

A multi-analytical approach to infer mineral–microbial interactions applied to petroglyph sites in the Negev desert of Israel

Laura Rabbachin¹, Guadalupe Piñar¹, Irit Nir², Ariel Kushmaro², Mariela J. Pavan³, Elisabeth Eitenberger⁴, Monika Waldherr⁵, Alexandra Graf⁵, Katja Sterflinger¹

Supplementary material

Table S1: Details of the sequencing runs performed on the four stone samples AV1, AV3, EZ1 and EZ4 using the MinIon device (Nanopore sequencing technology).

Sample	Raw data		Filtered data					
	Total reads ^a	Total yield (Gbases)	Total reads ^b	Unclassified reads	Classified reads ^c	Mean QS ^d	Mean length (Kb)	Time run (h)
AV1	1,809,737	8.9	1,562,173	1,516,827	45,346	13.0	4.9	48
AV3	1,610,674	7.6	1,457,067	1,428,825	28,242	13.0	4.8	48
EZ1	1,240,915	5.1	1,080,553	1,060,847	19,706	13.4	4.1	48
EZ4	3,329,384	15.7	2,885,034	2,818,645	66,389	13.2	4.8	48

^a Total number of reads generated in the sequencing run. ^b Total number of reads after filtering. ^c Number of reads classified phylogenetically. ^d Mean Quality Score.

Figure S1: Charts of the meteorological measurements from the in-situ monitoring system at Carmey Avdat farm in the period between January and April 2021 showing the amount of precipitation (a) and the fluctuations of maximum and minimum air temperature (b).

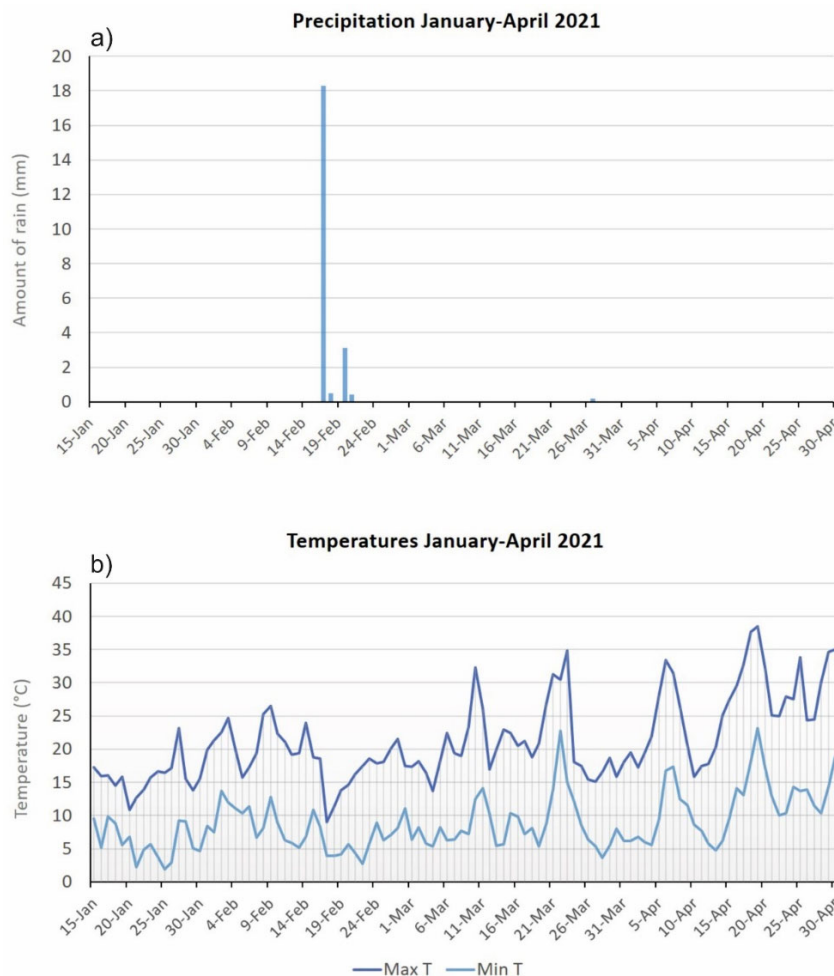


Figure S2: Relative abundance of the bacterial communities at the class level (cutoff 0.5%).

