisme Laut*. *Pewarta Oseana. LON-LIPI, Jakarta* (13):153-163.
- Ira, Rahmadani, N. Irawati, 2018, Komposisi Jenis Makroalga di Perairan Pulau Hari Sulawesi Tenggara (*Species Composition of Makroalga in Hari Island, South East Sulawesi*), *Jurnal Biologi Tropis*, 18 (2) : 141-158.

- Jang, M., Shim, W. J., Han, G. M., Song, Y. K. & Hong, S. H. 2018. Formation of microplastics by polychaetes (*Marphysa sanguinea*) inhabiting expanded polystyrene marine debris. *Mar. Pollut. Bull.* 131, 365–369.
- Jumarni. 2022. Kelimpahan dan Karakteristik Mikroplastik pada Kerang Darah (*Anadara granosa*) dari Perairan di Sekitar Maccini Baji, Kabupaten Pangkajene dan Kepulauan. SKRIPSI. Makassar: Universitas Hasanuddin.
- Kam Ph. 2001. *Codium fragile* the Race Rocks taxonomy. <http://www.racerocks.com/racerock/eco/taxalab/philipk.htm>
- Karuniastuti. N., 2013. Bahaya Plastik Terhadap Kesehatan dan Lingkungan, *Jurnal Forum Teknologi*, Vol. 03 No. 1.
- Kapo. F. A., Lumban N. L. T., Chaterina A. P., 2020. Jenis dan Kelimpahan Mikroplastik pada Kolom Permukaan Air di Perairan Teluk Kupang. *Jurnal Bahari Papadak* 1:(1).
- Kepel. R. C., Desy.M. H. M. 2019, Biodiversitas Makroalga di Perairan Pesisir Kora-Kora, Kecamatan Lembean Timur, Kabupaten Minahasa. *Jurnal Ilmiah Platax*, Vol.7(2).
- Kingfisher, J. 2011. *Microplastic Debris Accumulation on Puget Sound Beaches*. Port Townsend Marine Science Center.
- Knutsen, H., Jacob, B. C., Christian, C., Oyvind, L., Emma, J<W., Veronica, C., Arne, P., Jens, L., Thomas, S., & Hans, P. H. A et al. 2020. Microplastic accumulation by tube-dwelling, suspension feeding polychaetes from the sediment surface: A case study from the Norwegian Continental Shelf. *Mar. Environ. Res.* 161, 105073 .
- Laila, Q. N., Pujiono. W. P., & Oktavianto. E. J., 2020. *The Abundance of Microplastics in Sediment at the Coast of Mangunharjo Village, Tugu District, Semarang*. *Jurnal Pasir Laut*, 4 (1): 28.
- Lalodo, D. & W. A. Nugraha, 2019, Mikroplastik Pada Bulu Babi dari Rataan Terumbu Pulau Gili Labak Sumenep, *Jurnal Kelautan*, 12(2):112-122.
- Li, J., X. Qu, L. Su, W. Zhang, D. Yang, P. Kolandhasamy, D. Li, & H. Shi. 2016. *Microplastics in mussels along the coastal waters of China*. *Environ. Pollut.*, 214: 177–184. <https://doi.org/10.1016/j.envpol.2016.04.012>.
- Lin. V. S., 2016. Research Highlights: Impact of Microplastocs on Plankton. *Environmental Science: Processes & Impacts*. (2).
- Lusher, A. L., Mchugh, M., & Thompson, R. C. (2013). Occurrence Of Microplastics In The Gastrointestinal Tract of Pelagic and Demersal Fish from The English Channel. *Marine Pollution Bulletin*, 67(1-2), 94-99.
- Lusher, A. L., Tirelli, V., O'Connor, I., & Officer, R. (2015). *Mikroplastiks in Arctic polar waters: the first reported values of particles in surface and sub-surface samples*. *Scientific reports*, 5, 14947.
- Lusher, A. L., Peter H & Jeremy M. (2017). *Microplastics in Fisheries and 81 Aquaculture*. Roma: Food and Agriculture Organization of The United Nations.
- National Oceanic and Atmospheric Administration. 2013. *Programmatic environmental assessment (PEA) for the NOAA Marine Debris Program (MDP)*. Maryland (US):NOAA.168.
- Manalu, A. A., Hariyadi, S., & Wardiatno, Y. (2017). Microplastics Abundance in Coastal Sediments of Jakarta Bay, Indonesia. *AACL Bioflux*, 10(5): 1164–1173.

