Supplementary Documents

EFFECTS OF DESICCATION DYNAMICS ON PETRICHOR EMISSIONS IN NEGEV DESERT SOILS

Hai Anh Nguyen[1]*, Hayk Gevogyan[2], Benjamin Poodiack[3], Baris Weber[1], Jörg-Peter Schnitzler[1], Hagar Siebner[3], Osnat Gillor[3], Michael Bonkowski[2], Andrea Ghirardo[1]

[1] Research Unit Environmental Simulation, Helmholtz Center Munich, Neuherberg, Germany
[2] Institute of Zoology, Terrestrial Ecology, Cluster of Excellence on Plant Sciences (CEPLAS), University of Cologne, Cologne, Germany
[3] Zukerberg Institute for Water Research, Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Midreshet Ben Gurion, Israel

*Contact author: haianh.nguyen@helmholtz-munich.com

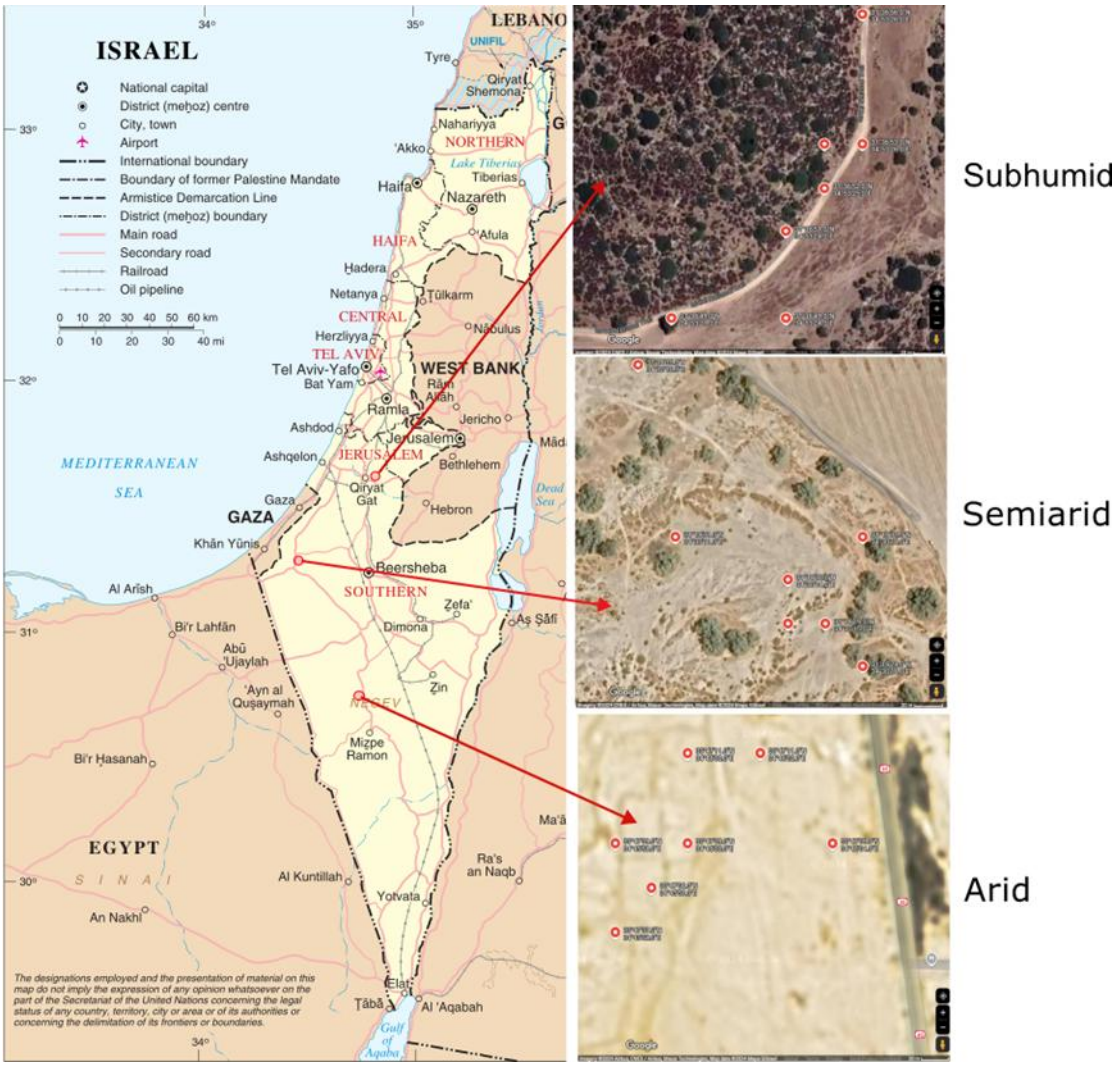


Figure 1. Locations of three sampling sites along the aridity gradient.

