

Table S1 Five elution gradients of mobile phase A (acetone) and mobile phase B (water)

Method 1		
Time / min	A / %	B / %
0	30	70
5	30	70
10	85	15
17	85	15
22	100	0
27	30	70
Method 2		
Time / min	A / %	B / %
0	55	45
5	65	35
7	75	25
10	85	15
16	55	45
Method 3		
Time / min	A / %	B / %
0	55	45
5	55	35
15	75	25
22	85	15
27	55	45
Method 4		
Time / min	A / %	B / %
0	90	10
2	90	10
10	80	20
20	30	70
22	0	100
27	90	10
Method 5 Isocratic elution, 90% A.		
Method 6		
Time / min	A / %	B / %
0	75	25
5	75	25
10	95	5
17	95	5
22	100	0
27	75	25

Table S2 Repeatability test results among four sessions of three groups of mixed standard samples of different concentrations in 14 days (n=6)

	Storage time / d	Capsanthin		Zeaxanthin		Lutein		β -cryptoxanthin		β -carotene	
		RSD% of retention time	RSD% of peak area	RSD% of retention time	RSD% of peak area	RSD% of retention time	RSD% of peak area	RSD% of retention time	RSD% of peak area	RSD% of retention time	RSD% of peak area
1 $\mu\text{g/mL}$	0	0.04	1.10	0.15	0.48	0.29	1.13	0.11	0.37	0.07	0.33
	3	0.22	0.93	0.10	0.67	0.08	1.17	0.17	0.37	0.08	0.14
	7	0.17	0.39	0.14	0.75	0.15	1.23	0.08	0.40	0.08	0.37
	14	0.07	0.33	0.14	0.28	0.08	1.39	0.11	0.45	0.07	0.39
2 $\mu\text{g/mL}$	0	0.12	0.26	0.05	0.35	0.05	0.94	0.10	0.30	0.05	0.46
	3	0.19	0.19	0.12	0.34	0.15	0.47	0.09	0.36	0.05	0.46
	7	0.22	0.23	0.06	0.32	0.08	0.97	0.08	0.39	0.08	0.61
	14	0.16	0.16	0.11	0.20	0.16	0.97	0.09	0.36	0.08	0.64
5 $\mu\text{g/mL}$	0	0.07	0.47	0.10	0.15	0.08	0.54	0.12	0.63	0.06	0.55
	3	0.08	1.46	0.06	0.12	0.13	0.43	0.09	0.50	0.05	0.65
	7	0.15	1.43	0.09	0.13	0.07	0.59	0.07	0.89	0.03	0.75
	14	0.10	1.09	0.13	0.10	0.12	0.31	0.10	0.51	0.06	1.01

Table S3 Recovery rate test results of 5 carotenoids in fresh chili peppers, dried chili peppers, fried chili sauce and fermented chili sauce

