

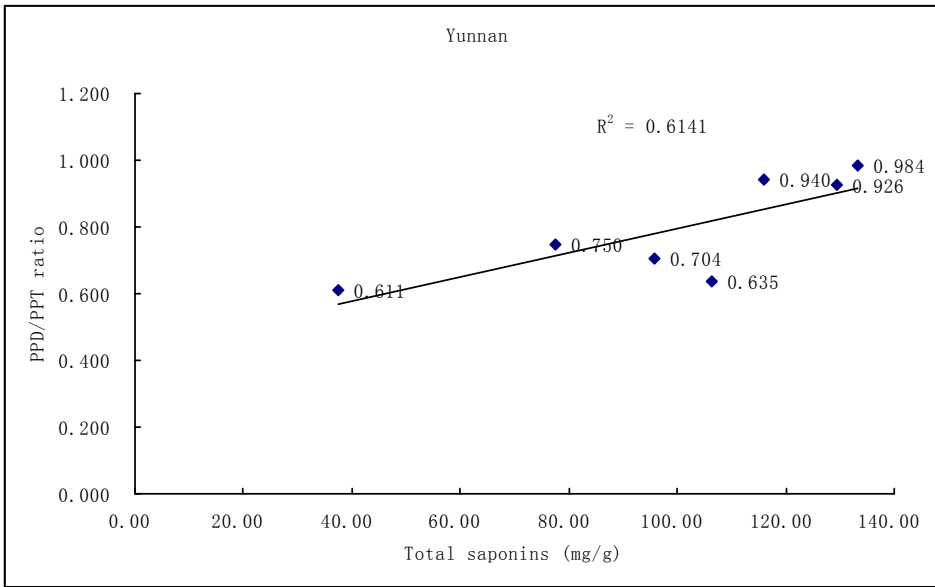


Fig. 1S. Linear correlation of PPD/PPT ratio versus total saponins in different sizes of main root of Yunnan notoginseng.

Table 1S. Method validation results of recovery and intra-day precision for each saponin

Saponin	spiked (mg)	Recovery (mean±S.D., %)	RSD (%)	Saponin	spiked (mg)	Recovery (mean±S.D., %)	RSD (%)
R ₁	3.22	93.3±1.5	1.6	F ₁	0.87	93.9±1.7	1.8
	1.38	102.6±3.0	2.9		0.37	93.4±2.2	2.3
	0.69	105.0±2.3	2.2		0.19	98.1±1.2	1.2
Rg ₁	10.67	93.2±1.5	1.6	Rd	1.85	93.1±2.6	2.8
	4.57	102.4±5.9	5.8		0.79	108.7±1.7	1.5
	2.29	112.9±3.3	2.9		0.40	99.9±4.4	4.4
Re	0.70	99.3±4.7	4.8	F ₂	1.11	104.1±2.2	2.1
	0.20	99.2±3.7	3.7		0.48	96.4±1.9	1.9
	0.10	96.5±6.5	6.8		0.24	93.0±5.2	5.6
Rf	0.88	101.1±2.6	2.6	20(S)-Rg ₃	0.57	103.4±1.9	1.9
	0.38	94.8±1.3	1.3		0.25	100.2±1.4	1.4
	0.19	92.0±2.1	2.3		0.12	106.1±3.5	3.3
Rb ₁	3.61	98.3±1.2	1.2	20(R)-Rg ₃	0.40	93.1±3.0	3.2
	2.07	94.2±0.8	0.8		0.17	100.4±2.9	2.9
	1.03	103.3±2.1	2.1		0.09	101.6±3.4	3.3
20(S)-Rg ₂	0.89	91.2±0.5	0.6	20(S)-PPT	0.80	103.6±0.3	0.3
	0.25	100.1±0.7	0.7		0.34	106.0±3.5	3.3

