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

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Table S3. BVOCs in the standard mixtures.

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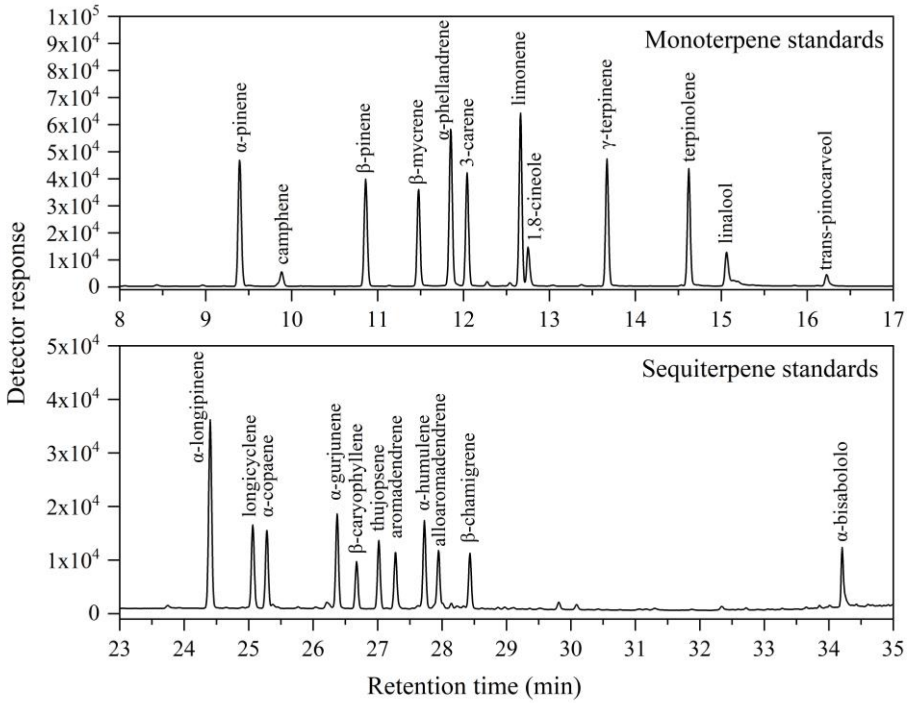

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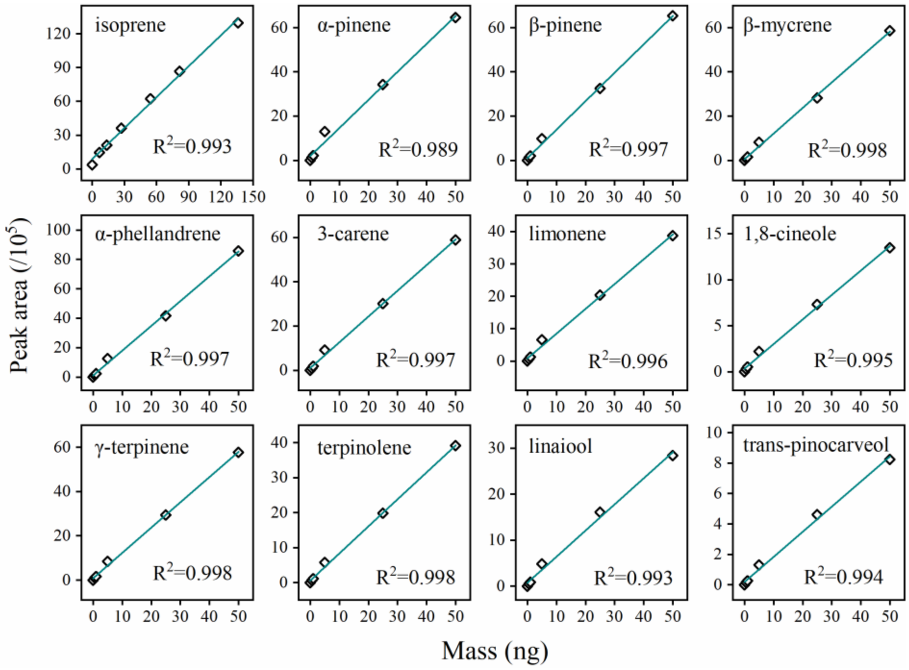


Figure S2. Calibration curves of isoprene and monoterpenes.

