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Supplementary material

The Influence of SPI 7S and 11S on the Stability of *Lonicera caerulea* L. Anthocyanins and Interaction Mechanism with C3G

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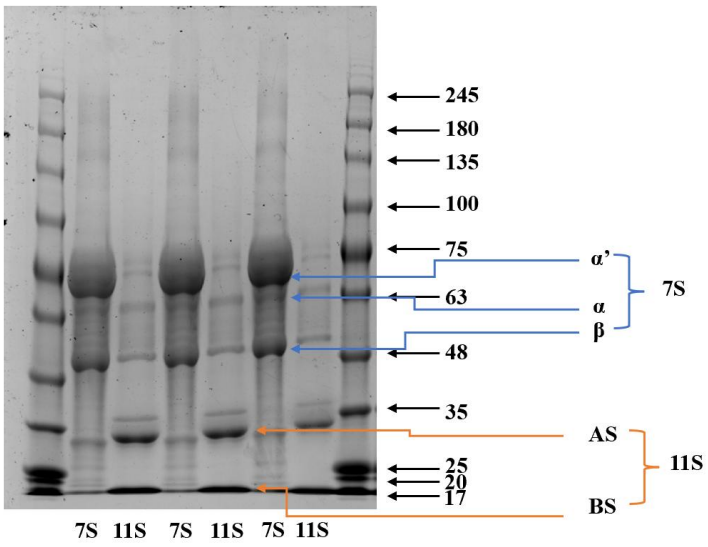


Figure S1: SDS-PAGE of 7S and 11S

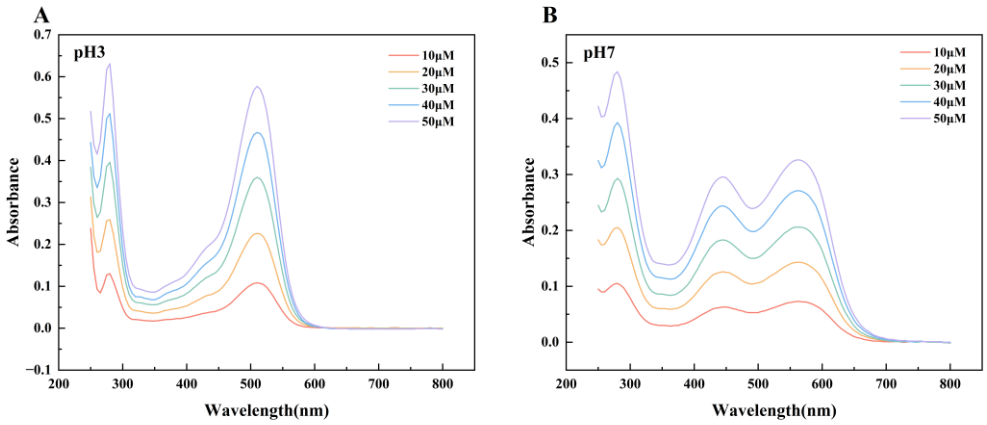


Figure S2: UV absorption spectra of C3G at different pH values.

