# Supplemental **Appendix S1**

## Analysis of ergosterol in leaf litter

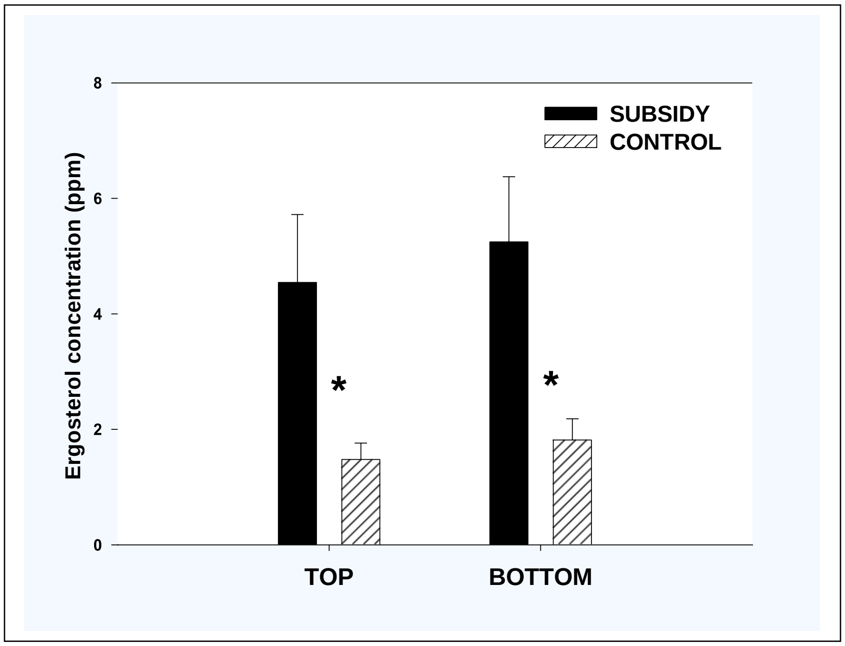
### *Methods*

Two leaves, one each from the top and bottom litter layers, were collected from each plot in August of Year 3. The samples were kept cool and in the dark until brought back to the lab. A disk (ca. 2-$cm^2$) was cut from each leaf, weighed, and stored in 5 ml of HPLC-grade MeOH in glass scintillation vials (covered with aluminum foil) and refrigerated at 5°C until processed. Ergosterol was extracted by the following procedure: 2 ml of 4% KOH in 95% ethanol were added to the stored samples. The vials were then heated in a water bath (80-85°C) for 30 minutes, removing them after 15 minutes to vortex-mix the contents. Samples were cooled to room temperature and 2 ml of MilliQ $H_2O$ was added, followed by 4 ml of HPLC-grade hexane. Samples were inverted 20x and allowed to settle for 10 minutes. The hexane extract, which contained the ergosterol, was removed with a Pasteur pipet and placed in a new scintillation vial. Hexane (3 ml) was added 2 more times. After each addition the sample was inverted 20x and allowed to settle, and the hexane extract was removed and added to the previous hexane harvest. The hexane harvest was dried under $N_2$ in a 40°C sand bath and then re-suspended in 2 ml MeOH and stored at -15°C until run in the HPLC.

All analyses were completed on a Varian Inc. HPLC equipped with an Econosil 5µm, C-18 reverse-phase column and guard column (Alltech, Deerfield, IL) in the College of Agriculture, University of Kentucky. HPLC-grade methanol was used as the isocratic mobile phase at a flow rate of 2ml/min at room temperature and a 25-µm injection loop. Detector wavelength was set at 282 nm. This procedure is based on the procedures of Newell et al. (1988) and Suberkropp (1995) modified by Mike Kaufman (*personal communication*). Ergosterol retention time was ca. 7 minutes. Purified ergosterol standard (Sigma Chemical, St. Louis, MO) was diluted in MeOH to concentrations of 0, 1, 2, 5, 10, 25, 50, and 100 ppm. Several dilutions of ergosterol standard were used to derive a linear regression equation for determining ergosterol content of the samples.

### *Results*

Ergosterol content was higher in the resource-subsidized plots, as illustrated in the following figure (* $P_{1,14} <$ .5 from 1-way ANOVA after MANOVA ($P_{1,13}$(Wilks' $\lambda$) = .004):




*References*

Newell, S. Y. et al. 1988. Fundamental procedures for determining ergosterol content of decaying plant-material by liquid-chromatography. – Applied and Environmental Microbiology 54: 1876-1879.

Suberkropp, K. 1995. The influence of nutrients on fugal growth, productivity, and sporulation during leaf breakdown in streams. – Canadian Journal of Botany-Revue Canadienne de Botanique 73: S1361-S1369.

# Supplemental Information: **Appendix 2**

## Methodological details of the statistical analyses

### *Multivariate Analyses*

Using the entire data set of all 18 response variables (fourth-root transformed) for all treatments, we first used the PRIMER-e / PERMANOVA+ software (Anderson et al. 2008) to calculate a distance matrix for the entire data set using Gower's similarity index [S15 (Legendre and Legendre 2012)]. Gower's index is appropriate for our data because it is designed to accommodate different types of variables (Kempson, sifting and sticky-trap samples; Fig. 1 in text). We employed S15 because this version of Gower's measure is a symmetrical index that gives equal weight to double zeroes and ++, which is the type of index philosophically appropriate for analyzing results of a field experiment (unlike the more commonly employed "Bray-Curtis" measure) (Legendre and Legendre 2012). We then used permutational multivariate analysis of variance (perMANOVA) to test for interactions between (Resource x Year) and both Season and/or Fencing (Anderson et al. 2008). Results of these analyses (Appendix S3) suggested we could pool Open and Fenced plots before examining how distances between communities in ordination space [PCO (Principal Coordinates Ordination)] changed over time in relation to the Resource treatment for summer and fall samples separately. Using perMANOVA, we then assessed the strength and nature of the pattern in ordination space by evaluating (1) the Resource x Year interaction, (2) the strength of evidence for the Resource effect each year, and (3) the proportion of variance explained each year by adding detritus (a measure of effect size).

### *Univariate patterns*

We first plotted univariate vectors on constrained principal coordinates ordinations (CAP in the Primer-E / PERMANOVA+ software; Resource and Fencing as constraining factors because they were integral to the experimental design) of those response variables with the highest correlations with the first CAP axis, the one most closely related to the Resource effect (Fig. 3 in text). We selected vectors based upon two criteria: (1) a simple (i.e. not accounting for co-variation with other variables) Spearman rank correlation with the first CAP axis $\geq .50$ or $\leq -.50$ ($R^2 \geq 25\%$), or (2) a multiple correlation coefficient (analogous to a univariate partial correlation coefficient) with CAP axis 1 $\geq .35$ or $\leq -.35$ ($R^2 \geq 12\%$). All multivariate analyses and ordination plots were done with the Primer-E / PERMANOVA+ software (Anderson et al. 2008).

We then relied on permutational univariate analysis of variance (permANOVA) to examine the strength of evidence for the influence of the Resource treatment on the pattern of change over time of each response variable (taxon-sampling method combination). In order to parallel the multivariate analyses, univariate models were fitted separately for summer and fall samples; in addition a possible interaction with Fencing was evaluated before testing for the Resource x Year interaction. permANOVA was performed with the "adonis" function in the R package "Vegan" (R Core Team 2014).

