Table S1: Percent Co accumulation in plants parts cultivated in Co contaminated solution

Root	Shoot	Dose	Plant	Reference
79	21	50 µM	Barley	(Lwalaba et al., 2020)
80	20	50 µM	Barley	(Lwalaba et al., 2020)
66	34	5 ppm	Vicia faba L.	(Kandil, 2007)
78	22	10 ppm	Vicia faba L.	(Kandil, 2007)
79	21	15 ppm	Vicia faba L.	(Kandil, 2007)
71	29	20 ppm	Vicia faba L.	(Kandil, 2007)
35	65	5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
33	67	7.5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
26	74	10 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
32	68	12.5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
34	66	15 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
35	65	5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
34	66	7.5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
28	72	10 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
28	72	12.5 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
34	66	15 mg/kg	Ipomoea batatas L	(Gad & Kandil, 2008)
94	6	200 µM	Lactuca sativa L.	(Samet, 2020)
45	55	100 µM	Zea mays L.	(Tuna et al., 2015)
76	24	200 µM	Zea mays L.	(Tuna et al., 2015)
67	33	0.025 mg/dm3	Dendrobium kingianum	(Prazak, 2013)
74	26	0.625 mg/dm3	Dendrobium kingianum	(Prazak, 2013)
74	26	1.250 mg/dm3	Dendrobium kingianum	(Prazak, 2013)
78	22	2.5 mg/dm3	Dendrobium kingianum	(Prazak, 2013)
14	86	50 µm	Phaseolus aureus Roxb	(Tewari et al., 2002)
17	83	100 µm	Phaseolus aureus Roxb	(Tewari et al., 2002)
21	79	200 µm	Phaseolus aureus Roxb	(Tewari et al., 2002)
17	83	300 µm	Phaseolus aureus Roxb	(Tewari et al., 2002)
18	82	400 µm	Phaseolus aureus Roxb	(Tewari et al., 2002)
51	49	50 mg/kg	Glycine max (L.)	(Jayakumar & Jaleel, 2009)
51	49	100 mg/kg	Glycine max (L.)	(Jayakumar & Jaleel, 2009)
51	49	150 mg/kg	Glycine max (L.)	(Jayakumar & Jaleel, 2009)
51	49	200 mg/kg	Glycine max (L.)	(Jayakumar & Jaleel, 2009)
51	49	250 mg/kg	Glycine max (L.)	(Jayakumar & Jaleel, 2009)

Table S2: Percent variation in different growth variables of plant shoots in response to Co

Co dose	Growth	% change	Organ	Plant species	Reference
50 µM	Dry weight	-72	Shoot	Barley	(Lwalaba et al., 2020)
50 µM	Tissue length	-80	Shoot	Barley	(Lwalaba et al., 2020)
2 mM 4 mM 6 mM 8 mM 10 mM	Tissue length	-11 -22 -29 -32 -41	Shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
2 mM 4 mM 6 mM 8 mM 10 mM	Leaf Area	-7 -18 127 120 85	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
2 mM 4 mM 6 mM 8 mM 10 mM	Fresh weight	-16 -44 -60 -64 -75	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
2 mM 4 mM 6 mM 8 mM 10 mM	Dry weight	-17 -33 -42 -58 -67	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
50 µM 150 µM 250 µM 350 µM	Fresh weight	-11 -37 -60 -77	Shoot	Triticum aestivum L	(Mohamed & Hassan, 2019)
50 µM 150 µM 250 µM 350 µM	Dry weight	-4 -17 -38 -44	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
50 µM 150 µM 250 µM 350 µM	Water content	-1 -6 -17 -30	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
50 µM 150 µM 250 µM 350 µM	Shoot Height	4 -22 -48 -67	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
50 µM	Leaf Area	10	Shoot	Raphanus sativus L	

100µM		-6			(Jayakumar et al., 2007)
150 µM		-20			
200 µM		-32			
250 µM		-46			
50 µM	Length	10	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-19			
150 µM		-31			
200 µM		-35			
250 µM		-43			
3 ppm	Leaf Area	20	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		45			
9 ppm		25			
12 ppm		15			
3 ppm	Fresh weight	-8	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		11			
9 ppm		25			
12 ppm		17			
3 ppm	Dry weight	11	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		-83			
9 ppm		-84			
12 ppm		-84			
3 ppm	Fresh weight	11	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		25			
9 ppm		17			
12 ppm		15			
3 ppm	Dry weight	11	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		11			
9 ppm		60			
12 ppm		34			
3 ppm	Phenols	7	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		16			
9 ppm		9			
12 ppm		7			
3 ppm	Proteins	21	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		21			
9 ppm		97			
12 ppm		84			
50 µM	Relative water Content (RWC)	-4	Shoot	Cicer arietinum L.	(Ali et al., 2013)
100 µM		-11			
150 µM		-26			
200 µM		-44			
500 µM	Dry weight	-57	shoot	Spinacia oleracea L.	(Pandey et al., 2009)
		-91			

