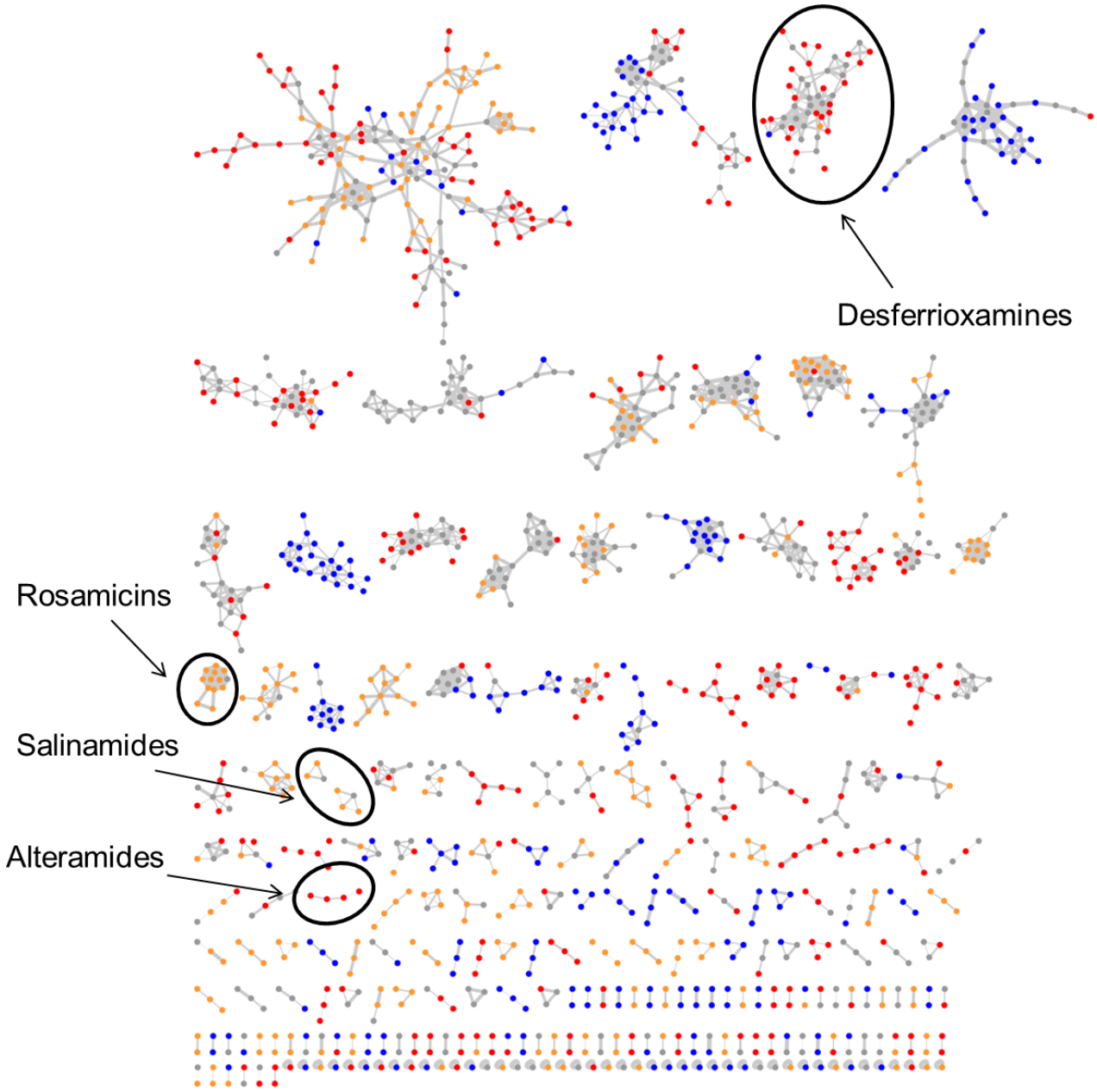


**Figure S1:** Molecular Network of All *Streptomyces* Extracts Color Coded By Culture Medium. Blue nodes represent ions that were only detected in MS extracts, orange nodes those only found in A1 and the red nodes represent ions only detected from R5 extracts. Only the clusters containing at least two nodes are shown. See also Figure 2E.

