**Alpha diversity metrics**

Reading OTU table of location 1, without taxonomic information. Turning it into a dataframe, with column (sample names) as ‘enummers’. Next removing the first row. The dataframe is turned into a 3 row table; Group, name and value.

# A tibble: 539,505 × 3

Group name value

<chr> <chr> <int>

1 e4057163188 OTU1 0

2 e4057163188 OTU2 0

3 e4057163188 OTU3 0

4 e4057163188 OTU4 0

5 e4057163188 OTU5 0

6 e4057163188 OTU6 0

7 e4057163188 OTU7 0

8 e4057163188 OTU8 0

9 e4057163188 OTU9 0

10 e4057163188 OTU10 0

# ℹ 539,495 more rows

Group is the sample name, name is the OTU. Value tells us how many times we saw each individual in that group and in that name. Next calculate a variety of alpha diversity metrics. To do so we are going to calculate the:

**Richness** (sobs); the total number of taxa that we saw in each sample greather than zero.

**The Shannon diversity**; measure the diversity of species in a community. The results look really high, what does that mean?

**The Simpson index**; measures the diversity of species but takes into account, the number of species, and the relative abundance of each species (number of individuals per species). Measures as followed: score close to 1 = high diversity. Score close to 0 = low diversity. Our scores are very low diversity.

**Inverse Simpson index**; same as simpson the larger the number the lower the diversity.

Lastly the total number of individuals in each of the samples.

