

## Supplementary material

**Title:** Ionic liquid-modified luffa sponge fiber for dispersive solid-phase extraction of benzoylurea insecticides from water and tea beverage samples

**Names of authors:** Huazi Wang <sup>a</sup>, Chaoran Liu <sup>a</sup>, Xiaodong Huang <sup>a,b</sup>, Chendi Jia <sup>a</sup>, Yang Cao <sup>a</sup>,  
Lu Hu <sup>a</sup>, Runhua Lu <sup>a</sup>, Sanbing Zhang <sup>a</sup>, Haixiang Gao <sup>a</sup>, Wenfeng Zhou <sup>a,\*</sup>, Donghui Xu <sup>b,\*</sup>

**Institute:** <sup>a</sup> Department of Applied Chemistry, College of Science, China Agricultural University;

<sup>b</sup> Institute of Vegetables and Flowers, Chinese Academy of Agricultural Sciences, Laboratory of Quality & Safety Risk Assessment for Vegetable Products (Beijing), Ministry of Agriculture

**Institute address:** <sup>a</sup> Yuanmingyuan West Road 2#, Haidian District, Beijing 100193, China;

<sup>b</sup> NO.12 Zhongguancun South St., Haidian District, Beijing 100081, China

\* **Corresponding author:** Wenfeng Zhou, Donghui Xu

**Email:** zhouwenfeng@cau.edu.cn (W. Zhou); xudonghui@caas.cn (D. Xu)

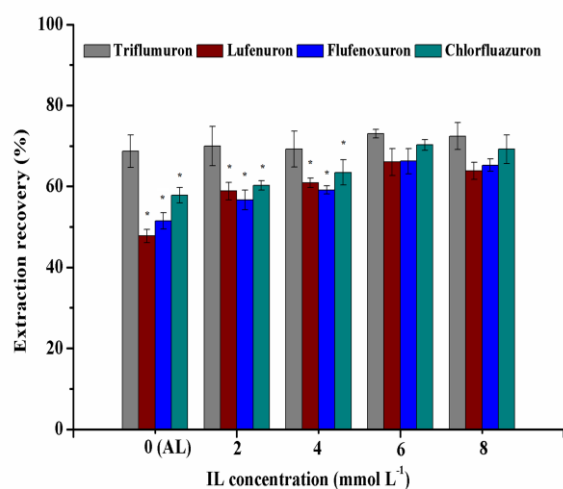


Fig. S1. Effect of the concentration of  $[C_{16}MIM]Br$  in the preparation of the sorbent. Extraction conditions: sorbent amount, 50 mg; vortex time, 6 min; salt addition, 10% (w/v); and sample volume, 8 mL. Desorption conditions: 300  $\mu L$  of methanol and ultrasound time, 15 min. Three replicate experiments were conducted. The asterisks indicate that the target recoveries are significantly different between 6  $mmol L^{-1}$  and the other concentrations ( $p < 0.05$ ).

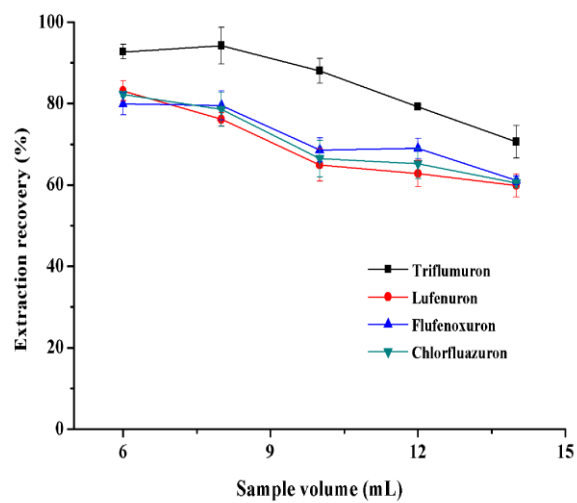


Fig. S2. Effect of the sample volume on the extraction of BUs. Extraction conditions: sorbent amount, 70 mg; salt addition, 10% (w/v); and vortex time, 6 min. Desorption conditions: 300  $\mu$ L of methanol and ultrasound time, 15 min. Three replicate experiments were conducted.

