

## DAFTAR PUSTAKA

- ArunkumarPatchaiyappan, Dowarah, K., ZakiAhmed, S., ManivannanPrabakaran, ShanmuganathanJayakumar, ChinnasamyThirunavukkarasu, & Devipriya, S. P. (2020). *Prevalence and characteristics of microplastics present in the street dust collected from Chennai metropolitan city, India*. *Chemosphere*, 128757. doi:10.1016/j.chemosphere.2020.128757
- Barnes, S.J., 2019. *Understanding plastics pollution: the role of economic development and technological research*. *Environ Pollut.* 249, 812–821. <https://doi.org/10.1016/j.envpol.2019.03.108>.
- Dris, R., Gasperi, J., Saad, M., Mirande, C., Tassin, B., 2016. *Synthetic fibers in atmospheric fallout: A source of microplastics in the environment?* *Mar. Pollut. Bull.* 104, 290–293
- Gasperi, J., Wright, S.L., Dris, R., Collard, F., Mandin, C., Guerrouache, M., Tassin, B., 2018. *Microplastics in air: are we breathing it in?* *Curr. Opin. Environ. Sci. Health* 1, 1–5. <https://doi.org/10.1016/j.coesh.2017.10.002>.
- Gaston, E., Woo, M., Steele, C., Sukumaran, S., & Anderson, S. (2020). *EXPRESS: Microplastics Differ Between Indoor and Outdoor Air Masses: Insights from Multiple Microscopy Methodologies*. *Applied Spectroscopy*, 000370282092065. doi:10.1177/0003702820920652
- Horton, Alice, Clark, Adrian, 2018. *Microplastic Methods Workshop Report* ((May): 1–19)
- Joana C. Prataa,\*<sup>1</sup>, Joana L. Castroa,b<sup>1</sup>, João P. da Costaa, Armando C. Duartea, Teresa Rocha-Santosa, Mário Cerqueirab. *The importance of contamination control in airborne fibers and microplastic sampling: Experiences from indoor and outdoor air sampling in Aveiro, Portugal*. Centre for Environmental and Marine Studies (CESAM), Department of Environment and Planning

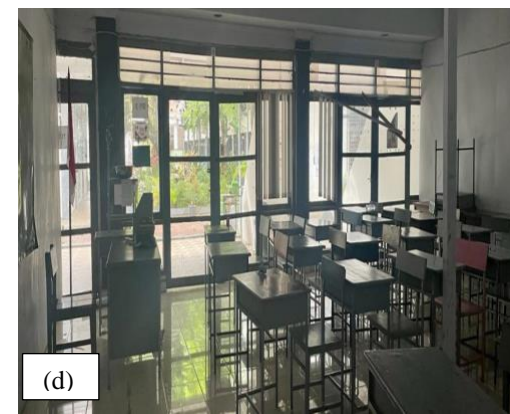
- Lebreton, L., Egger, M., Slat, B., 2019. *A global mass budget for positively buoyant macroplastic debris in the ocean*. Sci. Rep. 9, 12922. <https://doi.org/10.1038/s41598-019-49413-5>.
- Mubarak, Zaki. 2022. *Penelitian Kuantitatif dan Statistik Pendidikan*. Tasikmalaya: Pustaka Turats Press
- Nasution, W. P. (2019). *Analisis Kadar Gas O3 (Ozon) Di Udara Ambien Pada Salah Satu Perusahaan Container Di Belawan Dengan Metode Spektrofotometri Uv- Visible*. Universitas Sumatera Utara
- O'Brien, S., Okoffo, E.D., O'Brien, J.W., Ribeiro, F., Wang, X., Wright, S.L., Samanipour, S., Rauert, C., Toapanta, T.Y.A., Albarracin, R., Thomas, K.V., 2020. *Airborne emissions of microplastic fibres from domestic laundry dryers*. Sci. Total Environ. 747, 14117
- I Putu Ade Andre Payadnya dan I Gusti Agung Ngurah Trisna Jayantika. 2018. *Panduan Penelitian Eksperimen Beserta Analisa Statistik*.
- Rosal, R. (2021). *Morphological description of microplastik particles for environmental fate studies*. *Marine Pollution Bulletin*, 171, 112716. doi:10.1016/j.marpolbul.2021.1127
- Santoso, Singgih. 2018. *Statistik Multivariat*. Jakarta: Elex Media Komputindo
- Thongsanit, Pajarit dan Witchaya Imkrajang. (2015). *Dust fall in the residential air environment of northern part of Thailand: Chiang Mai, Lampang and Phitsanulok Province*. Thailand: Naresuan University
- Susanti, Elva, Nurjannah Ladjin, Laila Qadrini, Vera Selviana Adoe, Moh. Sopratman, dan Faula Arina. 2021. *Buku Ajar Statistika untuk Perguruan Tinggi*. Indramayu: Penerbit Adab
- Uheida, A., Mejía, H.G., Abdel-Rehim, M., Hamd, W., Dutta, J., 2021. *Visible light photocatalytic degradation of polypropylene microplastics in a continuous water flow system*. J. Hazard. Mater. 406, 124299 <https://doi.org/10.1016/j.jhazmat.2020.124299>
- Vianello, A., Jensen, R.L., Liu, L., Vollertsen, J., 2019. *Simulating human exposure to indoor airborne microplastics using a breathing thermal manikin*. Sci. Rep. 9, 8670. <https://doi.org/10.1038/s41598-019-45054-w>