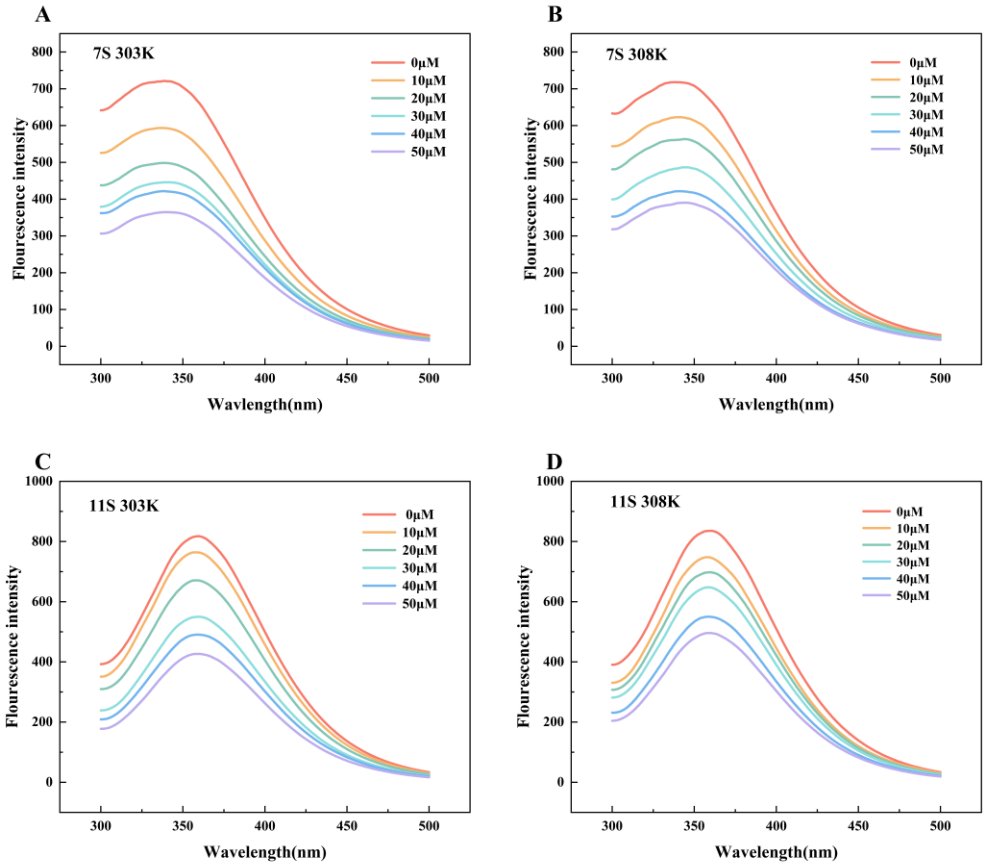


Figure S3: The fluorescence spectra of SPI7S (A, B) and 11S (C, D) at different concentrations of C3G in pH3 at 303K and 308.

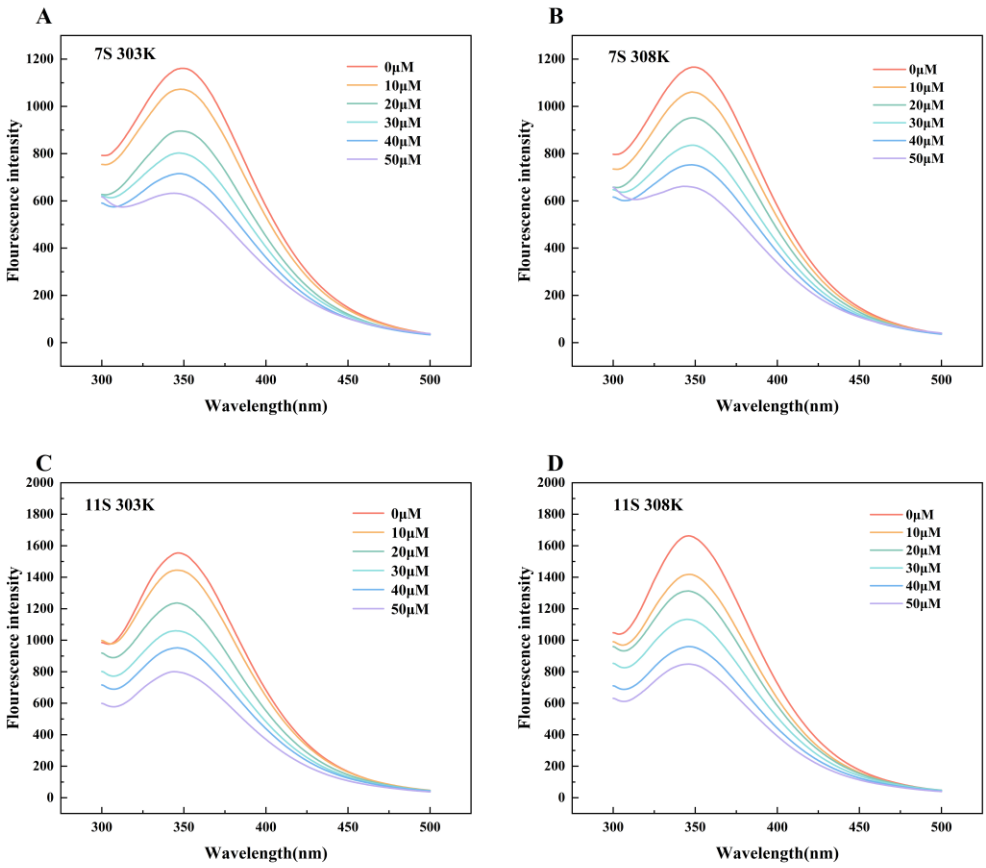


Figure S4: The fluorescence spectra of SPI7S (A, B) and 11S (C, D) at different concentrations of C3G in pH7 at 303K and 308K.

