

Winatta Sakdasri ¹, Panisara Arnutpongchai ¹,
Supasuta Phonsavat ¹, Ruengwit Sawangkeaw ^{2,*}

¹Program in Food process engineering, School of Food Industry, King Mongkut's Institute of Technology Ladkrabang, 1 Chalong Krung 1 Alley, Lad Krabang, Bangkok 10520, Thailand

² Research Unit in Bioconversion/Bioseparation for Value-Added Chemical Production, Institute of Biotechnology and Genetic Engineering, Chulalongkorn University, 254 Phayathai Road, Pathumwan, Bangkok, 10330, Thailand

First author: Winatta.sa@kmitl.ac.th,

*Corresponding author: Ruengwit.s@chula.ac.th

Introduction

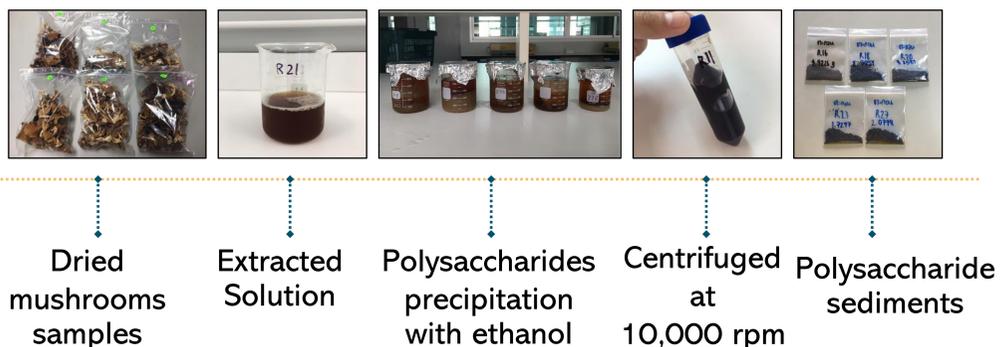
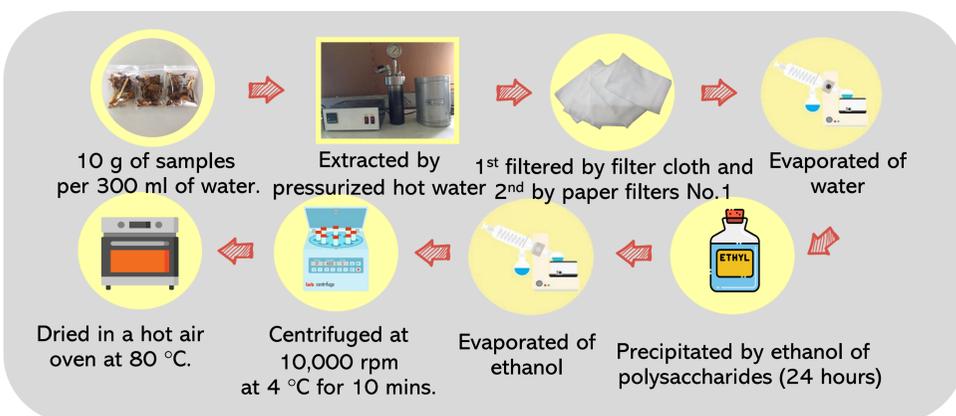
Grey oyster mushroom (*Pleurotus sajor-caju* (Fr.) Singer) is a popular edible mushroom worldwide due to its high nutritional and medicinal benefits. It is sources of carbohydrate, protein, vitamins, and minerals [1]. The bioactive compounds in mushrooms, which is polysaccharides, especially of β -glucan, have been reported to possess immunomodulatory, antitumor, antiviral, wound healing, anti-obesity, and antidiabetics activities [2].

This study aims to investigate the effects of extraction temperature (100-140 °C), extraction pressure (4-7 bar), and extraction time (20-60 min) on yield of extracted crude polysaccharides with environmentally friendly pressurized hot water [3]. The extraction condition was optimized by the maximize yield using response surface method based on a central composite design (CCD). Under optimal condition, the total phenolic and total glucan content of crude polysaccharides was indicated as 34.50 ± 1.79 g/100 g dry mushroom, which separated as 32.47 ± 1.95 mg/100 g of β -glucans and 2.04 ± 0.98 mg/100 g of α -glucans.

Materials And Methods

Grey oyster mushrooms (*Pleurotus sajor-caju* (Fr.) Singer) were harvested from mushroom farm in The Institute of biotechnology and genetic engineering, Chulalongkorn University. They were dried at 60 °C and stored in a desiccator at room temperature.

Extraction method



$$\%Yield = \frac{\text{Sediment weight after extraction}}{\text{Dried mushroom weight}} \times 100$$

References

1. Eswaran A, Ramabadran R: Studies on some physiological, cultural and postharvest aspects of oyster mushroom, *Pleurotus eous* (Berk.) sacc. 2000.
2. Ahmad A, Anjum FM, Zahoor T, Nawaz H, Dilshad SMR: Beta Glucan: A Valuable Functional Ingredient in Foods. *Critical Reviews in Food Science and Nutrition* 2012, 52(3):201-212.
3. Teo CC, Tan SN, Yong JWH, Hew CS, Ong ES: Pressurized hot water extraction (PHWE). *Journal of Chromatography A* 2010, 1217(16):2484-2494.