- Zhou, Q., Tian, C., Luo, Y., 2017. *Various forms and deposition fluxes of microplastics identified in the coastal urban atmosphere*. *Chin. Sci. Bull.* 62 (33), 3902–3909.
- Zhu, K., Jia, H., Sun, Y., Dai, Y., Zhang, C., Guo, X., Wang, T., Zhu, L., 2020. *Enhanced cytotoxicity of photoaged phenol-formaldehyde resins microplastics: combined effects of environmentally persistent free radicals, reactive oxygen species, and conjugated carbonyls*. *Environ. Int.* 145, 106137

## LAMPIRAN

### Lampiran 1. Ruang Kelas Lokasi Penelitian

#### 1) Kondisi Ruang Kelas di SMA Negeri 1 Makassar

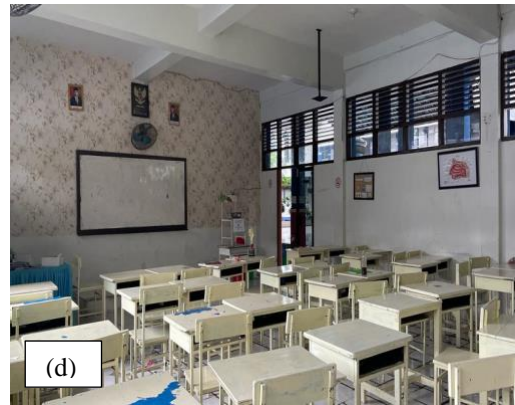


Kondisi Ruang 1 SMA Negeri 1 Makassar (a) hari kerja (b) hari libur

Kondisi Ruang 2 SMA Negeri 1 Makassar (c) hari kerja (d) hari libur

#### 2) Kondisi Ruang Kelas di SMP Negeri 6 Makassar





Kondisi Ruang 1 SMP Negeri 6 Makassar (a) hari kerja (b) hari libur  
Kondisi Ruang 2 SMP Negeri 6 Makassar (c) hari kerja (d) hari libur

3) UPT SPF SMP Negeri 47 Makassar



Kondisi Ruang 1 SMA Negeri 1 Makassar (a) hari kerja (b) hari libur  
Kondisi Ruang 2 SMA Negeri 1 Makassar (c) hari kerja (d) hari libur

## Lampiran 2. Dokumentasi Penelitian

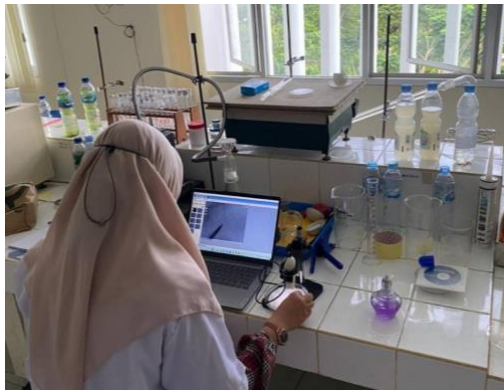
Peletakan wadah *stainless steel* di setiap ruangan pada ketinggian 1,2 m