5 mg/kg	Length of plant	2	Shoot	Vicia faba L.	(Kandil, 2007)
10 mg/kg		12			
15 mg/kg		30			
20 mg/kg		30			
5 mg/kg	Length of plant	5	Shoot	Vicia faba L.	(Kandil, 2007)
10 mg/kg		14			
15 mg/kg		33			
20 mg/kg		35			
5 ppm	Dry weight	41	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		85			
15 ppm		147			
20 ppm		156			
5 ppm	Dry weight	48	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		95			
15 ppm		158			
20 ppm		169			
2.5 mg/kg	Leaf Area	6	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		17			
7.5 mg/kg		29			
10 mg/kg		27			
12.5 mg/kg		29			
15 mg/kg		17			
2.5 mg/kg	Length	4	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		8			
7.5 mg/kg		26			
10 mg/kg		15			
12.5 mg/kg		22			
15 mg/kg		17			
2.5 mg/kg	Dry weight	7	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		10			
7.5 mg/kg		29			
10 mg/kg		17			
12.5 mg/kg		19			
15 mg/kg		14			
5 mg/kg	Height	1	Shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		3			
10 mg/kg		7			
12.5 mg/kg		5			
15 mg/kg		4			
5 mg/kg	Fresh weight	1	Shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		2			
10 mg/kg		3			
12.5 mg/kg		1			

15 mg/kg		1			
5 mg/kg		1			
7.5 mg/kg		2			
10 mg/kg	Dry weight	4	Shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
12.5 mg/kg		2			
15 mg/kg		1			
10 µg/L		0			
50 µg/L		-2			
100 µg/L	Length	-7	Shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-5			
400 µg/L		-14			
10 µg/L		0			
50 µg/L		-1			
100 µg/L	Fresh weight	-3	Shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-6			
400 µg/L		-12			
10 µg/L		0			
50 µg/L		-6			
100 µg/L	Dry weight	-14	Shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-15			
400 µg/L		-17			
10 µg/L		-1			
50 µg/L		-1			
100 µg/L	Yield	-3	Shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-6			
400 µg/L		-7			
15 mg/L	Dry weight	4	Shoot	Cucumis sativus L.	(Brengi et al., 2021)
20 mg/L		4			
15 mg/L	Yield	20	Shoot	Cucumis sativus L.	(Brengi et al., 2021)
20 mg/L		-3			

Table S3: Percent variation in different growth variables of plant roots in response to Co

Co dose	Growth	% change	Organ	Plant species	Reference
50 µM	Dry weight	-75	Root	Barley	(Lwalaba et al., 2020)
50 µM	Tissue length	-78	Root	Barley	(Lwalaba et al., 2020)
2 mM	Tissue length	-16	Root	Eleusine coracana (L.)	(Duraipandian et al., 2016)
4 mM		-27			
6 mM		-32			
8 mM		-39			
10 mM		-50			
50 µM	Fresh weight	6	Root	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-38			
250 µM		-62			
350 µM		-80			
50 µM	Dry weight	3	Root	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-27			
250 µM		-37			
350 µM		-63			
50 µM	Water content	-5	Root	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-11			
250 µM		-24			
350 µM		-40			
50 µM	Length	23	Root	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-9			
150 µM		-20			
200 µM		-33			
250 µM		-44			
3 ppm	Fresh weight	11	Root	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		25			
9 ppm		17			
12 ppm		15			
3 ppm	Dry weight	11	Root	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011, Pandey et al., 2009)
6 ppm		11			
9 ppm		60			
12 ppm		34			
500 µM	Dry weight	-64	Root	Spinacia oleracea L.	(Pandey et al., 2009)
		-68			
5 ppm	Dry weight	34	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		67			

15 ppm		121			
20 ppm		127			
5 ppm	Dry weight	40	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		73			
15 ppm		133			
20 ppm		140			
5 mg/kg	Diameter	14	Root	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		34			
10 mg/kg		49			
12.5 mg/kg		34			
15 mg/kg		19			
5 mg/kg	Yield	20	Root	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		40			
10 mg/kg		54			
12.5 mg/kg		51			
15 mg/kg		46			
10 µg/L	Length	0	Root	Cicer arietinum	(Khan & Khan, 2010)
50 µg/L		0			
100 µg/L		-1			
200 µg/L		-7			
400 µg/L		-10			
10 µg/L	Fresh weight	0	Root	Cicer arietinum	(Khan & Khan, 2010)
50 µg/L		0			
100 µg/L		-2			
200 µg/L		-2			
400 µg/L		-7			
10 µg/L	Dry weight	-4	Root	Cicer arietinum	(Khan & Khan, 2010)
50 µg/L		-4			
100 µg/L		-10			
200 µg/L		-20			
400 µg/L		-29			

Table S4: Percent variation in plants pigment contents in response to Co.

