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# Lampiran – lampiran

Lampiran 1 : Fase Populasi *Daphnia magna*

|  |  |  |  |
| --- | --- | --- | --- |
| Fase Populasi *Daphnia maghna* | | | |
| Perlakuan | Fase | Hari | Populasi (ekor) |
| A1 | Lag | 1 | 30 |
| 2 | 28 |
| 3 | 81 |
| 4 | 103 |
| Log | 5 | 265 |
| 6 | 358 |
| 7 | 348 |
| 8 | 447 |
| Stasioner | 9 | **705** |
| Kematian | 10 | 662 |
| 11 | 590 |
| 12 | 683 |
| 13 | 600 |
| 14 | 573 |
| A2 | Lag | 1 | 30 |
| 2 | 27 |
| 3 | 87 |
| 4 | 132 |
| Log | 5 | 294 |
| 6 | 367 |
| 7 | 359 |
| 8 | 467 |
| Stasioner | 9 | **773** |
| Kematian | 10 | 620 |
| 11 | 583 |
| 12 | 440 |
| 13 | 327 |
| 14 | 167 |
| B1 | Lag | 1 | 30 |
| 2 | 30 |
| 3 | 112 |
| 4 | 162 |
| Log | 5 | 324 |
| 6 | 420 |
| 7 | 447 |
| 8 | 503 |
| Stasioner | 9 | 830 |
| Kematian | 10 | **1.210** |
| 11 | 1.100 |
| 12 | 807 |
| 13 | 800 |
| 14 | 667 |
| Lag | 1 | 30 |
| 2 | 30 |
| B2 |  | 3 | 130 |
| 4 | 191 |
| Log | 5 | 353 |
| 6 | 540 |
| 7 | 534 |
| 8 | 617 |
| Stasioner | 9 | 967 |
| Kematian | 10 | **1.400** |
| 11 | 1.345 |
| 12 | 1.318 |
| 13 | 1.167 |
| 14 | 900 |
| C1 | Lag | 1 | 30 |
| 2 | 28 |
| 3 | 94 |
| 4 | 166 |
| Log | 5 | 328 |
| 6 | 428 |
| 7 | 419 |
| 8 | 453 |
| Stasioner | 9 | **624** |
| Kematian | 10 | 543 |
| 11 | 600 |
| 12 | 567 |
| 13 | 367 |
| 14 | 313 |
| C2 | Lag | 1 | 30 |
| 2 | 29 |
| 3 | 114 |
| 4 | 157 |
| Log | 5 | 319 |
| 6 | 408 |
| 7 | 435 |
| 8 | 497 |
| Stasioner | 9 | **712** |
| Kematian | 10 | 679 |
| 11 | 592 |
| 12 | 573 |
| 13 | 527 |
| 14 | 385 |
| Kontrol | Lag | 1 | 30 |
| 2 | 28 |
| 3 | 73 |
| 4 | 103 |
| Log | 5 | 187 |
| 6 | 237 |
| 7 | 219 |
| 8 | 497 |
|  | Stasioner | 9 | 453 |
| Kematian | 10 | **780** |
| 11 | 767 |
| 12 | 737 |
| 13 | 620 |
| 14 | 480 |
|  | | |  |

