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## LAMPIRAN



## LAMPIRAN 1 Kondisi lingkungan di lokasi stasiun penelian

Stasiun	Ulangan	Suhu (°C)	Saljinitas (‰)	pH
1	1	37	33	7.88
	2	37	32	7.82
	3	36	31	7.75
2	1	36	33	7.86
	2	35	32	7.77
	3	34	30	7.77
3	1	37	32	7.85
	2	36	31	7.75
	3	35	30	7.76

## LAMPIRAN 2 Bahan Organik Total Sedimen

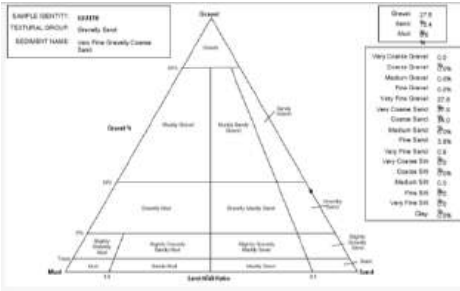
Stasiun	Ulangan	Titik	BCK	BS	BST	Berat BOT	BOT (%)
1	1	0	31.060	5.067	35.582	0.545	10.756
		50	25.704	5.031	30.440	0.295	5.864
		100	28.840	5.054	33.530	0.364	7.202
	2	0	28.667	5.009	33.309	0.367	7.327
		50	16.793	5.010	21.418	0.385	7.685
		100	28.305	5.022	32.977	0.350	6.969
	3	0	28.125	5.061	32.743	0.443	8.753
		50	29.388	5.016	34.080	0.324	6.459
		100	29.130	5.031	33.773	0.388	7.712
2	1	0	26.278	5.055	30.583	0.480	9.496
		50	28.694	5.091	33.388	0.397	7.798
		100	27.727	5.077	32.447	0.357	7.032
	2	0	28.701	5.044	32.852	0.893	17.704
		50	29.273	5.050	34.064	0.259	5.129
		100	25.945	5.028	30.641	0.332	6.603
	3	0	27.716	5.082	32.175	0.623	12.259
		50	26.141	5.081	30.874	0.348	6.489
		100	21.572	5.045	26.323	0.294	5.828
3	1	0	24.416	5.073	27.934	1.555	30.652
		50	27.791	5.073	32.607	0.275	5.402
		100	27.019	5.076	31.744	0.351	6.915
	2	0	27.179	5.039	31.515	0.703	13.951
		50	25.823	5.035	30.459	0.399	7.925
		100	26.625	5.087	31.328	0.384	7.549
3	0	27.384	5.025	31.980	0.429	8.537	
	50	29.750	5.083	34.364	0.469	9.227	
	100	26.553	5.016	31.293	0.276	5.502	



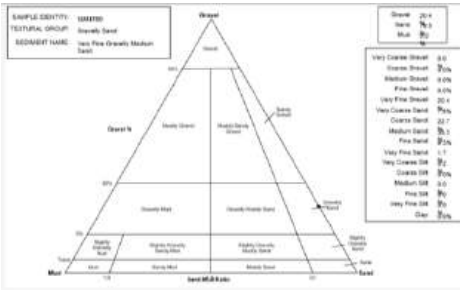


LAMPIRAN 3 Hasil Software Gradistat sedimen

SAMPLE STATISTICS																																																								
SEVING ERROR: 0.1%																																																								
SAMPLE IDENTITY: S101198 ANALYST & DATE: 100 023																																																								
SAMPLE TYPE: Polymodal, Poorly Sorted																																																								
TEXTURAL GROUP: Gravely Sand																																																								
SEDIMENT NAME: Very Fine Gravely Coarse Sand																																																								
GRAIN SIZE DISTRIBUTION																																																								
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FOLK & WARD METHOD		Description																																																						
MEAN (M)	1274.8	1462.3	0.985	1099.0 -0.127																																																				
SORTING (S)	786.3	2.150	1.104	2.053 1.042																																																				
SKEWNESS (Sk)	0.533	-0.550	0.990	-0.080 0.080																																																				
KURTOSIS (K)	1.794	3.323	3.303	0.754 0.754																																																				



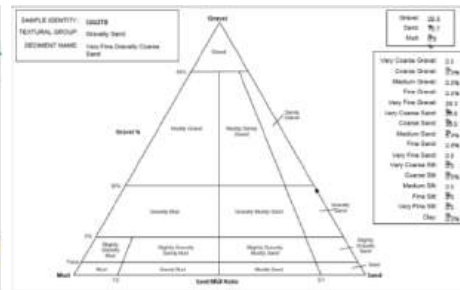
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MEAN (M)	877.9	533.3	0.861	597.1 0.896																																																				
SORTING (S)	826.7	2.522	1.338	3.529 1.384																																																				
SKEWNESS (Sk)	1.108	0.108	-0.224	0.261 -0.252																																																				
KURTOSIS (K)	2.870	2.201	2.201	0.857 0.857																																																				



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MEAN (M)	1623.3	1143.8	-0.194	1138.8 -2.240																																																				
SORTING (S)	970.7	2.781	1.433	2.933 1.287																																																				
SKEWNESS (Sk)	-0.246	-1.692	1.061	-0.814 0.914																																																				
KURTOSIS (K)	1.452	2.057	2.057	0.832 0.832																																																				



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MEAN (M)	1257.8	978.31	0.021	1108.5 -1.142																																																				
SORTING (S)	791.1	2.100	1.071	2.023 1.024																																																				
SKEWNESS (Sk)	0.490	-0.519	0.610	-0.080 0.080																																																				
KURTOSIS (K)	1.694	3.263	3.263	0.727 0.727																																																				



Optimization Software:  
www.balesio.com

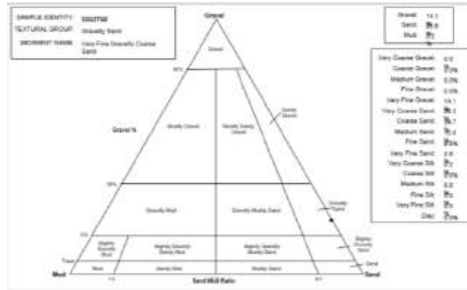
**SAMPLE STATISTICS**

SAMPLE IDENTITY: 5102750 ANALYST & DATE: 100 043  
 SAMPLE TYPE: Polymodal, Poorly Sorted TEXTURAL GROUP: Gravelly Sand  
 SEDIMENT NAME: Very Fine Gravelly Coarse Sand

MODE 1		MODE 2		MODE 3	
$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
200.9	0.747	1059.9	-0.243	164.8	-1.142
2490.0	-1.243	164.8	-1.142	2207.0	2.601
MEAN $\mu$	267.7	9.995		153.29	-2.278
$D_{10}$	2942.7	3.743		$D_{30}$	2.408
$D_{50}$	719.4	1.288		$D_{70}$	

GRAIN SIZE DISTRIBUTION	
GRAVEL: 14.1%	COARSE SAND: 54.1%
SAND: 85.0%	MEDIUM SAND: 10.6%
MUD: 0.2%	FINE SAND: 9.2%
V COARSE GRAVEL: 0.0%	V FINE SAND: 2.2%
COARSE GRAVEL: 0.0%	COARSE SILT: 0.0%
MEDIUM GRAVEL: 0.0%	MEDIUM SILT: 0.0%
FINE GRAVEL: 0.0%	FINE SILT: 0.0%
V FINE GRAVEL: 14.1%	V FINE SILT: 0.0%
V COARSE SAND: 28.3%	CLAY: 0.0%

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric/Logarithmic	Arithmetic	Geometric/Logarithmic
MEAN $\mu$	267.7	9.995	233.8
SD $\sigma$	1059.9	0.243	1.204
SKEWNESS (S1)	1.607	0.580	0.078
KURTOSIS (K)	3.102	2.854	3.555



**SAMPLE STATISTICS**

SAMPLE IDENTITY: 5102760 ANALYST & DATE: 100 057  
 SAMPLE TYPE: Polymodal, Fairly Sorted TEXTURAL GROUP: Sandy Gravel  
 SEDIMENT NAME: Sandy Very Fine Gravel

MODE 1		MODE 2		MODE 3	
$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
2400.0	-1.243	1200.0	-0.243	586.0	0.747
1200.0	-0.243	586.0	0.747	275.5	-1.368
MEAN $\mu$	1028.7	-0.297		2001.8	1.350
$D_{10}$	8.371	-1.393		2336.1	3.228
$D_{30}$	2.957	-0.967		1779.3	1.599

GRAIN SIZE DISTRIBUTION	
GRAVEL: 41.4%	COARSE SAND: 19.3%
SAND: 58.7%	MEDIUM SAND: 18.0%
MUD: 0.2%	FINE SAND: 4.9%
V COARSE GRAVEL: 0.0%	V FINE SAND: 2.2%
COARSE GRAVEL: 0.0%	COARSE SILT: 1.0%
MEDIUM GRAVEL: 0.0%	MEDIUM SILT: 1.0%
FINE GRAVEL: 0.0%	FINE SILT: 1.0%
V FINE GRAVEL: 11.4%	V FINE SILT: 1.0%
V COARSE SAND: 22.4%	CLAY: 1.0%