Co dose	Growth	% change	Organ	Plant species	Reference
200 µM	Chl-a	-52	Shoot	Lactuca sativa L	(Samet, 2020)
	Chl-b	-73	Shoot		
	Total Chl	-57	Shoot		
	Car	-48	Shoot		
50 µM	Chl-a	22	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		-10	shoot		
150 µM		-28	shoot		
200 µM		-41	shoot		
250 µM		-58	shoot		
50 µM	Chl-b	72	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		-11	shoot		
150 µM		-31	shoot		
200 µM		-41	shoot		
250 µM		-65	shoot		
50 µM	Total Chl	53	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		-11	shoot		
150 µM		-25	shoot		
200 µM		-41	shoot		
250 µM		-62	shoot		
50 µM	Car	42	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		-8	shoot		
150 µM		-31	shoot		
200 µM		-55	shoot		
250 µM		-60	shoot		
500 µM	Total Chl	-65	shoot	Spinacia oleracea L.	(Pandey et al., 2009)
500 µM	Car	-65	shoot	Spinacia oleracea L.	(Pandey et al., 2009)
100 µM	Chl-a	-26	Shoot	Salix babylonica	(Wang et al., 2020)
100 µM	Chl-b	-36	Shoot	Salix babylonica	(Wang et al., 2020)
100 µM	Total Chl	-16	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
101 µM	Total Chl	-39	Shoot		
102 µM	Total Chl	-65	Shoot		
50 µM	Chl-a	-3	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-21			
250 µM		-72			
350 µM		-81			
50 µM	Chl-b	4	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-40			
250 µM		-47			
350 µM		-71			
50 µM	Car	31	Shoot	Triticum aestivum L.	(Gad et al., 2019)

150 µM		-26			
250 µM		-52			
350 µM		-60			
500 µM	Total Chl	-70	shoot	Spinacia oleracea L.	(Pandey et al., 2009)
50 µM		3			
100 µM		-15			
150 µM	Total Chl	-18	shoot	Cicer arietinum L.)	(Ali et al., 2010)
200 µM		-42			
250 µM		-60			
0.1 ppm		7			
0.5 ppm		29			
1 ppm	Chl-a	-25	shoot	Monoraphidium minutum	(El-Sheekh et al., 2003)
2 ppm		-38			
3 ppm		-46			
0.1 ppm		0			
0.5 ppm		9			
1 ppm	Chl-b	28	shoot	Monoraphidium minutum	(El-Sheekh et al., 2003)
2 ppm		-24			
3 ppm		-39			
0.1 ppm		3			
0.5 ppm		7			
1 ppm	Car	-6	shoot	Monoraphidium minutum	(El-Sheekh et al., 2003)
2 ppm		-15			
3 ppm		-39			
0.5 ppm		4			
1.5 ppm		12			
2.5 ppm	Chl-a	-4	shoot	Nitzchia perminuta	(El-Sheekh et al., 2003)
3.5 ppm		-29			
5 ppm		-36			
10 ppm		38			
20 ppm		68			
30 ppm		85			
40 ppm	Chl-a	133	shoot	paulownia	(Hashish et al., 2023)
50 ppm		115			
60 ppm		25			
10 ppm		47			
20 ppm		67			
30 ppm		80			
40 ppm	Chl-b	153	shoot	paulownia	(Hashish et al., 2023)
50 ppm		113			
60 ppm		40			
10 ppm		11			
20 ppm	Car	-15	shoot	paulownia	(Hashish et al., 2023)
30 ppm		4			
40 ppm		37			

50 ppm		11			
60 ppm		7			
20 µM		-82	Shoot		
40 µM	Total Chl	-90	Shoot	Lippia filifolia	(Pimenta et al., 2013)
60 µM		-94	Shoot		
20 µM		778	Shoot		
40 µM	car	644	Shoot	Lippia filifolia	(Pimenta et al., 2013)
60 µM		1587	Shoot		
2 mM		0			
4 mM		-8			
6 mM	Chl-a	-17	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
8 mM		-24			
10 mM		-36			
2 mM		-28			
4 mM		-35			
6 mM	Chl-b	-50	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
8 mM		-66			
10 mM		-69			
2 mM		-14			
4 mM		-22			
6 mM	Total Chl	-33	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
8 mM		-43			
10 mM		-55			
2 mM		-18			
4 mM		-27			
6 mM	Car	-41	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
8 mM		-55			
10 mM		-59			
10 µg/L		0			
50 µg/L		0			
100 µg/L	Chl-a	-1	shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-4			
400 µg/L		-4			
10 µg/L		0			
50 µg/L		0			
100 µg/L	Chl-b	-1	shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-4			
400 µg/L		-5			
10 µg/L		0			
50 µg/L		0			
100 µg/L	Total Chl	-1	shoot	Cicer arietinum	(Khan & Khan, 2010)
200 µg/L		-1			
400 µg/L		-1			
0.22 µM	Chl-a	0	shoot		(Dos Reis et al., 2021)