	0.13	101.3±5.3	5.2		0.17	90.5±0.5	0.6
20(S)-Rh ₁	1.90	104.1±3.0	2.9	CK	0.71	102.6±2.3	2.3
	0.81	98.8±2.6	2.7		0.30	99.0±2.8	2.8
	0.41	85.7±3.1	3.7		0.15	110.2±5.8	5.3
20(R)-Rg ₂	1.59	104.8±2.2	2.1	20(S)-Rh ₂	0.54	102.6±1.6	1.6
	0.68	96.3±1.4	1.5		0.23	98.9±1.4	1.4
	0.34	88.5±3.3	3.7		0.12	86.3±3.2	3.7
20(R)-Rh ₁	1.37	104.8±4.1	3.9	20(R)-Rh ₂	0.41	93.9±3.1	3.3
	0.59	105.9±2.8	2.7		0.18	111.3±2.8	2.5
	0.29	89.9±2.8	3.1		0.09	110.8±1.4	1.3
Rb ₂	1.06	95.8±3.0	3.1	20(S)-PPD	0.92	94.5±0.8	0.8
	0.45	98.7±2.3	2.3		0.39	102.0±1.5	1.4
	0.23	103.4±2.3	2.3		0.20	108.8±1.8	1.6
Rb ₃	1.05	101.6±2.2	2.1	20(R)-PPD	0.35	94.0±0.2	0.2
	0.45	100.2±1.3	1.3		0.20	97.3±0.6	0.6
	0.22	103.0±0.8	0.8		0.15	90.1±0.5	0.5

Table 2Sa. The CAD RFs of optical saponin isomers

Saponin	CAD RF	RF difference (%)
20(S)-Rg ₂	3.14	1.3
20(R)-Rg ₂	3.10	
20(S)-Rh ₁	3.18	1.3
20(R)-Rh ₁	3.14	
20(S)-Rg ₃	3.52	2.3
20(R)-Rg ₃	3.44	
20(S)-Rh ₂	3.97	1.0
20(R)-Rh ₂	4.01	
20(S)-PPD	3.63	0.6
20(R)-PPD	3.65	

Table 2Sb. The CAD RFs of PPD and PPT saponins with same glycosyl substitute

Saponin	Aglycon	R ₁	R ₂	CAD RF	RF difference (%)
20(S)-PPD	PPD	-H	-H	3.63	11
20(S)-PPT	PPT	-H	-H	3.28	
F ₂	PPD	-Glc	-Glc	2.92	14
Rg ₁	PPT	-Glc	-Glc	2.55	

20(S)-Rh ₂	PPD	-Glc	-H	4.01	26
20(S)-Rh ₁	PPT	-Glc	-H	3.18	
20(S)-Rg ₃	PPD	-Glc-Glc	-H	3.48	6
Rf	PPT	-Glc-Glc	-H	3.29	

* R₁ refers to the glycosyl substitute at C-3 for PPD saponins, or that at C-6 for PPT saponins.

** R₂ refers to the glycosyl substitute at C-20 for PPD and PPT saponins.

Table 2Sc. The CAD RFs of PPD saponins with different glycosyl substituent at C-3

Saponin	R ₁	R ₂	CAD RF	RF (%)	difference
20(S)-PPD	-H	-H	3.63	15	
20(S)-Rh ₂	-Glc	-H	3.97		
20(S)-Rg ₃	-Glc-Glc	-H	3.44		
CK	-H	-Glc	2.91	11	
F ₂	-Glc	-Glc	2.97		
Rd	-Glc-Glc	-Glc	2.68		

Table 2Sd. The CAD RFs of PPT saponins with different glycosyl substituent at C-6

Saponin	R ₁	R ₂	CAD RF	RF (%)	difference
20(S)-PPT	-H	-H	3.28	5	
20(S)-Rh ₁	-Glc	-H	3.18		
Rf	-Glc-Glc	-H	3.29		
20(S)-Rg ₂	-Glc-Rha	-H	3.14		
F ₁	-H	-Glc	3.02	18	
Rg ₁	-Glc	-Glc	2.55		
Rg ₁	-Glc	-Glc	2.55	7	
R ₁	-Glc-Xyl	-Glc	2.74		
Rg ₁	-Glc	-Glc	2.55	23	
Re	-Glc-Rha	-Glc	3.14		

Table 2Se. The CAD RFs of PPT saponins with different glycosyl substituent at C-20

Saponin	R ₁	R ₂	CAD RF	RF (%)	difference
20(S)-PPT	-H	-H	3.28	9	
F ₁	-H	-Glc	3.02		
20(S)-Rh ₁	-Glc	-H	3.18	25	
Rg ₁	-Glc	-Glc	2.55		

20(S)-Rg ₂	-Glc-Rha	-H	3.14	0
Re	-Glc-Rha	-Glc	3.14	

Table 2Sf. The CAD RFs of PPD saponins with different glycosyl substituent at C-20