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric/Logarithmic	Arithmetic	Geometric/Logarithmic
MEAN $\mu$	1115.2	1977.9	0.226
SD $\sigma$	1981.6	0.585	2.532
SKEWNESS (S1)	6.002	0.672	0.372
KURTOSIS (K)	1.311	3.218	3.215



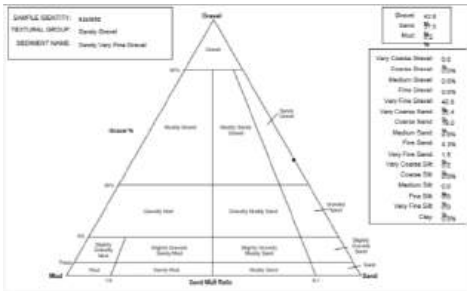
**SAMPLE STATISTICS**

SAMPLE IDENTITY: 5102870 ANALYST & DATE: 100 072  
 SAMPLE TYPE: Polymodal, Poorly Sorted TEXTURAL GROUP: Sandy Gravel  
 SEDIMENT NAME: Sandy Very Fine Gravel

MODE 1		MODE 2		MODE 3	
$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
2400.0	-1.243	1200.0	-0.243	586.0	0.747
1200.0	-0.243	586.0	0.747	275.5	-1.368
MEAN $\mu$	1028.7	-0.297		2001.8	1.350
$D_{10}$	8.371	-1.393		2336.1	3.228
$D_{30}$	2.957	-0.967		1779.3	1.599

GRAIN SIZE DISTRIBUTION	
GRAVEL: 42.0%	COARSE SAND: 19.0%
SAND: 57.0%	MEDIUM SAND: 18.0%
MUD: 0.2%	FINE SAND: 4.3%
V COARSE GRAVEL: 0.0%	V COARSE SILT: 1.5%
COARSE GRAVEL: 0.0%	COARSE SILT: 0.0%
MEDIUM GRAVEL: 0.0%	MEDIUM SILT: 0.0%
FINE GRAVEL: 0.0%	FINE SILT: 0.0%
V FINE GRAVEL: 42.0%	V FINE SILT: 0.0%
V COARSE SAND: 22.4%	CLAY: 0.0%

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric/Logarithmic	Arithmetic	Geometric/Logarithmic
MEAN $\mu$	1981.6	0.585	2.532
SD $\sigma$	976.8	2.429	1.280
SKEWNESS (S1)	-0.058	-0.981	0.861
KURTOSIS (K)	1.350	3.259	3.250



**SAMPLE STATISTICS**

SAMPLE IDENTITY: 5102930 ANALYST & DATE: 100 032  
 SAMPLE TYPE: Polymodal, Poorly Sorted TEXTURAL GROUP: Sandy Gravel  
 SEDIMENT NAME: Sandy Very Fine Gravel

MODE 1		MODE 2		MODE 3	
$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$
2400.0	-1.243	1200.0	-0.243	406.0	0.747
1200.0	-0.243	406.0	0.747	201.9	-1.371
MEAN $\mu$	1070.6	-0.348		2585.8	1.778
$D_{10}$	3.858	-1.296		2293.9	3.147
$D_{30}$	1.742	-0.580		1819.6	1.504

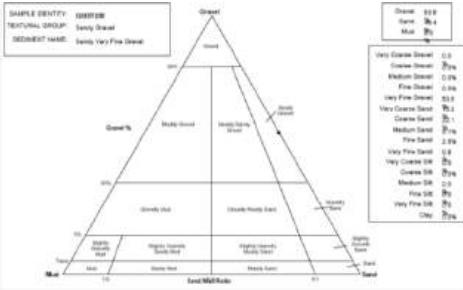
GRAIN SIZE DISTRIBUTION	
GRAVEL: 42.3%	COARSE SAND: 14.1%
SAND: 57.0%	MEDIUM SAND: 32.3%
MUD: 0.1%	FINE SAND: 3.2%
V COARSE GRAVEL: 0.0%	V FINE SAND: 1.3%
COARSE GRAVEL: 0.0%	COARSE SILT: 0.0%
MEDIUM GRAVEL: 0.0%	MEDIUM SILT: 0.0%
FINE GRAVEL: 0.0%	FINE SILT: 0.0%
V FINE GRAVEL: 42.3%	V FINE SILT: 0.0%
V COARSE SAND: 25.8%	CLAY: 0.0%

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric/Logarithmic	Arithmetic	Geometric/Logarithmic
MEAN $\mu$	1454.7	1056.2	-0.331
SD $\sigma$	853.1	2.387	1.243
SKEWNESS (S1)	-0.078	-1.039	1.009
KURTOSIS (K)	1.410	-1.380	3.250



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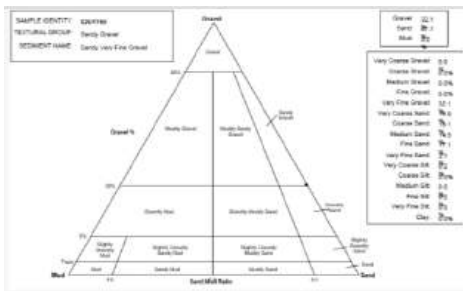
SAMPLE STATISTICS						
SEIVING ERROR: 0.0%		ANALYST & DATE: 100.001				
SAMPLE IDENTITY: 5022700		TEXTURAL GROUP: Sandy Gravel				
SAMPLE TYPE: Threshold, Poorly Sorted		TEXTURAL GROUP: Sandy Gravel				
SEDIMENT NAME: Sandy Very Fine Gravel						
GRAIN SIZE DISTRIBUTION						
MODE 1	2450.0	-1.243	GRAVEL: 22.0%			
MODE 2	605.8	8.747	SAND: 48.4%			
MODE 3	1250.0	-0.243	MID: 0.0%			
D <sub>10</sub>	511.9	-1.395	V FINE SAND: 0.0%			
D <sub>30</sub>	2455.5	-1.022	V COARSE SILT: 0.0%			
D <sub>50</sub>	2529.8	8.966	COARSE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>30</sub> )	5.119	-0.693	MEDIUM GRAVEL: 0.0%			
(D <sub>30</sub> /D <sub>50</sub> )	2117.6	2.361	FINE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>50</sub> )	3.886	-0.495	V FINE GRAVEL: 53.6%			
(D <sub>30</sub> /D <sub>50</sub> )	1743.9	1.802	V COARSE SAND: 12.0%			
METHOD OF MOMENTS		FOLK & WARD METHOD				
Arithmetic	Geometric	Logarithmic	Description			
MEAN(μ)	1022.1	1272.5	-3.240	1457.7	-0.515	Very Coarse Sand
SD(σ)	307.0	210.0	1.144	2.055	1.930	Poorly Sorted
SKEWNESS(Sk)	-0.370	-1.155	1.155	-0.734	0.734	Very Fine Grained
KURTOSIS(Kk)	1.380	3.701	3.701	0.714	0.714	Playktic



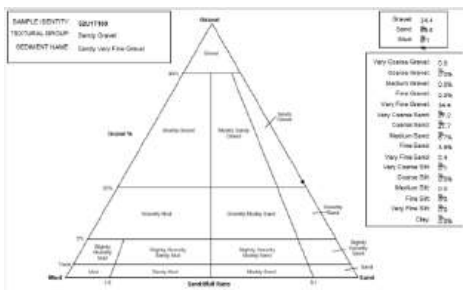
SAMPLE STATISTICS						
SEIVING ERROR: 0.3%		ANALYST & DATE: 100.021				
SAMPLE IDENTITY: 4241010		TEXTURAL GROUP: Gravelly Sand				
SAMPLE TYPE: Polymodal, Poorly Sorted		TEXTURAL GROUP: Gravelly Sand				
SEDIMENT NAME: Very Fine Medium Coarse Sand						
GRAIN SIZE DISTRIBUTION						
MODE 1	1025.0	0.747	GRAVEL: 25.1%			
MODE 2	2400.0	-1.243	SAND: 70.0%			
MODE 3	1250.0	-0.243	MID: 0.1%			
D <sub>10</sub>	335.1	-1.378	V FINE SAND: 0.0%			
D <sub>30</sub>	1079.5	-0.107	V COARSE SILT: 0.0%			
D <sub>50</sub>	2404.3	1.577	COARSE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>30</sub> )	7.442	-1.789	COARSE SILT: 0.0%			
(D <sub>30</sub> /D <sub>50</sub> )	2199.2	2.886	FINE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>50</sub> )	3.021	-0.737	V FINE GRAVEL: 29.1%			
(D <sub>30</sub> /D <sub>50</sub> )	1517.1	1.858	V COARSE SAND: 28.0%			
METHOD OF MOMENTS		FOLK & WARD METHOD				
Arithmetic	Geometric	Logarithmic	Description			
MEAN(μ)	1245.9	958.0	0.001	1596.7	-0.133	Very Coarse Sand
SD(σ)	797.6	2.144	1.101	2.055	1.040	Poorly Sorted
SKEWNESS(Sk)	0.483	-0.349	0.099	-0.062	0.082	Symmetrical
KURTOSIS(Kk)	1.700	3.137	3.137	0.734	0.734	Playktic



