Supporting information

Contents

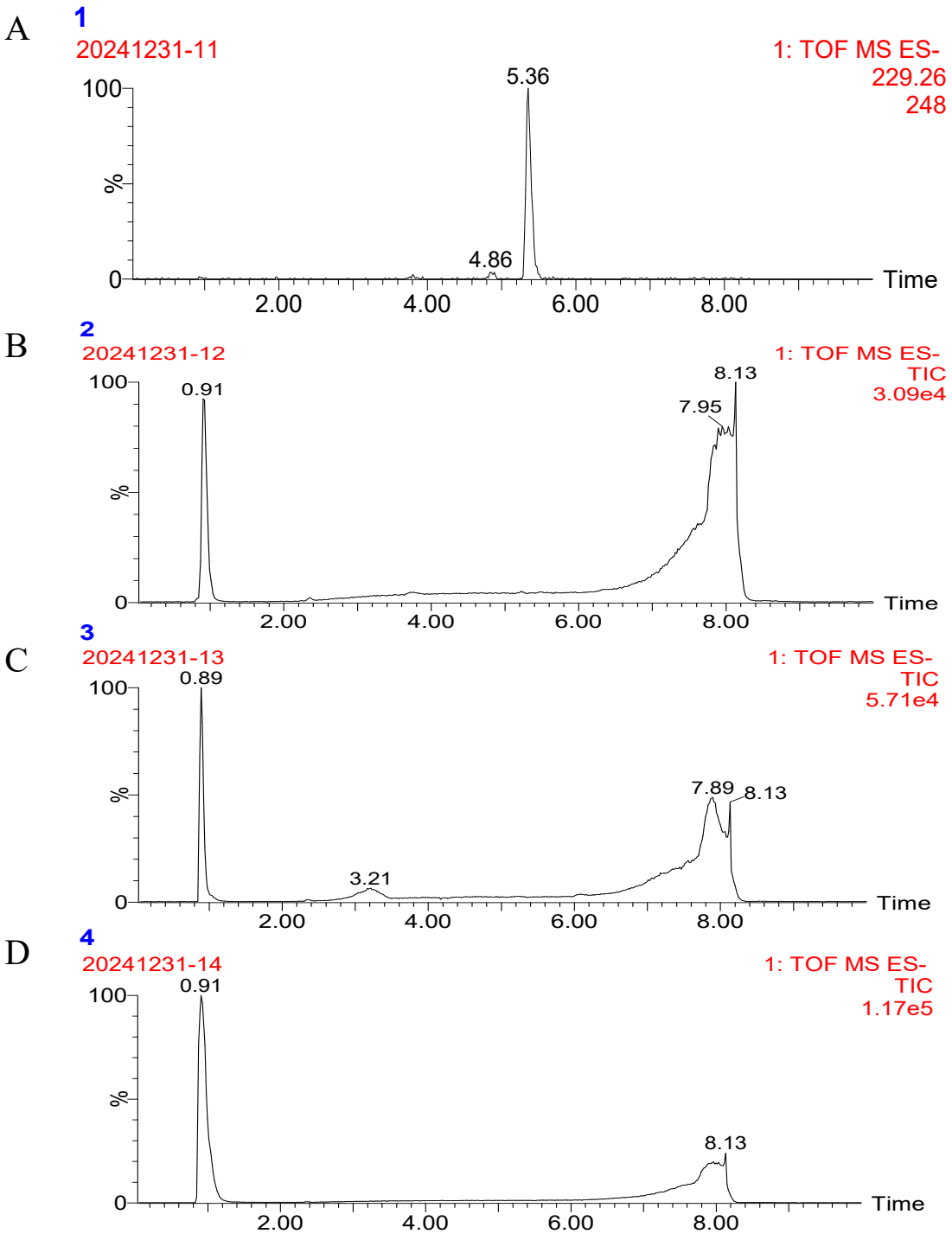

Fig. S1. LC-MS/MS analysis of NPX standard solution (A), sewage sample (B), soil sample (C) and serum samples (D).

