

Contaminant removal from wastewater by microalgal photobioreactors and modeling by artificial neural network

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Table S1. Performance of reactor 1 in the removal of pollutants.

Contact time (d)	Initial concentration (mg/L)	CAF removal (%)	CAF removal (mg/L)	DEET removal (%)	DEET Removal (mg/L)	TAN removal (%)	TAN removal (mg/L)	COD removal (%)	COD Removal (mg/L)
1.0	0.2	61.8	0.12	59.8	0.12	72.2	36.1	55.4	27.7
2.0	0.2	64.3	0.13	63.7	0.13	76.4	38.2	57.7	28.9
3.0	0.2	69.1	0.14	66.4	0.13	77.1	38.6	59.0	29.5
4.0	0.2	70.2	0.14	68.9	0.14	77.9	39.0	60.3	30.2
5.0	0.2	71.4	0.14	69.8	0.14	78.6	39.3	60.9	30.5
6.0	0.2	70.8	0.14	70.6	0.14	79.3	39.7	61.4	30.7
7.0	0.2	70.6	0.14	71.2	0.14	80.8	40.4	61.1	30.6
1.0	0.6	62.9	0.38	62.1	0.37	72.2	57.8	56.8	45.4
2.0	0.6	65.3	0.39	65.5	0.39	77.8	62.2	57.1	45.7
3.0	0.6	74.6	0.45	67.6	0.41	80.6	64.5	59.8	47.8
4.0	0.6	79.2	0.48	70.9	0.43	81.8	65.4	63.4	50.7
5.0	0.6	82.1	0.49	71.4	0.43	82.3	65.8	67.7	54.2
6.0	0.6	82.9	0.50	72.3	0.43	78.2	62.6	67.1	53.7
7.0	0.6	83.1	0.50	72.6	0.44	78.0	62.4	66.9	53.5
1.0	1.0	64.3	0.64	60.8	0.61	65.1	71.6	56.2	61.8
2.0	1.0	67.2	0.67	62.1	0.62	67.6	74.4	57.1	62.8
3.0	1.0	76.0	0.76	70.4	0.70	70.2	77.2	58.0	63.8
4.0	1.0	80.5	0.81	72.6	0.73	73.5	80.9	59.1	65.0
5.0	1.0	85.7	0.86	73.3	0.73	75.3	82.8	61.3	67.4
6.0	1.0	83.1	0.83	71.9	0.72	76.2	83.8	61.6	67.8
7.0	1.0	82.6	0.83	71.4	0.71	74.3	81.7	61.1	67.2
1.0	1.4	59.3	0.83	49.8	0.70	60.1	84.1	52.4	73.4
2.0	1.4	61.0	0.85	52.2	0.73	63.3	88.6	54.3	76.0
3.0	1.4	64.8	0.91	55.9	0.78	67.0	93.8	55.2	77.3
4.0	1.4	66.1	0.93	60.2	0.84	68.2	95.5	57.6	80.6
5.0	1.4	68.7	0.96	60.6	0.85	68.2	95.5	58.3	81.6
6.0	1.4	67.2	0.94	59.8	0.84	67.1	93.9	58.1	81.3
7.0	1.4	67.0	0.94	58.6	0.82	66.8	93.5	57.9	81.1
1.0	1.8	55.0	0.99	44.5	0.80	56.0	95.2	47.9	81.4
2.0	1.8	55.1	0.99	45.3	0.82	58.8	100.0	52.3	88.9
3.0	1.8	59.2	1.07	49.9	0.90	63.1	107.3	53.8	91.5
4.0	1.8	60.9	1.10	52.1	0.94	66.4	112.9	56.0	95.2
5.0	1.8	61.3	1.10	52.1	0.94	66.9	113.7	56.5	96.1
6.0	1.8	61.1	1.10	51.8	0.93	65.2	110.8	56.9	96.7
7.0	1.8	60.1	1.08	51.6	0.93	64.0	108.8	56.1	95.4
1.0	2.2	52.6	1.16	41.8	0.92	53.3	106.6	46.2	92.4
2.0	2.2	53.0	1.17	44.1	0.97	56.6	113.2	50.2	100.4
3.0	2.2	59.2	1.30	47.2	1.04	59.2	118.4	51.9	103.8
4.0	2.2	58.6	1.29	49.9	1.10	60.4	120.8	53.2	106.4
5.0	2.2	57.6	1.27	51.3	1.13	59.1	118.2	54.7	109.4
6.0	2.2	55.1	1.21	51.0	1.12	57.8	115.6	54.3	108.6
7.0	2.2	54.6	1.20	50.6	1.11	56.1	112.2	53.9	107.8

Table S2. Performance of reactor 2 in the removal of pollutants.