Saponin	R ₁	R ₂	CAD RF	RF difference (%)
20(S)-PPD CK	-H	-H	3.63	25
	-H	-Glc	2.91	
20(S)-Rh ₂ F2	-Glc	-H	3.97	34
	-Glc	-Glc	2.97	
20(S)-Rg ₃ Rd	-Glc-Glc	-H	3.44	28
	-Glc-Glc	-Glu	2.68	
Rd Rb ₁	-Glc-Glc	-Glc	2.68	49
	-Glc-Glc	-Glc-Glc	1.80	
Rb ₁	-Glc-Glc	-Glc-Glc	1.80	72
Rb ₂	-Glc-Glc	-Glc-Ara	3.12	
Rb ₃	-Glc-Glc	-Glc-Xyl	3.07	

Table 3S. Determination results of saponins contents in raw notoginsengs (n=3)

Sample	Amount(mg/g)																		Rg ₁ +Rb ₁ +R ₁ vs. total saponins	PPD/PPT
	20-O-Glu Rf	R ₃	R ₁	Rg ₁	Re	Malonyl - Rg ₁	Yesanchi -noside D	R ₄	Fa	20(S)- R ₂	Rb ₁	20(S)- Rg ₂	20(S)- Rh ₁	F ₁	Rd	Gypeno -side XVII	Total saponin s	Rg ₁ +Rb ₁ +R ₁		
YN-20 ^a	ND ^d	0.557	11.089	22.304	5.111	2.554	0.318	0.583	0.915	1.038	25.766	0.490	0.365	0.533	4.589	1.401	77.61	59.16	0.762	0.750
YN-30	0.251	0.484	9.136	45.334	1.617	3.382	0.468	2.546	1.486	1.726	30.299	0.814	2.135	ND	6.436	0.537	106.40	84.77	0.797	0.635
YN-40	0.304	0.615	9.787	41.477	7.557	1.377	0.331	3.349	2.649	1.372	48.862	1.164	1.794	1.655	10.788	0.428	133.20	100.12	0.752	0.984
YN-60	ND	0.431	7.620	42.829	8.065	0.614	0.270	2.720	1.797	1.292	45.736	1.531	2.143	2.422	10.503	1.469	129.44	96.19	0.743	0.926
YN-80	0.309	1.086	16.934	29.094	6.933	2.059	0.339	3.240	2.032	1.946	41.906	0.819	0.594	ND	6.951	2.068	116.00	87.93	0.758	0.940
YN-120	0.356	0.427	8.283	38.451	4.463	1.585	0.454	1.255	1.579	0.957	31.337	0.644	0.992	ND	4.614	0.821	95.86	78.07	0.814	0.704
YN-ctless ^b	ND	0.123	2.723	16.071	2.069	1.149	0.290	0.169	0.378	0.327	11.305	0.258	0.189	ND	1.459	0.859	37.37	30.10	0.805	0.611
GX-30 ^c	ND	1.952	28.258	44.268	4.528	1.527	0.386	1.396	1.505	4.182	33.810	0.972	1.135	ND	6.980	0.987	131.89	106.34	0.806	0.512
GX-40	ND	0.562	12.245	47.129	7.343	2.598	0.911	2.009	2.627	1.744	51.886	1.464	1.230	ND	10.207	1.781	143.65	111.26	0.775	0.912
GX-60	ND	0.760	15.536	41.891	4.331	2.039	0.658	0.821	2.521	2.568	42.964	1.078	1.260	ND	7.021	2.417	125.85	100.39	0.798	0.795
GX-120	ND	0.466	11.188	40.857	3.900	2.236	0.697	1.481	1.947	1.935	38.791	0.987	1.429	ND	6.941	1.862	114.67	90.84	0.792	0.802
GX-ctless	ND	0.000	2.827	13.945	1.802	0.677	0.459	0.156	0.431	0.394	11.150	0.255	0.330	ND	1.384	2.432	36.24	27.92	0.770	0.752
Branch root	ND	0.579	10.461	32.300	4.945	2.371	0.247	1.417	2.376	1.413	32.228	0.970	0.707	ND	7.708	2.859	100.58	74.99	0.746	0.863
Rhizome	0.351	0.885	14.075	45.835	7.539	2.281	0.397	1.762	1.872	2.026	42.538	1.295	1.491	1.250	8.244	2.418	133.93	102.45	0.765	0.737
Root hair	ND	0.387	7.934	25.424	3.488	1.449	0.318	0.762	2.545	1.511	19.136	0.724	0.498	ND	2.995	0.666	67.83	52.49	0.774	0.626