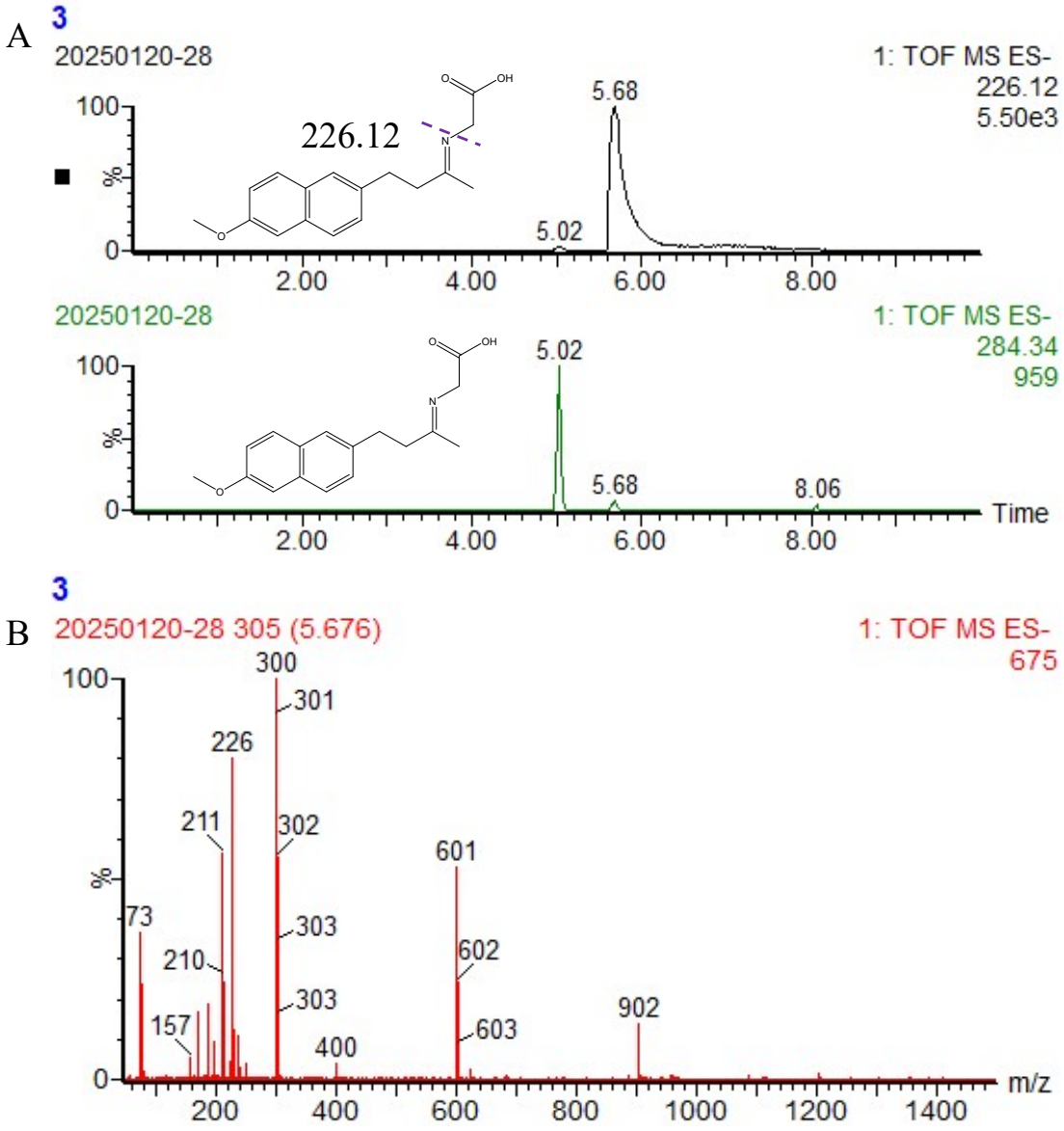

Fig. S2. LC-MS/MS analysis of H1. (A) The liquid chromatogram spectrum of H1. (B) The mass spectrum of H1.

Tab. S1. The standard curves of the ICA analysis for NPX in sewage samples, soil samples and serum samples (n=3).

