Table 1S

The operating conditions for the Agilent 5110 ICP OES instrument used in this work

RF power (kW): 1.2
Plasma flow rate (L min^{-1}): 12.0
Auxiliary flow rate (L min^{-1}): 1.00
Nebulizer flow rate (L min^{-1}): 0.70
Standard pump speed (mL min^{-1}): 0.8 for solution uptake and 1.3 for drainage
Fast pump speed (mL min^{-1}): 3.3 (during solution uptake and rinsing)
Viewing mode: SVDV
Viewing height (mm): 8
Replicate read time (s): 5
Stabilization time (s): 15
Sample uptake delay time (s): 10
Number of replicates: 3
Background correction: fitted (to correct for the spectral interferences)
Analytical lines (nm): Al I 396.15, Ba II 455.40, Ca II 396.85, Cu I 327.40, Fe II 238.20, K I 766.49, Mg II 279.55, Mn II 257.61, Na I 589.59, Sr II 407.77, Zn I 213.86

I and II denote the atomic and ionic lines, respectively.

Table 2S

The planned treatments within the Box-Behnken response surface design, giving the uncoded and coded values of the studied parameters: **A** (the temperature of water filling the ultrasonic bath, in ^{o}C), **B** (the sonication time, in min) and **C** (the volume of a concentrated HNO_3 solution added per 0.5 g of rice, in mL), as well as their standard and run orders

Standard order	Run order	**A**, ^{o}C	**B**, min	**C**, mL
14	1#	40 (0)	20 (0)	2.5 (0)
8	2	60 (+1)	20 (0)	4.0 (+1)
1	3	20 (-1)	10 (-1)	2.5 (0)
13	4#	40 (0)	20 (0)	2.5 (0)
9	5	40 (0)	10 (-1)	1.0 (-1)
10	6	40 (0)	30 (+1)	1.0 (-1)
2	7	60 (+1)	10 (-1)	2.5 (0)
7	8	20 (-1)	20 (0)	4.0 (+1)
12	9	40 (0)	30 (+1)	4.0 (+1)
3	10	20 (-1)	30 (+1)	2.5 (0)
5	11	20 (-1)	20 (0)	1.0 (-1)
11	12	40 (0)	10 (-1)	4.0 (+1)
15	13#	40 (0)	20 (0)	2.5 (0)
4	14	60 (+1)	30 (+1)	2.5 (0)
6	15	60 (+1)	20 (0)	1.0 (-1)

The center point.

Table 3S

The outcomes of the analysis of variance (ANOVA) for the response surface regression models established for the developed ultrasound-assisted extraction (USAE) sample preparation procedure of rice before its multielement analysis by ICP OES. The *p*-values for the model and the terms (linear, square, and 2-way interactions) included in them as well the lack-of-fit test are given in addition to the determination coefficients (R^2). The equations of the response surface regression models were found by using the stepwise-selection-of-terms procedure (α to enter = 0.15, α to remove = 0.15). In all experiments, the WR0 material was used