- Mari, A., Bordos, G., Gergely, S., Buki, M., Háhn, J., Palotai, Z., Szoboszlai, S. (2021). *Validation of microplastic sample preparation method for freshwater samples. Water Research*, 202. <https://doi.org/10.1016/j.watres.2021.117409>.
- Masura, J., Baker, J. E., Foster, G. D., Arthur, C., & Herring, C. 2015. Laboratory methods for the analysis of microplastics in the marine environment: recommendations for quantifying synthetic particles in waters and sediments. Technical Memorandum NOSOR & R-48. Maryland, USA: National Oceanic and Atmospheric Administration (NOAA).
- Mauro. R. D., Matthew J. K., & Mark. C. B., 2017. Abundant plankton-sized microplastic particles in shelf waters of the northern Gulf of Mexico. National Center for Biotechnology Information. 230:798-809. DOI: [10.1016/j.envpol.2017.07.030](https://doi.org/10.1016/j.envpol.2017.07.030)
- Mizraji, R., C. Ahrendt, D. Perez-Venegas, J. Vargas, J. Pulgar, M. Aldana, F.P. Ojeda, C. Duarte, & C. GalbanMalagon. 2017. *Is the feeding type related with the content of microplastics in intertidal fish gut?* Mar. Pollut. Bull., 116(1–2): 498– 500. <https://doi.org/10.1016/j.marpolbul.2017.01.008>.
- Mulyono, 2020, Performa Budidaya Rumput Laut *Gracilaria Changii* (Gracilariales, Rhodophyta) Pada Lokasi Tanam Berbeda di Perairan Ujung Baji Kabupaten Takalar, *Jurnal Ilmu Kelautan dan Perikanan*, 15(2).
- Nuzully. S, Takeshi. K, Satosi.I, & Edi. S, 2013. Pengaruh Konsentrasi Polyethylene Glycol (PEG) Pada Sifat Kemagnetan Nanopartikel Magnetik PEG-Coated Fe₃O₄. *Jurnal Fisika Indonesia* :51(XVII).
- Nor, M., J. P. Obbard. 2014. *Microplastics in Singapore's Coastal Mangrove Ecosystem Marine Pollution Bulletin.*, 79 (1/2) : 278-283.
- Prince, J.S., Trowbridge, C.D., 2004. Reproduction in the green macroalga *Codium* (Chlorophyta): characterization of gametes. *Bot. Mar.* 47, <http://dx.doi.org/10.1515/BOT.2004.062>.
- Putra, I.M.O., I, N.G.S., & Luhputu, S. 2021. Pengelolaan Sampah Plastik Rumah Tangga Dalam Rangka Pencegahan Pencemaran Lingkungan (Study Di Lingkungan Kelurahan Pedungan Kecamatan Denpasar Selatan Kota Denpasar), *Jurnal Konsruksi Hukum*, 2 (1) :86-91.
- Rahmat, S. M., 2020, *Microplastics Analysis On Epiphytic Plankton From Seaweeds In Intertidal Zone Of Pananjung Pangandaran In The Different Season.*
- Rasyid. A, 2004, Berbagai Manfaat Algae, *Oseana*, XXIX (3): 9-15.
- Rudi, Muh. S.S, & Andy. S. 2020. Teknologi Mister (Mesin Seaweed Terapung); Upaya Efektivitas Panen Budidaya Rumput Laut Di Takalar Sulawesi Selatan. *Jurnal PENA*. 7(1): 83.
- Samalwan. R, Neviaty. P. Z., Shinta. W, & Meutia. S.I, 2021. *Microplastic Accumulation In Economically Important Fish Species From Barranglombo Island Waters, Makassar.* *Jurnal Ilmu dan Teknologi Kelautan Tropis*, 13(2): 241-260.
- Sari, K., 2018. *Keberadaan Mikroplastik Pada Hewan Filter Feeder Di Padang Lamun Kepulauan Spermonde Kota Makassar.* Skripsi.Makassar:Universitas Hasanuddin.
- Septian. 2014. Sebaran Spasial Mikroplastik Di Sedimen Pada Pantai Pangandaran, Jawa Barat. *Jurnal Geomaritim Indonesia*, 1(1):1-8.
- Shanti. D., (2016). Plastik Sebagai Kemasan Makanan dan Minuman. Bagian patologi Klinik PSPS. Fakultas Kedokteran. Universitas Udayana. Padang.