0.44 µM		20			
0.67 µM		40		Raphidocelis subcapitata	
0.89 µM		60			
1.11 µM		53			
0.98 µM		13			
1.83 µM		7			
2.67 µM	Chl-a	17	shoot	Raphidocelis subcapitata	(Dos Reis et al., 2021)
3.53 µM		40			
4.37 µM		53			
0.98 µM		13			
1.83 µM		7			
2.67 µM	Chl-a	17	shoot	Raphidocelis subcapitata	(Dos Reis et al., 2021)
3.53 µM		40			
4.37 µM		53			
0.98 µM		13			
1.83 µM		7			
2.67 µM	Chl-a	17	shoot	Raphidocelis subcapitata	(Dos Reis et al., 2021)
3.53 µM		40			
4.37 µM		53			
400 µM	Chl-a	-79			
400 µM	Chl-b	-68	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)
400 µM	Car	-46			

Table S5: The effect of different macronutrients on Co accumulation in plant roots and shoots.

Co dose	Nutrients	% change	Organ	Plant species	Reference
2.5 mg/kg	N	5	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		35			
7.5 mg/kg		50			
10 mg/kg		50			
12.5 mg/kg		43			
15 mg/kg		37			
2.5 mg/kg	P	41	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		65			
7.5 mg/kg		88			
10 mg/kg		94			
12.5 mg/kg		88			
15 mg/kg		59			
2.5 mg/kg	K	27	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		53			
7.5 mg/kg		71			
10 mg/kg		71			
12.5 mg/kg		68			
15 mg/kg		65			
50 µM	N	11	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-3			
150 µM		-8			
200 µM		-15			
250 µM		-23			
50 µM	P	15	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-10			
150 µM		-19			
200 µM		-27			
250 µM		-32			
50 µM	K	7	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-8			
150 µM		-12			
200 µM		-17			
250 µM		-23			
3 ppm	N	16	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		102			
9 ppm		84			
12 ppm		20			

3 ppm	P	13	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		21			
9 ppm		13			
12 ppm		8			
3 ppm	K	20	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		48			
9 ppm		24			
12 ppm		16			
3 ppm	S	4	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
6 ppm		39			
9 ppm		21			
12 ppm		12			
5 ppm	N	130	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		178			
15 ppm		321			
20 ppm		512			
5 ppm	P	18	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		-9			
15 ppm		64			
20 ppm		91			
5 ppm	K	25	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		43			
15 ppm		94			
20 ppm		115			
5 ppm	N	82	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		150			
15 ppm		397			
20 ppm		612			
5 ppm	P	75	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		175			
15 ppm		275			
20 ppm		350			
5 ppm	K	50	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		88			
15 ppm		175			
20 ppm		275			
5 mg/kg	N	2	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		5			
10 mg/kg		8			
12.5 mg/kg		6			
15 mg/kg		4			

5 mg/kg	P	2	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		5			
10 mg/kg		6			
12.5 mg/kg		5			
15 mg/kg		4			
5 mg/kg	K	2	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		6			
10 mg/kg		10			
12.5 mg/kg		6			
15 mg/kg		3			
5 mg/kg	N	3	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		5			
10 mg/kg		8			
12.5 mg/kg		6			
15 mg/kg		5			
5 mg/kg	P	2	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		5			
10 mg/kg		8			
12.5 mg/kg		7			
15 mg/kg		5			
5 mg/kg	K	3	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		7			
10 mg/kg		10			
12.5 mg/kg		6			
15 mg/kg		4			
100 µM	Ca	19	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		72			
100 µM	K	-19	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		-8			
100 µM	Mg	5	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		47			
100 µM	Na	55	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		127			
100 µM	Ca	-8	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		-11			
100 µM	K	-12	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		25			
100 µM	Mg	42	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		104			
100 µM	Na	80	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		50			

Table S6: The effect of different micronutrients on Co accumulation in plant roots and shoots.

