**Supplementary Information**

**Soil mineral nitrogen content is increased by soil mesofauna and nematodes – a meta-analysis**



Fig. S1: PRISMA flow diagram for the systematic literature search. n refers to the number of research articles.

Tab. S1: Overview on data availability with ranges for continuous variables or covered subgroups for categorial variables. The number of observations is given within parentheses. Abbreviations denote: total number of observations (T), microfauna (Mi), mesofauna (Me), micro- and mesofauna (MM).

|  |  |  |  |
| --- | --- | --- | --- |
| **Moderator** | **NH4+ subgroups/ranges** | **NO3- subgroups/ranges** | **Nmin subgroups/ranges** |
| *Fauna related moderators* |  |  |
| Taxonomic groups | Enchytraeidae (26), enchytraeidae + acari (12), acari (10), collembola (7), undetermined mesofaunaa (2), Nematoda (79) | Enchytraeidae (20), enchytraeidae + acari (12), acari (10), collembola (63), undetermined mesofaunaa (2), Nematoda (50) | Enchytraeidae (20), enchytraeidae + acari (12), acari (14), collembola (7), undetermined mesofaunaa (2), Nematoda (76), mixed micro- and mesofauna (4) |
| Size classes | Mesofaunab (57), Microfaunac (79) | Mesofaunab (107), Microfaunac (50) | Mesofaunab (55), Microfaunac (76), micro- and mesofaunad (4) |
| Trophic groups | Microbial feeder (T:103/Mi:69/Me:34), Mixed trophic groups (T:24/Mi:10/Me:14), Omnivore (T:7/Mi:0/Me:7), Predator (T:2/Mi:0/Me:2) | Microbial feeder (T:114/Mi:40/Me:74), Mixed trophic groups (T:24/Mi:10/Me:14), Omnivore (T:17/Mi:0/Me:17), Predator (T:2/Mi:0/Me:2) | Microbial feeder (T:84/Mi:56/Me:28/MM:0), Mixed trophic groups (T:38/Mi:20/Me:14/MM:4), Omnivore (T:7/Mi:0/Me:7/MM:0), Predator (T:6/Mi:0/Me:6/MM:0) |
| Densitye | Mi: 5 – 146 (69), Me: 156 – 45326 (51) | Mi: 5 – 146 (40), Me: 156 – 45326 (101) | Mi: 5 – 146 (66), Me: 156 – 45326 (45) |
| *Soil related moderators* |  |  |
| Texture | Loams (T:87/Mi:79/Me:8), Sands (T:40/Mi:0/Me:40) | Loams (T:114/Mi:50/Me:64), Sands (T:34/Mi:0/Me:34) | Clays (T:6/Mi:6/Me:0/MM:0), Loams (T:74/Mi:58/Me:12/MM:4), Sands (T:34/Mi:0/Me:34/MM:0) |
| SOC (g kg-1) | 0.121 – 18.1 (T:30/Mi:16/Me:14) | 0.121 – 18.1 (T:30/Mi:16/Me:14) | 0.121 – 18.1 (T:30/Mi:16/Me:14/MM:0) |
| Soil C:N ratio | 8.6 – 18.1 (T:12/Mi:12/Me:0) | 8.6 – 18.1 (T:12/Mi:12/Me:0) | 8.6 – 18.1 (T:12/Mi:12/Me:0/MM:0) |
| Initial N-compound value (mg kg-1) | 0.24 – 131 (T:104/Mi:49/Me:55) | 0.6 – 118 (T:130/Mi:25/Me:105) | 1.4 – 170 (T:108/Mi:51/Me:53/MM:4) |
| *Experimental conditions* |  |  |
| Addition of organic material | Incorporated (T:61/Mi:27/Me:34), no input (T:63/Mi:52/Me:11), surface (T:12/Mi:0/Me:12) | Incorporated (T:61/Mi:27/Me:34), no input (T:66/Mi:23/Me:43), surface (T:30/Mi:0/Me:30) | Incorporated (T:83/Mi:49/Me:34/MM:0), no input (T:30/Mi:23/Me:7/MM:0), surface (T:10/Mi:0/Me:10/MM:0) |
| Litter C:N ratio | 10.1 – 90 (T:66/Mi:22/Me:44) | 10.1 – 90 (T:66/Mi:22/Me:44) | 10.1 – 90 (T:90/Mi:38/Me:48/MM:4) |
| Duration | Short (T:61/Mi:50/Me:11), Intermediate (T:49/Mi:21/Me:28), Long (T:51/Mi:24/Me:27) | Short (T:47/Mi:25/Me:22), Intermediate (T:54/Mi:17/Me:37), Long (T:56/Mi:8/Me:48) | Short (T:47/Mi:32/Me:13/MM:2), Intermediate (T:53/Mi:24/Me:27/MM:2), Long (T:35/Mi:20/Me:15/MM:0) |
| Temperature (° C) | 15 – 28 (T:73/Mi:17/Me:56) | 14 – 28 (T:123/Mi:17/Me:106) | 15 – 28 (T:77/Mi:27/Me:50/MM:0) |

