Tables and figures

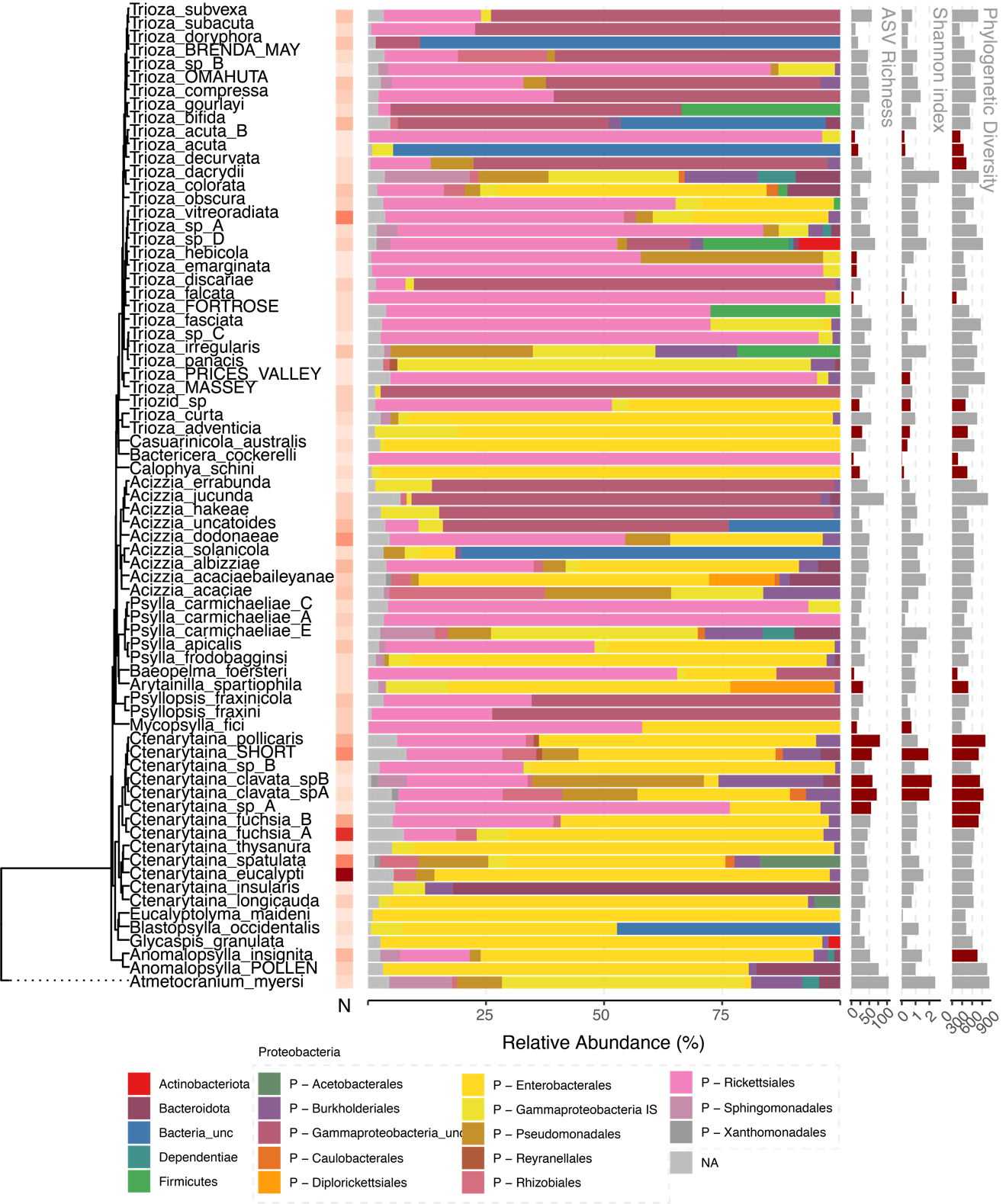


Fig 1 – Overview of microbiome results by species

A picture containing clock

Description automatically generated

Fig 2 Phylosymbiosis – Results of Mantel tests, partial Mantel tests, and beta diversity through time analysis.

A close up of a piece of paper

Description automatically generated

Fig3 - Phylogenetic congruence between psyllid species and microbiome. Links and taxa coloured according to their contribution to global fit.

A close up of a logo

Description automatically generated

Fig4 - Phylogenetic congruence between psyllid species and carsonella ASVs. Links and taxa coloured according to their contribution to global fit.

A picture containing text, map

Description automatically generated

Fig5 - Phylogenetic congruence between psyllid species and hostplant species. Links and taxa coloured according to their contribution to global fit.

