diversity

MDPI

Supplementary material

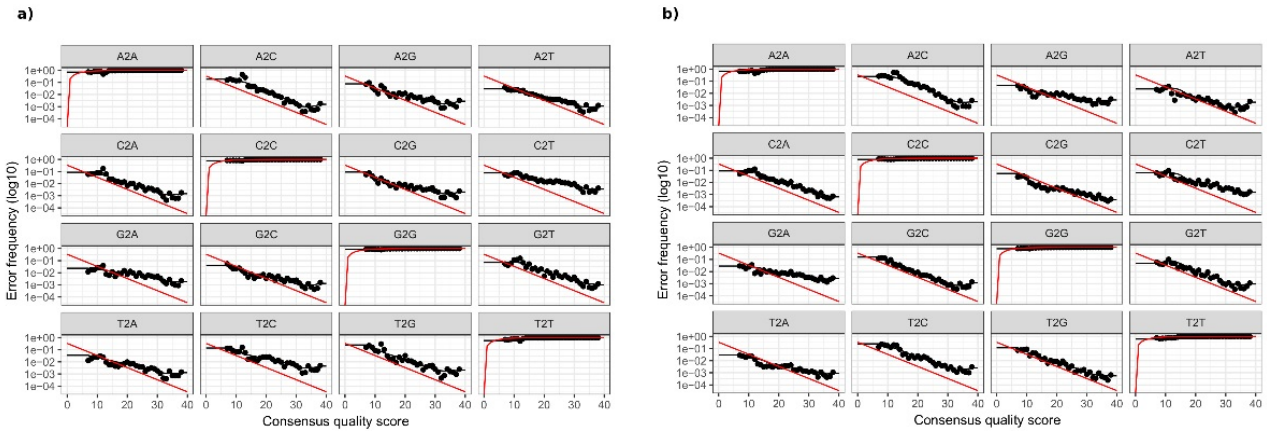

Figure S1. Plots of the estimated error rates of the amplicon dataset. a) error rates of the forward reads; b) error rates of the reverse reads.

Table S1. Number of reads throughout the filtering steps.

	sample	*input*	*noadapt*	*filtered*	*denoisedF*	*denoisedR*	*merged*	*nonchim*	*bacteria*	*no_mitochondria*	*no_chloroplast*
1	LPRS	223115	204311	151498	151498	151498	133935	126135	126109	93474	93474
2	LSV11	202925	183750	134883	134883	134883	127274	111530	111457	97594	97594
3	CPA	181298	151308	98792	98792	98792	97494	95695	93770	35633	35633
4	LPBS	178961	165903	118071	118071	118071	97408	86795	86765	75480	75480
5	LSV13	199820	186210	132537	132537	132537	98187	89817	89779	79823	79823
6	CPR	182289	162477	117142	117142	117142	114832	110450	109040	91753	91753
7	LSV14	221221	201308	155183	155183	155183	131527	119093	119093	66666	66666
8	CPRS	172642	163383	121260	121260	121260	113163	103330	103112	65113	65113
9	CPBS	182991	174102	130772	130772	130772	123212	110396	110384	82461	82461
10	CSF94	101778	99104	78418	78418	78418	77791	75875	75875	75824	75824
11	CSF56	97256	94694	71858	71858	71858	71355	70244	70244	70231	70231
12	LPA	158077	119479	87903	87903	87903	87111	85836	85826	18265	18265
13	CSCS	119675	116463	89593	89593	89593	87015	77729	77603	77499	77499
14	LPR	138645	119253	87225	87225	87225	86073	84471	80596	45323	45323

Table S2. Relative abundances of reads through the filtering steps.

