

Supplementary Materials

# Comparisons of the Effect of Different Metal Oxide Nanoparticles on the Root and Shoot Growth under Shaking and Non-Shaking Incubation, Different Plants and Binary Mixture Conditions

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**Table S1.** The two concentrations (high and low) of three nanoparticles (NPs) used in 12 combinations to study the effect of binary NP mixtures in *Lactuca sativa* and *Raphanus sativus*.

Plant	NPs (mg/L)			Combinations
	CuO	ZnO	NiO	
<i>L. sativa</i>	0.12 <sup>a</sup> , 0.06 <sup>b</sup>	0.25, 0.12	0.30, 0.15	12
<i>R. sativus</i>	0.18, 0.09	0.62, 0.31	1.42, 0.71	12

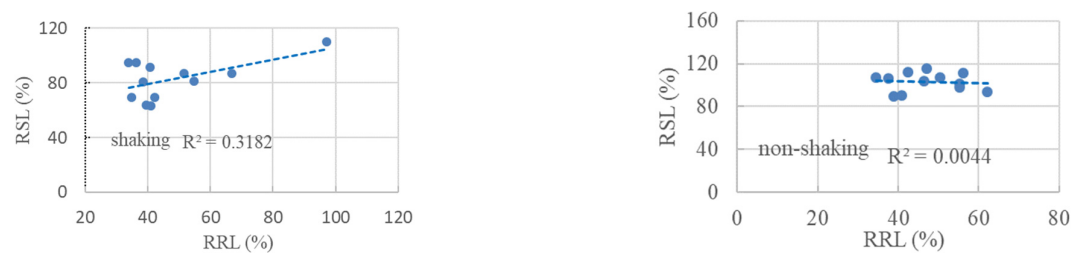
<sup>a</sup> high test concentration; <sup>b</sup> low test concentration.

**Table S2.** Soluble metal concentrations from nanoparticles (NPs) under experimental conditions.

Conditions	CuO		ZnO		NiO	
	NPs	Soluble metal	NPs	Soluble metal	NPs	Soluble metal
	(mg/L)	(µg/L)	(mg/L)	(µg/L)	(mg/L)	(µg/L)
<i>Lactuca sativa</i>	0.2	10 ± 1 (5%)	0.2	12 ± 3 (6%)	0.5	4 ± 1 (0.8%)
	0.5	19 ± 6 (3.8%)	0.5	33 ± 9 (6.6%)	1.0	10 ± 1 (1%)
	1.0	22 ± 7 (2.2%)	1.0	65 ± 36 (6.5%)	2.0	34 ± 5 (1.7%)
	2.0	57 ± 20 (2.9%)	2.0	120 ± 59 (6.0%)	5.0	156 ± 16 (3.1%)
<i>Raphanus sativus</i>	0.1	4 ± 2 (4%)	0.5	9 ± 2 (1.8%)	1.0	3 ± 2 (0.3%)
	0.2	11 ± 8 (5.5%)	1.0	23 ± 13 (2.3%)	2.0	4 ± 1 (0.2%)
	0.5	21 ± 3 (4.2%)	1.5	42 ± 31 (2.8%)	4.0	17 ± 6 (0.4%)
	1.0	40 ± 1 (4%)	2.0	55 ± 36 (2.75%)	5.0	37 ± 20 (0.7%)

**Table S3.** Preliminary results of DPPH scavenging activity (A<sub>517</sub>).

Absorbance (517 nm)	Control	CuO (mg/L)		ZnO (mg/L)	
		0.5	0.25	0.5	0.25
Extract (no DPPH)	0.025	0.018	0.019	0.022	0.024
DPPH:extract (1:1)	1.012	0.908	0.964	0.981	0.987
DPPH:extract (1:2)	0.620	0.505	0.568	0.603	0.621



**Figure S1.** Correlations between the root and shoot growth of *Lactuca sativa* under shaking and non-shaking conditions.