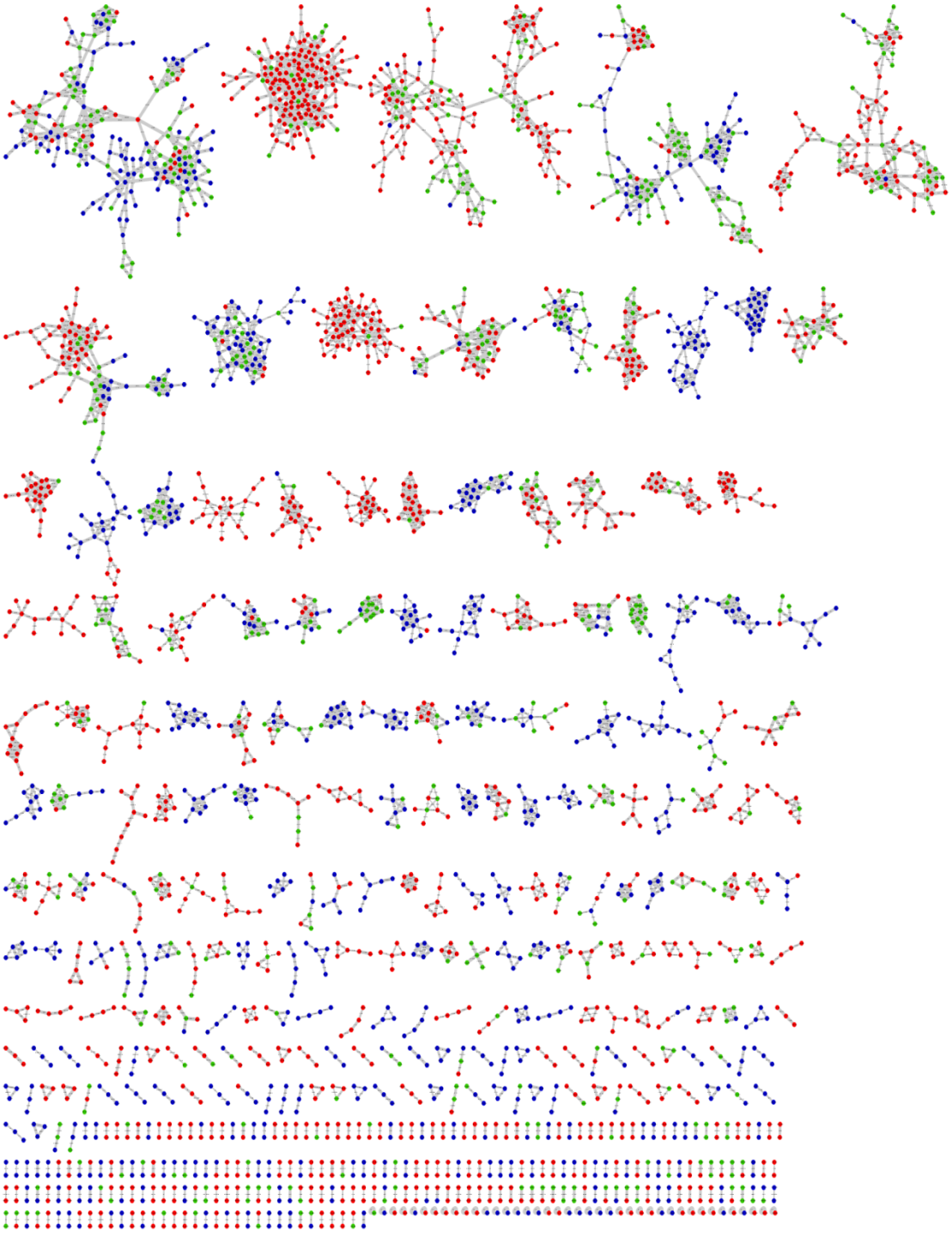

**Figure S2:** Molecular Network of All Acquired Extracts Color Coded By Genus. Blue nodes represent ions that were only detected from *Salinispora* extracts, red nodes those only found from *Streptomyces* extracts and the green nodes represent ions that are shared by the genera. Only the clusters containing at least two nodes are shown. See also Figure 2A.

