Supplementary information

List of contents:

1.LC-MS/MS conditions and methods

LC-MS was conducted on a Waters Quattro Premier XE system, equipped with an electrospray ionization (ESI) source. The analytical column used was a BEH C18 5 column (150 mm × 2.1 mm, 1.7 μm). The operation conditions were the following, flow rate, 0.3 mL/min; injection volume, 5 μL; and column temperature, 45℃. The mobile phases were 100% acetonitrile (A) and 0.1% (v/v) formic acid in ultrapure water (B): 0

to 8 min, 95% B; 6 min, 5% B; 7 min, 5% B; 7.1 min, 95% B; and 10 min, 95% B. All chromatographic separation processes were carried out under a gradient elution program. MS detection was performed in a positive ion mode (ESI+). The ions were detected by MSE with a scan range of m/z 50 to 2,000 and the parameters were set as follows, ion source block temperature, 100℃; capillary voltage, 3,500 V; desolvation gas temperature, 400℃; desolvation gas flow, 700 L/h; cone voltage, 30 V; and collision energies, 6 eV and 20 eV.

2. Sample pretreatment

The food samples were washed, cut into pieces, and homogenized. For celery, 1 g of homogenized sample was placed in a 15-mL centrifuge tube. Following the addition of different concentrations of CLZ standard solution and 2 mL of aqueous solution containing 50% methanol, we centrifuged the samples at 8,000 rpm for 5 min after vortexing for 3 min. The supernatant was extracted for detection. The pre-treatment of the orange samples was similar; however, due to the acidic nature of the extracted solution, the pH was adjusted to neutral with 0.1 M NaOH. Finally, the samples were tested by ic-ELISA and ICA, using three replicates for each group of experiments.

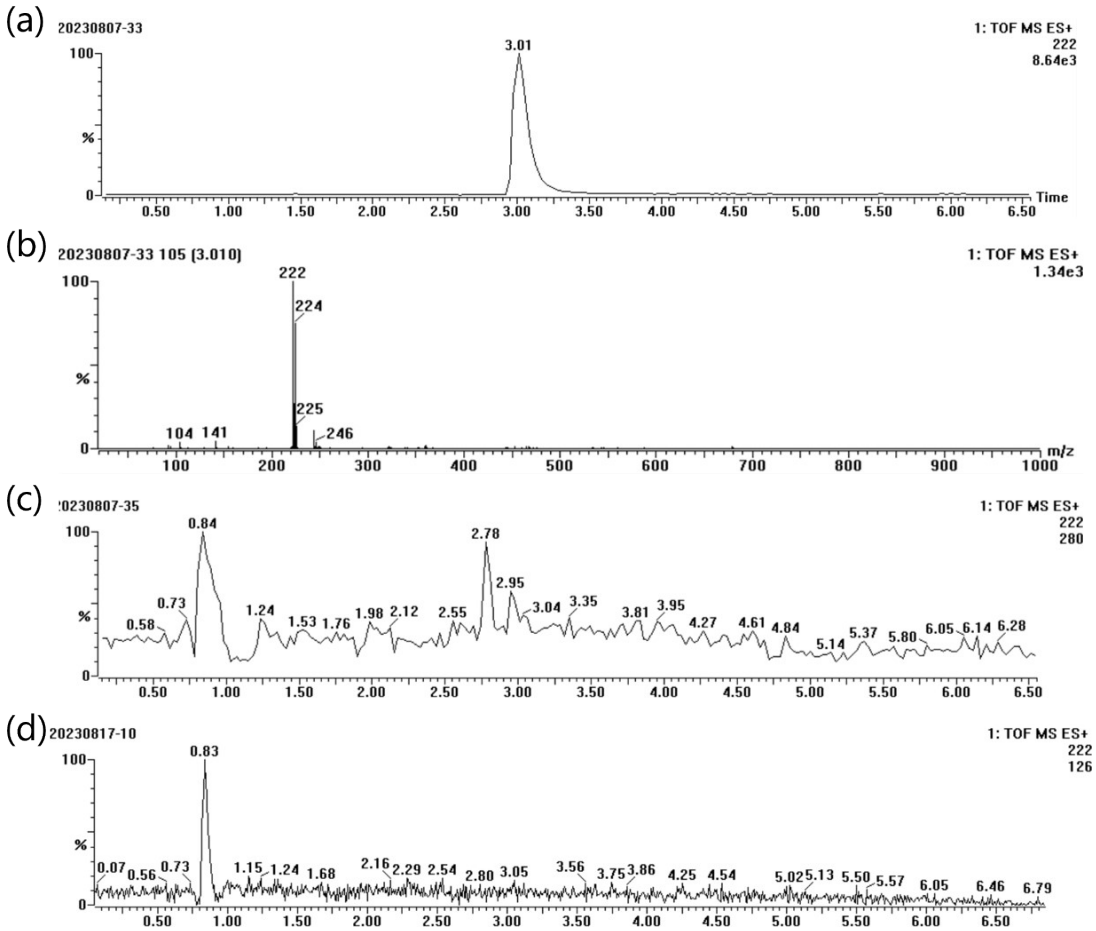

Figure S1 Characterization of negative orange and celery samples. (a) Extracted ion chromatogram of Chloridazon; (b) Mass spectrum of chloridazon; (c) Extracted ion chromatogram of negative orange samples; (d) Extracted ion chromatogram of negative celery samples.