Lampiran 2 : Data Pertumbuhan *Daphnia magna* (Individu/liter)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **HARI KE** | **ULANGAN** | **PERLAKUAN** | | | | | | | |
| A1 | A2 | A3 | | B1 | B2 | B3 | Kontrol |
| 1 | 1 | 30 | 30 | 30 | | 30 | 30 | 30 | 30 |
| 2 | 30 | 30 | 30 | | 30 | 30 | 30 | 30 |
| 3 | 30 | 30 | 30 | | 30 | 30 | 30 | 30 |
| Rata – rata | **30** | **30** | **30** | | **30** | **30** | **30** | **30** |
| 2 | 1 | 115 | 60 | 60 | | 85 | 60 | 180 | 120 |
| 2 | 60 | 120 | 90 | | 270 | 113 | 60 | 180 |
| 3 | 90 | 90 | 60 | | 60 | 180 | 120 | 120 |
| Rata – rata | **88** | **90** | **70** | | **138** | **117** | **120** | **140** |
| 3 | 1 | 160 | 120 | 126 | | 156 | 100 | 233 | 160 |
| 2 | 100 | 180 | 156 | | 336 | 173 | 113 | 220 |
| 3 | 150 | 150 | 126 | | 126 | 233 | 173 | 160 |
| Rata – rata | **137** | **150** | **136** | | **206** | **168** | **173** | **180** |
| 4 | 1 | 205 | 170 | 208 | | 256 | 163 | 278 | 205 |
| 2 | 145 | 230 | 238 | | 436 | 223 | 158 | 265 |
| 3 | 195 | 200 | 208 | | 226 | 273 | 218 | 210 |
| Rata – rata | **182** | **200** | **218** | | **306** | **220** | **215** | **227** |
| 5 | 1 | 255 | 232 | 261 | | 341 | 208 | 323 | 250 |
| 2 | 195 | 292 | 291 | | 521 | 268 | 203 | 310 |
| 3 | 245 | **262** | **261** | | **311** | **318** | **263** | **255** |
| Rata – rata | **232** | **262** | **271** | | **391** | **265** | **263** | **272** |
| 6 | 1 | 304 | 261 | 306 | | 403 | 270 | 368 | 279 |
| 2 | 244 | 321 | 336 | | 583 | 313 | 248 | 339 |
| 3 | 294 | 291 | 306 | | 373 | 363 | 308 | 284 |
| Rata – rata | **281** | **291** | **316** | | **453** | **315** | **308** | **301** |
| 7 | 1 | 365 | 313 | 378 | | 498 | 337 | 411 | 316 |
| 2 | 305 | 373 | 408 | | 678 | 380 | 291 | 376 |
| 3 | 355 | 343 | 378 | | 468 | 430 | 351 | 321 |
| Rata – rata | **342** | **343** | **376** | | **548** | **382** | **351** | **338** |
| 8 | 1 | 480 | 413 | 545 | | 688 | 464 | 516 | 397 |
| 2 | 420 | 473 | 575 | | 868 | 507 | 392 | 457 |
| 3 | 470 | 443 | 548 | | 658 | 557 | 452 | 402 |
| Rata –rata | **457** | **443** | **556** | | **738** | **509** | **453** | **419** |
| 9 | 1 | 647 | 589 | 1218 | | 1738 | 1414 | 866 | 751 |
| 2 | 587 | 649 | 1248 | | 1918 | 1457 | 742 | 811 |
| 3 | 637 | 619 | | 1221 | 1 708 | 1507 | 802 | 756 |
| Rata – rata | **624** | **619** | | **1229** | **1788** | **1459** | **803** | **773** |
| 10 | 1 | 897 | 1089 | | 1295 | 1888 | 1614 | 1416 | 851 |
| 2 | 837 | 1149 | | 1325 | 2068 | 1657 | 1292 | 911 |
| 3 | 887 | 1119 | | 1298 | 1858 | 1707 | 1352 | 856 |
| Rata – rata | **874** | **1119** | | **1306** | **1938** | **1659** | **1353** | **873** |
| 11 | 1 | 920 | 1039 | | 1345 | 1938 | 1564 | 1366 | 901 |
| 2 | 860 | 1099 | | 1375 | 2118 | 1607 | 1242 | 961 |
| 3 | 910 | 1069 | | 1348 | 1908 | 1657 | 1302 | 906 |
| Rata – rata | **896** | **1069** | | **1356** | **1988** | **1609** | **1303** | **923** |
| 12 | 1 | 890 | 939 | | 1195 | 1788 | 1464 | 1216 | 701 |
| 2 | 837 | 999 | | 1225 | 1968 | 1507 | 1092 | 761 |
| 3 | 887 | 969 | | 1198 | 1758 | 1557 | 1152 | 706 |
| Rata – rata | **871** | **969** | | **1206** | **1838** | **1509** | **1153** | **723** |
| 13 | 1 | 663 | 705 | | 958 | 1478 | 1157 | 1266 | 524 |
| 2 | 603 | 765 | | 988 | 1658 | 1200 | 1142 | 584 |
| 3 | 653 | 735 | | 961 | 1448 | 1482 | 1202 | 529 |
| Rata –rata | **640** | **735** | | **969** | **1528** | **1280** | **1203** | **546** |
| 14 | 1 | 647 | 589 | | 745 | 1188 | 914 | 959 | 444 |
| 2 | 587 | 649 | | 775 | 1368 | 957 | 835 | 504 |
| 3 | 637 | 619 | | 748 | 1158 | 1007 | 895 | 494 |
| Rata – rat | **624** | **619** | | **754** | **1238** | **959** | **896** | **466** |