We also attempted to model the univariate responses with a mixed-effects generalized linear model (GLMM; functions "glmer" and "glmer.nb" in the R package "lme4") using the Poisson and negative binomial families. However, for most response variables the residuals were poorly behaved (Zuur et al. 2009) and most models failed to converge properly, likely because of low replication and the large number of samples with zeroes for many taxa.

Final interpretation of each univariate response was based upon the pattern of vector overlays; the *P* values of the appropriate permANOVA statistics; and the pattern of density change in the plots over time, which was also used to estimate the size of the Resource effect.

Even though non-parametric analyses were performed, in the graphs in Appendix S5 we summarize univariate patterns with yearly means ± standard error rather than presenting the raw data points, in order to make it easier to compare patterns of change over time and estimate effect size.

## *References*


Anderson, M. J. et al. 2008. PERMANOVA+ for PRIMER: Guide to software and statistical methods. – PRIMER-E Ltd, Plymouth, UK.

Legendre, P., and Legendre, L. 2012. Numerical ecology.–Third English Edition edition. Elsevier, Oxford, UK.

R Core Team. 2014. R: A language and environment for statistical computing. –R foundation for statistical computing, Vienna, Austria.

Zuur, A. F. et al. 2009. Mixed effects models and extension in ecology with R.– Springer, New York, NY.

# Supplemental **Appendix S3**

## Multivariate analysis with perMANOVA

Our first analysis was a perMANOVA (> 9900 unique permutations for each statistic) of the distance matrix calculated for the entire data set.

Table S3.1 – Full model with all interactions (Resource x Year x Fencing x Season) included. The sole focus of this initial analysis is the **Resource x Year** interaction, highlighted in bold. The strength of evidence for this interaction cannot be determined from this table because of the possible interaction between **(Resource x Year)** and Season ($P$ = .037). There appears to be no interaction between **(Resource x Year)** and Fencing, and between [**(Resource x Year)** x Season] and Fencing ($P$ = .22 and .67, respectively).

| **Source** | **df** | **MS** | **Pseudo-*F*** | ***P*** |
|---|---|---|---|---|
| Resource | 1 | 2079.1 | 10.65 | < .001 |
| Year | 2 | 2614.3 | 13.39 | < .001 |
| Fencing | 1 | 618.5 | 3.17 | .009 |
| Season | 1 | 5097.3 | 26.11 | < .001 |
| **Resource x Year** | 2 | 510.8 | 2.62 | .003 |
| Resource x Fencing | 1 | 523.9 | 2.68 | .016 |
| Resource x Season | 1 | 569.1 | 2.92 | .012 |
| Year x Fencing | 2 | 259.2 | 1.33 | .207 |
| Year x Season | 2 | 2914.8 | 14.93 | < .001 |
| Fencing x Season | 1 | 129.8 | 0.66 | .676 |
| **(Resource x Year)** x Fencing | 2 | 254.7 | 1.30 | .225 |
| **(Resource x  Year)** x Season | 2 | 367.9 | 1.88 | .037 |
| Resource x Fencing x Season | 1 | 80.3 | 0.41 | .841 |
| Year x Fencing x Season | 2 | 220.5 | 1.13 | .342 |
| **(Resource x Year)** x Season x Fencing | 2 | 150.8 | 0.77 | .673 |
| Residual | 96 | 195.2 | | |
| Total | 119 | | | |

Table S3.2 – Reduced model, obtained from Table S3.1 by pooling Residual SS with SS[**(Resource x Year)** x Fencing x Season] and SS[**(Resource x Year)** x Fencing] along with all other interaction SS's for which $P$ > .20.

| **Source** | **df** | **MS** | **Pseudo-*F*** | ***P*** |
|---|---|---|---|---|
| Resource | 1 | 2079.1 | 10.64 | < .001 |
| Year | 2 | 2614.3 | 13.37 | < .001 |
| Fencing | 1 | 618.5 | 3.16 | .006 |
| Season | 1 | 5097.3 | 26.08 | < .001 |
| **Resource x Year** | 2 | 510.8 | 2.61 | .003 |
| Resource x Fencing | 1 | 523.9 | 2.68 | .017 |
| Resource x Season | 1 | 569.1 | 2.91 | .009 |
| Year x Season | 2 | 2914.8 | 14.91 | < .001 |
| **(Resource x Year)** x Season | 2 | 367.9 | 1.88 | .039 |
| Pooled | 106 | 195.5 | | |
| Total | 119 | | | |

Pooling SS does not alter the conclusion of an interaction between **(Resource x Year)** and Season. Thus, this statistical model provides additional support (in addition to the biological and logistical reasons discussed in the text) for analyzing the **Resource x Year** interaction separately for Summer and Fall. Because of this interaction with season, the *P* value for the **Resource x Year** entry in the above table is not reliable; any interpretation would be problematic. The correct analyses are presented in Table S3.3 (below). [NOTE: Main effects in Tables S3.1 and S3.2 are presented solely for completeness – even if there were no evidence of interactions in this models, the error degrees of freedom (Residual or Pooled) would be inflated (pseudoreplicated) with respect to any test of main effects].

Table S3.3 – perMANOVA's by Season and Year. Because P(Resource x Year) < .05 in both Summer and Fall, separate perMANOVA's were performed for each Year each season. For these latter analyses, if *P*(Resource x Fencing) > .20 the interaction SS was pooled with error SS. Re = Resource, Fe = Fencing, Res = Residuals. Unique permutations > 9950 for all tests.

## (A) SUMMER

### $P$[Pseudo-$F_{1,53}$ (Resource x Year)] = .04

**YEAR 1**

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 205 | 205.2 | 1.681 | .15 |
| Fe | 1 | 314 | 314.3 | 2.575 | .031 |
| Re x Fe | 1 | 239 | 239.3 | 1.960 | .087 |
| Res | 16 | 1953 | 122.0 | | |
| Total | 19 | 2712 | | | |

**YEAR 2**

*Reduced perMANOVA* [*P*(Re x Fe) = *.52]*

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 526 | 526.0 | 3.080 | .005 |
| Fe | 1 | 350 | 349.9 | 2.049 | .058 |
| Pooled | 17 | 2903 | 170.8 | | |
| Total | 19 | 3779 | | | |

**YEAR 3**

*Reduced perMANOVA* [*P*(Re x Fe) = *.47]*

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 720 | 719.6 | 3.217 | .012 |
| Fe | 1 | 337 | 337.0 | 1.507 | .18 |
| Pooled | 17 | 3802 | 223.7 | | |
| Total | 19 | 4859 | | | |

## (B) FALL

**$P$[Pseudo-$F_{1,53}$ (Resource x Year)] = .003**

**YEAR 1**

*Reduced perMANOVA [P(Re x Fe) = .22]*

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 448 | 447.7 | 2.023 | .035 |
| Fe | 1 | 210 | 210.3 | 0.950 | .50 |
| Pooled | 17 | 3763 | 221.3 | | |
| Total | 19 | 4421 | | | |

**YEAR 2**

*Reduced perMANOVA[P(Re x Fe) = .24]*

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 1764 | 1763.5 | 8.219 | .001 |
| Fe | 1 | 305 | 304.7 | 1.420 | .19 |
| Pooled | 17 | 3648 | 214.6 | | |
| Total | 19 | 5716 | | | |