a direct extraction to experimental units by heat extraction; b acari, collembola, enchytraeidae and undetermined mesofauna; c nematoda; d nematoda and acari; e Microfauna: Individuals g-1; Mesofauna: Individuals m-2

Tab S2: Overview on the taxa included in the analysis with the number of observations for the different nitrogen compounds.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Taxon | Taxonomic group | NH4+ | NO3- | Nmin |
| *Acrobeloides buetschlii* | Nematoda | 0 | 0 | 4 |
| *Acrobeloides buetschlii + Alliphis halleri* | Nematoda + acari | 0 | 0 | 4 |
| *Acrobeloides nanus* | Nematoda | 0 | 0 | 2 |
| *Acrobeloides nanus + Plectus parvus* | Nematoda | 0 | 0 | 2 |
| *Acrobeloides* sp. | Nematoda | 2 | 0 | 0 |
| *Alliphis halleri* | Acari | 0 | 0 | 4 |
| *Aphelenchus avenae* | Nematoda | 5 | 5 | 5 |
| *Bursilla monhystera* | Nematoda | 0 | 0 | 2 |
| *Bursilla monhystera + Acrobeloides nanus* | Nematoda | 0 | 0 | 2 |
| *Bursilla monhystera + Plectus parvus* | Nematoda | 0 | 0 | 2 |
| *Cephalobus persegnis* | Nematoda | 20 | 20 | 20 |
| *Cognettia sphagnetorum* | Enchytraeidae | 6 | 0 | 0 |
| *Enchytraeus albidus* | Enchytraeidae | 4 | 4 | 4 |
| *Enchytraeus albidus + Hypoaspis miles* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus albidus + Rhizoglyphus echinopus + Acarus siro* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus albidus + Rhizoglyphus robini + Acarus siro* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus albidus + Rhizoglyphus robini + Acarus siro + Hypoaspis miles* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus albidus + Rhizoglyphus robini + Acarus siro + Stratiolaelaps scimitus* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus albidus; Stratiolaelaps scimitus* | Enchytraeidae + acari | 2 | 2 | 2 |
| *Enchytraeus minutus* | Enchytraeidae | 16 | 16 | 16 |
| *Folsomia candida* | Collembola | 7 | 7 | 7 |
| *Folsomia quadrioculata* | Collembola | 0 | 10 | 0 |
| *Heteromurus nitidus* | Collembola | 0 | 10 | 0 |
| *Lepidocyrtus cyaneus* | Collembola | 0 | 10 | 0 |
| *Parisotoma notabilis* | Collembola | 0 | 10 | 0 |
| *Parisotoma notabilis + Protaphorura armata + Folsomia quadrioculata + Lepidocyrtus cyaneus* | Collembola | 0 | 6 | 0 |
| *Plectus parvus* | Nematoda | 0 | 0 | 2 |
| *Pristionchus lheritieri* | Nematoda | 27 | 0 | 0 |
| *Protaphorura armata* | Collembola | 0 | 10 | 0 |
| *Protorhabditis oxyuroides* | Nematoda | 1 | 1 | 1 |
| *Rhabditis intermedia* | Nematoda | 1 | 1 | 1 |
| *Rhabditis* sp. | Nematoda | 4 | 4 | 4 |
| *Rhabditis* sp. *+ Acrobeloides buetschlii* | Nematoda | 5 | 5 | 5 |
| *Rhizoglyphus echinopus + Acarus siro* | Acari | 2 | 2 | 2 |
| *Rhizoglyphus echinopus + Acarus siro + Hypoaspis miles* | Acari | 2 | 2 | 2 |
| *Rhizoglyphus robini + Acarus siro* | Acari | 2 | 2 | 2 |
| *Rhizoglyphus robini + Acarus siro + Stratiolaelaps scimitus* | Acari | 2 | 2 | 2 |
| *Stratiolaelaps scimitus* | Acari | 2 | 2 | 2 |
| *Zeldia punctata* | Nematoda | 4 | 4 | 4 |
| Undetermined mesofauna | NA | 2 | 2 | 2 |
| Undetermined nematodes | Nematoda | 10 | 10 | 20 |