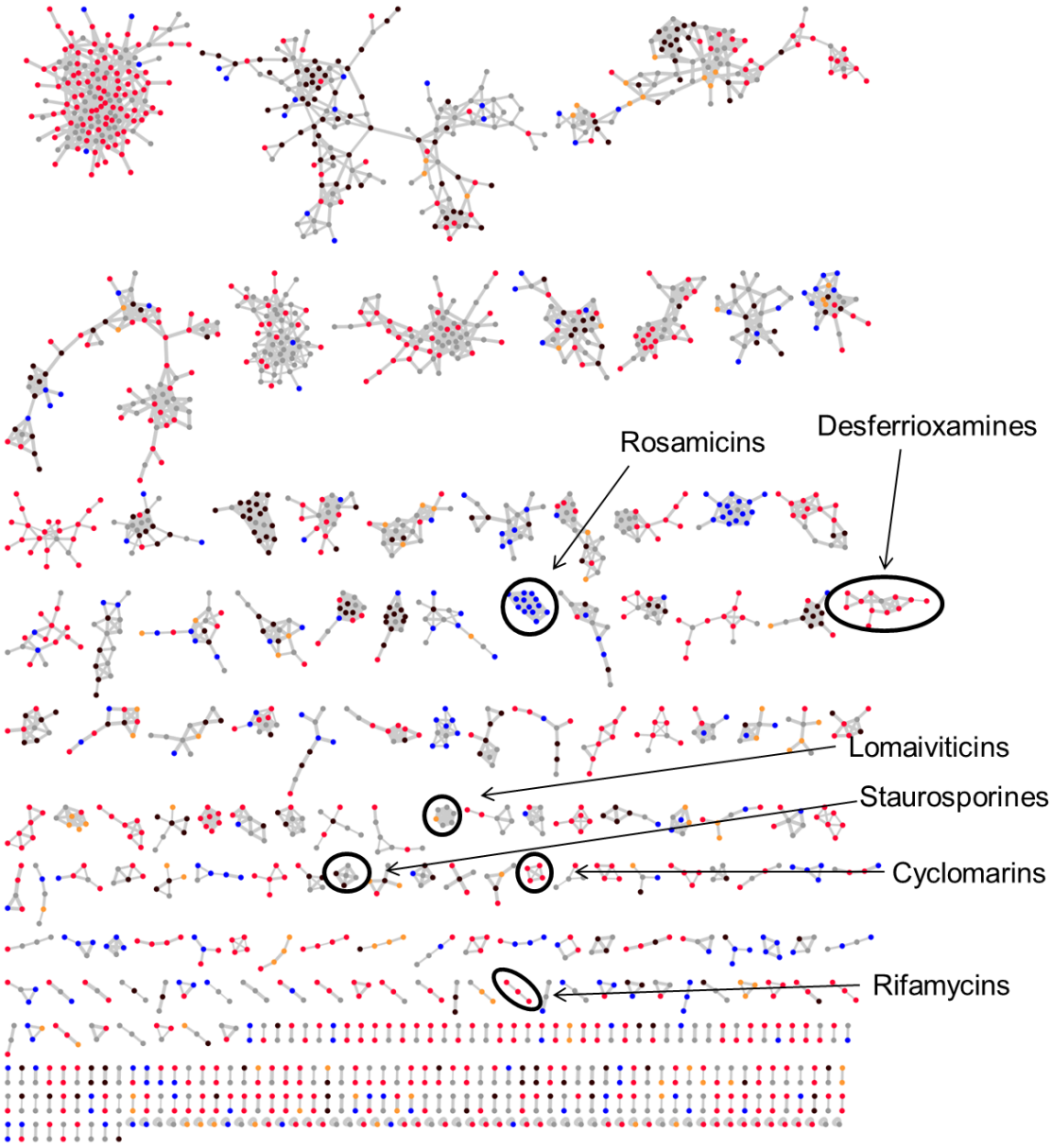


**Figure S3:** Molecular Network of All *Salinispora* Extracts Color Coded By Species. Blue nodes represent ions that were only detected from *S. pacifica* extracts, orange nodes those only found from *S. tropica* extracts and the red nodes represent ions only detected from *S. arenicola* extracts. Black nodes represent ions that found in all three species. Only the clusters containing at least two nodes are shown. See also Figure 2B.