Pengujian sampel di laboratorium



Identifikasi mikroplastik



### Lampiran 3. Hot Needle Test

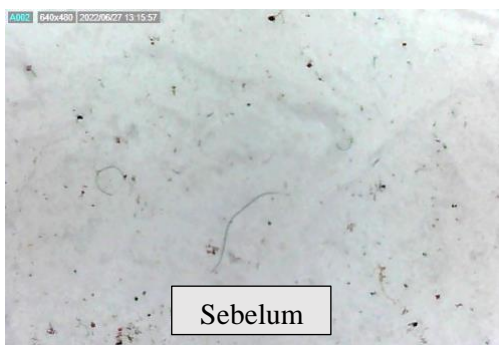
1) SMA Negeri 1 Makassar



2) SMP Negeri 6 Makassar



3) UPT SPF SMP Negeri 47 Makassar



**Lampiran 4. Data Kelimpahan Mikroplastik**

Sekolah	Waktu	Kelimpahan Mikroplastik	Konsentrasi Mikroplastik		
SMA Negeri 1 Makassar	Ruang 1	Hari 1	238	2961	
		Hari 2	386	4802	
		Hari 3	21	261	
		Hari 4	21	261	
	Ruang 2	Hari 1	303	3769	
		Hari 2	305	3794	
		Hari 3	14	174	
		Hari 4	40	498	
	Jumlah		1328	16521	
	SMP Negeri 6 Makassar	Ruang 1	Hari 1	792	9853
			Hari 2	530	6593
			Hari 3	164	2040
Hari 4			146	1816	
Ruang 2		Hari 1	550	6842	
		Hari 2	546	6792	
		Hari 3	192	2389	
		Hari 4	156	1941	
Jumlah		3076	38266		
UPT SPF SMP Negeri 47 Makassar		Ruang 1	Hari 1	301	3745
			Hari 2	302	3757
			Hari 3	89	1107
	Hari 4		103	1281	
	Ruang 2	Hari 1	249	3098	
		Hari 2	245	3048	
		Hari 3	166	2065	
		Hari 4	102	1269	
	Jumlah		1557	19370	



### Lampiran 5. Data Jenis Mikroplastik

Sekolah	Waktu		Jenis Mikroplastik				Total	
			Fiber	Film	Fragmen	Granula		
SMA Negeri 1 Makassar	Ruang 1	Hari 1	129	15	51	43	238	
		Hari 2	233	15	69	69	386	
		Hari 3	14	1	2	4	21	
		Hari 4	13	4	3	1	21	
	Ruang 2	Hari 1	170	17	93	23	303	
		Hari 2	178	7	88	32	305	
		Hari 3	5	3	4	2	14	
		Hari 4	26	4	7	3	40	
	Jumlah		768	66	317	177	1328	
	SMP Negeri 6 Makassar	Ruang 1	Hari 1	481	19	153	139	792
			Hari 2	378	7	62	83	530
			Hari 3	78	4	27	55	164
Hari 4			50	9	32	55	146	
Ruang 2		Hari 1	339	42	86	83	550	
		Hari 2	337	43	66	100	546	
		Hari 3	80	0	75	37	192	
		Hari 4	73	13	46	24	156	
Jumlah		1816	137	547	576	3076		
UPT SPF SMP Negeri 47 Makassar		Ruang 1	Hari 1	153	6	75	67	301
			Hari 2	101	9	99	93	302
			Hari 3	34	4	31	20	89
	Hari 4		43	7	35	18	103	
	Ruang 2	Hari 1	102	3	56	88	249	
		Hari 2	101	12	86	46	245	
		Hari 3	58	14	56	38	166	
		Hari 4	27	2	27	46	102	
	Jumlah		619	57	465	416	1557	

**Lampiran 6. Data Warna Mikroplastik**

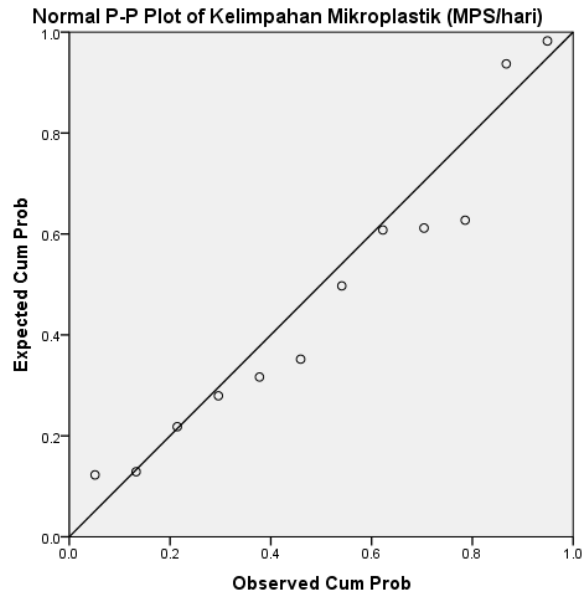
Sekolah	Waktu		Warna Mikroplastik								
			Merah	Ungu	Merah muda	Hijau	Biru	Orange	Kuning	Transparan	
SMA Negeri 1 Makassar	Ruang 1	Hari 1	29	55	13	62	32	6	26	15	
		Hari 2	27	27	1	165	21	0	45	17	
		Hari 3	32	85	28	108	79	8	31	15	
		Hari 4	39	30	11	130	55	12	21	7	
	Ruang 2	Hari 1	1	7	0	5	3	1	4	1	
		Hari 2	3	3	0	4	0	0	1	3	
		Hari 3	0	7	0	4	3	1	2	4	
		Hari 4	7	5	0	17	5	0	2	4	
	Jumlah		138	219	53	495	198	28	132	66	
	SMP Negeri 6 Makassar	Ruang 1	Hari 1	115	151	44	202	161	51	52	16
			Hari 2	76	81	25	161	57	26	86	42
			Hari 3	85	58	22	153	132	15	52	7
Hari 4			95	58	23	182	57	93	23	60	
Ruang 2		Hari 1	15	27	4	49	45	5	15	4	
		Hari 2	24	19	2	102	12	9	24	0	
		Hari 3	20	32	3	29	26	7	20	1	
		Hari 4	20	19	2	67	9	9	18	6	
Jumlah		450	445	125	945	499	215	290	136		

