

1 Supplementary material

1.1 Maximal rank depth for OTUs using RDP classifier

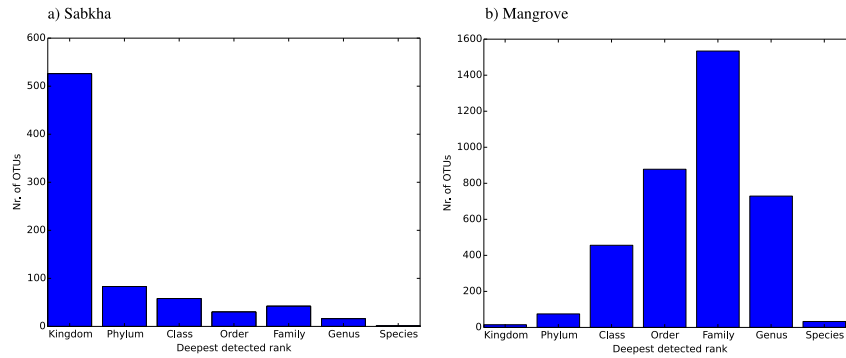


Figure 1: Histogram of deepest identified taxonomic ranks for OTUs from Sabkha (a) and Mangrove samples (b) as determined by the RDP classifier

1.2 Ecosystem distribution profiles for selected saline samples from Table 1

Ecosystem	Samples
Animal/Human	8680
Animal/Human/Anthropogenic	147
Animal/Human/Anthropogenic/Soil	519
Animal/Human/Freshwater/Marine	1
Animal/Human/Marine	3
Animal/Human/Soil	514
Anthropogenic	699
Anthropogenic/Biofilm	22
Anthropogenic/Freshwater	34
Anthropogenic/Freshwater/Soil	21
Anthropogenic/Marine	11
Anthropogenic/Plant	26
Anthropogenic/Plant/Soil	42
Anthropogenic/Soil	658
Biofilm	145
Biofilm/Freshwater	2
Biofilm/Freshwater/Soil	3
Biofilm/Geothermal	367
Biofilm/Geothermal/Soil	2
Biofilm/Hypersaline	3
Biofilm/Marine	23
Biofilm/Soil	3
Freshwater	1844
Freshwater/Geothermal	1
Freshwater/Hypersaline/Marine	8
Freshwater/Hypersaline/Marine/Soil	2
Freshwater/Marine	9
Freshwater/Marine/Soil	17
Freshwater/Soil	155
Geothermal	85
Geothermal/Marine	7
Geothermal/Soil	7
Hypersaline	8
Hypersaline/Marine	12
Hypersaline/Marine/Soil	1
Marine	835
Marine/Plant/Soil	3
Marine/Soil	414
Plant	295
Plant/Soil	590
Soil	2508

Table 1: Summary of number of samples per (composite) ecosystem in Database *EMP+*.