Contact time (d)	Initial concentration (mg/L)	CAF removal (%)	CAF removal (mg/L)	DEET removal (%)	DEET Removal (mg/L)	TAN removal (%)	TAN removal (mg/L)	COD removal (%)	COD Removal (mg/L)
1.0	0.2	52.3	0.10	44.9	0.09	54.1	27.1	49.4	24.7
2.0	0.2	57.2	0.11	45.2	0.09	55.3	27.7	50.3	25.2
3.0	0.2	58.4	0.12	46.8	0.09	57.8	28.9	50.8	25.4
4.0	0.2	60.5	0.12	48.3	0.10	59.2	29.6	51.8	25.9
5.0	0.2	61.8	0.12	50.1	0.10	60.8	30.4	52.4	26.2
6.0	0.2	60.0	0.12	50.1	0.10	60.8	30.4	52.3	26.2
7.0	0.2	59.1	0.12	49.6	0.10	58.4	29.2	51.6	25.8
1.0	0.6	53.2	0.32	44.9	0.27	56.0	44.8	49.5	39.6
2.0	0.6	57.8	0.35	45.4	0.27	55.9	44.7	50.7	40.6
3.0	0.6	59.2	0.36	46.3	0.28	58.2	46.6	51.0	40.8
4.0	0.6	61.0	0.37	48.9	0.29	61.0	48.8	52.1	41.7
5.0	0.6	62.7	0.38	51.8	0.31	62.2	49.8	52.8	42.2
6.0	0.6	61.1	0.37	50.7	0.30	59.0	47.2	51.4	41.1
7.0	0.6	60.8	0.36	49.9	0.30	58.2	46.6	50.8	40.6
1.0	1.0	49.9	0.50	42.8	0.43	50.0	55.0	46.2	50.8
2.0	1.0	50.4	0.50	43.9	0.44	52.6	57.9	48.2	53.0
3.0	1.0	55.3	0.55	45.1	0.45	53.9	59.3	50.7	55.8
4.0	1.0	58.4	0.58	47.0	0.47	55.1	60.6	52.0	57.2
5.0	1.0	60.2	0.60	49.8	0.50	57.3	63.0	52.6	57.9
6.0	1.0	58.2	0.58	48.3	0.48	59.2	65.1	51.3	56.4
7.0	1.0	57.3	0.57	47.5	0.48	56.9	62.6	51.1	56.2
1.0	1.4	46.4	0.65	38.4	0.54	48.7	68.2	43.4	60.8
2.0	1.4	47.8	0.67	40.2	0.56	51.3	71.8	45.6	63.8
3.0	1.4	52.3	0.73	43.3	0.61	52.6	73.6	46.8	65.5
4.0	1.4	54.0	0.76	45.7	0.64	54.3	76.0	48.5	67.9
5.0	1.4	57.2	0.80	44.9	0.63	55.5	77.7	48.9	68.5
6.0	1.4	54.1	0.76	43.0	0.60	56.2	78.7	47.2	66.1
7.0	1.4	53.2	0.74	41.8	0.59	55.1	77.1	46.1	64.5
1.0	1.8	42.4	0.76	34.0	0.61	45.1	76.7	40.9	69.5
2.0	1.8	44.2	0.80	35.2	0.63	46.9	79.7	41.4	70.4
3.0	1.8	45.7	0.82	37.1	0.67	47.6	80.9	43.6	74.1
4.0	1.8	47.2	0.85	37.9	0.68	48.2	81.9	45.2	76.8
5.0	1.8	51.1	0.92	38.3	0.69	48.8	83.0	45.9	78.0
6.0	1.8	49.2	0.89	37.4	0.67	49.3	83.8	43.6	74.1
7.0	1.8	46.8	0.84	36.7	0.66	48.1	81.8	42.0	71.4
1.0	2.2	38.7	0.85	32.4	0.71	42.6	85.2	38.6	77.2
2.0	2.2	40.9	0.90	33.9	0.75	44.8	89.6	40.2	80.4
3.0	2.2	43.2	0.95	35.1	0.77	45.3	90.6	42.3	84.6
4.0	2.2	44.7	0.98	36.7	0.81	46.1	92.2	43.6	87.2
5.0	2.2	46.5	1.02	37.8	0.83	47.2	94.4	44.2	88.4
6.0	2.2	45.6	1.00	36.3	0.80	48.1	96.2	43.0	86.0
7.0	2.2	43.7	0.96	34.2	0.75	46.3	92.6	41.9	83.8

