Supplement of

Design and characterization of a semi-open dynamic chamber for measuring biogenic volatile organic compounds (BVOCs) emissions from plants

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Figure captions

Figure S1. Testing ozone removal efficiencies of the four ozone scrubbers.

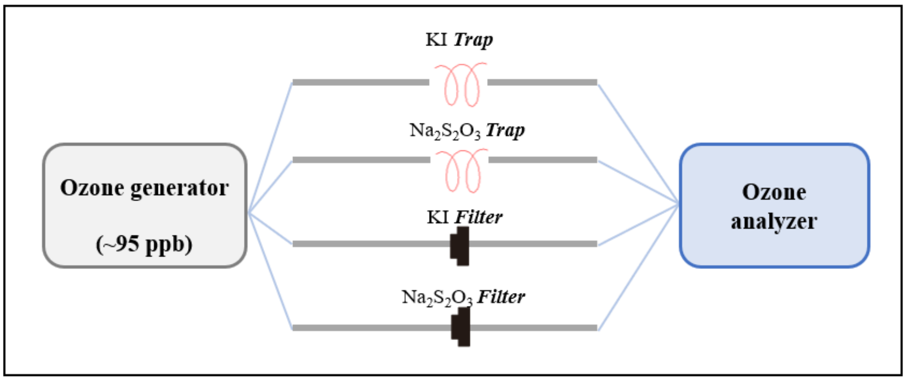
Figure S2. Testing losses of BVOCs in the ozone scrubbers.

Figure S3. Theoretically predicted steady state concentrations (solid line) changing with circulating air flow rates for a BVOC species in the enclosure, assuming 5.0 g dry mass of enclosed leaves and an extremely low emission rate of 0.01 μg g^{-1} h^{-1}. The colored bar area is the ranges of MDLs for sesquiterpenes listed in Table S1.

Figure S4. Changes of BVOCs loss ratios (mean $\pm 1\sigma$, n=5) with flow rates.

Figure S5. Measured BVOC species when conducting tests with branches of *Pinus massoniana* (upper) and *Mangifera indica* (lower).

Figure S6. Comparison of environmental parameters (temperature, RH and PAR) inside and outside the enclosure during testing emission of BVOCs from branches of a pine tree (*Pinus massoniana*) in the Guangdong Tree Garden (23.20 °N, 113.38 °E) of the Guangdong Academy of Forestry in Guangzhou, south China.



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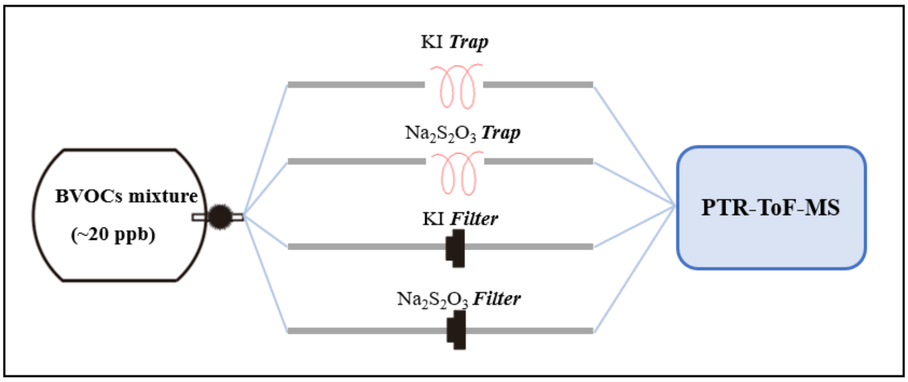