^a YN-20: 20 head main root cultivated in Yunnan

^b ctless: countless

^c GX-30: 30 head main root cultivated in Guangxi

^d ND: not detected

Table 4Sa. Determination results of saponins contents in processed notoginsengs (n=3)

Sample	Amount(mg/g)										
	20- <i>O</i> -glu Rf	20(S)-25-OH Rh ₁	R ₃	20(R)-25-OH Rh ₁	R ₁	Rg ₁	Re	Malonyl Rg ₁	Yesanchi-noside D	20(S)-Rh ₁ ^a	20(R)-Rh ₁ ^a
Raw	0.356	ND ^b	0.427	ND	8.283	38.451	4.463	1.585	0.454	ND	ND
Steam 1hr	0.119	0.049	0.534	ND	10.570	30.069	5.147	0.073	0.170	0.240	0.038
Steam 2hr	0.120	0.043	0.354	ND	7.418	23.755	2.606	0.077	0.157	0.203	0.284
Steam 3hr	0.149	0.040	0.214	ND	5.311	33.601	2.132	0.101	0.246	0.125	0.049
Steam 4hr	0.167	0.063	0.262	ND	5.469	39.029	3.297	0.088	0.287	0.246	0.039
Bake 100°C 24hr	0.382	ND	0.415	ND	9.011	45.734	7.953	0.334	0.731	0.345	ND
Bake 100°C 48hr	ND	ND	0.833	ND	15.699	20.650	3.792	0.353	0.329	0.217	ND
Bake 100°C 72hr	0.235	ND	0.459	ND	8.875	34.030	5.328	0.097	0.787	0.412	0.239
Bake 120°C 24hr	ND	ND	ND	ND	2.307	20.124	1.628	ND	0.352	ND	ND
Bake 120°C 48hr	ND	ND	ND	ND	2.476	15.282	1.703	ND	0.490	ND	ND
Bake 120°C 72hr	ND	ND	ND	ND	3.021	17.196	1.232	ND	0.375	ND	ND
Autoclave 100°C 2hr	0.193	ND	0.265	ND	7.181	44.688	2.425	0.375	0.413	0.174	ND
Autoclave 100°C 4hr	0.140	ND	0.210	ND	5.761	34.026	2.470	0.216	0.246	0.080	ND
Autoclave 100°C 6hr	0.182	ND	0.421	ND	8.766	47.502	8.958	0.229	0.498	0.423	ND
Autoclave 100°C 8hr	0.153	ND	0.319	ND	6.981	39.394	4.598	0.155	0.434	0.227	ND
Autoclave 100°C 12hr	ND	0.089	ND	ND	1.039	10.195	0.807	0.350	0.068	ND	ND
Autoclave 100°C 18hr	ND	0.310	ND	0.205	0.383	5.922	0.712	0.277	0.157	0.195	ND
Autoclave 100°C 24hr	ND	0.390	ND	0.271	0.392	4.436	0.368	0.203	0.158	0.263	ND
Autoclave 100°C 36hr	ND	0.864	ND	0.798	ND	ND	0.039	ND	ND	0.633	0.171
Autoclave 100°C 48hr	ND	0.473	ND	0.377	ND	ND	0.039	ND	ND	0.281	ND
Autoclave 100°C 72hr	ND	1.329	ND	1.652	ND	ND	0.039	ND	ND	1.347	0.368
Autoclave 120°C 2hr	0.146	ND	0.625	ND	12.015	33.575	4.028	0.128	0.588	0.176	ND
Autoclave 120°C 4hr	ND	0.176	ND	0.186	2.063	10.290	1.357	0.185	0.163	0.119	ND
Autoclave 120°C 6hr	ND	0.217	ND	0.175	0.429	1.977	0.436	0.156	0.115	0.173	ND
Autoclave 120°C 8hr	ND	0.289	ND	0.227	ND	ND	0.039	ND	ND	0.297	0.077
Autoclave 120°C 12hr	ND	0.422	ND	0.544	ND	ND	0.040	ND	ND	0.668	0.193
Autoclave 120°C 18hr	ND	0.374	ND	0.678	ND	ND	0.040	ND	ND	0.894	0.227
Autoclave 120°C 24hr	ND	0.519	ND	0.965	ND	ND	0.039	ND	0.257	1.428	0.362
Autoclave 120°C 36hr	ND	0.543	ND	1.243	ND	ND	0.039	ND	ND	2.022	0.550
Autoclave 120°C 48hr	ND	0.798	ND	1.688	ND	ND	0.039	ND	ND	3.215	0.924
Autoclave 120°C 72hr	ND	0.940	ND	1.936	ND	ND	0.039	ND	ND	3.875	1.122
Fried	0.169	0.032	0.621	ND	12.737	31.757	3.967	0.233	0.203	0.474	ND
Stewed	0.183	0.040	0.211	ND	4.920	26.762	2.465	0.133	0.167	0.103	0.259