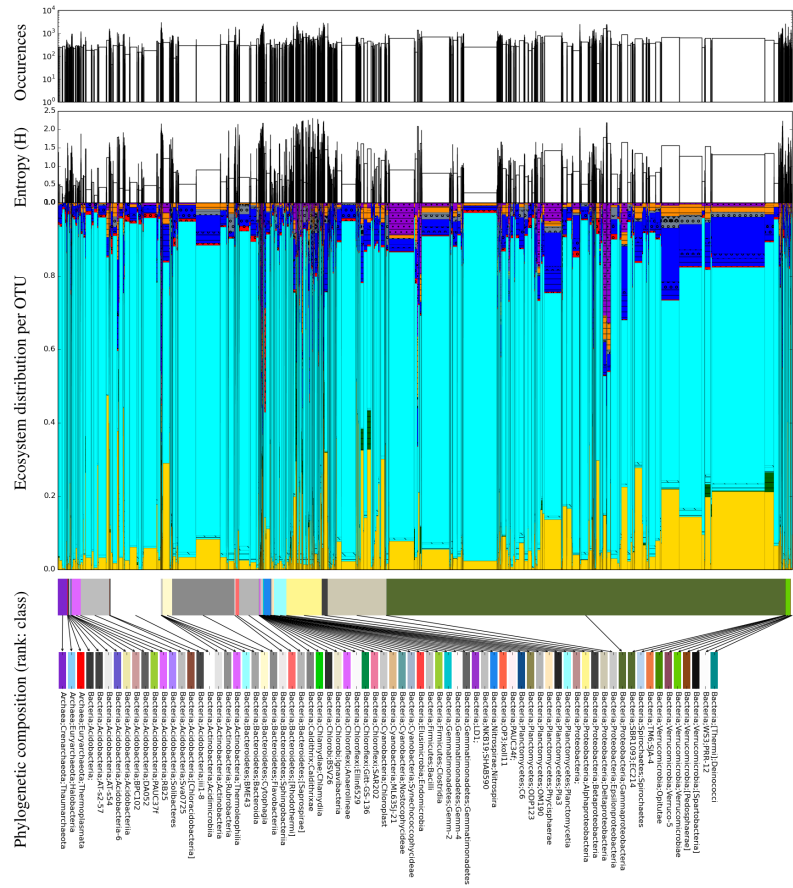


Figure 3: Ecosystem distribution profile for P.Masambaba.SB.414876

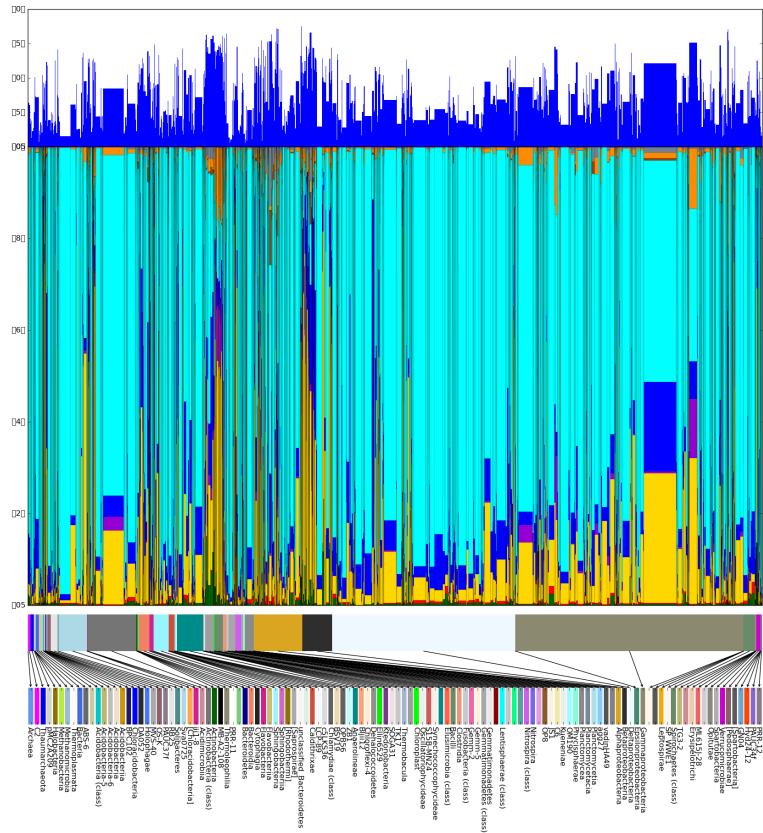


Figure 6: Ecosystem distribution profile for P.Dois.Rios.SB.414865. Constituent OTUs predominantly occur in marine environments