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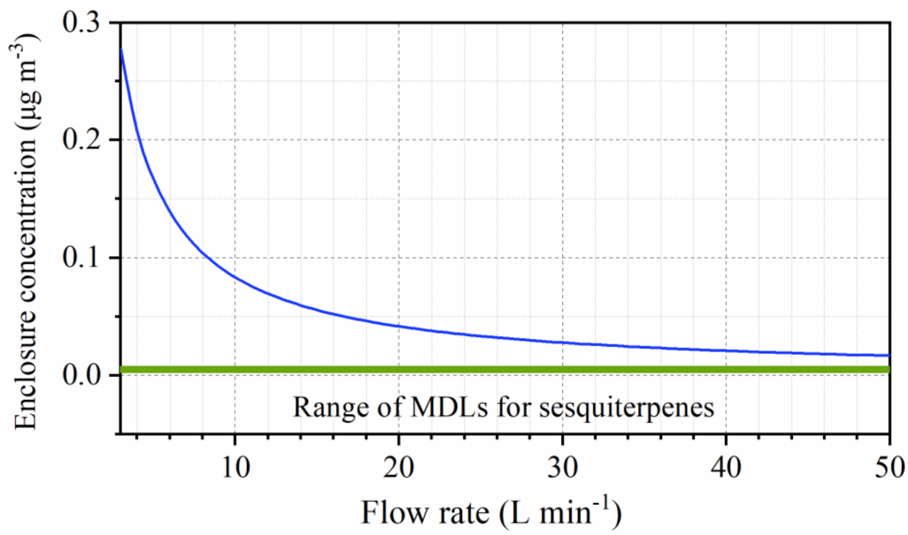

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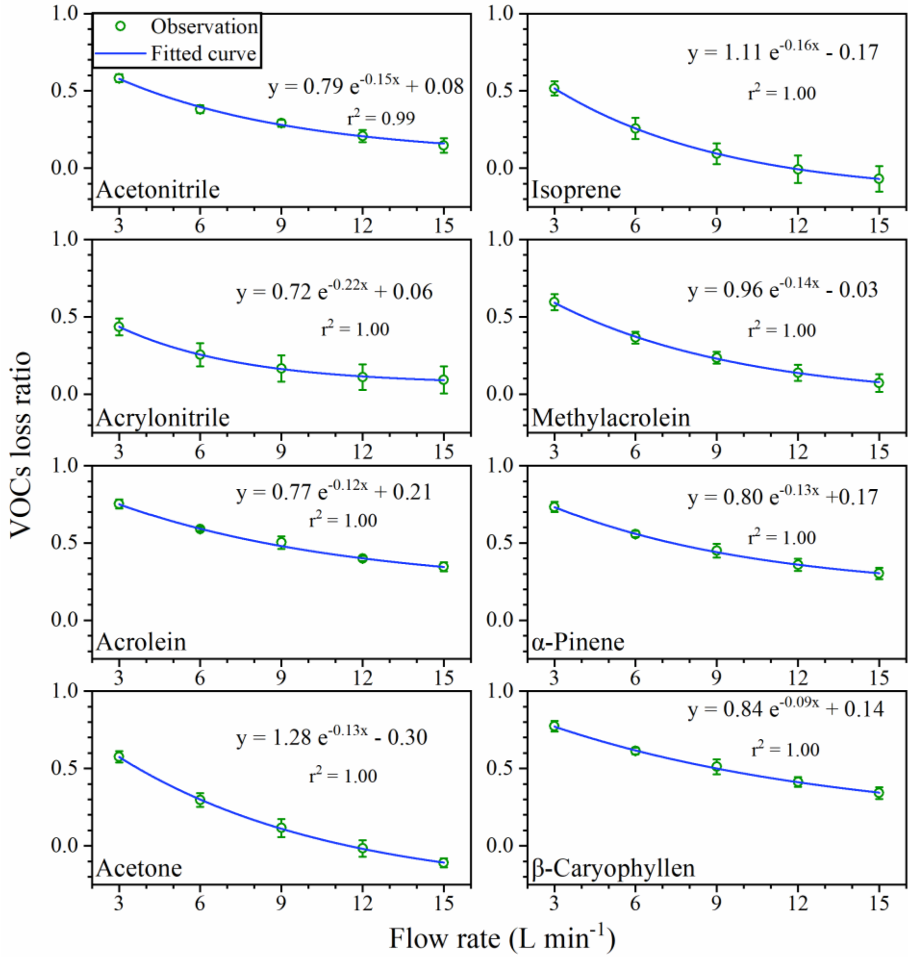