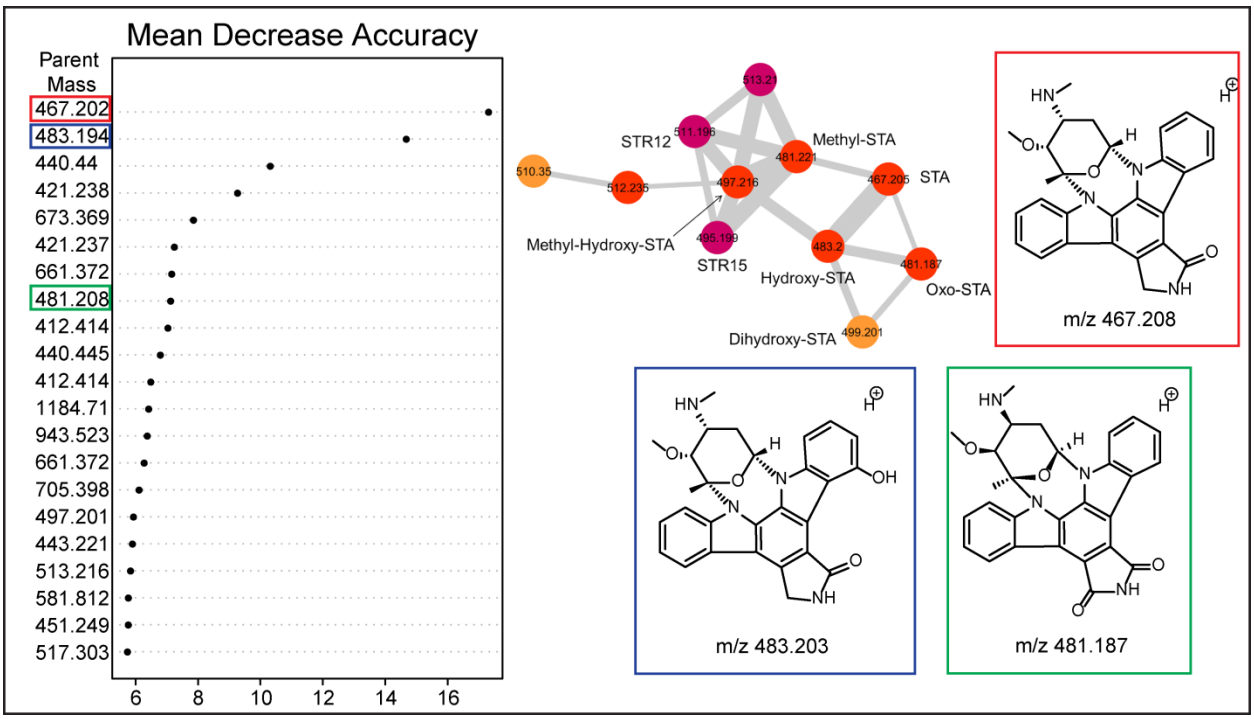


**Figure S4:** Illustration of the major drivers of chemical speciation within the *Salinispora* data. Depicted are the structures of three major examples of this analysis, staurosporine and its hydroxylated and oxidized analogs.