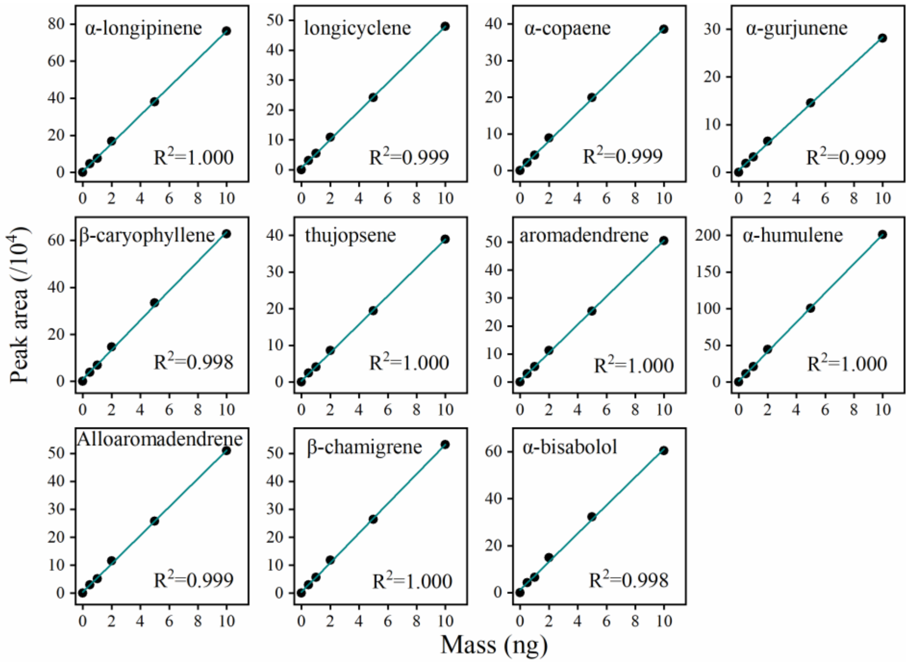
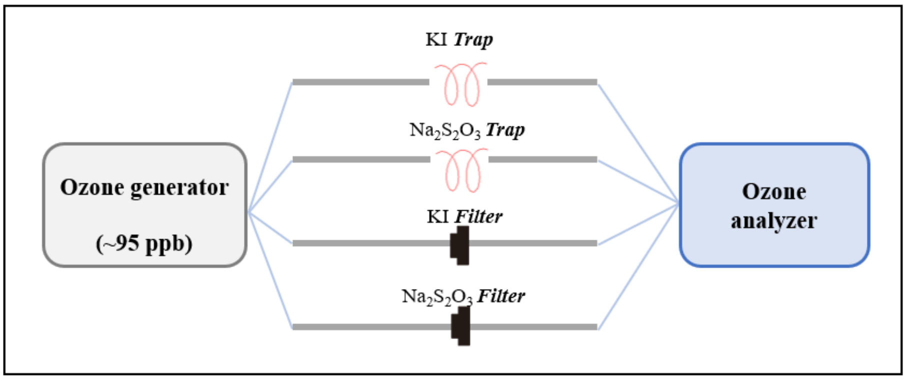


Figure S3. Calibration curves of sesquiterpenes.



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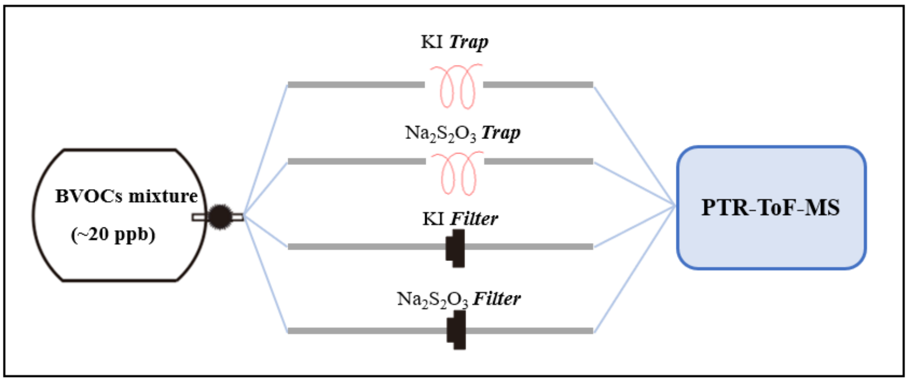
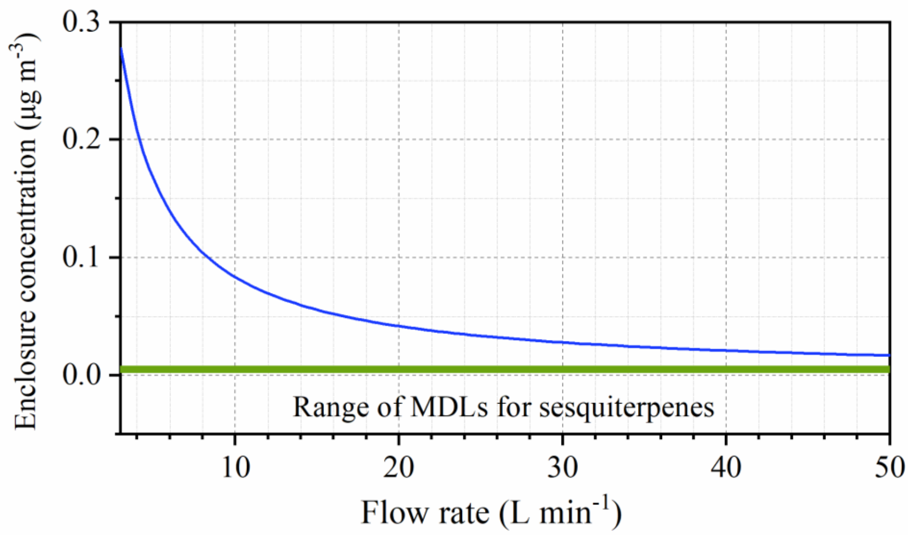