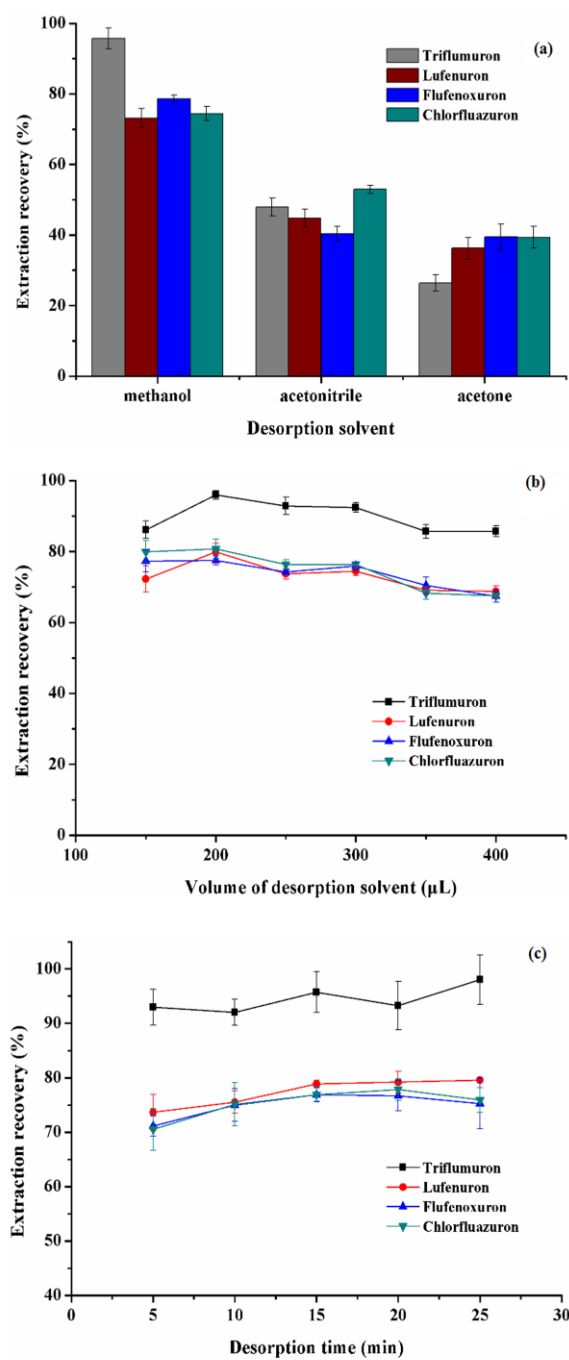


Fig. S3. Effect of the desorption conditions. Recoveries of BUs with different (a) types of desorption solvent, (b) volumes of desorption solvent, and (c) ultrasound times. Three replicate experiments were conducted.

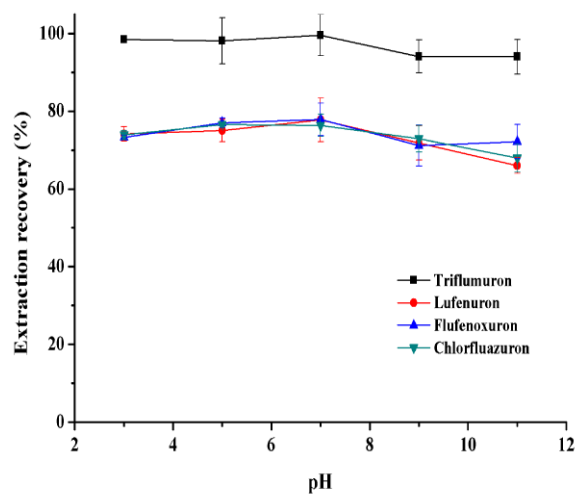


Fig. S4. Effect of the sample pH on the extraction of BUs. Extraction conditions: sorbent amount, 70 mg; salt addition, 5% (w/v); vortex time, 6 min; and sample volume, 8 mL. Desorption conditions: 200  $\mu$ L of methanol and ultrasound time, 15 min. Three replicate experiments were conducted.

