Supplementary Information

Modified soak pit system for septic tank effluent treatment in a laboratory scale

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Table S1 Septic tank effluent characteristics		
Parameter	Average concentration	Typical concentration
Total suspended solids (mg/L) 36-85	60	
BOD5 (mg/L)	118-189	
Fecal coliform Bacteria (CFU/100 mL)	106-107	106
Ammonium Nitrogen (mg/L)	30-50	40
Nitrate Nitrogen (mg/L)	0-10	0
Total Nitrogen (mg/L)	29.5-63.4	60
Ortho phosphate (mg/L)	10.2-12.8	12
Source: 2002 EPA Onsite Wastewater Treatment System Manual		

Table S2 Composition and concentration of synthetic septic tank effluent		
S. No.	Composition	Concentration (g/L)
1.	Peptone	0.1225
2.	Beef extract	0.0805
3.	Urea	0.1475
4.	Sodium chloride	0.059
5.	Calcium chloride	0.059
6.	Potassium chloride (KCl)	0.012
7.	$MgSO_4.7H_2O$	0.035
8.	K_2HPO_4	0.935
9.	KH_2PO_4	0.117
Source: Journal of Korean Institute of chemical Engineers		

Table S3 Values obtained for sand filter without impregnation						
Time (days)	TSS (mg/L)	Phosphate (mg/L)	Ammonia nitrogen (mg/L)	BOD (mg/L)	Nitrate nitrogen (mg/L)	E-coli (C.F.U/100mL) $x10^5$
1	63	12	47	140	2	24
3	59.08	11.6	40.25	130.12	1.8	24
6	55.15	11	36.12	124.23	1.69	21
9	52.68	10.3	31	113.51	1.55	15
12	50.54	9.6	28.75	104.01	1.43	15
15	48.63	9.1	25.21	94.5	1.33	12
18	46.8	8.8	23	85	1.26	12
21	41.55	8	20.125	74.5	1	9.3
24	36.32	7.2	18	61	0.92	9.3
27	34.12	6.7	15.5	54.54	0.79	9.3
30	31.54	6.1	12	49	0.5	7.5

Table S4: Values obtained for impregnated sand filter						
Time (days)	TSS (mg/L)	Phosphate (mg/L)	Ammonia nitrogen (mg/L)	BOD (mg/L)	Nitrate nitrogen (mg/L)	E-coli (C.F.U/100 mL) x 10^5
1	47	9.8	34.54	115	1.35	21
3	39	8.54	23.25	88.254	0.98	12
6	29.25	7.03	15.69	59	0.75	7.5
9	22	5	10.25	45.5	0.5	0.46
12	16.25	3.46	6.45	31.25	0.25	0.21
15	6.5	1.3	4.5	19	0	0.011

Table S5 Evaluation of percentage removal					
Parameter	Concentration before treatment	Sand- without impregnation		Impregnated sand	
		After treatment (30 days)	% removal	After treatment (15 days)	% Removal
BOD (mg/L)	140	49	65.89	19	86.42
Ammonia nitrogen (mg/L)	47	12	70.12	4.5	90.42
E-coli(C.F.U/100 ml) $x10^5$	24	7.5	68.75	0.011	99.95
Nitrate nitrogen (mg/L)	2	0.5	75	0	100
TSS (mg/L)	63	31.54	51.25	6.5	89.68
Phosphate (mg/L)	12	6.1	52	1.3	89.16

Table S6 Values obtained for 2.5g silver dosage						
Time (days)	TSS (mg/L)	Phosphate (mg/L)	Ammonia nitrogen (mg/L)	BOD (mg/L)	Nitrate nitrogen (mg/L)	E. coli (C.F.U/100 mL) x 10^5
0	63	12	47	140	2	24
2	54	10.36	30	120.8	1.65	21
4	42.15	8.1	18.25	100.4	1.39	15
6	35.26	6.5	14.75	80.4	1.1	12
8	26.36	5	12.2	62.5	0.79	9.3
10	18.65	4.02	10.52	48.5	0.45	7.5
12	15.25	3.2	8.9	31.5	0.25	1.1
15	13.78	2.2	7.5	28	0.2	0.46

Table S7 Values obtained for 2 g silver dosage						
Time (days)	TSS (mg/L)	Phosphate (mg/L)	Ammonia Nitrogen (mg/L)	BOD (mg/L)	Nitrate Nitrogen (mg/L)	E. coli (C.F.U/100 mL) x 10^5
0	63	12	47	140	2	24
2	56	11.02	33	125.8	1.75	24
4	48.25	9.58	20.25	110	1.45	21
6	42.45	7.9	17.2	94.2	1.22	15
8	35.26	6.3	14.98	70	0.9	12
10	28.12	4.5	11.9	58	0.6	9.3
12	20.125	3.89	10	45	0.45	7.5
14	15	2.5	8.98	30.89	0.3	1.1

Table S8 Values obtained for 1.5 g silver dosage						
Time (days)	TSS (mg/L)	Phosphate (mg/L)	Ammonia Nitrogen (mg/L)	BOD (mg/L)	Nitrate Nitrogen (mg/L)	E-coli (C.F.U/100 mL) x 10^5
0	63	1	47	140	2	24
2	60.58	11.7	37.5	129	1.8	24
4	53.21	10.2	24.96	115.8	1.6	21
6	48	8.75	20.25	100.5	1.42	21
8	40.12	7.12	17	78.2	1.22	15
10	31.58	6	15.2	67	1	12
12	25.65	4.6	13	50.65	0.75	9.3
14	18	3.25	11.23	35.69	0.45	7.5

Table S9 Silver leaching for without gradation	
Time (days)	Silver leaching (mg/L)- single gradation(0.5 mm) 3 g
1	0.45
3	0.28
6	0.15
9	0.08
12	0.045
15	0.025