Type Profiles

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```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.2     v tibble    3.2.1
## v lubridate 1.9.4     v tidyr     1.3.1
## v purrr     1.0.4
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

Isopora

Import and filter Host data

```
library(tidyverse)
load("~/AIMS@JCU/CoralSeaSymbioants/ITS2_Isopora_CS_2024/Isopora/ind_coords_iso.RData")

Cluster_Isopora_H <- ind_coords_iso %>%
  mutate(cluster = case_when(
    Axis1 < -30 ~ "IC1",
    Axis2 > 30 ~ "IC2",
    Axis1 > 0 & Axis2 < 0 ~ "IC3",
    TRUE ~ NA_character_  # Everything else gets NA
  )) %>%
  rename("sample_name" = SampleID) #rename column to be able to join with Symbioant data
```

Symbioant data

```
load("~/AIMS@JCU/CoralSeaSymbioants/ITS2_Isopora_CS_2024/symbioant_iso_all.RData")
```

Subset Isopora based on host clustering

```
Isopora_combined <- left_join(x = symbioant_iso_all, y= Cluster_Isopora_H, by = "sample_name")
```

Combine Host and Sybioant

```
Isopora_combined %>%
  filter(str_detect(name, "p_")) %>%    #profiles start with p_
  group_by(cluster, name) %>% #grouping by the host cluster and the div
  dplyr:: count() %>%
  dplyr:: arrange(cluster ,desc(n)) %>%
  group_by(cluster) %>%                 # group again by cluster for proportions
  mutate(
    prop = n / sum(n),
    cumulative_sum = cumsum(prop)
  ) %>%
  ungroup() %>%
  print(n=72) %>%
 write.csv(file ="Isopora_Cluster_Type_Profiles.csv")
```

```
## # A tibble: 72 x 5
##    cluster name                                        n    prop cumulative_sum
##    <chr>   <fct>                                   <int>   <dbl>          <dbl>
##  1 IC1     p_C3/C50b-C3bm-C50f-C21-C3b-C3acq          47 0.723          0.723
##  2 IC1     p_C50b-C3-C3bm-C50f-C21-C3b                 3 0.0462         0.769
##  3 IC1     p_C50b                                      2 0.0308         0.8
##  4 IC1     p_C50b/C3-C3bm-C50f-C21-C3b-C21ba           2 0.0308         0.831
##  5 IC1     p_C3k/C3-C50a-C3ba-C50f-C3dq-C21ab-C3a-~    2 0.0308         0.862
##  6 IC1     p_C3k/C3-C50a-C3ba-C29-C21ab-C50f-C3dq-~    2 0.0308         0.892
##  7 IC1     p_C21du/C21                                 1 0.0154         0.908
##  8 IC1     p_C21dw/C3-C21fc-C21fz-C26                  1 0.0154         0.923
##  9 IC1     p_A1/A1gr/A1gd                              1 0.0154         0.938
## 10 IC1     p_C15h/C15k                                 1 0.0154         0.954
## 11 IC1     p_C21/C3a                                   1 0.0154         0.969
## 12 IC1     p_C50b-C3-C3bh-C3bm-C50f                    1 0.0154         0.985
## 13 IC1     p_A1/A1g                                    1 0.0154         1
## 14 IC2     p_C1/C3-C1c-C1b-C72k-C3ju                  14 0.237          0.237
## 15 IC2     p_C3k/C3-C50a-C3ba-C29-C21ab-C50f-C3dq-~    7 0.119          0.356
## 16 IC2     p_D1/D2.2/D4-D2                             7 0.119          0.475
## 17 IC2     p_C3k/C3-C50a-C3ba-C50f-C3dq-C21ab-C3a-~    6 0.102          0.576
## 18 IC2     p_C21/C1                                    4 0.0678         0.644
## 19 IC2     p_C50b/C3-C3bm-C50f-C21-C3b-C21ba           3 0.0508         0.695
## 20 IC2     p_C3bo/C3k/C3-C3bp-C50a-C3jq-C3a-C3dq       3 0.0508         0.746
## 21 IC2     p_C26/C21ac                                 2 0.0339         0.780
## 22 IC2     p_C21/C3a                                   1 0.0169         0.797
## 23 IC2     p_D1-D17i-D4-D1r-D17s-D17r                  1 0.0169         0.814
## 24 IC2     p_C3k/C1/C3-C1c-C50a-C3dq-C1b-C3ba-C50y     1 0.0169         0.831
## 25 IC2     p_C1/C7                                     1 0.0169         0.847
## 26 IC2     p_C3fn/C3-C3fv-C115d                        1 0.0169         0.864
## 27 IC2     p_C31-C21-C21ac                             1 0.0169         0.881
## 28 IC2     p_C3k/C1-C3-C50a-C3cz-C3ba                  1 0.0169         0.898
## 29 IC2     p_C3bo/C3/C3k-C50a-C3bp-C29                 1 0.0169         0.915
```