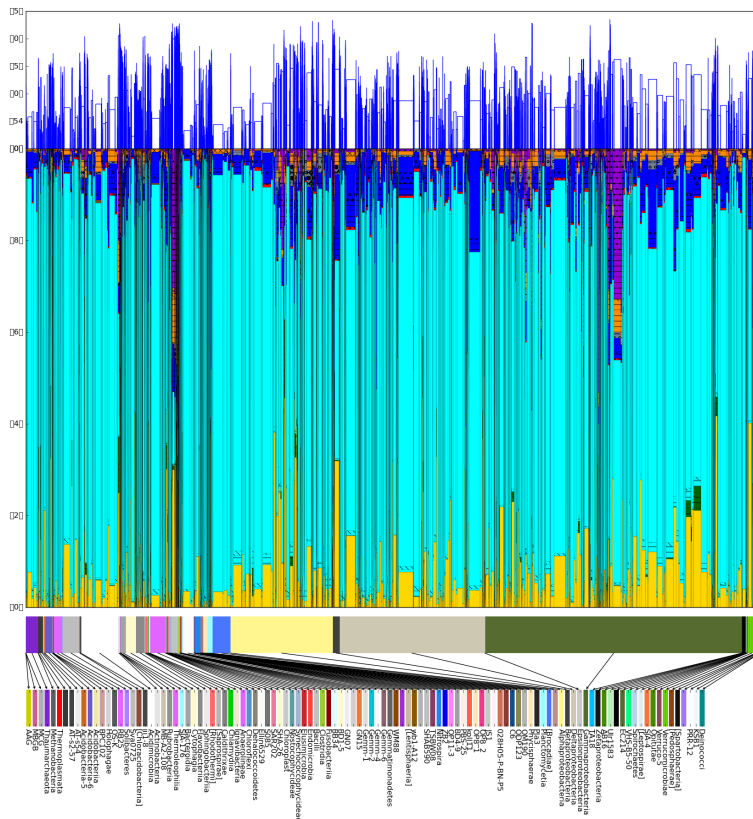


Figure 7: Ecosystem distribution profile for SE.20101009.GY.FF003.BC.221. Note that this sample is from the Mexican Gulf Spill study (Qiita 1197), this particular match is from a relatively unaffected area 41k away from the source of the spill, not exceeding the Environmental Protection Agency's threshold for Polycyclic aromatic hydrocarbons.

