Redundancy Analysis (RDA) – Bacterial Data

```
Call:
rda(formula = data ~ Succinic.acid + L.Lactic.acid + Acetic.acid, data =
ENV_OA[2:6])

Partitioning of variance:
              Inertia Proportion
Total         31699223      1.000
Constrained   18575075      0.586
Unconstrained 13124147      0.414

Eigenvalues, and their contribution to the variance

Importance of components:
                            RDA1      RDA2      RDA3       PC1       PC2
Eigenvalue            1.440e+07 2.552e+06 1.622e+06 3.810e+06 2.647e+06
Proportion Explained  4.543e-01 8.052e-02 5.117e-02 1.202e-01 8.351e-02
Cumulative Proportion 4.543e-01 5.348e-01 5.860e-01 7.062e-01 7.897e-01
                            PC3       PC4       PC5       PC6       PC7
Eigenvalue            2.006e+06 1.761e+06 1.125e+06 7.826e+05 5.445e+05
Proportion Explained  6.328e-02 5.556e-02 3.549e-02 2.469e-02 1.718e-02
Cumulative Proportion 8.530e-01 9.085e-01 9.440e-01 9.687e-01 9.859e-01
                            PC8
Eigenvalue            4.472e+05
Proportion Explained  1.411e-02
Cumulative Proportion 1.000e+00

Accumulated constrained eigenvalues
Importance of components:
                            RDA1      RDA2      RDA3
Eigenvalue            1.440e+07 2.552e+06 1.622e+06
Proportion Explained  7.753e-01 1.374e-01 8.733e-02
Cumulative Proportion 7.753e-01 9.127e-01 1.000e+00
```

```
Site scores (weighted sums of species scores)


           RDA1    RDA2     RDA3     PC1     PC2      PC3
NBFM12Ab -39.50 -20.103   20.573 -25.812  24.805  -1.4304
NBFM12Bb -48.81 -25.768   22.158 -22.349  24.092  -5.1347
OBYR16b  -58.94  -1.486  -19.060 -17.893  21.193  -0.1521
OBYR17b   35.41 -32.055 -116.064  11.579  38.298   1.5726
OBYR19b  -75.05  11.855  -31.548  77.697 -84.125  17.6739
OBYR20Ab  31.47 -54.579   27.251 -18.647 -28.304 -28.4759
OBYR20Bb  35.02 -21.348   34.811  33.937   5.641  55.3376
OBYR20Cb  31.51 -32.602   14.531  14.590  -9.938 -13.5885
OBYR20Db  30.65 -27.455   18.045  -6.172   6.809  31.3184
OBYR21Ab  32.56  28.674   -1.831 -16.882  31.369  62.7367
OBYR21Bb -12.72  68.213   48.797  50.282  40.204 -92.8876
OBYR21Cb  38.39 106.654  -17.663 -80.329 -70.044 -26.9700


Site constraints (linear combinations of constraining variables)

            RDA1    RDA2     RDA3     PC1     PC2      PC3
NBFM12Ab -47.895 -19.926   22.080 -25.812  24.805  -1.4304
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NBFM12Bb -47.895 -19.926   22.080 -22.349  24.092  -5.1347
OBYR16b  -68.709   1.885  -39.618 -17.893  21.193  -0.1521
OBYR17b   35.916 -19.349 -109.380  11.579  38.298   1.5726
OBYR19b  -49.694   8.305  -14.199  77.697 -84.125  17.6739
OBYR20Ab  25.322 -87.484   29.991 -18.647 -28.304 -28.4759
OBYR20Bb  42.864   8.679   21.941  33.937   5.641  55.3376
OBYR20Cb  41.953 -30.092    6.888  14.590  -9.938 -13.5885
OBYR20Db  22.907  -3.965   24.538  -6.172   6.809  31.3184
OBYR21Ab   7.993  49.147   26.639 -16.882  31.369  62.7367
OBYR21Bb  12.113  53.797   28.832  50.282  40.204 -92.8876
OBYR21Cb  25.124  58.929  -19.791 -80.329 -70.044 -26.9700


Biplot scores for constraining variables

                 RDA1    RDA2    RDA3 PC1 PC2 PC3
Succinic.acid  0.7069 -0.4636 -0.5342   0   0   0
L.Lactic.acid  0.6056  0.2334  0.7608   0   0   0
Acetic.acid   -0.6390 -0.7231 -0.2622   0   0   0
```

