

Green synthesis of selenium nanoparticles mediated from *Ceropegia bulbosa Roxb* extract and its cytotoxicity, antimicrobial, mosquitocidal and photocatalytic activities

Vetivel Cittrarasu¹, Durairaj Kaliannan^{2,3,†}, Dharman Kalaimurugan², Viji Maluventhen⁴, Murugesh Easwaran⁵, Wen Chao Liu^{6,*}, Balamuralikrishnan Balasubramanian^{7,†,*}, Maruthupandian Arumugam^{1,*}

¹Ethnopharmacology and algal biotechnology division, Department of Botany, School of Life Sciences, Periyar University, Salem-636011, Tamil Nadu India.

²Department of Environmental science, School of Life Sciences, Periyar University, Salem-636011, Tamil Nadu, India.

³Zoonosis Research Center, Department of Infection Biology, School of medicine, Wonkwang University, Iksan-54538, South Korea.

⁴Department of Botany, Thiagarajar College, Madurai – 625 099, Tamil Nadu, India.

⁵Nutritional Improvement of Crops, International Centre for Genetic Engineering and Biotechnology, New Delhi 110067, India.

⁶Department of Animal Science, College of Agriculture, Guangdong Ocean University, Zhanjiang, Guangdong 524088, P. R. China.

⁷Department of Food science and Biotechnology, College of life sciences, Sejong University, Seoul-05006, South Korea.

[†]Equally contributed as first author

***Corresponding authors:** maruthumdu82@gmail.com (M.A); geneticsmurali@gmail.com, bala.m.k@sejong.ac.kr (B.B), liuwc@gdou.edu.cn (W.L)

Supplementary Table 1: Raw data for cell viabilities of the MDA-MB-231 breast cancer cells and HBL-100 normal breast cells incubated with rapid synthesized SeNPs for 48 h.

Concentration ($\mu\text{g/mL}$)	Cell viability %			
	HBL - 100 cell	SD	MDA-MB 231 cell	SD
0	99.33	0.3333	99.67	0.577
5	98.00	0.3333	92.67	0.333
10	95.00	0.5774	88.00	0.333
15	89.67	0.6667	81.33	0.333
20	86.33	0.5774	74.00	0.333
25	80.67	0.3333	66.33	0.333
30	77.33	0.3333	58.33	0.333
35	71.67	0.3333	49.33	0.333
40	64.67	0.3333	41.33	0.333
45	58.33	0.5774	37.00	0.333
50	53.67	0.5774	32.00	0.284

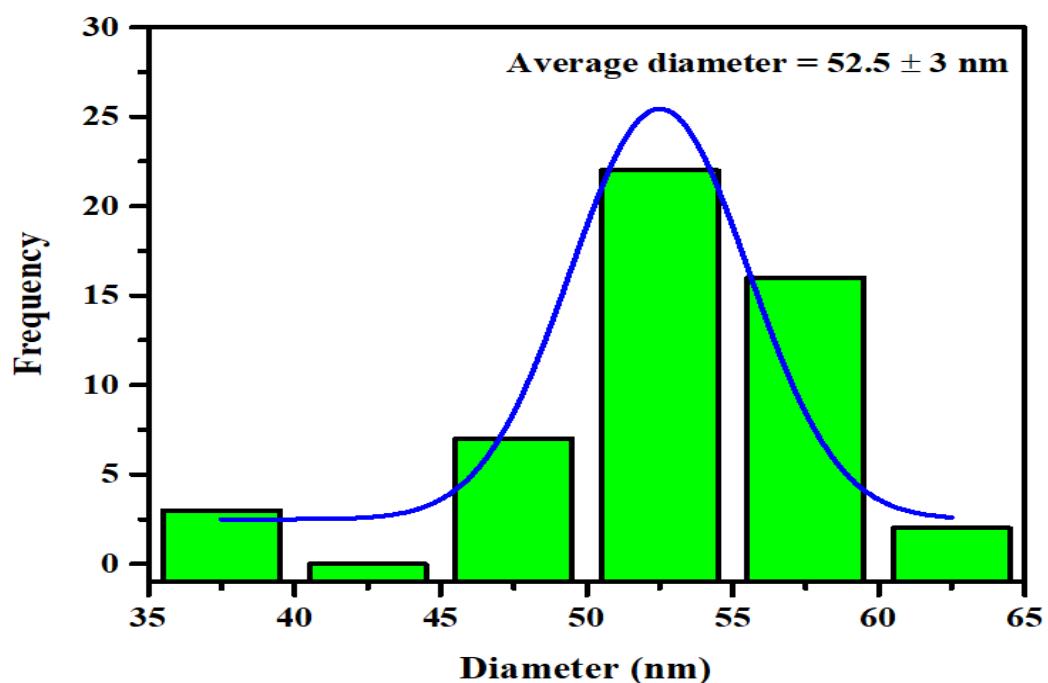
Supplementary Table 2: Raw data for the antibacterial activity of SeNPs on different *B. subtilis* and *E.coli*

Concentration ($\mu\text{g/mL}$)	Zone of Inhibition (mm)			
	<i>Bacillus subtilis</i>	SD	<i>E. coli</i>	SD
Control	14	0.5774	4.666666667	0.3333
25	10	0.5774	6	0.5774
50	13.66666667	0.3333	10.33333333	0.3333
75	16	0.5774	12.66666667	0.3333
100	16.66666667	0.3333	15.33333333	0.3333

Supplementary Table 3: Raw data of photocatalytic degradation of methylene blue in the presence SeNPs.

Time	Without catalyst	With catalyst
0	100	100
10	99	32.5
20	98.7	26
30	98	22.5
40	97	14
50	97.5	11
60	96.34	7.5
70	96.5	6.5
80	96	4

Figure S1: Average particle size distribution by Image J analysis.



Supplementary Table 4: Histogram raw data for average particle size analysis.

Bins				
Bin Centers	Counts	Cumulative Sum	Cumulative Probability	
65	0	0	0	0
75	3	3	6	
85	1	4	8	
95	7	11	22	
105	22	33	66	
115	15	48	96	
125	2	50	100	