Figure S5. Testing losses of BVOCs in the ozone scrubbers.



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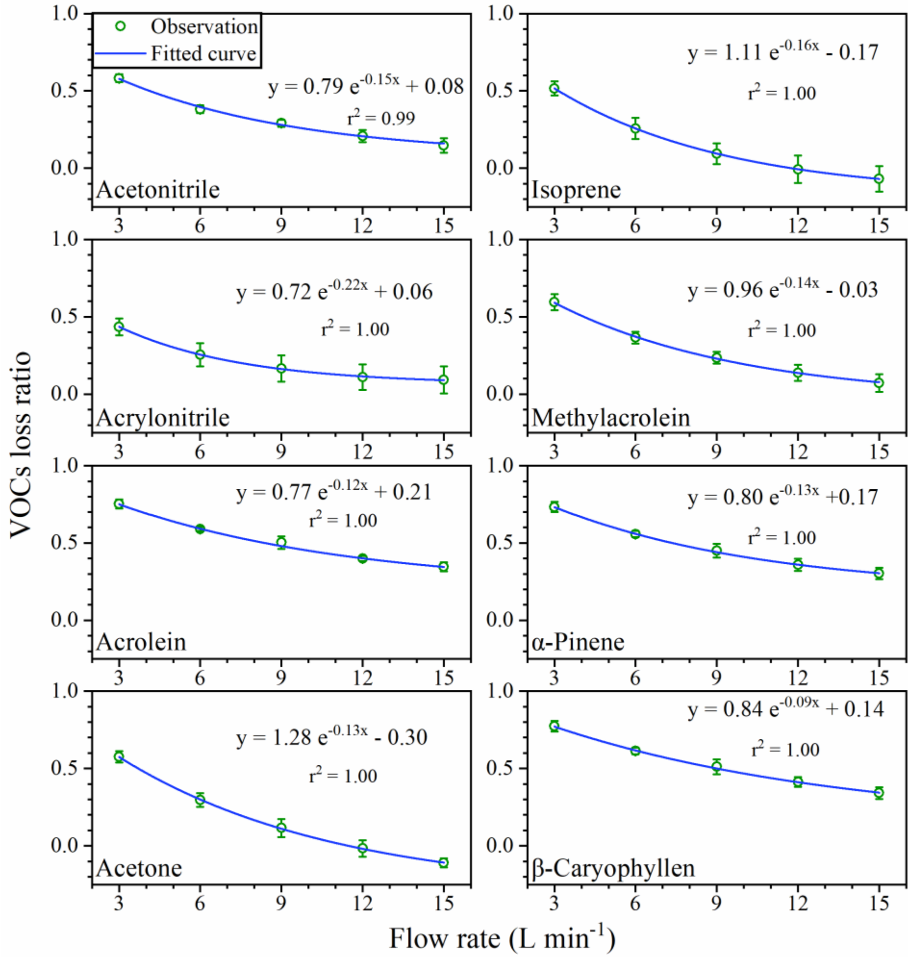