Co dose	Nutrients	% change	Organ	Plant species	Reference
2.5 mg/kg	Cu	7	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		16			
7.5 mg/kg		23			
10 mg/kg		23			
12.5 mg/kg		20			
15 mg/kg		15			
2.5 mg/kg	Fe	-3	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		-5			
7.5 mg/kg		-10			
10 mg/kg		-8			
12.5 mg/kg		-13			
15 mg/kg		-13			
2.5 mg/kg	Mn	7	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		11			
7.5 mg/kg		18			
10 mg/kg		18			
12.5 mg/kg		14			
15 mg/kg		12			
2.5 mg/kg	Zn	3	shoot	Moringa oleifera	(Gad et al., 2019)
5 mg/kg		8			
7.5 mg/kg		11			
10 mg/kg		11			
12.5 mg/kg		8			
15 mg/kg		6			
50 µM	Cu	7	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-11			
150 µM		-22			
200 µM		-37			
250 µM		-48			
50 µM	Fe	7	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-3			
150 µM		-8			
200 µM		-14			
250 µM		-20			
50 µM	Mn	5	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)
100µM		-7			
150 µM		-17			
200 µM		-22			
250 µM		-29			
50 µM	Zn	5	Shoot	Raphanus sativus L	(Jayakumar et al., 2007)

100µM		-3			
150 µM		-10			
200 µM		-19			
250 µM		-28			
3 ppm 6 ppm 9 ppm 12 ppm	Cu	9 19 26 29	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
3 ppm 6 ppm 9 ppm 12 ppm	Fe	-4 -8 -12 -16	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
3 ppm 6 ppm 9 ppm 12 ppm	Mn	4 11 12 16	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
3 ppm 6 ppm 9 ppm 12 ppm	Zn	9 20 24 31	Shoot	Brassica oleraceae L.	(Gad & Abd El-Moez, 2011)
5 mg/kg 10 mg/kg 15 mg/kg 20 mg/kg 25 mg/kg	Cu	2 8 6 5 -7	Grain	Triticum aestivum L.	(Kandil & El-Maghraby, 2017)
5 mg/kg 10 mg/kg 15 mg/kg 20 mg/kg 25 mg/kg	Fe	-2 -3 -5 -8 -11	Grain	Triticum aestivum L.	(Kandil & El-Maghraby, 2017)
5 mg/kg 10 mg/kg 15 mg/kg 20 mg/kg 25 mg/kg	Mn	6 27 26 24 21	Grain	Triticum aestivum L.	(Kandil & El-Maghraby, 2017)
5 mg/kg 10 mg/kg 15 mg/kg 20 mg/kg 25 mg/kg	Zn	3 8 8 2 -5	Grain	Triticum aestivum L.	(Kandil & El-Maghraby, 2017)
5 ppm 10 ppm 15 ppm 20 ppm	Cu	15 34 44 56	Shoot	Vicia faba L.	(Kandil, 2007)

5 ppm	Fe	68	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		53			
15 ppm		36			
20 ppm		18			
5 ppm	Mn	21	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		37			
15 ppm		63			
20 ppm		83			
5 ppm	Zn	17	Shoot	Vicia faba L.	(Kandil, 2007)
10 ppm		17			
15 ppm		17			
20 ppm		17			
5 ppm	Cu	19	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		33			
15 ppm		37			
20 ppm		42			
5 ppm	Fe	162	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		135			
15 ppm		127			
20 ppm		84			
5 ppm	Mn	10	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		19			
15 ppm		27			
20 ppm		33			
5 ppm	Zn	44	Root	Vicia faba L.	(Kandil, 2007)
10 ppm		53			
15 ppm		62			
20 ppm		78			
5 mg/kg	Cu	13	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		29			
10 mg/kg		45			
12.5 mg/kg		37			
15 mg/kg		24			
5 mg/kg	Fe	-3	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		-6			
10 mg/kg		-8			
12.5 mg/kg		-9			
15 mg/kg		-13			
5 mg/kg	Mn	-12	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		14			
10 mg/kg		19			
12.5 mg/kg		14			
15 mg/kg		4			
5 mg/kg	Zn	8	shoot	Ipomoea batatas L	(Gad & Kandil, 2008)
7.5 mg/kg		16			

10 mg/kg		28			
12.5 mg/kg		19			
15 mg/kg		9			
100 µM	Cu	-18	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		18			
100 µM	Fe	-35	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		24			
100 µM	Mn	-8	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		53			
100 µM	Zn	11	shoot	Zea mays L.	(Tuna et al., 2014)
200 µM		89			
100 µM	Cu	23	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		66			
100 µM	Fe	1376	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		2316			
100 µM	Mn	321	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		594			
100 µM	Zn	-12	Root	Zea mays L.	(Tuna et al., 2014)
200 µM		87			

Table S7: Percent change in plants reactive oxygen species in response to Co**.**