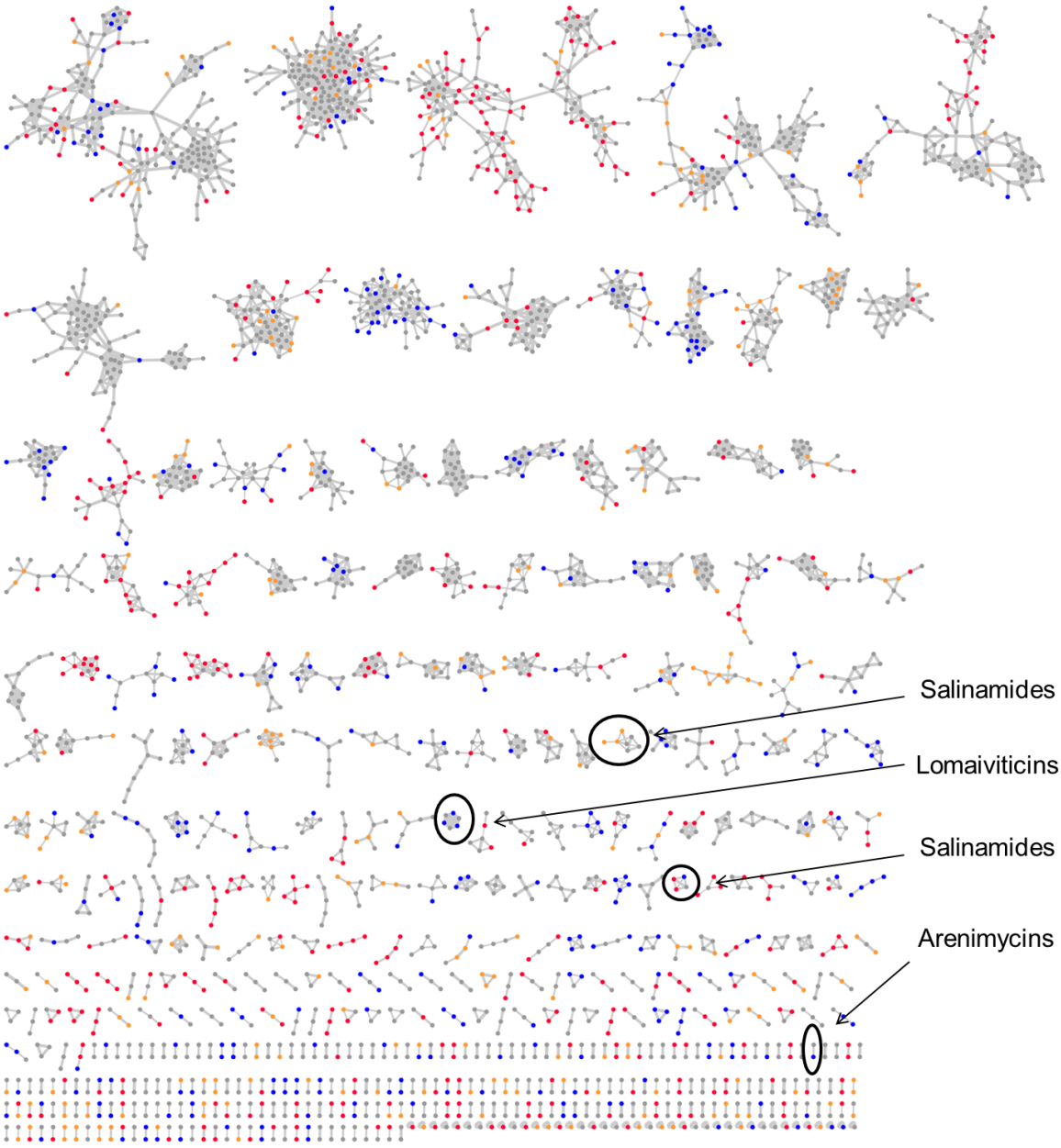


**Figure S5:** Molecular Network of All Generated Extracts Color Coded by Extraction Solvent. Blue nodes represent ions that were only detected in the ethyl acetate extracts, orange nodes those only found in butanol and the red nodes represent ions only detected from methanol extracts. Only the clusters containing at least two nodes are shown. See also Figure 3 A and B.

