**Data analysis**

Diversity indices characterizing the ants' epigaeic activity, including abundance, richness, evenness, dominance, Simpson’s, and Shannon-Wiener H′, were computed using PAST software (version 4.13). To assess the impact of the waiting period on these indices, a General Linear Model (GLM) with a log link was employed using the glm function of lme4 R package. Abundance was compared across three sampling periods using a Poisson distribution, while other indices were computed with a Gamma distribution.

Testing the influence of waiting days on community indices involved a Generalized Linear Model with Mixed Effects (GLMM) for each index. For abundance, a Poisson distribution with a log link was applied. Other indices were likewise analyzed, but using a Gamma distribution with the log link. However, the Shannon and Simpson's diversity indices encountered computational challenges in the glmer function; due to three out of 108 observations being non-positive -Zeros- as computed from PAST software. To address this, the Zeros were excluded to facilitate computation in the glmer function. We ran these GLMMs using days of sampling as the explanatory variable. 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”.

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 \*