```
## 30 IC2     p_C1-C21-C1c                                  1 0.0169          0.932
## 31 IC2     p_F4q                                         1 0.0169          0.949
## 32 IC2     p_C26/C21-C21ac-C50b                          1 0.0169          0.966
## 33 IC2     p_C3k/C1/C3/C42.2-C50a-C1b                    1 0.0169          0.983
## 34 IC2     p_A1-A1bw-A1bf-A1bx-A1eb                      1 0.0169          1
## 35 IC3     p_C3k/C3-C50a-C3ba-C50f-C3dq-C21ab-C3a-~     37 0.319           0.319
## 36 IC3     p_C3k/C3-C50a-C3ba-C29-C21ab-C50f-C3dq-~     25 0.216           0.534
## 37 IC3     p_D1/D2.2/D4-D2                               8 0.0690          0.603
## 38 IC3     p_C3/C50b-C3bm-C50f-C21-C3b-C3acq             5 0.0431          0.647
## 39 IC3     p_C3k/C3-C3ba-C3a-C50f-C3dq-C50a-C3acr-~      5 0.0431          0.690
## 40 IC3     p_C50b/C3-C3bm-C50f-C21-C3b-C21ba             3 0.0259          0.716
## 41 IC3     p_D1-D4-D2-D1u-D2.2                           3 0.0259          0.741
## 42 IC3     p_C21du/C21                                   2 0.0172          0.759
## 43 IC3     p_C21dw/C3-C21fc-C21fz-C26                    2 0.0172          0.776
## 44 IC3     p_D1/D4-D2-D17c-D17d-D1r-D17e                 2 0.0172          0.793
## 45 IC3     p_A1                                          2 0.0172          0.810
## 46 IC3     p_C1p-C3ds-C1                                 2 0.0172          0.828
## 47 IC3     p_C50b                                        1 0.00862         0.836
## 48 IC3     p_C21/C3a                                     1 0.00862         0.845
## 49 IC3     p_C21/C1                                      1 0.00862         0.853
## 50 IC3     p_C3k/C1/C3-C1c-C50a-C3dq-C1b-C3ba-C50y       1 0.00862         0.862
## 51 IC3     p_C3bo/C3k/C3-C3bp-C50a-C3jq-C3a-C3dq         1 0.00862         0.871
## 52 IC3     p_A1/A1cl                                     1 0.00862         0.879
## 53 IC3     p_D1/D17i                                     1 0.00862         0.888
## 54 IC3     p_A1qf                                        1 0.00862         0.897
## 55 IC3     p_A2y                                         1 0.00862         0.905
## 56 IC3     p_C21                                         1 0.00862         0.914
## 57 IC3     p_C3k                                         1 0.00862         0.922
## 58 IC3     p_C31/C21                                     1 0.00862         0.931
## 59 IC3     p_C50b/C3-C3k-C50a-C50f-C3ba                  1 0.00862         0.940
## 60 IC3     p_A1-A1eq-A1ep-A1hw                           1 0.00862         0.948
## 61 IC3     p_C21dw/C21fc-C21fz-C21fh-C3-C21ac-C21f~      1 0.00862         0.957
## 62 IC3     p_A1qe                                        1 0.00862         0.966
## 63 IC3     p_A1-A1qd-A1qe                                1 0.00862         0.974
## 64 IC3     p_C26/C21ac                                   1 0.00862         0.983
## 65 IC3     p_A1-A1gr-A1gd-A1mm-A1bf                      1 0.00862         0.991
## 66 IC3     p_C3/C3k-C50a-C3.10-C3gj-C21-C21cf            1 0.00862         1
## 67 <NA>    p_C50b/C3-C3bm-C50f-C21-C3b-C21ba             4 0.4             0.4
## 68 <NA>    p_C1/C3-C1c-C1b-C72k-C3ju                     2 0.2             0.6
## 69 <NA>    p_A1/A1gr/A1gd                                1 0.1             0.7
## 70 <NA>    p_C3k/C3-C50a-C3ba-C29-C21ab-C50f-C3dq-~      1 0.1             0.8
## 71 <NA>    p_C3bo/C3k/C3-C3bp-C50a-C3jq-C3a-C3dq         1 0.1             0.9
## 72 <NA>    p_C3k-C3-C50a-C3jv-C21ab                      1 0.1             1
```