|  | **Group** | **sobs** | **shannon** | **simpson** | **invsimpson** | **n** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| **1** | e4057163188 | 174 | 3.203419 | 0.12320578 | 8.116503 | 18235 |
| **2** | e4057163189 | 136 | 3.588141 | 0.06302566 | 15.866554 | 8304 |
| **3** | e4057163190 | 169 | 4.174255 | 0.03416452 | 29.270132 | 8692 |
| **4** | e4057163191 | 222 | 4.461284 | 0.02716308 | 36.814678 | 12559 |
| **5** | e4057163192 | 221 | 4.112048 | 0.03657777 | 27.339011 | 15758 |
| **6** | e4057163193 | 159 | 3.801168 | 0.04991478 | 20.034146 | 10807 |
| **7** | e4057163194 | 185 | 4.145681 | 0.03418623 | 29.251545 | 10676 |
| **8** | e4057163195 | 187 | 4.055514 | 0.04521282 | 22.117620 | 10144 |
| **9** | e4057163196 | 157 | 3.505907 | 0.10475062 | 9.546483 | 17581 |
| **10** | e4057163197 | 110 | 2.810031 | 0.18793414 | 5.321013 | 8732 |
| **11** | e4057163198 | 292 | 4.531800 | 0.02292076 | 43.628574 | 32789 |
| **12** | e4057163199 | 291 | 4.076640 | 0.03854522 | 25.943555 | 58997 |
| **13** | e4057163200 | 258 | 4.029860 | 0.03973783 | 25.164939 | 38744 |
| **14** | e4057163201 | 157 | 3.888718 | 0.04797211 | 20.845443 | 12099 |
| **15** | e4057163202 | 229 | 4.473849 | 0.02102898 | 47.553420 | 11086 |
| **16** | e4057163203 | 206 | 4.154716 | 0.03778678 | 26.464281 | 13235 |
| **17** | e4057163204 | 255 | 4.652551 | 0.01979308 | 50.522698 | 12287 |
| **18** | e4057163205 | 221 | 4.373780 | 0.02820268 | 35.457629 | 13219 |
| **19** | e4057163206 | 253 | 4.470907 | 0.02504793 | 39.923452 | 16011 |
| **20** | e4057163207 | 101 | 2.849722 | 0.12607856 | 7.931562 | 13651 |
| **21** | e4057163208 | 134 | 2.988840 | 0.17316512 | 5.774835 | 11441 |
| **22** | e4057163209 | 120 | 3.435379 | 0.10431969 | 9.585918 | 6796 |
| **23** | e4057163210 | 203 | 2.982685 | 0.15987121 | 6.255035 | 72566 |
| **24** | e4057163211 | 397 | 4.847941 | 0.01722994 | 58.038522 | 55822 |
| **25** | e4057163212 | 240 | 4.348447 | 0.02792379 | 35.811753 | 17697 |
| **26** | e4057163213 | 153 | 3.567296 | 0.10047565 | 9.952660 | 11389 |
| **27** | e4057163214 | 185 | 4.464761 | 0.01813504 | 55.141884 | 8541 |
| **28** | e4057163215 | 88 | 2.939780 | 0.16621036 | 6.016472 | 3698 |
| **29** | e4057163216 | 123 | 3.477323 | 0.09773649 | 10.231593 | 9464 |
| **30** | e4057163217 | 131 | 3.432910 | 0.06483928 | 15.422750 | 10804 |
| **31** | e4057163218 | 158 | 3.836839 | 0.03680407 | 27.170912 | 13427 |
| **32** | e4057163219 | 46 | 2.905442 | 0.08069112 | 12.392938 | 10745 |
| **33** | e4057163220 | 163 | 3.383781 | 0.15217306 | 6.571465 | 12433 |
| **34** | e4057163221 | 150 | 3.934025 | 0.04753064 | 21.039062 | 7477 |
| **35** | e4057163222 | 258 | 4.043335 | 0.04357057 | 22.951271 | 37937 |
| **36** | e4057163223 | 289 | 4.645646 | 0.01707004 | 58.582168 | 46676 |
| **37** | e4057163224 | 159 | 4.113722 | 0.02544697 | 39.297411 | 13684 |
| **38** | e4057163225 | 176 | 4.026217 | 0.03779584 | 26.457939 | 10987 |
| **39** | e4057163226 | 204 | 3.924634 | 0.05197574 | 19.239743 | 11751 |
| **40** | e4057163227 | 151 | 3.709291 | 0.05475398 | 18.263513 | 12192 |
| **41** | e4057163228 | 257 | 4.181671 | 0.05370706 | 18.619525 | 17070 |
| **42** | e4057163229 | 145 | 3.549960 | 0.06029941 | 16.583910 | 11895 |
| **43** | e4057163230 | 89 | 3.072626 | 0.08567968 | 11.671379 | 10091 |
| **44** | e4057163231 | 140 | 2.889851 | 0.20384050 | 4.905796 | 12313 |
| **45** | e4057163232 | 191 | 3.988105 | 0.05528072 | 18.089488 | 13129 |
| **46** | e4057163233 | 127 | 3.520510 | 0.06003814 | 16.656079 | 10940 |
| **47** | e4057163234 | 218 | 3.779453 | 0.06584746 | 15.186615 | 24121 |
| **48** | e4057163235 | 251 | 4.195496 | 0.03653758 | 27.369078 | 77461 |
| **49** | e4057163236 | 209 | 4.429166 | 0.02223929 | 44.965464 | 14874 |
| **50** | e4057163237 | 128 | 3.282320 | 0.09071610 | 11.023402 | 10151 |
| **51** | e4057163238 | 182 | 4.060076 | 0.04148093 | 24.107465 | 12169 |