	sample	*input*	*noadapt*	*filtered*	*denoisedF*	*denoisedR*	*merged*	*nonchim*	*bacteria*	*no_mitochondria*	*no_chloroplast*
1	LPRS	1	0.91572	0.67901	0.67901	0.67901	0.60030	0.56534	0.56522	0.41895	0.41895
2	LSV11	1	0.90551	0.66469	0.66469	0.66469	0.62720	0.54961	0.54925	0.48094	0.48094
3	CPA	1	0.83458	0.54491	0.54492	0.54492	0.53776	0.52783	0.51721	0.19654	0.19654
4	LPBS	1	0.92703	0.65976	0.65976	0.65976	0.54430	0.48500	0.48483	0.42177	0.42177
5	LSV13	1	0.93189	0.66328	0.66328	0.66328	0.49138	0.44949	0.44930	0.39947	0.39947
6	CPR	1	0.89132	0.64262	0.64262	0.64262	0.62994	0.60591	0.59817	0.50334	0.50334
7	LSV14	1	0.90999	0.70148	0.70148	0.70148	0.59455	0.53834	0.53834	0.30136	0.30135
8	CPRS	1	0.94637	0.70238	0.70238	0.70238	0.65548	0.59852	0.59726	0.37716	0.37716
9	CPBS	1	0.95142	0.71464	0.71464	0.71464	0.67332	0.60329	0.60322	0.45063	0.45063
10	CSF94	1	0.97373	0.77048	0.77048	0.77048	0.76432	0.74550	0.74550	0.74500	0.74500
11	CSF56	1	0.97366	0.73885	0.73885	0.73885	0.73368	0.72226	0.72226	0.72213	0.72213
12	LPA	1	0.75583	0.55608	0.55608	0.55608	0.55107	0.54300	0.54294	0.11554	0.11554
13	CSCS	1	0.97316	0.74864	0.74864	0.74864	0.72709	0.64950	0.64845	0.64758	0.64758
14	LPR	1	0.86013	0.62912	0.62912	0.62912	0.62082	0.60926	0.58131	0.32690	0.32690

Table S3. Geochemical data of the sampling sites.

	ID			*E*	*N*	*ΦCO₂ (g m⁻² day⁻¹)*	*T (°C)*	*depth (cm)*	*δ¹³C-CO₂*	*δ¹³C-CH₄*	*Carbon dioxide*	*Hydrogen sulfide*	*Nitrogen*	*Argon*	*Oxygen*
											mmol/mol	mmol/mol	mmol/mol	mmol/mol	mmol/mol
1	**CPBS**	33	S	496370	4250673		29	5	8,60	-45,4	16	0	965	14	5,2
2	**LPBS**	33	S	496435	4252285	2,6	30	30	-15,5	-47,7	21	0	961	15	3,1
3	**CSF94**	33	S	496754	4250890		94	5	1,11	-47,2	484	0,97	507	5,1	3,3
4	**CSF56**	33	S	496763	4250898		56	5	1,96	-44,8	287	0,38	702	7,3	3,9
5	**CSCS**	33	S	496816	4250933		31	5	2,39	-5,50	85	0,07	877	10	28
6	**LSV11**	33	S	496454	4252269	53	37,5	5	-1,15	6,47	389	0,36	567	7,1	36
7	**LSV13**	33	S	496482	4252310	6,5	30,9	30	-8,13	-46,2	15	0	963	13	8,7
8	**LSV14**	33	S	496460	4252285	346	35,2	10	-3,33	4,30	411	0,58	537	7,2	44

		Hydrogen	**Methane**	**Ethane**	**Propane**	**i-Butene**	**n-Hexane**	**i-Octane**	**Decane**	**Undecane**	**Benzene**	**Toluene**	**m-p-Xylene**	**Urea**	**Acetone**
		mmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol
1	**CPBS**	0	2,8	0,050	0,0081	0,0015	0,0026	0	0	0	0,021	0,0009	0,0011	0	0,0021
2	**LPBS**	0	5,7	0,070	0,0094	0,0024	0,0038	0	0	0	0,050	0,0012	0,0016	0	0,0018
3	**CSF94**	0,15	6,2	0,23	0,085	0,0056	0,0066	0,0005	0,0009	0,0004	0,11	0,013	0,015	0	0,0005
4	**CSF56**	0,07	7,1	0,19	0,066	0,0038	0,0089	0,0007	0,0011	0,0005	0,050	0,0009	0,0011	0	0,0023
5	**CSCS**	0	2,3	0,090	0,021	0,0029	0,0035	0	0,0005	0	0,016	0,0005	0,0007	0	0,0026
6	**LSV11**	0,44	1,9	0,84	0,21	0,039	0,045	0,0012	0,0015	0,0006	0,23	0,021	0,029	0	0
7	**LSV13**	0	5,1	0,050	0,0077	0,0027	0,0039	0	0	0	0,050	0,0012	0,0013	0	0,0015