Sekolah	Waktu		Warna Mikroplastik							
			Merah	Ungu	Merah muda	Hijau	Biru	Orange	Kuning	Transparan
UPT SPF SMP Negeri 47 Makassar	Ruang 1	Hari 1	58	63	20	73	55	14	15	6
		Hari 2	66	47	3	54	62	15	34	3
		Hari 3	10	20	5	23	13	1	13	4
		Hari 4	22	22	6	22	17	1	6	7
	Ruang 2	Hari 1	31	47	3	54	62	15	34	3
		Hari 2	46	36	9	70	22	23	27	12
		Hari 3	34	20	2	51	18	17	10	14
		Hari 4	10	16	0	46	8	10	10	2
	Jumlah		277	271	48	393	257	96	149	51

**Lampiran 7. Data Ukuran Mikroplastik**

Sekolah	Waktu		Ukuran Mikroplastik (mm)			
			Fiber	Film	Fragmen	Granula
SMA Negeri 1 Makassar	Ruang 1	Hari 1	0,2 - 4,912	0,08 - 0,328	0,08 - 1,6	0,08 - 1,2
		Hari 2	0,12 - 4,987	0,08 - 0,52	0,089 - 0,835	0,04 - 0,4
		Hari 3	0,92 - 4,46	0,232	0,2 - 0,402	0,154 - 0,4
		Hari 4	0,2 - 4,176	0,2 - 0,4	0,16 - 0,476	0,144 - 0,312
	Ruang 2	Hari 1	0,126 - 4,782	0,146 - 0,938	0,112 - 1,616	0,095 - 0,191
		Hari 2	0,191 - 1,629	0,199 - 0,982	0,506 - 4,968	0,102 - 0,199
		Hari 3	1,236 - 4,357	0,287 - 0,67	0,202 - 0,995	0,096 - 0,167
		Hari 4	0,907 - 1,98	0,318 - 0,788	0,536 - 1,012	0,137 - 0,175
SMP Negeri 6 Makassar	Ruang 1	Hari 1	0.424 - 4.922	0.1 - 1.389	0.1 - 1.501	0.084 - 0.98
		Hari 2	0.109 - 4.973	0.112 - 1.387	0.1 - 1.573	0.094 - 1.654
		Hari 3	0.3 - 4.84	0.15 - 0.2	0.125 - 0.477	0.072 - 0.291
		Hari 4	0.273 - 4.367	0.115 - 1.208	0.122 - 1.77	0.084 - 0.606
	Ruang 2	Hari 1	0.673 - 4.905	0.143 - 1.439	0.112 - 1.048	0.151 - 0.486
		Hari 2	0.479 - 4.894	0.151 - 1.552	0.402 - 2.172	0.146 - 0.476
		Hari 3	0.575 - 4.816	0.12 - 1.244	0.215 - 1.581	0.088 - 0.197
		Hari 4	0.476 - 4.91	0.214 - 1.124	0.183 - 1.811	0.087 - 0.188
UPT SPF SMP Negeri 47 Makassar	Ruang 1	Hari 1	0.322 - 4.984	0,126 - 4,782	0,146 - 0,938	0,112 - 1,616
		Hari 2	0.304 - 4.357	1,236 - 4,357	0,287 - 0,67	0,202 - 0,995
		Hari 3	0.283 - 4.772	0.424 - 4.922	0.1 - 1.389	0.1 - 1.501
		Hari 4	0.776 - 4.928	0.3 - 4.84	0.15 - 0.2	0.125 - 0.477
	Ruang 2	Hari 1	0.869 - 4.432	0,191 - 1,629	0,199 - 0,982	0,506 - 4,968
		Hari 2	0.617 - 4.046		0,318 - 0,788	0,536 - 1,012
		Hari 3	0.136 - 4.412	0.109 - 4.973	0.112 - 1.387	0.1 - 1.573
		Hari 4	0.506 - 2.327	0.273 - 4.367	0.115 - 1.208	0.122 - 1.77