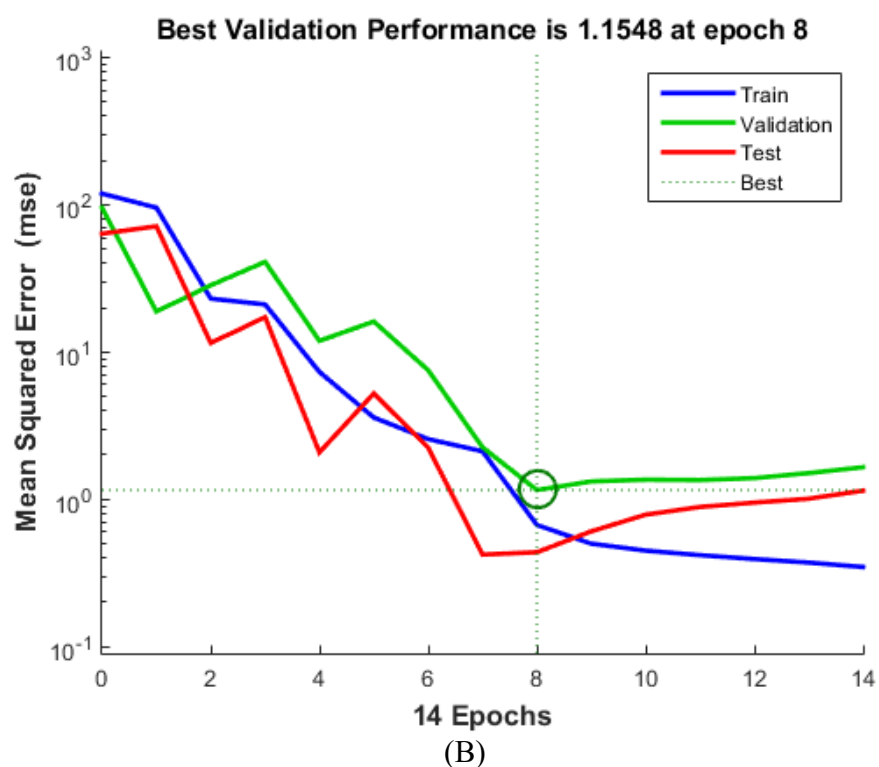
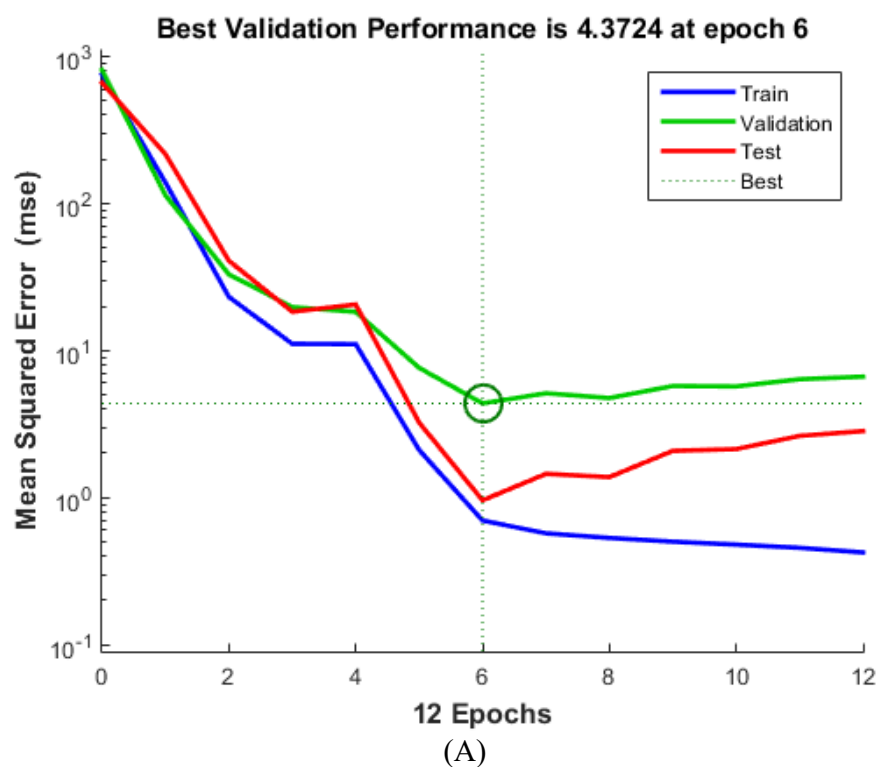


Figure S1. MSE versus the number of epochs for the removal of CAF (A) and DEET (B) in reactor 1.