8	**LSV 14**	0,11	1,7	0,71	0,16	0,022	0,028	0,0015	0,0019	0,0008	0,12	0,012	0,015	0	0,0006
		2-Butanone	**Ethyl butanoate**	**Ethyl hexanole**	**Dimethyl cyclehexanol**	**Acetophenone**	**Methylbutan-2-one**	**Dimethyl sulfide**	**Dimethyl disulfide**	**Dimethyl trisulfide**	**Methyl butanethioate**	**Thiophene**	**Methylcyclopentane**	**Cyclohexane**	**Methylcyclohexane**
		µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol	µmol/mol
1	**CPBS**	0,0025	0,0041	0,0011	0,0005	0,0007	0,0009	0	0	0	0	0	0	0	0
2	**LPBS**	0,0015	0,0016	0	0	0,0005	0	0	0	0	0	0	0	0	0
3	**CSF94**	0	0,0009	0	0	0	0	0,015	0,012	0,0051	0,0013	0,013	0,0031	0,0057	0,0069
4	**CSF56**	0,0028	0,0033	0,0019	0,0022	0,0014	0,0005	0,0014	0,0008	0	0	0,0053	0	0,0008	0,0012
5	**CSCS**	0,0021	0,0039	0,0022	0	0	0	0	0	0	0	0	0	0	0
6	**LSV 11**	0,0006	0	0	0	0	0	0,019	0,012	0,0044	0,0018	0,015	0,0009	0,0013	0,0033
7	**LSV 13**	0,0011	0,0015	0	0	0	0	0	0	0	0	0	0	0	0
8	**LSV 14**	0	0,0008	0,0006	0,0009	0,0012	0	0,013	0,0093	0	0	0,0007	0,0044	0,0035	0,0074

Table S4. List of the isolated strains and their taxonomic characterization.

Code	Site	Sample	Number of isolated strains	Number of RAPD haplotypes	Sample name	Taxonomy
CPA	La Fossa Crater	Plant Aerial Part	14	8	A1.37	*Arthrobacter* sp.
					A1.40	*Arthrobacter* sp.
					A1.48	*Staphylococcus* sp.
					A1.45	*Staphylococcus* sp.
					A1.47	*Arthrobacter* sp.
					A1.50	*Arthrobacter* sp.
					A1.51	*Kocuria* sp.
					A1.52	*Staphylococcus* sp.
CPR	La Fossa Crater	Plant Roots	5	1	A1.53	*Staphylococcus* sp.
CPRS	La Fossa Crater	Plant Rhizospheric Soil	11	4	A1.11	*Bacillus* sp.
					A1.17	*Staphylococcus* sp.
					A1.19	*Staphylococcus* sp.
					A1.20	*Rothia* sp.
CPBS	La Fossa Crater	Plant Bulk Soil	14	10	A5.5	*Staphylococcus* sp.
					A5.2	*Arthrobacter* sp.
					A5.3	*Arthrobacter* sp.
					A5.4	*Staphylococcus* sp.
					A5.7	*Staphylococcus* sp.
					A5.8	*Arthrobacter* sp.
					A5.10	*Staphylococcus* sp.
					A5.11	*Staphylococcus* sp.
					A5.14	*Azotobacter* sp.
					A5.16	*Arthrobacter* sp.
LPA	Levante Bay	Plant Aerial Part	16	12	B1.30	*Staphylococcus* sp.
					B1.28	*Bacillus* sp.
					B1.29	*Bacillus* sp.
					B1.32	*Bacillus* sp.
					B1.34	*Staphylococcus* sp.
					B1.36	*Bacillus* sp.
					B1.38	*Bacillus* sp.
					B1.39	*Staphylococcus* sp.
					B1.40	*Bacillus* sp.
					B1.41	*Bacillus* sp.
					B1.43	*Bacillus* sp.
					B1.44	*Bacillus* sp.
LPR	Levante Bay	Plant Roots	16	9	B1.45	*Bacillus* sp.
					B1.46	*Bacillus* sp.
					B1.48	*Bacillus* sp.
					B1.49	*Bacillus* sp.
					B1.50	*Bacillus* sp.
					B1.53	*Bacillus* sp.

					B1.54	*Bacillus* sp.
					B1.55	*Bacillus* sp.
					B1.56	*Bacillus* sp.
LPRS	Levante Bay	Plant Rhizospheric Soil	9	7	B1.58	*Bacillus* sp.
					B1.2	*Bacillus* sp.
					B1.5	*Bacillus* sp.
					B1.6	*Bacillus* sp.
					B1.9	*Bacillus* sp.
					B1.11	*Bacillus* sp.
					B1.12	*Bacillus* sp.
LPBS	Levante Bay	Plant Bulk Soil	14	9	E2.1	*Bacillus* sp.
					E2.2	*Bacillus* sp.
					E2.3	*Bacillus* sp.
					E2.4	*Bacillus* sp.
					E2.5	*Bacillus* sp.
					E2.7	*Bacillus* sp.
					E2.10	*Bacillus* sp.
					E2.11	*Bacillus* sp.
					E2.15	*Burkholderia* sp.
CSF94	La Fossa Crater	Soil, 94°C	0	0		
CSF56	La Fossa Crater	Soil, 56°C	0	0		
CSCS	La Fossa Crater	Soil	2	1	D3.1	*Arthrobacter* sp.
LSV11	Levante Bay	Soil	15	4	E1.2	*Bacillus* sp.
					E1.5	*Bacillus* sp.
					E1.12	*Bacillus* sp.
					E1.13	*Bacillus* sp.
LSV13	Levante Bay	Soil	46	9	E3.2	*Bacillus* sp.
					E3.6	*Bacillus* sp.
					E3.7	*Bacillus* sp.
					E3.9	*Staphylococcus* sp.
					E3.15	*Burkholderia* sp.
					E3.22	*Bacillus* sp.
					E3.25	*Bacillus* sp.
					E3.32	*Bacillus* sp.
					E3.41	*Burkholderia* sp.
LSV14	Levante Bay	Soil	32	8	E4.1	*Bacillus* sp.
					E4.6	*Arthrobacter* sp.
					E4.7	*Staphylococcus* sp.
					E4.18	*Bacillus* sp.
					E4.21	*Bacillus* sp.
					E4.29	*Bacillus* sp.
					E4.30	*Bacillus* sp.
					E4.31	*Staphylococcus* sp.