Tab. S3: Detailed results for the effect of overall soil fauna, and meso- and microfauna separately on NH4+, NO3- and Nmin. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Significant effect sizes are shown in bold, asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| N-compound | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ | 136 | 0.109 | -0.05, 0.267 | 0.072 | 10.4 | 0.16 |
| **NO3-** | **157** | **0.194** | **0.028, 0.361** | **0.078** | **13.7** | **0.026 \*** |
| **Nmin** | **135** | **0.128** | **0.07, 0.187** | **0.028** | **15** | **<0.001 \*\*\*** |
| Microfauna |  |  |  |  |  |  |
| NH4+ | 79 | 0.117 | -0.179, 0.413 | 0.12 | 5.69 | 0.367 |
| NO3- | 50 | 0.234 | -0.09, 0.558 | 0.137 | 6.91 | 0.132 |
| **Nmin** | **76** | **0.119** | **0.051, 0.187** | **0.03** | **9.51** | **0.003 \*\*** |
| Mesofauna |  |  |  |  |  |  |
| NH4+ | 57 | 0.092 | -0.008, 0.192 | 0.036 | 4.13 | 0.063 |
| NO3- | 107 | 0.151 | -0.022, 0.324 | 0.07 | 5.81 | 0.132 |
| **Nmin** | **55** | **0.143** | **0.018, 0.267** | **0.05** | **5.67** | **0.031 \*** |
| Micro- and Mesofauna |  |  |  |  |  |  |
| Nmin | 4 | 0.148 | -0.06, 0.356 | 0.046 | 1.91 | 0.09 |