Co dose	ROS	% change	Organ	Plant species	Reference
200 µM	H2O2	127	Shoot	Lactuca sativa L	(Samet, 2020)
100 µM	H2O2	75	Shoot	Brassica juncea L.	(Karuppanapandian & Kim, 2013)
		102	Shoot		(Karuppanapandian & Kim, 2013)
		102	Shoot		(Karuppanapandian & Kim, 2013)
100 µM	O2	95	Shoot	Brassica juncea L.	(Karuppanapandian & Kim, 2013)
		158	Shoot		(Karuppanapandian & Kim, 2013)
		162	Shoot		(Karuppanapandian & Kim, 2013)
50 µM	H2O2	3	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		173			(Mohamed & Hassan, 2019)
250 µM		258			(Mohamed & Hassan, 2019)
350 µM		352			(Mohamed & Hassan, 2019)
150 µM	H2O2	62	Leaves	Triticum aestivum L.	(Yildiztugay et al., 2019)
300 µM	H2O2	82	Leaves		(Yildiztugay et al., 2019)
500 µM	H2O2	-31	Leaves	Salvia officinalis L.	(Torun, 2019)
50 mg/L	H2O2	-7	shoot	BRASSICA NAPUS L.	(Jahani et al., 2019)
100 mg/L		-8			(Jahani et al., 2019)
250 mg/L		14			(Jahani et al., 2019)
500 mg/L		38			(Jahani et al., 2019)
1000 mg/L		41			(Jahani et al., 2019)
2000 mg/L		76			(Jahani et al., 2019)
4000 mg/L		115			(Jahani et al., 2019)
0.1 mM	O2	9	shoot	Lemna minor L.	(Begović et al., 2016)
1 mM		-18			(Begović et al., 2016)
0.1 mM	O2	8			(Begović et al., 2016)
1 mM		-23			(Begović et al., 2016)
0.1 mM	O2	9			(Begović et al., 2016)
1 mM		-26			(Begović et al., 2016)
50 µm	H2O2	-8	Leaves	Phaseolus aureus Roxb	(Tewari et al., 2002)
100 µm		-22			(Tewari et al., 2002)
200 µm		-28			(Tewari et al., 2002)
300 µm		-30			(Tewari et al., 2002)
400 µm		-35			(Tewari et al., 2002)
15 mg/L	H2O2	4	Leaves		(Brengi et al., 2021)

20 mg/L		5		*Cucumis sativus* L.	(Brengi et al., 2021)
400 µM	H2O2	236	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)

Table S8: Percent change in plant Lipid peroxidation in response to Co.

Co dose	LPO	% change	Organ	Plant species	Reference
0 µM	MDA	0	Seed	Solanum lycopersicum	(Azarakhsh et al., 2015)
100 µM	MDA	17	Seed		
500 µM	MDA	69	Seed		
150 µM	TBARS	76	shoot	Triticum aestivum L.	(Yildiztugay et al., 2019)
300 µM	TBARS	132	shoot		
50 µM	TBARS	5	Leaves	Cicer arietinum L.	(Ali et al., 2010)
100µM		14	Leaves		
150 µM		19	Leaves		
200 µM		24	Leaves		
250 µM		38	Leaves		
200 µM	MDA	24	Shoot	Lactuca sativa L	(Samet, 2020)
50 µM	MDA	60	Shoot	Barley	(Lwalaba et al., 2020)
50 µM	MDA	52	root	Barley	(Lwalaba et al., 2020)
500 µM	TBARS	120	shoot	Spinacia oleracea L.	(Pandey et al., 2009)
100 µM	MDA	-4	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		126	Shoot		
		177	Shoot		
50 µM	MDA	7	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		186			
250 µM		300			
350 µM		436			
20 µM	TBARS	-81	Shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		-88	Shoot		
60 µM		-88	Shoot		
50 µM	TBARS	9	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		32			
150 µM		55			
200 µM		85			
50 µM	TBARS	11	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		33			
150 µM		46			
200 µM		78			
500 µM	TBARS	5	shoot	Salvia officinalis L.	(Torun, 2019)
50 mg/kg	TBARS	-9	shoot	BRASSICA NAPUS L.	(Jahani et al., 2019)
100 mg/kg		-9			

250 mg/kg		14			
500 mg/kg		118			
1000 mg/kg		214			
2000 mg/kg		214			
4000 mg/kg		291			
100 µM	MDA	20	Shoot	Ocimum basilicum L.	(Azarakhsh et al., 2015)
500 µM		71	Shoot		
0.1 mM	TBARS	17	shoot	Lemna minor L.	(Begović et al., 2016)
1 mM		50			
0.1 mM	TBARS	-20			
1 mM		43			
0.1 mM	TBARS	50			
1 mM		67			
20 µM	TBARS	-81	shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		-88			
60 µM		-88			
100 mg/L	EL	-22	shoot	Daffodil	(Aslmoshtaghi et al., 2014)
200 mg/L		-44			
300 mg/L		-8			
50 mg/L	EL	-6	shoot	BRASSICA NAPUS L.	(Jahani et al., 2019)
100 mg/L		-3			
250 mg/L		24			
500 mg/L		106			
1000 mg/L		112			
2000 mg/L		206			
4000 mg/L		224			
50 µm	MDA	-2	Leaves	Phaseolus aureus Roxb	(Tewari et al., 2002)
100 µm		-18			
200 µm		-29			
300 µm		-28			
400 µm		-28			
15 mg/L	MDA	-17	Leaves	*Cucumis sativus* L.	(Brengi et al., 2021)
20 mg/L		8			
400 µM	MDA	-54	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)
2.5 mg/L	MDA	20	Shoot	Catharanthus roseus	(Fouad & Hafez, 2020)
5 mg/L		57			
7.5 mg/L		51			
10 mg/L		63			