- Sianturi. K. P.T., Bintal. A., & Musrifin. G, 2021, Microplastic Distribution In Sediments in Coastal of Pariaman City, West Sumatera Province, Asian Journal of Aquatic Science. 4 (73:79).
- Thompson. R. C. 2006. Plastic Debris in the Marine Environment: Consequences and Solutions. In: Krause, J. C., Nordheim, H., Brager, S. (Eds), *Marine Nature Conservation in Europe Federal Agency for Nature Conservation Straisund Germany*, pp. 107-155.
- Tuhumury, N. C. & Ritonga, A. 2020. Identifikasi Keberadaan dan Jenis Mikroplastik pada Kerang Darah (*Anadara granosa*) di Perairan Tanjung Tiram, Teluk Ambon. Jurnal TRITON, 16(1), 1–7.
- Trowbridge CD. 1998. *Ecology of the green macroalga Codium fragile (Suringar) Hariot: invasive and noninvasive subspecies. Oceanography and Marine Biology Annual Reviews*, 26: 1-64.
- Prathep A., S. Pongparadon A. Darakrai B. Wichachucherd and S. Sinutok. 2011. *Diversity and distribution of seaweed at Khanom. Mu Ko Thale Tai National Park, Nakhon Si Thammarat Province, Thailand. Songklanakarin J. Sci. Technol.* 33 (6): 633-640.
- Puspitasari, R. 2007. Laju Polutan Dalam Ekosistem Laut, *Oseana*. XXXII (2): 21-28.
- United Nations Environment Programme. 2017. *Combating marine plastic litter and microplastics: an assessment of the effectiveness of relevant international, regional and subregional governance strategies and approaches*.
- Utami. I., & Agustina, 2022, Deteksi Pencemaran Mikroplastik Pada Air di TPA Piyungan Yogyakarta Indonesia, *Florea: Jurnal Biologi dan Pembelajarannya*. 9(1).
- Vecchi. S., Jessica. B., Massimillion. S., Fabrizio. F., & Paolo. T. Field Evidence for Microplastic Interactions in Marine Benthic Invertebrates. *Scientific Reports*: 20900.
- Victoria, A. V. (2017) "Kontaminasi Mikroplastik di Perairan Tawar. Teknik Kimia ITB.
- Wang. W., Ndungu. A. W., Li. Z., Wang. J. 2017 *Microplastics Pollution in Inland 1 Freshwater of China: A Case Study in Urban Surface Waters of Wuhan, China. Science Of the Total Environment.* 575: 1369-1374.
- Wang, R., Mou, H., Lin, X., Zhu, H., Li, B., Wang, J., Junaid, M., & Jun, W., 2021. Microplastics in Mollusks: Research Progress, Current Contamination Status, Analysis Approaches, and Future Perspectives. *Sec. Marine Pollution. Vol 8*.
- Widianarko. B & I. Hantoro. 2018. *Mikroplastik Dalam Seafood dari Pantai Utara Jawa. Universitas Katolik Soegijapranata. Semarang*.
- Wagner, M., & Lambert, S. (2018). *Freshwater Microplastics - The Handbook of Environmental Chemistry 58*. <https://doi.org/10.1007/978-3-319-61615-5>
- Wright, S.L., Thompson, R.C., & Galloway, T.S. 2013. *The Physical Impacts of Microplastics on Marine Organisms: A Review. Environmental Pollution*, 178:483–492.
- Woodall L. C., C. Gwinnett., M. Packer., R. C. Thompson., L. F. Robinson., dan G. L. Paterson. 2015. *Using A Forensic Science Approach to Minimize Environmental Contamination and To Identify Microfibres in Marine Sediments. Marine Pollution Bulletin.*, 95(1):40-46.
- WoRMS (World Register of Marine Species). 2015. *Codium fragile (Suringar) Hariot, 1889*. Tersedia: <http://www.marinespecies.org/>. (Diakses tanggal 11 Januari 2022).

- Wright, S. L., Thompson, R. C., Galloway, T. S., 2013. *The Physical Impacts of Microplasticson marine: a revie. Environ. Pollut.* 178, 483-492.
- Yunanto. A, N. Fitriani, & N. Widagti, 2021. Karakteristik Mikroplastik Pada Ekosistem Pesisir di Kawasan Mangrove Perancak, Bali, *Journal of Fisheries and Marine Research*, Vol. 5(2): 436-444.
- Yolla, M. Fauzi, & Eni. S, 2020. Jenis dan Kepadatan Mikroplastik Di Sedimen Pantai Desa Naras Hilir Kota Pariaman Provinsi Sumatera Barat. *Jurnal. Fakultas Perikanan dan Kelautan*. Universitas Riau. Pekanbaru.
- Zaiko A. 2005. *Codium fragile*. In: *Baltic Sea Alien Species Database*. <http://www.corpi.ku.lt/nemo/mainnemo.html>.
- Zhao, S., Zhu, L., Wang, T., & Li, D. (2014). *Suspended microplastics in the surfacewater of the Yangtze Estuary System, China: First observations on occurrence, distribution*. *Marine Pollution Bulletin*, 86(1–2), 562–568. <https://doi.org/10.1016/j.marpolbul.2014.06.032>.

LAMPIRAN

Lampiran 1. Uji One-way ANOVA

ANOVA					
kelimpahan	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2419,733	2	1209,867	15,283	0,001
Within Groups	950,000	12	79,167		
Total	3369,733	14			

Lampiran 2. Hasil Uji Tukey kelimpahan Mikroplastik *Codium fragile* antar stasiun

(I) stasiun			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	1	2	19,200*	5,627	0,013	4,19	34,21
		3	30,800*	5,627	0,000	15,79	45,81
	2	1	-19,200*	5,627	0,013	-34,21	-4,19
		3	11,600	5,627	0,140	-3,41	26,61
	3	1	-30,800*	5,627	0,000	-45,81	-15,79
		2	-11,600	5,627	0,140	-26,61	3,41

*. The mean difference is significant at the 0.05 level.

