Supporting Information

***Rec. Nat. Prod*. 13:1 (2019) 1-9**

Phytochemical Changes in Aerial Parts of *Hypericum perforatum* at Different Harvest Stages

Ping Sun, Tianlan Kang[2], Hua Xing[1], Zhen Zhang[1], Delong Yang[1], Jinlin Zhang[1,3], Paul W. Paré[4] and Mengfei Li[1,4*]

[1]*Gansu Provincial Key Lab of Aridland Crop Science / College of Life Science and Technology, Gansu Agricultural University, 730070 Lanzhou, China*

[2]*Institute of Industrial Crops and Production, 730000 Lanzhou, China*

[3]*College of Pastoral Agriculture Science and Technology, Lanzhou University, 730000 Lanzhou, China*

[4]*Department of Chemistry and Biochemistry, Texas Tech University, 79409 Texas, USA*

Table of Contents **Page**

Figure S1: Different harvest stages of *H. perforatum* 2

Figure S2: Calibration curve of linear regression of Hyp at different concentrations 2

Table S1: Antioxidant capacity of extracts from aerial parts of *H. perforatum* at different harvest stages, evaluated by DPPH and FRAP assays 3

Table S2: Aerial parts dry weight of *H. perforatum* at different harvest stages 3

Table S3: Hypericin (Hyp) content in aerial parts at different harvest stages 3

Table S4: Flavonoids content in aerial parts at different harvest stages 3

Table S5: Polyphenols content in aerial parts at different harvest stages 3

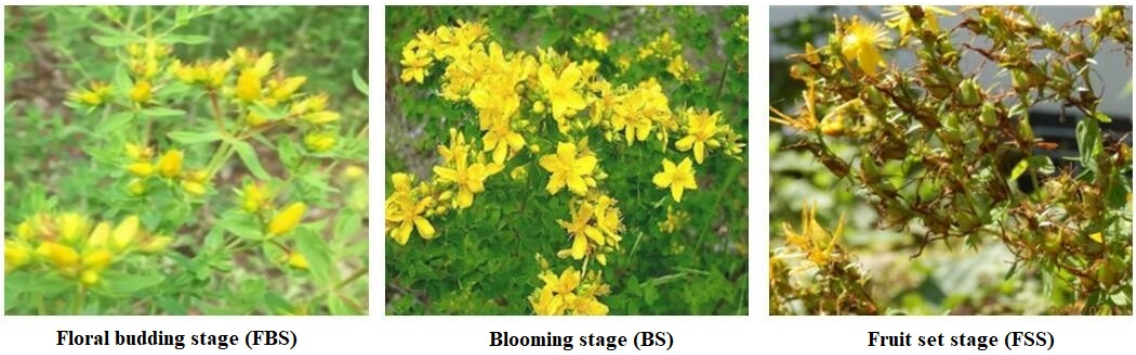

Figure S1: Different harvest stages of *H. perforatum*

Standard solution of Hyp (56690; Sigma, USA) was prepared at the concentration of 2.0 mg/mL in a methanol and then diluted with methanol to six concentration points including: 1.0, 0.5, 0.1, 0.05, 0.01 and 0.005 mg/mL. A calibration curve was calculated for the quantification using the concentration as *x*-axis and the peak area as *y*-axis, the equation for the calibration curve using linear regression analysis was y=18352x +518.66 (R^2=0.998). The lowest-concentration quantification (LOQ) that can be determined was 0.001 mg/mL at 254 nm with the injection volume 20 µL.

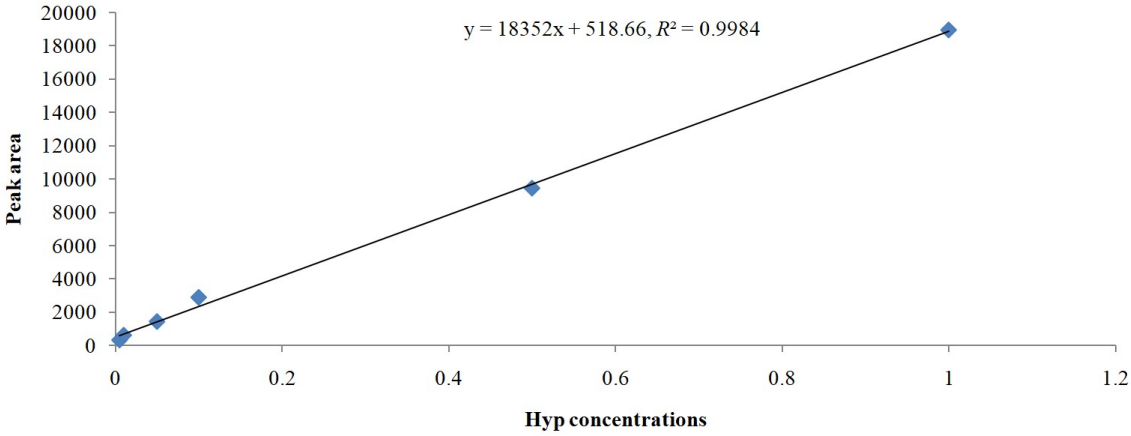

Figure S2: Calibration curve of linear regression of Hyp at different concentrations