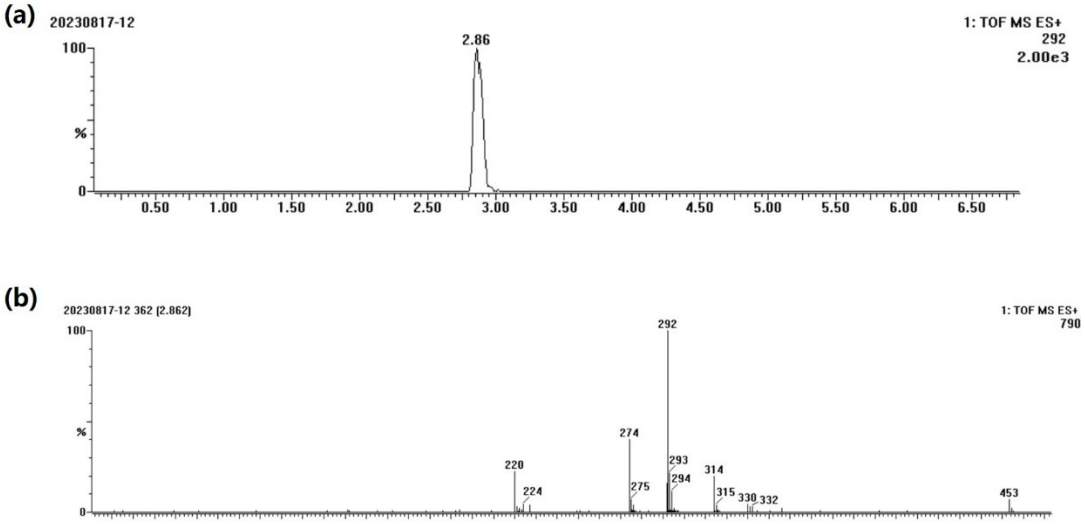

Figure S2 Characterization of CLZH. (a) Extracted ion chromatogram of CLZH; (b)

Mass spectrum of CLZH.

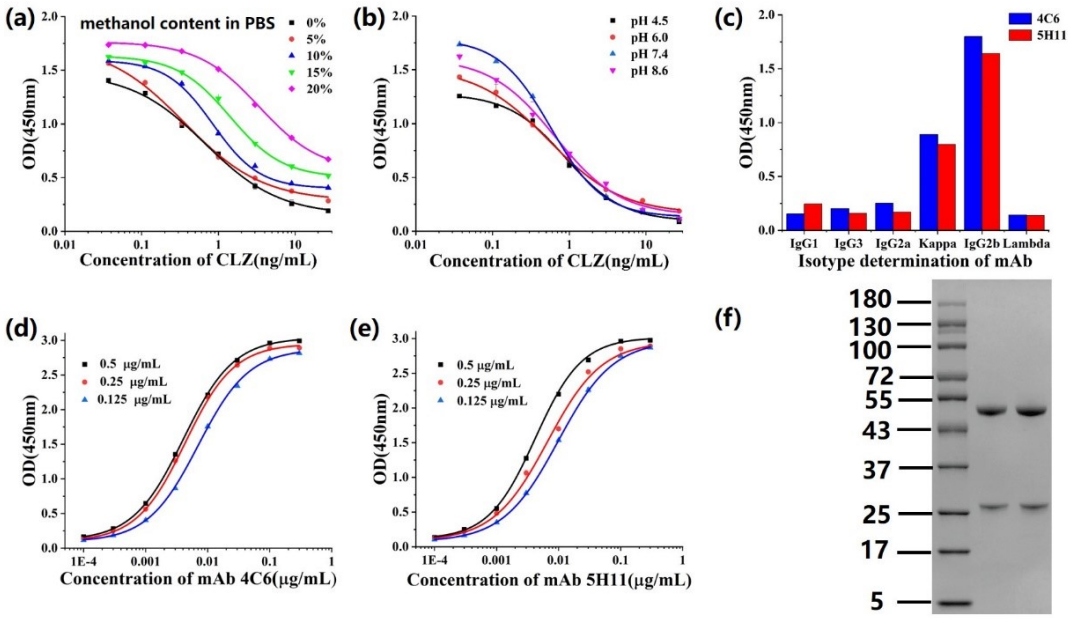

Figure S3 Characterization of anti-CLZ mAb. (a) Optimization of methanol content in the buffer for ic-ELISA; (b) Optimization of pH in the buffer for ic-ELISA; (c) subtypes determination; (d) affinity detection of mAb 4C6; (e) affinity detection of mAb 5H11; (f) the SDS-PAGE result of mAb 4C6 and 5H11.