SAMPLE STATISTICS						
SEIVING ERROR: 0.0%		ANALYST & DATE: 100.047				
SAMPLE IDENTITY: 4241156		TEXTURAL GROUP: Sandy Gravel				
SAMPLE TYPE: Polymodal, Poorly Sorted		TEXTURAL GROUP: Sandy Gravel				
SEDIMENT NAME: Sandy Very Fine Gravel						
GRAIN SIZE DISTRIBUTION						
MODE 1	2440.0	-1.243	GRAVEL: 22.1%			
MODE 2	1250.0	-0.243	SAND: 87.7%			
MODE 3	152.5	2.757	MID: 0.2%			
D <sub>10</sub>	341.9	-1.344	V FINE SAND: 3.1%			
D <sub>30</sub>	981.9	8.526	V COARSE SILT: 0.0%			
D <sub>50</sub>	2545.4	2.754	COARSE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>30</sub> )	17.49	-2.044	V COARSE SILT: 0.0%			
(D <sub>30</sub> /D <sub>50</sub> )	2377.3	4.128	FINE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>50</sub> )	7.716	-1.642	V FINE GRAVEL: 32.1%			
(D <sub>30</sub> /D <sub>50</sub> )	1875.4	2.948	V COARSE SAND: 10.9%			
METHOD OF MOMENTS		FOLK & WARD METHOD				
Arithmetic	Geometric	Logarithmic	Description			
MEAN(μ)	1142.0	854.1	3.527	1458.8	0.327	Coarse Sand
SD(σ)	528.7	3.302	1.583	3.081	1.424	Poorly Sorted
SKEWNESS(Sk)	0.400	-0.352	0.302	-0.097	0.807	Symmetrical
KURTOSIS(Kk)	1.472	1.709	1.709	0.506	0.506	Very Playktic



SAMPLE STATISTICS						
SEIVING ERROR: 0.0%		ANALYST & DATE: 100.043				
SAMPLE IDENTITY: 4241108		TEXTURAL GROUP: Sandy Gravel				
SAMPLE TYPE: Polymodal, Poorly Sorted		TEXTURAL GROUP: Sandy Gravel				
SEDIMENT NAME: Sandy Very Fine Gravel						
GRAIN SIZE DISTRIBUTION						
MODE 1	2440.0	-1.243	GRAVEL: 14.4%			
MODE 2	1250.0	-0.243	SAND: 85.0%			
MODE 3	805.9	8.747	MID: 0.1%			
D <sub>10</sub>	341.9	-1.344	V FINE SAND: 0.4%			
D <sub>30</sub>	1164.7	-0.238	V COARSE SILT: 0.1%			
D <sub>50</sub>	2510.4	1.549	COARSE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>30</sub> )	7.429	-1.152	MEDIUM GRAVEL: 0.0%			
(D <sub>30</sub> /D <sub>50</sub> )	2197.8	2.383	FINE GRAVEL: 0.0%			
(D <sub>10</sub> /D <sub>50</sub> )	3.660	-0.912	V FINE GRAVEL: 34.4%			
(D <sub>30</sub> /D <sub>50</sub> )	1569.0	1.872	V COARSE SAND: 27.2%			
METHOD OF MOMENTS		FOLK & WARD METHOD				
Arithmetic	Geometric	Logarithmic	Description			
MEAN(μ)	1340.1	1029.1	-0.055	1710.0	0.188	Very Coarse Sand
SD(σ)	819.4	3.153	1.113	2.060	1.947	Poorly Sorted
SKEWNESS(Sk)	0.201	-0.792	0.720	-0.152	0.952	Fine Grained
KURTOSIS(Kk)	1.481	3.088	3.088	0.731	0.731	Playktic



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SAMPLE STATISTICS			
BEAVING ERROR: 0.0%		ANALYST & DATE : 100 055	
SAMPLE IDENTITY : S20276		TEXTURAL GROUP: Sandy Gravel	
SAMPLE TYPE: Polymodal, Poorly Sorted		SEDIMENT NAME: Sandy Very Fine Gravel	
GRAIN SIZE DISTRIBUTION			
MODE 1	1451.0	-1.247	GRAVEL: 58.4%
MODE 2	1205.0	-0.243	COARSE SAND: 32.2%
MODE 3	302.5	1.747	SAND: 41.2%
MODE 3	302.5	1.747	MUD: 0.2%
MODE 3	302.5	1.747	FINE SAND: 4.6%
MODE 3	302.5	1.747	V FINE SAND: 0.2%
MODE 3	302.5	1.747	V COARSE SILT: 0.3%
MODE 3	302.5	1.747	V FINE SILT: 0.0%
MODE 3	302.5	1.747	CLAY: 0.0%
METHOD OF MOMENTS			
MEAN (μ)	1371.4	1210.4	-0.275
SORTING (σ)	896.3	2.638	1.400
SKEWNESS (S)	-0.209	-1.254	1.324
KURTOSIS (K)	1.611	3.690	3.690



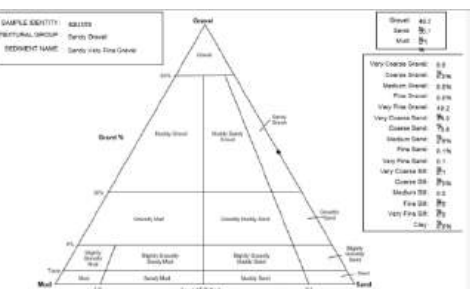
SAMPLE STATISTICS			
BEAVING ERROR: 1.2%		ANALYST & DATE : 100 057	
SAMPLE IDENTITY : S202750		TEXTURAL GROUP: Gravelly Sand	
SAMPLE TYPE: Polymodal, Moderately Sorted		SEDIMENT NAME: Very Fine Gravelly Coarse Sand	
GRAIN SIZE DISTRIBUTION			
MODE 1	608.8	0.747	GRAVEL: 7.8%
MODE 2	302.5	1.747	SAND: 91.3%
MODE 3	1205.0	-0.243	MUD: 0.0%
MODE 3	302.5	1.747	FINE SAND: 0.0%
MODE 3	302.5	1.747	V FINE SAND: 0.0%
MODE 3	302.5	1.747	V COARSE SILT: 0.0%
MODE 3	302.5	1.747	V FINE SILT: 0.0%
MODE 3	302.5	1.747	CLAY: 0.0%
METHOD OF MOMENTS			
MEAN (μ)	742.0	588.0	0.799
SORTING (σ)	993.7	1.813	0.836
SKEWNESS (S)	1.934	0.034	-0.024
KURTOSIS (K)	6.158	4.594	4.594



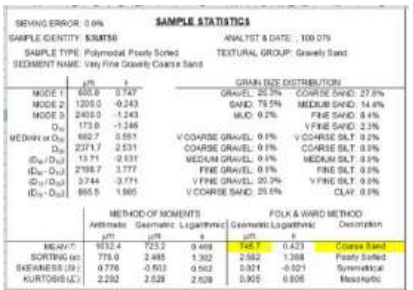
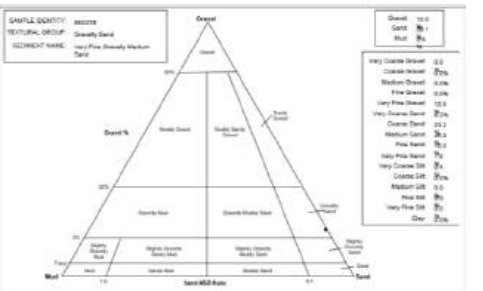
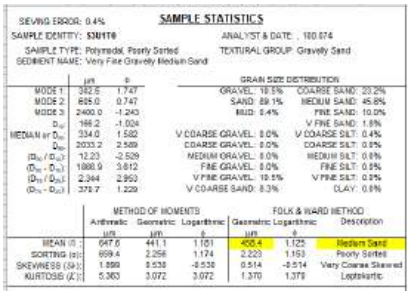
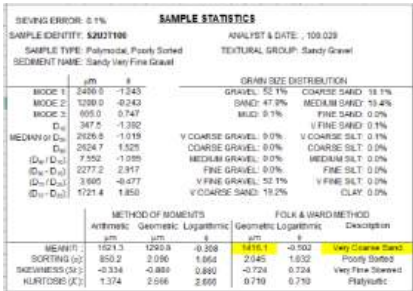
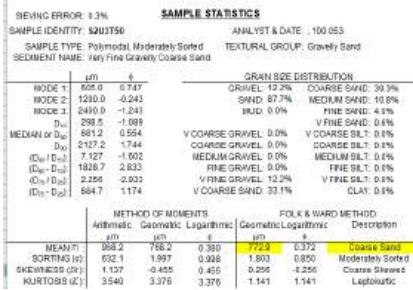
SAMPLE STATISTICS			
BEAVING ERROR: 0.0%		ANALYST & DATE : 100 058	
SAMPLE IDENTITY : S2027198		TEXTURAL GROUP: Gravelly Sand	
SAMPLE TYPE: Polymodal, Poorly Sorted		SEDIMENT NAME: Very Fine Gravelly Medium Sand	
GRAIN SIZE DISTRIBUTION			
MODE 1	302.5	1.747	GRAVEL: 15.2%
MODE 2	905.0	0.747	SAND: 64.5%
MODE 3	1205.0	-0.243	MUD: 0.3%
MODE 3	302.5	1.747	FINE SAND: 12.7%
MODE 3	302.5	1.747	V FINE SAND: 2.7%
MODE 3	302.5	1.747	V COARSE SILT: 0.3%
MODE 3	302.5	1.747	V FINE SILT: 0.0%
MODE 3	302.5	1.747	CLAY: 0.0%
METHOD OF MOMENTS			
MEAN (μ)	825.7	545.3	0.835
SORTING (σ)	751.3	2.551	1.327
SKEWNESS (S)	1.183	-0.353	0.523
KURTOSIS (K)	3.069	2.183	2.193