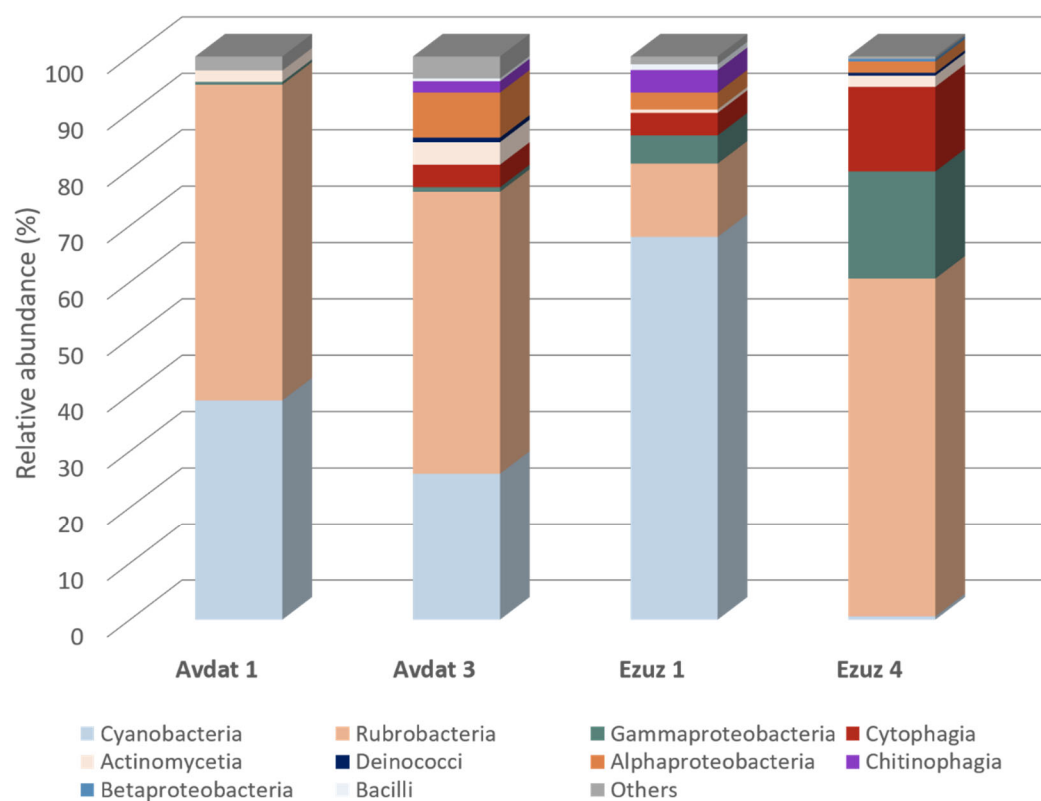


Figure S3: Relative abundance of the fungal communities at the class level (cutoff 0.5%).