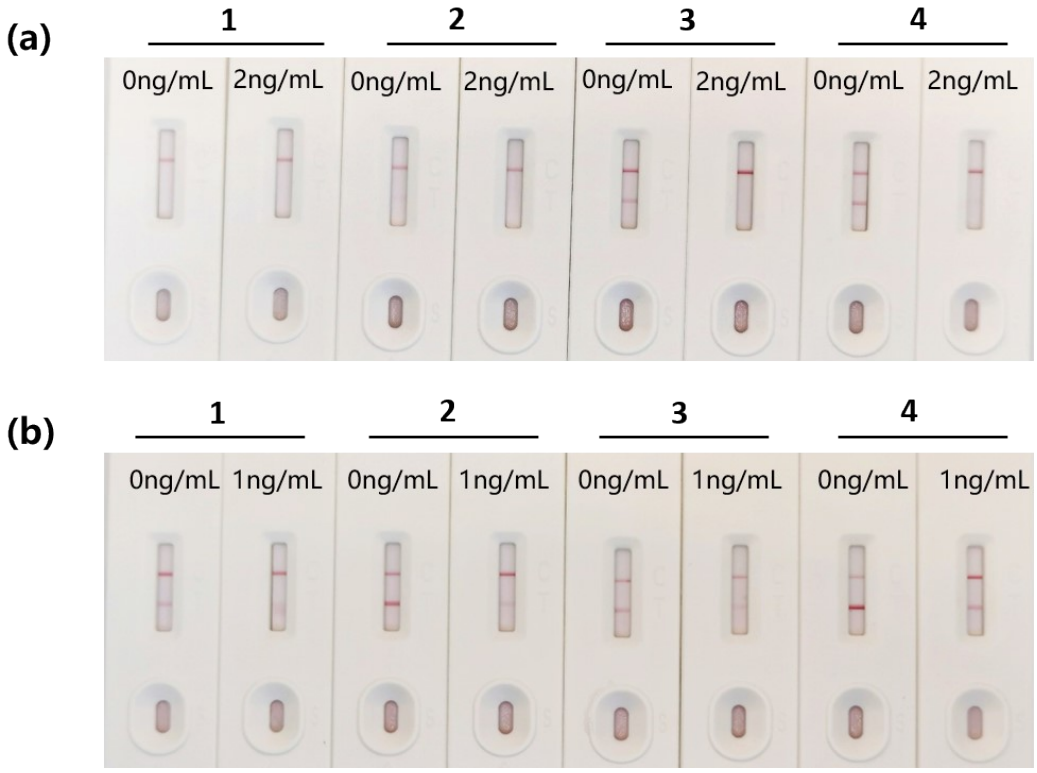

Figure. S4 Optimization of ICA strip. (a) Optimization of the coating antigen concentration and the concentration of anti-CLZ mAb for labeling gold nanoparticles (1,3: the coating antigen concentration was 0.2 mg/mL and the concentration of mAb were 5 μg/mL and 10 μg/mL, respectively; 2,4: the coating antigen concentration was 0.8 mg/mL and the concentration of mAb were 5 μg/mL and 10 μg/mL, respectively); (b) Optimization of the resuspension buffer(1: 5% PVP; 2: 5% PEG; 3: 5% BSA;4: 5% ON-870).

Table S1 The comparison of the ICA with other analytical methods.

Method	Matrix	Pretreatment	LOD	Duration of analysis	Reference
The immunochromatographic strip	oranges celery	simple	2 ng/mL 10 ng/mL	short	This work
LC-MS/MS	hazelnuts	complex	4 μg/kg	long	Cebi, N.et al.(2021)
LC-MS/MS (SAM) LC-MS/MS (ISM)	seawater	complex	10 ng/L 0.3 ng/L	long	Skeff, W.et al.(2017)
HPLC-MS	wastewater	complex	/	long	Godejohann, M.et al.(2011)
α-Fe2O3-CdO electrochemical nanosensor	spinach, lettuce, cauliflower, cucumber, and cabbage	simple	0.059μg/mL	short	Aruna, P.et al.(2022)

References

1. N. Cebi, O. G. Manav and E. O. Olgun, *Microchem J.*, 2021, **166**, 8.

2. W. Skeff, A. Orlikowska and D. E. Schulz-Bull, *Mar. Pollut. Bull.*, 2017, **114**, 1110-1117.

3. M. Godejohann, J. D. Berset and D. Muff, *J. Chromatogr. A*, 2011, **1218**, 9202-9209.

4. P. Aruna, P. R. Prasad, P. Sandhya, N. Rao and N. Y. Sreedhar, *Biointerface Res. Appl. Chem.*, 2022, **12**, 5772-5784.