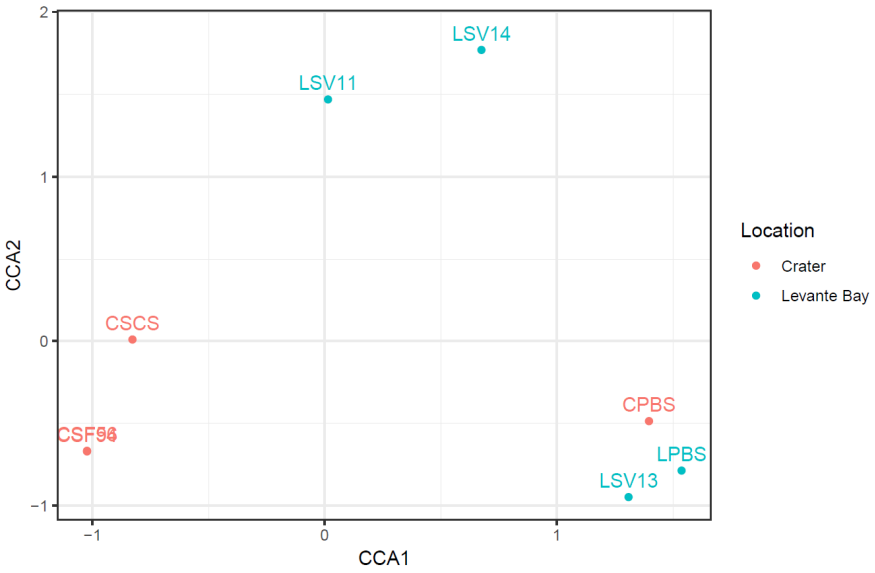

Figure S2. CCA ordination analysis of soil microbiome taxonomic composition collapsed at the genus level, constrained on the interstitial gases composition.

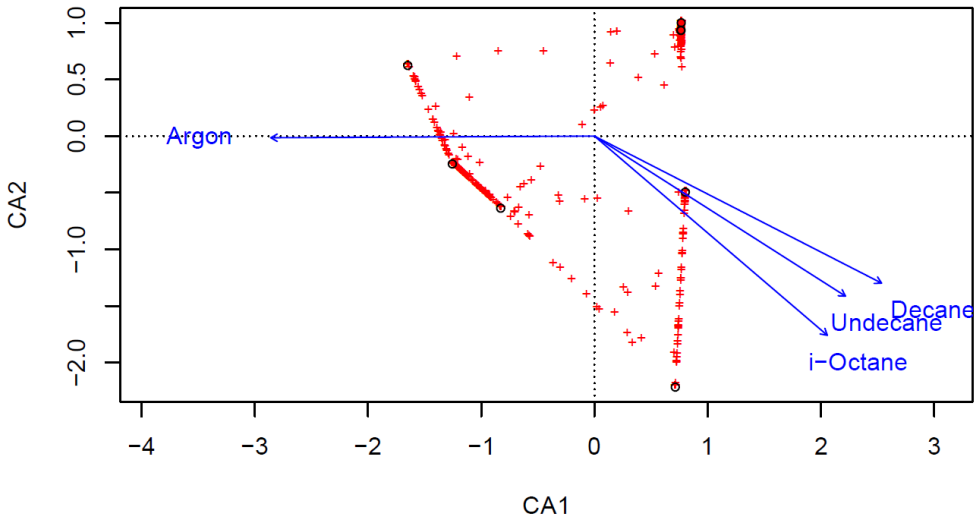

Figure S3. Plot of the gases fitted on the taxa distribution. In blue, the gases that significantly affect the bacteria distribution (p-value < 0.05).