Lampiran 3 : Pengukuran Suhu ( ͦ C )

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Hari Ke | Rata – rata Suhu | | | | | | |
| A1 | A2 | B1 | B2 | C1 | C2 | Kontrol |
| 1 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| 2 | 25 | 25 | 25 | 25 | 27 | 27 | 27 |
| 3 | 25 | 25 | 25 | 25 | 26 | 26 | 27 |
| 4 | 25 | 25 | 26 | 25 | 26 | 26 | 27 |
| 5 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| 6 | 26 | 26 | 26 | 26 | 26 | 26 | 27 |
| 7 | 25 | 25 | 25 | 25 | 25 | 25 | 27 |
| 8 | 27 | 25 | 27 | 26 | 26 | 27 | 27 |
| 9 | 25 | 27 | 25 | 25 | 25 | 25 | 27 |
| 10 | 27 | 25 | 25 | 25 | 25 | 26 | 27 |
| 11 | 26 | 27 | 27 | 26 | 26 | 27 | 27 |
| 12 | 27 | 27 | 27 | 27 | 27 | 26 | 27 |
| 13 | 26 | 27 | 25 | 26 | 26 | 27 | 27 |
| 14 | 25 | 25 | 26 | 25 | 26 | 25 | 27 |

Lampiran 4 : Pengukuran Derajat Keasaman (pH)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Hari Ke | Rata – rata derajat keasaman (pH) | | | | | | |
| A1 | A2 | B1 | B2 | C1 | C2 | Kontrol |
| 1 | 7.9 | 7.9 | 7.9 | 7.9 | 7.6 | 7.6 | 7.6 |
| 2 | 8.2 | 7.8 | 7.5 | 7.6 | 7.6 | 7.6 | 7.5 |
| 3 | 8.2 | 8 | 7.7 | 7.7 | 7.7 | 7.7 | 7.6 |
| 4 | 7,9 | 8.1 | 7.1 | 7.9 | 7.7 | 7.7 | 7.9 |
| 5 | 8 | 8.1 | 7.6 | 7.7 | 7.9 | 7.8 | 7.9 |
| 6 | 8 | 7.9 | 7.8 | 7.7 | 7.8 | 7.5 | 7.9 |
| 7 | 7.8 | 7.9 | 7.6 | 7.7 | 7.7 | 7.8 | 7.7 |
| 8 | 7. | 7.7 | 7.7 | 7.6 | 7.9 | 7.2 | 7 |
| 9 | 7.6 | 8.3 | 8 | 7.7 | 7.9 | 7.8 | 7.6 |
| 10 | 7.6 | 7.9 | 7.7 | 7.8 | 7.5 | 7.8 | 7.6 |
| 11 | 7.8 | 7.5 | 7.8 | 7.8 | 7.8 | 7.8 | 6.9 |
| 12 | 7.9 | 7.7 | 7.6 | 7.8 | 7.8 | 7.6 | 6.9 |
| 13 | 8.1 | 8.2 | 8 | 8 | 8.1 | 8.2 | 6.9 |
| 14 | 8.1 | 8.2 | 8 | 8 | 8 | 8 | 7 |

Lampiran 5 : Perhitungan Statistik

- **Uji normalitas Populasi *Daphnia magna***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Tests of Normality** | | | | | | | |
| Sampel | | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
|  | | Statistic | Df | Sig. | Statistic | Df | Sig. |
| Populasi | A1 | .177 | 14 | .200\* | .897 | 14 | .100 |
| A2 | .144 | 14 | .200\* | .919 | 14 | .210 |
| B1 | .153 | 14 | .200\* | .897 | 14 | .103 |
| B2 | .161 | 14 | .200\* | .901 | 14 | .117 |
| C1 | .168 | 14 | .200\* | .913 | 14 | .175 |
| C2 | .167 | 14 | .200\* | .920 | 14 | .221 |
| KONTROL | .117 | 14 | .200\* | .927 | 14 | .280 |

a. Liliefors S ignificance Correction

H0 : Sig > alpha (normal)

H1 : Sig < alpha (tidak normal)

* Sig 0.200 > 0,05 untuk uji Kolmogorov-Smirnov ͣ maka dapat dikatakan bahwa pertumbuhan populasi *Daphnia magna* dengan pemberian pakan tepung udang dan tepung spirulina mempunyai distribusi normal.
* Sig 0.100 > 0,05 pada uji Shapiro-Wilk dapat dikatakan bahwa pertumbuhan Daphnia magna dengan pemberian pakan tepung udang dan tepung spirulina mempunyai distribusi normal.