Sample	Compound name	1 mg/kg			5 mg/kg			10 mg/kg		
		Average recovery rate%	Intraday RSD%	Interday RSD%	Average recovery rate%	Intraday RSD%	Interday RSD%	Average recovery rate%	Intraday RSD%	Interday RSD%
Fresh chili peppers	Capsanthin	99.28±3.70	1.01	3.72	100.96±6.39	0.88	6.33	99.60±6.41	0.78	6.44
	Zeaxanthin	99.60±6.41	0.98	1.25	100.73±1.25	0.45	2.08	102.28±2.12	0.60	3.50
	Lutein	91.51±1.22	0.48	1.33	94.05±1.95	1.07	2.07	95.90±4.29	0.77	4.47
	β-cryptoxanthin	95.51±3.30	0.75	3.46	96.98±4.25	1.10	4.38	98.48±3.02	2.27	3.06
	β-carotene	98.35±4.78	0.57	4.86	97.80±4.02	0.62	4.11	99.00±2.16	1.13	2.18
Dried chili peppers	Capsanthin	90.35±2.25	0.93	2.48	87.80±1.26	0.24	1.44	101.35±4.34	0.63	4.29
	Zeaxanthin	102.07±3.17	0.88	3.11	97.07±1.33	1.01	1.37	98.10±3.26	0.65	3.32
	Lutein	99.77±2.28	0.64	2.28	100.14±2.29	0.21	2.29	97.32±2.98	0.87	3.07
	β-cryptoxanthin	96.76±4.86	0.45	5.02	95.24±2.88	0.09	3.02	98.38±2.49	0.89	2.52
	β-carotene	97.22±3.39	0.98	3.49	95.00±1.57	0.49	1.65	99.03±2.01	0.97	2.04
Fried chili sauce	Capsanthin	92.47±2.52	1.47	2.72	98.69±5.74	0.43	5.81	107.47±3.77	0.64	3.51
	Zeaxanthin	97.44±3.35	0.89	3.44	100.56±1.80	0.20	1.79	99.14±4.10	0.38	4.13
	Lutein	96.91±2.67	0.38	2.75	99.56±2.38	1.26	2.39	99.32±6.62	0.08	6.66
	β-cryptoxanthin	98.13±6.63	0.86	6.76	98.80±0.88	1.18	0.89	97.61±4.34	0.12	4.44
	β-carotene	96.61±5.16	1.14	5.34	97.60±3.72	1.25	3.82	97.56±3.32	1.08	3.40
Fermented chili sauce	Capsanthin	103.31±1.99	1.86	1.93	99.08±7.47	0.84	7.54	102.67±5.59	0.27	5.45
	Zeaxanthin	103.19±5.43	0.99	5.26	97.20±3.63	0.99	3.74	97.14±2.25	0.29	2.31
	Lutein	98.38±3.35	0.38	3.40	99.53±4.64	1.19	4.66	98.90±3.27	1.52	3.30
	β-cryptoxanthin	98.93±2.48	0.86	2.50	101.40±5.26	0.52	5.19	99.02±5.18	0.53	5.23
	β-carotene	97.97±2.86	1.09	2.92	97.61±2.37	1.04	2.42	95.43±1.66	2.18	1.74

(Note: Average recovery rate% was the average of 18 samples (n=6 / day) in three days which was expressed as mean ± standard deviation.)