Table S1: Antioxidant capacity of extracts from aerial parts of *H. perforatum* at different harvest stages, evaluated by DPPH and FRAP assays

Harvest stages		95% ethanol			15% ethanol		
		Stem	Leaf	Flower	Stem	Leaf	Flower
DPPH	FBS	88.77±6.55^{Aa}	87.54±8.57^{Aa}	91.58±0.32^{Aa}	30.38±1.96^{Ba}	18.75±8.57^{Ba}	24.91±8.00^{Bb}
	BS	87.69±4.20^{Aa}	91.47±0.29^{Aa}	92.30±0.16^{Aa}	23.90±4.76^{Ca}	18.86±7.79^{Ca}	37.04±1.40^{Ba}
	FSS	79.91±14.20^{Aa}	53.96±3.62^{Bb}	55.72±3.46^{Bb}	24.98±8.26^{Ca}	11.81±1.08^{Ca}	17.17±7.43^{Cb}
FRAP	FBS	13447.37 ±2580.96^{Ba}	20078.95 ±7769.71^{Aa}	20956.14 ±2276.94^{Aa}	3008.77 ±955.13^{Ca}	2622.81 ±1014.55^{Ca}	4736.84 ±1277.33^{Cab}
	BS	13219.30 ±1243.36^{Ca}	16701.75 ±2013.52^{Bab}	21666.67 ±1093.40^{Aa}	2921.05 ±569.91^{Ea}	2570.18 ±66.23^{Ea}	5491.23 ±720.85^{Da}
	FSS	11385.96 ±1488.96^{Aa}	10043.86 ±1548.91^{ABbc}	9482.46 ±478.29^{Bb}	2385.96 ±1012.50^{Ca}	1745.61 ±427.85^{Ca}	2228.07 ±226.89^{Ca}

Note: Different lowercase letters indicate significant difference at $P<0.05$ for different harvest stages within the same tissue component. Different uppercase letters indicate significant difference at $P<0.05$ for different tissue components and solvents within the same harvest stage. The same as below.

Table S2: Aerial parts dry weight of *H. perforatum* at different harvest stages

Harvest stages	Stem	Leaf	Flower
FBS	8.92±0.28^{a}	5.61±0.15^{a}	0.43±0.03^{b}
BS	8.57±0.22^{a}	5.34±0.19^{a}	1.06±0.03^{a}
FSS	7.94±0.19^{b}	4.52±0.12^{b}	0.08±0.01^{c}

Table S3: Hypericin (Hyp) content in aerial parts at different harvest stages

Harvest stages		Stem	Leaf	Flower
mg/g dry weight	FBS	0.088±0.004^{a}	0.881±0.016^{a}	3.204±0.095^{b}
	BS	0.080±0.002^{a}	0.453±0.018^{b}	3.440±0.081^{a}
	FSS	0.035±0.011^{b}	0.227±0.008^{c}	2.846±0.978^{c}
mg/ plant	FBS	0.781±0.038^{a}	4.944±0.091^{a}	1.378±0.041^{b}
	BS	0.690±0.017^{b}	2.418±0.099^{b}	3.646±0.086^{a}
	FSS	0.278±0.083^{c}	1.025±0.035^{c}	0.228±0.008^{c}

Table S4: Flavonoids content in aerial parts at different harvest stages

Harvest stages		Stem	Leaf	Flower
mg/g dry weight	FBS	34.70±2.00^{a}	39.32±1.65^{a}	49.80±0.33^{b}
	BS	31.65±1.71^{b}	34.63±1.34^{b}	56.68±1.97^{a}
	FSS	29.63±0.65^{b}	19.00±1.65^{c}	25.87±0.67^{c}
mg/ plant	FBS	309.52±17.82^{a}	202.83±24.74^{a}	21.41±0.14^{b}
	BS	271.24±14.64^{b}	184.94±7.14^{ab}	60.08±2.09^{a}
	FSS	235.29±5.18^{c}	85.88±7.47^{b}	2.07±0.05^{c}

Table S5: Polyphenols content in aerial parts at different harvest stages

Harvest stages		Stem	Leaf	Flower
mg/g dry weight	FBS	63.40±3.09^{a}	83.77±3.65^{a}	91.45±2.61^{b}
	BS	56.09±1.30^{b}	69.99±3.47^{b}	97.03±1.58^{a}
	FSS	51.54±1.12^{c}	44.80±0.83^{c}	52.8±0.73^{c}
mg/ plant	FBS	565.51±27.53^{a}	469.94±20.46^{a}	39.32±1.12^{b}
	BS	480.71±11.18^{b}	373.73±18.55^{b}	102.85±1.67^{a}
	FSS	409.20±8.91^{c}	202.51±3.73^{c}	4.22±0.06^{c}