Descriptives										
kelimpahan		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum	Between-Component Variance
1		5	39,80	11,367	5,083	25,69	53,91	24	56	
2		5	20,60	9,154	4,094	9,23	31,97	7	32	
3		5	9,00	4,950	2,214	2,85	15,15	5	17	
Total		15	23,13	15,514	4,006	14,54	31,72	5	56	
Model	Fixed Effects			8,898	2,297	18,13	28,14			
	Random Effects				8,981	-15,51	61,78			226,140

Lampiran 3. Tabel Kisaran Ukuran Mikroplastik pada *Codium fragile*

Kisaran Ukuran	Dekat Pemukiman	Jauh dari Pemukiman	PPI Beba	Persentase			Rata-rata (%)
0,01-0,5mm	135	54	29	67,84	63,53	64,44	65,27
0,6-1mm	34	17	9	17,09	20,0	20,0	19,03
1-2mm	21	9	3	10,55	10,59	6,67	9,27
2-5mm	9	5	4	4,52	5,88	8,89	6,43
Total	199	85	45	100,00	100,00	100,00	100,00

Lampiran 4. Tabel Bentuk Mikroplastik pada *Codium fragile*

Bentuk	Dekat Pemukiman	Jauh dari Pemukiman	PPI Beba	Persentase			Rata-rata (%)
<i>Film</i>	17	14	9	8.54	16.47	20.0	15.00
<i>Line</i>	182	71	36	91.46	83.53	80.0	85.00
Total	199	85	45	100.00	100.00	100.0	100.00

Lampiran 5. Tabel warna Mikroplastik pada *Codium fragile*

Warna	Dekat Pemukiman	Jauh dari Pemukiman	PPI Beba	Persentase			Rata-rata(%)
Biru	143	47	31	71.86	55.29	68.89	65.35
Hitam	0	18	9	0	21.18	20.0	13.73
Merah	16	11	3	8.04	12.94	6.67	9.22
Putih	28	5	2	14.07	5.88	4.44	8.13
Kuning	12	4	0	6.03	4.71	0	3.58
Total	199	85	45	100.00	100.00	100.00	100.00

Lampiran 6. Uji Normalitas

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
kelimpahan	0,144	15	,200*	0,927	15	0,245

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Lampiran 7. Kelimpahan Mikroplastik *Codium fragile* di stasiun dekat pemukiman

KODE	Stasiun Dekat Pemukiman				Jumlah Total	Kelimpahan
	Bentuk	Warna	Ukuran (μm)	ukuran (mm)		
	<i>film</i>	Merah	4949,4	4,9494		
	<i>film</i>	merah	4266,86	4,26686		
	<i>film</i>	merah	4358,49	4,35849		
	<i>film</i>	biru	11,95	0,01195		
	<i>film</i>	biru	12,72	0,01272		
	<i>film</i>	biru	11,95	0,01195		
	<i>film</i>	biru	17,91	0,01791		
	<i>line</i>	merah	495,73	0,49573		
	<i>line</i>	Merah	23	0,023		
	<i>line</i>	Merah	191,95	0,19195		
	<i>line</i>	Merah	130,29	0,13029		
	<i>line</i>	merah	16,5	0,0165		
	<i>line</i>	merah	50,35	0,05035		
	<i>line</i>	putih	218,45	0,21845		
	<i>line</i>	putih	251,62	0,25162		
	<i>line</i>	putih	150,35	0,15035		
	<i>line</i>	putih	503,52	0,50352		
	<i>line</i>	putih	328,28	0,32828		
Ulangan I	<i>line</i>	putih	344,99	0,34499	56	0,56
	<i>line</i>	putih	517,19	0,51719		
	<i>line</i>	putih	90,44	0,09044		
	<i>line</i>	putih	407,08	0,40708		
	<i>line</i>	putih	111,05	0,11105		
	<i>line</i>	putih	163,42	0,16342		
	<i>line</i>	putih	219,46	0,21946		
	<i>line</i>	putih	54,55	0,05455		
	<i>line</i>	putih	78,36	0,07836		
	<i>line</i>	putih	70,44	0,07044		
	<i>line</i>	putih	27,77	0,02777		
	<i>line</i>	putih	60,48	0,06048		
	<i>line</i>	putih	419,62	0,41962		
	<i>line</i>	putih	94,37	0,09437		
	<i>line</i>	putih	65,84	0,06584		
	<i>line</i>	putih	91,16	0,09116		
	<i>line</i>	biru	893,21	0,89321		
	<i>line</i>	biru	17,91	0,01791		
	<i>line</i>	biru	2656,88	2,65688		
	<i>line</i>	biru	150,65	0,15065		
	<i>line</i>	biru	74,78	0,07478		

