

Phycoremediation of Landfill Leachate with *Desmodesmus subspicatus*: A Pre-Treatment for Reverse Osmosis

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Supplementary Materials

1. Statistical Analyses

1.1. Analysis of Correlation

Table S1. Correlation matrices for the assessment of correlation between the initial parameters and dilutions of the LL and pollutant removal. The tested means: remaining TAN concentration (PAR 1); remaining Fe concentration (PAR 2); initial TAN concentration (PAR 3); and initial Fe concentration (PAR 4). For each pair the *r*-value was determined.

	PAR1	10% PAR2	PAR3	PAR4
PAR1	1	−0.0736	0.994	−0.1714
PAR2	−0.0736	1	−0.1406	0.9837
PAR3	0.9940	−0.1406	1	−0.2298
PAR4	−0.1714	0.9837	−0.2298	1

	PAR1	20% PAR2	PAR3	PAR4
PAR1	1	−0.0998	0.9954	−0.1743
PAR2	−0.0998	1	−0.1624	0.9869
PAR3	0.9954	−0.1624	1	−0.2298
PAR4	−0.1743	0.9869	−0.2298	1

	PAR1	30% PAR2	PAR3	PAR4
PAR1	1	−0.1574	0.9902	−0.179
PAR2	−0.1574	1	−0.2107	0.9984
PAR3	0.9902	−0.2107	1	−0.2298
PAR4	−0.179	0.9984	−0.2298	1

Table S2. Test of correlations between the biomass concentration and Fe/TAN removal efficiency.

Pollutant	<i>r</i> -value
TAN	0.79
Fe	0.81

1.2. One-Way Analysis of Variance (ANOVA) and Tukey–Kramer Multiple Comparison Test ($p = 0.05$)

Table S3. One-way analysis of variance for determination whether group mean differences exist in the values of remediation efficiency between the particular leachates and dilutions ($p = 0.05$).

	Between Leachates	Between Dilutions					
		A	B	C	D	E	F
Fe removal	4.6217E−16*	/	0.298	/	8.7E−13 *	0.787	0.054
TAN removal	6.90774E−22*	0.282	0.094	8.14E−05 *	9.62E−05 *	0.2408	0.004 *

^a for the means with p -values followed by the “*” sign, a subsequent Tukey–Kramer test was performed; ^b “/” sign indicates that the analysis of variance was not performed, because all group means had the same value.

Table S4. Tukey–Kramer multiple comparison test ($p = 0.05$).

Between Dilutions												
TAN removal ($F_{crit} =$	C				D				F			
		10%	20%	50%		10%	20%	50%		10%	20%	50%
	10%	x	0.021	0.205*	10%	x	0.014	0.645*	10%	x	0.153*	0.449*
	20%	x	x	0.226*	20%	x	x	0.658*	20%	x	x	0.296*
	50%	x	x	x	50%	x	x	x	50%	x	x	x
Between Leachates												
TAN removal ($F_{crit} = 0.104$)		B	C	D	E	F						
	A	0.463	0.372	0.134	0.540	0.499						
	B	x	0.090 *	0.328	0.077 *	0.036 *						
	C	x	x	0.238	0.168	0.126						
	D	x	x	x	0.406	0.365						
	E	x	x	x	x	0.041 *						
	F	x	x	x	x	x						
Fe removal ($F_{crit} = 0.279$)		B	C	D	E	F						
	A	0.773	0.000 *	0.324	0.930	0.826						
	B	x	0.773	0.449	0.158 *	0.053 *						
	C	x	x	0.324	0.930	0.826						
	D	x	x	x	0.607	0.502						
	E	x	x	x	x	0.104 *						
	F	x	x	x	x	x						

To evaluate statistical significance, the mean absolute differences and a critical value were compared. Means followed by the “*” sign differ by Tukey – Kramer test.

2. BBM Medium composition for Microalgae Cultivation

Table S5. BBM medium composition.

Component	Stock Solution (to 1 litre dH ₂ O)	Quantity Used (to 1 litre)
NaNO ₃	25.00 g	10 ml
CaCl ₂ ·2H ₂ O	2.50 g	10 ml
MgSO ₄ ·7H ₂ O	7.50 g	10 ml
K ₂ HPO ₄	7.50 g	10 ml
KH ₂ PO ₄	17.50 g	10 ml
NaCl	2.50 g	10 ml
EDTA solution:		
EDTA	50.00 g	1 ml
KOH	31.00 g	
Acidified iron solution		
FeSO ₄ ·7H ₂ O	4.98 g	1 ml
H ₂ SO ₄ (96%)	1.00 ml	
H ₃ BO ₃	11.42 g	1 ml
Trace metals solution		
ZnSO ₄ ·7H ₂ O	8.82 g	
MnCl ₂ ·4H ₂ O	1.44 g	
MoO ₃	0.71 g	1 ml
CuSO ₄ ·5H ₂ O	1.57 g	
Co(NO ₃) ₂ ·6H ₂ O	0.49 g	