**Lampiran 8. Uji Waktu Pengukuran terhadap Kelimpahan Mikroplastik**



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		12
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	121.0259802
Most Extreme Differences	Absolute	.230
	Positive	.230
	Negative	-.136
Test Statistic		.230
Asymp. Sig. (2-tailed)		.079 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

**Test of Homogeneity of Variances**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
7.974	1	10	.018

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	260190.750	1	260190.750	16.149	.002
Within Groups	161120.167	10	16112.017		
Total	421310.917	11			

**Ranks**

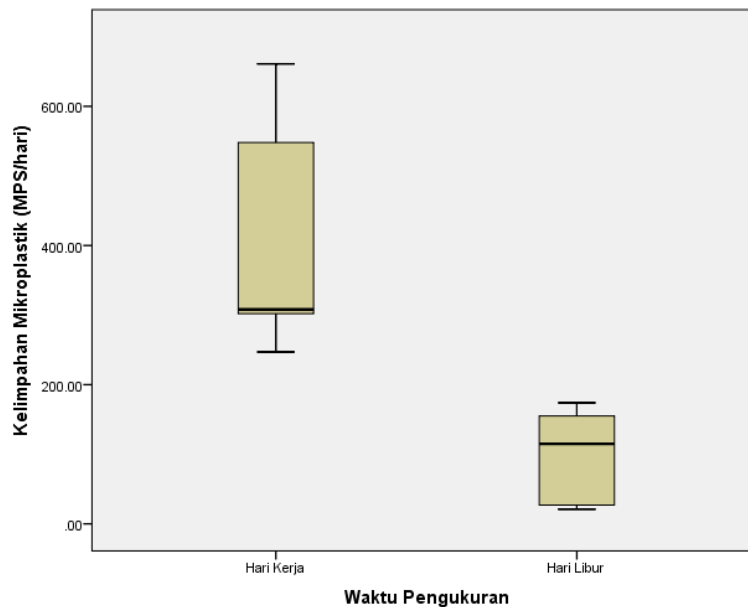
	Waktu Pengukuran	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	Hari Kerja	6	9.50
	Hari Libur	6	3.50
	Total	12	

**Test Statistics<sup>a,b</sup>**

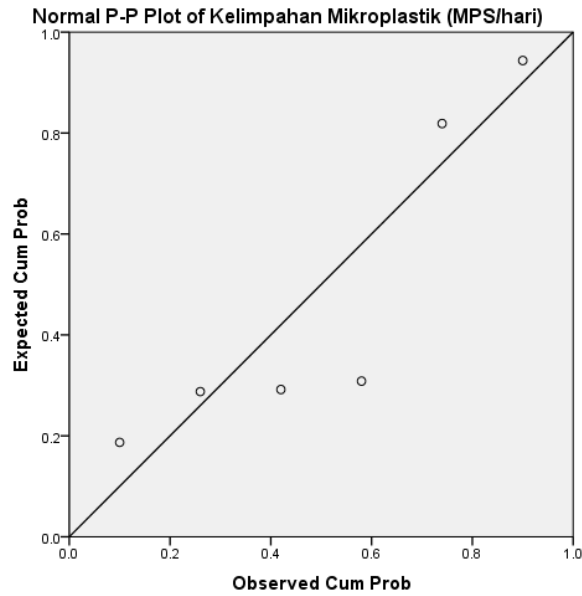
	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	8.308
df	1
Asymp. Sig.	.004

a. Kruskal Wallis Test

b. Grouping Variable: Waktu Pengukuran



**Lampiran 9. Uji Jumlah Penghuni terhadap Kelimpahan Mikroplastik**



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		6
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	162.7028039
Most Extreme Differences	Absolute	.251
	Positive	.251
	Negative	-.132
Test Statistic		.251
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

**Test of Homogeneity of Variances**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
3.985E+15	2	3	.000

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	131956.333	2	65978.167	24.963	.013
Within Groups	7929.000	3	2643.000		
Total	139885.333	5			

**Ranks**

	Jumlah Penghuni (orang)	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	26.00	2	3.50
	34.00	2	5.50
	36.00	2	1.50
	Total	6	