	<i>line</i>	biru	26,07	0,02607		
	<i>line</i>	biru	66,68	0,06668		
	<i>line</i>	biru	29,02	0,02902		
	<i>line</i>	biru	19,14	0,01914		
	<i>line</i>	biru	422,18	0,42218		
	<i>line</i>	biru	19,32	0,01932		
	<i>line</i>	biru	56,27	0,05627		
	<i>line</i>	biru	36,36	0,03636		
	<i>line</i>	biru	23,42	0,02342		
	<i>line</i>	biru	37,22	0,03722		
	<i>line</i>	biru	27,56	0,02756		
	<i>line</i>	biru	31	0,031		
	<i>line</i>	biru	33,76	0,03376		
	<i>line</i>	biru	21,63	0,02163		
	<i>line</i>	biru	42,2	0,0422		
	<i>line</i>	biru	60,71	0,06071		
	<i>line</i>	biru	35,26	0,03526		
	<i>line</i>	kuning	31,24	0,03124		
	<i>line</i>	kuning	15,6	0,0156		
	<i>line</i>	kuning	82,78	0,08278		
	<i>line</i>	kuning	167,77	0,16777		
	<i>line</i>	biru	559,43	0,55943		
	<i>line</i>	biru	447,21	0,44721		
	<i>line</i>	biru	1104,03	1,10403		
	<i>line</i>	biru	834,92	0,83492		
	<i>line</i>	biru	629,46	0,62946		
	<i>line</i>	biru	32,5	0,0325		
	<i>line</i>	biru	513,08	0,51308		
	<i>line</i>	biru	48,57	0,04857		
	<i>line</i>	biru	63,91	0,06391		
Ulangan	<i>line</i>	biru	34,06	0,03406	38	0,38
II	<i>line</i>	biru	13,51	0,01351		
	<i>line</i>	biru	17,36	0,01736		
	<i>line</i>	biru	1193,96	1,19396		
	<i>line</i>	biru	792,16	0,79216		
	<i>line</i>	biru	1709,01	1,70901		
	<i>line</i>	biru	691,28	0,69128		
	<i>line</i>	biru	2610,23	2,61023		
	<i>line</i>	biru	559,9	0,5599		
	<i>line</i>	biru	442,48	0,44248		
	<i>line</i>	biru	2082,96	2,08296		
	<i>line</i>	biru	178,08	0,17808		
	<i>line</i>	biru	138,45	0,13845		
	<i>line</i>	biru	1316,34	1,31634		
	<i>line</i>	biru	865,07	0,86507		

	<i>line</i>	biru	878,94	0,87894		
	<i>line</i>	biru	338,37	0,33837		
	<i>line</i>	biru	3221,53	3,22153		
	<i>line</i>	biru	649,15	0,64915		
	<i>line</i>	biru	302,95	0,30295		
	<i>line</i>	biru	816,36	0,81636		
	<i>line</i>	putih	1147,59	1,14759		
	<i>film</i>	biru	69,01	0,06901		
	<i>film</i>	biru	28,97	0,02897		
	<i>film</i>	biru	581,47	0,58147		
	<i>line</i>	biru	43,26	0,04326		
	<i>line</i>	biru	83,67	0,08367		
	<i>line</i>	biru	44,24	0,04424		
	<i>line</i>	biru	16	0,016		
	<i>line</i>	biru	42,36	0,04236		
	<i>line</i>	biru	25,84	0,02584		
	<i>line</i>	biru	32,52	0,03252		
	<i>line</i>	biru	32,56	0,03256		
	<i>line</i>	biru	29,75	0,02975		
	<i>line</i>	biru	150,11	0,15011		
	<i>line</i>	biru	34,98	0,03498		
	<i>line</i>	biru	16,94	0,01694		
	<i>line</i>	biru	28,27	0,02827		
	<i>line</i>	biru	13,3	0,0133		
	<i>line</i>	biru	31,9	0,0319		
	<i>line</i>	biru	20,52	0,02052		
Ulangan III	<i>line</i>	biru	33,12	0,03312		
	<i>line</i>	biru	22,42	0,02242	41	0,41
	<i>line</i>	biru	56,66	0,05666		
	<i>line</i>	biru	118,38	0,11838		
	<i>line</i>	biru	41,4	0,0414		
	<i>line</i>	biru	23,41	0,02341		
	<i>line</i>	biru	472,31	0,47231		
	<i>line</i>	biru	930,52	0,93052		
	<i>line</i>	biru	296,92	0,29692		
	<i>line</i>	biru	1104,1	1,1041		
	<i>line</i>	biru	402,8	0,4028		
	<i>line</i>	biru	124,71	0,12471		
	<i>line</i>	biru	178,63	0,17863		
	<i>line</i>	biru	2014,84	2,01484		
	<i>line</i>	biru	783,53	0,78353		
	<i>line</i>	biru	169,63	0,16963		
	<i>line</i>	biru	903,18	0,90318		
	<i>line</i>	biru	503,52	0,50352		
	<i>line</i>	biru	482,85	0,48285		