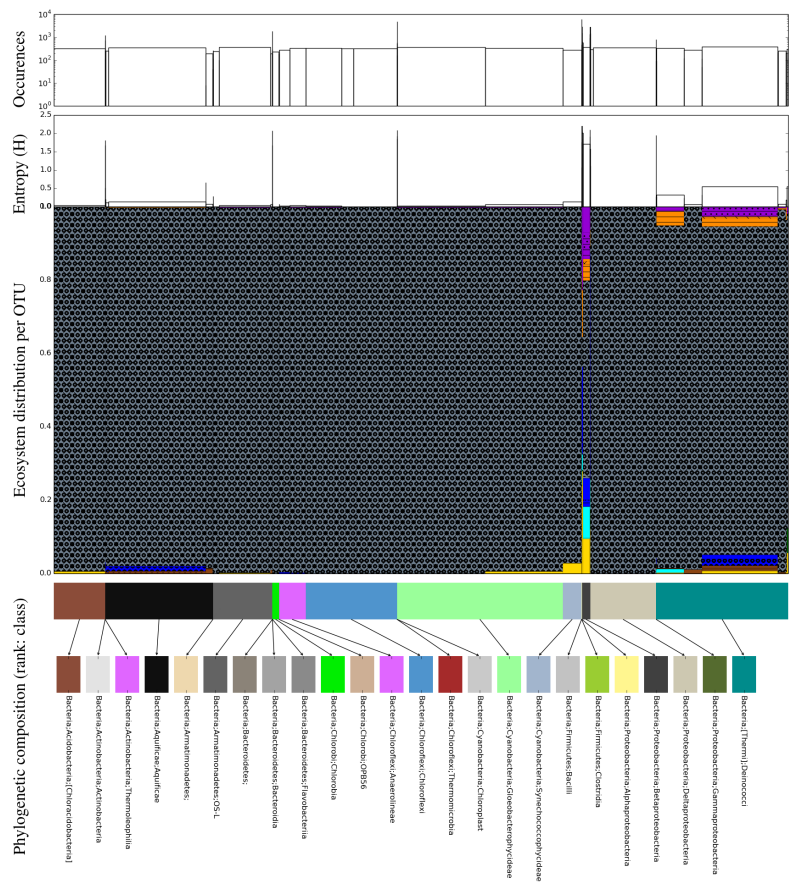


Figure 8: Ecosystem distribution profile for Yellowstone Biofilm (Sample event ID SA4x.609398, Qiita Project ID 925). The figure shows an extreme environment as evidenced by very low ecosystem distribution entropy ($H_W = 0.134$, $H_U = 0.682$). Note that OTUs are predominantly from the composite ecosystem Biofilm/Freshwater/Geothermal/Marine (gray, circular hatching) according to the present background database, which is immediately apparent from the visualization of the OTU ecosystem distributions.

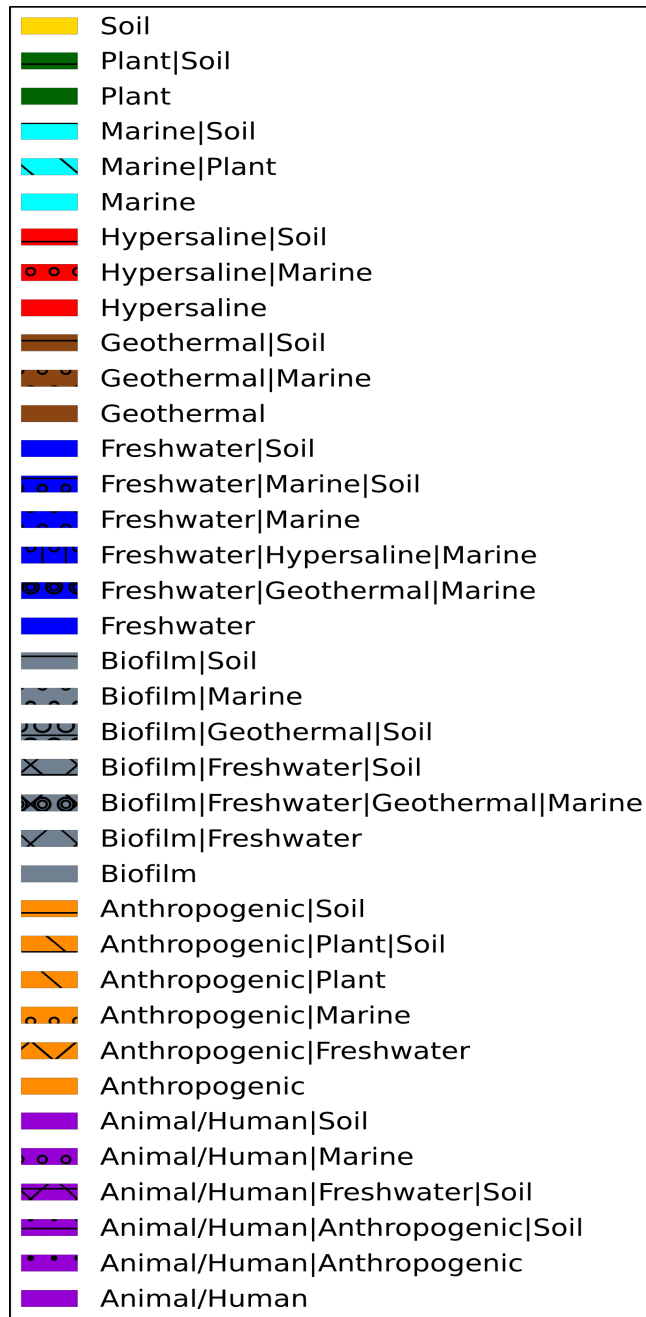


Figure 9: Figure legend for all used composite environments in Figures 1,2, and S2-S8

