SUPPORTING INFORMATION

A Robot Assisted High-flow Portable Cyclone Sampler for Bacterial and SARS-CoV-2 Aerosols

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Supporting Figures

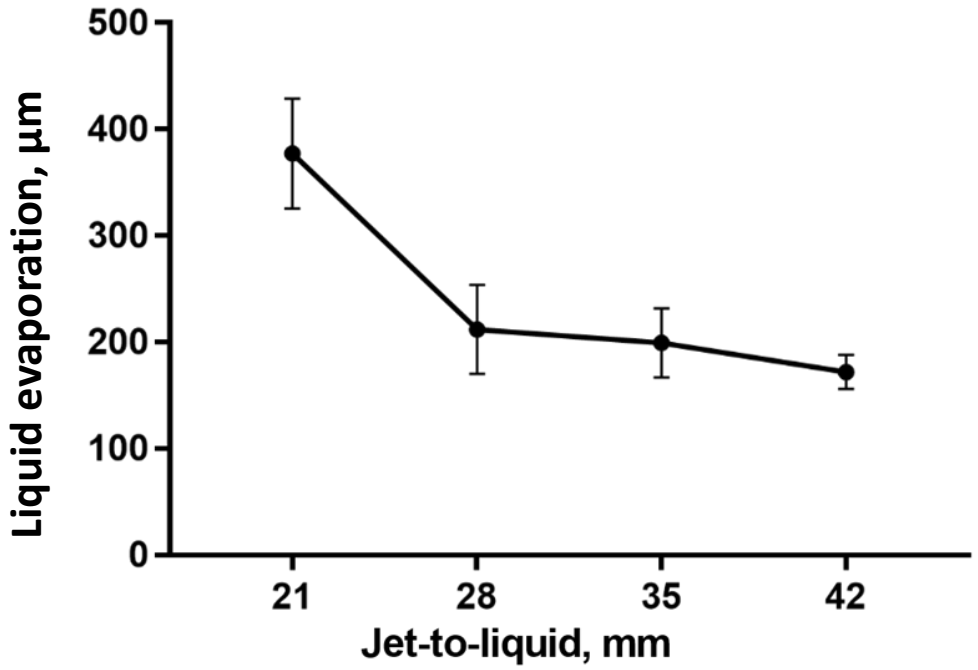

Fig. S1 The evaporation, the y axis, of the collection liquid varies with the Jet-to-liquid distance (mm), the x-axis, from the downstream exit of the Yao-CSpler to the collection liquid surface during a five-minute sampling duration. The error bars stand for the standard error.