Table S1 Results for the orthogonal experiments.

Standard order	Factors					Average recovery (%)
	Amount of sorbent (mg)	Vortex time (min)	Salt addition (% w/v)	Sample volume (mL)	Volume of desorption solvent ( $\mu$ L)	
1	40	1	0	6	200	31.7
2	40	2	5	8	250	43.7
3	40	4	10	10	300	43.3
4	40	6	15	12	350	46.3
5	40	8	20	14	400	39.7
6	50	1	5	10	350	25.2
7	50	2	10	12	400	35.9
8	50	4	15	14	200	42.6
9	50	6	20	6	250	62.6
10	50	8	0	8	300	68.5
11	60	1	10	14	250	30.1
12	60	2	15	6	300	62.4
13	60	4	20	8	350	55.6
14	60	6	0	10	400	65.4
15	60	8	5	12	200	83.1
16	70	1	15	8	400	36.2
17	70	2	20	10	200	46.2
18	70	4	0	12	250	61.9
19	70	6	5	14	300	79.8
20	70	8	10	6	350	88.3
21	80	1	20	12	300	36.8
22	80	2	0	14	350	48.3
23	80	4	5	6	400	87.0
24	80	6	10	8	200	84.5
25	80	8	15	10	250	67.6
$K_1$	40.9	32.0	55.2	66.4	57.6	
$K_2$	47.0	47.3	63.7	57.7	53.2	
$K_3$	59.3	58.1	56.5	49.5	58.2	
$K_4$	62.5	67.7	51.0	52.8	52.7	
$K_5$	64.8	69.5	48.2	48.1	52.8	
$R$	23.9	37.5	15.5	18.3	5.4	

$K_i$ : average of the average recoveries of three repetitions for each level  $i=1, 2, 3, 4, 5$ ;  
 $R$ :  $K_{\max} - K_{\min}$ , larger  $R$  value indicating more significant effects.

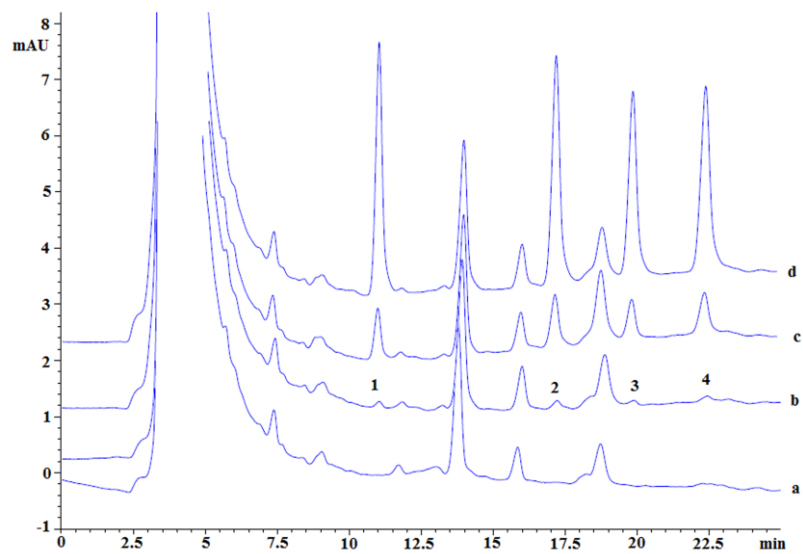


Fig. S5. The HPLC chromatograms of benzoylurea insecticides in the blank (a) and spiked (b, c and d, spiked with 2, 20 and 100 ng mL<sup>-1</sup>, respectively) green tea: 1. triflumuron; 2. lufenuron; 3. flufenoxuron; and 4. chlorfluazuron.