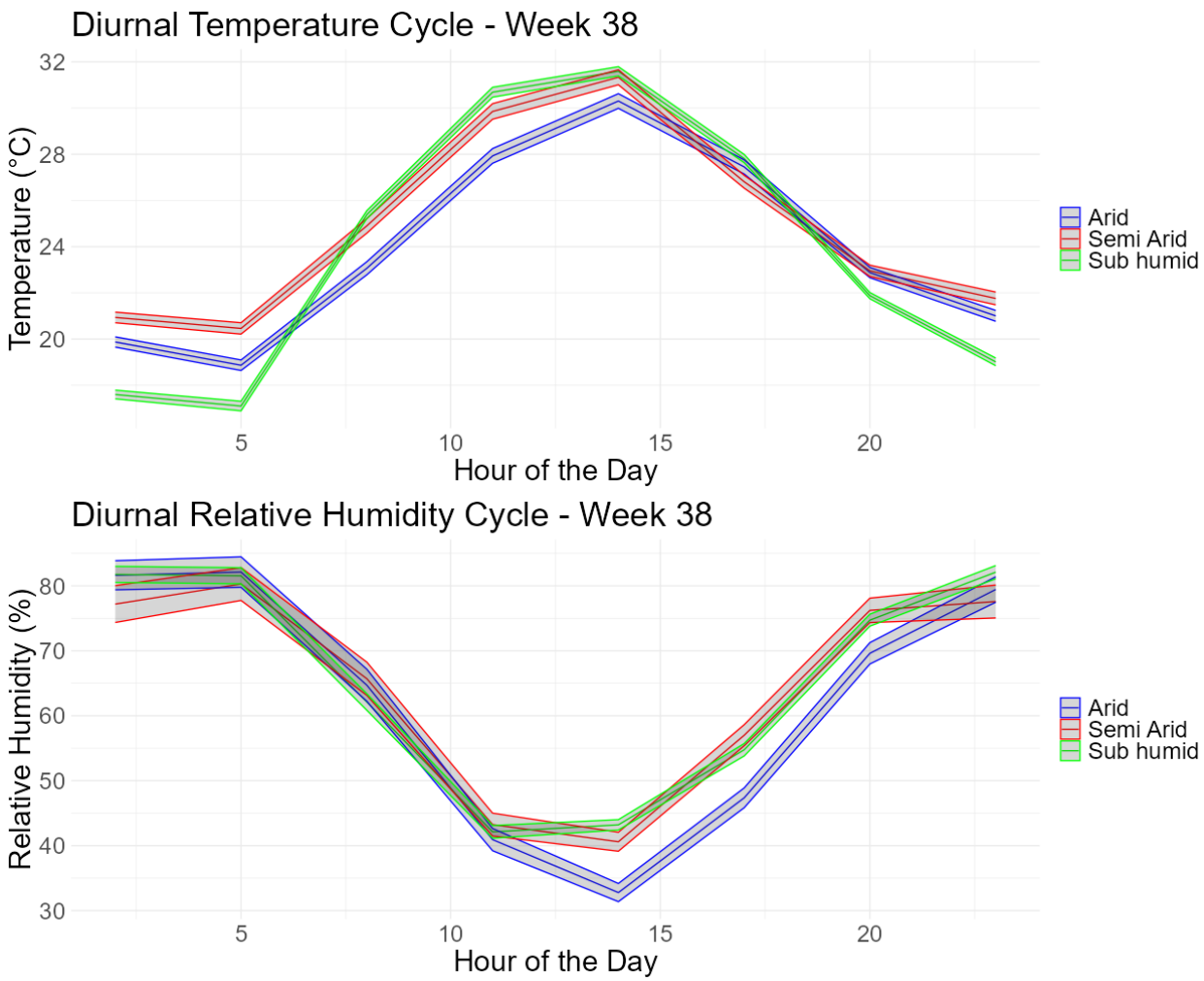


Figure 2. Average climate conditions at three sampling sites during the first week of rainy season over 20 years.

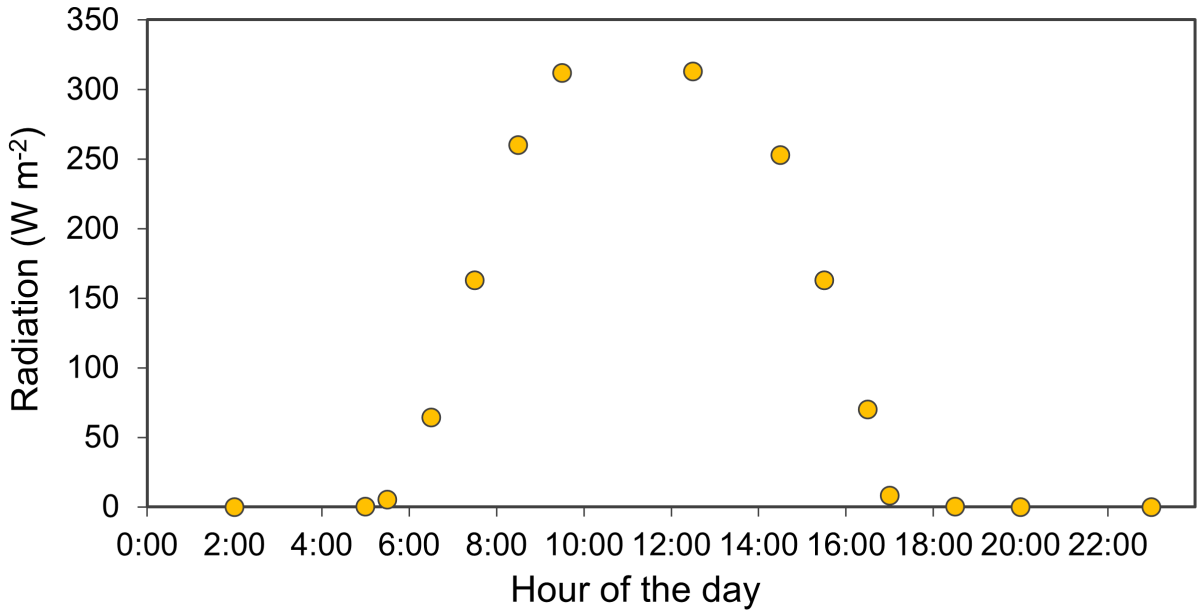


Figure 3. Diurnal global radiation at 300-800 nm simulated inside the climate chamber.

