**Data analysis**

Diversity indices (abundance, richness, evenness, dominance, Simpson’s, and Shannon-Wiener H′ indices) of the ants epigaeic activity were computed using PAST software (version 4.13). generalized linear model with mixed effects (GLMM) for all indices. For abundance, we employed the Poisson distribution with a log link. For evenness and dominance, we used the Gamma distribution with the log link. For Shannon and Simpsons diversity indices, Three out of 108 observations were non-positives (Zeros- as computed from PAST software). So, we eliminated the Zeros to allow for computation in the glmer function.

The diversity indices were the response variables. We ran two sets of GLMMs, one to predict the diversity indices using Period of sampling as the explanatory variable, and another using days of sampling, likewise. Since different pitfall traps were used, and multiple collections were made temporarily and spatially, we used Pitfall traps as the random effect. These analyses utilized R version 4.1.3- "One Push-Up”, in lme4 package and glmer function.

RESULT

Table 1: GLMM result for day……….

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diversity indices | Regression equation (intercept + slope estimate (x)) | Standard error  (intercept + slope estimate (x)) | Z/t value | P value |
| Abundance | 4.7102 | 0.1890 | 24.93 | <0.001 |
|  | -0.2640 | 0.0238 | -11.09 | <0.001 |
| Evenness | -0.54106 | 0.11260 | -4.805 | <0.001 |
|  | 0.02969 | 0.01537 | 1.932 | >0.05 |
| Dominance | -0.28506 | 0.15590 | -1.828 | <0.05 |
|  | -0.06016 | 0.02186 | -2.752 | <0.01 |
| Simpson\_1.D | -1.14559 | 0.19444 | -5.892 | <0.001 |
|  | 0.05483 | 0.02604 | 2.106 | <0.05 |
| Shannon\_H | -0.59283 | 0.17691 | -3.351 | < 0.001 |
|  | 0.06355 | 0.02369 | 2.683 | <0.01 |

Results relevant to our research hypothesis were summarized in table… We detected a significant negative relationship between ant abundance and waiting day intervals f (Z= -11.09; p < 0.001). There was significant outlier at the beginning of the second period ant collection, which stepped down as collection continued (fig. ). Also, dominance reduced significantly with increase in waiting days (t= -1.828; p< 0.01). Evenness did not differ significantly with time, however Simpson and Shannon diversity estimates increased significantly with increasing waiting period.

Table 2: GLM table for Periods

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diversity indices | | Regression equation (intercept + slope estimate (x)) | Standard error  (intercept + slope estimate (x)) | Z/t value | P value |
| Abundance | Intercept | 3.32023 | 0.03169 | 104.785 | <0.001 |
|  | Period 2 | 0.12623 | 0.04346 | 2.904 | <0.01 |
|  | Period 3 | -0.89003 | 0.05873 | -15.155 | <0.001 |
| Evenness | Intercept | -0.29593 | 0.03879 | -7.630 | <0.001 |
|  | Period 2 | -0.15669 | 0.05485 | -2.856 | <0.01 |
|  | Period 3 | 0.05466 | 0.05485 | 0.996 | >0.05 |
| Dominance | Intercept | -0.58380 | 0.06535 | -8.933 | <0.001 |
|  | Period 2 | -0.03244 | 0.09242 | -0.351 | >0.05 |
|  | Period 3 | -0.13234 | 0.09242 | -1.432 | >0.05 |
| Simpson\_1.D | Intercept | -0.78774 | 0.06676 | -11.800 | <0.001 |
|  | Period 2 | 0.01128 | 0.09375 | 0.120 | >0.05 |
|  | Period 3 | 0.17423 | 0.09510 | 1.832 | >0.05 |
| Shannon\_H | Intercept | -0.26257 | 0.06697 | -3.921 | <0.001 |
|  | Period 2 | 0.17660 | 0.09405 | 1.878 | >0.05 |
|  | Period 3 | 0.27447 | 0.09540 | 2.877 | <0.01 |

Table 2: GLM table for Periods correct (without releveling)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diversity indices | | Regression equation (intercept + slope estimate (x)) | Standard error  (intercept + slope estimate (x)) | Z/t value | P value |
| Abundance | Intercept | 4.41884 | 0.03169 | 139.457 | <0.001 |
|  | Period 2 | 0.12534 | 0.04347 | 2.883 | <0.01 |
|  | Period 3 | -0.90481 | 0.05904 | -15.326 | <0.001 |
| Evenness | Intercept | -0.50629 | 0.08087 | -6.261 | <0.001 |
|  | Period 2 | -0.26483 | 0.11437 | -2.316 | <0.05 |
|  | Period 3 | 0.04415 | 0.11437 | 0.386 | >0.05 |
| Dominance | Intercept | -0.74299 | 0.08796 | -8.447 | <0.001 |
|  | Period 2 | 0.13760 | 0.12439 | 1.106 | >0.05 |
|  | Period 3 | -0.34163 | 0.12439 | -2.746 | <0.01 |
| Simpson\_1.D | Intercept | -0.64568 | 0.09351 | -6.905 | <0.001 |
|  | Period 2 | -0.14369 | 0.13224 | -1.087 | >0.05 |
|  | Period 3 | 0.23314 | 0.13224 | 1.763 | >0.05 |
| Shannon\_H | Intercept | -0.09426 | 0.09276 | -1.016 | >0.05 |
|  | Period 2 | 0.09149 | 0.13118 | 0.697 | >0.05 |
|  | Period 3 | 0.40884 | 0.13118 | 3.117 | <0.01 |

Releveling with ref= S2

Abundance: PeriodS3 -1.03015 0.05803 -17.753 < 2e-16 \*\*\*

Evenness: PeriodS3 0.30899 0.11437 2.702 0.0108 \*

Dominance: PeriodS3 -0.47923 0.12439 -3.853 0.00051 \*\*\*

Simpsons: PeriodS3 0.37682 0.13224 2.850 0.00748 \*\*

Shannon: PeriodS3 0.31735 0.13118 2.419 0.0212 \*