Supplementary Material

FTIR analysis of *Mucuna pruriens* seed powder

Table S1
Mucuna pruriens seed powder FTIR bands and assignments

Bands position (cm^{-1})		Assignments
This work	**From reported** (Arulkumar & Sabesan, 2010; Gamedze et al., 2022; Rima et al., 2023; Sardjono et al., 2024; Sardjono et al., 2018; Theansungnoen et al., 2022)	
3272	3745	O–H, N–H
2923	2922–2925	C–H, N–H
2843	2362–2859	N–H, C–O, C–H,
2078	2033	C=C
1742	1740–1874	C=O
1648	1610–1634	N–H, C–N, C=C, C=O
1525	1527–1529	C=C, N–H
1445	1447–1448	C–H
1398	1384–1406	O–H, C=C
1275	1288	C–C
1233	1248	C–F, C–Br
1143	1146	C–O
1072	1062–1118	C–O
987	929–997	C–H, P–H
845	812.06	C–C

Table S2
ANOVA of the quadratic response model for ultrasound-assisted extraction of total flavonoids from *Mucuna pruriens* seed powder

Source	SS	DF	MS	F-value	p-value
X_{UP}	11.11	1	11.11	47.78	<0.0001*
X_{UP}^2	22.86	1	22.86	98.33	<0.0001*
X_{PC}	85.58	1	85.58	368.13	<0.0001*
X_{PC}^2	0.02	1	0.02	0.12	0.7311**
X_{ET}	127.99	1	127.99	550.55	<0.0001*
X_{ET}^2	4.64	1	4.64	19.98	0.0001*
$X_{UP}*X_{PC}$	191.87	1	191.87	825.31	<0.0001*
$X_{UP}*X_{PC}^2$	2.61	1	2.61	11.26	0.0002*
$X_{UP}^2*X_{PC}$	14.81	1	14.81	63.73	<0.0001*
$X_{UP}^2*X_{PC}^2$	21.48	1	21.48	92.43	<0.0001*
$X_{UP}*X_{ET}$	7.67	1	7.67	32.99	<0.0001*
$X_{UP}^2*X_{ET}^2$	15.22	1	15.22	65.46	<0.0001*
$X_{UP}^2*X_{ET}$	27.43	1	27.43	118.00	<0.0001*
$X_{PC}*X_{ET}$	40.61	1	40.61	174.68	<0.0001*
Error	6.97	30	0.23		
Total SS	633.87	44			
Lack of fit (*p*-value)	0.7311**				
R-square	0.9889				
R-adjust	0.9834				

SS: Sum of squares; DF: Degree of freedom; MS: Mean square; X_{UP}: Ultrasonic power; X_{PC}: Pulses cycle; X_{ET}: Extraction Time; *significant ($p < 0.05$), **non-significant ($p > 0.05$). Note: Interpretation of the Lack of Fit Test (p-value): a) $p < 0.05$: The model does not fit the data. b) $p > 0.05$: This indicates that the model fits the data well.

Table S3
Estimated regression coefficients of the predicted 2nd-order polynomial model with the ultrasound-assisted extraction conditions on the total flavonoids content from *M. pruriens* seed powder

Source	Total flavonoids	
	β-coefficient	***p*-value**
Mean/Intercept	-193.03	0.0004*
X_{UP}	5.20	<0.0001*
X_{UP}^2	-0.02	0.0003*
X_{PC}	-84.58	<0.0001*
X_{PC}^2	98.73	<0.0001*
X_{ET}	-1.54	0.0935**
X_{ET}^2	1.81	<0.0001*
$X_{UP}*X_{PC}$	0.15	0.0004*
$X_{UP}*X_{PC}^2$	-0.10	0.0009*
$X_{UP}^2*X_{PC}^2$	-0.002	0.0010*
$X_{UP}*X_{ET}$	-2.73	<0.0001*
$X_{UP}*X_{ET}^2$	0.020	0.0515**
$X_{UP}^2*X_{ET}$	0.011	<0.0001*
$X_{PC}*X_{ET}$	-0.92	<0.0001*
R-square	0.9759	
R-adjust	0.9658	

X_{UP}: Ultrasonic power; X_{PC}: Pulse cycle; X_{ET}: Extraction time; *significant ($p < 0.05$), **non-significant ($p > 0.05$).

Table S4
Estimated LC_{50} values of *M. pruriens* seeds from ultrasound and magnetic stirring extractions

Treatment	Regression Equation	LC_{50} Value
UAE[1]	*y= x + 2.5*	143.65 µg/mL
MS[2]	*y= 0.68x+3.7*	132.18 µg/mL

[1]UAE: Ultrasound-assisted extraction conditions: 85% ultrasound power, 3:1 s on/off pulse cycle, and 5 min extraction time. [2]MS: Magnetic stirring: 400 rpm for 60 minutes.