**Perhitungan Keanekaragaman Zooplankton Setiap Stasiun Penelitian**

**LAMPIRAN 7**

**KEANEKARAGAMAN ZOOPLANKTON**

Rumus indeks keanekaragaman (Shannon-Wiener) zooplankton :

**H’ = - ∑ Pi ln Pi**

Dimana:

Pi = ni = jumlah individu dari satu spesies

N = jumlah total semua individu

 *ln* = logaritma dengan dasar *e*

Keterangan :

H’ : indeks keanekaragaman Shannon-Wiener

Pi : ni/N

ni : jumlah individu ke-i

N : jumlah total individu

**Diketahui :**

|  |  |  |  |
| --- | --- | --- | --- |
| No | Nama Spesies | Stasiun | Jumlah |
| I | II | III |
| 1. | *Nauplius sp* | 168 | 456 | 480 | **1104** |
| 2. | *Streptocephalus sp* | 24 | 24 | 72 | **120** |
| 3. | *Daphnia sp* | 24 | 48 | 144 | **216** |
| 4. | *Leptodiaptomus siciloides* | 48 |  |  | **48** |
| 5. | *Paramecium sp* | 24 |  | 24 | **48** |
| 6. | *Keratella sp* | 168 | 288 | 192 | **648** |
| 7. | *Filinia longiseta* | 64 |  |  | **64** |
| 8. | *Mesocyclops edax* | 24 | 72 | 264 | **360** |
| 9. | *Copepod nauplii* | 48 | 120 | 72 | **240** |
| 10. | *Branchionus calyciflorus* |  | 24 | 24 | **48** |
| 11. | *Canthocamptus sp* |  | 72 | 48 | **120** |
| 12. | *Cletocamptus sp* |  | 24 |  | **24** |
| 13. | *Temopteris sp* |  | 24 |  | **24** |
| 14. | *Acroperus sp* |  |  | 24 | **24** |
| 15. | *Diaphanosoma excisum* |  |  | 72 | **72** |
| 16. | *Leptodiaptomus sicilis* |  | 96 | 72 | **168** |
| 17. | *Leptodiaptomus minutes* |  |  | 48 | **48** |
| 18. | *Acanthodiaptomus sp* |  |  | 24 | **24** |
| 19. | *Oithona brevicornis* |  | 24 |  | **24** |
| 20. | *Leptodiaptomus ashlandi* |  | 24 |  | **24** |
| **Jumlah spesies/ stasiun** | **592** | **1296** | **1560** |  |
| **Jumlah total individu** | **3448** |

**Ditanya:** Nilai Pi, ln dan H’ ?

**Stasiun Penelitian 1**

$$1. Pi Nauplius sp. ^{} = \frac{168}{592} = 0.29$$

**Jadi, indeks keanekaragaman jenis pada stasiun 1 adalah**

**H’ =** –**∑ pi ln pi**  = – ∑ (0,29 X – 1,24) + (0,04 X – 3,21) + (0,04 X – 3,21) + (0,08 X – 2,52) + (0,04 X – 3,21)+ (0,29 X – 1,24) + (0,11 X – 2,21) + (0,04 X – 3,21) + (0,08 X – 2,52)

= –∑((-0,359) + (- 0,128) + (- 0,128) + (- 0,202) + (- 0,128)+ (- 0,359) + (- 0,243)+ (-0,128) + (-0,202))

= **1,88**

**H’ (1 < H’ < 3) : Keanekaragaman jenis sedang**

 ln 0,29 = - 1,24

$$2. Pi Streptocephalus sp. ^{} = \frac{24}{592} = 0.04$$

 ln 0,04 = - 3,21

$$3. Pi Daphnia sp. ^{} = \frac{24}{592} = 0.04$$

 ln 0,04 = - 3,21

$$4. Pi L.siciloides ^{} = \frac{48}{592} = 0.08$$

 ln 0,08 = - 2,52

$$5. Pi Paramecium sp. ^{} = \frac{24}{592} = 0.04$$

 ln 0,04 = - 3,21

$$6. Pi Keratella sp. ^{} = \frac{168}{592} = 0.29$$

 ln 0,29 = - 1,24

$$7. Pi Filinia longiseta. ^{} = \frac{64}{592} = 0.11$$

 ln 0,11 = - 2,21

$$8. Pi Mesocyclops edax. ^{} = \frac{24}{592} = 0.04$$

 ln 0,04 = - 3,21

$$9. Pi Copepod nauplii. ^{} = \frac{48}{592} = 0.08$$

 ln 0,08 = - 2,52

**Stasiun Penelitian 2**

$$1. Pi Nauplius sp. ^{} = \frac{456}{1296} = 0.35$$

 ln 0,36 = - 1,049

$$2. Pi Streptocephalus sp. ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