A close up of a logo

Description automatically generated

Fig6 - Phylogenetic congruence between Trioza species and hostplant species. Links and taxa coloured according to their contribution to global fit.

# Supplementary information

A picture containing clock

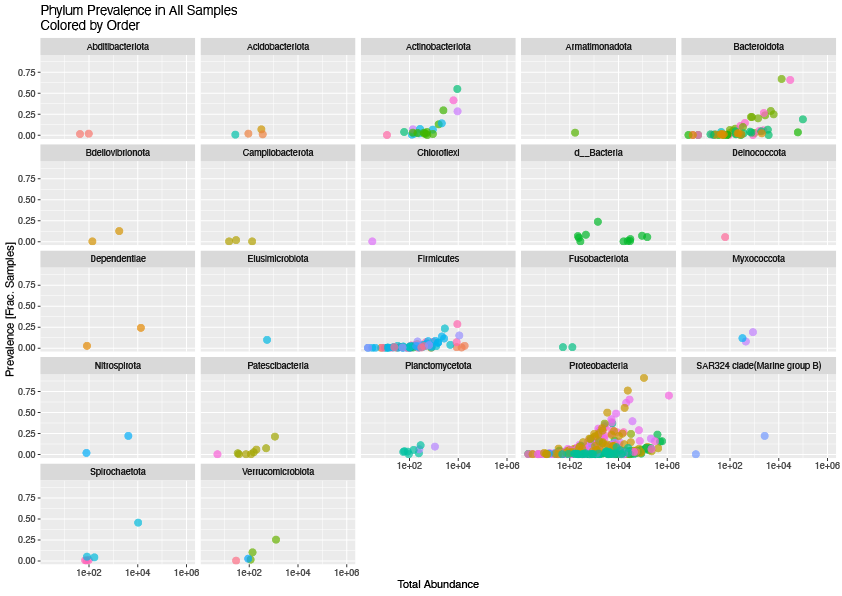
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Summary of hierarchical taxonomic assignment using IDTAXA

A screenshot of a computer

Description automatically generated

Rarefaction curves showing sequencing depth for each sample. All samples below 1000 sequence reads were removed



Abundance and prevalence of different bacterial phyla across the entire dataset after filtering

A close up of a map

Description automatically generated

PCA plot of Aitchison distance between microbial communities coloured by psyllid phylogenetic cluster.

A screenshot of a cell phone

Description automatically generated

PCA plot of Aitchison distance between microbial communities coloured by hostplant phylogenetic cluster.

A picture containing table, sitting, white, man

Description automatically generated

PCA plot of Aitchison distance between microbial communities coloured by UPGMA cluster of spatial distance

A close up of a map

Description automatically generated

Collection locations of NZ psyllid samples

Adonis results for different distance measures

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ­ | term | df | SumsOfSqs | MeanSqs | F.Model | R2 | p.value |
| Bray | psyllid\_spp | 74 | 75.9719275 | 1.02664767 | 4.49700625 | 0.65279035 | 0.001 |
| Bray | hostplant\_spp | 55 | 54.5869929 | 0.99249078 | 3.14804707 | 0.46903986 | 0.001 |
| Jaccard | psyllid\_spp | 74 | 43.4323434 | 0.58692356 | 2.04770318 | 0.46123647 | 0.001 |
| Jaccard | hostplant\_spp | 55 | 32.9151396 | 0.59845708 | 1.9150663 | 0.3495474 | 0.001 |
| Aitchison | psyllid\_spp | 74 | 142965.303 | 1931.96356 | 2.19311858 | 0.47832357 | 0.001 |
| Aitchison | hostplant\_spp | 55 | 108585.661 | 1974.28475 | 2.03339208 | 0.36329851 | 0.001 |
| Unifrac | psyllid\_spp | 74 | 25.7110859 | 0.34744711 | 2.01199508 | 0.45686801 | 0.001 |
| Unifrac | hostplant\_spp | 55 | 20.3455383 | 0.36991888 | 2.01785367 | 0.36152598 | 0.001 |
| WUnifrac | psyllid\_spp | 74 | 25.7206748 | 0.34757669 | 5.3239992 | 0.69000445 | 0.001 |
| WUnifrac | hostplant\_spp | 55 | 20.412656 | 0.3711392 | 4.31366712 | 0.54760708 | 0.001 |

