

a.

Kruskal-Wallis rank sum test

data: alpha_tests\$Observed and alpha_tests\$pop
Kruskal-Wallis chi-squared = 9.5226, df = 7, p-value = 0.2173

Kruskal-Wallis rank sum test

data: alpha_tests\$PD and alpha_tests\$pop
Kruskal-Wallis chi-squared = 10.012, df = 7, p-value = 0.1879

b.

Call:

adonis(formula = Jaccard_site ~ pop_ID, data = sampled_f_site)

Permutation: free

Number of permutations: 999

Terms added sequentially (first to last)

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)
pop_ID	7	2.7043	0.38633	0.95808	0.30896	0.688
Residuals	15	6.0485	0.40323		0.69104	
Total	22	8.7528			1.00000	

c.

Call:

```
adonis(formula = bray_site ~ pop_ID, data = sampled_site)
```

Permutation: free

Number of permutations: 999

Terms added sequentially (first to last)

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)
pop_ID	7	2.2042	0.31489	0.93286	0.3033	0.711
Residuals	15	5.0633	0.33755		0.6967	
Total	22	7.2675			1.0000	

d.

Mantel statistic based on Pearson's product-moment correlation

Call:

```
mantel(xdis = dist.matrix.scaro, ydis = bray_site, method = "pearson", permutations = 999, strata = NULL,  
na.rm = TRUE, parallel = getOption("mc.cores"))
```

Mantel statistic r: 0.03343

Significance: 0.302

Upper quantiles of permutations (null model):

90%	95%	97.5%	99%
0.0907	0.1186	0.1428	0.1781

Permutation: free

Number of permutations: 999