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Ultrasound extraction optimization, structural features, and antioxidant activity of polysaccharides from *Tricholoma matsutake*

Key words: *Tricholoma matsutake* polysaccharide, orthogonal test design, ultrasound-assisted extraction, monosaccharide composition, antioxidant activity

Research Summary

This paper mainly focused on the ultrasound extraction optimization, structural features and antioxidant activity of polysaccharides from *Tricholoma matsutake*.

- **UAE technique was employed to obtain the crude TMP from *T. matsutake* fruiting bodies.**
- **Based on single-factor tests, an orthogonal experiment ($L_9(3)^3$) was used to optimize extraction conditions for UAE.**
- **The preliminary structural features of three novel polysaccharides TMP30, TMP60 and TMP80, were determined by HPAEC-PAD and FT-IR analysis.**
- **The antioxidant activities were investigated in terms of a reducing power assay and the scavenging rate of DPPH and hydroxyl radicals.**

Samples	TMP30	TMP60	TMP80	TMP
Yields (W%)	45.38[a]	30.51[a]	24.11[a]	8.06
Total sugar content (W%)	41.71	57.49	20.55	35.81
Reducing sugar content (W%)	4.12	4.41	4.58	4.54
Polysaccharide content (W%)[b]	37.59	53.08	15.97	31.27
Protein content (W%)	5.73	3.52	11.63	7.48
Monosaccharide components (M%)				
L-Fucose(M%)	9.3	6.6	8.1	nd[a]
D-Galactose(M%)	26.8	17.6	21.2	nd
D-Glucose(M%)	40.1	42.3	43.0	nd
D-Xylose(M%)	2.6	12.1	4.2	nd
D-Mannose(M%)	16.4	21.1	23.6	nd

Antioxidant activity assay	[a]EC_{50} value (mg/ml)			
	TMP30	TMP60	TMP80	TMP
DPPH-scavenging activity	0.83	0.86	0.26	0.72
Hydroxyl-scavenging activity	3.73	3.58	2.53	3.06
	[b]$RP_{0.5AU}$			
Reducing power	4.33	4.30	1.39	2.15

Innovation points

- **Single-factor** and orthogonal design were studied to obtain the optimal conditions for ultrasonic-assisted extraction.

- **Three** novel fractions were fractionated from TMP by stepwise alcohol precipitation.

- **Their** structural features were determined by HPAEC-PAD and FT-IR analysis.

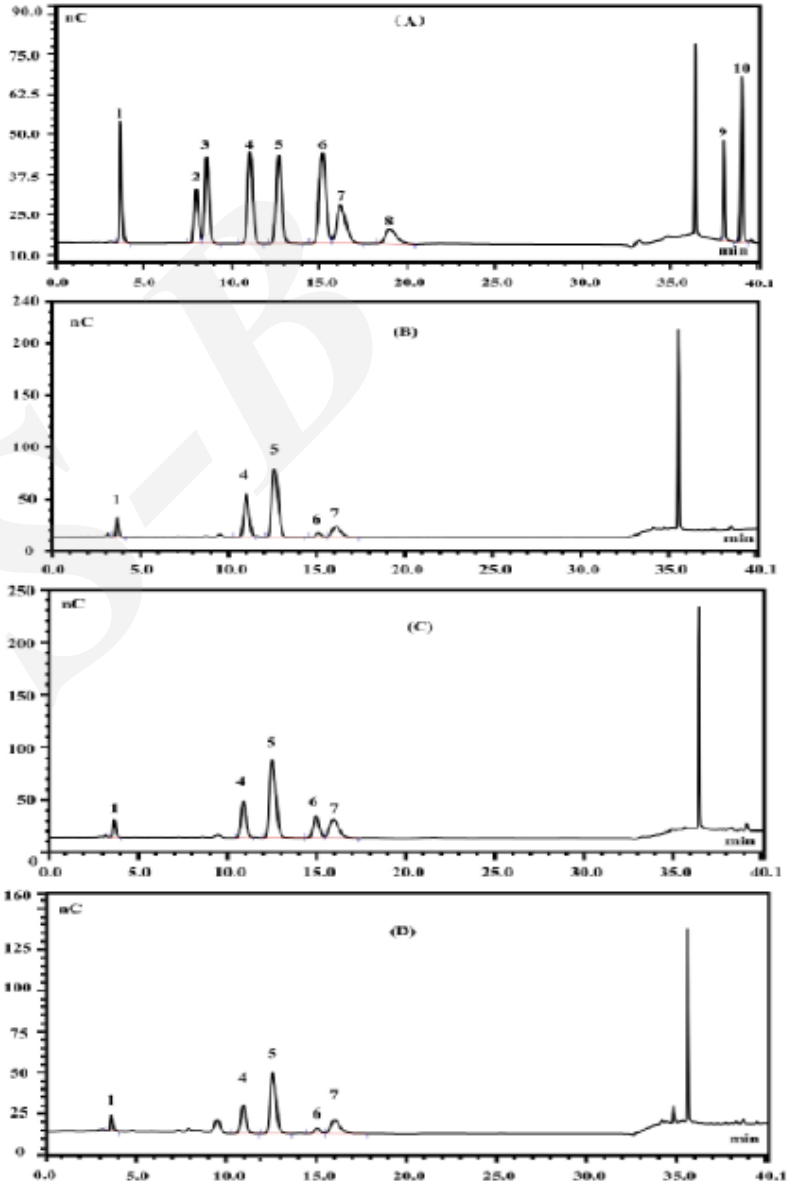


Figure 4