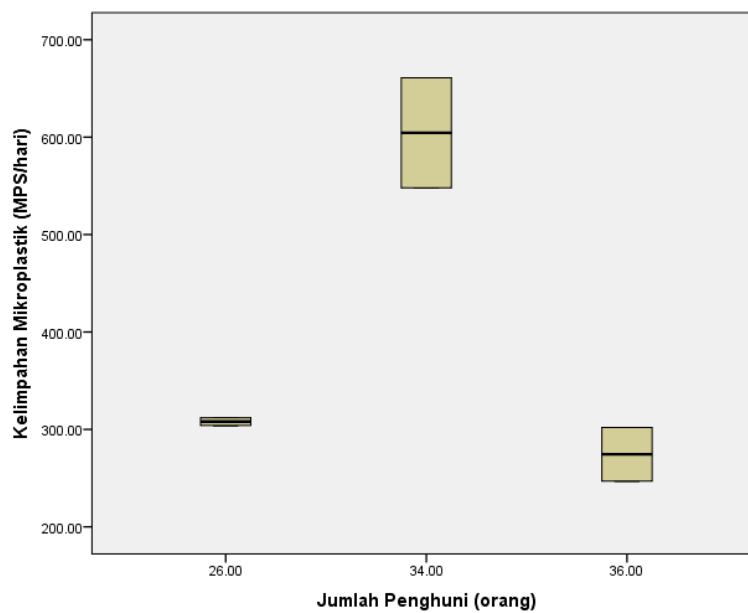
Jumlah Ventilasi terhadap Kelimpahan Mikroplastik

**Test Statistics<sup>a,b</sup>**

	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	4.571
df	2
Asymp. Sig.	.102

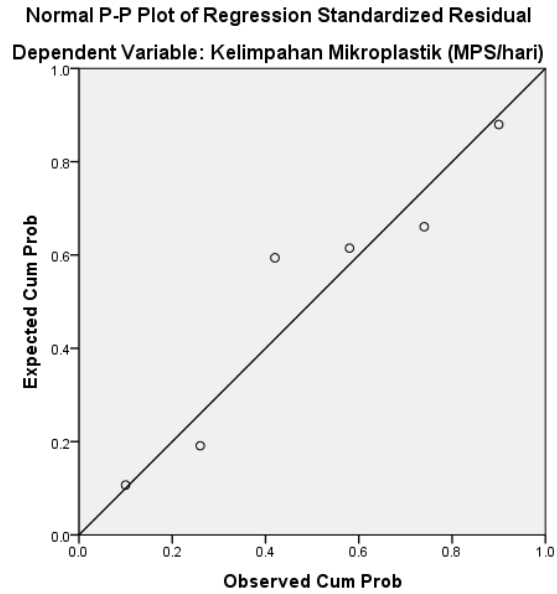
a. Kruskal Wallis Test

b. Grouping Variable: Jumlah Penghuni (orang)





**Lampiran 10. Uji Jumlah Ventilasi terhadap Kelimpahan Mikroplastik**



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		6
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	133.0488198
Most Extreme Differences	Absolute	.271
	Positive	.169
	Negative	-.271
Test Statistic		.271
Asymp. Sig. (2-tailed)		.190 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

**Test of Homogeneity of Variances**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
3.985E+15	2	3	.000

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	131956.333	2	65978.167	24.963	.013
Within Groups	7929.000	3	2643.000		
Total	139885.333	5			

**Ranks**

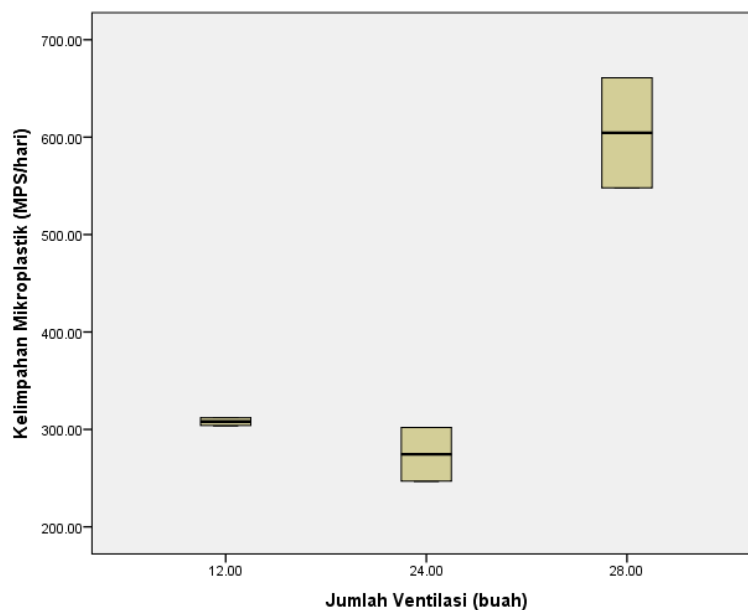
	Jumlah Ventilasi (buah)	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	12.00	2	3.50
	24.00	2	1.50
	28.00	2	5.50
	Total	6	