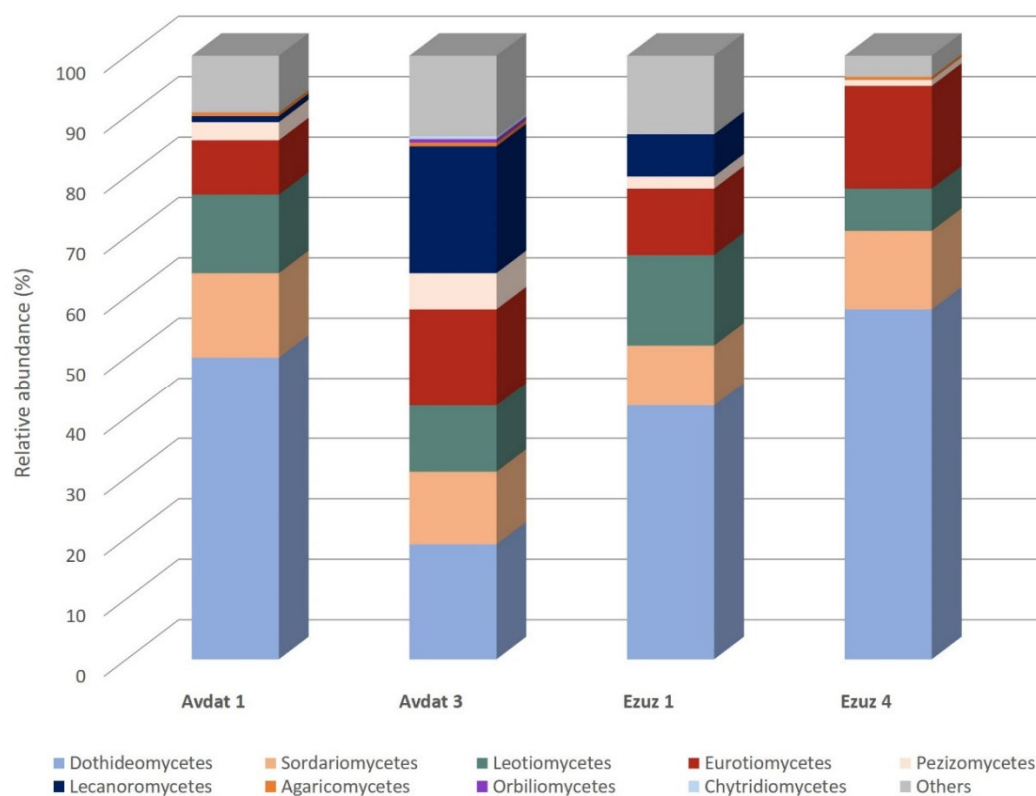


Figure S4: 3D pictures of the stone slabs acquired with the Keyence digital microscope in normal light: (a) example of the black shiny varnish with accretion of brownish material and accumulation of dust grains in the depressions (sample AV1), (b) transversal section of sample AV1 showing the bright reddish layer intermixed with the stone grains, (c) example of the black crust being more intermixed with the reddish layer (sample AV3), (d) detail of the orange crust of sample EZ4, (e-f) examples of cyanobacterial aggregates on the samples.

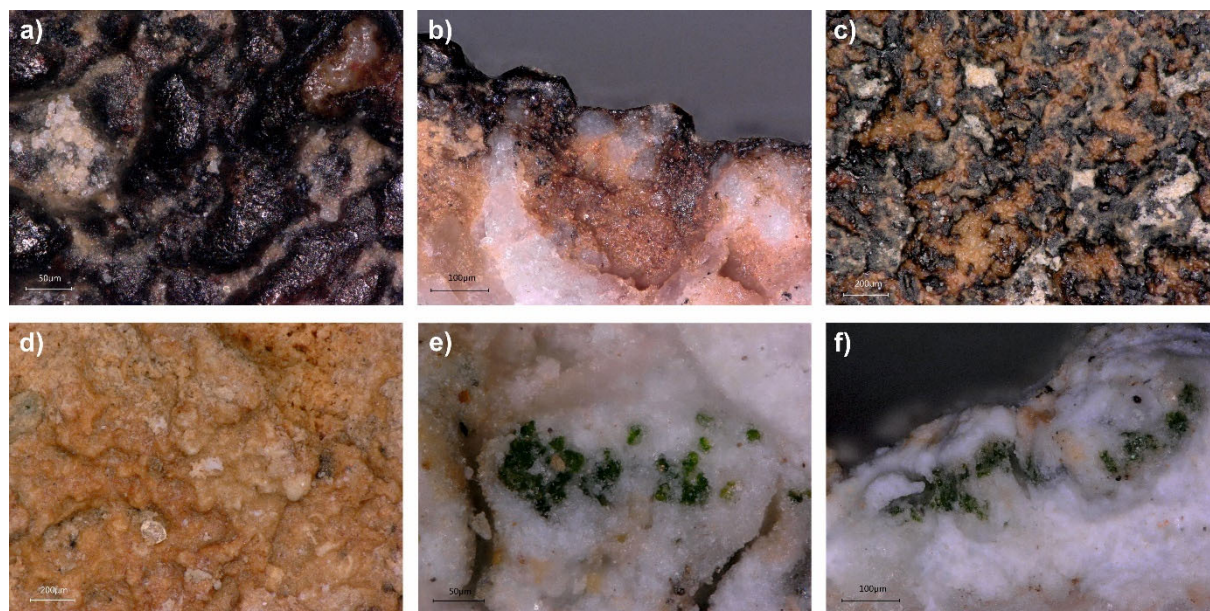


Figure S5: SEM image in backscattered electron mode (a) and digital optical microscopy picture (b) of a detail of the weathered area of sample EZ3 (dashed box of Figure 7c) with EDX elemental mappings (Si, Mg, K, Al, Mn and Fe) showing the black crust along the edges of the pores and the accumulation of detrital particles on the depressions of the crust.

