**Heat map and Dendrogram**

A close up of a chart

Description automatically generated

Colors in the heat map represent the correlation between a treatment number on the y-axis and a phenotype on the x-axis. The color gradient goes from red (high correlation) to yellow (low correlation).

The dendrogram (hierarchal tree-like structure) is the correlation found among the axes. The dendrogram on the top indicates that B, DM, and Treatment are related overall, whereas the rest of the phenotypes are related. The dendrogram on the left shows the correlation among the treatments (Y axis). The length of the lines quantifies (on some scale) how similar the variables are. The shorter the vertical lines, the higher the similarity. The main reason for many short lines could be the method of calculations.

**Principal component analysis**

A graph showing different colored dots

Description automatically generated

Principal component analysis displays the complete phenotypic data in 2 dimensions (PC1 and PC2) that cover the majority of the dimensionalities of the data (PC1 + PC2 ≈ 80%). In this plot, Environment is the factor, so we can conclude that “ID\_2020” has skewed the data. In other words, ID\_2020 has intrinsic effects on the phenotypes. We can also say that data generated in “WA” has a slight displacement from the central tendency but is insignificant (p-value is unknown. It is only visual perception). The ideal condition would be central data with all the colors mixed up to eliminate any environmental factors from the data, but that is not the case. Hence, we have performed other analyses taking that into consideration. Additionally, the plot proves that Environment has significant effects (p-value unknown as ANOVA was not conducted, but it seems to be <0.05) on the phenotypes. Hence, the design of future experiments should incorporate data from various environments.