^a The glycosyl substituents of these two saponins are proposed to be mannose

^b ND: not detected

Table 4Sb. Determination results of saponins contents in processed notoginsengs (n=3)(continued)

Sample	Amount(mg/g)										
	R ₄	Fa	20(S)- R ₂	Rb ₁	20(S)-Rg ₂	20(S)-Rh ₁	20(R)-Rg ₂	20(R)-Rh ₁	25-OH Rg ₃	F ₁	Rd
Raw	1.255	1.579	0.957	31.337	0.644	0.992	ND	ND	ND	ND	4.614
Steam 1hr	1.706	1.825	1.951	34.580	1.151	1.372	ND	0.164	0.039	0.124	6.591
Steam 2hr	1.218	2.000	1.471	31.327	0.693	1.479	ND	0.270	0.036	0.082	4.325
Steam 3hr	1.011	1.614	1.219	32.073	0.665	3.211	0.024	1.059	0.041	0.114	5.607
Steam 4hr	1.253	2.350	1.409	33.734	1.035	3.563	0.044	1.240	0.106	0.163	5.840
Bake 100℃ 24hr	3.417	2.491	1.252	43.561	1.406	2.077	ND	ND	ND	0.045	7.105
Bake 100℃ 48hr	1.447	2.703	2.303	48.126	0.619	1.001	ND	ND	ND	0.045	11.233
Bake 100℃ 72hr	4.278	2.536	1.955	47.519	1.151	3.326	ND	ND	ND	0.046	6.606
Bake 120℃ 24hr	1.095	0.507	1.080	16.384	0.842	3.837	ND	ND	ND	0.097	2.678
Bake 120℃ 48hr	0.649	1.170	1.903	14.714	1.315	5.686	ND	0.504	ND	0.077	1.912
Bake 120℃ 72hr	0.637	0.876	1.237	12.789	0.564	4.079	ND	0.290	ND	0.088	1.391
Autoclave 100℃ 2hr	1.230	1.632	1.121	29.745	0.468	1.707	0.010	0.116	ND	0.084	4.278
Autoclave 100℃ 4hr	1.206	0.889	1.276	25.291	0.580	2.998	3.163	0.523	ND	0.124	4.373
Autoclave 100℃ 6hr	2.369	3.261	1.715	39.026	2.021	4.322	0.091	1.427	ND	0.093	7.477
Autoclave 100℃ 8hr	1.209	2.131	1.455	34.778	1.233	3.864	0.074	1.194	ND	0.117	8.149
Autoclave 100℃ 12hr	0.593	0.915	1.259	25.417	1.151	5.065	0.172	2.372	ND	0.083	4.240
Autoclave 100℃ 18hr	0.390	0.446	1.946	22.090	2.511	10.182	0.591	5.791	0.095	0.073	3.619
Autoclave 100℃ 24hr	0.537	0.649	2.383	15.271	2.105	10.861	0.438	6.301	ND	0.075	3.733
Autoclave 100℃ 36hr	ND	ND	3.051	0.772	3.485	12.917	1.209	9.340	0.238	0.111	1.339
Autoclave 100℃ 48hr	ND	ND	4.754	2.013	3.876	7.779	0.736	5.364	0.134	0.083	1.385
Autoclave 100℃ 72hr	ND	ND	3.443	ND	3.589	9.978	1.177	9.499	0.326	0.262	0.338
Autoclave 120℃ 2hr	1.174	2.202	2.968	32.543	1.518	4.173	0.095	1.611	ND	0.237	5.595
Autoclave 120℃ 4hr	0.201	0.876	3.028	14.398	2.514	8.572	0.452	4.404	ND	0.138	3.632
Autoclave 120℃ 6hr	0.289	0.509	2.206	9.769	2.622	8.058	0.671	4.631	ND	0.086	2.313
Autoclave 120℃ 8hr	ND	ND	1.982	ND	2.162	7.508	0.653	4.854	ND	0.083	0.733
Autoclave 120℃ 12hr	ND	ND	1.074	ND	1.171	7.596	0.469	6.599	ND	0.132	0.092
Autoclave 120℃ 18hr	ND	ND	0.525	ND	0.966	4.931	0.647	5.029	ND	0.168	ND
Autoclave 120℃ 24hr	ND	ND	0.720	ND	1.074	3.432	0.283	5.197	ND	0.262	ND
Autoclave 120℃ 36hr	ND	ND	0.246	ND	0.241	2.330	0.340	4.623	0.430	0.432	ND
Autoclave 120℃ 48hr	ND	ND	ND	ND	0.084	2.328	0.277	5.097	0.674	0.853	ND
Autoclave 120℃ 72hr	ND	ND	ND	ND	ND	1.699	0.272	4.087	0.651	1.230	ND
Fried	2.563	3.509	1.831	43.807	0.641	1.061	ND	0.007	0.611	0.075	7.240
Stewed	0.868	1.080	0.680	24.090	0.444	1.047	ND	0.173	0.018	0.100	3.132