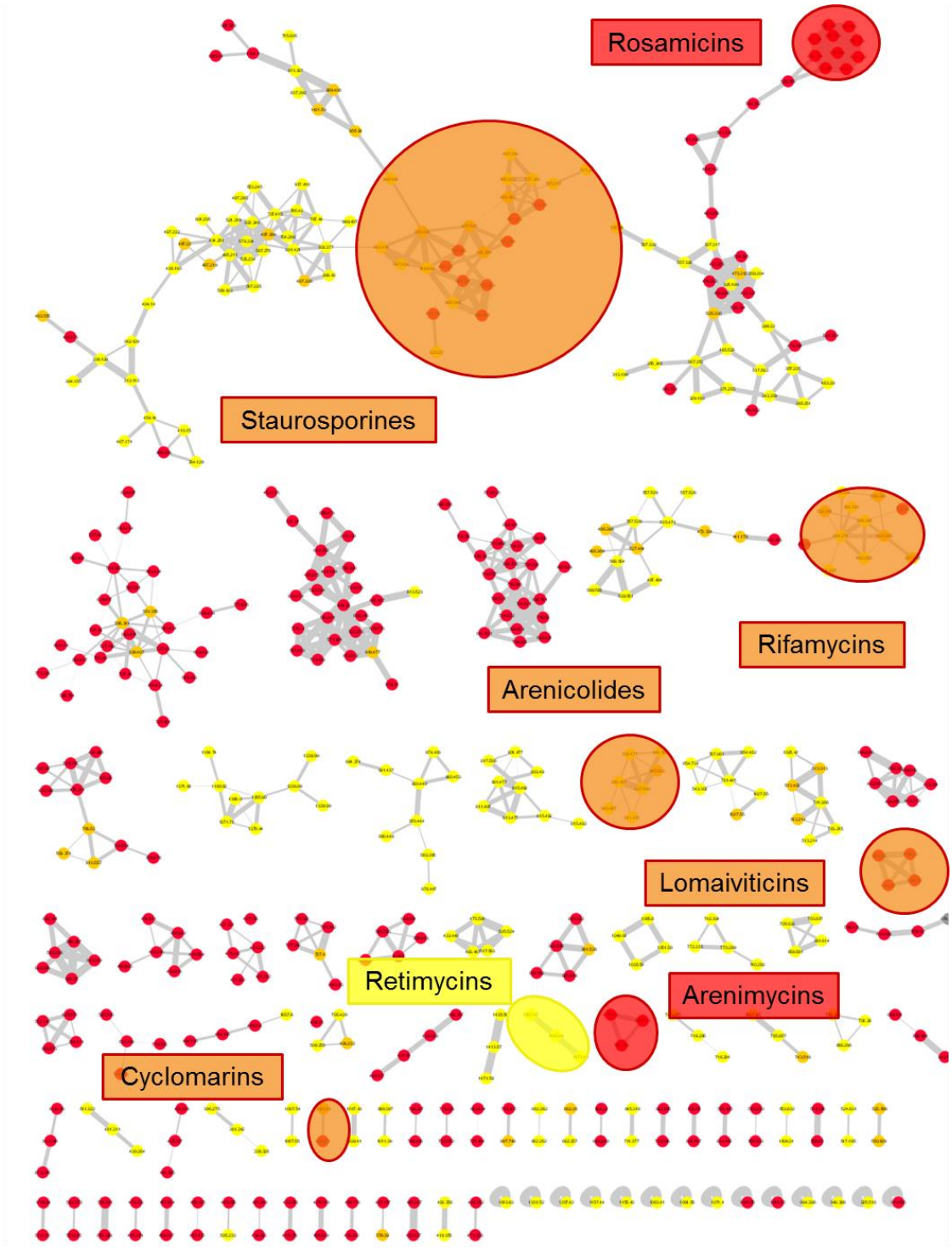


**Figure S6:** Molecular Network of *Salinispora* Extracts from Different Media Phases. Extracts from previous work (Duncan, Crüsemann et al. 2015) (30 *Salinispora* strains, liquid A1, solvent: ethyl acetate) and ethyl acetate extracts of the same 30 strains, grown on solid A1, extracted with ethyl acetate, were networked together. Yellow nodes represent ions extracted from liquid, red nodes from solid medium and orange nodes represent ions extracted from both approaches.

