

**Reliability evaluation of traditional Chinese medicine fingerprints combined
with qualitative and quantitative analysis and antioxidant activity to
comprehensively evaluate the quality of Citri Reticulatae pericarpium**

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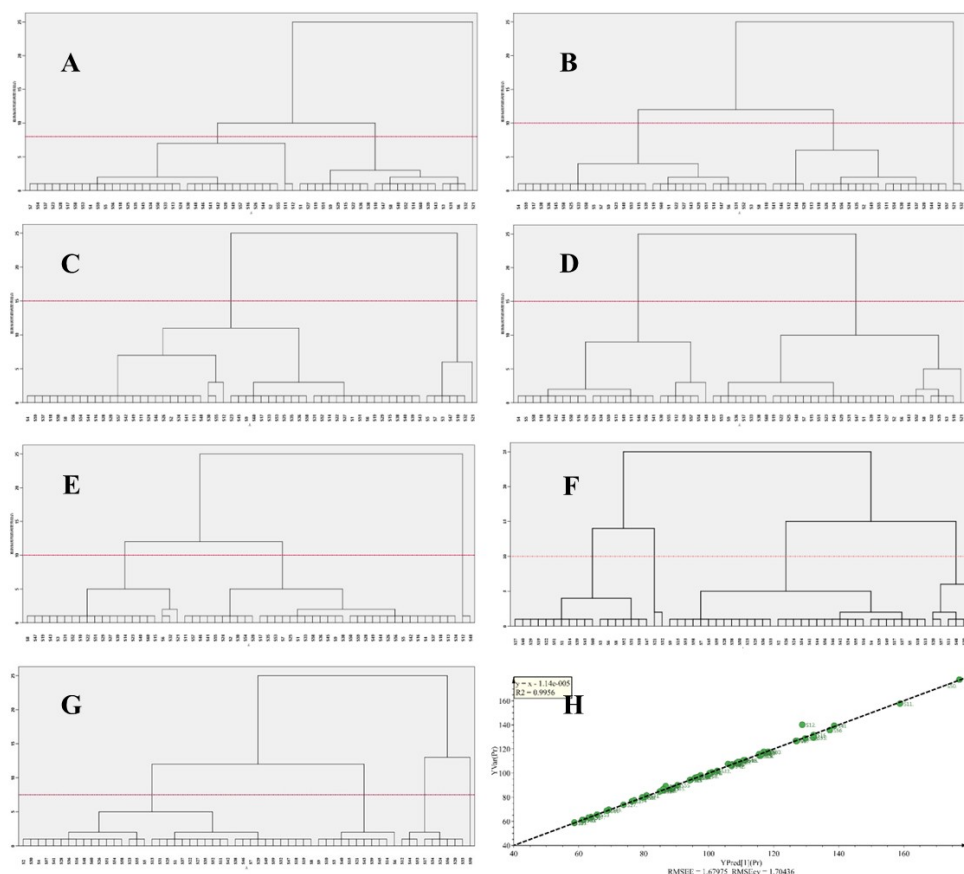


Fig.S1 Clustering chart of 230 nm wavelength pre-evaluation (A) clustering chart of 254 nm wavelength pre-evaluation (B) clustering chart of 283 nm wavelength pre-evaluation (C) clustering chart of 305 nm wavelength pre-evaluation (D) clustering chart of 327 nm wavelength pre-evaluation (E) clustering chart of CSF pre-evaluation (F) Clustering Chart of UV-SD pre-evaluation (G) Pr% and PA% correlation prediction chart (H)