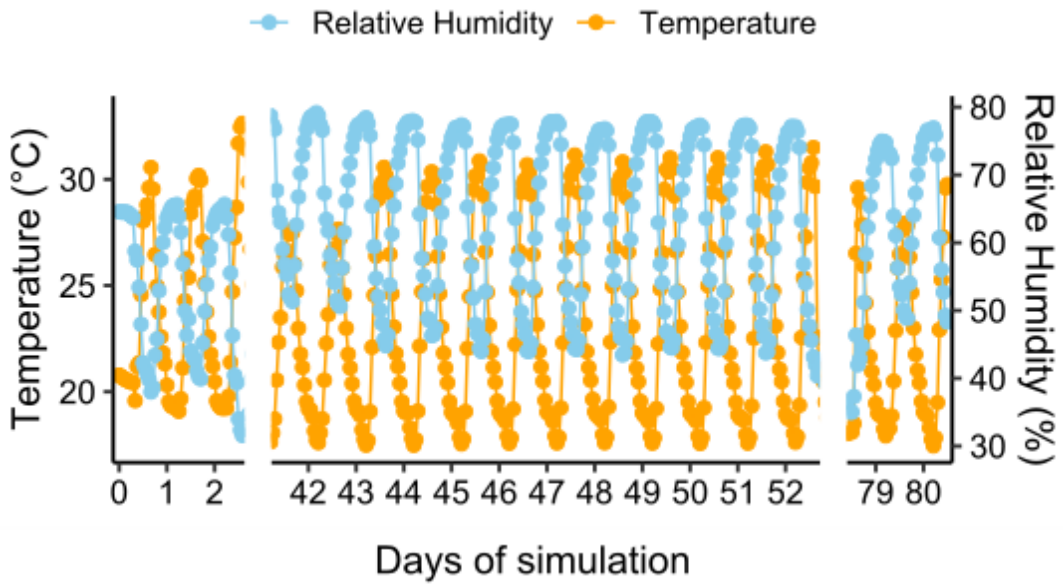


Figure 4. Temperature and relative humidity measured inside the climate chamber.

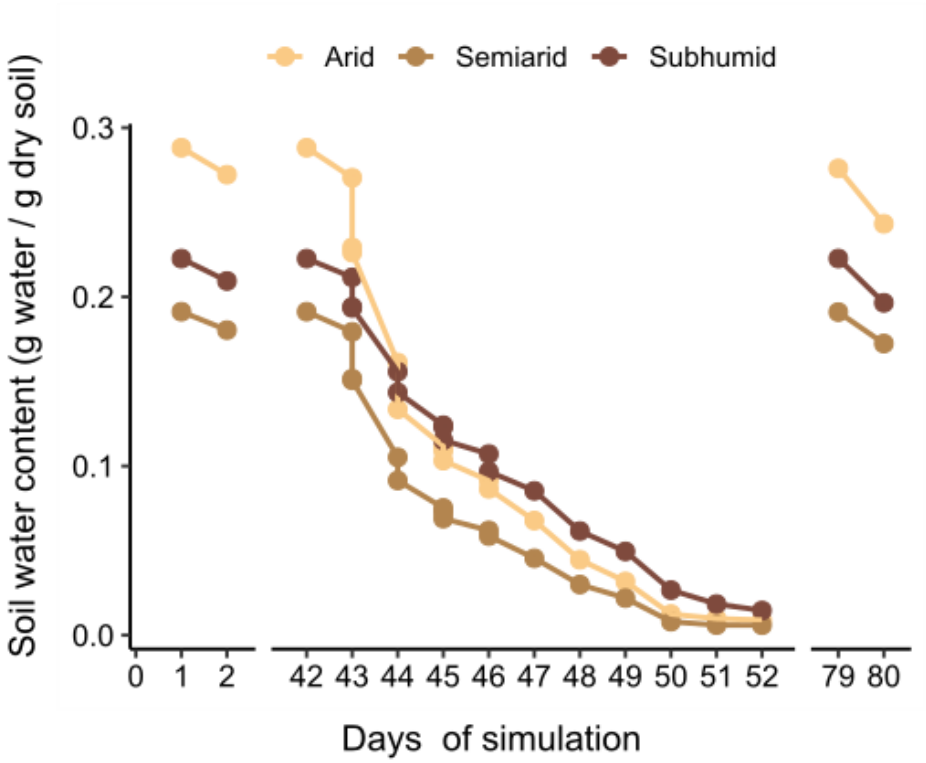


Figure 5. Average water content of soil samples during desiccation simulation.

