

Supplementary Information

Table 1. Experimental planning and results of the Box–Behnken design for optimization of exopolysaccharide production by *Fusarium* sp. GloS2.

RUN	YEC (g L ⁻¹)	GC (g L ⁻¹)	MpH	FT (days)	EPS yield (g L ⁻¹) (Observed)	EPS yield (g L ⁻¹) (expected)
1	-1(0.3)	-1(4)	0(7)	0(8)	4.70 ±0.031	4.68±0.038
2	1 (0.5)	-1	0	0	4.60±0.022	4.59±0.033
3	-1	1(6)	0	0	4.41±0.043	4.40±0.025
4	1	1	0	0	3.72±0.022	3.73±0.017
5	0 (0.4)	0(5)	-1(6)	-1(6)	4.51±0.034	4.51±0.042
6	0	0	1(6.5)	-1	4.41±0.035	4.39±0.025
7	0	0	-1	1(10)	4.03±0.037	4.03±0.022
8	0	0	1	1	3.84±0.025	3.83±0.017
9	-1	0	0	-1	4.66±0.027	4.68±0.023
10	1	0	0	-1	4.10±0.154	4.11±0.029
11	-1	0	0	1	3.95±0.115	3.97±0.014
12	1	0	0	1	3.77±0.056	3.78±0.022
13	0	-1	-1	0	4.73±0.041	4.74±0.044
14	0	1	-1	0	4.21±0.037	4.23±0.041
15	0	-1	1	0	4.62±0.031	4.64±0.043
16	0	1	1	0	3.99±0.046	4.01±0.025
17	-1	0	-1	0	4.65±0.040	4.63±0.043
18	1	0	-1	0	4.33±0.045	4.30±0.047
19	-1	0	1	0	4.52±0.030	4.52±0.030
20	1	0	1	0	4.09±0.029	4.09±0.030
21	0	-1	0	-1	4.92±0.049	4.92±0.042
22	0	1	0	-1	3.93±0.033	3.91±0.361
23	0	-1	0	1	3.97±0.028	3.96±0.027
24	0	1	0	1	3.84±0.022	3.82±0.020
25	0	0	0	0	5.42±0.126	5.43±0.126
26	0	0	0	0	5.42±0.120	5.43±0.122
27	0	0	0	0	5.43±0.146	5.43±0.146
28	0	0	0	0	5.44±0.125	5.43±0.124

Table 2. ANOVA for the response surface quadratic regression model of EPS production by *Fusarium* sp. GloS2

Source	DF	Seq SS	Contribution	Adj SS	Adj MS	F Value	P Value
Model	14	8.28080	99.57%	8.28080	0.59149	231.91	0.000
Linear	4	2.36317	28.42%	2.36317	0.59079	231.64	0.000
YEC	1	0.32835	3.95%	0.32835	0.32835	128.74	0.000
GC	1	0.97927	11.77%	0.97927	0.97927	383.95	0.000
MpH	1	0.07857	0.94%	0.07857	0.07857	30.81	0.000
FT	1	0.97698	11.75%	0.97698	0.97698	383.05	0.000
Square	4	5.63689	67.78%	5.63689	1.40922	552.52	0.000
YEC*YEC	1	0.54494	6.55%	1.75749	1.75749	689.07	0.000
GC*GC	1	0.82735	9.95%	1.89777	1.89777	744.07	0.000
MpH*MpH	1	0.91927	11.05%	1.65766	1.65766	649.93	0.000
FT*FT	1	3.34534	40.23%	3.34534	3.34534	1311.63	0.000

2-Way Interaction	6	0.28075	3.38%	0.28075	0.04679	18.35	0.000
YEC*GC	1	0.08497	1.02%	0.08497	0.08497	33.32	0.000
YEC*MpH	1	0.00255	0.03%	0.00255	0.00255	1.00	0.334
YEC*FT	1	0.00133	0.02%	0.00133	0.00133	0.52	0.000
GC*MpH	1	0.00281	0.03%	0.00281	0.00281	1.10	0.312
GC*FT	1	0.18706	2.25%	0.18706	0.18706	73.34	0.000
MpH*FT	1	0.00203	0.02%	0.00203	0.00203	0.79	0.388
Error	14	0.03571	0.43%	0.03571	0.00255		
Lack-of-Fit	10	0.03506	0.42%	0.03506	0.00351	21.55	0.005
Pure Error	4	0.00065	0.01%	0.00065	0.00016		
Total	28	8.31651	100.00%				

Table 3. IC₅₀ values of the EPS from endophytic *Fusarium* sp. GloS2

Antioxidant assays	GloS2 EPS	Standard
Hydrogen Peroxide scavenging	15.05±0.51 ^a	21.88±0.66 ^b
DPPH radicals scavenging	29.21±0.41 ^a	31.93±0.68 ^b
ABTS radicals scavenging	25.35±0.086 ^a	37.51±0.61 ^b
Reducing power assay	73.44±1.32 ^a	82.48±1.56 ^b

One-way ANOVA (Tukey's multiple comparison test) was performed to determine the potentially significant differences, and the standard (ascorbic acid) showed statistically significant differences ($P < 0.05$, the two different letters a and b in each case indicate significant differences) from the *Fusarium* sp. GloS2 EPS.

Table 4. Flocculation activity of different concentrations of EPS

Exopolysaccharide concentration (mg L ⁻¹)	Flocculation activity
20	28.59±0.77 ^a
30	52.43±1.22 ^b
40	88.37±1.28 ^c
50	73.59±2.46 ^d
60	69.18±0.96 ^e

One-way ANOVA (Tukey's multiple comparison test) was performed to determine the potential significant differences, and the standard showed statistically significant differences ($P < 0.05$, different letters in each case indicate significant differences) from the *Fusarium* sp. GloS2 EPS.

Supplementary Figure

Fig. 1. 3D graph plot with 2D projections showing the most important interactions of factors in RSM optimization of EPS production by *Fusarium* sp. GloS2.

Fig.1