$$3. Pi Daphnia sp. ^{} = \frac{48}{1296} = 0.04$$

 ln 0,04 = - 3,21

$$4. Pi Keratella sp ^{} = \frac{288}{1296} = 0.22$$

 ln 0,22 = - 1,514

$$5. Pi Mesocyclops edax. ^{} = \frac{72}{1296} = 0.05$$

 ln 0,05 = - 2,995

$$6. Pi Copepod nauplii. ^{} = \frac{120}{1296} = 0.09$$

 ln 0,09 = - 2,408

$$7. Pi Branchionus calyciflorus. ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

$$8. Pi Canthocamptus sp . ^{} = \frac{72}{1296} = 0.05$$

 ln 0,04 = - 2,995

$$9. Pi Cletocamptus sp . ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

$$10. Pi Temopteris sp . ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

$$11. Pi Leptodiaptomus sicilis . ^{} = \frac{96}{1296} = 0.07$$

 ln 0,07 = - 2,659

$$12. Pi Oithona brevicornis. ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

$$13. Pi Leptodiaptomus ashlandii. ^{} = \frac{24}{1296} = 0.02$$

 ln 0,02 = - 3,912

**Jadi, indeks keanekaragaman jenis pada stasiun 2 adalah**

**H’ =** –**∑ pi ln pi**  = – ∑ (0,35 X – 1,049) + (0,02 X – 3,912) + (0,04 X – 3,21) + (0,22 X – 1,514) + (0,05 X – 2,995)+ (0,09 X – 2,408) + (0,02 X – 3,912) + (0,05 X – 2,995) + (0,02 X – 3,912) + (0,02 X – 3,912) + (0,07 X – 2,659) + (0,02 X – 3,912) + (0,02 X – 3,912)

= –∑((-0,37) + (- 0,08) + (- 0,13) + (- 0,33) + (- 0,15)+ (- 0,21) + (- 0,08)+ (-0,15) + (-0,08) + (-0,08)+ (0,18) + (0,08) + ( 0,08))

= **2**

**H’ (1 < H’ < 3) : Keanekaragaman jenis sedang**

**Stasiun Penelitian 3**

$$1. Pi Nauplius sp. ^{} = \frac{480}{1560} = 0.31$$

 ln 0,31 = - 1,171

$$2. Pi Streptocephalus sp. ^{} = \frac{72}{1560} = 0,046$$

 ln 0,046 = - 3,079

$$3. Pi Daphnia sp. ^{} = \frac{144}{1560} = 0.09$$

 ln 0,09 = - 2,408

$$4. Pi Paramecium sp. ^{} = \frac{24}{1560} = 0.015$$

 ln 0,015 = - 4,199

$$5. Pi Keratella sp. ^{} = \frac{192}{1560} = 0.12$$

 ln 0,12 = - 2,120

$$6. Pi Mesocyclops edax. ^{} = \frac{264}{1560} = 0.17$$

 ln 0,17 = - 1,772

$$7. Pi Copepod nauplii. ^{} = \frac{72}{1560} = 0.05$$

 ln 0,05 = - 2,996

$$8. Pi Branchionus calicyflorus. ^{} = \frac{24}{1560} = 0.015$$

 ln 0,015 = - 4,199

$$9. Pi Diaphanosoma excisum. ^{} = \frac{48}{1560} = 0.031$$

 ln 0,031 = - 3,474

$$10. Pi Leptodiaptomus sicilis. ^{} = \frac{72}{1560} = 0.046$$

 ln 0,046 = - 3,079

$$11. Pi Leptodiaptomus minutes. ^{} = \frac{48}{1560} = 0.03$$

 ln 0,03 = - 3,506

$$12. Pi Acanthodiaptomus sp. ^{} = \frac{24}{1560} = 0.015$$

 ln 0,015 = - 4,199

**Jadi, indeks keanekaragaman jenis pada stasiun 3 adalah**

**H’ =** –**∑ pi ln pi**  = – ∑ (0,31 X – 1,171) + (0,046 X – 3,079) + (0,09 X – 2,408) + (0,015 X – 4,199) + (0,12 X – 2,120)+ (0,17 X – 1,772) + (0,05 X – 2,996) + (0,015 X – 4,199) + (0,031 X – 3,474) + (0,046 X – 3,079) + (0,03 X – 3,506) + (0,015 X – 4,199)

= –∑((-0,36) + (- 0,14) + (- 0,22) + (- 0,06) + (- 0,25)+ (- 0,30) + (- 0,15)+ (-0,06) + (-0,11) + (-0,14)+ (0,11) + (0,06))

= **1,96**

**H’ (1 < H’ < 3) : Keanekaragaman jenis sedang**