NUMERICAL DATA

Exploring ozone pollution in Chengdu, southwestern China: A case study from radical chemistry to O3-VOC-NOx sensitivity (2018)

Table 1: The measured parameters at PZ, PX, SL and CZ averaged for the ozone pollution episode (EP1). The averaged for four measurement sites are shown and used in EKMA model calculation.

Parameters	PZ	PX	SL	CZ	Average
Temperature/°C	26.1	26.5	26.5	26.3	26.4
Pressure/hPa	945.9	948.5	955.5	955.4	951.3
RH/%	63.7	63.2	65.5	62.3	63.7
O_3/ppbv	65.4	76.4	59.7	51.4	63.2
NO_2/ppbv	12.9	13.7	19.0	26.2	18.0
CO/ppmv	0.65	0.67	0.33	0.47	0.5
Isoprene/ppbv	0.4	0.3	0.5	0.2	0.4
AHC/ppbv	24.6	22.7	25.7	33.6	26.6

Source : 10.1016/j.scitotenv.2018.04.286

Review of plants to mitigate particulate matter, ozone as well as nitrogen dioxide air pollutants and applicable recommendations for green roofs in Montreal, Quebec (2018)

Table 1: The Comparative potential of air pollutants removed by green roofs.

References	Type of	City	Green Roof Area Green Roof Cover		Type of Pollutant(s)	Amount of	Annual Removal per
	Study		(m^2)		Removed	Pollutant(s)	Unit Area
						Removed (kg)	(g/m^2)
Currie & Bass,	Model	Midtown	2 432 000	Grass	Total	3050	1.25
2008		Toronto			PM10	880	0.36
					O_3	1270	0.52
					NO_2	650	0.27
					SO_2	250	0.10
Currie & Bass,	Model	Midtown	2 432 000	Shrubs	Total	7870	3.23
2008		Toronto			PM10	4480	1.84
					O3	1740	0.72
					NO_2	1240	0.51
					SO_2	410	0.17
Speak et al.,	Model	Manchester	500 000	Red Fescue	PM_{10}	1605	3.21
2012							
Speak et al.,	Model	Manchester	500 000	Creeping Bentgrass	PM_{10}	905	1.81
2012							
Speak et al.,	Model	Manchester	500 000	Ribwort Plantain	PM_{10}	245	0.49
2012							
Speak et al.,	Model	Manchester	500 000	Sedum	PM_{10}	210	0.42
2012							
Yang et al.,	Actual	Chicago	198 000	63% grass/low plants,	Total	1675	8.45
2008				14% herbaceous plants, 11% trees/shrubs &	PM10	234.5	1.18
				12% hard surfaces	O3	871	4.40
					NO_2	452.25	2.28
					SO_2	117.25	0.59

Note: Values for Midtown Toronto's green roof area, total pollutants removed, shrubs' amount of pollutants removed and annual removal per unit area have been calculated from Currie and Bass (2008).Values for Chicago's amount of pollutants removed and annual removal per unit area have been calculated from Yang et al. (2008).
Source: https://www.sciencedirect.com/science/article/pii/S0269749118303099

Review of plants to mitigate particulate matter, ozone as well as nitrogen dioxide air pollutants and applicable recommendations for green roofs in Montreal, Quebec. (2018)

Recommended trees and shrubs to reduce air pollutants on intensive green roofs in Montreal, Quebec.

Target air	**Recommen ded tree or**	**Effects on the target air pollutants**	**Maxim um**	**Hardiness**
pollutan t	shrub		height (m)	zone
PM	Pinus strobus 'Nana'	Pines most effectively capture PM, when compared to other plant species and contribute to	2.0	3
	Pinus mugho var. pumilio	mitigating PM all year-round.	1.5	2
	Pinus mugho 'Slowmound'		0.90	2
	Pinus pumila 'Dwarf Blue'		0.60e1.0	4
O_3	Acer palmatum 'Shaina'	Such drought-tolerant deciduous broadleaved trees with low BVOC emissions are good options 1.75		5b
	Acer palmatum 'Mikawa-	to mitigate O_3.	1.5	5
	Yatsubusa'			
NO_2	Magnolia 'Genie'	Magnolias can help mitigate NO_2 because they are both NO_2 tolerant and it is important in their 3.0e3.5		5
		metabolic pathways.		

Note: Values for Pinus strobus 'Nana', Pinus mugho var. pumilio and Pinus mugho 'Slowmound' are from Jardin 2m (2017a; 2017b; 2017c), for Pinus pumila 'Dwarf Blue' and Magnolia 'Genie' are from Pepiniere jasmin (2017a;2017b) as well as for Acer palmatum 'Shaina' and Acer palmatum 'Mikawa-Yatsubusa' are from François Lemay Nursery (2004a; 2004b). Pines effective PM capture has been demonstrated (Beckett et al., 2000a; Beckett et al., 2000b; Freer-Smith et al., 2004; Manes et al., 2016). Jim & Chen (2008) classify Magnolias as NO2 tolerant. Morikawa et al. (1998) found Magnolias to greatly metabolize NO2.