SAMPLE STATISTICS			
BEAVING ERROR: 0.2%		ANALYST & DATE : 100 010	
SAMPLE IDENTITY : S20310		TEXTURAL GROUP: Sandy Gravel	
SAMPLE TYPE: Trimodal, Moderately Sorted		SEDIMENT NAME: Sandy Very Fine Gravel	
GRAIN SIZE DISTRIBUTION			
MODE 1	2400.0	-1.037	GRAVEL: 43.2%
MODE 2	1205.0	-0.243	COARSE SAND: 10.0%
MODE 3	605.0	0.747	SAND: 50.2%
MODE 3	605.0	0.747	MUD: 0.0%
MODE 3	605.0	0.747	FINE SAND: 0.0%
MODE 3	605.0	0.747	V FINE SAND: 0.0%
MODE 3	605.0	0.747	V COARSE SILT: 0.0%
MODE 3	605.0	0.747	V FINE SILT: 0.0%
MODE 3	605.0	0.747	CLAY: 0.0%
METHOD OF MOMENTS			
MEAN (μ)	950.5	1413.3	-0.637
SORTING (σ)	740.5	1.772	0.825
SKEWNESS (S)	-0.253	-1.126	1.126
KURTOSIS (K)	1.477	4.558	4.558



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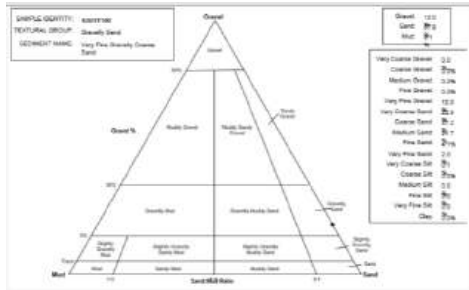
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**SAMPLE STATISTICS**

SAMPLE IDENTITY: S201100 ANALYST & DATE: 100 077  
 SAMPLE TYPE: Polymodal, Poorly Sorted TEXTURAL GROUP: Gravelly Sand  
 SEDIMENT NAME: Very Fine Gravelly Coarse Sand

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric	Logarithmic	Geometric
Mean	Stdev	Mean	Stdev
MEAN (µ)	361.3	361.3	361.3
STDEV (σ)	188.2	188.2	188.2
SKWNESS (Sk)	0.261	0.261	0.261
KURTOSIS (K)	3.087	3.087	3.087



**SAMPLE STATISTICS**

SAMPLE IDENTITY: S201070 ANALYST & DATE: 100 034  
 SAMPLE TYPE: Polymodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand  
 SEDIMENT NAME: Slightly Very Fine Gravelly Medium Sand

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric	Logarithmic	Geometric
Mean	Stdev	Mean	Stdev
MEAN (µ)	361.3	361.3	361.3
STDEV (σ)	188.2	188.2	188.2
SKWNESS (Sk)	0.261	0.261	0.261
KURTOSIS (K)	3.087	3.087	3.087



**SAMPLE STATISTICS**

SAMPLE IDENTITY: S201050 ANALYST & DATE: 100 059  
 SAMPLE TYPE: Trimodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand  
 SEDIMENT NAME: Slightly Very Fine Gravelly Medium Sand

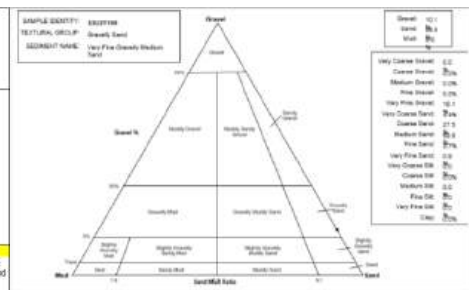
METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric	Logarithmic	Geometric
Mean	Stdev	Mean	Stdev
MEAN (µ)	361.3	361.3	361.3
STDEV (σ)	188.2	188.2	188.2
SKWNESS (Sk)	0.261	0.261	0.261
KURTOSIS (K)	3.087	3.087	3.087



**SAMPLE STATISTICS**

SAMPLE IDENTITY: S201200 ANALYST & DATE: 100 070  
 SAMPLE TYPE: Trimodal, Moderately Sorted TEXTURAL GROUP: Gravelly Sand  
 SEDIMENT NAME: Very Fine Gravelly Medium Sand

METHOD OF MOMENTS		FOLK & WARD METHOD	
Arithmetic	Geometric	Logarithmic	Geometric
Mean	Stdev	Mean	Stdev
MEAN (µ)	361.3	361.3	361.3
STDEV (σ)	188.2	188.2	188.2
SKWNESS (Sk)	0.261	0.261	0.261
KURTOSIS (K)	3.087	3.087	3.087



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SEVING ERROR: 0.1%

**SAMPLE STATISTICS**

SAMPLE IDENTITY: 430070 ANALYST & DATE: 100.028

SAMPLE TYPE: Bimodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Medium Sand

MODE	$\mu$	$\sigma$
MODE 1	322.3	1.747
MODE 2	651.0	0.747
MODE 3		

MEDIAN $\mu$		GRAN SIZE DISTRIBUTION	
$D_{10}$	258.0	9.596	GRAVEL: 0.1%
$D_{20}$	314.7	1.966	COARSE SAND: 22.4%
$D_{30}$	622.6	1.996	SAND: 91.4%
$D_{40}$	2.642	3.261	MEDIUM SAND: 91.6%
$D_{50}$	411.9	1.402	MUD: 8.0%
$D_{60}$	1.537	2.029	FINE SAND: 0.5%
$D_{70}$	258.0	0.964	V FINE SAND: 0.4%
			V COARSE GRAVEL: 0.0%
			V FINE GRAVEL: 0.0%
			COARSE SILT: 0.0%
			MEDIUM SILT: 0.0%
			FINE SILT: 0.0%
			V FINE SILT: 0.0%
			V COARSE SAND: 6.3%
			CLAY: 0.0%

METHOD OF MOMENTS			FOLK & WARD METHOD		
Arithmetic	Geometric	Logarithmic	Arithmetic	Geometric	Logarithmic
MEAN ( $\mu$ )	460.6	355.7	1.12	37.7	1.426
SORTING ( $\sigma$ )	246.2	1.661	0.732	1.656	0.728
SKEWNESS ( $S_k$ )	2.357	0.184	0.184	0.354	-0.394
KURTOSIS ( $K_k$ )	11.16	4.664	4.664	1.937	1.937



SEVING ERROR: 0.1%

**SAMPLE STATISTICS**

SAMPLE IDENTITY: 430070 ANALYST & DATE: 100.034

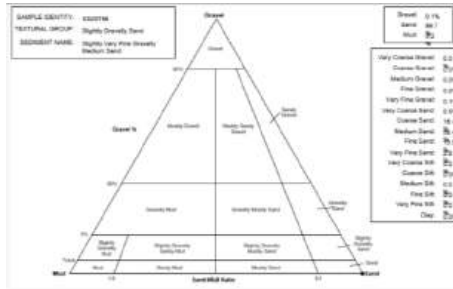
SAMPLE TYPE: Polymodal, Moderately Sorted TEXTURAL GROUP: Slightly Gravelly Sand

