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POLYPHENOLIC COMPOUNDS FROM *Pentaphylloides fruticosa* AND *P. parvifolia*

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Pentaphylloides fruticosa (L.) and *P. parvifolia* (Fisch. ex Lehm.) (Rosaceae) are widely used in folk and traditional medicine for various illnesses. In Tibetan medicine, the plants are known by the names spen, spen-ma, spen-nag, and spen-dkar [1]. The plants are abundant in the wild, distributed throughout eastern Siberia and the Far East, and encountered in certain regions of the Arctic, southwestern Siberia, and the Caucasus [2, 3]. The polyphenolic composition of *P. fruticosa* has been studied in more detail than that of *P. parvifolia* [4-7].

We used HPLC to study the qualitative and quantitative compositions of shoots of *P. fruticosa* and *P. parvifolia*. The HPLC (Gilston, France) had a manual injector (Rheodyne 7125, USA). Results were processed on a computer using the Multichrom for Windows program. The stationary phase was a metal column (4.6 × 250 mm) with Platinum EPS C-18100 (5 μm); the mobile phase, CH_3OH:H_2O:H_3PO_4 (conc.) (40:60:0.5). Analyses were made at room temperature. Samples were chromatographed in isocratic mode at flow rate 0.5 mL/min for 60 min with detection by a UV detector at 254 nm.

Raw material of *P. fruticosa* was collected in the beginning of July 2006 in Baikal region; *P. parvifolia*, at the end of July 2006 in Mukhorshibir region of Buryatia during mass flowering. Raw material was ground. A weighed portion (5 g) was exhaustively extracted with ethanol (70%). The extract was placed in a 100-mL volumetric flask and adjusted to the mark with ethanol (70%) (extract 1). Extract 1 (2.5 mL) was placed in a 25-mL volumetric flask, adjusted to the mark with ethanol (70%), and stirred (test solution). A series of reference solutions (0.05%) in ethanol (70%) was prepared in parallel that contained rutin, quercetin, luteolin-7-glycoside, caffeic acid, chlorogenic acid, cinnamic acid, chicoric acid, ferulic acid, hyperoside, hesperidin, apigenin, dihydroquercetin, robinin, vitexin, and dihydrocoumarin. The test solutions (20 μL each) and reference solutions were chromatographed by the method given above. Peaks in the chromatograms were identified by retention time (t_R). Table 1 lists the results.

A total of 12 compounds was detected in the sample of *P. fruticosa*; 11, in *P. parvifolia*. Table 1 shows that the qualitative and quantitative compositions of the polyphenolic compounds were different in the samples. The contents of cinnamic, caffeic, and chicoric acids in the samples had relatively similar values whereas those of apigenin, hyperoside, rutin, dihydroquercetin, and quercetin were significantly different. Furthermore, chlorogenic acid, ferulic acid, luteolin-7-glycoside, and robinin were observed in shoots of *P. fruticosa*; hesperidin, vitexin, and dihydrocoumarin, in those of *P. parvifolia*. The qualitative and quantitative differences in the chemical composition of the polyphenols provides an additional signature of the differentiation of the studied *Pentaphylloides* species.

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TABLE 1. Qualitative and Quantitative Detection of Compounds by HPLC in Shoots of *Pentaphylloides fruticosa* and *P. parvifolia*

Compound	Retention time, min	Quantitative content, µg/g	
		P. fruticosa shoots	*P. parvifolia* shoots
Cinnamic acid	5.45	595.20	481.11
Chlorogenic acid	6.39	364.00	-
Caffeic acid	7.48	392.40	337.10
Chicoric acid	10.13	288.70	216.90
Ferulic acid	12.48	188.00	-
Hesperidin	13.46	-	86.21
Luteolin-7-glycoside	15.15	106.40	-
Dihydrocoumarin	16.04	-	43.49
Apigenin	17.12	81.15	23.64
Hyperoside	19.55	22.24	12.51
Rutin	23.95	25.30	35.83
Robinin	26.58	32.48	-
Vitexin	30.00	-	46.44
Dihydroquercetin	44.63	12.57	7.79
Quercetin	50.18	2.03	188.80

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