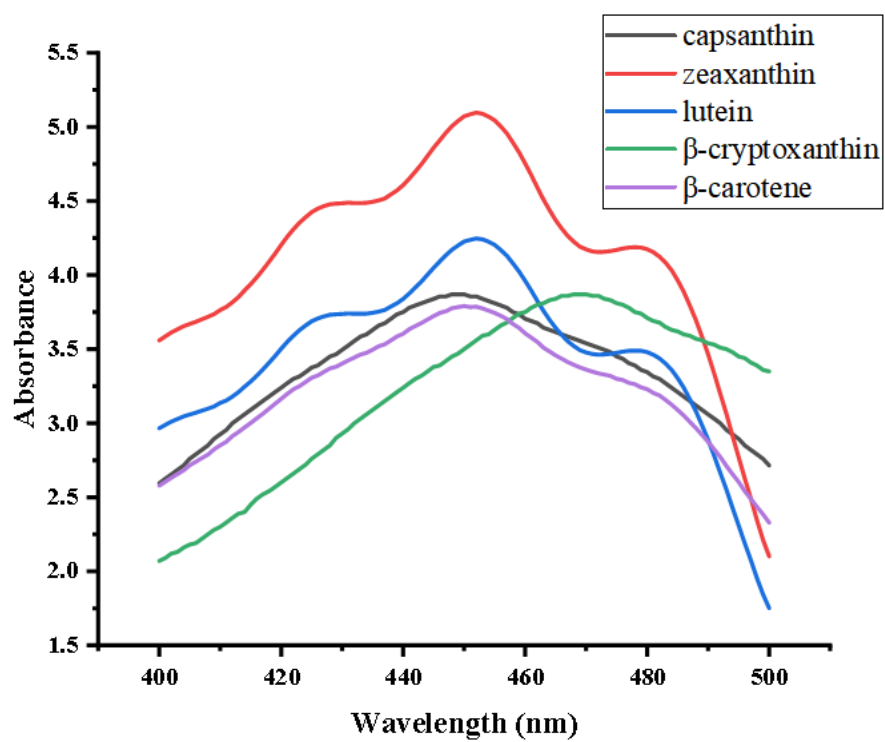
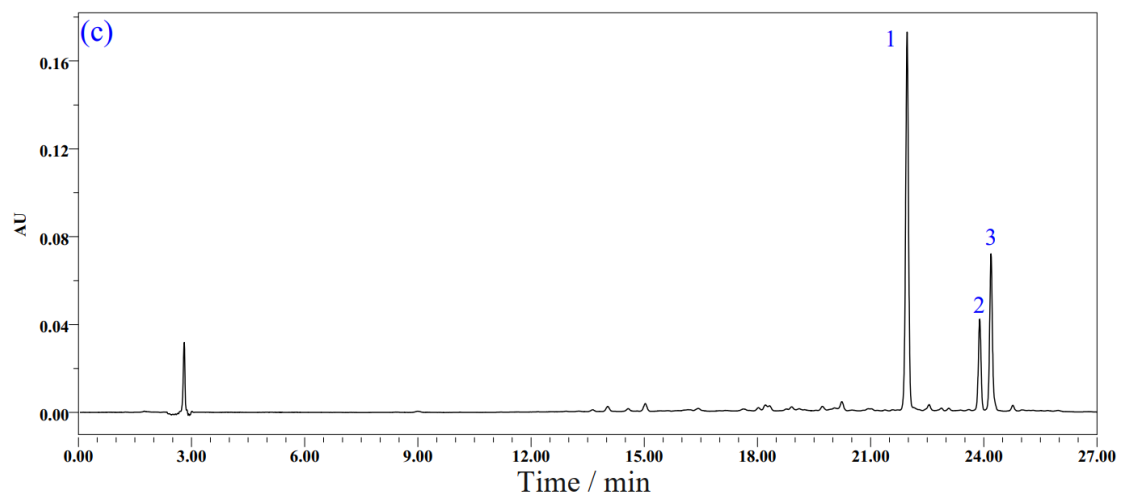
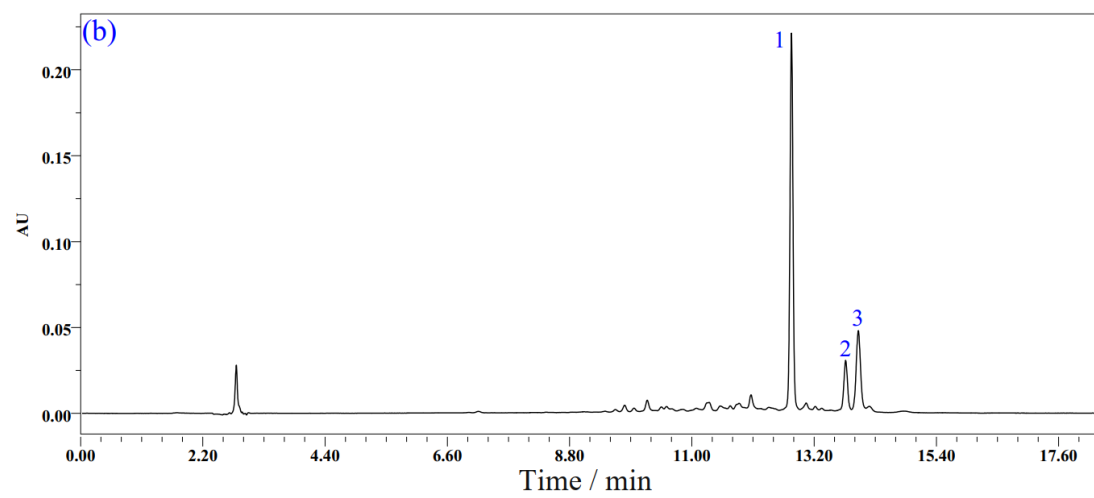
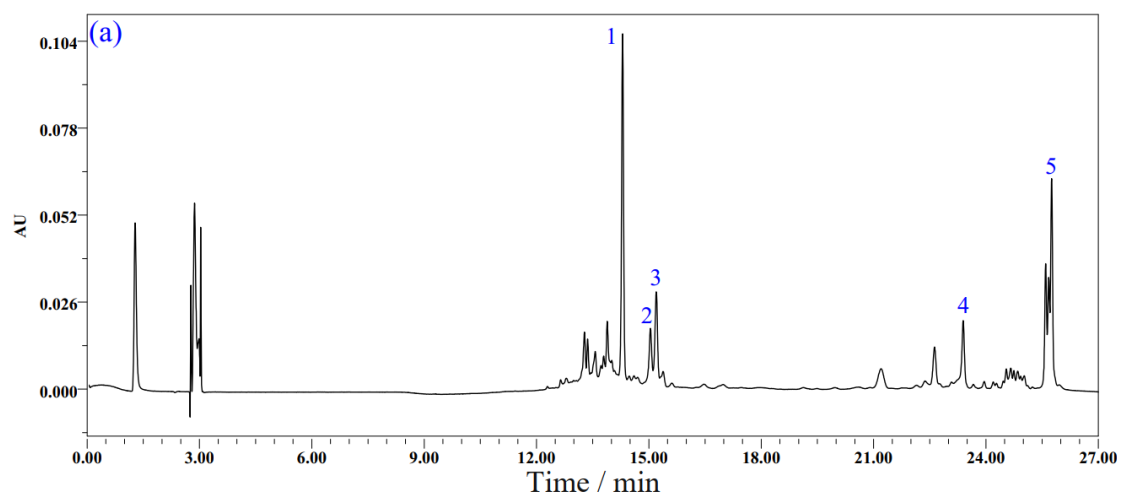