Tab. S4: Detailed results for the effect of various mesofaunal taxonomic groups on NH4+, NO3- and Nmin. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Mesofauna indet. denotes observations where taxonomic groups were not specified. Asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Taxonomic group | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ |  |  |  |  |  |  |
| Acari | 10 | 0.001 | -0.588, 0.590 | 0.046 | 1 | 0.989 |
| Collembola | 7 | 0.088 | -0.168, 0.343 | 0.02 | 1 | 0.143 |
| Enchytraeidae | 26 | 0.107 | -0.369, 0.583 | 0.096 | 1.74 | 0.393 |
| Enchytraeidae + acari | 12 | 0.128 | -0.222, 0.479 | 0.028 | 1 | 0.136 |
| Mesofauna indet. | 2 | 0.172 | 0.172, 0.172 | < 0.001 | 1 | < 0.001 \*\*\* |
| NO3- |  |  |  |  |  |  |
| Acari | 10 | 0.071 | -0.492, 0.6349 | 0.095 | 1.52 | 0.553 |
| Collembola | 63 | -0.023 | -0.088, 0.0432 | 0.015 | 1.96 | 0.274 |
| Enchytraeidae | 20 | 0.273 | -0.22, 0.7665 | 0.106 | 1.84 | 0.133 |
| Enchytraeidae + acari | 12 | 0.432 | 0.051, 0.8135 | 0.067 | 1.56 | 0.041 |
| Mesofauna indet. | 2 | 0.357 |  0.357, 0.3574 | < 0.001 | 1 | < 0.001 \*\*\* |
| Nmin |  |  |  |  |  |  |
| Acari | 14 | 0.09 | -0.154, 0.334 | 0.061 | 2.17 | 0.269 |
| Collembola | 7 | 0.058 | -0.004, 0.121 | 0.005 | 1 | 0.054 |
| Enchytraeidae | 20 | 0.154 | -0.169, 0.478 | 0.064 | 1.72 | 0.158 |
| Enchytraeidae + acari | 12 | 0.299 | -0.134, 0.731 | 0.061 | 1.35 | 0.081 |
| Mesofauna indet. | 2 | 0.247 | 0.247, 0.247 | < 0.001 | 1 | < 0.001 \*\*\* |
| Acari + Nematoda | 4 | 0.123 | -0.127, 0.372 | 0.049 | 1.71 | 0.15 |

Tab. S5: Detailed results for the effect of trophic groups on NH4+, NO3- and Nmin. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Significant effect sizes are shown in bold, asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Taxonomic group | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ |  |  |  |  |  |  |
| Microbi-detritivore | 103 | 0.133 | -0.078, 0.345 | 0.09 | 7.28 | 0.182 |
| Omnivore | 7 | 0.088 | -0.167, 0.343 | 0.02 | 1 | 0.143 |
| Predator | 2 | -0.099 | -0.28, 0.081 | 0.022 | 1.24 | 0.103 |
| Mixed trophic groups | 24 | 0.015 | -0.225, 0.255 | 0.083 | 3.61 | 0.864 |
| NO3- |  |  |  |  |  |  |
| Microbi-detritivore | 114 | 0.169 | -0.032, 0.371 | 0.091 | 10.78 | 0.091 |
| Omnivore | 17 | 0.124 | -0.18, 0.429 | 0.084 | 2.44 | 0.254 |
| Predator | 2 | -0.042 | -0.431, 0.346 | 0.094 | 2.1 | 0.695 |
| **Mixed trophic groups** | **24** | **0.303** | **0.171, 0.436** | **0.049** | **4.25** | **0.003 \*\*** |
| Nmin |  |  |  |  |  |  |
| **Microbi-detritivore** | **84** | **0.124** | **0.06, 0.188** | **0.029** | **9.95** | **0.002 \*\*** |
| Omnivore | 7 | 0.058 | -0.004, 0.121 | 0.005 | 1 | 0.054 |
| Predator | 6 | 0.01 | -0.198, 0.219 | 0.022 | 1.14 | 0.713 |
| **Mixed trophic groups** | **38** | **0.174** | **0.078, 0.269** | **0.039** | **6.21** | **0.004 \*\*** |