**YEAR 3**

*Reduced perMANOVA [P(Re x Fe) = .41]*

| Source | df | SS | MS | Pseudo-*F* | *P* |
|---|---|---|---|---|---|
| Re | 1 | 744 | 743.6 | 3.285 | .004 |
| Fe | 1 | 191 | 191.5 | 0.846 | .55 |
| Pooled | 17 | 3848 | 226.4 | | |
| Total | 19 | 4783 | | | |

# Supplemental **Appendix S4**

## Multivariate analyses using perMANOVA for Years 2 and 3

Results of perMANOVA (> 9900 unique permutations for each statistic) restricted to Years 2 and 3, when rates of detrital supplementation were more similar to each other than to the rate in Year 1 (see text for details). Residual SS have been pooled with all interaction SS with $P > .20$ (e.g. the 4-way interaction that included Fencing). The effect of Resource supplementation on community structure differed between Years 2 and 3 since *P***(Resource x Year)** = .012. Note that there is much less support for an interaction between **(Resource x Year)** and Season than in the model that includes all three years (Tables S3.1 and S3.2 in Appendix S3).

| **Source** | **df** | **MS** | **Pseudo-*F*** | ***P*** |
|---|---|---|---|---|
| Resource | 1 | 1923.2 | 9.21 | <.001 |
| Year | 2 | 3036.4 | 14.53 | <.001 |
| Fencing | 1 | 472.9 | 2.26 | .043 |
| Season | 1 | 8506.3 | 40.72 | <.001 |
| **Resource x Year** | 1 | 628.4 | 3.01 | .012 |
| Resource x Fencing | 1 | 412.5 | 1.97 | .069 |
| Resource x Season | 1 | 867.6 | 4.15 | .002 |
| Year x Season | 1 | 572.65 | 2.74 | .024 |
| **(Resource x Year)** x Season | 1 | 333.51 | 1.61 | .153 |
| Pooled | 70 | 207.1 | | |
| Total | 79 | | | |

# Supplemental **Appendix S5**

## Univariate patterns: Overview

Here we present plots over time of mean abundances ± SE for Supplemented and Ambient treatments for those response variables (taxon – sampling method combinations) that displayed a response to detrital supplementation, and present relevant statistics from permANOVA's (detailed permANOVA results for all response variables appear in Appendix S6). Based upon these plots, and in the context of the permANOVA results, we also give estimates of effect size, and direction.

We analyzed each of the 18 response variables separately for summer and fall, yielding 36 univariate analyses. We first tested for an interaction with Fencing. Seven analyses produced weak to strong evidence of a Fence effect {*P*(Resource x Year) x Fencing] < .15}. We used a criterion more liberal than *P* < .05 because of the desire not to overlook possible fencing effects, which a priori one would expect for some taxa. For these seven taxa patterns of the Resource x Year interaction are given separately for Open and Fenced plots. First we present patterns of response variables that exhibited no evidence of an interaction with fencing (*P* ≥ .19). Open and Fenced plots were pooled for these latter analyses, producing a 2 x 3 (Resource x Year) design, with 10 replicates for each level of the Resource treatment (Appendix S6).

## Univariate patterns: Open and Fenced plots pooled

We first summarize patterns for response variables that showed a response to Resource addition each year of the experiment. Then we present results for variables exhibiting evidence of a Resource x Year interaction. In parallel with the multivariate analyses, results are presented by season.

*Immediate and consistent effect of Resource supplementation –*
*No Resource x Year interaction:*

*Summer* – Adult Coleoptera and cursorial spiders displayed a temporally consistent positive response to resource supplementation (Fig. S5.1A, Fig. S5.1B), but the evidence was weak (*P*(Resource ~ .05). Effect size was ~ 2x for adult Coleoptera and only ~ 1.3x (i.e. ~30 % higher in Supplemented plots) for cursorial spiders.

*Fall* – Adult Diptera and entomobryid Collembola exhibited a temporally consistent [*P*(Resource x Year) > .50] positive response to resource supplementation (Fig. S5.1C, Fig. S5.1D). For Diptera the evidence was weak (*P*(Resource ~ .05) and effect size was ~2x. Entomobryidae, which showed a clearer response (*P*(Resource ~.001), were ~3x more abundant in the Supplemented treatment in all three years.

