

Supplementary materials

Table S1: Abundance of springtail (species and morphospecies) sampled in 2018 and 2019 on undefoliated sites and sites with a defoliation history during the 2015-2017 outbreak (litter and soil combined). The unidentified genus is noted as "Unknown".

Genera and species or morpho-species	Abundance of springtails in litter and soil			
	Undefoliated 2018	Outbreak 2018	Undefoliated 2019	Outbreak 2019
<i>Anurophorus</i> sp1	159	0	11	2
<i>Arrthopalites</i> sp1	2	1	0	0
<i>Desoria</i> sp1	2	0	1	7
<i>Desoria</i> sp2	3	3	0	0
<i>Desoria</i> sp3	10	27	0	0
<i>Desoria</i> sp4	0	2	0	0
<i>Entomobrya</i> sp1	3	2	0	0
<i>Entomobrya</i> sp2	0	3	0	0
<i>Entomobrya</i> sp3	0	7	0	0
<i>Folsomia candida</i> Willen, 1902	1	0	0	0
<i>Folsomia nivalis</i> Packard, 1873	33	0	21	5
<i>Folsomia similis</i> Bagnall, 1939	0	0	1	0
<i>Friezea mirabilis</i> Tullberg, 1871	4	8	7	8
<i>Friezea pentacantha</i> Mills, 1934	0	1	0	0
<i>Heteromurus nitidus</i> Templeton et Westwood, 1836	0	1	4	0
<i>Hypogastrura</i> sp1	0	3	0	1
<i>Isotoma viridis</i> Bourlet, 1839	2	1	0	0
<i>Isotomiella minor</i> Schäffer, 1896	11	0	4	0
<i>Isotomorus palustri</i> Müller, 1776	0	0	4	0
<i>Lepidocyrtus</i> sp1	65	89	208	80
<i>Mesaphorura</i> sp1	15	12	5	2
<i>Mesaphorura</i> sp2	2	0	0	0
<i>Metisotoma grandiceps</i> Reuter, 1891	5	0	2	0
<i>Neanura muscorum</i> Templeton, 1836	0	14	4	0
<i>Morulodes serratus</i> Folsom, 1916	0	0	0	15
<i>Orchesella</i> sp1	3	0	0	1
<i>Paranura</i> sp1	0	0	4	1
<i>Parisotoma ekmani</i> Fjellberg, 1977	10	1	10	11
<i>Parisotoma notabilis</i> Schäffer, 1896	1	26	11	2
<i>Pseudachorutes simplex</i> Maynard, 1951	11	0	0	0
<i>Pseudachorutes</i> sp1	5	0	0	0
<i>Sinela</i> sp1	1	0	6	0
<i>Sminthurides lepus</i> Mills, 1934	2	1	0	0
<i>Sminthurides occultus</i> Mills, 1934	6	8	0	0
<i>Sminthurides pumilis</i> Krausbauer, 1878	0	11	0	0
<i>Sminthurides quadrimaculatus</i> Ryder, 1878	4	0	0	0
<i>Sminthurides</i> sp1	1	4	0	0
<i>Plutomurus californicus</i> Folsom, 1913	2	0	0	0
<i>Pogonognathellus celsus</i> Christensen, 1965	0	0	1	0
<i>Tomocerus curtus</i> Christensen, 1964	2	0	0	0
<i>Pogonognathellus elongatus</i> Maynard, 1951	0	0	1	0
<i>Pogonognathellus flavescens</i> Tullberg, 1871	14	0	0	0
<i>Tomocerina lamellifera</i> Mills, 1934	1	0	0	0
<i>Xenylla christianseni</i> Yosii, 1960	109	0	0	0
<i>Xenyllodes armatus</i> Axelson, 1903	3	0	0	0
<i>Xenyllodes</i> sp1	2	0	0	0
Unknown	3	5	3	1
Total	498	230	308	136

Table S2: Abundance of springtail in litter only (species and morphospecies) sampled in 2018 and 2019 on undefoliated sites and sites with a defoliation history during the 2015-2017 outbreak. The unidentified genus is noted as "Unknown".