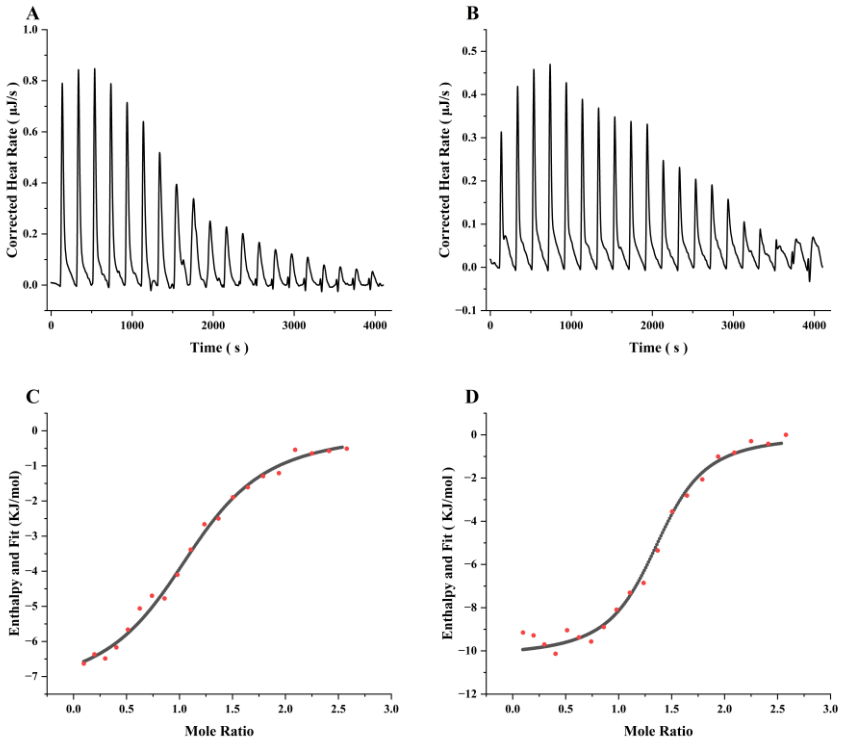


Figure S5: Combined heat flux-time curves for C3G-7S (A) and C3G-11S (B). Enthalpy-concentration curves and isotherms for C3G-7S (C) and C3G-11S (D)

Table S1: At pH 7, retention rate of anthocyanins after heating

Time (h)	sample	0.1mg/ml	0.2mg/ml	0.5mg/ml	1.0mg/ml
1	7S	32.8±0.8%	35.6±0.7%	41.7±1.7%	38.4±1.4%
	11S	30.9±0.5%	32.7±1.4%	38.7±1.4%	33.8±1.8%
2	7S	19.5±1.8%	22.7±1.6%	25.2±1.1%	25.1±1.7%
	11S	20.1±0.4%	21.7±0.4%	24.6±2.1%	22.1±1.6%
3	7S	12.9±0.7%	13.2±1.6%	14.7±0.5%	16.7±0.9%
	11S	10.7±1.4%	14.0±0.8%	15.4±1.4%	15.4±0.8%
4	7S	7.1±0.6%	7.2±0.3%	7.5±0.5%	7.4±0.6%
	11S	6.7±0.2%	7.4±0.5%	8.1±0.7%	7.2±0.6%

Table S2: At pH 3, retention rate of anthocyanins after heating

Time (h)	sample	0.1mg/ml	0.2mg/ml	0.5mg/ml	1.0mg/ml
1	7S	92.8±2.9%	91.9±3.3%	90.4±0.9%	91.3±1.3%
	11S	90.3±1.3%	93.1±3.4%	94.5±2.4%	95.1±2.3%
2	7S	77.9±3.1%	81.6±0.9%	77.7±2.3%	85.5±4.5%
	11S	78.7±2.9%	80.4±2.7%	79.9±2.8%	85.9±0.5%
3	7S	64.2±3.5%	72.2±3.2%	68.9±0.4%	73.8±4.5%
	11S	67.2±3.6%	67.9±1.8%	71.9±3.1%	73.3±3.5%
4	7S	51.1±1.1%	59.1±2.8%	61.3±1.3%	62.3±3.2%
	11S	53.8±3.6%	60.1±2.7%	61.0±3.1%	64.7±3.7%