	<i>line</i>	biru	413,83	0,41383		
	<i>line</i>	biru	396,78	0,39678		
	<i>line</i>	kuning	121,52	0,12152		
	<i>line</i>	kuning	1140,59	1,14059		
	<i>film</i>	biru	12,68	0,01268		
	<i>film</i>	merah	178,79	0,17879		
	<i>film</i>	merah	813,4	0,8134		
	<i>film</i>	merah	135,31	0,13531		
	<i>film</i>	merah	549,3	0,5493		
	<i>film</i>	merah	156,56	0,15656		
	<i>film</i>	biru	1139,85	1,13985		
	<i>line</i>	kuning	336,46	0,33646		
	<i>line</i>	biru	413,83	0,41383		
	<i>line</i>	biru	256,2	0,2562		
	<i>line</i>	biru	189,35	0,18935		
	<i>line</i>	merah	189,35	0,18935		
	<i>line</i>	biru	305,01	0,30501		
	<i>line</i>	biru	837,54	0,83754		
	<i>line</i>	merah	639,77	0,63977		
	<i>line</i>	kuning	1619,39	1,61939		
	<i>line</i>	biru	1829,2	1,8292		
	<i>line</i>	biru	74,02	0,07402		
	<i>line</i>	putih	1287,33	1,28733		
	<i>line</i>	putih	111,3	0,1113		
Ulangan IV	<i>line</i>	biru	218,82	0,21882	40	0,4
	<i>line</i>	putih	1343,54	1,34354		
	<i>line</i>	biru	565,32	0,56532		
	<i>line</i>	putih	1415,34	1,41534		
	<i>line</i>	putih	602,9	0,6029		
	<i>line</i>	biru	396,78	0,39678		
	<i>line</i>	biru	321,29	0,32129		
	<i>line</i>	biru	966,01	0,96601		
	<i>line</i>	biru	391,66	0,39166		
	<i>line</i>	putih	502,64	0,50264		
	<i>line</i>	biru	166,32	0,16632		
	<i>line</i>	kuning	1029,48	1,02948		
	<i>line</i>	biru	512,89	0,51289		
	<i>line</i>	biru	1183,74	1,18374		
	<i>line</i>	kuning	1968,75	1,96875		
	<i>line</i>	biru	682,62	0,68262		
	<i>line</i>	biru	223,69	0,22369		
	<i>line</i>	biru	2535,65	2,53565		
	<i>line</i>	biru	432,31	0,43231		
	<i>line</i>	biru	422,18	0,42218		
	<i>line</i>	biru	830,66	0,83066		

	<i>line</i>	kuning	1668,22	1,66822		
	<i>line</i>	biru	314,81	0,31481	24	0,24
	<i>line</i>	biru	488,43	0,48843		
	<i>line</i>	biru	394,05	0,39405		
	<i>line</i>	biru	236,3	0,2363		
	<i>line</i>	biru	822,13	0,82213		
	<i>line</i>	kuning	819,1	0,8191		
	<i>line</i>	biru	230,68	0,23068		
	<i>line</i>	biru	1319,34	1,31934		
	<i>line</i>	biru	155,16	0,15516		
	<i>line</i>	biru	286,26	0,28626		
	<i>line</i>	biru	445,18	0,44518		
Ulangan	<i>line</i>	biru	259,26	0,25926		
V	<i>line</i>	biru	473,82	0,47382		
	<i>line</i>	biru	199,74	0,19974		
	<i>line</i>	biru	194,56	0,19456		
	<i>line</i>	biru	867,24	0,86724		
	<i>line</i>	biru	896,09	0,89609		
	<i>line</i>	biru	442,05	0,44205		
	<i>line</i>	biru	179,57	0,17957		
	<i>line</i>	biru	1433,8	1,4338		
	<i>line</i>	biru	460,34	0,46034		
	<i>line</i>	biru	1015,9	1,0159		
	<i>line</i>	biru	1067,46	1,06746		
	<i>line</i>	biru	428,14	0,42814		

Lampiran 7. Kelimpahan Mikroplastik *Codium fragile* pada stasiun jauh dekat pemukiman.