Mantel results for different distance measures

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| dist | mantelr | pval | llim.2.5% | ulim.97.5% | dist1 |
| Bray | 0.18157003 | 0.001 | 0.16818337 | 0.22324658 | phylo.dist |
| Bray | 0.18921805 | 0.001 | 0.17482358 | 0.20832634 | plant.dist |
| Bray | 0.09517944 | 0.001 | 0.0825982 | 0.1080083 | spat.dist |
| Jaccard | 0.04946199 | 0.072 | 0.036153 | 0.08002391 | phylo.dist |
| Jaccard | 0.13591112 | 0.001 | 0.11255801 | 0.15800243 | plant.dist |
| Jaccard | 0.02287177 | 0.436 | 0.00238033 | 0.045936 | spat.dist |
| Aitchison | 0.22976035 | 0.001 | 0.15992586 | 0.25201626 | phylo.dist |
| Aitchison | 0.04756532 | 0.156 | 0.02038544 | 0.07000935 | plant.dist |
| Aitchison | 0.04123014 | 0.429 | 0.00338496 | 0.0788697 | spat.dist |
| Unifrac | 0.0578 | 0.078 | 0.0464187 | 0.07798872 | phylo.dist |
| Unifrac | 0.12409659 | 0.001 | 0.10298463 | 0.14371115 | plant.dist |
| Unifrac | 0.00937781 | 0.805 | -0.007235 | 0.02648686 | spat.dist |
| WUnifrac | 0.08395321 | 0.026 | 0.06615729 | 0.09472239 | phylo.dist |
| WUnifrac | 0.09855466 | 0.001 | 0.07975156 | 0.11531844 | plant.dist |
| WUnifrac | -0.0577221 | 0.129 | -0.068447 | -0.0421818 | spat.dist |

Partial mantel results for different distance measures

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| dist | mantelr | pval | llim.2.5% | ulim.97.5% | dist1 | dist2 | dist3 |
| Bray | 0.13411929 | 0.001 | 0.12223275 | 0.16200041 | phylo.dist | plant.dist | spat.dist |
| Bray | 0.10493659 | 0.001 | 0.09449539 | 0.11547555 | spat.dist | phylo.dist | plant.dist |
| Bray | 0.1523537 | 0.001 | 0.1331613 | 0.17044173 | plant.dist | spat.dist | phylo.dist |
| Jaccard | 0.01076958 | 0.722 | 4.06E-05 | 0.03349455 | phylo.dist | plant.dist | spat.dist |
| Jaccard | 0.03001003 | 0.32 | 0.00920232 | 0.05010296 | spat.dist | phylo.dist | plant.dist |
| Jaccard | 0.12876763 | 0.001 | 0.107261 | 0.14463066 | plant.dist | spat.dist | phylo.dist |
| Aitchison | 0.22504417 | 0.001 | 0.14889203 | 0.24836672 | phylo.dist | plant.dist | spat.dist |
| Aitchison | 0.03957756 | 0.475 | 0.00228897 | 0.07970439 | spat.dist | phylo.dist | plant.dist |
| Aitchison | -0.0166416 | 0.66 | -0.0474116 | 0.00697877 | plant.dist | spat.dist | phylo.dist |
| Unifrac | 0.02337332 | 0.512 | 0.01444681 | 0.03792453 | phylo.dist | plant.dist | spat.dist |
| Unifrac | 0.01543671 | 0.658 | -0.0019277 | 0.03447449 | spat.dist | phylo.dist | plant.dist |
| Unifrac | 0.11319137 | 0.001 | 0.09170898 | 0.13328527 | plant.dist | spat.dist | phylo.dist |
| WUnifrac | 0.06000782 | 0.091 | 0.03684844 | 0.06989536 | phylo.dist | plant.dist | spat.dist |
| WUnifrac | -0.0543991 | 0.147 | -0.0653216 | -0.0395205 | spat.dist | phylo.dist | plant.dist |
| WUnifrac | 0.07514953 | 0.008 | 0.05857711 | 0.09637918 | plant.dist | spat.dist | phylo.dist |

Adonis results – No Gammaproteobacteria

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| dist | term | df | SumsOfSqs | MeanSqs | F.Model | R2 | p.value |
| Bray | psyllid\_spp | 74 | 56.2319176 | 0.75989078 | 2.55442109 | 0.51642933 | 0.001 |
| Bray | hostplant\_spp | 55 | 40.8846547 | 0.74335736 | 2.14257626 | 0.37548132 | 0.001 |
| Jaccard | psyllid\_spp | 74 | 39.4183321 | 0.53268016 | 1.76508244 | 0.42460749 | 0.001 |
| Jaccard | hostplant\_spp | 55 | 30.2606138 | 0.55019298 | 1.72336084 | 0.32596212 | 0.001 |
| Aitchison | psyllid\_spp | 74 | 53131.3574 | 717.991316 | 2.01192424 | 0.45685927 | 0.001 |
| Aitchison | hostplant\_spp | 55 | 40202.5091 | 730.954711 | 1.8827532 | 0.34568831 | 0.001 |
| Unifrac | psyllid\_spp | 74 | 27.3303761 | 0.36932941 | 1.87192149 | 0.43902519 | 0.001 |
| Unifrac | hostplant\_spp | 55 | 21.4381932 | 0.38978533 | 1.87184593 | 0.34437532 | 0.001 |
| WUnifrac | psyllid\_spp | 74 | 44.7501597 | 0.60473189 | 3.52677772 | 0.59587339 | 0.001 |
| WUnifrac | hostplant\_spp | 55 | 33.2964558 | 0.60539011 | 2.83842287 | 0.44336092 | 0.001 |