Table S9: Percent variation in ascorbate peroxidase (APX) activity in response to Co

Co dose	Enzymes	% change	Organ	Plant species	Reference
150 µM	APX	-18	Shoot	Triticum aestivum L	(Yildiztugay et al., 2019)
300 µM		-36	Shoot		
200 µM	APX	3750	Shoot	Lactuca sativa L	(Samet, 2020)
50 µM	APX	44	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		89			
250 µM		167			
350 µM		44			
100 µM	APX	173	Shoot	Ocimum basilicum L.	(Azarakhsh et al., 2015)
500 µM		387	Shoot		
400 µM	APX	-39	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)

Co dose	Enzymes	% change	Organ	Plant species	Reference
150 µM	CAT	56	Shoot	Triticum aestivum L	(Yildiztugay et al., 2019)
300 µM		63	shoot		
50 µM	CAT	-1	shoot	Cicer arietinum L.	(Ali et al., 2010)
100µM		-10	shoot		
150 µM		-17	shoot		
200 µM		-33	shoot		
250 µM		-40	shoot		
200 µM	CAT	800	shoot	Lactuca sativa L	(Samet, 2020)
50 µM	CAT	26	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		-10	shoot		
150 µM		-30	shoot		
200 µM		-33	shoot		
250 µM		-40	shoot		
100µM	CAT	3	Shoot	Lycopersicon esculentum	(Hasan et al., 2011)
200 µM		10			
300 µM		13			
100 µM	CAT	-10	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		-29	Shoot		
		-37	Shoot		
50 µM	CAT	6	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		-96			
250 µM		-98			
350 µM		-99			
50 µM	CAT	400	Shoot	Vigna radiata	(Jayakumar et al., 2008)
100µM		-13			
150 µM		-31			
200 µM		-33			
250 µM		-38			
20 µM	CAT	-24	Shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		-94	Shoot		
60 µM		-98	Shoot		
50 µM	CAT	-3	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		423			
150 µM		335			
200 µM		292			
50 µM	CAT	-2	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		427			
150 µM		345			
200 µM		281			
2 mM	CAT	39	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
4 mM		85			

6 mM		136			
8 mM		141			
10 mM		172			
2 mM		39			
4 mM		85			
6 mM	CAT	136	shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
8 mM		141			
10 mM		172			
50 µM		50			
100µM		-9			
150 µM	CAT	-11	shoot	Cyamopsis tetragonaloba	(Jayakumar, 2019)
200 µM		-13			
250 µM		-16			
20 µM		-24			
40 µM	CAT	0	shoot	Lippia filifolia	(Pimenta et al., 2013)
60 µM		-16			
400 µM	CAT	60	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)

Table S11: Percent variation in SOD activity in response to Co

Co dose	Enzymes	% change	Organ	Plant species	Reference
150 µM	SOD	-20	Shoot	Triticum aestivum L	(Yildiztugay et al., 2019)
300 µM		-7	shoot		
50 µM	SOD	-1	shoot	Cicer arietinum L.	(Ali et al., 2010)
100µM		-7	shoot		
150 µM		-10	shoot		
200 µM		-20	shoot		
250 µM		-33	shoot		
100µM	SOD	14	Shoot	Lycopersicon esculentum	(Hasan et al., 2011)
200 µM		21			
300 µM		30			
100 µM	SOD	9	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		56	Shoot		
		156	Shoot		
50 µM	SOD	11	Shoot	Triticum aestivum L.	(Mohamed & Hassan, 2019)
150 µM		39			
250 µM		-17			
350 µM		-33			
20 µM	SOD	-47	Shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		-19			
60 µM		-52			
50 µM	SOD	-8	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		-16			
150 µM		-24			
200 µM		-38			
50 µM	SOD	-8	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		-19			
150 µM		-27			
200 µM		-36			
20 µM	SOD	-47	shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		-19			
60 µM		-52			
15 mg/L	SOD	0	Leaves	*Cucumis sativus* L.	(Brengi et al., 2021)
20 mg/L		-10			
400 µM	SOD	-71	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)

Table S12: Percent variation in GR activity in response to Co

Co dose	Enzymes	% change	Organ	Plant species	Reference
150 µM	GR	-22	Shoot	Triticum aestivum L	(Yildiztugay et al., 2019)
300 µM		2	shoot		
50 µM	GR	6	shoot	Cicer arietinum L.	(Ali et al., 2010)
100µM		-13	shoot		
150 µM		-25	shoot		
200 µM		-44	shoot		
250 µM		-75	shoot		
50 µM	GR	220	Shoot	Barley	(Lwalaba et al., 2020)
50 µM		300	root		
100 µM	GR	55	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		82	Shoot		
		99	Shoot		