Constrained correspondence analysis (CCA) – Fungal Data

```
Call:
cca(formula = data ~ Citric.acid + L.Malic.acid + Succinic.acid +
L.Lactic.acid + Acetic.acid, data = ENV_OA[2:6])

Partitioning of scaled Chi-square:
              Inertia Proportion
Total           4.971     1.0000
Constrained     2.659     0.5349
Unconstrained   2.312     0.4651

Eigenvalues, and their contribution to the scaled Chi-square

Importance of components:
                         CCA1   CCA2   CCA3    CCA4    CCA5    CA1    CA2
Eigenvalue             0.6948 0.6606 0.5596 0.41916 0.32465 0.6656 0.5597
Proportion Explained   0.1398 0.1329 0.1126 0.08432 0.06531 0.1339 0.1126
Cumulative Proportion  0.1398 0.2727 0.3853 0.46958 0.53489 0.6688 0.7814
                          CA3     CA4     CA5     CA6
Eigenvalue             0.42109 0.33339 0.23348 0.09874
Proportion Explained   0.08471 0.06707 0.04697 0.01986
Cumulative Proportion  0.86610 0.93317 0.98014 1.00000

Accumulated constrained eigenvalues
Importance of components:
                         CCA1   CCA2   CCA3   CCA4   CCA5
Eigenvalue             0.6948 0.6606 0.5596 0.4192 0.3247
Proportion Explained   0.2613 0.2484 0.2105 0.1576 0.1221
Cumulative Proportion  0.2613 0.5098 0.7203 0.8779 1.0000
```

```
Site scores (weighted averages of species scores)

             CCA1    CCA2     CCA3     CCA4     CCA5     CA1
NBFM12Af -1.15503  0.1861 -0.30945 -0.02984  0.05115 -0.7670
NBFM12Bf -1.47926  0.3925 -0.80317  0.06541  0.71648 -0.8442
```

OBYR16f	1.12989	-1.3025	-0.29487	-0.06099	1.29331	-0.2158
OBYR17f	0.55881	1.0032	2.91781	-0.53071	1.16115	-0.6241
OBYR19f	-0.58768	-0.3217	0.20374	-0.55432	0.85376	2.4445
OBYR20Af	1.79370	1.6598	-1.02770	3.13725	0.49693	0.2455
OBYR20Bf	-0.88149	0.8206	0.73283	1.13535	-1.92464	0.9980
OBYR20Cf	1.85642	2.4860	-1.82905	-3.12256	-0.71810	0.2955
OBYR20Df	0.14923	1.1088	0.27588	0.56168	-0.90395	1.2624
OBYR21Af	0.74359	-1.2112	-0.07982	0.03519	-0.71662	-0.1168
OBYR21Bf	-0.50285	-0.4714	-0.23810	-0.10497	-1.44999	-0.9850
OBYR21Cf	-0.07951	-0.4091	0.73464	-0.16127	-1.91699	-0.5175

Site constraints (linear combinations of constraining variables)

	CCA1	CCA2	CCA3	CCA4	CCA5	CA1
NBFM12Af	-1.2992	0.3819	-0.58344	0.01179	0.4881	-0.7670
NBFM12Bf	-1.2992	0.3819	-0.58344	0.01179	0.4881	-0.8442
OBYR16f	1.1252	-1.3261	-0.26458	-0.13291	1.5549	-0.2158
OBYR17f	0.5480	1.1573	2.80329	-0.40063	0.7915	-0.6241
OBYR19f	-0.6404	-0.4986	0.08624	-0.46858	0.6405	2.4445
OBYR20Af	1.8582	1.6156	-0.92471	3.08479	0.4907	0.2455
OBYR20Bf	-0.5523	0.7981	0.66862	0.85709	-1.3025	0.9980
OBYR20Cf	1.8471	2.4510	-1.81660	-3.15661	-0.6260	0.2955
OBYR20Df	-0.4800	0.7722	0.20625	0.80249	-0.8280	1.2624
OBYR21Af	0.3307	-0.8517	-0.21895	0.11310	-1.2248	-0.1168
OBYR21Bf	0.5281	-0.9457	-0.28187	0.11841	-1.3603	-0.9850
OBYR21Cf	0.0571	-0.6530	1.19347	-0.49181	-1.1453	-0.5175

Biplot scores for constraining variables

	CCA1	CCA2	CCA3	CCA4	CCA5	CA1
Citric.acid	0.318835	0.6207	-0.303157	-0.525599	-0.38060	0
L.Malic.acid	0.571694	-0.6863	-0.005369	0.054655	-0.44633	0
Succinic.acid	0.460097	0.6519	0.602461	0.007447	0.01948	0
L.Lactic.acid	-0.005779	0.1361	-0.281468	0.201035	-0.92833	0
Acetic.acid	-0.140427	0.1634	-0.180933	0.057723	0.95787	0