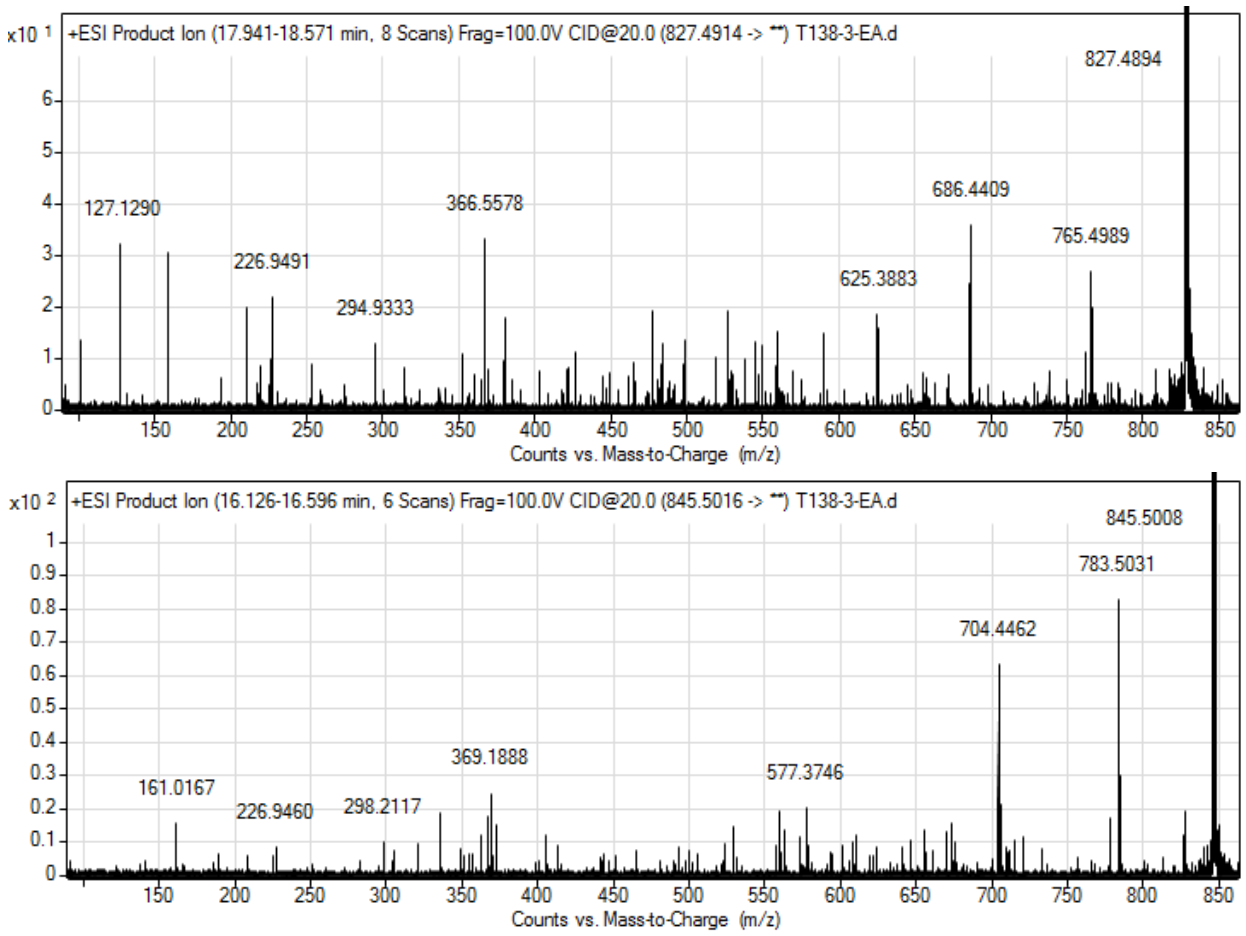


**Figure S7:** Comparison of MS/MS spectra of arenicolide A (upper spectrum, *m/z:* 827.489,) and a novel, formally hydrated arenicolide analogue (lower spectrum, m/z: 845.501) from the ethyl acetate extract of *Salinispora pacifica* CNT-138.

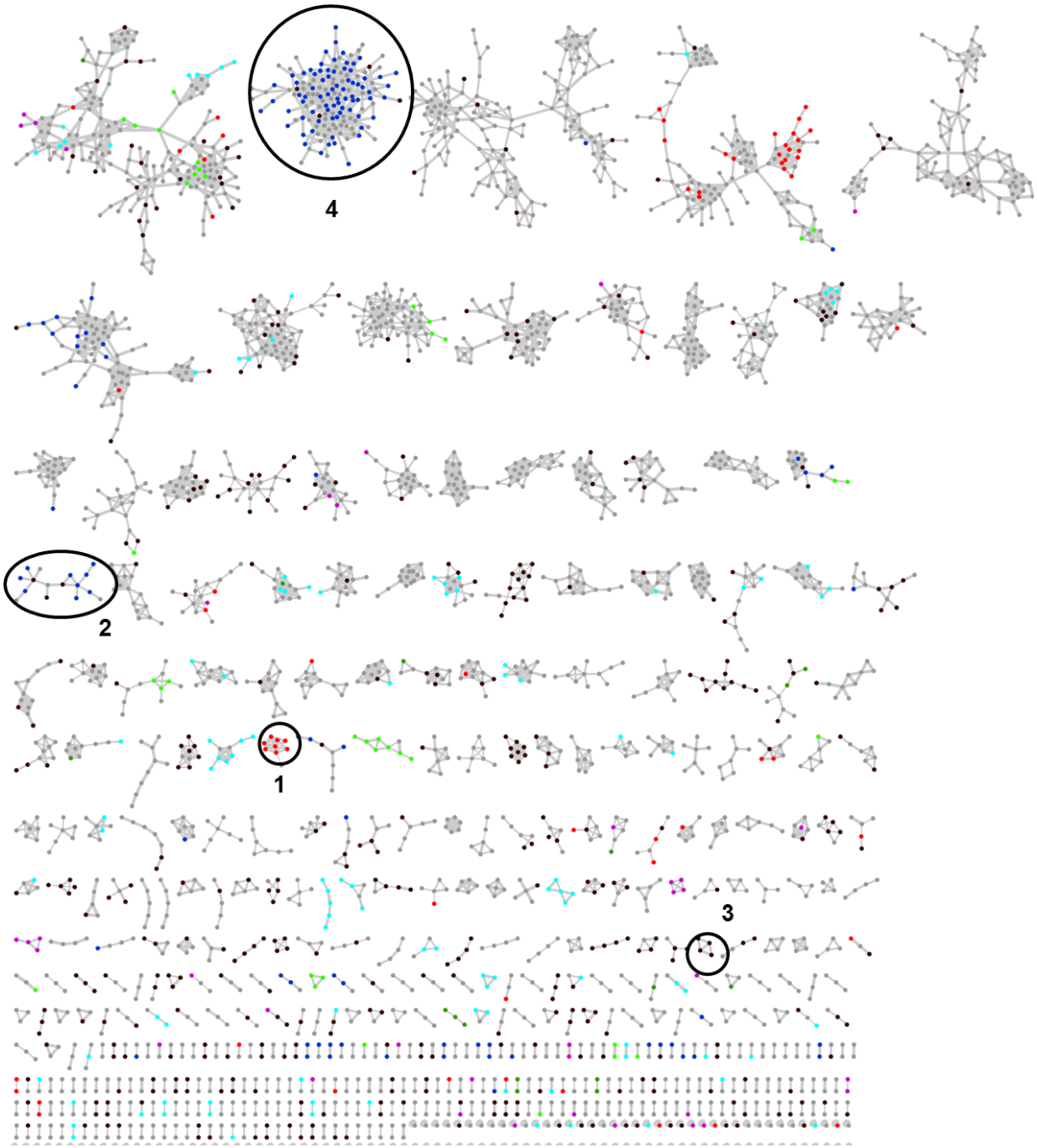


**Figure S8:** Molecular Network of All Acquired Extracts Color Coded By Strain Location. Ions that were only extracted from one location are color-coded as follows Bahamas: yellow, Fiji: black, Guam: red, Hawaii: blue, Palau: purple, Palmyra: light green, Red Sea: dark green, San Diego: light blue. Highlighted are clusters 1, 2, 3 and 4 in the order mentioned in the main text.