Mantel results – No Gammaproteobacteria

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| dist | mantelr | pval3 | llim.2.5% | ulim.97.5% | dist1 |
| Bray | 0.10173472 | 0.001 | 0.09201224 | 0.1176122 | phylo.dist |
| Bray | 0.07645643 | 0.001 | 0.06441567 | 0.08987944 | plant.dist |
| Bray | 0.09653493 | 0.002 | 0.08178993 | 0.10992345 | spat.dist |
| Jaccard | 0.03645645 | 0.187 | 0.02358766 | 0.06218962 | phylo.dist |
| Jaccard | 0.12640614 | 0.001 | 0.10635685 | 0.14563726 | plant.dist |
| Jaccard | 0.02559136 | 0.395 | 0.00438016 | 0.04697594 | spat.dist |
| Aitchison | 0.20948266 | 0.001 | 0.14641777 | 0.23061167 | phylo.dist |
| Aitchison | 0.02414901 | 0.456 | 1.86E-04 | 0.04296708 | plant.dist |
| Aitchison | 0.06152691 | 0.256 | 0.02348832 | 0.08935163 | spat.dist |
| Unifrac | 0.03015174 | 0.395 | 0.01846147 | 0.04835 | phylo.dist |
| Unifrac | 0.11288769 | 0.001 | 0.09217884 | 0.13477319 | plant.dist |
| Unifrac | 0.00385297 | 0.926 | -0.0165861 | 0.02090566 | spat.dist |
| WUnifrac | 0.09073475 | 0.001 | 0.08066551 | 0.10155848 | phylo.dist |
| WUnifrac | 0.05882365 | 0.008 | 0.04310485 | 0.07589714 | plant.dist |
| WUnifrac | 0.11339481 | 0.001 | 0.09604389 | 0.12953364 | spat.dist |

Partial mantel – No Gammaproteobacteria

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| dist | mantelr | pval3 | llim.2.5% | ulim.97.5% | dist1 | dist2 | dist3 |
| Bray | 0.08179899 | 0.001 | 0.07196513 | 0.09433957 | phylo.dist | plant.dist | spat.dist |
| Bray | 0.09936836 | 0.001 | 0.08502017 | 0.11450454 | spat.dist | phylo.dist | plant.dist |
| Bray | 0.05567498 | 0.012 | 0.04057298 | 0.06855663 | plant.dist | spat.dist | phylo.dist |
| Jaccard | -1.42E-04 | 0.998 | -0.0103766 | 0.01664303 | phylo.dist | plant.dist | spat.dist |
| Jaccard | 0.03246953 | 0.278 | 0.01111876 | 0.05395916 | spat.dist | phylo.dist | plant.dist |
| Jaccard | 0.12278456 | 0.001 | 0.1037497 | 0.14295823 | plant.dist | spat.dist | phylo.dist |
| Aitchison | 0.21038406 | 0.002 | 0.14867445 | 0.23540317 | phylo.dist | plant.dist | spat.dist |
| Aitchison | 0.05930987 | 0.233 | 0.02892096 | 0.08613387 | spat.dist | phylo.dist | plant.dist |
| Aitchison | -0.034298 | 0.345 | -0.064394 | -0.0148972 | plant.dist | spat.dist | phylo.dist |
| Unifrac | -0.0022051 | 0.952 | -0.0120048 | 0.01022506 | phylo.dist | plant.dist | spat.dist |
| Unifrac | 0.00985356 | 0.815 | -0.0098981 | 0.0288481 | spat.dist | phylo.dist | plant.dist |
| Unifrac | 0.10923405 | 0.001 | 0.08943142 | 0.1282031 | plant.dist | spat.dist | phylo.dist |
| WUnifrac | 0.07515898 | 0.016 | 0.06345529 | 0.08680397 | phylo.dist | plant.dist | spat.dist |
| WUnifrac | 0.1153887 | 0.002 | 0.10134501 | 0.13202448 | spat.dist | phylo.dist | plant.dist |
| WUnifrac | 0.04136585 | 0.09 | 0.02314086 | 0.05837275 | plant.dist | spat.dist | phylo.dist |