SEDIMENT NAME: Slightly Very Fine Gravelly Medium Sand

MODE	$\mu$	$\sigma$
MODE 1	322.5	1.747
MODE 2	685.0	0.747
MODE 3	132.5	2.757

MEDIAN $\mu$		GRAN SIZE DISTRIBUTION	
$D_{10}$	192.7	0.528	GRAVEL: 3.1%
$D_{20}$	391.0	1.711	COARSE SAND: 16.4%
$D_{30}$	687.7	2.739	SAND: 89.1%
$D_{40}$	4.070	0.676	MEDIUM SAND: 58.4%
$D_{50}$	538.0	2.150	FINE SAND: 13.6%
$D_{60}$	1.962	1.828	V FINE SAND: 2.8%
$D_{70}$	237.3	0.928	V COARSE SILT: 0.2%
			COARSE SILT: 0.8%
			MEDIUM SILT: 0.6%
			FINE SILT: 0.6%
			V FINE SILT: 0.6%
			V COARSE SAND: 3.5%
			CLAY: 0.6%

METHOD OF MOMENTS			FOLK & WARD METHOD		
Arithmetic	Geometric	Logarithmic	Arithmetic	Geometric	Logarithmic
MEAN ( $\mu$ )	452.7	329.2	1.688	32.1	1.443
SORTING ( $\sigma$ )	261.5	1.921	0.961	1.828	0.918
SKEWNESS ( $S_k$ )	1.983	0.219	0.219	0.166	-0.369
KURTOSIS ( $K_k$ )	6.365	3.997	3.997	1.302	1.302



SEVING ERROR: 0.0%

**SAMPLE STATISTICS**

SAMPLE IDENTITY: 43007190 ANALYST & DATE: 100.007

SAMPLE TYPE: Polymodal, Poorly Sorted TEXTURAL GROUP: Gravelly Sand

SEDIMENT NAME: Very Fine Gravelly Coarse Sand

MODE	$\mu$	$\sigma$
MODE 1	605.0	0.747
MODE 2	1200.0	-0.243
MODE 3	302.5	1.747

MEDIAN $\mu$		GRAN SIZE DISTRIBUTION	
$D_{10}$	146.3	-1.230	GRAVEL: 19.0%
$D_{20}$	580.6	0.732	COARSE SAND: 21.3%
$D_{30}$	2340.6	2.773	SAND: 92.3%
$D_{40}$	16.03	-2.254	MUD: 0.0%
$D_{50}$	2199.2	4.093	FINE SAND: 17.3%
$D_{60}$	4.617	-2.552	V FINE SAND: 2.5%
$D_{70}$	988.4	2.237	V COARSE SILT: 0.0%
			COARSE SILT: 0.0%
			MEDIUM SILT: 0.0%
			FINE SILT: 0.0%
			V FINE SILT: 0.0%
			V COARSE SAND: 19.8%
			CLAY: 0.0%

METHOD OF MOMENTS			FOLK & WARD METHOD		
Arithmetic	Geometric	Logarithmic	Arithmetic	Geometric	Logarithmic
MEAN ( $\mu$ )	970.3	576.3	0.791	597.6	0.758
SORTING ( $\sigma$ )	805.9	2.701	1.424	2.950	1.665
SKEWNESS ( $S_k$ )	0.942	-0.088	0.088	-0.004	0.004
KURTOSIS ( $K_k$ )	2.457	1.907	1.907	0.795	0.795



**Optimization Software:**  
[www.balesio.com](http://www.balesio.com)

LAMPIRAN 4 Tabel data Echinodermata

Stasiun	Ulangan	Plot	Species							Jumlah Individu	Jumlah Jenis	
			<i>Holothuria scabra</i>	<i>Holothuria atra</i>	<i>Diadema setosum</i>	<i>Protoreaster nodosus</i>	<i>Linckia laevigata</i>	<i>Ophiocoma scolopendrina</i>	<i>Ophiocoma erinaceus</i>			<i>Ophiocoma echinata</i>
		0	0	0	0	0	0	0	0	0	0	0
		10	0	0	0	0	0	0	0	0	0	0
		20	0	0	0	0	0	0	0	0	0	0
		30	0	0	0	0	0	0	0	0	0	0
	1	40	0.5	0	1.75	0	0.25	0	0	0	2.5	3
		50	0	0	1	0	0	0	0	0	1	1
		60	0	0.5	0	0	0	0	0	0	0.5	1
		70	0.25	0	0	0.5	0.75	0	0	0	1.5	3
		80	0.25	0.5	0	0	0.25	0	0	0	1	3
		90	0	0	0	1.25	0	0	0	0	1.25	1
1		100	0.25	0	0	0.5	0.25	0	0	0	1	3
		Total	1.25	1	2.75	2.25	1.5	0	0	0	8.75	
		0	0	0	0	0	0	0	0	0	0	0
		10	0	0	0	0	0	0	0	0	0	0
		20	0	0	0	0	0	0	0	0	0	0
		30	0	0	0	0	0	0	0	0	0	0
		40	0	0	1.25	0	0	0	0	0	1.25	1
		50	0.5	0	0	0	0	3.5	1.25	1	6.25	4
		60	0	0	0	0	0	8	2.25	0	10.25	2
		70	0	0	0	0	0	5	0	0	5	1
		80	0	0	0	0	0.75	0	0	0	0.75	1





	90	0	0.5	0	0	0	0	0	0	0.5	1
	100	0	0	0	0	0.5	0	0	0	0.5	1
	Total	0.5	0.5	1.25	0	1.25	16.5	3.5	1	24.5	
	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0	0	0
	40	0	0	1.75	0	0	1.5	2.25	0	5.5	3
3	50	0	0	0	0	0	89.6	80	54.4	224	3
	60	0	0	0	0	0	128	70.4	76.8	275.2	3
	70	0	0	0	0	0	5.25	2.75	1.5	9.5	3
	80	0	0	0	0	0	4.75	3.75	2	10.5	3
	90	0	0	0	0	0	5.75	4.25	1	11	3
	100	0	0	0	0	0.25	1.75	1.25	0	3.25	3
	Total	0	0	1.75	0	0.25	236.6	164.65	135.7	538.9	
		1.75	1.5	5.75	2.25	3	253.1	168.15	136.7	572.2	
	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0	0	0
	40	0	0	1.5	0	0	0	0	0	1.5	1
	50	0	0	0	0	0	217.6	118.4	60.8	396.8	3
	60	0	0	0	0	0	108.8	76.8	67.2	252.8	3
	70	0.5	0.25	0	0	0	198.4	166.4	80	445.5	5
										5	



	80	0	0	0	0	0	121.6	73.6	48	243.2	<b>3</b>
	90	0	0	0	0	0	70.4	89.6	44.8	204.8	<b>3</b>
	100	0	0.75	0	0	0	6.75	3	2.25	12.75	<b>4</b>
	Total	0.5	1	1.5	0	0	723.55	527.8	303.05	4	22
	0	0	0	0	0	0	0	0	0	0	<b>0</b>
	10	0	0	0	0	0	0	0	0	0	<b>0</b>
	20	0	0	0	0	0	0	0	0	0	<b>0</b>
	30	0	0	0	0	0	0	0	0	0	<b>0</b>
	40	0	0	2	0	0	2.5	1.75	0	6.25	<b>3</b>
2	50	0	0	0	0	0	4.75	1	0	5.75	<b>2</b>
	60	0	0	0	0	0	169.6	99.2	80	348.8	<b>3</b>
	70	0	0.25	0	0	0	131.2	118.4	51.2	301.05	<b>4</b>
	80	0	0	0	0	0	140.8	76.8	48	265.6	<b>3</b>
	90	0	0	0	0	0	137.6	124.8	80	342.4	<b>3</b>
	100	0	0	0	0	0	211.2	115.2	76.8	403.2	<b>3</b>
	Total	0	0.25	2	0	0	797.65	537.15	336	05	21
	0	0	0	0	0	0	0	0	0	0	<b>0</b>
	10	0	0	0	0	0	0	0	0	0	<b>0</b>
	20	0	0	0	0	0	0	0	0	0	<b>0</b>
	30	0	0	1.25	0	0	0	0	0	1.25	<b>1</b>
	40	0	0	8	0	0	0	0	0	8	<b>1</b>
	50	0	0	1.75	0	0	128	105.6	0	235.35	<b>3</b>
	60	0	0	0	0	0	124.8	105.6	0	230.4	<b>2</b>
	70	0	0.5	0	0	0	89.6	67.2	54.4	211.7	<b>4</b>