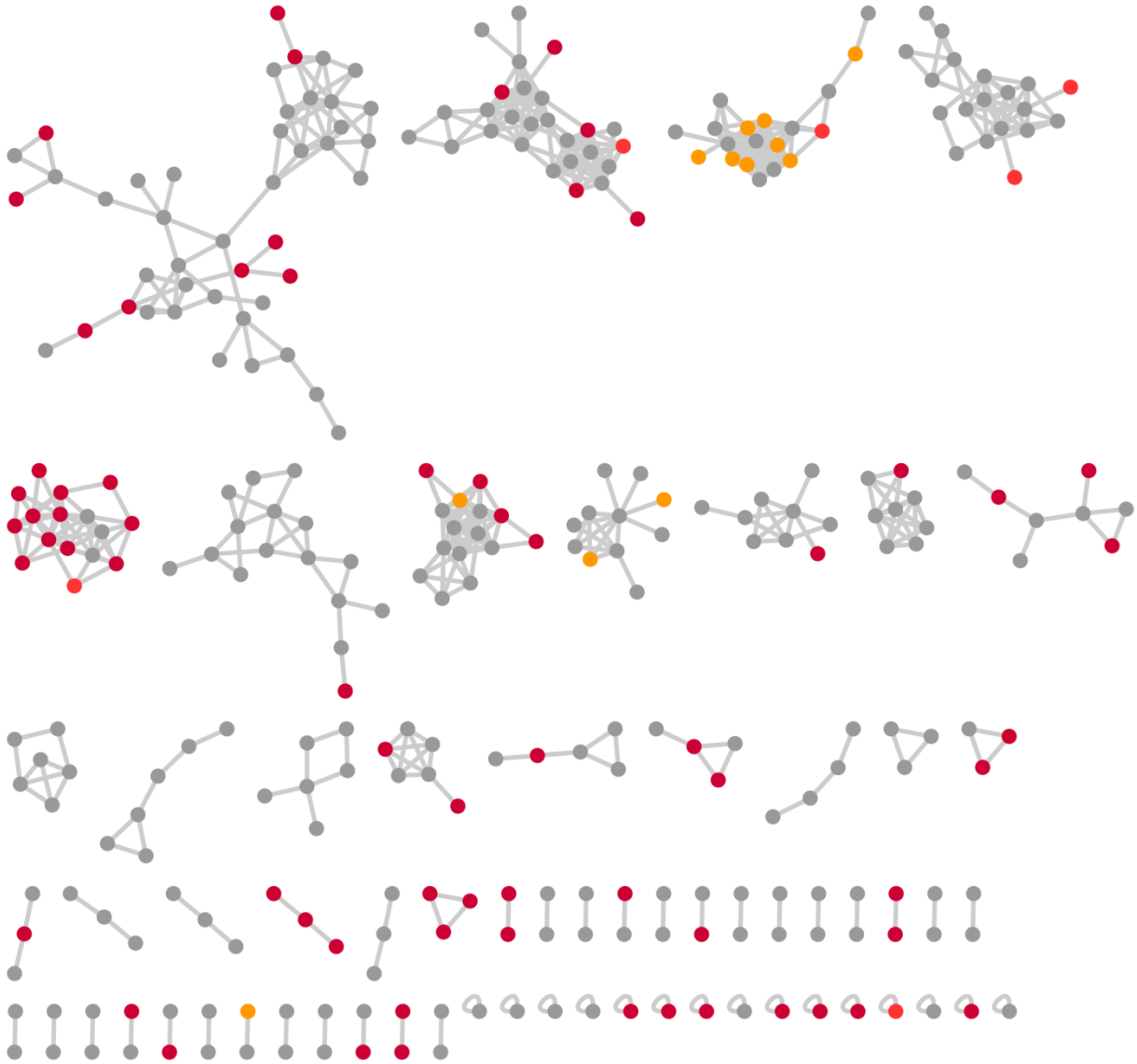

**Figure S9:** Molecular Network of *Salinispora arenicola* CNH877 strains grown in four different liquid media and extracted at three different time points. Ions that were only extracted after one time point are color-coded as follows: 14 days orange, 21 days red, 28 days dark red (see Figure 4).