Source: https://www.sciencedirect.com/science/article/pii/S0269749118303099

Water stress mitigates the negative effects of ozone on photosynthesis and biomass in poplar plants. (2018)

Table : 1 Effects on both younger leaves (YL) and older leaves (OL) in September: Analysis of variance (P values) of the effects of O3, Water stress and Leaf Age, and their interactions on gas exchange, chlorophyll a fluorescence parameters and pigment content. Statistically significant effects (P< 0.05) are marked in bold.

	O_3	Water	Age	O_3 Water	O_3 Age	Water Age	O_3 Water Age
Chl a	<0.001	<0.001	0.007	<0.001	<0.001	0.441	<0.001
Chl b	<0.001	<0.001	0.125	0.002	<0.001	0.322	<0.001
Chl a/Chl b	0.168	0.004	<0.001	0.252	0.123	0.751	0.485
Car	<0.001	<0.001	0.132	0.034	0.068	0.264	0.002
A_{sat}	0.003	0.109	<0.001	0.018	0.380	0.002	0.122
g_s	0.285	<0.001	0.021	0.584	0.543	0.731	0.833
Ci	0.905	<0.001	0.004	0.579	0.753	0.499	0.540
WUE	0.975	<0.001	0.009	0.637	0843	0.509	0.474
Fv'/Fm'	0.021	0.245	<0.001	0.230	0.271	0.870	0.552
qP	0.464	0.207	<0.001	0.402	0.775	0.517	0.966
ΦPSII	0.005	0.114	<0.001	0.463	0.088	0.255	0.759
V_{cmax}	0.004	<0.001	<0.001	0.036	0.312	0.996	0.189
J_{max}	0.034	0.093	<0.001	0.138	0.311	0.550	0.701
V_{cmax}/J_{max}	0.134	0.002	0.588	0.608	0.931	0.705	0.409
L_s	0.089	0.227	0.003	0.452	0.191	0.742	0.917

Table: 2 Effects on biomass, growth and senescence-related parameters at the final harvest time, and analysis of variance (P values) of O3, water stress and their interactions. Plants were grown in charcoal-filtered air (CF), non-filtered air (NF) and elevated O3 (E-O3) under well water (WW, irrigated to field capacity) and water stress (RW, 40% irrigation) conditions. Each treatment showed the mean ± SD. Statistically significant differences between treatments are noted with different letters (Tukey test, P < 0.05, n ¼ 3). Statistically significant effects (P< 0.05) are marked in bold.

	WW			RW			O_3	Water	O_3 Water
	CF	NF	E-O_3	CF	NF	E-O_3			
Height (cm)	96.43 ± 11.16 a	91.81 ± 3.11 a	90.07 ± 7.75 a	66.13 ± 11.04 b	60.11 ± 0.77 b	60.00 ± 4.60 b	0.494	<0.001	0.960
Totoal biomass (g)	121.16 ± 3.55 a	112.56 ± 4.36 a	97.32 ± 5.32 b	83.54 ± 3.99 c	80.45 ± 5.07 c	78.19 ± 0.68 c	0.003	<0.001	0.049
Stem diameter (mm)	9.51 ± 0.40 a	8.48 ± 0.42 ab	7.63 ± 0.60 b	6.27 ± 0.30 c	5.75 ± 0.40 c	5.56 ± 0.37 c	0.006	<0.001	0.120
Stem biomass (g)	35.99 ± 2.82 a	33.68 ± 1.58 ab	29.84 ± 1.30 b	21.08 ± 1.28 c	20.53 ± 1.24 c	20.30 ± 0.90 c	0.070	<0.001	0.012
Attached leaves (number)	37.22 ± 2.87 a	33.83 ± 2.47 ab	24.44 ± 1.50 cd	28.78 ± 1.26 bc	25.67 ± 0.67 cd	23.39 ± 1.13 d	0.001	<0.001	0.002
Newly formed leaves	24.78 ± 2.14 a	22.11 ± 1.26 ab	17.89 ± 1.9 bc	18.22 ± 2.8 bc	16.31 ± 2.15 c	15.89 ± 1.17 c	0.033	<0.001	0.321
(number per plant)									
Abscised leaves	1.56 ± 0.19 b	2.33 ± 0.58 b	6.33 ± 0.88 a	1.00 ± 0.33 b	3.56 ± 1.71 ab	5.94 ± 1.58 a	0.001	0.820	0.200
(number per plant)									
Leaves area	0.54 ± 0.05 a	0.53 ± 0.04 a	0.46 ± 0.04 ab	0.36 ± 0.08 b	0.34 ± 0.06 b	0.34 ± 0.05 b	0.370	<0.001	0.312
(m^2 per plant)									
Leaves biomass (g)	52.81 ± 1.57 a	48.37 ± 2.79 a	41.08 ± 3.76 b	36.42 ± 1.77 b	35.84 ± 0.34 b	34.70 ± 1.90 b	0.006	<0.001	0.025
Root biomass (g)	32.36 ± 0.62 a	30.51 ± 0.18 ab	26.40 ± 3.00 abc	26.05 ± 2.68 abc	24.08 ± 3.68 bc	23.19 ± 1.37 c	0.058	0.002	0.389
Root/Shoot	0.37 ± 0.02 b	0.37 ± 0.02 ab	0.37 ± 0.05 ab	0.45 ± 0.04 a	0.43 ± 0.05 ab	0.42 ± 0.03 ab	0.929	0.001	0.350

Source: https://www.sciencedirect.com/science/article/pii/S0269749117305018