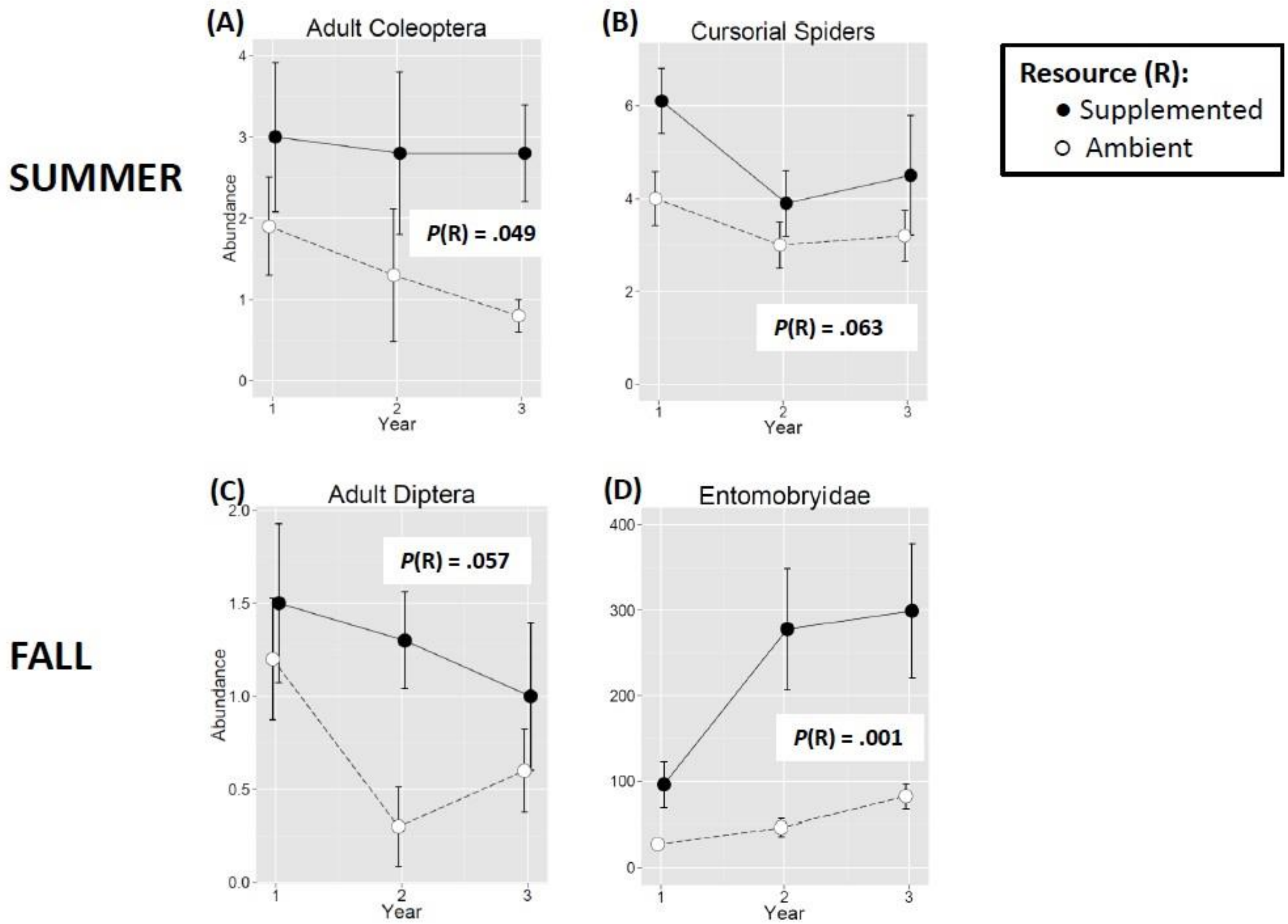



Figure S5.1 – Taxa for which there was no effect of fencing [*P*(Resource x Year x Fencing) > .50] and that exhibited no Resource x Year interaction ($P \geq .15$), but showed a weak to strong response to Resource addition. *P* values from permANOVA (df = 1, 18). Cursorial spiders are from litter sifting, adult Diptera from sticky traps, other taxa from Kempson samples. Note difference in ordinate axes.

*Effect of Resource supplementation varied with time –*
*A Resource x Year interaction:*

*Summer* – Six response variables displayed a Resource x Year interaction. Two responses were negative, i.e. adding detritus decreased the density compared to Ambient plots. In all cases adding detritus produced no discernable effect in Year 1, but densities responded to detrital supplementation in Years 2 and/or 3 (Fig. S5.2). Four distinctly different patterns emerged: (i) Densities were ~2x higher in Supplemented plots in both Years 2 and 3 (larval Coleoptera and adult Diptera; Fig. S5.2A, Fig. S5.2B). (ii) The difference in densities increased gradually to an effect size of ~ 2x in Year 3 (entomobryid Collembola; Fig. S5.2C). (iii) Densities were ~4x higher in Supplemented plots in Year 2 but did not differ between Resource treatments in Years 1 or 3 (sminthurid Collembola; Fig. S5.2D). (iv) Densities were at least ~50% lower in the Supplemented treatment by the end of the experiment, even though densities in Ambient plots had increased steadily over three years (tomocerid Collembola and Pseudoscorpiones; Fig. S5.2E, Fig. S5.2F).

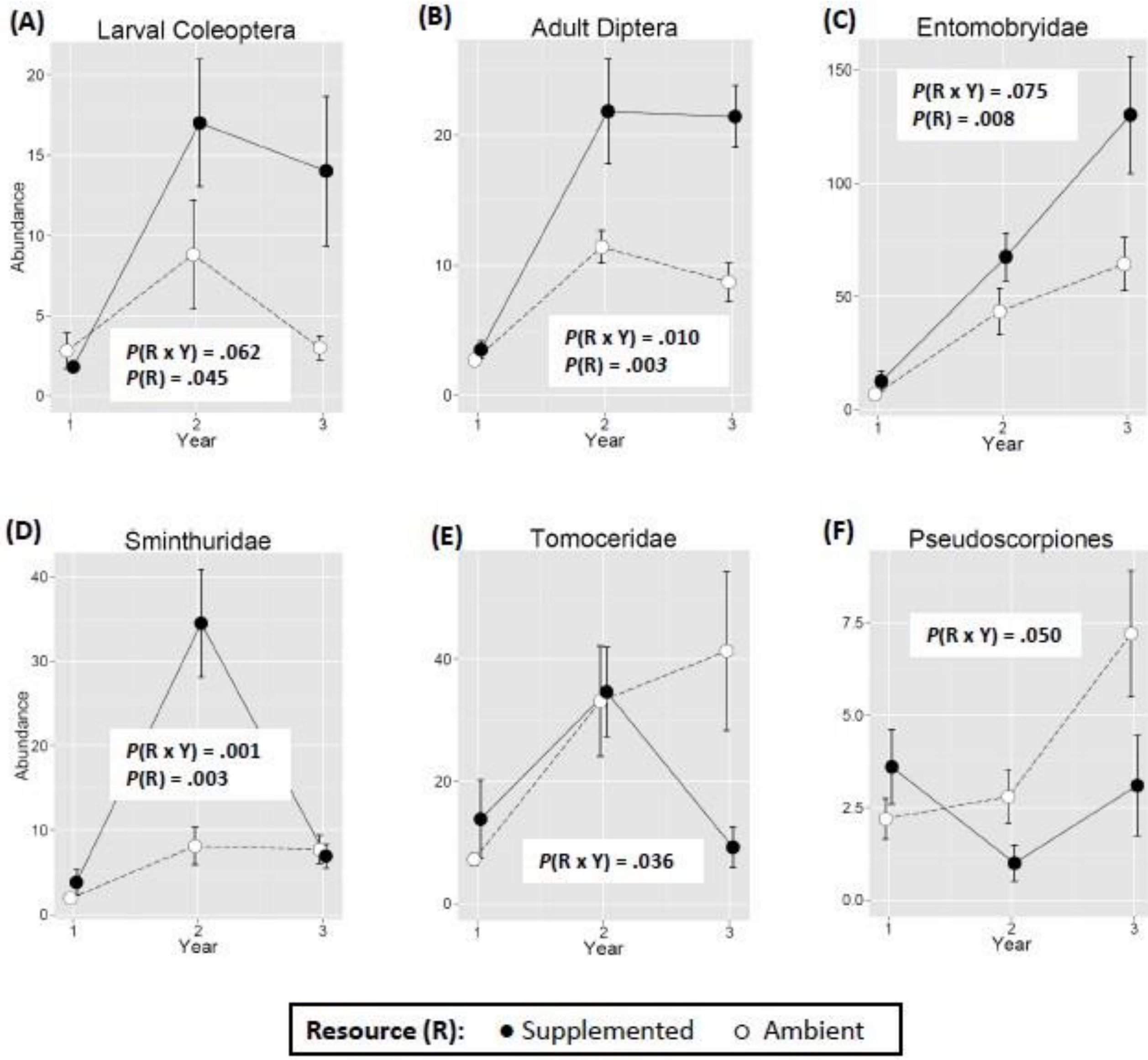



Figure S5.2 – SUMMER patterns of taxa for which there was no effect of fencing (*P*(Resource x Year x Fencing > .19), but which displayed clear (*P*(Resource x Year) = .001) to less strongly supported (*P*(Resource x Year) = .075) changes in the effect of Resource addition over the experiment. All taxa are from Kempson samples except adult Diptera (sticky traps). *P*(Resource) is based upon the mean response over three years, which is conservative since the response to Resource addition differed in at least one Year. Ordinate axes differ.

*Fall* – The pattern of Resource x Year interactions differed between fall and summer samples (Figs. E2, E3). Three major differences are apparent. In the fall samples (i) several groups displayed positive responses to detrital supplementation in Year 1; (ii) densities were never lower in Supplemented than Ambient plots in any year; and (iii) positive effects of Resource supplementation had disappeared by Year 3. With the exception of the disappearing Resource effect in Year 3, patterns for larval Diptera, larval Coleoptera and adult Coleoptera (Fig. S5.3A, Fig. S5.3B, Fig. S5.3C) were broadly similar to those of larval Coleoptera and adult Diptera in the summer (Fig. S5.2A, Fig. S5.2B). Onychurid Collembola were ~2-3x more abundant in Supplemented plots in fall in Years 1 and 2 (Fig. S5.3D), but exhibited no response in summer. Sminthurid Collembola were ~4x higher in Supplemented plots in Year 2, but showed no difference between treatments in Years 1 and 3 (Fig. S5.3E) – which mimicked the summer pattern (Fig. S5.2D). The only predatory group that displayed a temporal change in the effect of Resource in the fall was web-weaving spiders sampled by litter sifting. Web spinners were ~2x more abundant in the detritus-supplemented treatment in Year 1, but the

Resource effect gradually declined, so that by the end of the experiment densities were similar in Ambient and Resource plots (Fig. S5.3).