Montipora

Import and filter Host data

```
library(tidyverse)
load("~/AIMS@JCU/CoralSeaSymbioants/ITS2 Montipora/Montipora_CS_Analysis/ind_coords_monti.RData")
```

```
Cluster_Montipora_H <- ind_coords_monti %>%
  mutate(cluster = case_when(
    Axis1 < -9 ~ "M1a",
    Axis1 >-9 & Axis1 < -3 ~ "M1b",
    Axis2 > 15 ~ "M2",
    Axis1 > 7 & Axis1 <20 ~ "M3",
    Axis1 > 20 ~ "M4"
  )) %>%
  rename("sample_name" = SampleID)
```

Symbioant data

```
load("~/AIMS@JCU/CoralSeaSymbioants/ITS2 Montipora/Montipora_CS_Analysis/symbioant_monti_all.RData")
```

Combine Host and Sybioant

```
Montipora_combined <- left_join(x = symbioant_monti_all, y= Cluster_Montipora_H, by = "sample_name")
```

Type Profiles

```
Montipora_combined %>%
  filter(str_detect(name, "p_")) %>%    # profiles start with p_
  group_by(cluster, name) %>%           # grouping by cluster and profile name
  count() %>%
  arrange(cluster, desc(n)) %>%
  group_by(cluster) %>%                 # group again by cluster for proportions
  mutate(
    prop = n / sum(n),
    cumulative_sum = cumsum(prop)
  ) %>%
  ungroup() %>%
  print(n = 101) #%>%
```

```
## # A tibble: 101 x 5
##     cluster name                                        n   prop cumulative_sum
##     <chr>   <fct>                                   <int>  <dbl>          <dbl>
##   1 M1a     p_C21/C17-C17q-C21ac-C21aj-C21fd           17 0.17           0.17
##   2 M1a     p_C15-C15sw                                 6 0.06           0.23
##   3 M1a     p_C15-C15he-C15f-C15pg                      6 0.06           0.29
##   4 M1a     p_C21gd-C21-C17-C17az                       5 0.05           0.34
##   5 M1a     p_C17/C21-C21ac                             5 0.05           0.39
##   6 M1a     p_C17-C21-C17ax-C17aw-C21ac-C17ay-C17av     5 0.05           0.44
##   7 M1a     p_C15-C116ch-C15sw                          5 0.05           0.49
##   8 M1a     p_C26/C21-C21ac-C21ek-C17-C21aj             4 0.04           0.53
##   9 M1a     p_C26-C26g-C26f                             4 0.04           0.57
##  10 M1a     p_C26-C21-C21ac-C21ek                       3 0.03           0.6
```

```
##  11 M1a     p_A1-A1qd-A1qe                                  3 0.03          0.63
##  12 M1a     p_A5                                            2 0.02          0.65
##  13 M1a     p_C7ae/C7i-C7af-C7ad                            2 0.02          0.67
##  14 M1a     p_C21du/C21                                     2 0.02          0.69
##  15 M1a     p_C17ba                                         2 0.02          0.71
##  16 M1a     p_C15-C15v-C15he-C15lj                          2 0.02          0.73
##  17 M1a     p_C15-C15he-C15pg                               2 0.02          0.75
##  18 M1a     p_A1-A1bw-A1bf-A1bx-A1eb                        2 0.02          0.77
##  19 M1a     p_C21/C17                                       1 0.01          0.78
##  20 M1a     p_C17-C17ai                                     1 0.01          0.79
##  21 M1a     p_C1/C3/C42.2                                   1 0.01          0.8
##  22 M1a     p_G3a/G3ac-G3ai                                 1 0.01          0.81
##  23 M1a     p_G3a/G3ai                                      1 0.01          0.82
##  24 M1a     p_C17z-C17aj-C21-C17-C21ac                      1 0.01          0.83
##  25 