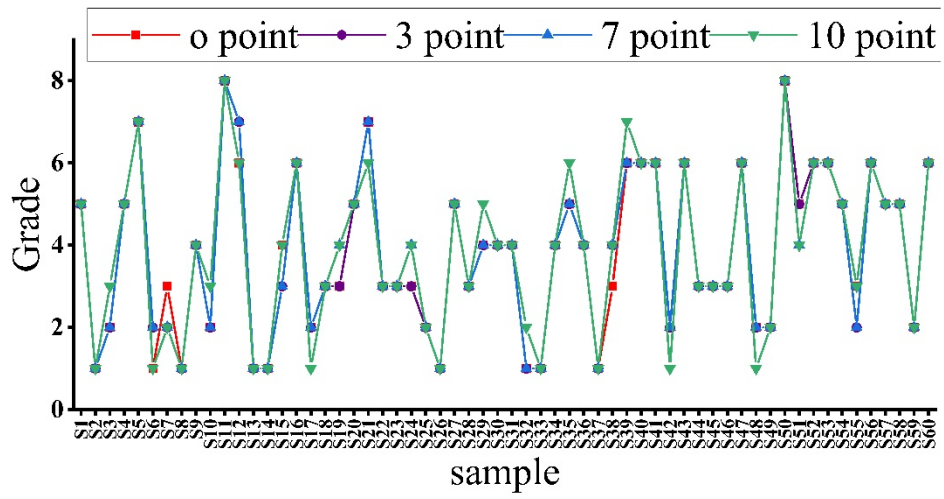


Fig.S2 Comparison of quality evaluation grades of different merging points of UV-QTFP

2 Supplementary Tables

Table S1 Quality evaluation scale and Reliability classification table

Quality evaluation scale								
Par.	I	II	III	IV	V	VI	VII	VIII
Sr	≥ 0.95	≥ 0.90	≥ 0.85	≥ 0.80	≥ 0.70	≥ 0.60	≥ 0.50	≤ 0.50
Pr	95~105	90~110	85~115	80~120	70~130	60~140	50~150	0~ ∞
α	≤ 0.05	≤ 0.10	≤ 0.15	≤ 0.20	≤ 0.30	≤ 0.40	≤ 0.50	> 0.50
Quality	best	better	good	fine	moderate	common	inferior	defective
Reliability classification table								
Par.	R1	R2	R3	R4	R5	R6	R7	R8
$U_i \leq$	0.05	0.1	0.15	0.2	0.3	0.4	0.5	$U_i > 0.50$
$R_i \geq$	0.95	0.9	0.85	0.8	0.7	0.6	0.5	$R_i < 0.50$
Result	extremely reliable	very reliable	reliable	more reliable	moderate	general	unreliable	very unreliable