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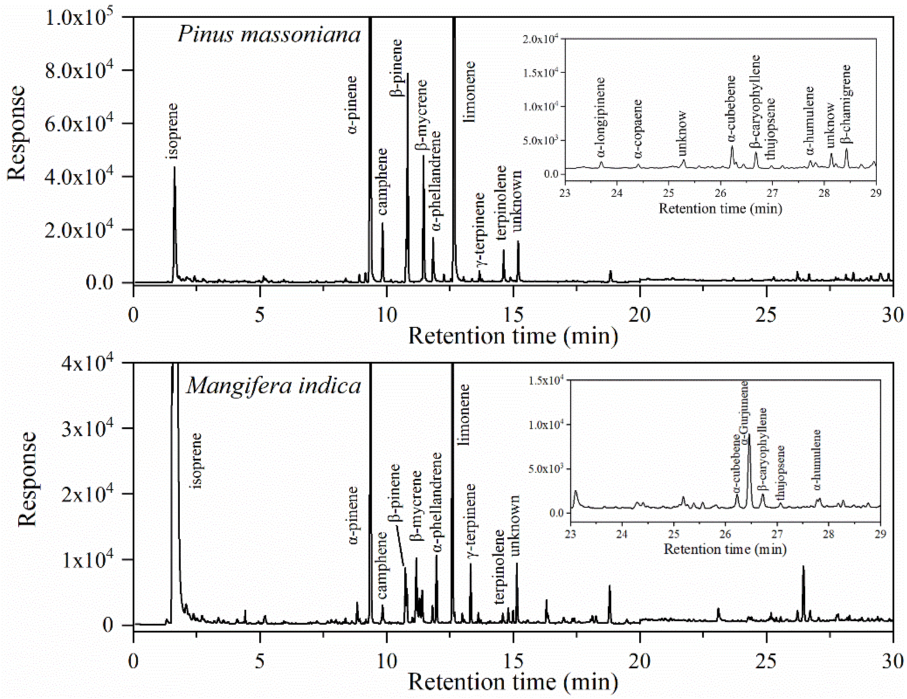

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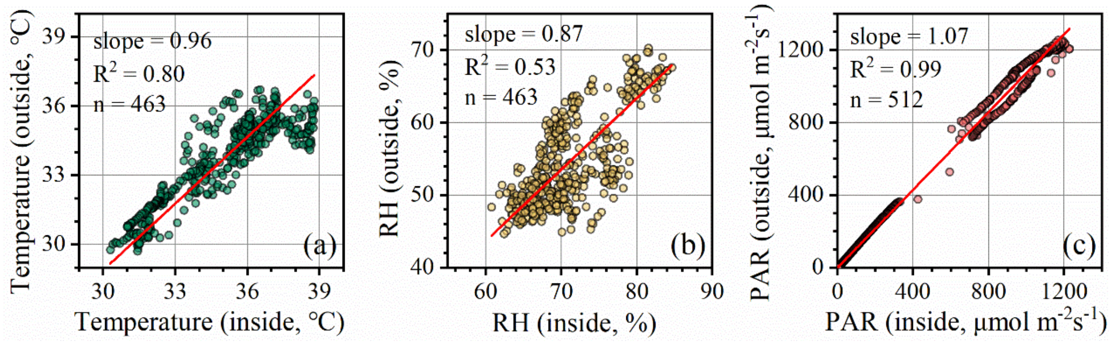

Figure S9. Comparison of environmental parameters (temperature, RH and PAR) inside and outside the enclosure during testing emission of BVOCs from branches of a pine tree (*pinus massoniana*) in the Guangdong Tree Garden (23.20° N, 113.38° E) of the Guangdong Academy of Forestry in Guangzhou, south China.

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

Instruments	Compounds	MDL (ng m^{-3})	*m/z*	Precise (%)
	Isoprene	56	93	1%
	α-Pinene	10	93	4%
	β-Pinene	8	93	4%
	β-Mycrene	16	93	6%
	α-Phellandrene	5	93	3%
	3-Carene	6	93	3%
	Limonene	11	93	6%
	1,8-Cineole	17	93	5%
	γ-Terpinene	8	93	6%
	Terpinolene	15	93	9%
	Linalool	10	93	6%
TD-GC/MS	trans-Pinocarveol	10	93	6%
	α-Longipinene	1	119	3%
	Longicyclene	6	119	9%
	α-Copaene	2	119	9%
	α-Gurjunene	4	119	14%
	β-Caryophyllene	5	93	13%
	Thujopsene	6	119	15%
	Aromadendrene	5	93	12%
	α-Humulene	4	93	12%
	Alloaromadendrene	8	93	12%
	β-Chamigrene	6	93	14%
	α-Bisabololo	6	119	6%
PTR-ToF-MS	Isoprene	176	69	10%
	Monoterpenes	389	81, 137	10%

Table S2. Response (cps) of PTR-ToF-MS for monoterpenes mixture before and after passing through four types of ozone scrubbers. And recoveries of monoterpenes mixture after passing through these four scrubbers.

Types	Before (cps)	After (cps)	BVOCs recoveries
KI trap	178.98	180.11	100.63%
$Na_2S_2O_3$ trap	178.98	119.38	66.70%
KI filter	178.98	17.99	10.05%
$Na_2S_2O_3$ filter	178.98	180.57	100.89%

Table S3. 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 S4. 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

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