	80	0	0	0	0.5	0	76.8	80	60.8	218.1	4
	90	0	0.25	0	0	0	5.5	5.75	0	11.5	3
	100	0.25	0.75	0	0	0	4.75	4.25	2.75	12.75	5
	Total	0.25	1.5	11	0.5	0	429.45	368.4	117.95	929.0	23
		0.75	2.75	14.5	0.5	0	1950.65	1433.35	757	4159.	66
	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0	0	0
	40	0	0	0	0	0	4	1.75	0	5.75	2
1	50	0	0.25	0	0	0	153.6	137.6	115.2	406.6	4
	60	0	0	0	0	0	105.6	73.6	76.8	256	3
	70	0	0	0	1.25	0	160	169.6	0	330.8	3
	80	0	0	0	0	0	166.4	153.6	86.4	406.4	3
	90	0	0	0	0	0	137.6	99.2	54.4	291.2	3
	100	0	0.25	0	0	0	5.25	3.25	2.5	11.25	4
	Total	0	0.5	0	1.25	0	732.45	638.6	335.3	1708.	22
	0	0	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0
	30	0	0	1.75	0	0	0	0	0	1.75	1
	40	0	0	2.25	0	0	13	0	0	15.25	2
	50	0	0	0	0	0	118.4	124.8	67.2	310.4	3

3



	60	0	0	0	0	0	140.8	131.2	73.6	345.6	<b>3</b>
	70	0	0	0	0	0	36	102.4	67.2	205.6	<b>3</b>
	80	0	0	0	0	0	102.4	73.6	38.4	214.4	<b>3</b>
	90	0	0	0	0	0	124.8	86.4	73.6	284.8	<b>3</b>
	100	0	0	0	0	0	147.2	105.6	67.2	320	<b>3</b>
										1697.	
	Total	0	0	4	0	0	682.6	624	387.2	8	21
	0	0	0	0	0	0	0	0	0	0	<b>0</b>
	10	0	0	0	0	0	0	0	0	0	<b>0</b>
	20	0	0	0	0	0	0	0	0	0	<b>0</b>
	30	0	0	3	0	0	0	0	0	3	<b>1</b>
	40	0.5	0.75	2.25	0	0	0	0	0	3.5	<b>3</b>
3	50	0.25	0.5	0	0	0	2.75	0	4.5	8	<b>4</b>
	60	0.25	0.5	0	0	0	121.6	99.2	60.8	282.3	<b>5</b>
	70	0	0	0	0	0	115.2	96	86.4	297.6	<b>3</b>
	80	0	0	0	0.5	0	137.6	70.4	48	256.5	<b>3</b>
	90	0.25	0.25	0	0	0	140.8	102.4	28.8	272.5	<b>5</b>
	100	0.5	0.75	0	1	0	160	115.2	35.2	312.6	<b>6</b>
										5	
	Total	1.75	2.75	5.25	1.5	0	677.95	483.2	263.7	1436.	30
		1.75	3.25	9.25	2.75	0	2093	1745.8	986.2	4842	73



LAMPIRAN 5 Komposisi jenis Echinodermata pada stasiun penelitian

Stasiun	Jenis Echinodermata	Ulangan			Individu Jenis	Komposisi Jenis
		1	2	3		
1	<i>Holothuria scabra</i>	√	√		1.75	0.31
	<i>Holothuria atra</i>	√	√	√	1.5	0.26
	<i>Diadema setosum</i>	√	√	√	5.75	1.00
	<i>Protoreaster nodosus</i>	√			2.25	0.39
	<i>Linckia laevigata</i>	√	√		3	0.52
	<i>Ophiocoma scolopendrina</i>		√	√	253	44.23
	<i>Ophiocoma erinaceus</i>		√	√	168	29.39
	<i>Ophiocoma echinata</i>				137	23.89
	Total				572.2	100
2	<i>Holothuria scabra</i>	√			1.75	0.04
	<i>Holothuria atra</i>	√	√	√	3.25	0.08
	<i>Diadema setosum</i>	√	√	√	9.25	0.22
	<i>Protoreaster nodosus</i>			√	2.75	0.07
	<i>Linckia laevigata</i>				0	0.00
	<i>Ophiocoma scolopendrina</i>	√	√	√	1951	46.91
	<i>Ophiocoma erinaceus</i>	√	√	√	1433	34.47
	<i>Ophiocoma echinata</i>	√	√	√	757	18.21
	Total				4158	100
3	<i>Holothuria scabra</i>			√	0.75	0.02
	<i>Holothuria atra</i>	√		√	2.75	0.06
	<i>Diadema setosum</i>		√	√	14.5	0.30
	<i>Protoreaster nodosus</i>	√		√	0.5	0.01
	<i>Linckia laevigata</i>				0	0.00
	<i>Ophiocoma scolopendrina</i>	√	√	√	2093	43.21
	<i>Ophiocoma erinaceus</i>	√	√	√	1746	36.04
	<i>Ophiocoma echinata</i>	√	√	√	986	20.36
	Total				4843.5	100



## LAMPIRAN 6 Analisis jumlah jenis Echinodermata

**Descriptives**

Jumlah\_Jenis

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Stasiun 1	33	1.4242	1.37000	.23849	.9385	1.9100	.00	4.00
Stasiun 2	33	2.0000	1.68558	.29516	1.3988	2.6012	.00	5.00
Stasiun 3	33	2.2121	1.76348	.30698	1.5868	2.8374	.00	6.00
Total	99	1.8788	1.63678	.16450	1.5523	2.2052	.00	6.00

**Test of Homogeneity of Variances**

		Levene Statistic	df1	df2	Sig.
Jumlah_Jenis	Based on Mean	1.591	2	96	.209
	Based on Median	.722	2	96	.489
	Based on Median and with adjusted df	.722	2	85.691	.489
	Based on trimmed mean	1.839	2	96	.165

**ANOVA**

Jumlah\_Jenis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.970	2	5.485	2.093	.129
Within Groups	251.576	96	2.621		
Total	262.545	98			

**Multiple Comparisons**

Dependent Variable: Jumlah\_Jenis

Tukey HSD

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Stasiun	(J) Stasiun	J			Lower Bound	Upper Bound
Stasiun 1	Stasiun 2	-.57576	.39853	.322	-1.5245	.3730
	Stasiun 3	-.78788	.39853	.123	-1.7366	.1609
Stasiun 2	Stasiun 1	.57576	.39853	.322	-.3730	1.5245
	Stasiun 3	-.21212	.39853	.856	-1.1609	.7366
Stasiun 3	Stasiun 1	.78788	.39853	.123	-.1609	1.7366
	Stasiun 2	.21212	.39853	.856	-.7366	1.1609



LAMPIRAN 7 Analisis kepadatan Echinodermata

**Descriptives**

Kepadatan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Stasiun 1	3	17.3394	60.34712	10.50509	-4.0588	38.7376	.00	275.20
Stasiun 2	3	126.0455	154.18897	26.84085	71.3724	180.7185	.00	445.55
Stasiun 3	3	146.7273	155.52034	27.07262	91.5822	201.8724	.00	406.65
Total	9	96.7040	141.78629	14.25006	68.4253	124.9828	.00	445.55

**Test of Homogeneity of Variances**

Kepadatan	Levene Statistic	df1	df2	Sig.
	60.332	2	96	.000
	10.156	2	96	.000
	10.156	2	74.374	.000
	59.649	2	96	.000

**ANOVA**

Kepadatan

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	318845.652	2	159422.826	9.268	.000
Within Groups	1651282.881	96	17200.863		
Total	1970128.533	98			

**Multiple Comparisons**

Dependent Variable: Kepadatan

Tukey HSD

(I) Stasiun	(J) Stasiun	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Stasiun 1	Stasiun 2	-108.70606*	32.28741	.003	-185.5697	-31.8425
	Stasiun 3	-129.38788*	32.28741	.000	-206.2515	-52.5243
Stasiun 2	Stasiun 1	108.70606*	32.28741	.003	31.8425	185.5697
	Stasiun 3	-20.68182	32.28741	.798	-97.5454	56.1818
Stasiun 3	Stasiun 1	129.38788*	32.28741	.000	52.5243	206.2515
	Stasiun 2	20.68182	32.28741	.798	-56.1818	97.5454