Table S2 Five-wavelength evaluation results by EWRQFM

Para.	230nm			254nm			283nm			305nm			327nm			CSF		
	Sr	Pr%	α	Sr	Pr%	α	Sr	Pr%	α	Sr	Pr%	α	Sr	Pr%	α	Sr	Pr%	α
S1	0.969	75.4	0.031	0.992	91.9	0.008	0.992	91.9	0.008	0.979	93.8	0.021	0.979	80.3	0.021	0.973	81.4	0.027
S2	0.984	99.7	0.016	0.987	114.7	0.013	0.987	114.7	0.013	0.91	97.7	0.09	0.988	106.4	0.012	0.986	103.8	0.014
S3	0.953	63.2	0.047	0.982	76.1	0.018	0.982	76.1	0.018	0.96	75.5	0.04	0.971	64	0.029	0.963	66.4	0.037
S4	0.984	94.4	0.016	0.988	111.2	0.012	0.988	111.2	0.012	0.987	124.6	0.013	0.982	98.8	0.018	0.979	96	0.021
S5	0.973	93.8	0.027	0.977	103.5	0.023	0.977	103.5	0.023	0.985	124.8	0.015	0.976	100.9	0.024	0.974	98.4	0.026
S6	0.97	64.4	0.03	0.989	82.8	0.011	0.989	82.8	0.011	0.982	85.6	0.018	0.95	58	0.05	0.977	66.5	0.023
S7	0.967	88.1	0.033	0.972	103.8	0.028	0.972	103.8	0.028	0.971	101.7	0.029	0.975	81	0.025	0.973	91.2	0.027
S8	0.967	67.2	0.033	0.99	75.5	0.01	0.99	75.5	0.01	0.996	83	0.004	0.975	66.6	0.025	0.978	68.6	0.022
S9	0.972	79.8	0.028	0.987	100.4	0.013	0.987	100.4	0.013	0.986	109.9	0.014	0.975	87.5	0.025	0.974	85.6	0.026
S10	0.972	68.2	0.028	0.991	77.4	0.009	0.991	77.4	0.009	0.992	78.5	0.008	0.975	62.3	0.025	0.979	67.8	0.021
S11	0.979	115.8	0.021	0.968	131.7	0.032	0.968	131.7	0.032	0.982	140.8	0.018	0.974	110.6	0.026	0.974	117.3	0.026
S12	0.993	119.4	0.007	0.997	146.3	0.003	0.997	146.3	0.003	0.995	160.7	0.005	0.99	131.8	0.01	0.991	127	0.009
S13	0.991	97.9	0.009	0.988	122.9	0.012	0.988	122.9	0.012	0.993	135.2	0.007	0.994	96.2	0.006	0.994	100.7	0.006
S14	0.965	71.6	0.035	0.972	84.3	0.028	0.972	84.3	0.028	0.979	96.8	0.021	0.977	75.8	0.023	0.973	76.3	0.027
S15	0.97	80.3	0.03	0.983	101.3	0.017	0.983	101.3	0.017	0.983	102.8	0.017	0.971	78.5	0.029	0.977	85.3	0.023
S16	0.986	103.1	0.014	0.987	127.9	0.013	0.987	127.9	0.013	0.992	130.5	0.008	0.985	101.5	0.015	0.989	105.6	0.011
S17	0.974	86.4	0.026	0.984	108.3	0.016	0.984	108.3	0.016	0.982	111.8	0.018	0.976	82.9	0.024	0.979	93.6	0.021
S18	0.972	93.1	0.028	0.98	122.6	0.02	0.98	122.6	0.02	0.979	122.3	0.021	0.99	98	0.01	0.976	97.5	0.024
S19	0.961	76.6	0.039	0.982	88.8	0.018	0.982	88.8	0.018	0.988	100.8	0.012	0.975	65.7	0.025	0.978	80.2	0.022
S20	0.986	102.8	0.014	0.993	129.4	0.007	0.993	129.4	0.007	0.996	147.6	0.004	0.99	116.5	0.01	0.987	110.3	0.013
S21	0.904	46.5	0.096	0.968	54	0.032	0.968	54	0.032	0.978	61	0.022	0.965	44.6	0.035	0.937	50.6	0.063