Figure. S1. UV absorption spectra of 5 standards in acetone, obtained by the DAD detector (400~500 nm).



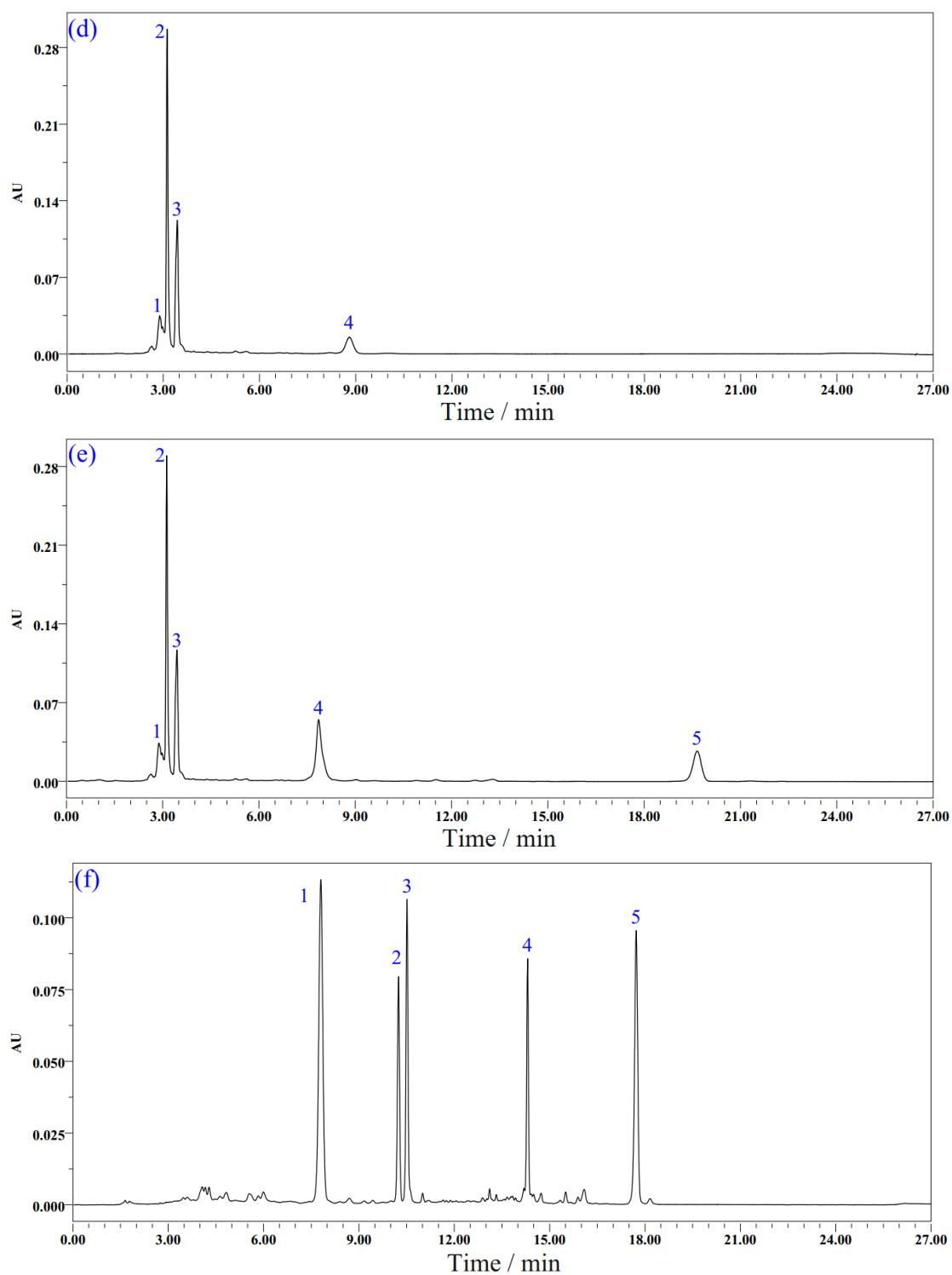