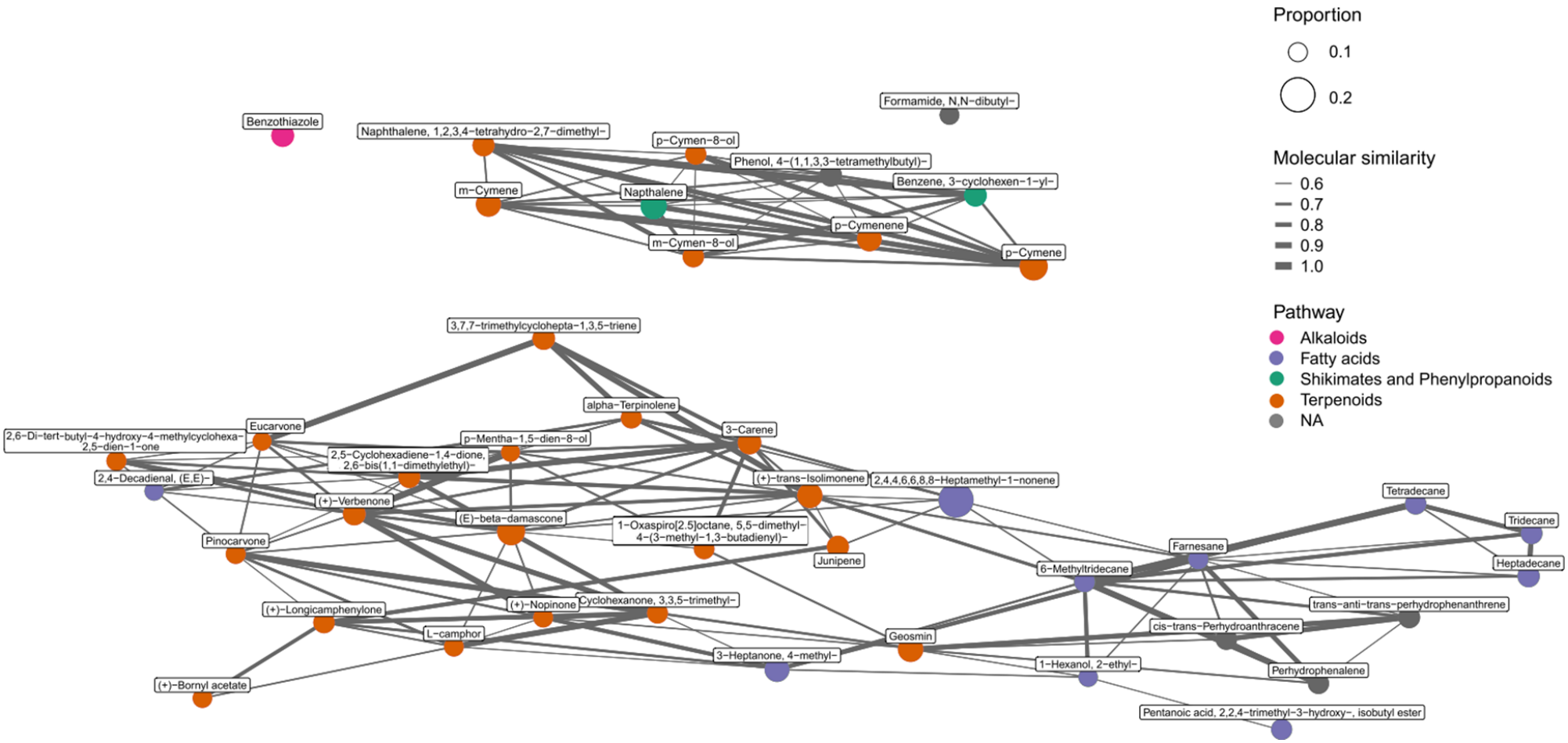


Figure 6. Molecular network analysis of the measured VOCs in all samples using chemodiv R package (v0.3.1; Petrén, Köllner & Junker 2023).

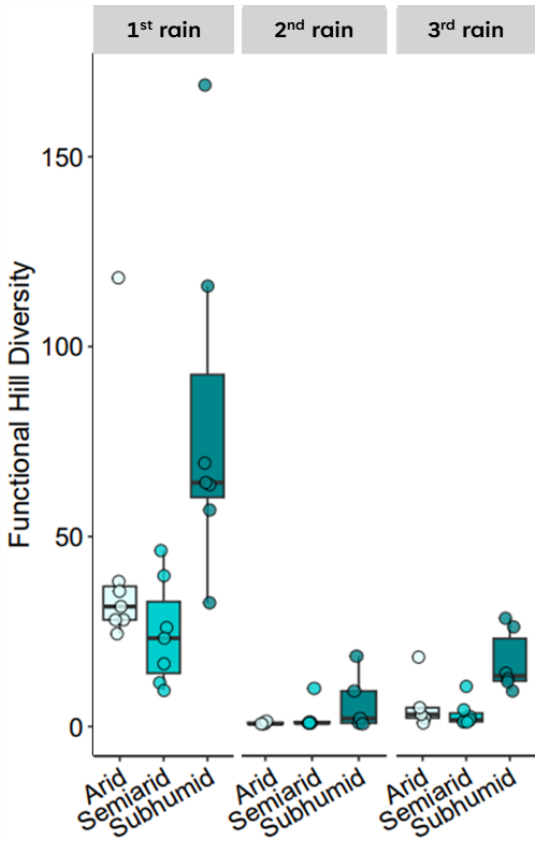


Figure 7. Chemical diversity of petrichor emissions after the three rains with diversity order q = 1 using chemodiv R package.

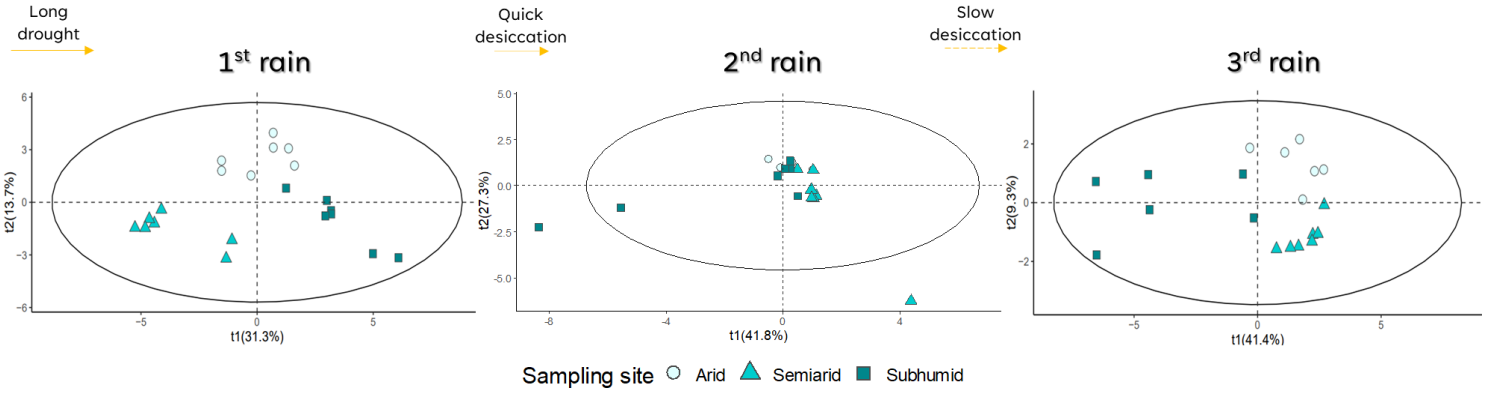


Figure 8. Partial Least Square Discriminant Analysis (PLS-DA) of VOC profiles among 3 aridity sites within each scenario

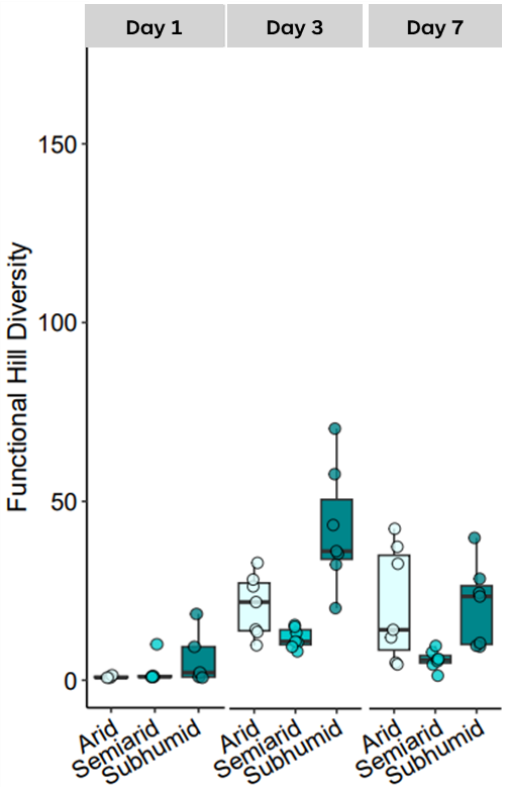


Figure 9. Chemical diversity of petrichor emissions during the desiccation after 2nd rain with diversity order q =1 using chemodiv R package.