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



LAMPIRAN 8 Analisis kepadatan jenis Echinodermata di stasiun penelitian

		Descriptives							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
Holothuria_scabra	Stasiun 1	3	.5833	.62915	.36324	-.9796	2.1462	.00	1.25
	Stasiun 2	3	.2500	.25000	.14434	-.3710	.8710	.00	.50
	Stasiun 3	3	.5833	1.01036	.58333	-1.9265	3.0932	.00	1.75
	Total	9	.4722	.63053	.21018	-.0124	.9569	.00	1.75
Holothuria_atra	Stasiun 1	3	.5000	.50000	.28868	-.7421	1.7421	.25	1.50
	Stasiun 2	3	.9167	.62915	.36324	-.6462	2.4796	.00	1.00
	Stasiun 3	3	1.0833	1.46487	.84574	-2.5556	4.7223	.00	2.75
	Total	9	1.0000	.86603	.28868	.3343	1.6657	.00	2.75
Diadema_setosum	Stasiun 1	3	1.9167	.76376	.44096	.0194	3.8140	1.25	2.75
	Stasiun 2	3	4.8333	5.34634	3.08671	-8.4477	18.1144	1.50	11.00
	Stasiun 3	3	3.0833	2.74241	1.58333	-3.7292	9.8959	.00	5.25
	Total	9	3.2778	3.28454	1.09485	.7531	5.8025	.00	11.00
Protoreaster_nodosus	Stasiun 1	3	.7500	1.29904	.75000	-2.4770	3.9770	.00	2.25
	Stasiun 2	3	.1667	.28868	.16667	-.5504	.8838	.00	.50
	Stasiun 3	3	.9167	.80364	.46398	-1.0797	2.9130	.00	1.50
	Total	9	.6111	.84881	.28294	-.0413	1.2636	.00	2.25
Linckia_laevigata	Stasiun 1	3	1.0000	.6144	.210108	-.01241	.9569	.00	1.75
	Stasiun 2	3	.0000	.00000	.00000	.0000	.0000	.00	.00
	Stasiun 3	3	.0000	.00000	.00000	.0000	.0000	.00	.00
	Total	9	.1667	.35355	.11785	-.1051	.4384	.00	1.00
Ophiocoma_scolopendrina	Stasiun 1	3	84.3667	132.09581	76.26555	-243.7775	412.5109	.00	236.60
	Stasiun 2	3	650.2167	194.74636	112.43686	166.4399	1133.9934	429.45	797.65
	Stasiun 3	3	697.6667	30.21284	17.44339	622.6138	772.7195	677.95	732.45
	Total	9	477.4167	318.42408	106.14136	232.6543	722.1791	.00	797.65
Ophiocoma_erinaceus	Stasiun 1	3	56.0500	94.06664	54.30940	-177.6245	289.7245	.00	164.65
	Stasiun 2	3	477.7833	94.84403	54.75823	242.1777	713.3890	368.40	537.15
	Stasiun 3	3	581.9333	85.81663	49.54625	368.7530	795.1137	483.20	638.60
	Total	9	371.9222	253.88884	84.62961	176.7660	567.0785	.00	638.60
Ophiocoma_echinata	Stasiun 1	3	45.5667	78.05936	45.06759	-148.3435	239.4769	.00	135.70
	Stasiun 2	3	252.3333	117.53972	67.86159	-39.6515	544.3182	117.95	336.00
	Stasiun 3	3	328.7333	62.01132	35.80225	174.6887	482.7780	263.70	387.20
	Total	9	208.8778	148.44245	49.48082	94.7748	322.9807	.00	387.20

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Holothuria_scabra	Based on Mean	3.604	2	6	.094
	Based on Median	.333	2	6	.729
	Based on Median and with adjusted df	.333	2	2.651	.743
	Based on trimmed mean	3.096	2	6	.119
Holothuria_atra	Based on Mean	4.000	2	6	.079
	Based on Median	4.000	2	6	.079
	Based on Median and with adjusted df	4.000	2	2.000	.200
	Based on trimmed mean	4.000	2	6	.079
Ophiocoma_echinata	Based on Mean	6.324	2	6	.033
	Based on Median	.534	2	6	.612





	Based on Median and with adjusted df	.534	2	2.682	.638
	Based on trimmed mean	5.231	2	6	.048
Protoreaster_nodosus	Based on Mean	4.820	2	6	.056
	Based on Median	.349	2	6	.719
	Based on Median and with adjusted df	.349	2	3.202	.729
	Based on trimmed mean	3.889	2	6	.083
Linckia_laevigata	Based on Mean	2.701	2	6	.146
	Based on Median	.414	2	6	.679
	Based on Median and with adjusted df	.415	2	3.216	.692
	Based on trimmed mean	2.390	2	6	.172
Ophiocoma_scolopendrina	Based on Mean	4.693	2	6	.059
	Based on Median	.633	2	6	.563
	Based on Median and with adjusted df	.633	2	3.968	.577
	Based on trimmed mean	4.048	2	6	.077
Ophiocoma_erinaceus	Based on Mean	.049	2	6	.952
	Based on Median	.002	2	6	.998
	Based on Median and with adjusted df	.002	2	5.879	.998
	Based on trimmed mean	.039	2	6	.962
Ophiocoma_echinata	Based on Mean	1.417	2	6	.313
	Based on Median	.154	2	6	.860
	Based on Median and with adjusted df	.154	2	4.409	.861
	Based on trimmed mean	1.219	2	6	.359

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Holothuria_scabra	Between Groups	.222	2	.111	.225	.805
	Within Groups	2.958	6	.493		
	Total	3.181	8			
Holothuria_atra	Between Groups	.500	2	.250	3.000	1.25
	Within Groups	.500	6	.083		
	Total	1.000	8			
Diadema_setosum	Between Groups	12.931	2	6.465	.529	.615
	Within Groups	73.375	6	12.229		
	Total	86.306	8			
	Between Groups	.931	2	.465	.578	.590
	Within Groups	4.833	6	.806		
	Total	5.764	8			
	Between Groups	.042	2	.021	.021	.979
	Within Groups	5.958	6	.993		
	Total	6.000	8			



Ophiocoma_scolopendrina	Between Groups	698574.615	2	349287.307	18.616	.003
	Within Groups	112576.525	6	18762.754		
	Total	811151.140	8			
Ophiocoma_erinaceus	Between Groups	465259.507	2	232629.754	27.685	.001
	Within Groups	50416.833	6	8402.806		
	Total	515676.341	8			
Ophiocoma_echinata	Between Groups	128772.776	2	64386.388	8.132	.020
	Within Groups	47508.505	6	7918.084		
	Total	176281.281	8			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Stasiun	(J) Stasiun	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Holothuria_scabra	Stasiun 1	Stasiun 2	.33333	.57333	.835	-1.4258	2.0925
		Stasiun 3	.00000	.57333	1.000	-1.7591	1.7591
	Stasiun 2	Stasiun 1	-.33333	.57333	.835	-2.0925	1.4258
		Stasiun 3	-.33333	.57333	.835	-2.0925	1.4258
	Stasiun 3	Stasiun 1	.00000	.57333	1.000	-1.7591	1.7591
		Stasiun 2	.33333	.57333	.835	-1.4258	2.0925
Holothuria_atra	Stasiun 1	Stasiun 2	.50000	.23570	.165	-2.232	1.2232
		Stasiun 3	-.50000	.23570	.165	-2.232	1.2232
	Stasiun 2	Stasiun 1	-.08333	.81366	.994	-2.5799	2.4132
		Stasiun 3	-.16667	.81366	.977	-2.6632	2.3299
	Stasiun 3	Stasiun 1	.08333	.81366	.994	-2.4132	2.5799
		Stasiun 2	.16667	.81366	.977	-2.3299	2.6632
Diadema_setosum	Stasiun 1	Stasiun 2	-2.91667	2.85531	.591	-11.6775	5.8442
		Stasiun 3	-1.16667	2.85531	.913	-9.9275	7.5942
	Stasiun 2	Stasiun 1	2.91667	2.85531	.591	-5.8442	11.6775
		Stasiun 3	1.75000	2.85531	.819	-7.0109	10.5109
	Stasiun 3	Stasiun 1	1.16667	2.85531	.913	-7.5942	9.9275
		Stasiun 2	-1.75000	2.85531	.819	-10.5109	7.0109
Protoreaster_nodosus	Stasiun 1	Stasiun 2	.58333	.73283	.719	-1.6652	2.8319
		Stasiun 3	-.16667	.73283	.972	-2.4152	2.0819
	Stasiun 2	Stasiun 1	-.58333	.73283	.719	-2.8319	1.6652
		Stasiun 3	-.75000	.73283	.590	-2.9985	1.4985
	Stasiun 3	Stasiun 1	.16667	.73283	.972	-2.0819	2.4152
		Stasiun 2	.75000	.73283	.590	-1.4985	2.9985
Linckia_laevigata	Stasiun 1	Stasiun 2	.08333	.81366	.994	-2.4132	2.5799
		Stasiun 3	.08333	.81366	.994	-2.5799	2.4132
	Stasiun 2	Stasiun 1	-.50000	.23570	.165	-1.2232	.2232
		Stasiun 3	.00000	.23570	1.000	-.7232	.7232
	Stasiun 3	Stasiun 1	-.50000	.23570	.165	-1.2232	.2232
		Stasiun 2	.00000	.23570	1.000	-.7232	.7232
Stasiun 1	Stasiun 2	-565.85000*	111.84142	.006	-909.0102	-222.6898	
	Stasiun 3	-613.30000*	111.84142	.004	-956.4602	-270.1398	
Stasiun 2	Stasiun 1	565.85000*	111.84142	.006	222.6898	909.0102	