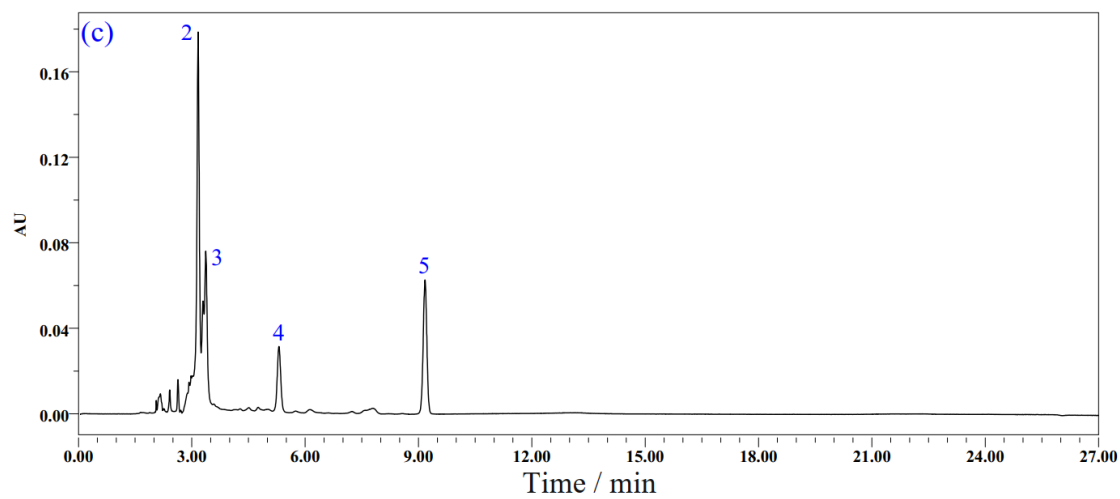
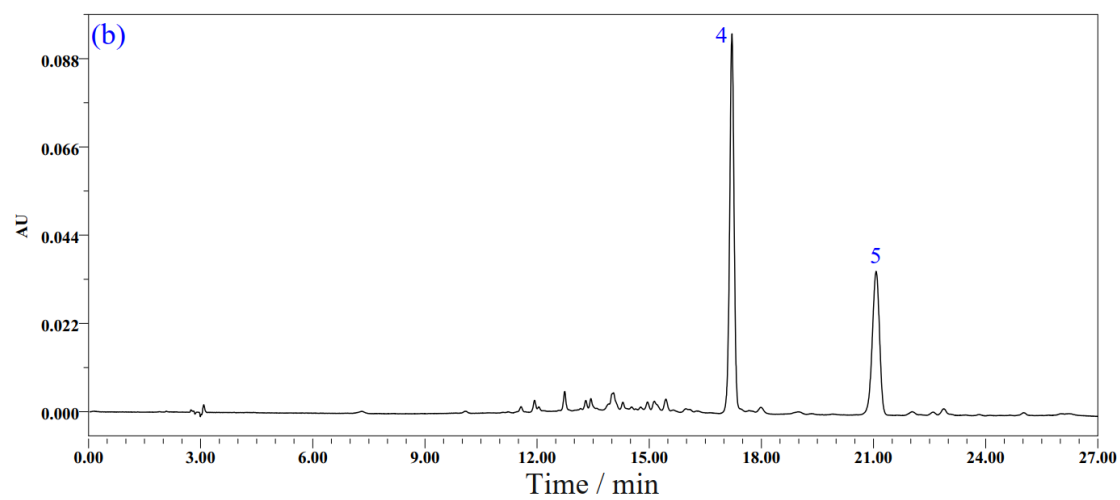
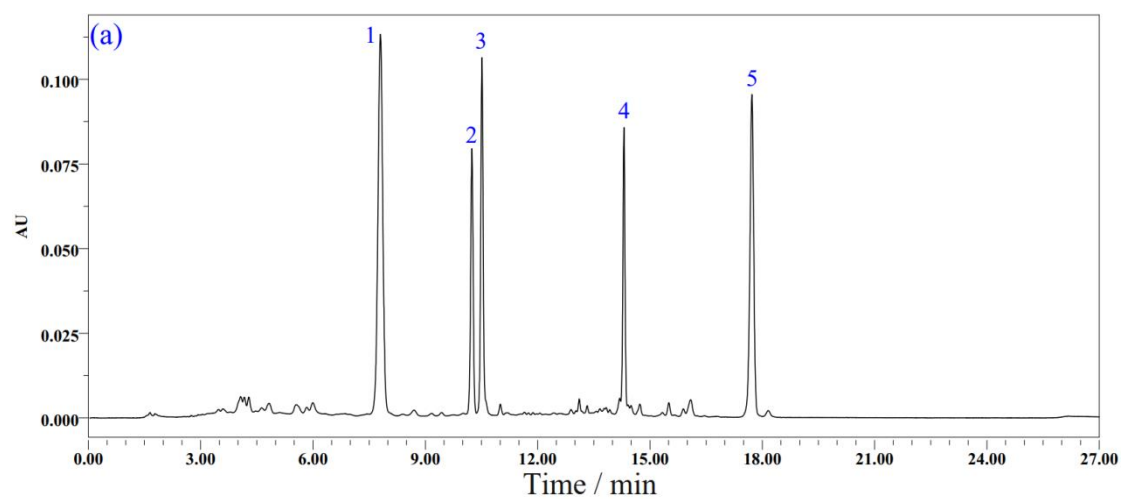