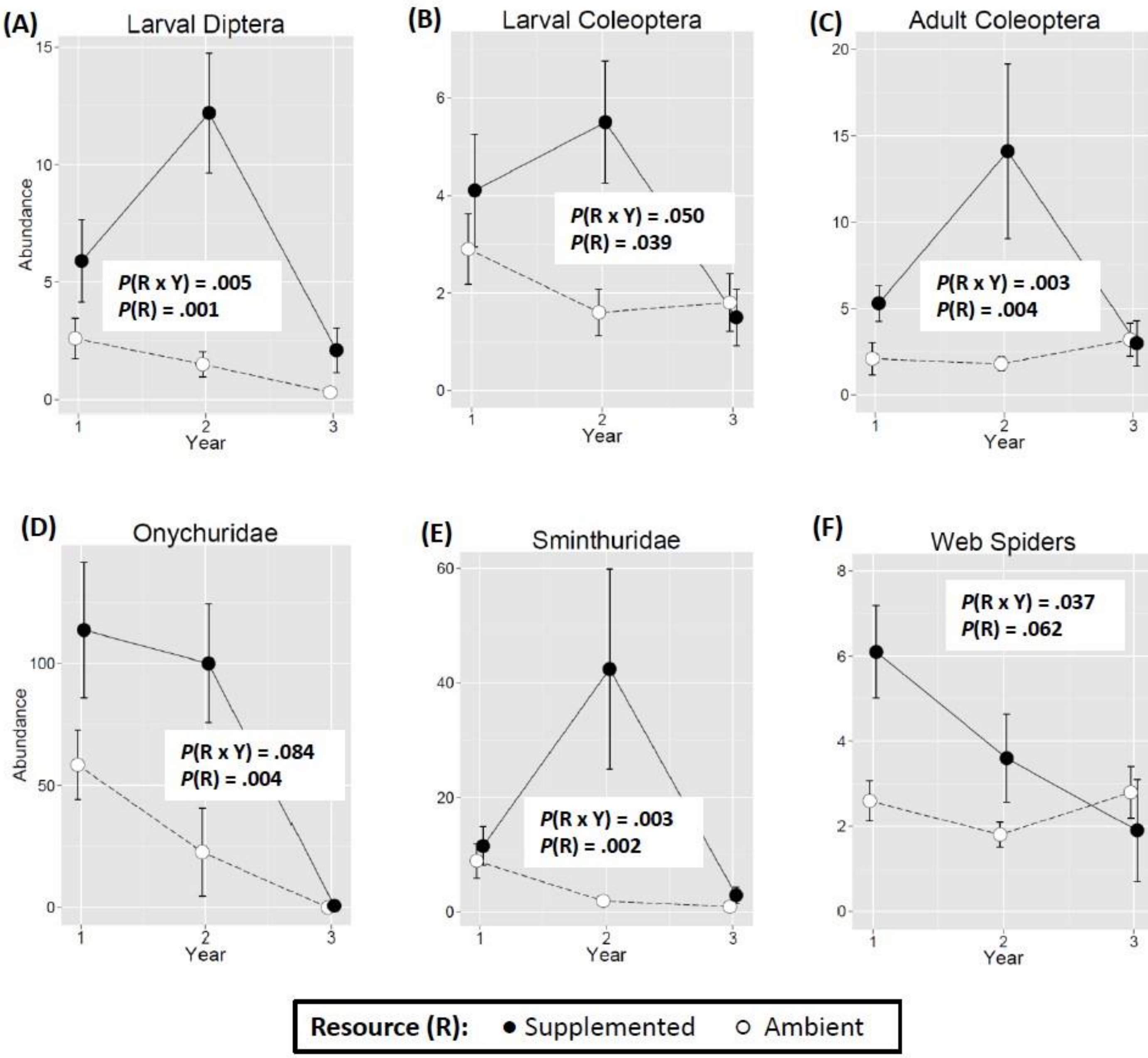



Figure S5.3 – FALL patterns of taxa for which there was no effect of fencing (*P*(Resource x Year x Fencing > .26), but which displayed clear (*P*(Resource x Year) = .003) to less strongly supported (*P*(Resource x Year) = .084) changes in the effect of Resource addition over the experiment. All taxa are from Kempson samples except cursorial spiders (litter sifting). As in Fig. S5.2, *P*(Resource) is based upon the mean response over three years. Ordinate axis differs between taxa.

## Univariate patterns: Open and Fenced plots analyzed separately

*Summer* – Only two taxa, larval Lepidoptera and hypogastrurid Collemboa, showed evidence that Fencing affected the Resource x Year interaction (Fig. S5.4). Effect size and strength of evidence are weak for Lepidoptera (Fig. S5.4A) but strong for Hypogastruridae (Fig. S5.4B), which responded dramatically to detrital supplementation only in Year 3, and only in Fenced plots. Absence of fencing in the Open Ambient treatment likely contributed to the high variability in hypogastrurid densities among replicate plots.