S22	0.984	81	0.016	0.991	91.3	0.009	0.991	91.3	0.009	0.993	100.2	0.007	0.992	71.8	0.008	0.988	80	0.012
S23	0.965	87.6	0.035	0.987	100	0.013	0.987	100	0.013	0.988	104.1	0.012	0.982	75.9	0.018	0.981	88.7	0.019
S24	0.978	97.3	0.022	0.981	116.4	0.019	0.981	116.4	0.019	0.986	134.3	0.014	0.982	108.3	0.018	0.978	103.9	0.022
S25	0.975	92.9	0.025	0.991	106.9	0.009	0.991	106.9	0.009	0.984	102.3	0.016	0.978	81.5	0.022	0.98	88.6	0.02
S26	0.993	100.6	0.007	0.993	122.2	0.007	0.993	122.2	0.007	0.994	129.6	0.006	0.985	93.4	0.015	0.992	103.8	0.008
S27	0.973	75.2	0.027	0.996	92.8	0.004	0.996	92.8	0.004	0.993	96.7	0.007	0.986	70.8	0.014	0.982	79.1	0.018
S28	0.983	87	0.017	0.859	157.8	0.141	0.859	157.8	0.141	0.995	127.3	0.005	0.992	94.9	0.008	0.981	89.8	0.019
S29	0.981	79.8	0.019	0.984	92.9	0.016	0.984	92.9	0.016	0.981	91.3	0.019	0.972	72	0.028	0.976	79.1	0.024
S30	0.973	107.8	0.027	0.987	130.3	0.013	0.987	130.3	0.013	0.989	158.4	0.011	0.973	105.7	0.027	0.977	115.4	0.023
S31	0.933	63.1	0.067	0.966	79.4	0.034	0.966	79.4	0.034	0.986	91.3	0.014	0.98	64.1	0.02	0.968	69.5	0.032
S32	0.936	57.3	0.064	0.967	61.4	0.033	0.967	61.4	0.033	0.974	71.8	0.026	0.973	51.5	0.027	0.96	57.9	0.04
S33	0.972	95.1	0.028	0.975	106.7	0.025	0.975	106.7	0.025	0.975	111.7	0.025	0.968	84.6	0.032	0.967	87.7	0.033
S34	0.975	96.1	0.025	0.989	121.7	0.011	0.989	121.7	0.011	0.993	134.5	0.007	0.987	97	0.013	0.98	101.8	0.02
S35	0.978	92.4	0.022	0.967	116.9	0.033	0.967	116.9	0.033	0.974	72	0.026	0.99	82.7	0.01	0.98	95.7	0.02
S36	0.979	83.9	0.021	0.984	107.8	0.016	0.984	107.8	0.016	0.978	109.1	0.022	0.983	87.9	0.017	0.978	88.8	0.022
S37	0.946	87.8	0.054	0.979	127.9	0.021	0.979	127.9	0.021	0.974	117.4	0.026	0.967	98.5	0.033	0.885	94.4	0.115
S38	0.955	82.6	0.045	0.981	108	0.019	0.981	108	0.019	0.979	112.2	0.021	0.976	89.3	0.024	0.965	90	0.035
S39	0.981	69.9	0.019	0.992	97.4	0.008	0.992	97.4	0.008	0.994	94.3	0.006	0.991	70.9	0.009	0.989	75.5	0.011
S40	0.982	73.7	0.018	0.99	101.8	0.01	0.99	101.8	0.01	0.994	102.1	0.006	0.992	75.2	0.008	0.986	79	0.014
S41	0.935	101.3	0.065	0.97	145.2	0.03	0.97	145.2	0.03	0.96	143.7	0.04	0.962	107.1	0.038	0.939	104.3	0.061
S42	0.938	101.7	0.062	0.959	138.9	0.041	0.959	138.9	0.041	0.958	127.8	0.042	0.964	100.4	0.036	0.944	103	0.056
S43	0.959	70.1	0.041	0.977	92.9	0.023	0.977	92.9	0.023	0.973	85.3	0.027	0.959	68.7	0.041	0.96	76.9	0.04
S44	0.992	100.3	0.008	0.993	128.6	0.007	0.993	128.6	0.007	0.989	126.7	0.011	0.985	94.7	0.015	0.991	102.9	0.009
S45	0.94	91.9	0.06	0.971	108.7	0.029	0.971	108.7	0.029	0.96	106.4	0.04	0.919	87.7	0.081	0.929	91.3	0.071
S46	0.959	106.5	0.041	0.986	143.9	0.014	0.986	143.9	0.014	0.979	140.1	0.021	0.978	112	0.022	0.967	102.7	0.033