- **Uji Homogenitas**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test of Homogeneity of Variances** | | | | | |
|  | | Levene Statistic | df1 | df2 | Sig. |
| populasi | Based on Mean  Based on Median  Based on Median and with adjusted df  Based on trimmed mean | .517 | 6 | 91 | .794 |
| .500 | 6 | 91 | .807 |
| .500 | 6 | 87.284 | .807 |
| .514 | 6 | 91 | .796 |

**Hipotesis :**

Sign = 0,794 > alpha 0,05

Pertumbuhan populasi *Daphnia magna* dengan pemberian pakan tepung udang rebon dan tepung spirulina mempunyai ragam data yang sama (data homogen).

**Analisis Sidik Ragam Anova**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ANOVA**  Pertumbuhan Populasi | | | | | |
|  | Sum of Squares | Df | Mean Square | F | Sig. |
| Between Groups | 4.254 | 6 | .709 | .616 | .717 |
| Within Groups | 104.773 | 91 | 1.151 |  |  |
| Total | 109.026 | 97 |  |  |  |

Sign Anova : 0,717 > 0,05

Pemberian pakan tepung udang rebon dan tepung spirulina, **berpengaruh** nyata terhadap pertumbuhan populasi *Daphnia magna.*

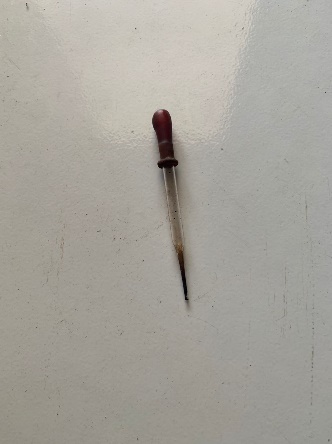
Uji Duncan

|  |  |  |  |
| --- | --- | --- | --- |
| **POPULASI** | | | |
|  | SAMPEL | N | Subset for alpha = 0.05 |
|  | 1 |
| Tukey HSDa | A1 | 3 | 70.0000 |
| A2 | 3 | 90.0000 |
| B1 | 3 | 91.6667 |
| B2 | 3 | 117.6667 |
| C1 | 3 | 120.0000 |
| C2 | 3 | 138.3333 |
| 7.00 | 3 | 140.0000 |
| Sig. |  | .748 |
| Duncana | A1 | 3 | 70.0000 |
| A2 | 3 | 90.0000 |
| B | 3 | 91.6667 |
| B2 | 3 | 117.6667 |
| C1 | 3 | 120.0000 |
| C2 | 3 | 138.3333 |
| B2 | 3 | 140.0000 |
| Sig. |  | .205 |

Berdasarkan uji duncan mendapat hasil terbaik pada perlakuan B2 dengan nilai 140.0000

Lampiran 6. Foto Penelitian

* Alat dan Bahan Penelitian

** **

Gambar 1.Pipet Gambar 2. Akuarium

Gambar 3. Toples Kaca Gambar 4. Baskom

Gambar 5. Timbangan dan Scopnet Gambar 6. Udang Rebon

Gambar 7. Tepung Spirulina Gambar 8. PH Meter

Gambar 9. Penimbangan pakan Tepung Gambar10 Pengamatan *Daphnia* Spirulina dan Tepung Udang

  Gambar 11. Pembersihan Akuarium Gambar 12. *Daphnia Magna*

**RIWAYAT HIDUP**

HABIB AL FARISI, dilahirkan di Tegal, 28 Mei 2000. Anak kedua dari tiga bersaudara keluarga Bapak Bayani dan Ibu Mumtahanah. Pendidikan Sekolah Dasar diselesaikan pada tahun 2013 di SD N 01 Bogares kidul Kabupaten Tegal. Pendidikan Sekolah Lanjutan Tingkat Menengah Pertama diselesaikan pada tahun 2016 di SMP Negeri 02 Pangkah, Kabupaten Tegal. Pendidikan Sekolah Lanjutan Tingkat Menengah Atas diselesaikan pada tahun 2019 di SMK Kusuma bangsa, Kabupaten Tegal. Pada tahun yang sama 2019 penulis melanjutkan pendidikan di Universitas Pancasakti Tegal, Fakultas Perikanan dan Ilmu Kelautan, Program studi Budidaya Perairan (BDP).