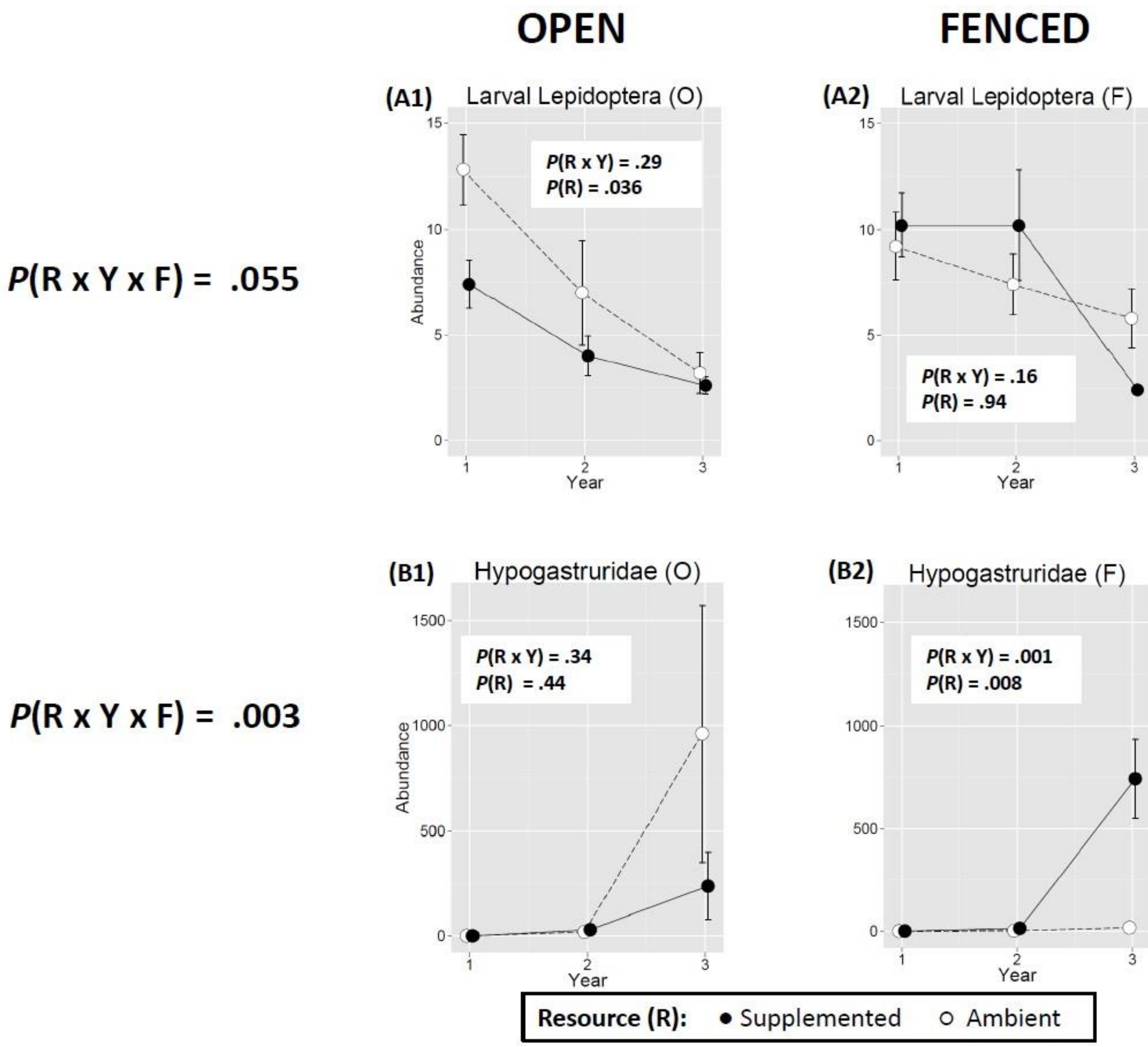
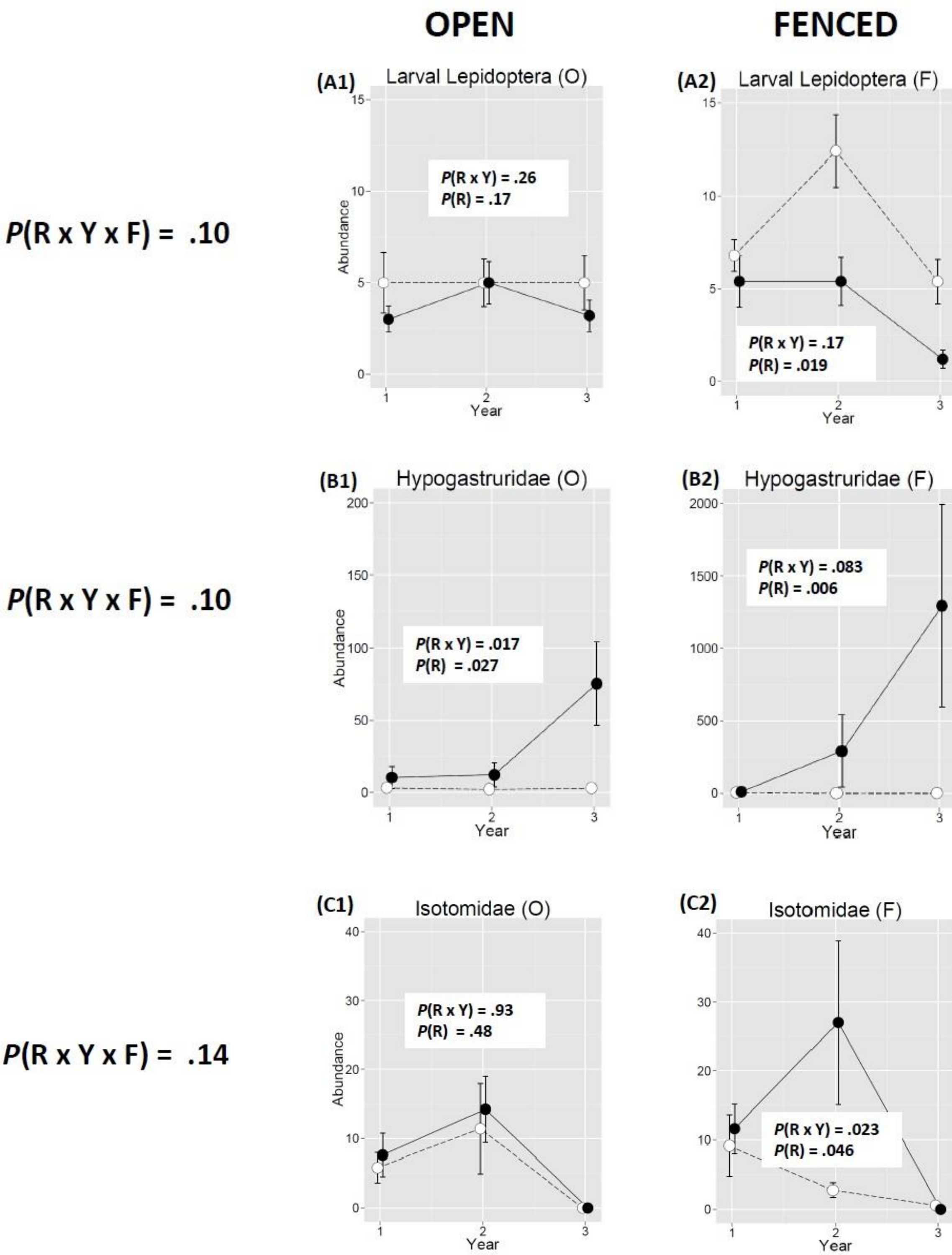



Figure S5.4 – Responses of taxa in SUMMER that displayed a weak to strong three-way interaction with Fencing [*P*(Resource x Year x Fencing) ranged from .055 to .003]. Both taxa are from Kempson samples. In order to aid in evaluating the strength of the fence effect, both *P*(Resource x Year) and *P*(Resource) are given for Open and Fenced plots. As in previous figures, *P*(Resource) is based upon the mean response over three years. Ordinate axes differ between taxa.

*Fall* -- Fencing influenced the responses of five taxa, but evidence of a Fence effect was weak for three [*P*(Resource x Year x Fencing) = .10, .10, .14 for larval Lepidoptera, Hypogastruridae, and Isotomidae, respectively; Fig. S5.5A, Fig. S5.5B, Fig. S5.5C). Patterns for Lepidoptera and Hypogastruridae were broadly similar to those of the summer samples, although Lepidoptera appeared to respond negatively to Resource addition the last two years only in Fenced plots (Fig. S5.5A). Hypogastrurids again responded dramatically to Resource addition, but now clearly in both Open and Fenced plots (Fig. S5.5B), and still more strongly in Year 3. Isotomid Collembola responded positively to Resource addition only in Year 2 in Fenced plots, but only in some replicates, as the between-plot variance in the Resource treatment was very high (Fig. S5.5C). Tomocerid Collembola exhibited a similar one-time positive response (~2x) in Fenced plots, but only in Year 1 (Fig. S5.5D).