Table 4Sc. Determination results of saponins contents in processed notoginsengs (n=3)(continued)

Sample	Amount(mg/g)										
	Gypenoside XVII	Gypenoside LXXV	Gypenoside LXXV isomer	T ₅	U	T ₅ isomer	F ₄	Rk ₃	Rh ₄	20(S)-Rg ₃	20(R)-Rg ₃
Raw	0.821	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Steam 1hr	1.494	0.094	0.029	0.070	0.034	0.064	0.048	0.333	0.471	0.311	0.137
Steam 2hr	0.966	0.114	0.020	0.101	0.044	0.127	0.056	0.411	0.570	0.431	0.207
Steam 3hr	0.681	0.176	0.022	0.152	0.075	0.253	0.083	1.200	1.619	0.855	0.452
Steam 4hr	0.943	0.172	0.017	0.170	0.086	0.201	0.114	1.267	1.693	0.867	0.558
Bake 100℃ 24hr	1.154	0.489	0.105	0.070	0.102	0.203	ND	0.652	0.873	0.483	0.714
Bake 100℃ 48hr	0.726	0.193	0.345	0.373	0.640	0.101	ND	0.508	0.658	0.999	0.403
Bake 100℃ 72hr	0.447	0.734	ND	0.530	0.870	0.500	0.500	1.936	2.670	2.209	0.515
Bake 120℃ 24hr	0.386	0.591	ND	0.333	0.381	0.555	0.495	2.544	3.332	1.471	0.381
Bake 120℃ 48hr	0.491	1.513	0.232	1.052	0.730	1.739	0.996	5.793	8.446	3.187	0.690
Bake 120℃ 72hr	0.868	0.668	ND	0.585	0.306	0.921	0.370	3.796	5.243	1.605	0.324
Autoclave 100℃ 2hr	0.421	0.284	ND	ND	ND	ND	ND	0.324	0.455	0.178	0.086
Autoclave 100℃ 4hr	0.258	0.170	ND	0.184	0.056	0.268	0.066	1.285	1.701	0.597	0.164
Autoclave 100℃ 6hr	0.428	0.323	ND	0.259	0.228	0.443	0.297	1.643	2.112	0.888	0.419
Autoclave 100℃ 8hr	0.613	0.292	ND	0.373	0.238	0.621	0.289	2.114	2.658	1.282	0.550
Autoclave 100℃ 12hr	0.995	0.144	0.134	0.337	0.236	0.616	0.346	2.620	3.329	3.861	2.525
Autoclave 100℃ 18hr	0.396	0.618	0.253	0.596	0.657	0.945	0.886	5.207	6.585	5.259	4.086
Autoclave 100℃ 24hr	0.809	0.753	0.310	0.820	0.523	1.403	0.719	6.076	7.372	5.720	4.269
Autoclave 100℃ 36hr	ND	0.765	0.572	1.283	0.950	1.894	1.328	7.159	8.926	7.394	6.343
Autoclave 100℃ 48hr	0.157	0.297	0.521	2.076	0.565	3.046	0.852	4.308	5.368	5.125	4.138
Autoclave 100℃ 72hr	ND	0.386	0.922	1.814	0.821	2.852	1.243	7.060	9.514	8.831	7.313
Autoclave 120℃ 2hr	1.264	0.438	0.123	0.949	0.254	1.339	0.340	2.501	2.930	1.717	0.857
Autoclave 120℃ 4hr	0.331	0.481	0.251	1.351	0.679	1.777	0.850	5.591	6.516	4.280	3.078
Autoclave 120℃ 6hr	0.408	0.542	0.291	1.199	1.062	1.609	1.365	5.853	6.783	5.191	4.155
Autoclave 120℃ 8hr	ND	0.546	0.498	1.363	0.949	1.806	1.238	6.260	7.113	7.256	5.604
Autoclave 120℃ 12hr	ND	0.560	0.611	0.776	0.509	1.072	0.697	6.648	8.254	7.722	5.889
Autoclave 120℃ 18hr	0.174	0.344	0.698	0.492	0.717	0.785	1.101	5.414	7.591	5.031	4.253
Autoclave 120℃ 24hr	ND	ND	1.103	0.199	1.247	2.172	0.490	5.115	8.181	4.603	4.424
Autoclave 120℃ 36hr	ND	ND	1.662	0.432	0.247	0.705	0.378	4.748	8.218	5.646	5.304
Autoclave 120℃ 48hr	ND	ND	2.623	0.804	0.181	0.641	0.197	6.116	12.153	5.265	6.432
Autoclave 120℃ 72hr	ND	ND	2.635	1.145	0.230	0.560	ND	4.830	10.085	3.406	5.685
Fried	0.811	0.083	0.031	0.041	0.020	0.041	0.023	0.161	0.220	0.168	0.081
Stewed	0.516	0.091	0.018	0.022	0.009	0.021	0.018	0.126	0.196	0.228	0.089

