Pack effect on skin microbiome

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```
library(vegan)
library(dplyr)
library(printr)
library(tidyr)
```

```
# import decontaminated feature table
df_ftTable <- read.delim("~/master/wolfskin/dataflow/03-asv-table/feature-table-decontam.txt",
                         comment.char = "", skip = 1, header = TRUE)

# convert to numeric
df_ftTable <- sapply(df_ftTable, as.numeric)

# convert to data frame and remove first row
df_ftTable <- as.data.frame(t(df_ftTable))
df_ftTable <- df_ftTable[-1,]

# order by rownames
df_ftTable <-
  df_ftTable[order(rownames(df_ftTable)), order(names(df_ftTable))]

# calculate bray curtis distance matrix
df_dsDist <- vegdist(df_ftTable, method="bray")

# convert distance matrix to matrix
df_dsMatrix <- as.matrix(df_dsDist)

# convert distance matrix to data frame
df_dsTable <- as.data.frame(df_dsMatrix)
```

```
# read in meta data
df_meta <- read.csv("~/master/wolfskin/dataflow/00-meta/sample-metadata.csv")

rownames(df_meta) <- df_meta$SampleID

# order the rows
df_meta <- df_meta[order(rownames(df_meta)), ]

# subset meta data to those samples present in the dissimilarity matrix
df_meta_sub <- df_meta[rownames(df_meta) %in% names(df_dsTable),]
```

```
# packs with n >= 3
true_packs <-
  names(table(df_meta_sub$Pack_wolf_dog)[table(df_meta_sub$Pack_wolf_dog) >= 3])

# subset meta data, packs with 3 animals
df_meta_sub_wolf_dog_pack <-
  df_meta_sub[df_meta_sub$Pack_wolf_dog %in% true_packs, ]
```

```r
# distance matrix, packs with 3 animals
df_dsTable_wolf_dog_pack <- df_dsTable[
  rownames(df_dsTable) %in% rownames(df_meta_sub_wolf_dog_pack),
  colnames(df_dsTable) %in% rownames(df_meta_sub_wolf_dog_pack)]

# convert matrix to distance object
df_dsDist_wolf_dog <- as.dist(as.matrix(df_dsTable_wolf_dog_pack))
```

```r
set.seed(4)
# carry out permanova with packs
adonis(df_dsDist_wolf_dog ~ SAMPLEtype*Pack_wolf_dog,
       df_meta_sub_wolf_dog_pack, permutations = length(df_dsDist_wolf_dog))
```

```
##
## Call:
## adonis(formula = df_dsDist_wolf_dog ~ SAMPLEtype * Pack_wolf_dog,      data = df_meta_sub_wolf_dog_pa
##
## Permutation: free
## Number of permutations: 171
##
## Terms added sequentially (first to last)
##
##               Df SumsOfSqs MeanSqs F.Model      R2   Pr(>F)
## SAMPLEtype     1    0.5079 0.50795  1.3150 0.06986 0.005814 **
## Pack_wolf_dog  4    1.7416 0.43540  1.1272 0.23953 0.034884 *
## Residuals     13    5.0215 0.38627         0.69061
## Total         18    7.2710                 1.00000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```