KODE	Stasiun Jauh dari Pemukiman				Jumlah Total	Kelimpahan
	Bentuk	Warna	Ukuran (μm)	Ukuran (mm)		
Ulangan I	<i>line</i>	Hitam	1788,9	1,7889	22	0,22
	<i>line</i>	kuning	633,44	0,63344		
	<i>line</i>	Biru	653,23	0,65323		
	<i>line</i>	Biru	569,93	0,56993		
	<i>line</i>	Biru	469,88	0,46988		
	<i>line</i>	Biru	823,17	0,82317		
	<i>line</i>	Biru	3275,95	3,27595		
	<i>line</i>	Biru	267,12	0,26712		
	<i>line</i>	Biru	1919,06	1,91906		
	<i>line</i>	Biru	318,88	0,31888		
	<i>line</i>	Biru	415,24	0,41524		
	<i>line</i>	Biru	270,16	0,27016		
	<i>line</i>	Biru	411,56	0,41156		
	<i>line</i>	Biru	94,26	0,09426		
	<i>line</i>	Biru	422,24	0,42224		
	<i>line</i>	Biru	224,24	0,22424		
	<i>line</i>	merah	187,22	0,18722		
	<i>line</i>	merah	572,04	0,57204		
	<i>film</i>	merah	567,14	0,56714		
	<i>film</i>	merah	1353,56	1,35356		
<i>film</i>	merah	484,29	0,48429			
<i>film</i>	merah	103,79	0,10379			
Ulangan II	<i>film</i>	merah	906,34	0,90634	7	0,07
	<i>line</i>	merah	910,51	0,91051		
	<i>line</i>	Hitam	354,15	0,35415		
	<i>line</i>	kuning	1150,62	1,15062		
	<i>line</i>	kuning	126,68	0,12668		
	<i>line</i>	Biru	181,92	0,18192		
	<i>line</i>	Biru	1919,97	1,91997		
Ulangan III	<i>line</i>	Biru	768,98	0,76898	18	0,18
	<i>line</i>	Biru	153,43	0,15343		
	<i>line</i>	Biru	234,73	0,23473		
	<i>line</i>	Biru	435,67	0,43567		
	<i>line</i>	Biru	1081,05	1,08105		
	<i>line</i>	Biru	436,43	0,43643		
	<i>line</i>	Biru	309,8	0,3098		
	<i>line</i>	Biru	278,42	0,27842		
	<i>line</i>	Biru	309,02	0,30902		
	<i>line</i>	Biru	541,98	0,54198		
	<i>line</i>	Biru	327,24	0,32724		

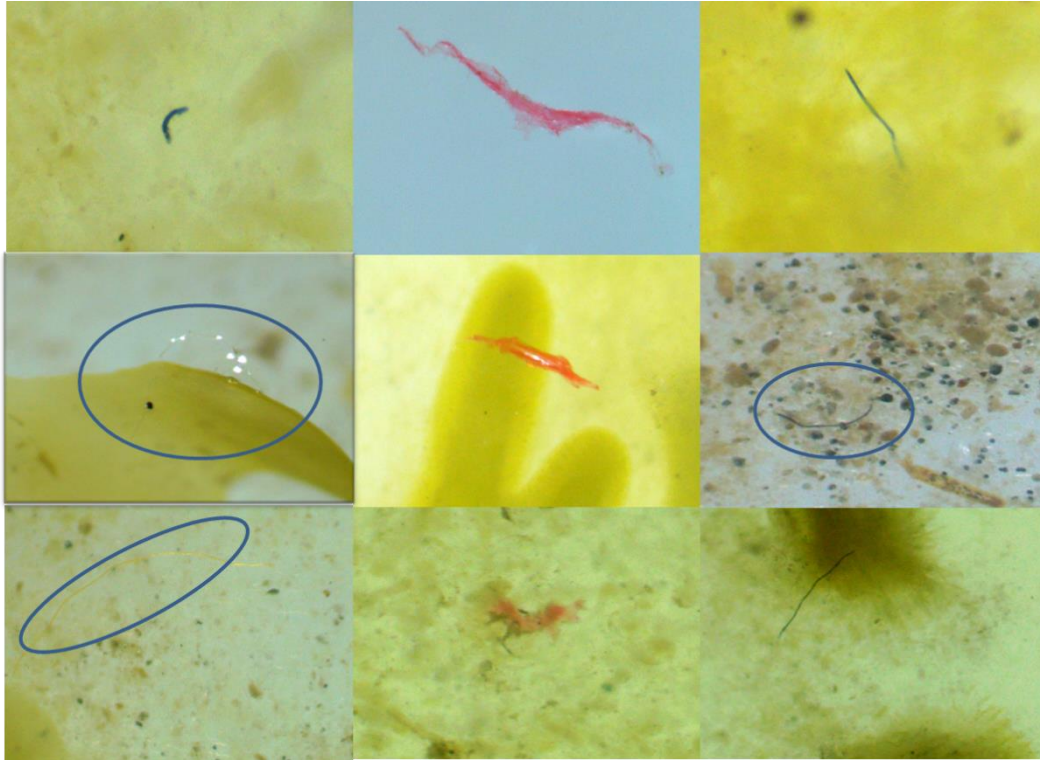
	<i>line</i>	Biru	294,02	0,29402		
	<i>line</i>	Biru	200,74	0,20074		
	<i>line</i>	Putih	2250,03	2,25003		
	<i>line</i>	Putih	1205	1,205		
	<i>line</i>	Hitam	449,15	0,44915		
	<i>line</i>	Hitam	291,07	0,29107		
	<i>line</i>	merah	807,94	0,80794		
	<i>film</i>	Biru	149,15	0,14915		
	<i>line</i>	Biru	251,36	0,25136		
	<i>line</i>	Biru	212,21	0,21221		
	<i>line</i>	Biru	825,09	0,82509		
	<i>line</i>	Biru	104,29	0,10429		
	<i>line</i>	Biru	4775,29	4,77529		
Ulangan IV	<i>line</i>	Biru	64,12	0,06412	32	0,32
	<i>line</i>	Biru	1129,11	1,12911		
	<i>line</i>	Biru	795,48	0,79548		
	<i>line</i>	Biru	249,01	0,24901		
	<i>line</i>	merah	755,42	0,75542		
	<i>line</i>	kuning	2250,25	2,25025		
	<i>line</i>	Putih	139,68	0,13968		
	<i>line</i>	Hitam	128,97	0,12897		
	<i>line</i>	Hitam	413,39	0,41339		
	<i>line</i>	Hitam	70,32	0,07032		
	<i>line</i>	Hitam	146,22	0,14622		
	<i>line</i>	Hitam	278,42	0,27842		
	<i>line</i>	Hitam	25,65	0,02565		
	<i>line</i>	Hitam	38,61	0,03861		
	<i>line</i>	Hitam	137,9	0,1379		
	<i>line</i>	Biru	202,8	0,2028		
	<i>line</i>	Biru	227,09	0,22709		
	<i>line</i>	Biru	314,46	0,31446		
	<i>line</i>	Biru	467,82	0,46782		
	<i>line</i>	Biru	1147,58	1,14758	24	0,24
Ulangan V	<i>line</i>	Biru	700,75	0,70075		
	<i>line</i>	Biru	2713,67	2,71367		
	<i>line</i>	Biru	465,82	0,46582		
	<i>line</i>	Putih	360,82	0,36082		
	<i>film</i>	Hitam	172,92	0,17292		
	<i>film</i>	Hitam	222,06	0,22206		
	<i>film</i>	Hitam	734,59	0,73459		
	<i>film</i>	Hitam	144,88	0,14488		
	<i>film</i>	Hitam	334,54	0,33454		
	<i>film</i>	Hitam	702,68	0,70268		
	<i>film</i>	Putih	344,2	0,3442		
	<i>film</i>	merah	412,8	0,4128		