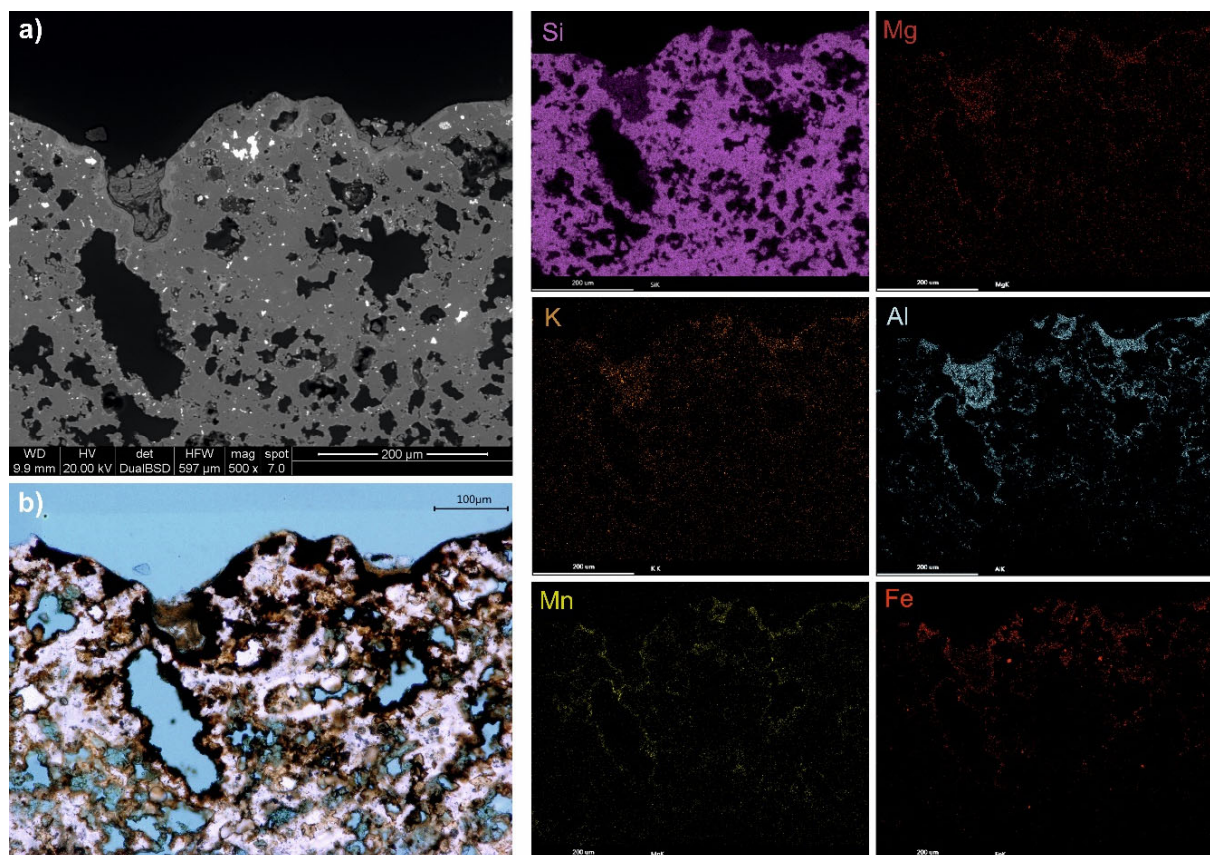


Figure S6: SEM image in backscattered electron mode (a) and digital optical microscopy picture (b) of a cyanobacteria colonized area with EDX elemental mappings (Si, Ca, Fe, Al, Mg and K).

