

Table S1. Source merchant and lot number information of Xiaochaihu capsules.

Lot number	Number	Source Merchant
20200502	S1	Yunnan Yunlong Pharmaceutical CO., LTD.
20190502	S2	
20190701	S3	
20200402	S4	
20210201	S5	
20210102	S11	
20200202	S12	Zhejiang Pralife Pharmaceutical CO., LTD
32008061	S6	
32008291	S7	
32009071	S8	
32008281	S9	
32008271	S10	

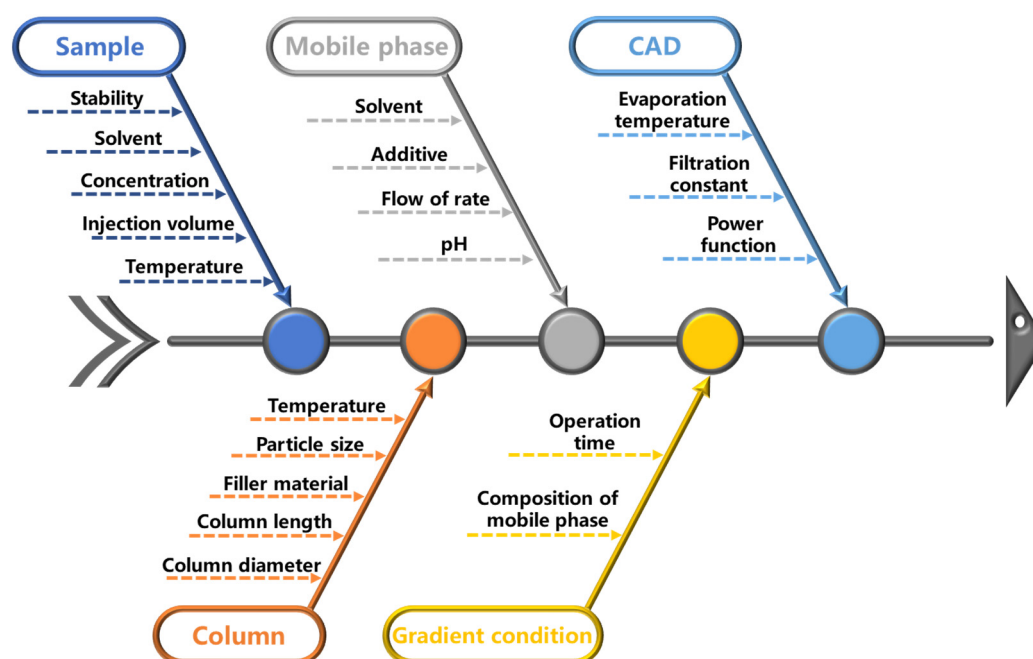


Figure S1. Fishbone diagram of potential critical method parameters.

Table S2. LC-Q-TOF-MS analysis of some sugar components of Xiaochaihu capsules.

Peak number	t _R (min)	Measured value (m/z)	Ion type	Chemical formula	ppm	Name	CAS	Remarks
2	12.889	151.0606	[M-H] ⁻	C ₅ H ₁₂ O ₅	-3.66	Ribitol	488-81-3	Common peak
3	14.194	179.0555	[M-H] ⁻	C ₆ H ₁₂ O ₆	-3.18	Fructose	7660-25-5	Common peak
5	17.020	179.0554	[M-H] ⁻	C ₆ H ₁₂ O ₆	-4.13	Glucose	50-99-7	Common peak
6	19.963	341.1085	[M-H] ⁻	C ₁₂ H ₂₂ O ₁₁	-1.65	Sucrose	57-50-1	Common peak
7	21.887	341.1079	[M-H] ⁻	C ₁₂ H ₂₂ O ₁₁	-3.18	Maltose	133-99-3	
8	24.011	503.1604	[M-H] ⁻	C ₁₈ H ₃₂ O ₁₆	-2.89	Raffinose	512-69-6	
9	26.870	665.2135	[M-H] ⁻	C ₂₄ H ₄₂ O ₂₁	-2.00	Stachyose	470-55-3	Common peak

Table S3. Fingerprint similarity evaluation results of 10 batches of Xiaochaihu capsule sample solution.