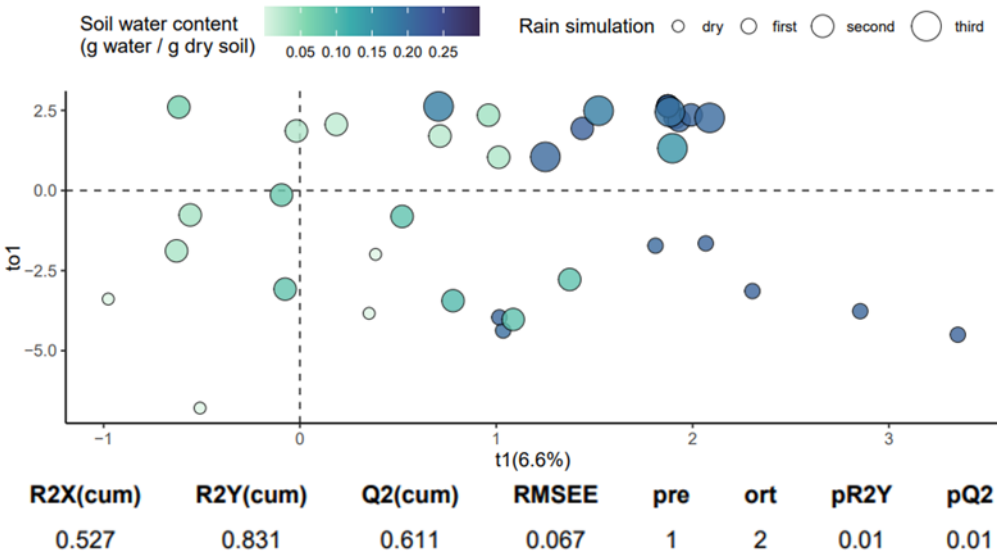


Figure 10. Orthogonal partial least square (OPLS) regression analysis of VOC emissions and soil water content in arid soil samples.

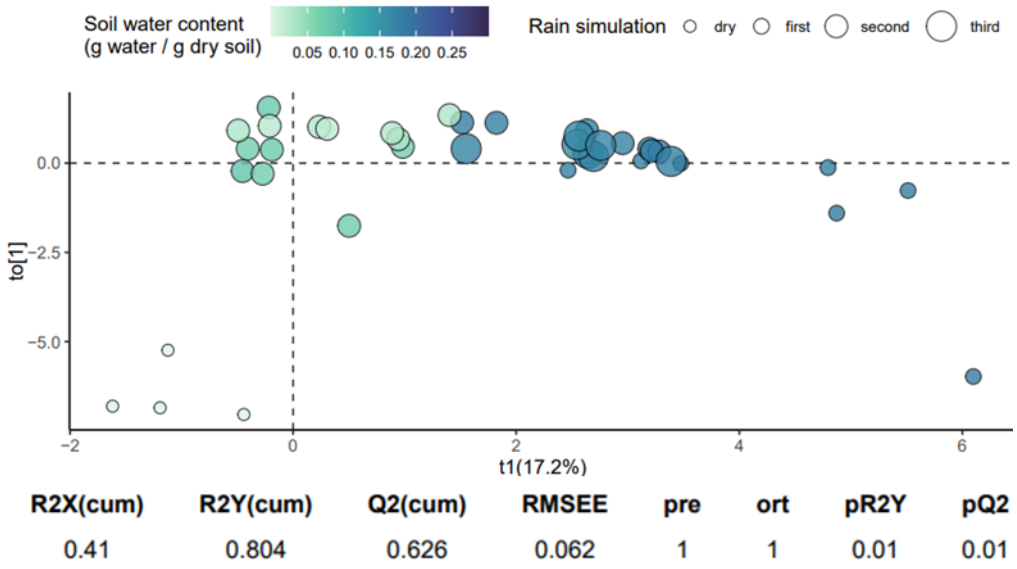
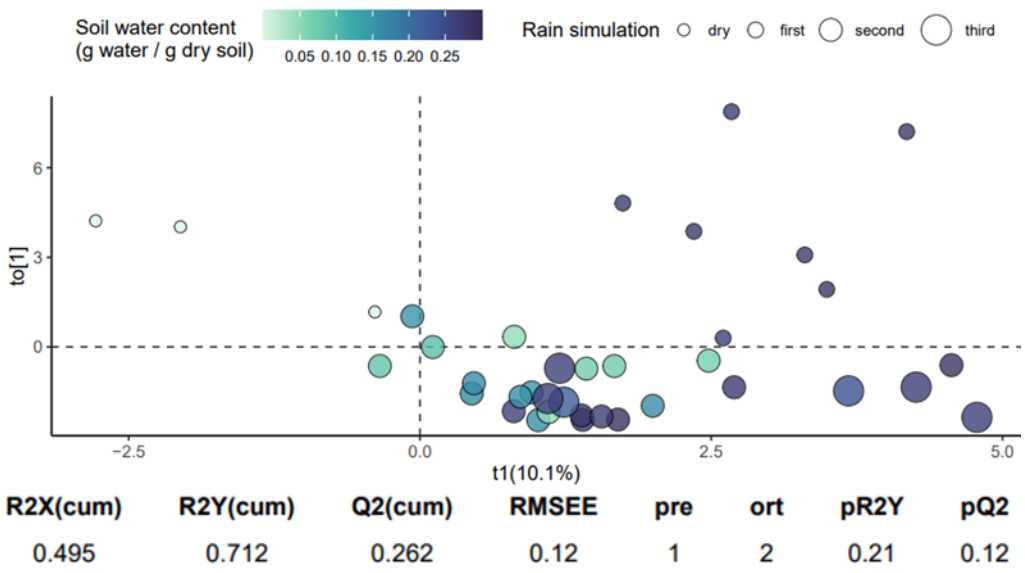


Figure 11. Orthogonal partial least square (OPLS) regression analysis of VOC emissions and soil water content in semiarid soil samples.