Lampiran 8. Kelimpahan Mikroplastik *Codium fragile* pada stasiun PPI Beba.

KODE	Stasiun PPI Beba				Jumlah Total	Kelimpahan
	Bentuk	Warna	Ukuran (μm)	Ukuran (mm)		
Ulangan I	<i>film</i>	putih	1118,83	1,11883	10	0,1
	<i>film</i>	hitam	344,2	0,3442		
	<i>film</i>	hitam	344,2	0,3442		
	<i>film</i>	hitam	200,17	0,20017		
	<i>line</i>	Biru	1140,29	1,14029		
	<i>line</i>	Biru	738,5	0,7385		
	<i>line</i>	Biru	611,21	0,61121		
	<i>line</i>	Biru	230,42	0,23042		
	<i>line</i>	merah	2463,81	2,46381		
	<i>line</i>	Biru	619,3	0,6193		
Ulangan II	<i>line</i>	Biru	66,02	0,06602	5	0,05
	<i>line</i>	Biru	1034,09	1,03409		
	<i>line</i>	Biru	29,6	0,0296		
	<i>line</i>	putih	288,2	0,2882		
	<i>film</i>	merah	25,99	0,02599		
Ulangan III	<i>film</i>	hitam	22,47	0,02247	17	0,17
	<i>film</i>	hitam	158,67	0,15867		
	<i>line</i>	hitam	22,47	0,02247		
	<i>line</i>	Biru	33,74	0,03374		
	<i>line</i>	Biru	18,82	0,01882		
	<i>line</i>	Biru	10,16	0,01016		
	<i>line</i>	Biru	626,55	0,62655		
	<i>line</i>	Biru	3298,06	3,29806		
	<i>line</i>	Biru	992,02	0,99202		
	<i>line</i>	Biru	178,15	0,17815		
	<i>line</i>	Biru	437,81	0,43781		
	<i>line</i>	Biru	935,63	0,93563		
	<i>line</i>	Biru	69,53	0,06953		
	<i>line</i>	Biru	946,5	0,9465		
	<i>line</i>	Biru	2067,46	2,06746		
<i>line</i>	Biru	218,32	0,21832			
<i>line</i>	merah	4236,53	4,23653			
Ulangan IV	<i>line</i>	Biru	504,86	0,50486	5	0,05
	<i>line</i>	Biru	894,97	0,89497		
	<i>line</i>	hitam	414,67	0,41467		
	<i>line</i>	Biru	10,92	0,01092		
	<i>line</i>	Biru	42,35	0,04235		
Ulangan V	<i>film</i>	hitam	15,67	0,01567	8	0,08
	<i>film</i>	hitam	14,11	0,01411		
	<i>line</i>	Biru	17,14	0,01714		
	<i>line</i>	Biru	18,06	0,01806		

<i>line</i>	Biru	11,95	0,01195
<i>line</i>	Biru	11,41	0,01141
<i>Line</i>	Biru	10,37	0,01037
<i>Line</i>	Biru	21,91	0,02191

Lampiran 9. Bentuk-bentuk mikroplastik pada makroalga *Codium fragile*



Lampiran 10. Dokumentasi Analisis Sampel di Laboratorium



Preparasi dan analisis sampel makrolag *C. fragile* di Laboratorium *Multitropic research group*.