Tab. S6: Detailed results for the effect of all fauna, meso- and microfauna on NH4+, NO3- and Nmin for the various time categories. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Significant effect sizes are shown in bold, asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001). Results that are considered not significant due to low degrees of freedom (see methods for explanation) are shown in cursive.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Duration | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ |  |  |  |  |  |  |
| Short | 61 | 0.139 | -0.202, 0.481 | 0.144 | 6.93 | 0.366 |
| **Intermediate** | **49** | **0.141** | **0.045, 0.238** | **0.141** | **6.78** | **0.011 \*** |
| Long | 26 | -0.039 | -0.349, 0.272 | 0.112 | 3.99 | 0.747 |
| NO3- |  |  |  |  |  |  |
| **Short** | **47** | **0.104** | **0.01, 0.198** | **0.043** | **11.37** | **0.033 \*** |
| **Intermediate** | **54** | **0.322** | **0.064, 0.58** | **0.117** | **10.76** | **0.019 \*** |
| Long | 56 | 0.191 | -0.122, 0.503 | 0.134 | 7.37 | 0.194 |
| Nmin |  |  |  |  |  |  |
| **Short** | **45** | **0.101** | **0.025, 0.177** | **0.035** | **11.25** | **0.014 \*** |
| **Intermediate** | **51** | **0.198** | **0.123, 0.273** | **0.034** | **10.71** | **<0.001 \*\*\*** |
| Long | 35 | 0.061 | -0.12, 0.242 | 0.073 | 5.54 | 0.435 |
| Microfauna |  |  |  |  |  |  |
| NH4+ |  |  |  |  |  |  |
| Short | 50 | 0.152 | -0.316, 0.618 | 0.18 | 4.84 | 0.439 |
| Intermediate | 21 | 0.106 | -0.075, 0.287 | 0.067 | 4.3 | 0.185 |
| Long | 8 | -0.068 | -1.587, 1.451 | 0.374 | 2.13 | 0.872 |
| NO3- |  |  |  |  |  |  |
| Short | 25 | 0.123 | -0.063, 0.308 | 0.076 | 6.04 | 0.156 |
| Intermediate | 17 | 0.457 | -0.003, 0.917 | 0.18 | 5.07 | 0.051 |
| Long | 8 | 0.138 | -1.379, 1.655 | 0.492 | 3.18 | 0.796 |
| Nmin |  |  |  |  |  |  |
| **Short** | **32** | **0.115** | **0.008, 0.223** | **0.046** | **7.46** | **0.039 \*** |
| **Intermediate** | **24** | **0.186** | **0.078, 0.294** | **0.044** | **6.1** | **0.005 \*\*** |
| Long | 20 | -0.011 | -0.31, 0.288 | 0.095 | 3.09 | 0.917 |
| Mesofauna |  |  |  |  |  |  |
| NH4+ |  |  |  |  |  |  |
| Short | 11 | 0.068 | -0.041, 0.177 | 0.025 | 1.96 | 0.113 |
| *Intermediate* | *28* | *0.098* | *0.007, 0.188* | *0.022* | *2.05* | *0.044 \** |
| Long | 18 | 0.016 | -0.917, 0.949 | 0.147 | 1.44 | 0.926 |
| NO3- |  |  |  |  |  |  |
| Short | 22 | 0.072 | -0.041, 0.185 | 0.038 | 3.44 | 0.143 |
| Intermediate | 37 | 0.195 | -0.106, 0.497 | 0.104 | 3.6 | 0.141 |
| Long | 48 | 0.158 | -0.101, 0.416 | 0.085 | 3.22 | 0.153 |
| Nmin |  |  |  |  |  |  |
| Short | 13 | 0.046 | -0.006, 0.099 | 0.017 | 3.12 | 0.069 |
| *Intermediate* | *27* | *0.204* | *0.007, 0.401* | *0.071* | *3.94* | *0.045 \** |
| Long | 15 | 0.169 | -0.014, 0.353 | 0.026 | 1.35 | 0.056 |