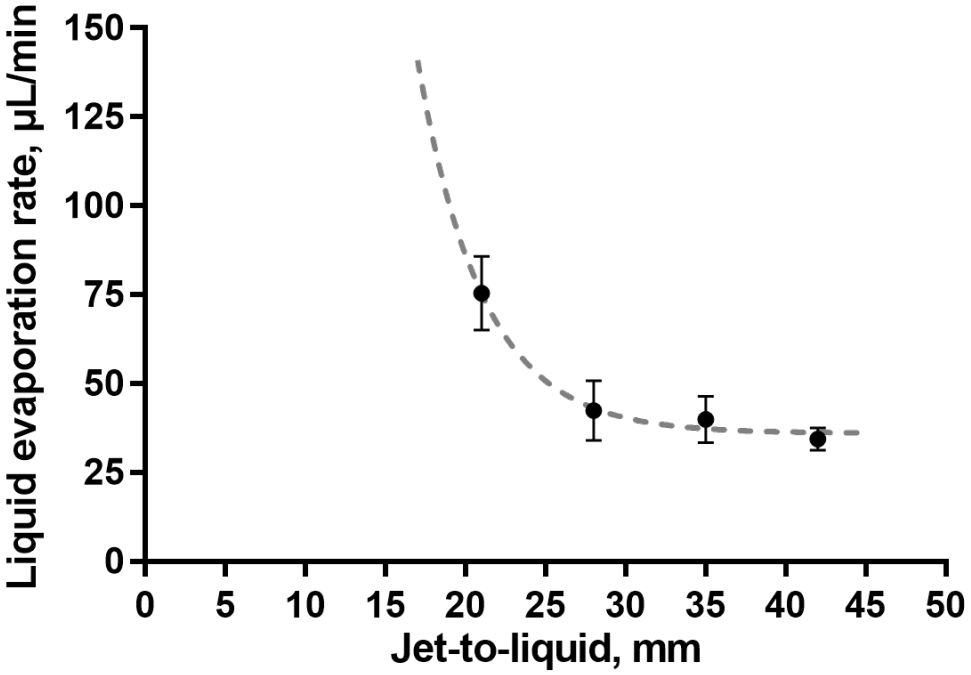

Fig. S2. Exponential regression analysis of the liquid loss per minute of the sample-collection-liquid for varying Jet-to-liquid distances(the downstream exit of the Yao-CSpler to the liquid surface of sample-collection-liquid). The regression fitting equation is (the goodness of fit: $R^2 = 0.9897$): $Y=6747e^{(-0.245X)} + 36.06$. The error bars stand for the standard error.

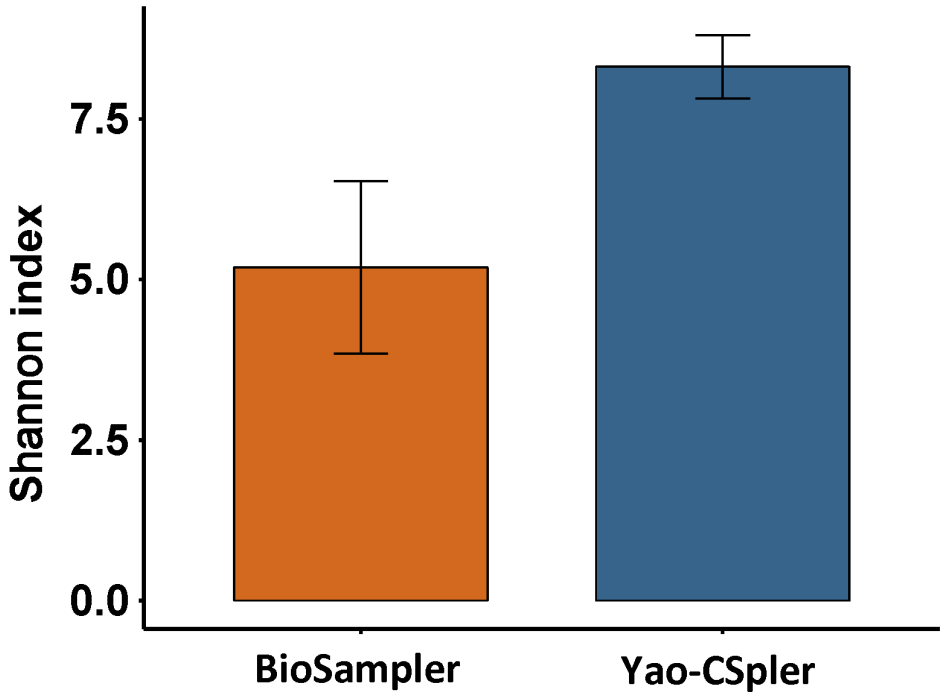

Fig. S3. Shannon index of the bacterial community structures form samples collected by BioSmapler and the Yao-CSpler (The error bar represents the standard deviation of Shannon indexes for three different pollution dates. p-value <0.001, rank sum test).

Supporting Tables

Table S1. Meteorological information of three different pollution dates.

Pollution Conditions	Time	Temp.	Dew Point	RH	Wind	Wind Speed	Wind Gust	Pres.	Precip.	Condition
Clean	2019/3/13 14:00	15 ℃	-15 ℃	11 %	WSW	4 mph	0 mph	29.97 in	0.0 in	Partly Cloudy
Haze	2019/3/19 14:00	23 ℃	2 ℃	25 %	SSW	7 mph	0 mph	29.58 in	0.0 in	Mostly Cloudy
Dusty	2019/3/26 14:00	17 ℃	-4 ℃	23 %	SE	7 mph	0 mph	29.79 in	0.0 in	Mostly Cloudy

Table S2. Ambient Air Quality Information (AQI) and main pollutant concentration of three different pollution dates**.**

Pollution Conditions	Time	PM2.5	PM10	AQI	SO2	NO2	O3	CO
Clean	2019/3/13 14:00	5	10	25	1	8	81	300
Haze	2019/3/19 14:00	198	229	248	17	128	71	1000
Dusty	2019/3/26 14:00	54	155	106	10	35	88	800

Table S3. The details of relative abundances of bacterial species.