Sample number	Similarity	Sample number	Similarity
S1	0.942	S6	0.989
S2	0.996	S7	0.997
S3	0.997	S8	0.998
S4	0.993	S9	0.998
S5	0.930	S10	0.998

1. Method validation

1.1. Method validation of fingerprint

Injection precision was tested by consecutively analysing the same sample 6 times. Method repeatability was tested by preparing 6 parallel samples using the same procedure. For the

sample stability test, the samples were injected at 0, 4, 8, 12, 16, and 24 h. A reference peak was chosen. The results were expressed by the relative standard deviation (RSD) of the relative retention time and relative peak areas of each common peak with respect to the reference peaks.

1.2. Method validation of content determination

1.2.1. Linear investigation

A series of mixed standard solution with different concentration were injected for analysis. The peak area of each component was used as the vertical coordinate and the concentration was used as the horizontal coordinate to make the standard curve. The linear regression equation, analytical range, the limit of detection (LOD) and limit of quantification (LOQ) were calculated. Among them, the LOD was calculated as shown in Equation (S1), the LOQ was calculated as shown in Equation (S2).

$$LOD = \frac{3.3\sigma}{s} \text{ (S1)}$$

$$LOQ = \frac{10\sigma}{s} \text{ (S2)}$$

Where σ is the deviation of the response value, and s is the slope of the standard curve.

1.2.2. Injection precision

The experimental procedure referred to 1.1. The results were expressed by the RSD of the peak area and the retention time of each content determination component.

1.2.3. Method repeatability

The experimental procedure referred to 1.1. The results were expressed by the RSD of the content of each component.

1.2.4. Sample stability

The experimental procedure referred to 1.1. The results were expressed by the RSD of the content of each component.

1.2.5. Recovery

Recovery can represent the accuracy of the method. 9 sample solutions with known contents were divided into three groups. The concentration levels were set low, medium and high. Compared to the amount of the components in the sample solutions, the amount of the chemical reference substances added was about 0.8:1.0, 1.0:1.0 and 1.2:1.0, respectively. The

results were expressed by the average and RSD of each component recovery.

Table S4. The relative retention time of injection precision, method repeatability and sample stability.

Peak number	Method repeatability		Injection precision		Sample stability	
	Average	RSD (%)	Average	RSD (%)	Average	RSD (%)
1	0.84	0.08	0.84	0.05	0.84	0.13
2	0.92	0.04	0.92	0.07	0.92	0.07
3	1.00	0.00	1.00	0.00	1.00	0.00
4	1.15	0.05	1.15	0.08	1.15	0.07
5	1.26	0.08	1.26	0.05	1.26	0.13
6	1.52	0.06	1.52	0.09	1.52	0.17
9	2.06	0.04	2.06	0.09	2.06	0.19

Table S5. The relative peak areas of each common peak of injection precision, method repeatability and sample stability.

Peak number	Method repeatability		Injection precision		Sample stability	
	Average	RSD (%)	Average	RSD (%)	Average	RSD (%)
1	0.03	3.75	0.03	2.41	0.03	1.32
2	0.33	0.74	0.33	0.91	0.33	1.18
3	1.00	0.00	1.00	0.00	1.00	0.00
4	0.01	2.41	0.01	3.42	0.01	3.05
5	0.09	3.14	0.09	2.76	0.09	2.71
6	0.53	0.67	0.53	0.86	0.54	1.06
9	0.16	1.80	0.17	1.99	0.17	2.28

Table S6. The linear equation, coefficient of determination and analytical range of each component.

Name	Linear equation	R ²	analytical range (mg/mL)	LOD (mg/mL)	LOQ (mg/mL)
Ribitol	y = 179.59x	0.9999	0.06512~0.1172	0.002042	0.006805
Fructose	y = 150.22x	1	0.2189~0.3941	0.004787	0.015957
Sucrose	y = 120.84x	1	0.1636~0.2944	0.009466	0.031553
Stachyose	y = 87.067x	0.9999	0.06767~0.1218	0.004105	0.013684

Table S7. Injection precision of the peak area.