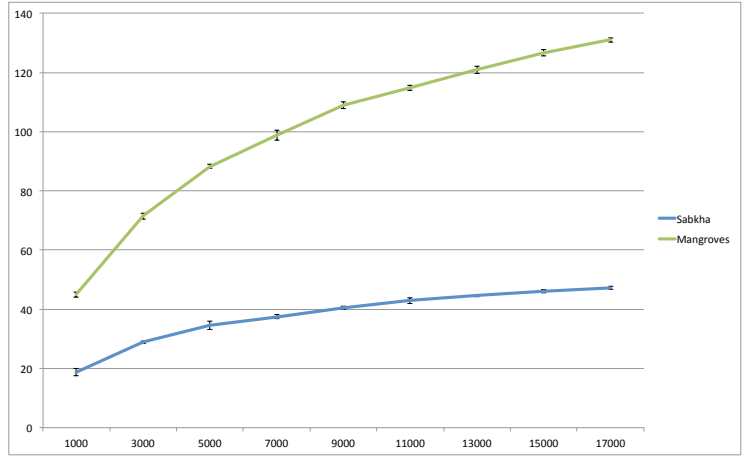


Figure 10: Rarefaction curves for Sabkha and Mangrove, displaying average Phylogenetic Distance values for multiple rarefaction runs using QIIME (see Methods).

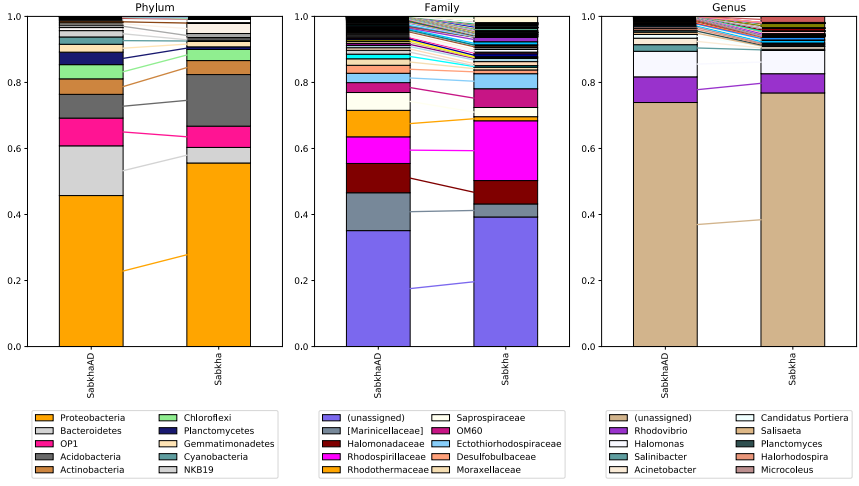


Figure 11: Compositional similarities between the Abu Dhabi mangrove sample (SabkhaAD) and its best matches when searching with Visiome. Relative abundances are shown for the taxonomic ranks phylum, family and genus. The only match in the database is differently rarefied version of the same sabkha sample.

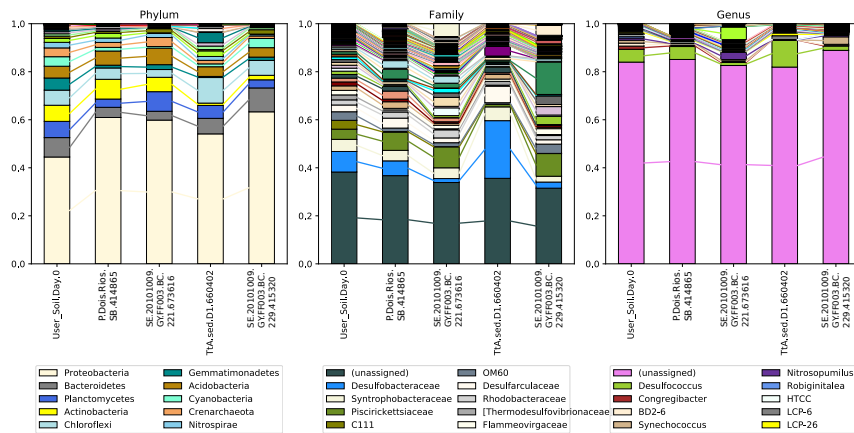


Figure 12: Compositional similarities between the Abu Dhabi mangrove sample (User_Soil.Day.0) and its best matches when searching with Visibiome.