Results and Discussion

Effect of factors on the extraction yield

Table.1 ANOVA table of the effect of reaction condition on the extraction yield

Source	Sum of Squares	df	Mean Square	F-value	p-value
Model	677.12	10	67.71	12.85	< 0.0001
A-Temperature	282.61	1	282.61	53.64	< 0.0001
B-Pressure	1.24	1	1.24	0.2356	0.6329
C-Time	32.11	1	32.11	6.09	0.0232
AB	43.99	1	43.99	8.35	0.0094
AC	5.34	1	5.34	1.01	0.3268
BC	81.38	1	81.38	15.45	0.0009
A ²	6.43	1	6.43	1.22	0.2833
B ²	4.15	1	4.15	0.7874	0.3860
C ²	3.78	1	3.78	0.7183	0.4073
ABC	216.19	1	216.19	41.03	< 0.0001

Significant Factor: p-value < 0.05

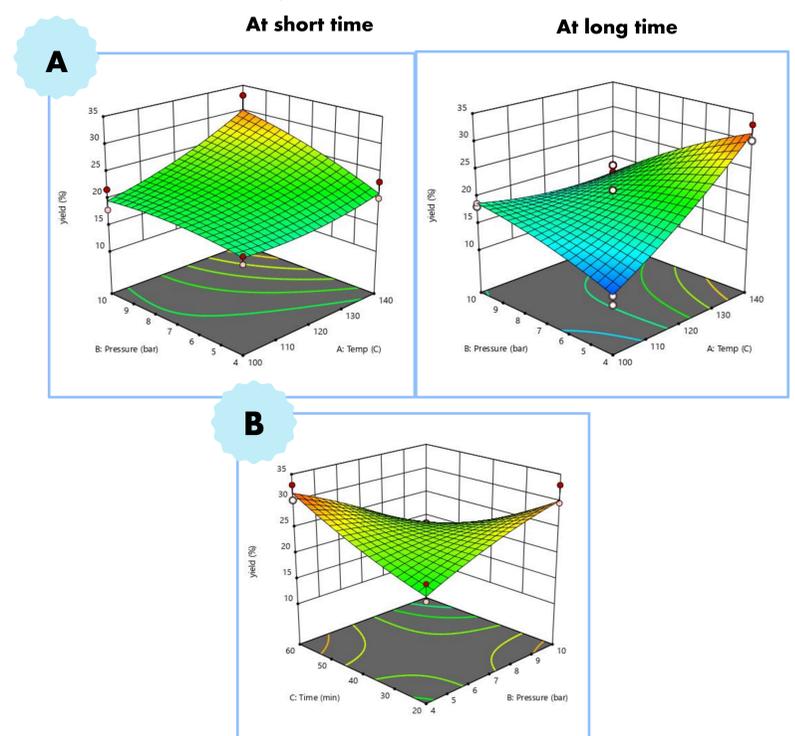
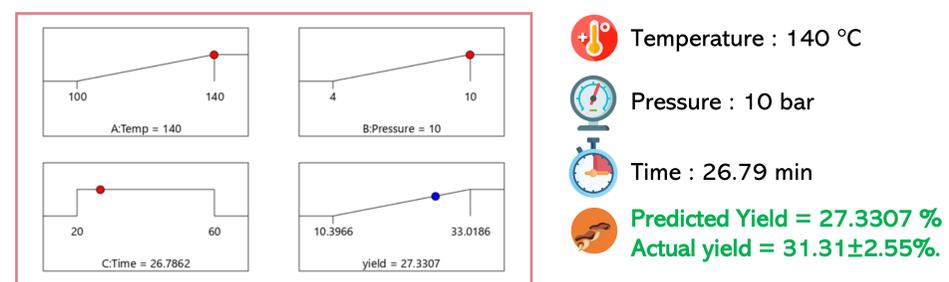


Fig.1 (A) Effect of interaction of temperature and pressure and (B) effect of interaction of pressure and time on extraction yield

Optimal condition of the highest yield



Bioactive compounds

Total phenolic content: 401 ± 8.24 mg GAE/g dried mushroom
Total glucan content: 34.50 ± 1.79 g/100 g dried mushroom
 β -glucans: 32.47 ± 1.95 mg/100 g
 α -glucans: 2.04 ± 0.98 mg/100 g

Conclusions

Crude polysaccharides of grey oyster mushrooms were successfully extracted by pressurized hot water. The temperature was the main effect on the increasing of extracted yield. The optimum extraction condition was 140 °C, 10 bar, and 26.79 min with a corresponding yield of $31.31 \pm 2.55\%$. Under these conditions, the total phenolic content of crude polysaccharides was 401 ± 8.24 mg GAE/g dry mushroom. In addition, the total glucan content was indicated as 34.50 ± 1.79 g/100 g dried mushroom, which separated as 32.47 ± 1.95 mg/100 g of β -glucans and 2.04 ± 0.98 mg/100 g of α -glucans.

Acknowledgements

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