Figure. S2. Chromatograms of capsanthin, zeaxanthin, lutein, β -cryptoxanthin and β -carotene under different gradient elution

(1: capsanthin, 2: zeaxanthin, 3: lutein, 4: β -cryptoxanthin, 5: β -carotene;
a: method 1, b: method 2, c: method 3, d: method 4, e: method 5, f: method 6)



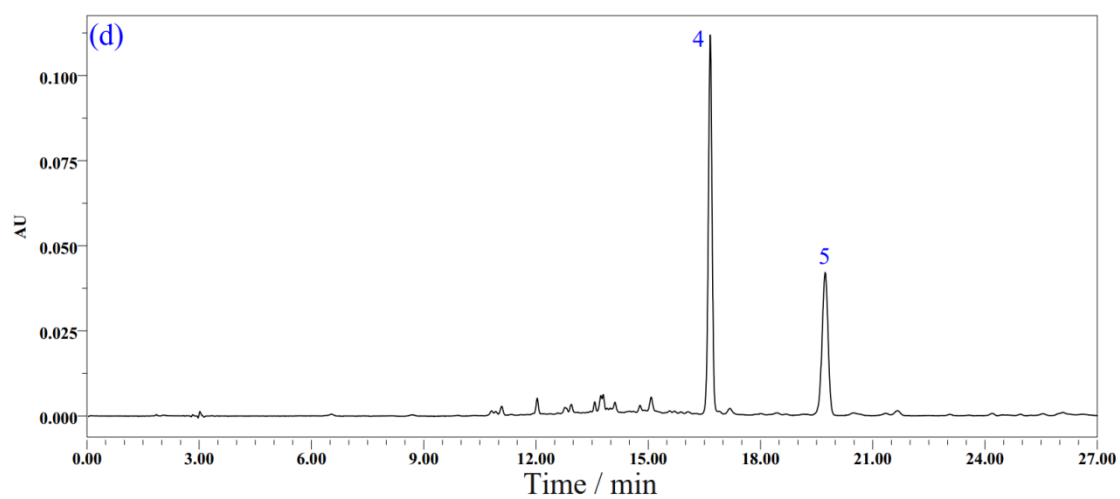


Figure. S3. Chromatograms of capsanthin, zeaxanthin, lutein, β -cryptoxanthin and β -carotene eluted by different mobile phases(a: acetone-water, b: MeOH-water, c: b: tetrahydrofuran-water, d: acetonitrile-water)