Tab. S7: Detailed results for the effect of all fauna, meso- and microfauna on NH4+, NO3- and Nmin differentiated by type of organic matter input. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Significant effect sizes are shown in bold, asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001). Results that are considered not significant due to low degrees of freedom (see methods for explanation) are shown in cursive.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Organic matter input | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ |  |  |  |  |  |  |
| No input | 63 | 0.159 | -0.196, 0.514 | 0.146 | 6.16 | 0.316 |
| Surface | 12 | -0.052 | -0.397, 0.294 | 0.057 | 1.49 | 0.487 |
| Incorporated | 61 | 0.082 | -0.058, 0.221 | 0.053 | 4.61 | 0.187 |
| NO3- |  |  |  |  |  |  |
| No input | 66 | 0.093 | -0.1, 0.285 | 0.085 | 8.75 | 0.304 |
| Surface | 30 | 0.057 | -0.263, 0.378 | 0.106 | 3.3 | 0.624 |
| **Incorporated** | **61** | **0.346** | **0.089, 0.602** | **0.107** | **6.46** | **0.016 \*** |
| Nmin |  |  |  |  |  |  |
| No input | 30 | 0.098 | -0.079, 0.275 | 0.072 | 5.95 | 0.222 |
| Surface | 10 | 0.083 | -0.904, 1.07 | 0.094 | 1.09 | 0.53 |
| **Incorporated** | **83** | **0.174** | **0.072, 0.276** | **0.044** | **7.64** | **0.005 \*\*** |
| Microfauna |  |  |  |  |  |  |
| NH4+ |  |  |  |  |  |  |
| No input | 52 | 0.132 | -0.341, 0.605 | 0.176 | 4.37 | 0.492 |
| Incorporated | 27 | 0.076 | -0.495, 0.647 | 0.134 | 2.02 | 0.625 |
| NO3- |  |  |  |  |  |  |
| No input | 23 | 0.096 | -0.305, 0.496 | 0.15 | 4.44 | 0.555 |
| Incorporated | 27 | 0.397 | -0.194, 0.989 | 0.189 | 3.09 | 0.124 |
| Nmin |  |  |  |  |  |  |
| No input | 23 | 0.148 | -0.081, 0.376 | 0.082 | 3.97 | 0.147 |
| *Incorporated* | *49* | *0.076* | *0.01, 0.141* | *0.02* | *2.93* | *0.035 \** |
| Mesofauna |  |  |  |  |  |  |
| NH4+ |  |  |  |  |  |  |
| No input | 11 | 0.151 | -0.179, 0.482 | 0.071 | 1.84 | 0.177 |
| Surface | 12 | -0.034 | -0.088, 0.02 | 0.008 | 1.4 | 0.093 |
| Incorporated | 34 | 0.074 | -0.001, 0.15 | 0.011 | 1.4 | 0.051 |
| NO3- |  |  |  |  |  |  |
| No input | 43 | 0.025 | -0.098, 0.149 | 0.024 | 1.67 | 0.415 |
| Surface | 30 | 0.01 | -0.501, 0.521 | 0.075 | 1.38 | 0.912 |
| *Incorporated* | *34* | *0.328* | *0.105, 0.552* | *0.047* | *1.8* | *0.026 \** |
| Nmin |  |  |  |  |  |  |
| No input | 7 | 0.058 | -0.004, 0.12 | 0.005 | 1 | 0.053 |
| Surface | 10 | 0.099 | -0.915, 1.11 | 0.084 | 1.02 | 0.443 |
| *Incorporated* | *34* | *0.267* | *0.153, 0.38* | *0.024* | *1.81* | *0.011 \** |