M1a     p_C3k/C3                                        1 0.01          0.84
##  26 M1a     p_C17z/C21-C21ac-C3                             1 0.01          0.85
##  27 M1a     p_C21/C3-C21k                                   1 0.01          0.86
##  28 M1a     p_A4ac                                          1 0.01          0.87
##  29 M1a     p_A1-A1ey-A1bf-A1on-A1eb                        1 0.01          0.88
##  30 M1a     p_C31-C17d-C31aj-C21-C31ak                      1 0.01          0.89
##  31 M1a     p_A1/A1gr/A1gd                                  1 0.01          0.9
##  32 M1a     p_A1/A1bx-A1bw-A1bf                             1 0.01          0.91
##  33 M1a     p_C31-C21-C31ak-C31aj-C31ao-C31am               1 0.01          0.92
##  34 M1a     p_C116-C1-C42.2                                 1 0.01          0.93
##  35 M1a     p_C26/C21ac                                     1 0.01          0.94
##  36 M1a     p_C50a                                          1 0.01          0.95
##  37 M1a     p_D1/D4-D6-D1ab-D1qq                            1 0.01          0.96
##  38 M1a     p_C21/C1                                        1 0.01          0.97
##  39 M1a     p_G3fd                                          1 0.01          0.98
##  40 M1a     p_C15-C15he-C15xv-C15f-C15ed-C15v               1 0.01          0.99
##  41 M1a     p_C15h/C15do                                    1 0.01          1
##  42 M1b     p_C7ae/C7i-C7af-C7ad                            4 0.444         0.444
##  43 M1b     p_C21/C17-C17q-C21ac-C21aj-C21fd                2 0.222         0.667
##  44 M1b     p_C31/C17d/C21-C17i-C21ac-C17                   1 0.111         0.778
##  45 M1b     p_C15/C3                                        1 0.111         0.889
##  46 M1b     p_C31-C17d-C31aj-C21-C31ak                      1 0.111         1
##  47 M2      p_C21dw/C21fc-C21fz-C21fh-C3-C21ac-C21f~       25 0.625         0.625
##  48 M2      p_C21du/C21                                     4 0.1           0.725
##  49 M2      p_C21/C17-C17q-C21ac-C21aj-C21fd                3 0.075         0.8
##  50 M2      p_C17/C21-C21ac                                 2 0.05          0.85
##  51 M2      p_C42.2/C1-C1b-C42u-C42a-C3-C115k-C115l         1 0.025         0.875
##  52 M2      p_C42.2-C1-C42u-C1b-C115k                       1 0.025         0.9
##  53 M2      p_C7ae                                          1 0.025         0.925
##  54 M2      p_C15/C93a                                      1 0.025         0.95
##  55 M2      p_A1-A1bw-A1bf-A1bx-A1eb                        1 0.025         0.975
##  56 M2      p_A1-A1bw-A1du-A1bf-A1bx                        1 0.025         1
##  57 M3      p_C31-C21-C31d-C21ac-C21aj-C3                   9 0.231         0.231
##  58 M3      p_C7i                                           6 0.154         0.385
##  59 M3      p_C15-C15pg-C15aaf                              3 0.0769        0.462
##  60 M3      p_C21dw-C21fc-C21fz-C3                          2 0.0513        0.513
##  61 M3      p_C21/C17-C17q-C21ac-C21aj-C21fd                2 0.0513        0.564
##  62 M3      p_C7ae/C7i-C7af-C7ad                            1 0.0256        0.590
##  63 M3      p_C3/C1                                         1 0.0256        0.615
##  64 M3      p_C3ig                                          1 0.0256        0.641
```