R2X(cum)	R2Y(cum)	Q2(cum)	RMSEE	pre	ort	pR2Y	pQ2
0.495	0.712	0.262	0.12	1	2	0.21	0.12

Figure 12. Orthogonal partial least square (OPLS) regression analysis of VOC emissions and soil water content in subhumid soil samples.

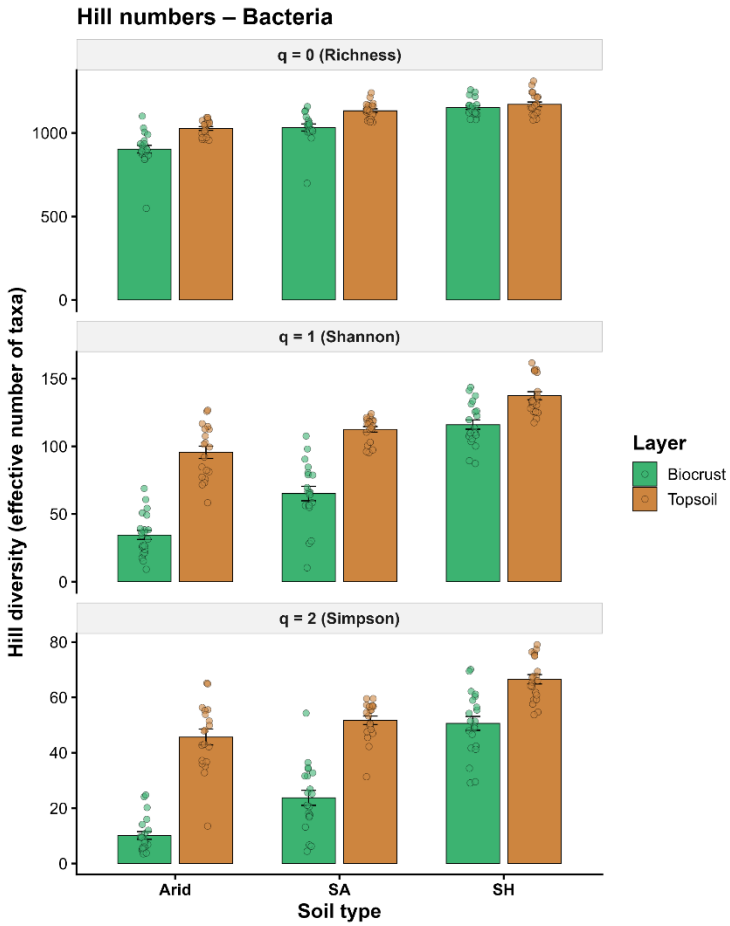


Figure 13. Diversity profile of bacteria across the aridity gradient.

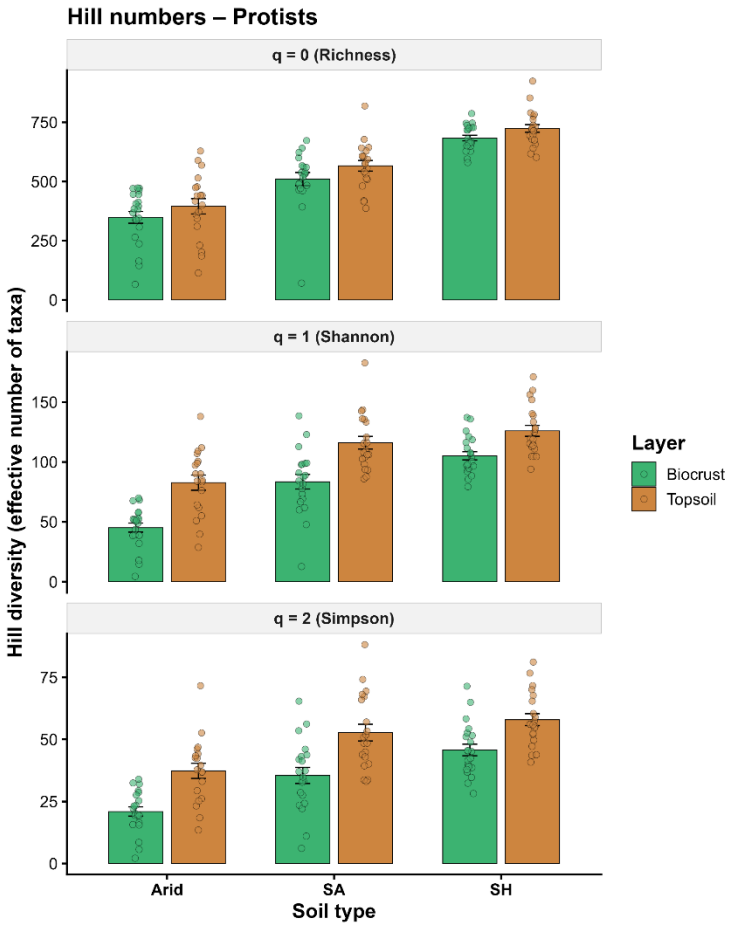


Figure 14. Diversity profile of protists across the aridity gradient.