Name	1	2	3	4	5	6	Average	RSD (%)
Ribitol	16.550	16.613	16.339	16.424	16.408	16.384	16.453	0.642
Fructose	50.974	49.866	49.149	49.491	50.112	49.681	49.879	1.260
Sucrose	27.144	26.346	26.047	26.779	26.412	26.428	26.526	1.440
Stachyose	8.259	8.451	8.491	8.297	8.288	8.366	8.359	1.135

Table S8. Injection precision of retention time.

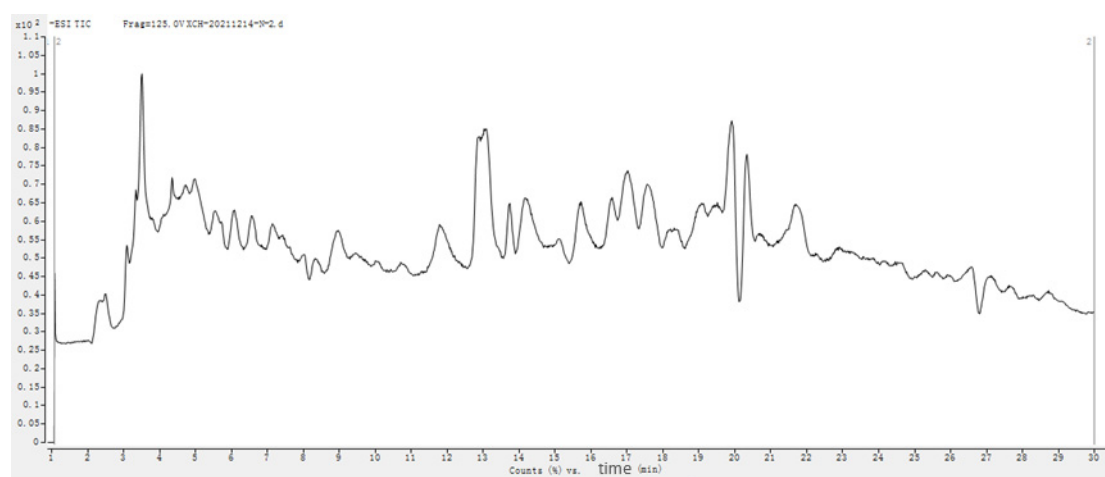
Name	1 (min)	2 (min)	3 (min)	4 (min)	5 (min)	6 (min)	Average (min)	RSD (%)
Ribitol	12.009	12.012	12.019	12.023	12.041	12.041	12.024	0.116
Fructose	12.987	13.001	13.018	13.021	13.020	13.020	13.011	0.108
Sucrose	19.721	19.723	19.729	19.725	19.731	19.726	19.726	0.019
Stachyose	26.766	26.771	26.772	26.773	26.776	26.779	26.773	0.017

Table S9. Method repeatability of content determination.

Name	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	Average (%)	RSD (%)
Ribitol	2.380	2.310	2.284	2.296	2.265	2.202	2.289	2.552
Fructose	8.572	8.326	8.294	8.230	8.143	8.072	8.273	2.108
Sucrose	5.616	5.541	5.489	5.459	5.474	5.329	5.485	1.737
Stachyose	2.380	2.412	2.320	2.319	2.385	2.304	2.353	1.886

Table S10. Sample stability of content determination.

Name	0h (%)	4h (%)	8h (%)	12h (%)	16h (%)	24h (%)	Average (%)	RSD (%)
Ribitol	2.403	2.380	2.440	2.395	2.443	2.402	2.411	0.025
Fructose	8.539	8.572	8.890	8.506	8.703	8.532	8.624	0.148
Sucrose	5.774	5.616	5.907	5.748	5.798	5.765	5.768	0.093
Stachyose	2.417	2.380	2.447	2.464	2.485	2.435	2.438	0.037

**Figure S2.** The total ion chromatogram of LC-Q-TOF-MS.