Genera and species or morpho-species	Abundance of springtails in litter			
	Undefoliated 2018	Outbreak 2018	Undefoliated 2019	Outbreak 2019
<i>Anurophorus</i> sp1	157	0	3	2
<i>Arrthopalites</i> sp1	2	1	0	0
<i>Desoria</i> sp1	0	0	1	2
<i>Desoria</i> sp2	1	3	0	0
<i>Desoria</i> sp3	10	26	0	0
<i>Desoria</i> sp4	0	2	0	0
<i>Entomobrya</i> sp1	3	2	0	0
<i>Entomobrya</i> sp2	0	3	0	0
<i>Entomobrya</i> sp3	0	7	0	0
<i>Folsomia nivalis</i> Packard, 1873	10	0	12	1
<i>Folsomia similis</i> Bagnall, 1939	0	0	1	0
<i>Friezea mirabilis</i> Tullberg, 1871	4	6	4	0
<i>Friezea pentacantha</i> Mills, 1934	0	1	0	0
<i>Heteromurus nitidus</i> Templeton et Westwood, 1836	0	1	1	0
<i>Hypogastrura</i> sp1	0	3	0	1
<i>Isotomiella minor</i> Schäffer, 1896	1	0	2	0
<i>Isotomorus palustri</i> Müller, 1776	0	0	2	0
<i>Isotoma viridis</i> Bourlet, 1839	0	1	0	0
<i>Lepidocyrtus</i> sp1	47	80	134	34
<i>Mesaphorura</i> sp1	2	9	0	0
<i>Mesaphorura</i> sp2	2	0	0	0
<i>Metisotoma grandiceps</i> Reuter, 1891	5	0	0	0
<i>Neanura muscorum</i> Templeton, 1836	0	14	4	0
<i>Paranura</i> sp1	0	0	2	0
<i>Morulodes serratus</i> Folsom, 1916	0	0	0	15
<i>Orchesella</i> sp1	3	0	0	1
<i>Parisotoma ekmani</i> Fjellberg, 1977	6	0	1	10
<i>Parisotoma notabilis</i> Schäffer, 1896	0	23	3	1
<i>Pseudachorutes simplex</i> Maynard, 1951	11	0	0	0
<i>Pseudachorutes</i> sp1	5	0	0	0
<i>Sinela</i> sp1	1	0	0	0
<i>Sminthurides lepus</i> Mills, 1934	2	1	0	0
<i>Sminthurides occultus</i> Mills, 1934	6	8	0	0
<i>Sminthurides pumilis</i> Krausbauer, 1878	0	11	0	0
<i>Sminthurides quadrimaculatus</i> Ryder, 1878	4	0	0	0
<i>Sminthurides</i> sp1	1	4	0	0
<i>Plutomurus californicus</i> Folsom, 1913	2	0	0	0
<i>Pogonognathellus celsus</i> Christensen, 1965	0	0	1	0
<i>Tomocerus curtus</i> Christensen, 1964	2	0	0	0
<i>Pogonognathellus elongatus</i> Maynard, 1951	0	0	1	0
<i>Pogonognathellus flavescens</i> Tullberg, 1871	13	0	0	0
<i>Xenylla christianseni</i> Yosii, 1960	109	0	0	0
Unknown	3	3	3	1
Total	414	209	175	68

Table S3: Abundance of springtail in soil only (species and morphospecies) sampled in 2018 and 2019 on undefoliated sites and sites with a defoliation history during the 2015-2017 outbreak. The unidentified genus is noted as “Unknown”.

Genera and species or morpho-species	Abundance of springtails in soil			
	Undefoliated 2018	Outbreak 2018	Undefoliated 2019	Outbreak 2019
<i>Anurophorus sp1</i>	2	0	8	0
<i>Desoria sp1</i>	2	0	0	5
<i>Desoria sp2</i>	2	0	0	0
<i>Desoria sp3</i>	0	1	0	0
<i>Folsomia nivalis</i> Packard, 1873	23	0	9	4
<i>Friesia mirabilis</i> Tullberg, 1871	1	2	3	8
<i>Heteromurus nitidus</i> Templeton et Westwood, 1836	0	0	3	0
<i>Isotoma candida</i>	1	0	0	0
<i>Isotomiella minor</i> Schäffer, 1896	10	0	2	0
<i>Isotomorus palustri</i> Müller, 1776	0	0	2	0
<i>Isotoma viridis</i> Bourlet, 1839	2	0	0	0
<i>Lepidocyrtus sp1</i>	18	9	74	46
<i>Mesaphorura sp1</i>	13	3	5	2
<i>Mesaphorura sp2</i>	0	0	2	0
<i>Paranura sp1</i>	0	0	2	1
<i>Parisotoma ekmani</i> Fjellberg, 1977	4	1	9	1
<i>Parisotoma notabilis</i> Schäffer, 1896	1	3	8	1
<i>Sinela sp1</i>	0	0	6	0
<i>Pogonognathellus flavescens</i> Tullberg, 1871	1	0	0	0
<i>Tomocerina lamellifera</i> Mills, 1934	1	0	0	0
<i>Xenyllodes armatus</i> Axelson, 1903	3	0	0	0
Unknown	0	2	0	0
Total	84	21	133	68