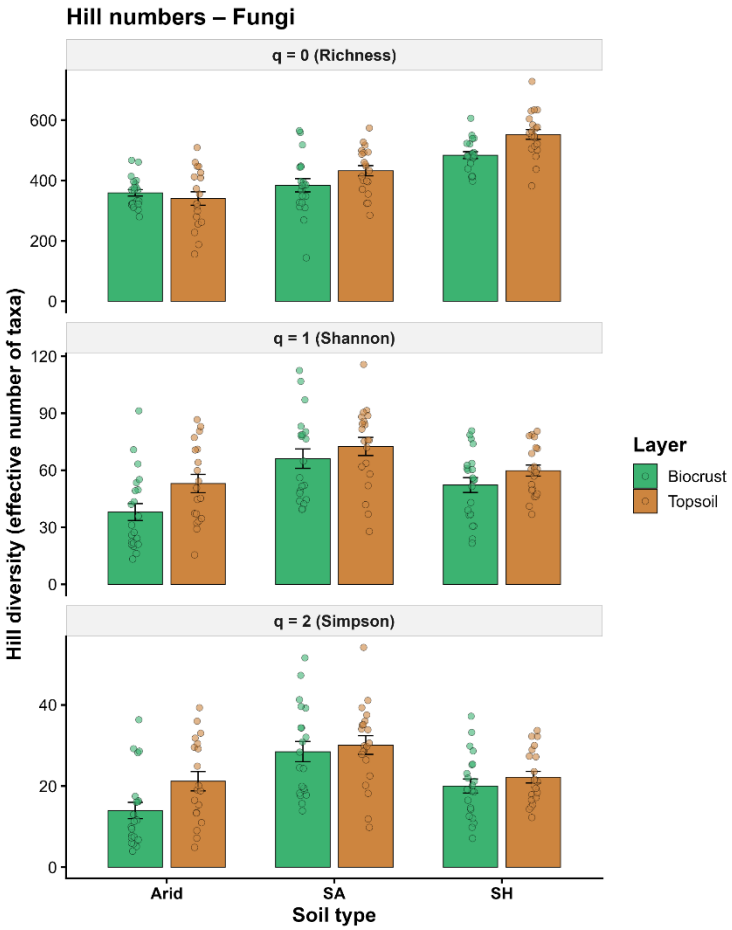


Figure 15. Diversity profile of fungi across the aridity gradient.

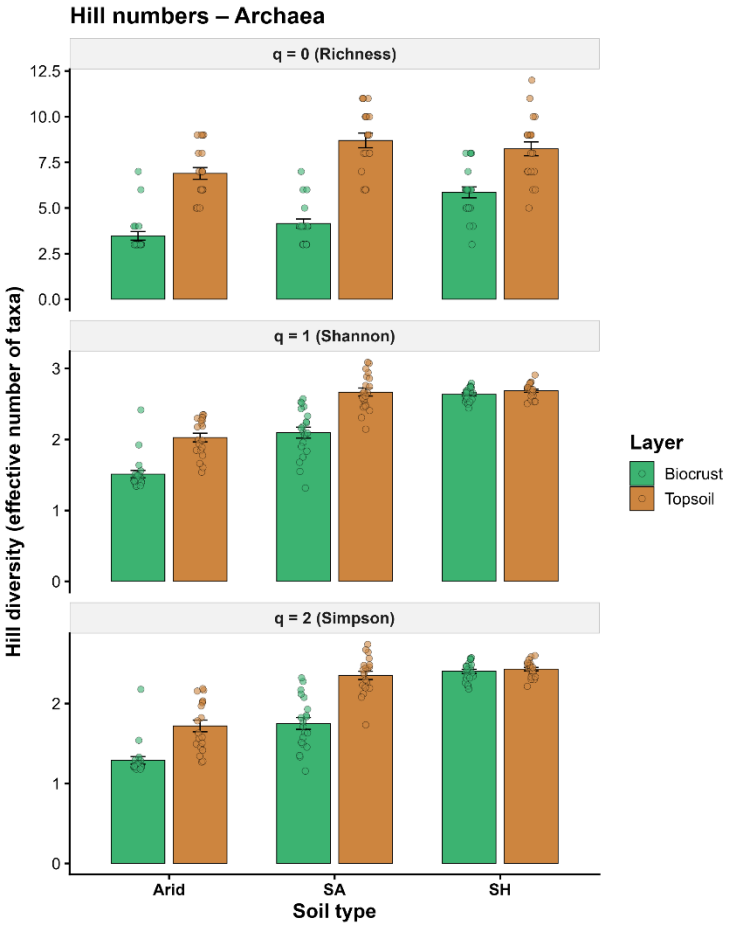


Figure 16. Diversity profile of archaea across the aridity gradient.