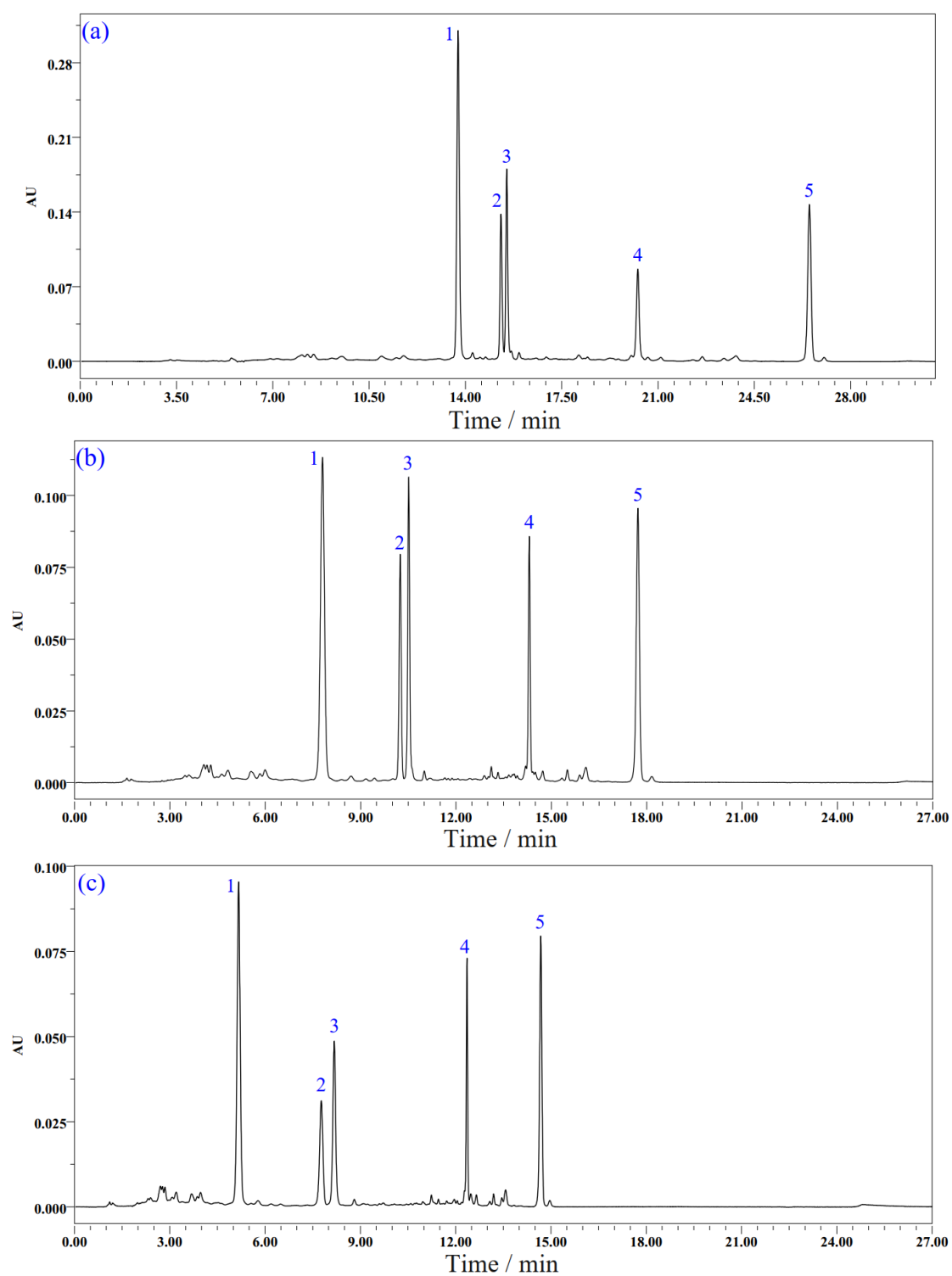


Figure. S4. Chromatograms of capsanthin, zeaxanthin, lutein, β -cryptoxanthin and β -carotene eluted at different flow rates(1: capsanthin, 2: zeaxanthin, 3: lutein, 4: β -cryptoxanthin, 5: β -carotene; a: 0.5 mL/min, b: 1.0 mL/min, c: 1.5 mL/min)