**Test Statistics<sup>a,b</sup>**

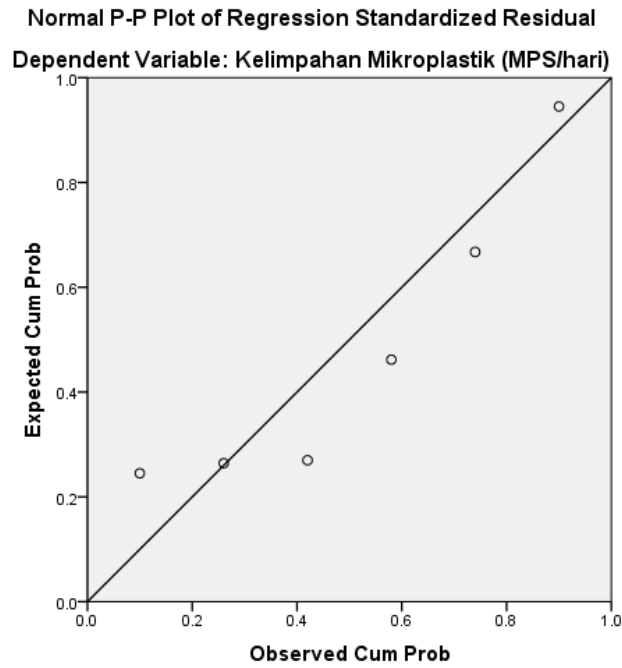
	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	4.571
df	2
Asymp. Sig.	.102

a. Kruskal Wallis Test

b. Grouping Variable: Jumlah Ventilasi (buah)



**Lampiran 11.** Uji Jumlah Kipas Angin terhadap Kelimpahan Mikroplastik



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		6
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	93.07709891
Most Extreme Differences	Absolute	.254
	Positive	.254
	Negative	-.220
Test Statistic		.254
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

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

**Test of Homogeneity of Variances<sup>a</sup>**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
.	1	.	.

a. Test of homogeneity of variances cannot be performed for Kelimpahan Mikroplastik (MPS/hari) because the sum of caseweights is less than the number of groups.

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	138340.833	3	46113.611	59.713	.017
Within Groups	1544.500	2	772.250		
Total	139885.333	5			

**Ranks**

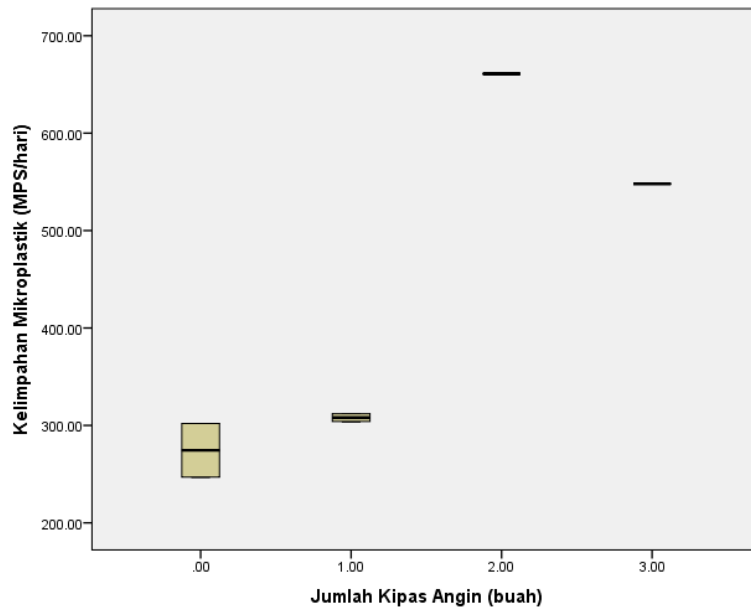
	Jumlah Kipas Angin (buah)	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	.00	2	1.50
	1.00	2	3.50
	2.00	1	6.00
	3.00	1	5.00
	Total	6	

**Test Statistics<sup>a,b</sup>**

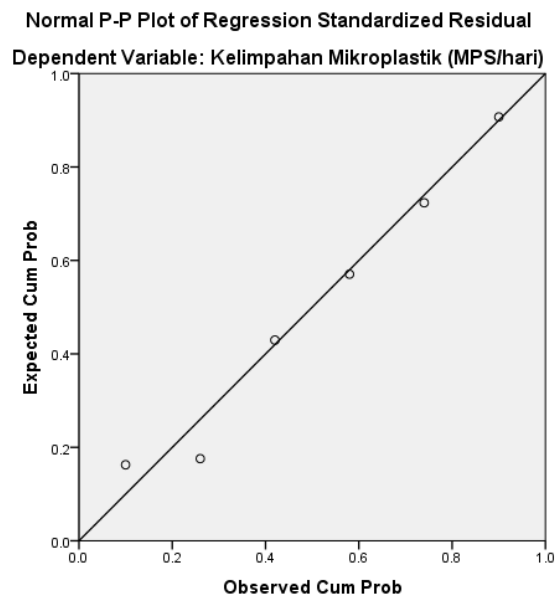
	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	4.714
df	3
Asymp. Sig.	.194

a. Kruskal Wallis Test

b. Grouping Variable: Jumlah Kipas Angin (buah)