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		Stasiun 3	-47.45000	111.84142	.907	-390.6102	295.7102	
	Stasiun 3	Stasiun 1	613.30000*	111.84142	.004	270.1398	956.4602	
		Stasiun 2	47.45000	111.84142	.907	-295.7102	390.6102	
Ophiocoma_erinaceus	Stasiun 1	Stasiun 2	-421.73333*	74.84564	.003	-651.3803	-192.0863	
		Stasiun 3	-525.88333*	74.84564	.001	-755.5303	-296.2363	
	Stasiun 2	Stasiun 1	421.73333*	74.84564	.003	192.0863	651.3803	
		Stasiun 3	-104.15000	74.84564	.402	-333.7970	125.4970	
	Stasiun 3	Stasiun 1	525.88333*	74.84564	.001	296.2363	755.5303	
		Stasiun 2	104.15000	74.84564	.402	-125.4970	333.7970	
Ophiocoma_echinata	Stasiun 1	Stasiun 2	-206.76667	72.65482	.066	-429.6916	16.1583	
		Stasiun 3	-283.16667*	72.65482	.019	-506.0916	-60.2417	
	Stasiun 2	Stasiun 1	206.76667	72.65482	.066	-16.1583	429.6916	
		Stasiun 3	-76.40000	72.65482	.575	-299.3249	146.5249	
	Stasiun 3	Stasiun 1	283.16667*	72.65482	.019	60.2417	506.0916	
		Stasiun 2	76.40000	72.65482	.575	-146.5249	299.3249	

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

LAMPIRAN 9 Indeks Ekologi Echinodermata pada setiap stasiun

Stasiun	Spesies	ni	ni/N	ln ni/N	H	Ln S	E	Ni/n 2	C
1	<i>Holothuria scabra</i>	1.75	0.00	-5.79	-0.02	2.08	0.57	0.00	0.34
	<i>Holothuria atra</i>	1.5	0.01	-5.94	-0.02	2.08	0.57	0.00	
	<i>Diadema setosum</i>	5.75	0.01	-4.60	-0.05	2.08	0.57	0.00	
	<i>Protoreaster nodosus</i>	2.25	0.00	-5.54	-0.02	2.08	0.57	0.00	
	<i>Linckia laevigata</i>	3	0.00	-5.25	-0.03	2.08	0.57	0.00	
	<i>Ophiocoma scolopendrina</i>	253	0.44	-0.82	-0.36	2.08	0.57	0.20	
	<i>Ophiocoma erinaceus</i>	168	0.29	-1.22	-0.36	2.08	0.57	0.09	
	<i>Ophiocoma echinata</i>	137	0.24	-1.43	-0.34	2.08	0.57	0.06	
	Total		<b>572.2</b>			1.19			
2	<i>Holothuria scabra</i>	0.75	0.00	-8.62	0.00	1.95	0.54	0.00	0.37
	<i>Holothuria atra</i>	2.75	0.00	-7.32	0.00	1.95	0.54	0.00	
	<i>Diadema setosum</i>	14.5	0.00	-5.66	-0.02	1.95	0.54	0.00	
	<i>Protoreaster nodosus</i>	0.5	0.00	-9.03	0.00	1.95	0.54	0.00	
	<i>Ophiocoma scolopendrina</i>	1950.65	0.47	-0.76	-0.36	1.95	0.54	0.22	
	<i>Ophiocoma erinaceus</i>	1433.35	0.34	-1.07	-0.37	1.95	0.54	0.12	
	<i>Ophiocoma echinata</i>	757	0.18	-1.70	-0.31	1.95	0.54	0.03	
	Total		<b>4159.5</b>			1.06			
3	<i>Holothuria scabra</i>	1.75	0.00	-7.93	0.00	1.95	0.56	0.00	0.36
	<i>Holothuria atra</i>	3.25	0.00	-7.31	0.00	1.95	0.56	0.00	
	<i>Diadema setosum</i>	9.25	0.00	-6.26	-0.01	1.95	0.56	0.00	
	<i>Protoreaster nodosus</i>	2.75	0.00	-7.47	0.00	1.95	0.56	0.00	
	<i>Ophiocoma echinata</i>	2093	0.43	-0.84	-0.36	1.95	0.56	0.19	



<i>Ophiocoma erinaceus</i>	1745.8	0.36	-1.02	-0.37	1.95	0.56	0.13
<i>Ophiocoma echinata</i>	986.2	0.20	-1.59	-0.32	1.95	0.56	0.04
Total	<b>4842</b>			1.08			

#### LAMPIRAN 10 Analisis PCA kepadatan Echinodermata terhadap kondisi lingkungan

##### Summary statistics (Quantitative data):

Variable	Observations	Obs. with missing data	Obs. without missing data	Min	Max	Mean	Std. deviation
Kepadatan	3	0	3	17.339	146.773	96.704	69.512
Suhu	3	0	3	35.000	37.000	36.000	1.000
Salinitas	3	0	3	31.000	32.000	31.557	0.510
pH	3	0	3	7.79	0	7.820	7.803
Besar Butir	3	0	3	0.95	0	1.030	0.987
Organik Total	3	0	3	7.64	0	10.630	9.003
Total	3	0	3	0	10.630	9.003	1.512

##### Correlation matrix (Pearson (n)):

Variables	Kepadatan	Suhu	Salinitas	pH	Besar Butir	Organik Total
Kepadatan	<b>1</b>	<b>-0.931</b>	<b>-0.843</b>	<b>-0.983</b>	<b>-0.974</b>	<b>0.865</b>
Suhu	<b>-0.931</b>	<b>1</b>	<b>0.981</b>	<b>0.982</b>	<b>0.990</b>	<b>-0.989</b>
Salinitas	<b>-0.843</b>	<b>0.981</b>	<b>1</b>	<b>0.927</b>	<b>0.944</b>	<b>-0.999</b>
pH	<b>-0.983</b>	<b>0.982</b>	<b>0.927</b>	<b>1</b>	<b>0.999</b>	<b>-0.942</b>
Besar Butir	<b>-0.974</b>	<b>0.990</b>	<b>0.944</b>	<b>0.999</b>	<b>1</b>	<b>-0.957</b>
Organik Total	<b>0.865</b>	<b>-0.989</b>	<b>-0.999</b>	<b>-0.942</b>	<b>-0.957</b>	<b>1</b>

Values in bold are different from 0 with a significance level  $\alpha=0,95$

##### Principal Component Analysis:

###### Eigenvalues:

	F1	F2
Eigenvalue	5.770	0.230
Variability (%)	96.173	3.827
Cumulative %	96.173	100.000



	F1	F2
	-	0.645
	0.396	0.124
	0.416	0.523
	0.403	-0.272
	0.413	

Besar Butir	0.415	-0.175
Organik Total	0.407	-0.437

Factor loadings:

	F1	F2
Kepadatan	0.951	0.309
Suhu	0.998	0.059
Salinitas	0.968	0.251
pH	0.991	-0.130
Besar Butir	0.996	-0.084
Organik Total	0.978	-0.209

Correlations between variables and factors:

	F1	F2
Kepadatan	-0.951	0.309
Suhu	0.998	0.059
Salinitas	0.968	0.251
pH	0.991	-0.130
Besar Butir	0.996	-0.084
Organik Total	-0.978	-0.209

Contribution of the variables (%):

	F1	F2
Kepadatan	15.675	41.587
Suhu	17.269	1.538
Salinitas	16.242	27.349
pH	17.036	7.393
Besar Butir	17.208	3.057
Organik Total	16.571	19.075

Squared cosines of the variables:

	F1	F2
Kepadatan	<b>0.905</b>	0.095
Suhu	<b>0.996</b>	0.004
Salinitas	<b>0.937</b>	0.063
pH	<b>0.983</b>	0.017
Besar Butir	<b>0.993</b>	0.007
Organik Total	<b>0.956</b>	0.044



Factor scores:

	F1	F2
Stasiun 1	3.038	-0.303
Stasiun 2	-0.202	0.676
Stasiun 3	-2.836	-0.373

Contribution of the observations (%):

	F1	F2
Stasiun 1	53.307	13.359
Stasiun 2	0.235	66.431
Stasiun 3	46.457	20.209

Squared cosines of the observations:

	F1	F2
Stasiun 1	<b>0.990</b>	0.010
Stasiun 2	0.082	<b>0.918</b>
Stasiun 3	<b>0.983</b>	0.017

*Values in bold correspond for each observation to the factor for which the squared cosine is the largest*

## LAMPIRAN 11 Dokumentasi selama penelitian

### A. Kegiatan di Lapangan



Pengambilan Sampel



Pengambilan Sampel Sedimen





Tim Turlap



Lokasi Penelitian

### B. Kegiatan di Laboatorium



Pengukuran pH



Pengukuran Salinitas





Analisis BOT



Analisis Besar Butir



*Holothuria scabra*



*Holothuria atra*



*dosus*



*Linckia laevigata*



Optimization Software:  
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*Diadema setosum*



*Ophiocoma scolopendrina*



*Ophiocoma erinaceus*



*Ophiocoma echinata*

LAMPIRAN 12 Buku identifikasi yang digunakan