p-values					R^2, %
Model	Linear	Square	2-way interaction	Lack-of-fit	
Al					
0.000	**A** (0.006) **B** (0.099) **C** (0.000)	$\mathbf{C}^2$ (0.099)	**AC** (0.053)	0.889	92.0
$C_{Al} = -2.00\times10^{-2} - 1.55\times10^{-3}\mathbf{A} + 3.32\times10^{-3}\mathbf{B} - 7.71\times10^{-2}\mathbf{C} + 2.16\times10^{-2}\mathbf{C}^2 + 1.90\times10^{-3}\mathbf{AC}$					
Ba					
0.013	**A** (0.522) **B** (0.038) **C** (0.010)	-	**AC** (0.019) **BC** (0.109)	0.166	75.8
$C_{Ba} = 4.85\times10^{-1} - 8.16\times10^{-4}\mathbf{A} + 1.47\times10^{-3}\mathbf{B} - 1.45\times10^{-2}\mathbf{C} + 2.97\times10^{-4}\mathbf{AC}$					
Ca					
0.061	**A** (0.287) **C** (0.209)	-	**AC** (0.024)	0.569	47.4
$C_{Ca} = 5.29\times10^{1} - 1.78\times10^{-1}\mathbf{A} - 2.84\mathbf{C} + 6.01\times10^{-2}\mathbf{AC}$					
Cu					
0.035	**B** (0.026) **C** (0.593)	$\mathbf{C}^2$ (0.040)	-	0.414	52.8
$C_{Cu} = 1.67 - 2.68\times10^{-2}\mathbf{B} - 8.31\times10^{-1}\mathbf{C} - 1.56\times10^{-1}\mathbf{C}^2$					
Fe					
0.033	**A** (0.954) **B** (0.639) **C** (0.005)	$\mathbf{A}^2$ (0.133)	**AC** (0.069) **BC** (0.120)	0.175	76.0
$C_{Fe} = 1.85 - 2.87\times10^{-2}\mathbf{A} - 1.80\times10^{-2}\mathbf{B} - 1.83\times10^{-1}\mathbf{C} + 2.39\times10^{-4}\mathbf{A}^2 + 3.87\times10^{-3}\mathbf{AC} + 6.42\times10^{-3}\mathbf{BC}$					
K					
0.000	**A** (0.427) **B** (0.700) **C** (0.000)	$\mathbf{C}^2$ (0.000)	**AB** (0.123)	0.249	94.8
$C_{K} = 4.78\times10^{2} - 6.63\times10^{-1}\mathbf{A} - 1.04\mathbf{B} + 7.18\times10^{1}\mathbf{C} - 1.11\times10^{1}\mathbf{C}^2 + 2.82\times10^{-2}\mathbf{AB}$					
Mg					
0.387	**A** (0.521) **B** (0.647)	-	**AB** (0.131)	0.448	23.2
$C_{Mg} = 1.97\times10^{2} - 3.86\times10^{-1}\mathbf{A} - 6.07\times10^{-1}\mathbf{B} + 1.69\times10^{-1}\mathbf{AB}$					
Mn					
0.018	**A** (0.057) **B** (0.405) **C** (0.010)	**AB** (0.060)	-	0.380	66.7
$C_{Mn} = 9.19 - 1.20\times10^{-2}\mathbf{A} - 1.52\times10^{-2}\mathbf{B} + 6.28\times10^{-2}\mathbf{C} + 4.43\times10^{-4}\mathbf{AB}$					
Na					

0.011	**A** (0.776) **B** (0.730) **C** (0.003)	$\mathbf{C^2}$ (0.006)	**AC** (0.103) **BC** (0.142)	0.193	82.4
$C_{Na} = 3.64 - 3.25\times10^{-2}\mathbf{A} - 5.61\times10^{-2}\mathbf{B} + 1.31\mathbf{C} - 3.82\times10^{-1}\mathbf{C^2} + 1.40\times10^{-2}\mathbf{AC} + 2.47\times10^{-2}\mathbf{BC}$					
Sr					
0.047	**C** (0.111)	$\mathbf{C^2}$ (0.045)	-	0.795	39.8
$C_{Sr} = 1.88\times10^{-1} - 3.08\times10^{-3}\mathbf{C} - 5.33\times10^{-4}\mathbf{C^2}$					
Zn					
0.002	**A** (0.129) **B** (0.526) **C** (0.000)	$\mathbf{C^2}$ (0.083)	**AB** (0.092)	0.656	88.3
$C_{Zn} = 1.48\times10^{1} - 2.25\times10^{-2}\mathbf{A} - 6.63\times10^{-2}\mathbf{B} + 4.70\mathbf{C}\times10^{-1} - 8.15\times10^{-1}\mathbf{C^2} + 8.56\times10^{-4}\mathbf{AC} + 1.12\times10^{-2}\mathbf{BC}$					

A: The temperature of water filling the ultrasonic bath (in ^{o}C).
B: The sonication time (in min).
C: The volume of a concentrated HNO_3 solution added per 0.5 g of rice (in mL).

Table 4S

The individually optimized settings of the parameters of the ultrasound-assisted extraction (USAE), i.e., **A** – the temperature of water filling the ultrasonic bath (in °C), **B** – the sonication time (in min), and **C** – the volume of a concentrated HNO_3 solution added per 0.5 g of rice (in mL), based on the established response surface regression models. In all experiments, the WR0 material was used

Element	Target value[a]	Fitted value[b]	*d*	**A**, °C	**B**, min	**C**, mL
Al	0.498±0.038	0.479±0.170	0.963	60	30	1.0
Ba	0.451±0.020	0.449±0.023	0.956	60	30	4.0
Ca	48.5±0.8	47.7±3.9	0.871	-	20	1.0
Cu	2.04±0.14	2.04±0.62	1.000	-	15	4.0
Fe	1.35±0.14	1.35±0.35	1.000	60	21	4.0
K	543±3	543±9	1.00	40	20	1.7
Mg	184±1	184±8	1.000	46	30	-
Mn	9.09±0.04	9.09±0.19	1.000	22	17	4.0
Na	4.80±0.35	4.80±0.66	1.000	40	20	2.6
Sr	0.190±0.006	0.190±0.004	1.000	-	-	1.0
Zn	14.8±0.1	14.8±0.4	1.000	40	26	4.0

d The individual desirability.