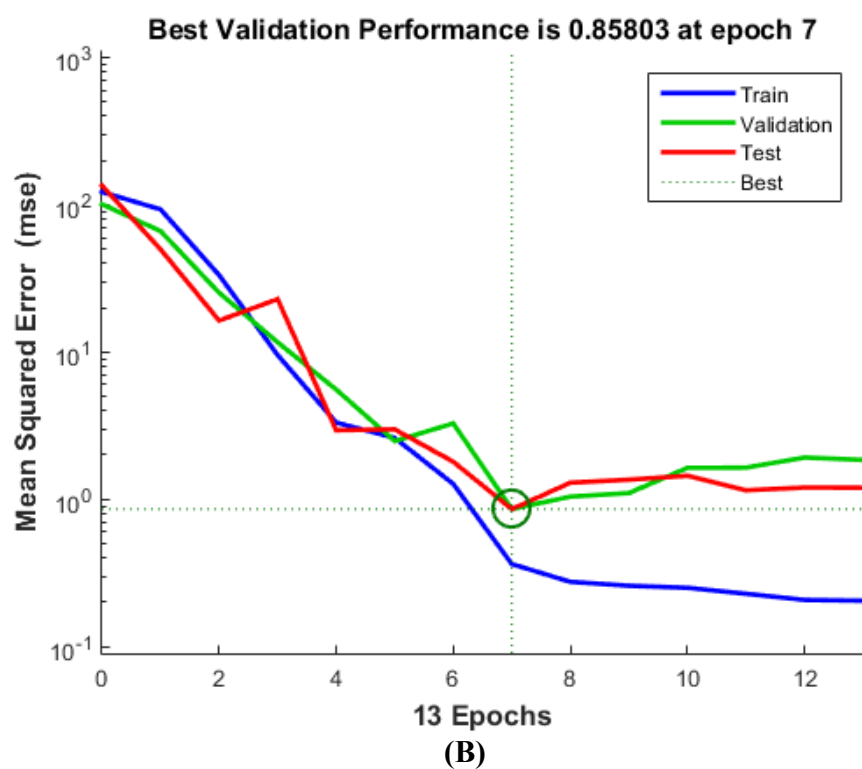
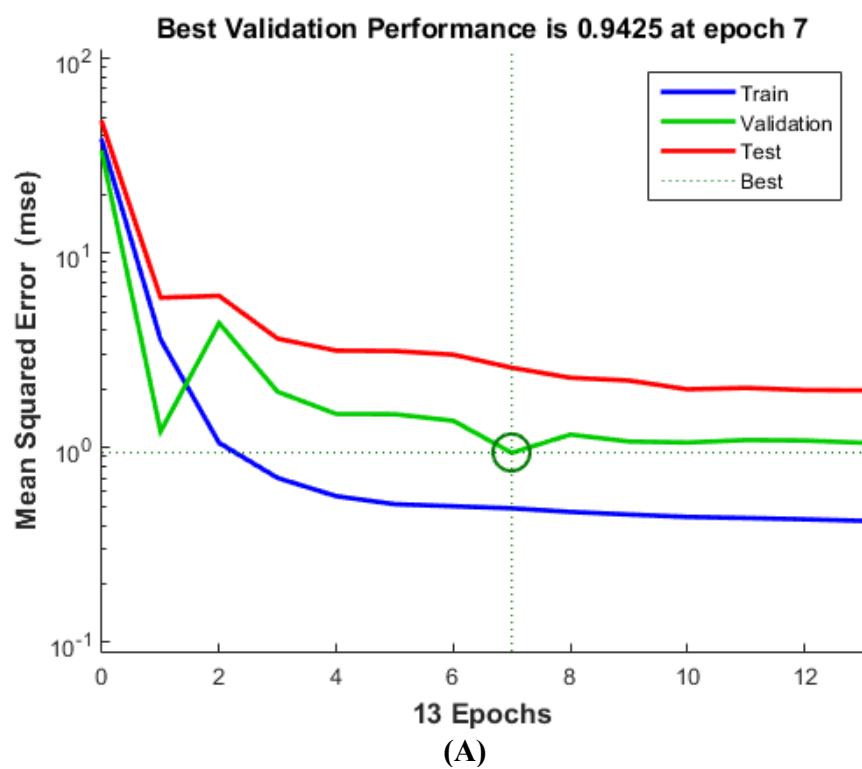


Figure S2. MSE versus the number of epochs for the removal of CAF (A) and DEET (B) in reactor 2.