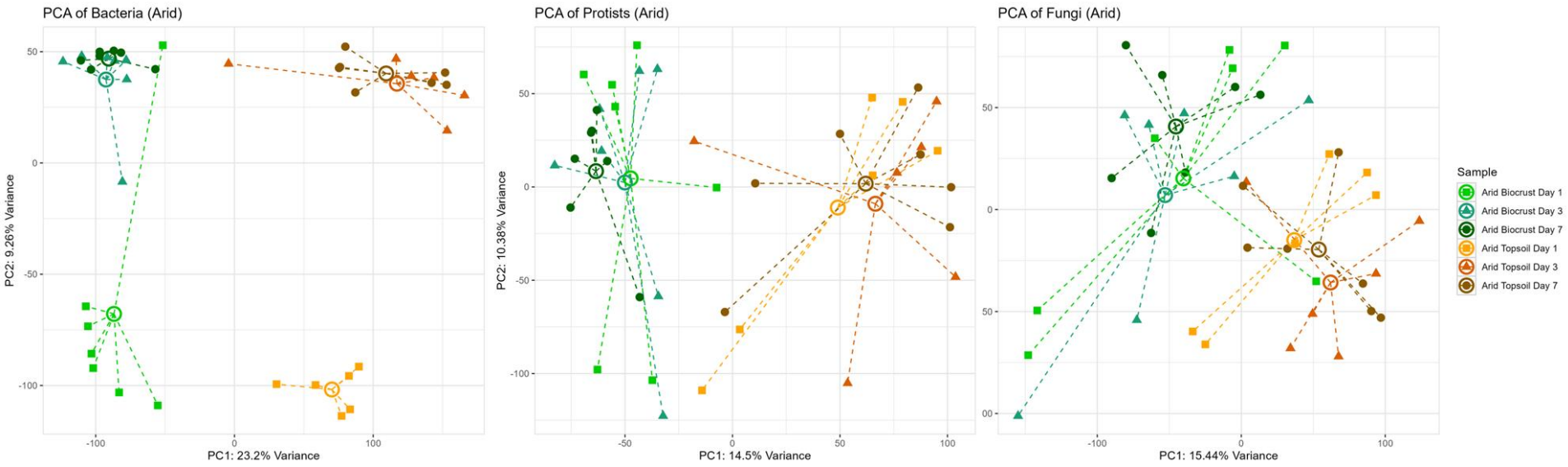


Figure 17. Principle Component Analysis (PCA) of microbial succession in arid soils during slow desiccation. Centered log ratio (CLR) transformation of abundances was perfomed separately for each Taxa.

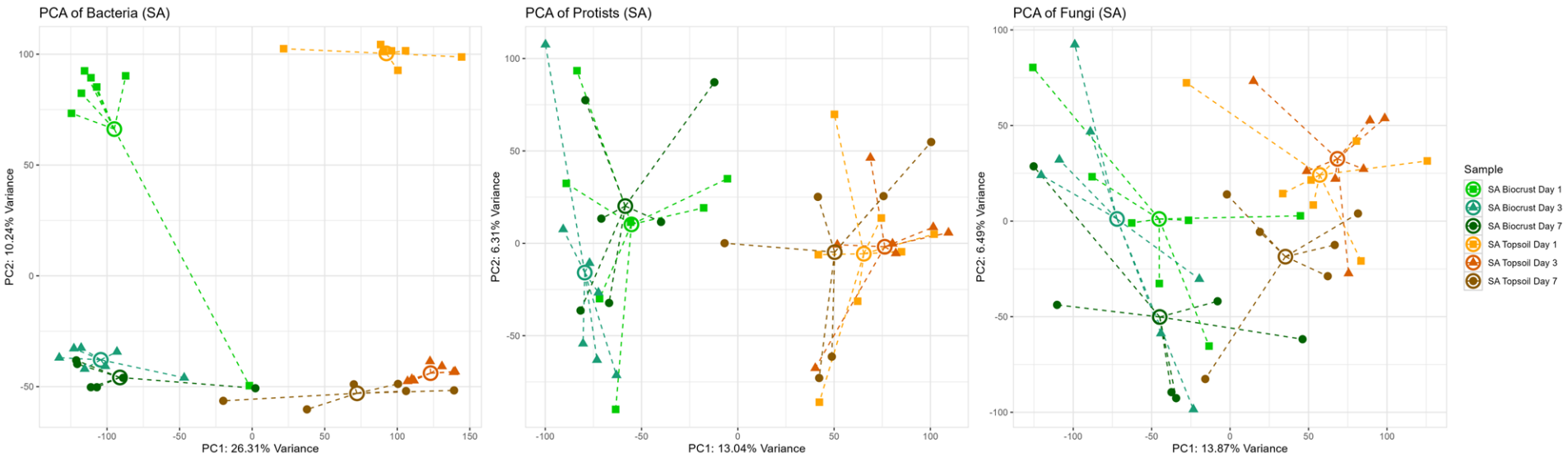


Figure 18. Principle Component Analysis (PCA) of microbial succession in semiarid soils during slow desiccation. Centered log ratio (CLR) transformation of abundances was perfomed separately for each Taxa.

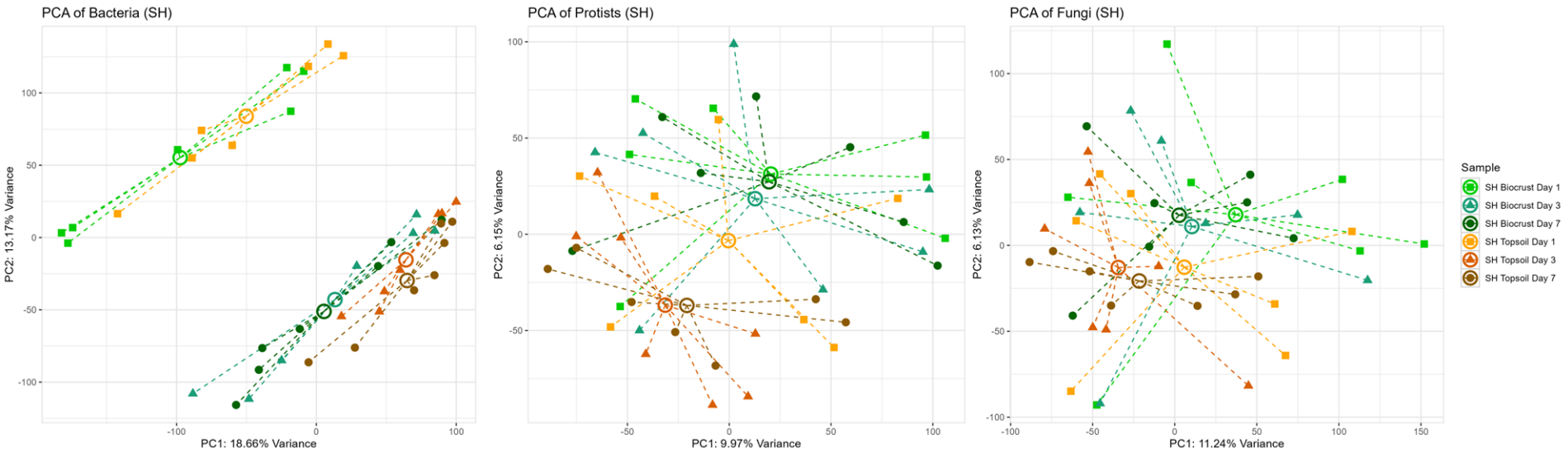


Figure 19. Principle Component Analysis (PCA) of microbial succession in subhumid soils during slow desiccation. Centered log ratio (CLR) transformation of abundances was perfomed separately for each Taxa.