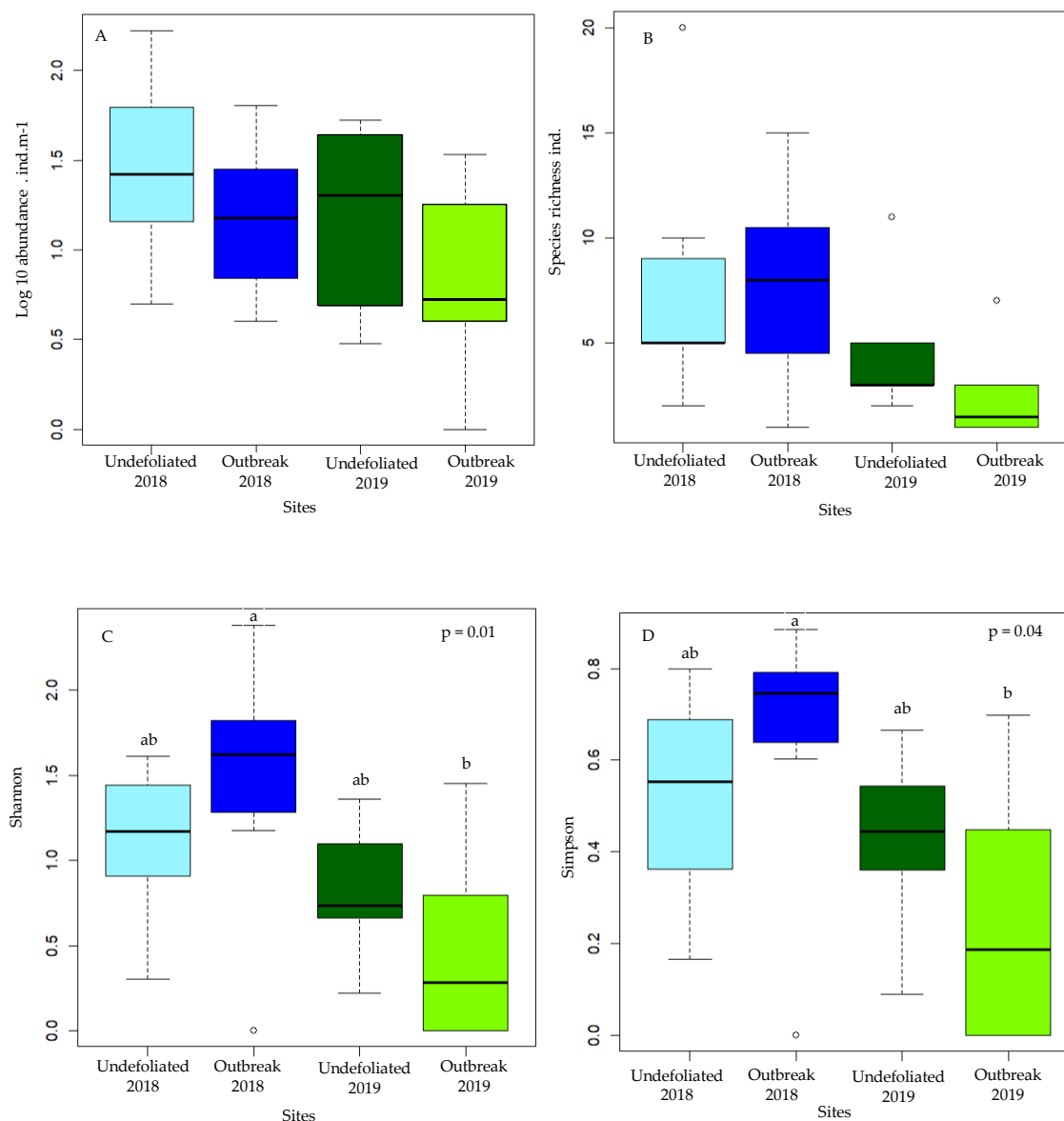


Figure S1 : Mean abundance (A), species richness (B alpha diversity) Shannon-Wiener index (C) and dominance (Simpson index) (D) of springtail communities in undefoliated and defoliated forests in 2018 and 2019 (n = 8) in the litter. Each whisker box has the lower boundary indicating the 25th percentile, the bold line inside the box marks the median, and the upper boundary of the box the 75th percentile. The whiskers indicate the 10th and 90th percentiles. Dots are outliers ($>Q3 + 1.5 \times$ interquartile range).

Table S4 : Summary description of biotic and abiotic factors in soils with contrasting defoliation histories sampled in 2018 and 2019 on undefoliated sites and sites with a defoliation history during the 2015-2017 outbreak . Each factor is presented as mean (\pm SE). Significant values are also present. ***= $p < 0.001$; * $p < 0.05$.

Factors	Means and SE		
	Undeveloped sites	Outbreak sites	p-Value
Carbon (C)	31.55 ± 9.38	18.45 ± 14.12	0.0622
Nitrogen (N)	1.39 ± 0.47	0.87 ± 0.58	0.0891
pH	5.21 ± 0.56	5.22 ± 0.35	0.9646
Phosphorus (P)	288.36 ± 162.27	127.90 ± 109.02	0.3554
Calcium (Ca)	29.90 ± 7.67	19.98 ± 8.41*	0.0400 *
Magnesium (Mg)	5.42 ± 0.95	3.92 ± 2.40	0.1639
Sodium (Na)	0.21 ± 0.32	0.11 ± 0.05	0.6989
Manganese (Mn)	1.05 ± 0.32	0.47 ± 0.19	0.0024 **
Canopy cover	21.90 ± 6.63	39.83 ± 7.71	0.0002 ***
Soil humidity	25.90 ± 4.89	38.16 ± 3.30	0.0001 ***
Predator	66.50 ± 18.90	63.25 ± 16.16	0.7180
Microbial biomass using glucose	919.98 ± 248.90	458.71 ± 184.27	0.0013 ***