(**Figure A5.5** ***continued)***

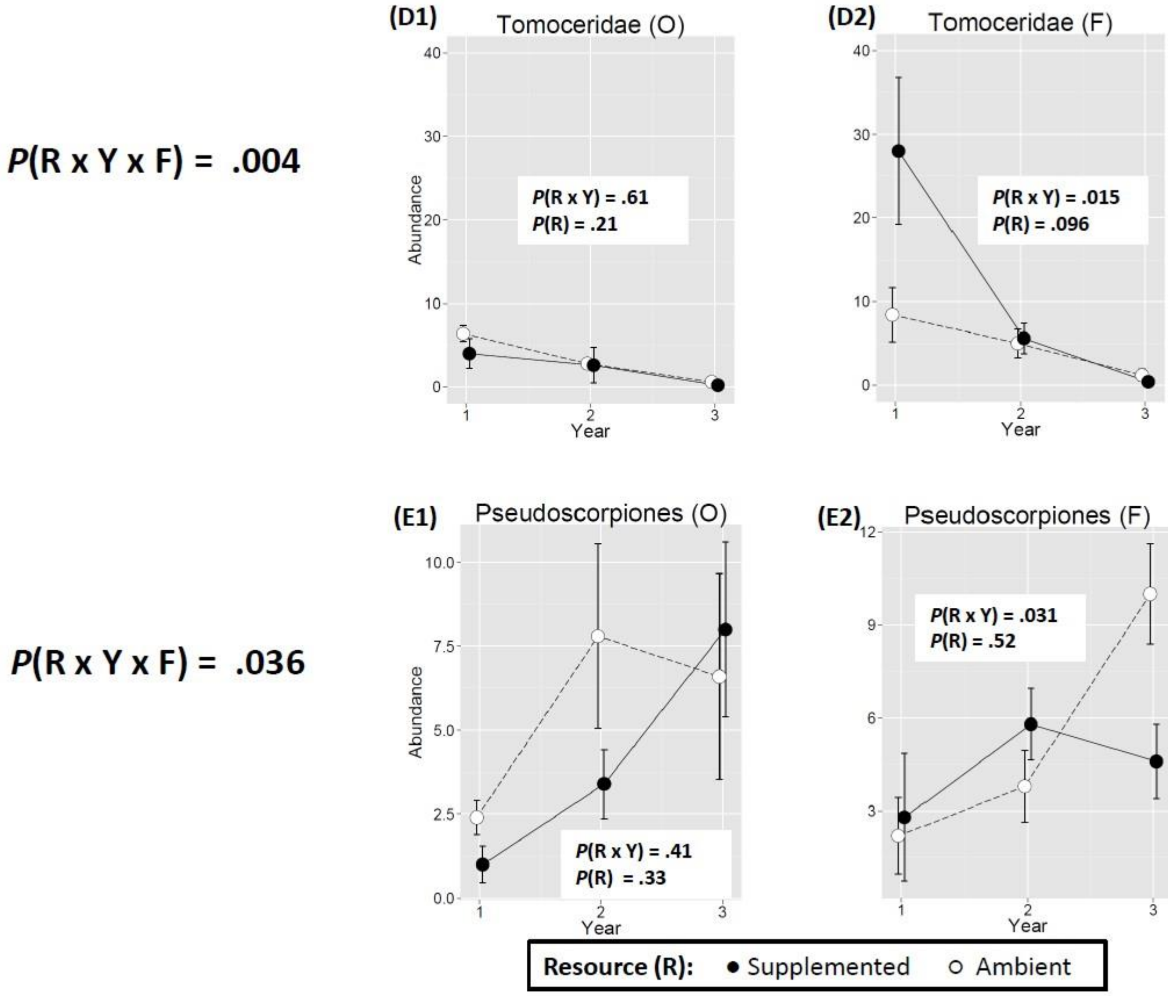



Figure S5.5 – Responses of taxa in FALL that displayed a weak to strong three-way interaction with Fencing [*P*(Resource x Year x Fencing) ranged from .14 to .004]. All taxa are from Kempson samples. In order to aid in evaluating the strength of the fence effect, both *P*(Resource x Year) and *P*(Resource) are given for Open and Fenced plots. As in previous figures, *P*(Resource) is based upon the mean response over three years. Note that the maximum value for the ordinate axis differs between taxa; in addition, for the Hypogastruridae (D1, D2), the ordinate axis differs by an order of magnitude between Open and Fenced plots.

By the end of the experiment (fall of Year 3), Pseudoscorpiones exhibited a negative response to Resource addition in the Fenced plots (Fig. S5.5E). This negative impact of Resource addition is similar to the pattern for Pseudoscorpiones in pooled Open and Fenced plots for summer samples in both Years 2 and 3 (Fig. S5.2F).

Supplemental **Appendix S6**

Summary of permANOVA’s and vector overlays, all response variables, Tables S6.1 and S6.2:

Table S6.1 – Results of SUMMER analyses. Response variables are arranged in descending order of total abundance (Fig. 1 in text). Tr = trophic level [D = detritivores and microbivores; P = predators; M = mixture (D and P)]. “X” = a vector for that taxon met the criteria for plotting (Figs. 3, 4 in text); “na” = “not applicable” (no multivariate response to Resource). *P* values from permANOVA’s are for the [(**Resource x Year)** x Fence] interaction (R x Y x F), (**Resource x Year**) interaction (R x Y) and simple effect of Resource on the 3-year average (R). As a guide to estimating effect size and strength of evidence, the *P* value for the overall Resource effect is given even if there was a **Resource x Year** interaction. Separate analyses for Open and Fenced plot are given if *P*[(**Resource x Year)** x Fence] < 0.15. “Fig. No.” refers to the plot of abundance over time from Appendix S5. Negative correlations and negative effects, due either to a **Resource x Year** interaction or a main effect of Resource, are in brackets **[ ].** $P \leq .05$ in **bold**, .10 > *P* > .05 in *italics*.