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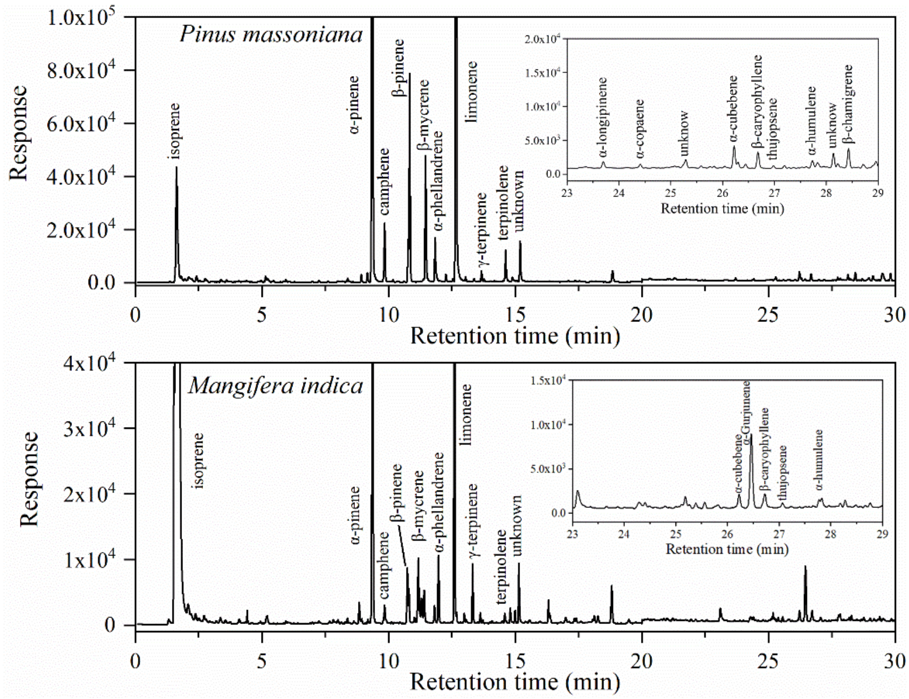

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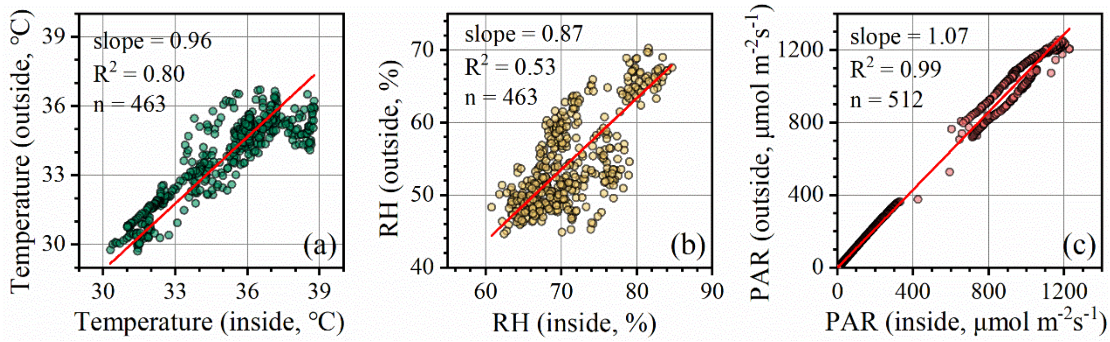

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Table captions

Table S1. Method detection limits (MDLs) and measurement precisions.

Table S2. BVOCs in the standard mixtures.

Table S3. Correction factors (*k*) of BVOCs under different flow rates and humidity.

Table S1. Method detection limits (MDLs) and measurement precisions.

Instruments	Compounds	MDL (ng m^{-3})	Precise (%)
	Isoprene	56	1%
	α-Pinene	10	4%
	β-Pinene	8	4%
	β-Mycrene	16	6%
	α-Phellandrene	5	3%
	3-Carene	6	3%
	Limonene	11	6%
	1,8-Cineole	17	5%
	γ-Terpinene	8	6%
	Terpinolene	15	9%
	Linalool	10	6%
TD-GC/MS	trans-Pinocarveol	10	6%
	α-Longipinene	1	3%
	Longicyclene	6	9%
	α-Copaene	2	9%
	α-Gurjunene	4	14%
	β-Caryophyllene	5	13%
	Thujopsene	6	15%
	Aromadendrene	5	12%
	α-Humulene	4	12%
	Alloaromadendrene	8	12%
	β-Chamigrene	6	14%
	α-Bisabololo	6	6%
PTR-ToF-MS	Isoprene	176	10%
	Monoterpenes	389	10%

Table S2. BVOCs in the standard mixtures.