Table S3: At pH 7, anthocyanins retention rate after light exposure

Time (d)	sample	0.1mg/ml	0.2mg/ml	0.5mg/ml	1.0mg/ml
1	7S	88.0±2.3%	88.5±0.8%	91.5±1.7%	90.8±1.8%
	11S	89.3±0.9%	92.1±0.9%	89.8±1.4%	90.8±1.7%
2	7S	82.4±0.9%	83.8±2.4%	85.2±0.6%	85.6±0.8
	11S	79.8±1.5%	82.2±1.4%	84.5±1.8%	87.2±0.6%
3	7S	74.2±1.5%	69.6±0.5%	69.3±0.6%	74.3±1.2%
	11S	72.4±2.6%	74.1±1.4%	71.2±1.8%	74.6±2.1%
4	7S	53.6±1.8%	55.6±2.1%	61.3±2.3%	59.9±1.9%
	11S	62.3±2.5%	62.5±2.1%	56.3±1.9%	60.5±0.3%

Table S4: At pH 3, anthocyanins retention rate after light exposure

Time (d)	sample	0.1mg/ml	0.2mg/ml	0.5mg/ml	1.0mg/ml
1	7S	89.5±1.3%	84.1±1.2%	85.1±1.6%	86.0±0.7%
	11S	89.2±1.7%	92.4±4.1%	91.5±3.3%	89.5±3.9%
2	7S	85.9±0.3%	83.8±1.6%	82.9±2.0%	84.5±0.5%
	11S	86.6±2.6%	85.4±0.8%	80.4±1.6%	83.8±0.5%
3	7S	77.4±2.0%	78.3±0.6%	75.6±0.5%	79.3±2.1%
	11S	76.5±3.5%	77.1±2.4%	74.7±3.7%	77.5±1.4%
4	7S	64.4±0.7%	64.7±0.5%	66.7±2.0%	68.9±1.9%
	11S	65.3±1.3%	65.9±0.7%	67.2±1.0%	69.9±0.8%

Table S5: At pH3, the content of the secondary structure on FT-IR.

Samples	α-Helix (%)	β-Sheet (%)	β-Turn (%)	Random Coil (%)
7S	16.61	33.29	33.21	16.89
7S-C3G$_{0.2}$	16.82	32.66	33.45	17.07
7S-C3G$_{0.5}$	17.18	31.65	33.92	17.25
7S-C3G$_{1.0}$	19.29	27.95	35.44	17.32
11S	14.49	27.45	28.58	29.49
11S-C3G$_{0.2}$	22.21	26.44	29.20	22.15
11S-C3G$_{0.5}$	30.43	24.77	29.02	15.78
11S-C3G$_{1.0}$	17.63	31.03	34.05	17.29

Table S6: At pH 7, the content of the secondary structure on FT-IR

Samples	α-Helix (%)	β-Sheet (%)	β-Turn (%)	Random Coil (%)
7S	30.78	23.88	29.64	15.70
7S-C3G$_{0.2}$	32.45	20.84	31.56	15.15
7S-C3G$_{0.5}$	32.18	20.89	31.92	15.01
7S-C3G$_{1.0}$	16.25	21.45	30.42	31.88
11S	15,35	33.42	34.05	17.18
11S-C3G$_{0.2}$	16.54	29.37	36.44	17.65
11S-C3G$_{0.5}$	17.48	28.91	36.16	17.45
11S-C3G$_{1.0}$	16.01	20.42	48.57	15.00

Table S7 Binding energies of 7S and 11S to C3G at pH 3 and pH 7.

Sample	Affinity (kcal/mol)
pH 3 7S-C3G	-7.4
pH 3 11S-C3G	-7.9
pH 7 7S-C3G	-7.6
pH 7 11S-C3G	-7.4

Table S8: ITC-derived thermodynamic parameters.

Sample	Model	K_d (M)	n	ΔH(kJ/mol)	ΔS(J/mol·K)	ΔG(kJ/mol)
C3G-7S	Independent	3.40×10^{-5}	1.205	-7.258	61.22	-25.502
C3G-11S	Independent	9.52×10^{-6}	1.358	-10.19	61.94	-28.648