**Lampiran 12.** Uji Interval Pembersihan terhadap Kelimpahan Mikroplastik



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		6
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	138.4494493
Most Extreme Differences	Absolute	.185
	Positive	.185
	Negative	-.136
Test Statistic		.185
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

**Test of Homogeneity of Variances**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
12.119	1	4	.025

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	44044.083	1	44044.083	1.838	.247
Within Groups	95841.250	4	23960.313		
Total	139885.333	5			

**Ranks**

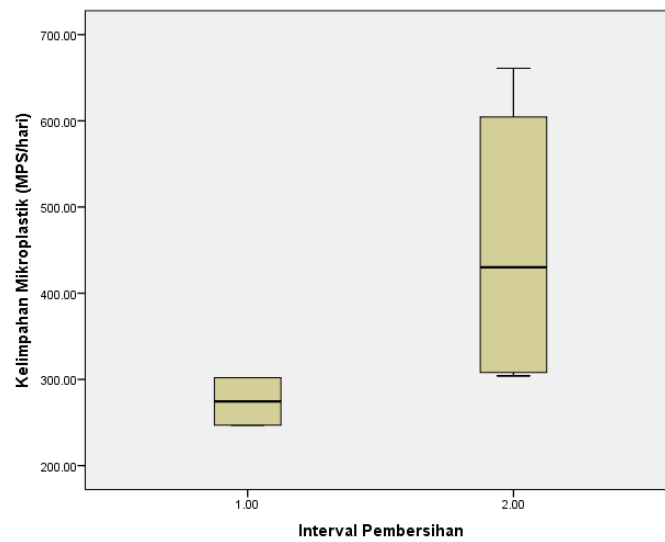
	Interval Pembersihan	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	1.00	2	1.50
	2.00	4	4.50
	Total	6	

**Test Statistics<sup>a,b</sup>**

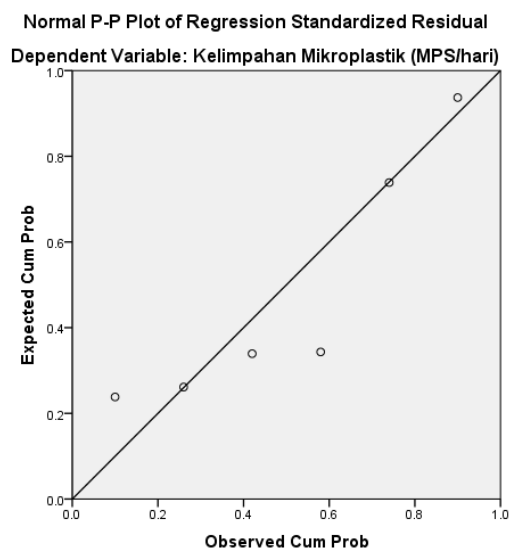
	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	3.429
df	1
Asymp. Sig.	.064

a. Kruskal Wallis Test

b. Grouping Variable: Interval Pembersihan



**Lampiran 13. Uji Jumlah Taplak Meja terhadap Kelimpahan Mikroplastik**



**One-Sample Kolmogorov-Smirnov Test**

		Unstandardized Residual
N		6
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	165.1357018
Most Extreme Differences	Absolute	.341
	Positive	.341
	Negative	-.213
Test Statistic		.341
Asymp. Sig. (2-tailed)		.028 <sup>c</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.

**Test of Homogeneity of Variances**

Kelimpahan Mikroplastik (MPS/hari)

Levene Statistic	df1	df2	Sig.
.100	1	4	.767

**ANOVA**

Kelimpahan Mikroplastik (MPS/hari)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3536.333	1	3536.333	.104	.764
Within Groups	136349.000	4	34087.250		
Total	139885.333	5			

**Ranks**

	Jumlah Taplak Meja (buah)	N	Mean Rank
Kelimpahan Mikroplastik (MPS/hari)	.00	4	3.00
	1.00	2	4.50
	Total	6	



**Test Statistics<sup>a,b</sup>**

	Kelimpahan Mikroplastik (MPS/hari)
Chi-Square	.857
df	1
Asymp. Sig.	.355

a. Kruskal Wallis Test

b. Grouping Variable: Jumlah Taplak Meja (buah)