Compounds	CAS Number	Formula	Molar mass	Purity (%)	Supplier
Isoprene	78-79-5	C_5H_8	68.12	99	Sigma-Aldrich
α-pinene	7785-26-4	$C_{10}H_{16}$	136.23	97	Sigma-Aldrich
β-Caryophyllene	87-44-5	$C_{15}H_{24}$	204.35	98.5	Sigma-Aldrich
Acetonitrile	70-05-8	C_2H_3N	41.05	99.5	CHEMSERVICE
Acrylonitrile	107-13-1	C_3H_3N	53.06	99	CHEMSERVICE
Acrolein	107-02-8	C_3H_4O	56.06	99	CHEMSERVICE
Acetone	67-64-1	C_3H_6O	58.08	99.5	CHEMSERVICE
Methylacrolein	78-85-3	C4H6O	70.09	95	CHEMSERVICE

Table S3. Correction factors (*k*) of BVOCs under different flow rates and humidity.

Species	Flow rate (L min^{-1})	0% RH	20% RH	40% RH	60% RH	80% RH	100% RH
Acetonitrile	3	3.58	4.53	4.34	3.73	4.34	4.63
	6	3.67	2.95	4.00	3.95	3.75	3.94
	9	3.84	2.96	3.71	3.66	3.99	4.01
	12	3.59	2.01	2.72	2.98	3.99	3.65
	15	2.91	0.97	2.28	2.87	2.98	3.63
Acrylonitrile	3	2.96	3.06	2.15	1.71	2.17	2.09
	6	3.40	2.76	1.39	1.19	1.95	2.04
	9	3.15	3.21	0.76	0.62	1.78	1.75
	12	2.76	3.08	0.06	0.26	1.80	1.55
	15	3.21	3.42	-0.20	-0.09	2.25	1.33
Acrolein	3	7.19	10.85	10.88	8.21	9.30	9.35
	6	8.07	8.75	9.52	8.45	8.51	8.61
	9	11.64	9.15	10.21	8.56	7.55	8.00
	12	8.85	7.72	8.41	7.46	7.84	7.49
	15	9.39	7.86	8.47	6.87	6.84	8.35
Acetone	3	3.94	4.77	4.60	3.21	3.76	4.35
	6	3.31	2.77	2.48	2.00	1.88	2.84
	9	2.29	1.75	0.81	0.68	0.49	1.24
	12	0.86	0.04	-1.02	-0.18	-0.55	-0.13
	15	-0.92	-1.44	-1.79	-1.32	-1.41	-1.91
Isoprene	3	2.88	3.29	3.01	2.46	3.63	4.20
	6	2.61	1.97	1.24	1.41	2.32	3.25
	9	1.13	1.25	0.25	0.00	1.27	1.98
	12	-0.49	0.21	-1.68	0.02	0.74	1.10
	15	-2.13	-0.99	-2.03	-0.90	-0.10	0.75
Methylacrolein	3	3.07	4.50	4.50	4.04	5.15	5.65
	6	3.09	2.93	3.09	3.48	3.82	4.48
	9	2.47	2.22	2.61	2.38	3.26	3.81
	12	1.65	0.70	1.69	1.99	2.90	2.82
	15	0.97	0.19	0.09	1.32	2.46	2.31
α-Pinene	3	7.26	10.29	10.29	7.11	8.10	7.55
	6	8.15	7.73	8.40	7.15	7.05	6.93
	9	9.43	8.27	7.95	6.84	6.05	6.10
	12	8.42	7.19	7.36	6.71	5.48	5.48
	15	8.22	6.82	7.49	6.18	5.55	5.20
β-Caryophyllene	3	8.25	13.34	12.80	8.84	9.86	9.85
	6	10.20	10.22	10.65	8.76	8.73	8.88
	9	12.52	10.26	10.38	8.71	7.28	8.22
	12	10.25	8.74	8.88	8.44	7.53	7.12
	15	10.49	7.79	8.15	6.73	6.75	7.17