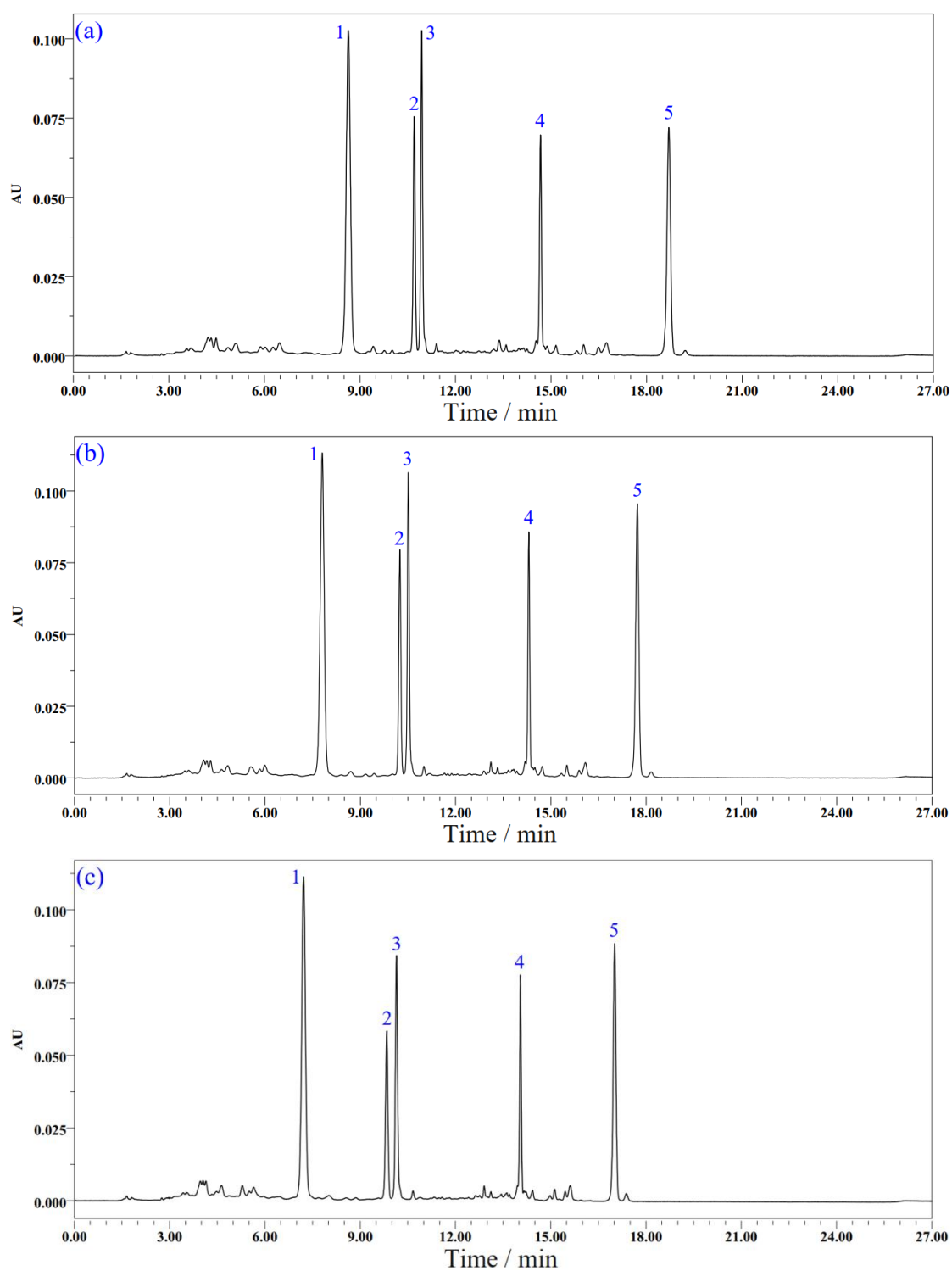


Figure.S5. Chromatograms of capsanthin, zeaxanthin, lutein, β -cryptoxanthin and β -carotene eluted at different column temperatures(1: capsanthin, 2: zeaxanthin, 3: lutein, 4: β -cryptoxanthin, 5: β -carotene; a: 25 °C, b: 30 °C, c: 35 °C)