[a] The mean value along with the standard deviation obtained by using the wet digestion procedure followed by the analysis of the resulting sample solutions by ICP OES, n=3.

[b] The value along with the standard deviation obtained by using the response surface regression models, n=15.

Table 5S

The outcomes of the two-sided one-way Welch analysis of variance (ANOVA) and the *post-hoc* Fisher least significance difference (LSD) test used to compare different rice samples, *i.e.*, white rice (WR), basmati rice (BR), jasmine rice (JR), parboiled rice (PBR), and red rice (RR)

F-value[a]	*p*-value[b]	Concentration, μg g^{-1}					Differences[c]
		WR, n=5	BR, n=2	JR, n=2	PBR, n=2	RR, n=2	
Al							
9.86	0.044	0.979±1.422	0.513±0.031	0.296±0.029	0.330±0.020	0.478±0.117	-
Ba							
8175.17	0.000	0.248±0.152	0.088±0.007	0.338±0.005	0.112±0.028	2.65±0.01	BR-JR (<0.050), BR-RR (0.000), JR-RR (0.000), PBR-RR (0.000), WR-RR (0.000)
Ca							
23.34	0.021	132±206	54.5±4.8	39.6±1.3	32.0±29.3	98.3±6.6	-
Fe							
86.25	0.002	1.57±0.84	2.01±0.38	1.24±0.47	2.28±1.51	7.98±0.27	BR-RR (0.000), JR-RR (0.000), PBR-RR (0.000), WR-RR (0.000)
K							
638.30	0.000	875±433	766±8	569±17	1800±247	2380±35	BR-PBR (0.012), BR-RR (0.001), JR-PBR (0.005), JR-RR (0.000), PBR-WR (0.009), WR-

							RR (0.000)
Mg 513.56	0.000	192±109	138±13	116±28	302±173	762±9	BR-RR (0.000), JR-RR (0.000), PBR-RR (0.002), WR-RR (0.000)
Mn 10.26	0.052	9.31±1.32	7.90±0.15	9.43±0.31	8.78±9.64	27.5±5.1	BR-RR (0.001), JR-RR (0.002), PBR-RR (0.002), WR-RR (0.001)
Na 3.64	0.189	6.70±4.58	22.3±6.5	8.36±0.11	6.06±1.05	12.6±2.3	BR-JR (0.009), BR-PBR (0.004), BR-WR (0.002), BR-RR (0.044)
Sr 45.25	0.006	0.230±0.123	0.334±0.043	0.146±0.013	0.114±0.031	0.548±0.032	BR-PBR (0.041), BR-RR (0.044), JR-RR (0.002), PBR-RR (0.001), WR-RR (0.003)
Zn 17.15	0.026	13.7±3.4	15.0±4.2	13.2±0.9	7.04±4.32	20.2±0.5	BR-PBR (0.039), PBR-

	RR (0.003), PBR-WR (0.039), WR-RR (0.040)

[a] The Welch *F* test corrected value.
[b] The probability of the Welch *F* test.
[c] The results of the *post-hoc* Fisher LSD test along with the *p*-values in the brackets.

Caption for figures

Fig. 1S. A scheme of the new method for the fast determination of Al, Ba, Ca, Cu, Fe, K, Mg, Mn, Na, Sr, and Zn in rice by inductively coupled plasma optical emission spectrometry (ICP OES) along with the sample preparation by the ultrasound-assisted extraction (USAE)

Fig. 2S. The effect of the parameters **A**, **B** and **C** on the overall desirability (*D*). **A**: the temperature of water filling an ultrasonic bath (in ^{o}C), **B**: the sonication time (in min), **C**: the volume of a concentrated HNO_3 solution added per 0.5 g of rice (in mL)