| **52** | e4057163239 | 20 | 2.710737 | 0.08387636 | 11.922311 | 190 |
| **53** | e4057163240 | 215 | 4.308884 | 0.03211192 | 31.141086 | 14166 |
| **54** | e4057163241 | 142 | 3.474226 | 0.07576566 | 13.198591 | 10951 |
| **55** | e4057163242 | 114 | 3.388167 | 0.06877644 | 14.539863 | 11949 |
| **56** | e4057163243 | 217 | 4.026084 | 0.07999790 | 12.500328 | 16001 |
| **57** | e4057163244 | 170 | 3.388613 | 0.15112050 | 6.617236 | 12285 |
| **58** | e4057163245 | 236 | 4.145427 | 0.04165776 | 24.005130 | 12815 |
| **59** | e4057163246 | 211 | 4.298979 | 0.02960532 | 33.777709 | 16446 |
| **60** | e4057163247 | 171 | 3.850353 | 0.05522513 | 18.107697 | 39025 |
| **61** | e4057163248 | 145 | 3.792887 | 0.04585217 | 21.809218 | 13303 |
| **62** | e4057163249 | 130 | 3.773318 | 0.04962634 | 20.150589 | 6598 |
| **63** | e4057163250 | 167 | 3.840343 | 0.05681544 | 17.600850 | 11335 |
| **64** | e4057163251 | 206 | 4.257116 | 0.03356802 | 29.790258 | 11073 |
| **65** | e4057163252 | 207 | 4.316321 | 0.02769214 | 36.111334 | 10631 |
| **66** | e4057163253 | 178 | 4.372257 | 0.02566777 | 38.959370 | 7581 |
| **67** | e4057163254 | 183 | 4.234651 | 0.03075619 | 32.513777 | 10768 |
| **68** | e4057163255 | 190 | 4.376231 | 0.02444725 | 40.904398 | 16380 |
| **69** | e4057163256 | 123 | 3.636075 | 0.06913267 | 14.464940 | 7596 |
| **70** | e4057163257 | 161 | 3.869767 | 0.06064888 | 16.488350 | 9213 |
| **71** | e4057163258 | 236 | 4.420520 | 0.02665169 | 37.521071 | 16410 |
| **72** | e4057163259 | 216 | 3.648864 | 0.08136349 | 12.290524 | 47091 |
| **73** | e4057163260 | 195 | 4.264289 | 0.02383372 | 41.957357 | 16351 |
| **74** | e4057163261 | 186 | 4.244288 | 0.02641371 | 37.859132 | 12016 |
| **75** | e4057163262 | 183 | 4.282631 | 0.02854672 | 35.030296 | 9572 |
| **76** | e4057163263 | 209 | 4.241145 | 0.03107241 | 32.182889 | 11511 |
| **77** | e4057163264 | 170 | 3.969779 | 0.03803649 | 26.290545 | 13021 |
| **78** | e4057163265 | 224 | 4.305907 | 0.03066825 | 32.607008 | 12820 |
| **79** | e4057163266 | 191 | 4.195180 | 0.02718360 | 36.786887 | 11614 |
| **80** | e4057163267 | 221 | 4.382276 | 0.03682661 | 27.154280 | 16855 |
| **81** | e4057163268 | 127 | 2.764005 | 0.21922802 | 4.561461 | 13326 |
| **82** | e4057163269 | 174 | 4.193387 | 0.03197767 | 31.271818 | 8835 |
| **83** | e4057163270 | 203 | 3.660314 | 0.07726462 | 12.942535 | 19276 |
| **84** | e4057163271 | 319 | 3.957427 | 0.05867543 | 17.042908 | 62943 |
| **85** | e4057163272 | 79 | 3.397892 | 0.06558485 | 15.247423 | 2466 |
| **86** | e4057163273 | 139 | 3.965371 | 0.04195540 | 23.834837 | 6805 |
| **87** | e4057163274 | 130 | 3.299972 | 0.12116105 | 8.253477 | 9989 |
| **88** | e4057163275 | 165 | 4.302538 | 0.02489863 | 40.162855 | 7569 |
| **89** | e4057163276 | 116 | 3.509982 | 0.06558666 | 15.247003 | 7941 |
| **90** | e4057163277 | 123 | 3.281694 | 0.11867872 | 8.426110 | 9234 |
| **91** | e4057163278 | 76 | 2.883068 | 0.09539339 | 10.482906 | 8842 |
| **92** | e4057163279 | 139 | 4.076343 | 0.04446130 | 22.491468 | 5976 |
| **93** | e4057163280 | 146 | 3.844328 | 0.06441869 | 15.523445 | 9659 |
| **94** | e4057163281 | 83 | 3.020836 | 0.12830913 | 7.793677 | 3349 |
| **95** | e4057163282 | 143 | 2.991728 | 0.18742403 | 5.335495 | 29453 |

Showing 83 to 95 of 95 entries, 6 total columns

Plots of the statistics.

Afbeelding met tekst, overdekt, schermopname, meerdere

Automatisch gegenereerde beschrijving

Plot using the random sampling from the same community but keeping the same number of sequences.

Afbeelding met tekst, overdekt, schermopname

Automatisch gegenereerde beschrijving

**Rarefaction curve**

Reading OTU table of location 1, without taxonomic information. Turning the data into a dataframe. Using vegan, rarecurve, creating a curve with the steps of 50.

Afbeelding met diagram

Automatisch gegenereerde beschrijving

Next drop NA, stick together and plot:

Afbeelding met diagram

Automatisch gegenereerde beschrijving