Table S13: Percent variation in POD activity in response to Co

Co dose	Enzymes	% change	Organ	Plant species	Reference
50 µM	POD	6	shoot	Cicer arietinum L.	(Ali et al., 2010)
100µM		-13	shoot		
150 µM		-38	shoot		
200 µM		-50	shoot		
250 µM		-59	shoot		
50 µM	POD	-17	shoot	Vigna radiata (L.)	(Jaleel et al., 2009)
100µM		17	shoot		
150 µM		27	shoot		
200 µM		29	shoot		
250 µM		30	shoot		
100µM	POD	27	shoot	Salix babylonica	(Wang et al., 2020)
		69	Root	Salix babylonica	(Wang et al., 2020)
100µM	POD	4	Shoot	Lycopersicon esculentum	(Hasan et al., 2011)
200 µM		8			
300 µM		7			
50 µM	POD	5	Shoot	Vigna radiata	(Jayakumar et al., 2008)
100µM		25			
150 µM		50			
200 µM		60			
250 µM		100			
20 µM	POD	-48	Shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		4	Shoot		
60 µM		-18	Shoot		
50 µM	POD	-8	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		-20			
150 µM		-27			
200 µM		-41			
50 µM	POD	-6	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		-25			
150 µM		-33			
200 µM		-45			
2 mM	POD	2	Shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
4 mM		5			
6 mM		15			
8 mM		26			
10 mM		45			
20 µM	POD	-48	Shoot	Lippia filifolia	(Pimenta et al., 2013)
40 µM		4			
60 µM		-18			

15 mg/L 20 mg/L	POD	0 0	Leaves	*Cucumis sativus* L.	(Brengi et al., 2021)
400 µM	POD	217	Shoot	Solanum lycopersicum L.	(Kamran et al., 2021)

Table S14: Percent variation in plant non-enzymes activity in response to Co

Co dose	Non-enzymes	% change	Organ	Plant species	Reference
50 µM		15	Leaves		
100µM		54	Leaves		
150 µM	Proline	92	Leaves	Cicer arietinum L.	(Ali et al., 2010)
200 µM		115	Leaves		
250 µM		138	Leaves		
200 µM	Proline	283	Shoot	Lactuca sativa L	(Samet, 2020)
	PC	450	Shoot		
		1900	root		
50 µM	GSH	127	Shoot	Hordeum vulgare	(Lwalaba et al., 2020)
		145	root		
	GSSH	160	Shoot		
		198	root		
100µM	GSH	19	Shoot	Salix babylonica	(Wang et al., 2020)
		-33	root		
100µM		20			
200 µM	Proline	66	Shoot	Lycopersicon esculentum	(Hasan et al., 2011)
300 µM		98			
		16	Shoot		
100 µM	Proline	83	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		170	Shoot		
		103	Shoot		
100 µM	DHAR	138	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		176	Shoot		
		18	Shoot		
100 µM	GSH	82	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		145	Shoot		
		7	Shoot		
100 µM	GSSG	129	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		170	Shoot		
		19	Shoot		
100 µM	DHA	69	Shoot	Brassica junceaL.	(Karuppanapandian & Kim, 2013)
		91	Shoot		
150 µM	GSH	-13	Leaves	Triticum aestivum L.	(Yildiztugay et al., 2019)
300 µM		-23	Leaves		
150 µM	GSSH	12	Leaves	Triticum aestivum L.	(Yildiztugay et al., 2019)
300 µM		9	Leaves		
150 µM	DHA	44	Leaves	Triticum aestivum L.	(Yildiztugay et al., 2019)
300 µM		89	Leaves		

50 µM	Amino acid	10	Shoot	Vigna radiata	(Jayakumar et al., 2008)
100µM		-6			
150 µM		-13			
200 µM		-25			
250 µM		-32			
50 µM	Proline	17	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		29			
150 µM		54			
200 µM		69			
50 µM	Proline	9	Seeds	Cicer arietinum L.	(Ali et al., 2013)
100µM		11			
150 µM		42			
200 µM		60			
2 mM	Amino acid	13	Shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
4 mM		26			
6 mM		60			
8 mM		124			
10 mM		203			
2 mM	Proline	24	Shoot	Eleusine coracana (L.)	(Duraipandian et al., 2016)
4 mM		48			
6 mM		77			
8 mM		93			
10 mM		99			
0 µM	Proline	1	Shoot	Lycopersicon esculentum	(Hasan et al., 2011)
100µM		18			
200 µM		40			
300 µM		61			

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