Preliminary Metabolomic Investigation of Saline-Stressed *Portulaca oleracea* using $^1$H NMR

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**Effect of Salinity on Fitness**

The effect of salinity on reproductive fitness was demonstrated in several ways; here we show that flower production decreases notably under salinity stress.

**Principal Components Analysis**

Principal components analysis on the unscaled spectra also shows clear separation into the groups identified by HCA. In particular, each genotype in the high salt treatment moves in a different direction along PC2.

**Peaks of Interest, cont’’**

Another valuable approach to finding significant peaks is the S-plot, shown below. The peaks in the extreme corners, where a high correlation suggests a reliable marker, and high covariance means good signal-to-noise, are of greatest interest.

**Compounds & Pathways of Interest**

In addition to identifying the peaks that appear to be the most important markers generally, we need to identify which compounds correspond to these peaks. Nicholson’s STOCSY (Statistical Total Correlation Spectroscopy) is an important tool in this regard. The figure below shows the STOCSY plot for the busiest region of the spectrum. This plot is interpreted much as any 2D NMR plot is interpreted. Strong cross peaks are indicative of peaks from the same compound and can be followed to make a tentative identification. Somewhat less strong cross peaks are expected from different compounds which belong to the same metabolic pathway and are up or down-regulated in a coordinated manner.

**Next Steps**

We are currently studying the STOCSY loadings and S-plot results to identify which specific compounds are involved in the response to saline stress in *Portulaca*.

**References**


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