| Tr | Taxon (Response Variable) | Vectors from CAP Ordinations | | | | | | Results of UNIVARIATE Analyses with permANOVA (*P* values) | | | | | | | Fig. No. in App. A5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Simple Corr. | | | Partial Corr. | | | | ALL PLOTS | | Open | | Fenced | | |
| | | YEAR | | | YEAR | | | R x Y x F | R x Y | R | R x Y | R | R x Y | R | |
| | | 1 | 2 | 3 | 1 | 2 | 3 | | | | | | | | |
| D | Hypogastruridae (Hyp) | na | **X** | **X** | na | **X** | **X** | **.003** | | | .34 | .44 | **.001** | **.008** | 4B |
| D | Onychuridae (Ony) | na | | | na | | | .21 | .13 | .12 | | | | | |
| D | Entomobryidae (Ent) | na | | **X** | na | | | .77 | *.075* | **.008** | | | | | 2C |
| D | Isotomidae (Iso) | na | | | na | | | .62 | .54 | .58 | | | | | |
| D | Tomoceridae (Tom) | na | | | na | | **[X]** | .58 | **[.036]** | .22 | | | | | 2E |
| D | Sminthuridae (Smi) | na | **X** | | na | | | .69 | **.001** | **.003** | | | | | 2D |
| D | Thysanoptera (Thy) | na | | | na | | | .57 | .72 | .85 | | | | | |
| D | Diptera (A) (TrpDip) | na | **X** | **X** | na | | | .36 | **.010** | **.003** | | | | | 2B |
| D | Lepidoptera (L) (Llep) | na | | | na | | | *.055* | .55 | .22 | .29 | **[.036]** | .16 | .95 | 4A |
| M | Coleoptera (L) (Lcol) | na | | **X** | na | | **X** | .32 | *.062* | **.045** | | | | | 2A |
| P | Cursorial Spiders (Cur) | na | | | na | | | .81 | .72 | *.063* | | | | | 1B |
| P | Total Spiders - (Ara) | na | | | na | **[X]** | | .20 | .54 | .51 | | | | | |
| D | Diptera (L) (Ldip) | na | | | na | | | .54 | .25 | .46 | | | | | |
| P | Pseudoscorpiones (Pse) | na | | | na | | **[X]** | .19 | **[.048]** | .12 | | | | | 2F |
| P | Web Spiders (Web) | na | | | na | | | .94 | .52 | .77 | | | | | |
| M | Coleoptera (A) (Acol) | na | **X** | **X** | na | **X** | | .83 | .82 | **.049** | | | | | 1A |
| D | Diptera (A) (Adip) | na | **X** | | na | | | .98 | .95 | .62 | | | | | |
| P | Chilopoda (Chi) | na | | | na | | | .74 | .83 | .86 | | | | | |

Table S6.2 – Results of FALL analyses. Response variables are arranged in descending order of total abundance (Fig. 1 in text). Tr = trophic level [D = detritivores and microbivores; P = predators; M = mixture (D and P)]. “X” = a vector for that taxon met the criteria for plotting (Figs. 3, 4 in text); “na” = “not applicable” (no multivariate response to Resource). *P* values from permANOVA’s are for the [(**Resource x Year)** x Fence] interaction (R x Y x F), (**Resource x Year**) interaction (R x Y) and simple effect of Resource on the 3-year average (R). As a guide to estimating effect size and strength of evidence, the *P* value for the overall Resource effect is given even if there was a **Resource x Year** interaction. Separate analyses for Open and Fenced plot are given if *P*[(**Resource x Year)** x Fence] < 0.15. “Fig. No.” refers to the plot of abundance over time from Appendix S5. Negative correlations and negative effects, due either to a **Resource x Year** interaction or a main effect of Resource, are in brackets **[ ].** $P \leq .05$ in **bold**, .10 > *P* > .05 in *italics*.

| Tr | Taxon (Response Variable) | Vectors from MULTIVARIATE Analysis | | | | | | Results of UNIVARIATE Analyses with permANOVA (*P* values) | | | | | | | Fig. No. in App. A5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Simple Corr. | | | Partial Corr. | | | | ALL PLOTS | | Open | | Fenced | | |
| | | YEAR | | | YEAR | | | R x Y x F | R x Y | R | R x Y | R | R x Y | R | |
| | | 1 | 2 | 3 | 1 | 2 | 3 | | | | | | | | |
| D | Hypogastruridae (Hyp) | | **X** | **X** | | | **X** | .10 | **.041** | **.001** | **.017** | **.027** | *.083* | **.006** | 5D |
| D | Onychuridae (Ony) | **X** | **X** | | | **X** | | .81 | *.084* | **.004** | | | | | 3D |
| D | Entomobryidae (Ent) | **X** | **X** | | **X** | | | .53 | .15 | **.001** | | | | | 1D |
| D | Isotomidae (Iso) | **X** | | | | | | .14 | *.065* | **.029** | .93 | .49 | **.023** | **.046** | 5B |
| D | Tomoceridae (Tom) | **X** | | | | | | **.004** | | | .61 | .21 | **.015** | .10 | 5C |
| D | Sminthuridae (Smi) | **X** | **X** | | | **X** | | .91 | **.003** | **.002** | | | | | 3E |
| D | Thysanoptera (Thy) | | **[X]** | | | | | .80 | .24 | .77 | | | | | |
| D | Diptera (A) (TrpDip) | | **X** | | | | | .58 | .51 | *.057* | | | | | 1C |
| D | Lepidoptera (L) (Llep) | | | **[X]** | | | | .10 | .59 | **[.004]** | .26 | .17 | .17 | **[.019]** | 5A |
| M | Coleoptera (L) (Lcol) | | **X** | | | | | .72 | **.050** | **.039** | | | | | 3B |
| P | Cursorial Spiders (Cur) | **X** | | | | | | .28 | .59 | .21 | | | | | |
| P | Total Spiders - (Ara) | | | | | | | .77 | .49 | .31 | | | | | |
| D | Diptera (L) (Ldip) | | **X** | **X** | | | | .26 | **.005** | **.001** | | | | | 3A |
| P | Pseudoscorpiones (Pse) | | | | | | | **.036** | .83 | .24 | .41 | .33 | **[.031]** | .52 | 5E |
| P | Web Spiders (Web) | **X** | | **[X]** | | | **[X]** | .91 | **.037** | *.062* | | | | | 3F |
| M | Coleoptera (A) (Acol) | | **X** | | | | | .50 | **.003** | **.004** | | | | | 3C |
| D | Diptera (A) (Adip) | **X** | | | **X** | | | .42 | .58 | .40 | | | | | |
| P | Chilopoda (Chi) | | | | | | | .21 | .25 | .89 | | | | | |

# Supplemental **Appendix S7**

## Arthropod Data Set

Each line in the accompanying comma-delimited file (Supplemental Data S8) represents a sample from one of the 20 experimental units.

**Design Variables**

| | |
|---|---|
| Row | 1-120; each row is a complete set of samples for one of 20 experimental units for a single sampling period |
| Plot | 7-28; numbers used to designate each of 20 exp. units |
| Resource | A = Ambient, S = Supplemented |
| Fencing | F = Fenced, O = Open |
| Year | 1, 2, 3 -- 1997, 1998, 1999, respectively |
| Season | S=Summer, F=Fall<br>NOTE: Values for Year = 1, Season = S are averages of July and August samples |

**Response Variables**

| | |
|---|---|
| ***Kempson Samples*** | Number extracted per single 0.05 sq.-m sample of litter |
| Thy | Thysanoptera (thrips) |
| Acol | Beetles (Coleoptera) -- Adults |
| Adip | Diptera (flies) --- adults |
| Lcol | Beetle larvae |
| Llep | Lepidoptera (moths, etc) larvae |
| Ldip | Diptera larvae |
| Ara | Spiders (Araneae) |
| Pse | Pseudosorpiones(Pseudoscorpions) |
| Chi | Centipedes (Chilopoda) |
| Ent | Entomobryidae (Collembola --- springtails) |
| Iso | Isotomidae (Collembola --- springtails) |
| Tom | Tomoceridae (Collembola --- springtails) |
| Ony | Onychiuridae (Collembola --- springtails) |
| Smi | Sminthuridae (Collembola --- springtails) |
| Hyp | Hypogastruridae (Collembola --- springtails) |
| | |
| ***Sticky Trap Samples*** | Number per trap |
| TrpDip | Adult Diptera |
| | |
| ***Litter Sifting Samples*** | Number per single 0.2 sq m sample of litter sorted in the |
| Cur | Cursorial spiders |
| Web | Web-building spiders |

**No. of Response Variables = 18**