Tab. S8: Detailed results for the faunal effect on NH4+, NO3- and Nmin differentiated by soil textures. n = number of observations; LRR = log-response ratio; 95 % CI = 95 % confidence intervals; SE = standard error; d.f. = degrees of freedom. Significant effect sizes are shown in bold, asterisks indicate levels of significance (\* *P* = 0.05, \*\* *P* = 0.01, \*\*\* *P* < 0.001).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Texture | n | LRR | 95 % CI | SE | d.f. | P-value |
| NH4+ |  |  |  |  |  |  |
| Loams | 87 | 0.11 | -0.148, 0.367 | 0.108 | 6.65 | 0.343 |
| Sands | 40 | 0.1 | -0.066, 0.265 | 0.05 | 2.78 | 0.147 |
| NO3- |  |  |  |  |  |  |
| Loams | 114 | 0.216 | -0.011, 0.444 | 0.101 | 9.46 | 0.06 |
| Sands | 34 | 0.22 | -0.19, 0.63 | 0.101 | 2.13 | 0.153 |
| Nmin |  |  |  |  |  |  |
| Clays | 6 | 0.028 | -0.164, 0.22 | 0.018 | 1.07 | 0.346 |
| **Loams** | **74** | **0.113** | **0.04, 0.185** | **0.032** | **8.86** | **0.007 \*\*** |
| Sands | 34 | 0.225 | -0.026, 0.476 | 0.059 | 2.02 | 0.061 |

Tab. S9: Results for the sensitivity analysis with a variance-covariance matrix that assumed a correlation of r = 0.5 (main analysis), r = 0.9 or r = 0.1 between dependent outcomes. Shown are the significance levels for the general soil faunal effect and moderator variables. For categorical moderators, results are shown for each category separately. Asterisks indicate levels of significance (\* P = 0.05, \*\* P = 0.01, \*\*\* P < 0.001). n.s. = not significant, NA = no data available. Asterisks within parentheses denote significance levels for results which are not considered significant based on low degrees of freedom.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | NH4+ |  |  | NO3- |  |  | Nmin |  |  |
| Moderator | Size group | r = 0.5 | r = 0.9 | r = 0.1 | r = 0.5 | r = 0.9 | r = 0.1 | r = 0.5 | r = 0.9 | r = 0.1 |
| Soil faunal effect |  |  |  |  |  |  |  |  |  |  |
|  | All | n.s. | n.s. | n.s. | \* | \* | \* | \*\*\* | \*\*\* | \*\*\* |
|  | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \*\* | \*\* | \*\* |
|  | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \* | \* | \* |
|  | MM | NA | NA | NA | NA | NA | NA | n.s. | n.s. | n.s. |
| Trophic group |  |  |  |  |  |  |  |  |  |  |
|  Microbi-detritivore | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \*\* | \*\* | \*\* |
|  Omnivore | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Predator | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Mixed | All | n.s. | n.s. | n.s. | \*\* | \*\* | \*\* | \*\* | \*\* | \*\* |
| Abundance | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Duration |  |  |  |  |  |  |  |  |  |  |
|  Short | All | n.s. | n.s. | n.s. | \* | \* | \* | \* | \* |  |
|  Intermediate | All | \* | \* | \* | \* | \* | \* | \*\*\* | \*\*\* | \*\*\* |
|  Long | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Short | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \* | \* | \* |
|  Intermediate | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \*\* | \*\* | \*\* |
|  Long | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Short | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Intermediate | Meso | (\*) | (\*) | n.s. | n.s. | n.s. | n.s. | (\*) | (\*) | (\*) |
|  Long | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | (\*) | n.s. |
| Organic Input |  |  |  |  |  |  |  |  |  |  |
|  No input | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Incorporated | All | n.s. | n.s. | n.s. | \* | \* | \* | \*\* | \*\* | \*\* |
|  No input | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Incorporated | Micro | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | (\*) | (\*) | (\*) |
|  No input | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Surface | Meso | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
|  Incorporated | Meso | n.s. | n.s. | (\*) | (\*) | (\*) | (\*) | (\*) | (\*) | (\*) |
| Texture |  |  |  |  |  |  |  |  |  |  |
|  Clays | All | NA | NA | NA | NA | NA | NA | n.s. | n.s. | n.s. |
|  Loams | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | \*\* | \*\* | \*\* |
|  Sands | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Initial NH4+ / NO3- / Nmin | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Litter C/N | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| SOC | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | (\*) | (\*) | (\*) |
| Temperature | All | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |