Bioplastics production from high-rate algal pond biomass

Waste and Biomass Valorization

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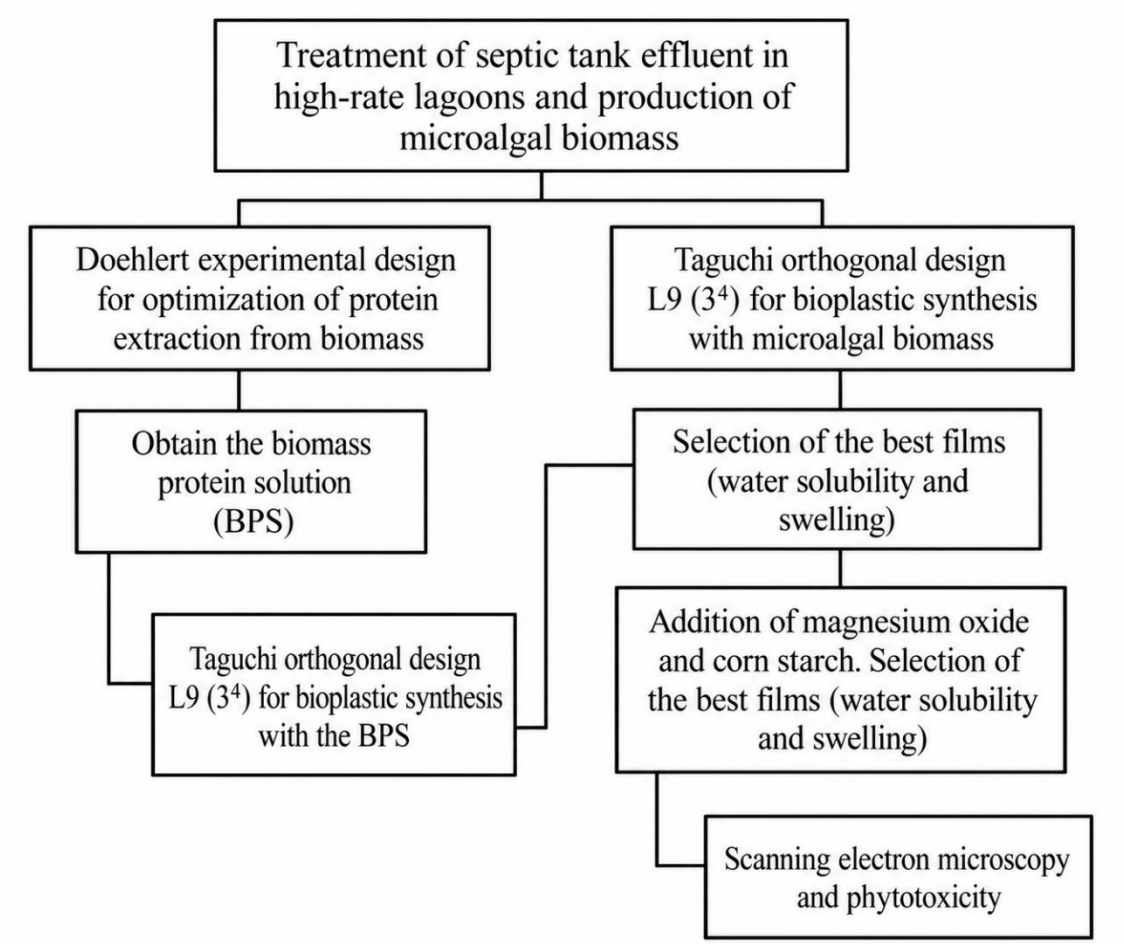

Fig. S1 Detailed flowchart of the experimental steps for bioplastics production

Table S1 Coded coefficients of the response surface regression for extracted protein content as a function of time, pH, and temperature.

Term	Coef	SE Coef	T-Value	p-value	VIF
Constant	6.5134	0.0972	66.99	0.000	
Time	0.278	0.129	2.16	0.059	1.00
pH	1.780	0.111	15.98	0.000	1.00
Temperature	0.391	0.105	3.72	0.005	1.00
Time*Time	-0.103	0.206	-0.50	0.628	1.07
pH*pH	2.287	0.155	14.78	0.000	1.06
Temperature*Temperature	-0.846	0.128	-6.59	0.000	1.02
Time*pH	-0.253	0.257	-0.98	0.352	1.12
Time*Temperature	0.160	0.272	0.59	0.571	1.12
pH*Temperature	1.067	0.234	4.55	0.001	1.11

SE Coef: Standard Error of the Coefficient. VIF: Variance Inflation Factor

Table S2: Summary of the response surface regression model for protein content, showing the standard error of the estimate (S) and the coefficients of determination (R^2).

S	R^2	R^2(adj)	R^2(pred)
0.257226	98.42%	96.85%	92.92%

Table S3 Analysis of Variance (ANOVA) for the response surface regression model of protein content, indicating the statistical significance of the model terms.

Source	DF	Adj SS	Adj MS	F-value	p-value
Model	9	37.1633	4.1293	62.41	0.000
Linear	3	18.1709	6.0570	91.54	0.000
Time	1	0.3091	0.3091	4.67	0.059
pH	1	16.8893	16.8893	255.26	0.000
Temperature	1	0.9160	0.9160	13.84	0.005
Square	3	18.8121	6.2707	94.77	0.000
Time*Time	1	0.0166	0.0166	0.25	0.628
pH*pH	1	14.4627	14.4627	218.59	0.000
Temperature*Temperature	1	2.8754	2.8754	43.46	0.000
2-Way Interaction	3	1.4414	0.4805	7.26	0.009
Time*pH	1	0.0638	0.0638	0.96	0.352
Time*Temperature	1	0.0229	0.0229	0.35	0.571
pH*Temperature	1	1.3721	1.3721	20.74	0.001
Error	9	0.5955	0.0662		
Lack-of-Fit	3	0.1272	0.0424	0.54	0.670
Pure Error	6	0.4683	0.0780		
Total	18	37.7588			

DF: Degree of freedom. Adj SS: Adjusted Sum of Squares. Adj MS: Adjusted Mean Squares

Table S4 Multiple quadratic regression equation for extracted protein content in real (un-coded) units.

Protein = 6.26 - 1.311 pH + 0.0774 Temperature + 0.09148 pH^2 - 0.000940 $Temperature^2$ + 0.00711 pH * Temperature