Samples	Spiked level of NPX (μg/kg or ng/mL)	T/C value Mean ± SD	Error value
Sewage	0	1.29±0.09	0.05
	0.02	1.15±0.07	0.04
	0.3	1.11±0.07	0.04
	0.05	1.04±0.07	0.04
	0.1	0.88±0.03	0.02
	0.2	0.53±0.05	0.03
	0.5	0.17±0.06	0.03
	1	0.06±0.07	0.04
Soil	0	1.02±0.02	0.01
	0.01	0.96±0.07	0.04
	0.05	0.86±0.03	0.02
	0.1	0.72±0.07	0.04
	0.2	0.6±0.07	0.04
	0.5	0.4±0.07	0.04
	1	0.27±0.03	0.02
	2	0.21±0.02	0.01
Serum	0	1.24±0.05	0.03
	0.05	1.12±0.03	0.02
	0.1	1.06±0.05	0.03
	0.2	0.76±0.07	0.04
	0.5	0.51±0.07	0.04
	1	0.31±0.05	0.03
	2	0.09±0.07	0.04
	5	0.04±0.02	0.01

Tab. S2. Comparison of the ICA with other reporting methods.

Method	Samples	Linearity and range	LOD	Reference
ICA	Sewage	0.08-0.42 ng/mL	0.010 ng/mL	This work
	Soil	0.06-0.85 μg/kg	0.051 μg/kg	
	Serum	0.11-1.26 ng/mL	0.028 ng/mL	
HPLC	Lake water	-	12 ng/mL	[1]
HPLC-UV	Water	-	0.09 ng/mL	[2]
CHEMILUMINISCENCE	Wastewater	115.13-2184.26 ng/mL	25.3 ng/mL	[3]
FLUORESCENCE SENSOR	Water	11.5-921 ng/mL	6.9 ng/mL	[4]

Tab. S3. Detection of NPX in sewage, soil and serum samples by ICA and LC-MS/MS (n=3).

Samples	Spiked level of NPX (μg/kg or ng/mL)	ICA			LC-MS/MS		
		Detection level (μg/kg or ng/mL) Mean ± SD	Recovery (%) ± SD	CV (%)	Detection level (μg/kg or ng/mL) Mean ± SD	Recovery (%) ± SD	CV (%)
Sewage	0	ND	NC	NC	ND	NC	NC
	0.01	0.009±0.001	90.3±4.8	11.1	0.012±0.001	120.3±4.8	8.3
	0.1	0.098±0.002	98.1±2.7	2.0	0.092±0.012	92.1±3.1	13.0
	1	0.961±0.011	96.0±3.1	1.0	1.031±0.101	103.5±2.1	9.7
Soil	0	ND	NC	NC	ND	NC	NC
	0.01	0.009±0.001	90.3±2.3	11.1	0.009±0.001	90.1±2.3	11.1
	0.2	0.182±0.004	90.8±4.2	2.2	0.221±0.003	110.8±4.2	1.4
	2	2.131±0.052	106.5±2.5	2.3	2.072±0.051	103.5±2.5	2.4
Serum	0	ND	NC	NC	ND	NC	NC
	0.05	0.048±0.001	96.9±2.9	2.1	0.051±0.002	102.9±4.1	3.9
	0.5	0.531±0.021	106.0±1.8	3.8	0.521±0.041	104.1±7.9	7.7
	5	5.074±0.092	101.5±4.6	1.8	4.931±0.090	98.6±4.7	1.8

ND: not detectable; NC: not calculated.

Tab. S4. Real samples analysis using the ICA and LC-MS/MS.

Samples	ICA		LC-MS/MS		Relative accuracy (%)
	Detection value (ng/mL) Mean ± SD	CV (%)	Detection value (ng/mL) Mean ± SD	CV (%)	
1 (Serum)	0.73±0.02	2.74	0.71±0.05	7.04	102.8
2 (Serum)	1.04±0.07	6.73	0.95±0.02	2.11	109.5

Tab. S5. Chromatographic conditions for analysis of NPX by LC-MS/MS.

Chromatographic conditions			
Chromatographic Column	BEH-C18 column (2.1×100 mm, 1.7 μm)		
	Column temperature: 40 °C		
Mobile Phase	A: 0.1% FA in water		
	B: Acetonitrile		
Gradient Profile	Time (min)	Percentage A (%)	Percentage B (%)
	0.00	95.00%	5.00%
	0.71	95.00%	5.00%
	2.00	2.00%	98.00%
	8.70	2.00%	98.00%
	9.07	98.00%	2.00%
	10.00	98.00%	2.00%
Injection Volume	2 μL		

References

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4. K. Li, M. Zhang, X. Y. Ye, Y. M. Zhang, G. S. Li, R. Fu and X. F. Chen, *Rsc Advances*, 2021, **11(46)**, 29073-29079.