Table 4Sd. Determination results of saponins contents in processed notoginsengs (n=3)(continued)

Sample	Amount(mg/g)							
	Unknown 1 ^c	Unknown 2 ^d	RK ₁	Rg ₅	20(S)-Rh ₂	20(R)-Rh ₂	Rk ₂	Rh ₃
Raw	ND	ND	ND	ND	ND	ND	ND	ND
Steam 1hr	ND	ND	0.182	0.241	0.033	ND	0.021	ND
Steam 2hr	0.007	ND	0.256	0.333	0.029	0.037	0.022	ND
Steam 3hr	0.022	0.013	0.548	0.658	0.030	0.038	0.018	0.029
Steam 4hr	0.025	0.008	0.521	0.620	0.030	0.038	0.022	0.031
Bake 100℃ 24hr	ND	ND	0.464	0.563	0.028	0.109	ND	ND
Bake 100℃ 48hr	ND	ND	0.990	1.221	0.028	0.105	ND	ND
Bake 100℃ 72hr	ND	ND	2.509	3.160	0.050	0.135	ND	ND
Bake 120℃ 24hr	ND	ND	1.865	2.234	0.028	0.036	ND	ND
Bake 120℃ 48hr	ND	ND	4.707	6.109	0.028	0.036	ND	0.167
Bake 120℃ 72hr	ND	ND	2.221	2.835	0.167	0.082	ND	0.187
Autoclave 100℃ 2hr	ND	ND	0.123	0.149	0.028	0.090	ND	ND
Autoclave 100℃ 4hr	ND	ND	0.520	0.603	0.028	0.067	ND	ND
Autoclave 100℃ 6hr	ND	ND	0.655	0.748	0.028	0.106	ND	ND
Autoclave 100℃ 8hr	ND	ND	1.099	1.231	0.028	0.096	ND	ND
Autoclave 100℃ 12hr	ND	ND	2.850	3.285	0.106	0.119	0.058	0.068
Autoclave 100℃ 18hr	0.140	0.059	3.801	4.200	0.072	0.117	0.032	0.044
Autoclave 100℃ 24hr	0.182	0.087	4.163	4.655	0.445	0.326	0.283	0.329
Autoclave 100℃ 36hr	0.492	0.218	4.930	5.303	0.272	0.248	0.138	0.144
Autoclave 100℃ 48hr	0.217	0.079	3.206	3.638	0.203	0.215	0.097	0.119
Autoclave 100℃ 72hr	0.662	0.385	5.686	5.869	0.249	0.245	0.113	0.104
Autoclave 120℃ 2hr	0.049	0.027	1.500	1.597	0.049	0.114	ND	ND
Autoclave 120℃ 4hr	0.171	0.080	3.802	4.023	0.081	0.097	ND	ND
Autoclave 120℃ 6hr	0.251	0.128	4.635	4.862	0.146	0.149	0.095	0.093
Autoclave 120℃ 8hr	0.387	0.247	6.665	6.811	0.254	0.194	0.156	0.178
Autoclave 120℃ 12hr	0.478	0.281	6.276	6.205	0.405	0.283	0.106	0.234
Autoclave 120℃ 18hr	0.357	0.241	4.596	5.088	0.474	0.355	0.339	0.362
Autoclave 120℃ 24hr	0.462	0.383	4.380	5.159	0.304	0.278	0.217	0.248
Autoclave 120℃ 36hr	0.498	0.503	5.677	6.698	0.605	0.498	0.491	0.555
Autoclave 120℃ 48hr	0.682	0.802	6.724	9.282	0.655	0.665	0.700	0.964
Autoclave 120℃ 72hr	0.723	0.939	4.747	6.720	0.566	0.733	0.672	0.927
Fried	ND	ND	0.107	0.130	0.029	0.037	0.018	0.031
Stewed	ND	ND	0.048	0.066	0.027	0.034	ND	0.013