Taxon	A1*	A2	A3	B1#	B2	B3
Acinetobacter	0.053965	0.072412	0.013102	0.008958	0.012557	0.00747
Aeromonas	0.012096	0.009846	0.000912	0.001252	0.001632	0.000358
Allorhizobium-Neorhizobium-Pararhizobium-Rhizobium	0.003029	0.000278	0.000452	0.010348	0.005755	0.003636
Bacillus	0.000678	0.005118	0.026461	0.005524	0.009555	0.012199
Blastococcus	0.002457	0.001015	0.00081	0.006742	0.007375	0.011501
Brachybacterium	0.002002	0.007426	0.000486	0.009912	0.027592	0.01451
Brevundimonas	0.008484	0.01552	0.000946	0.004548	0.003413	0.002615
Burkholderia-Caballeronia-Paraburkholderia	0.000201	0.000234	0.049997	0.000425	0.001333	0.000376
Carnobacterium	0.003283	0.00583	0.002302	0.004973	0.013703	0.009817
Chryseobacterium	0.00949	0.013108	0.000213	0.014632	0.001545	0.00086
Elizabethkingia	0.174478	0.178276	0.002847	0.021385	0.003102	0.002042
Enterobacter	0.022486	0.023501	0.73651	0.010394	0.005381	0.004998
Exiguobacterium	0.00269	0.004607	0.001296	0.011531	0.003787	0.003708
FFCH7168	0.020495	2.6E-05	9.38E-05	0.00085	0.000324	0.000376
Hymenobacter	0.000699	0.000139	0.000213	0.023613	0.003625	0.003619
Kocuria	0.004163	0.013785	0.004049	0.023016	0.046054	0.081508
Labrenzia	0.009289	0.010193	0.000136	0.001103	0.000199	0.000287
Lactococcus	0.016513	0.01742	0.00046	0.00224	0.000847	0.000681
Luteibacter	7.41E-05	6.94E-05	0.013657	0.00023	0.000174	0.000125
Massilia	0.001991	0.001509	0.002302	0.00882	0.00517	0.01005
Methylobacterium	0.006408	0.000191	0.000887	0.013667	0.007051	0.012289
Microvirga	0.006842	0.001249	0.002054	0.011807	0.022398	0.020852
Myroides	0.011174	0.009656	0.000179	0.002056	0.000349	0.000107
Ochrobactrum	0.00376	0.003618	0.002242	0.011301	0.001482	0.001344
Paracoccus	0.004449	0.012727	0.004953	0.014104	0.021837	0.031564
Planococcus	0.003877	0.040357	0.006283	0.025979	0.067318	0.124393
Planomicrobium	0.002267	0.004797	0.004322	0.00503	0.01151	0.016982
Pseudarthrobacter	0.010698	0.031855	0.003623	0.028988	0.07904	0.072228
Pseudomonas	0.082234	0.082276	0.003751	0.014655	0.009355	0.003654
Psychrobacter	0.001419	0.004433	0.002037	0.007856	0.024553	0.020207
Ralstonia	0.010073	0.007435	0.000435	0.001367	0.000299	0.000179
Rubellimicrobium	0.00716	0.005622	0.003751	0.013793	0.019483	0.028429
Ruminococcaceae_UCG-005	0.005518	0.001024	0.000324	0.011324	0.003687	0.001988
Serratia	0.017201	0.015919	0.001918	0.001619	0.000399	0.000215
Sphingobacterium	0.022274	0.014418	0.000205	0.003066	0.00228	0.001397
Sphingomonas	0.011323	0.012952	0.003981	0.058252	0.035752	0.043441
Staphylococcus	0.002606	0.006611	0.002285	0.004651	0.019234	0.007327
Stenotrophomonas	0.02577	0.023371	0.008857	0.003044	0.001345	0.001236
Streptococcus	0.018832	0.015693	0.003879	0.004158	0.003712	0.002168

Taibaiella	0.004544	0.013351	0.000119	0.000976	0.000187	0.000215
Uruburuella	0.020188	0.011278	0.000426	0.001998	0.000374	0.000305
Others	0.372819	0.300856	0.086245	0.589813	0.515235	0.438744

[*] A1, A2 and A3 represent the samples collected by the BioSampler on clean, haze and dusty days, respectively.

[#] B1, B2 and B3 represent the samples collected on the same corresponding clean, haze and dusty days using the Yao-CSpler, respectively.