S47	0.967	68.4	0.033	0.982	85	0.018	0.982	85	0.018	0.975	90.2	0.025	0.974	66.6	0.026	0.973	72.5	0.027
S48	0.943	108	0.057	0.987	151	0.013	0.987	151	0.013	0.974	168.4	0.026	0.988	127.4	0.012	0.957	116.5	0.043
S49	0.978	102.9	0.022	0.982	114.5	0.018	0.982	114.5	0.018	0.981	132.4	0.019	0.975	94.7	0.025	0.974	96.1	0.026
S50	0.973	95.9	0.027	0.978	105.6	0.022	0.978	105.6	0.022	0.99	127.9	0.01	0.976	91.1	0.024	0.972	89.4	0.028
S51	0.958	78.1	0.042	0.97	94.3	0.03	0.97	94.3	0.03	0.971	103.4	0.029	0.968	71.6	0.032	0.957	79.7	0.043
S52	0.965	73.1	0.035	0.971	80.4	0.029	0.971	80.4	0.029	0.972	87.3	0.028	0.966	64.5	0.034	0.963	68.9	0.037
S53	0.955	86.2	0.045	0.965	102.1	0.035	0.965	102.1	0.035	0.952	117.3	0.048	0.948	83	0.052	0.946	86.4	0.054
S54	0.97	88.1	0.03	0.982	132	0.018	0.982	132	0.018	0.989	153.8	0.011	0.976	104.6	0.024	0.972	104	0.028
S55	0.964	99.1	0.036	0.955	115.2	0.045	0.955	115.2	0.045	0.975	157.3	0.025	0.962	107.3	0.038	0.953	102.2	0.047
S56	0.969	93.8	0.031	0.966	124.1	0.034	0.966	124.1	0.034	0.984	138.9	0.016	0.97	93.4	0.03	0.967	102.8	0.033
S57	0.988	102.6	0.012	0.993	135	0.007	0.993	135	0.007	0.994	150.7	0.006	0.986	110.9	0.014	0.989	109.7	0.011
S58	0.951	86.3	0.049	0.974	109.3	0.026	0.974	109.3	0.026	0.98	125.2	0.02	0.961	85.5	0.039	0.958	86.9	0.042
S59	0.982	94.5	0.018	0.982	111.1	0.018	0.982	111.1	0.018	0.987	133.7	0.013	0.972	91.7	0.028	0.975	92.5	0.025
S60	0.953	71.7	0.047	0.964	88	0.036	0.964	88	0.036	0.977	110.7	0.023	0.956	74.5	0.044	0.955	78.1	0.045
RFP	1	100	0	1	100	0	1	100	0	1	100	0	1	100	0	1	100	0

Table S3 Reliability evaluation of RFP and 33 batches of CRP

Reliability evaluation of RFP									
Para.	Ur	SRr	Up	PRp	Para.	Ur	SRr	Up	PRp
S9	0.073	0.927	0.076	0.924	S41	0.067	0.933	0.07	0.93
S15	0.064	0.936	0.067	0.933	S44	0.045	0.955	0.05	0.95
S53	0.162	0.838	0.163	0.837	S56	0.067	0.933	0.07	0.93
S58	0.108	0.892	0.11	0.89	S46	0.082	0.918	0.085	0.915
S7	0.053	0.947	0.057	0.943	S42	0.128	0.872	0.13	0.87
S45	0.107	0.893	0.109	0.891	S34	0.079	0.921	0.081	0.919
S59	0.041	0.959	0.046	0.954	S55	0.069	0.931	0.072	0.928
S28	0.012	0.988	0.024	0.976	S16	0.017	0.983	0.027	0.973
S38	0.155	0.845	0.157	0.843	S4	0.012	0.988	0.024	0.976
S50	0.047	0.953	0.051	0.949	S35	0.017	0.983	0.026	0.974
S23	0.02	0.98	0.029	0.971	S49	0.039	0.961	0.044	0.956
S25	0.086	0.914	0.088	0.912	S17	0.103	0.897	0.105	0.895
S26	0.02	0.98	0.028	0.972	S37	0.126	0.874	0.128	0.872
S36	0.046	0.954	0.051	0.949	S5	0.06	0.94	0.064	0.936
S33	0.027	0.973	0.034	0.966	S18	0.057	0.943	0.06	0.94
S2	0.05	0.95	0.054	0.946	S13	0.023	0.977	0.03	0.97
S24	0.045	0.955	0.049	0.951	RFP	0.011	0.989	0.023	0.977
S54	0.045	0.955	0.049	0.951					