^{c,d} a pair of PPT type saponin isomers, which refer to the compounds of No. 34 and 35 in Table 2b

Table 4Se. Determination results of saponins contents in processed notoginsengs (n=3)(continued)

Sample	Amount(mg/g)			Secondary vs. Original(%)	PPD/PPT
	R ₁ +R _{g1} +R _{b1}	Total Saponins	Original saponins		
Raw	78.07	96.22	96.22	0	0.70
Steam 1hr	75.22	100.07	97.48	2.59	0.90
Steam 2hr	62.50	81.64	78.05	3.60	1.02
Steam 3hr	70.99	95.53	87.95	7.58	0.85
Steam 4hr	78.23	107.05	98.89	8.16	0.79
Bake 100℃ 24hr	98.31	132.27	127.07	5.20	0.85
Bake 100℃ 48hr	84.48	116.64	109.86	6.78	1.42
Bake 100℃ 72hr	90.42	134.64	117.67	16.97	1.11
Bake 120℃ 24hr	38.81	65.56	51.32	14.25	0.73
Bake 120℃ 48hr	32.47	83.80	47.87	35.93	0.74
Bake 120℃ 72hr	33.01	63.95	44.35	19.60	0.63
Autoclave 100℃ 2hr	81.61	98.24	96.23	2.02	0.64
Autoclave 100℃ 4hr	65.08	89.54	80.06	9.47	0.62
Autoclave 100℃ 6hr	95.29	137.36	127.27	10.09	0.68
Autoclave 100℃ 8hr	81.15	117.95	105.58	12.36	0.77
Autoclave 100℃ 12hr	36.65	75.44	52.18	23.27	1.50
Autoclave 100℃ 18hr	28.40	89.83	49.10	40.73	1.03
Autoclave 100℃ 24hr	20.10	88.08	41.98	46.10	0.92
Autoclave 100℃ 36hr	0.77	83.25	21.68	61.58	0.52
Autoclave 100℃ 48hr	2.01	61.46	20.05	41.42	0.53
Autoclave 100℃ 72hr	ND	87.37	17.65	69.72	0.53
Autoclave 120℃ 2hr	78.13	119.44	102.78	16.67	0.70
Autoclave 120℃ 4hr	26.75	86.20	47.75	38.45	0.70
Autoclave 120℃ 6hr	12.17	73.64	29.37	44.27	0.83
Autoclave 120℃ 8hr	ND	66.39	12.47	53.92	0.77
Autoclave 120℃ 12hr	ND	65.97	10.06	55.90	0.76
Autoclave 120℃ 18hr	ND	52.85	6.76	46.09	0.70
Autoclave 120℃ 24hr	ND	53.46	5.74	47.72	0.63
Autoclave 120℃ 36hr	ND	55.80	3.25	52.55	0.97
Autoclave 120℃ 48hr	ND	70.72	3.26	67.46	0.92
Autoclave 120℃ 72hr	ND	60.32	2.93	57.39	0.79
Fried	88.30	113.48	111.22	2.25	1.09
Stewed	55.77	68.39	66.80	1.59	0.80