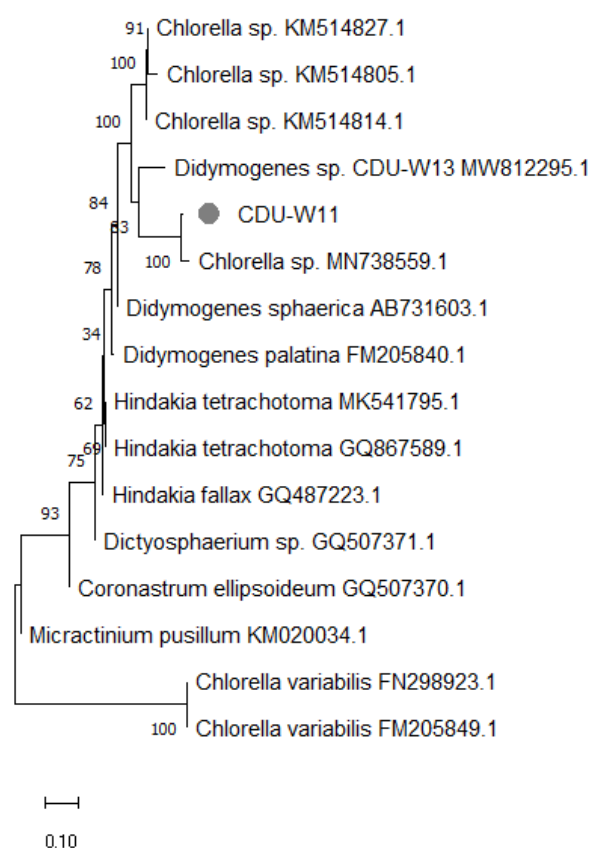
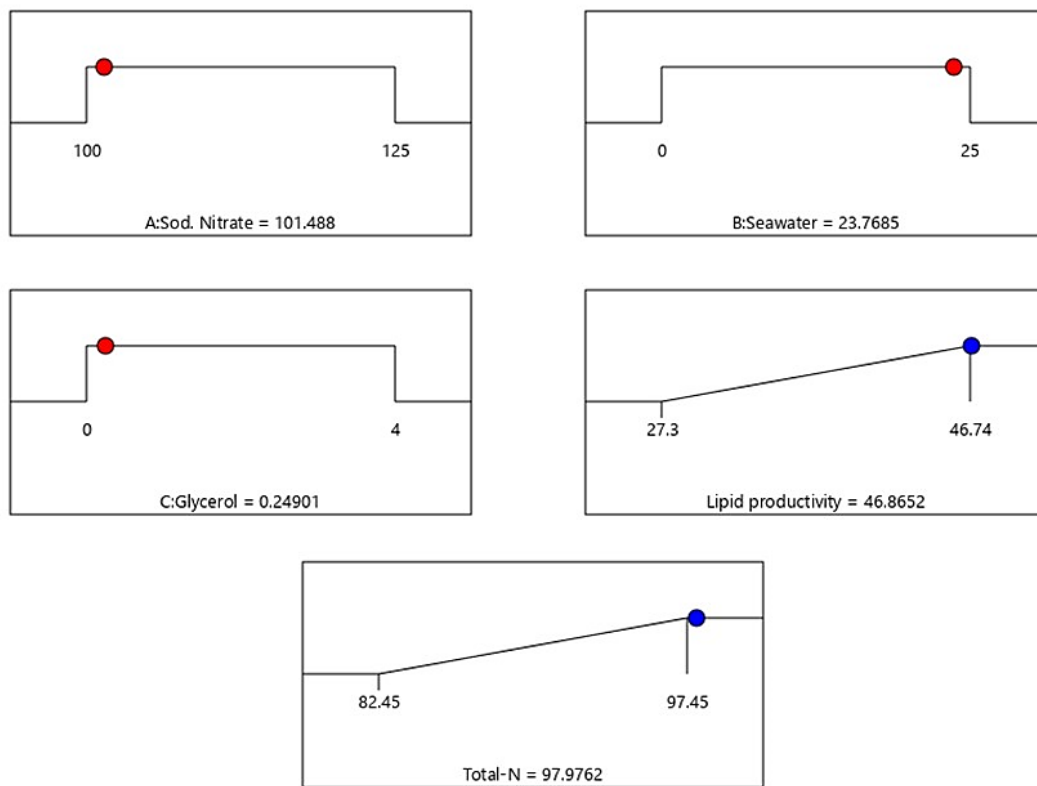


## SUPPLEMENTARY DATA



**Fig. S1.** The phylogenetic tree of the isolate CDU-W11 showing high similarity of 95.77% with *Chlorella* sp. isolated from Cheshme Sabz lake, Iran (accession number MN738559.1).



**Fig. S2.** Numerical optimization ramp for input factors and responses of lipid productivity and nitrogen removal at the maximum with desirability of 1.

**Table S1.** The experimental runs of the optimization experiment using randomized central composite design.

Run	Sodium nitrate (mg/L)	Seawater ratio (%)	Glycerol (g/L)
1	125	0	4
2	112.5	25	2
3	112.5	12.5	0
4	112.5	12.5	2
5	125	25	0
6	112.5	12.5	2
7	95	12.5	2
8	130	12.5	2
9	100	25	4
10	112.5	12.5	5
11	112.5	0	2
12	112.5	12.5	2
13	100	0	0
14	112.5	12.5	2
15	112.5	12.5	2

**Table S2.** ANOVA analysis for central composite design of lipid productivity responses at different studied conditions of sodium nitrate, seawater, and glycerol

Source	Sum of Squares	df	Mean Square	F-value	P-value
<i>Model</i>	<i>253.56</i>	<i>10</i>	<i>25.36</i>	<i>8.54</i>	<i>0.0266</i>
A-NaNO <sub>3</sub>	0.3698	1	0.3698	0.1246	0.7419
B-Seawater	1.21	1	1.21	0.4080	0.5577
C-Glycerol	2.29	1	2.29	0.7722	0.4291
AB	44.60	1	44.60	15.03	0.0179
AC	0.7683	1	0.7683	0.2588	0.6377
BC	22.98	1	22.98	7.74	0.0497
A <sup>2</sup>	3.25	1	3.25	1.09	0.3545
B <sup>2</sup>	6.54	1	6.54	2.20	0.2118
C <sup>2</sup>	0.0207	1	0.0207	0.0070	0.9375
ABC	0.5911	1	0.5911	0.1992	0.6785

**Table S3.** ANOVA analysis for central composite design of nitrogen removal responses at different studied conditions of sodium nitrate, seawater, and glycerol

Source	Sum of Squares	df	Mean Square	F-value	P-value
<i>Model</i>	<i>226.42</i>	<i>10</i>	<i>22.64</i>	<i>161.19</i>	<i>&lt; 0.0001</i>
A-NaNO <sub>3</sub>	2.00	1	2.00	14.24	0.0195
B-Seawater	0.0677	1	0.0677	0.4816	0.5259
C-Glycerol	26.55	1	26.55	189.01	0.0002
AB	2.76	1	2.76	19.65	0.0114
AC	0.0581	1	0.0581	0.4139	0.5550
BC	3.65	1	3.65	26.00	0.0070
A <sup>2</sup>	0.1355	1	0.1355	0.9648	0.3816
B <sup>2</sup>	45.00	1	45.00	320.35	< 0.0001
C <sup>2</sup>	0.0000	1	0.0000	0.0002	0.9906
ABC	17.87	1	17.87	127.19	0.0004