```
##  65 M3      p_C17/C21-C21ac                                1 0.0256          0.667
##  66 M3      p_C1/C42.2/C42u-C1b-C42a-C1au-C115l-C11~       1 0.0256          0.692
##  67 M3      p_A1er                                         1 0.0256          0.718
##  68 M3      p_C1/C3/C42.2                                  1 0.0256          0.744
##  69 M3      p_C26-C26g-C26f                                1 0.0256          0.769
##  70 M3      p_C31/C17d/C21-C17i-C21ac-C17                  1 0.0256          0.795
##  71 M3      p_C31-C17d-C31am-C31al                         1 0.0256          0.821
##  72 M3      p_C31-C21-C31z-C21ap                           1 0.0256          0.846
##  73 M3      p_C31-C21-C31z-C21ac                           1 0.0256          0.872
##  74 M3      p_C93a                                         1 0.0256          0.897
##  75 M3      p_C31-C17d-C31aj-C21-C31ak                     1 0.0256          0.923
##  76 M3      p_A1-A1du                                      1 0.0256          0.949
##  77 M3      p_C15/C1/C1b                                   1 0.0256          0.974
##  78 M3      p_C31-C21-C21ac                                1 0.0256          1
##  79 M4      p_C31/C21-C31z-C31an-C21ac-C21ap               6 0.188           0.188
##  80 M4      p_C31-C21-C31d-C21ac-C21aj-C3                  5 0.156           0.344
##  81 M4      p_C31-C21-C31z-C21ap                           5 0.156           0.5
##  82 M4      p_C31-C21-C31z-C21ac                           5 0.156           0.656
##  83 M4      p_C21/C17-C17q-C21ac-C21aj-C21fd               3 0.0938          0.75
##  84 M4      p_C17z/C21-C21ac-C3                            2 0.0625          0.812
##  85 M4      p_C7ae/C7i-C7af-C7ad                           1 0.0312          0.844
##  86 M4      p_C31/C17d/C21-C17i-C21ac-C17                  1 0.0312          0.875
##  87 M4      p_C15-C15pg-C15aaf                             1 0.0312          0.906
##  88 M4      p_C93a                                         1 0.0312          0.938
##  89 M4      p_F3.1/F3k                                     1 0.0312          0.969
##  90 M4      p_A4at/A4dl                                    1 0.0312          1
##  91 <NA>    p_C15/C15bq                                    3 0.188           0.188
##  92 <NA>    p_C15aag                                       3 0.188           0.375
##  93 <NA>    p_C15-C15sw                                    2 0.125           0.5
##  94 <NA>    p_C1p-C3ds-C1                                  1 0.0625          0.562
##  95 <NA>    p_G3a/G3ac-G3ai                                1 0.0625          0.625
##  96 <NA>    p_F2o                                          1 0.0625          0.688
##  97 <NA>    p_G3a/G3ai                                     1 0.0625          0.75
##  98 <NA>    p_C15-C15mc                                    1 0.0625          0.812
##  99 <NA>    p_C21/C17-C17q-C21ac-C21aj-C21fd               1 0.0625          0.875
## 100 <NA>    p_C15-C15ev                                    1 0.0625          0.938
## 101 <NA>    p_C17-C21-C17ax-C17aw-C21ac-C17ay-C17av        1 0.0625          1
```

```
#save(file = "Montipora_Cluster_Type_Profiles.RData")
#write.csv("Montipora_Cluster_Type_Profiles.csv")
```