

NEW ANTIOXIDANT PHYTOPREPARATION FROM *Rumex thyrsiflorus* ROOTS. III

Yu. A. Litvinenko and R. A. Muzychkina

UDC 547.972

The flora of Kazakhstan contains 23 described species of sorrel [1], of which 5 are pharmacopeic. Among them, *Rumex thyrsiflorus* was introduced to medicine in 2006.

Sorrel phytopreparations are known to exhibit hemostatic, astringent, anti-inflammatory, antiseptic, diuretic, cholegogic, laxative, analgesic, sedative, antitumor, and antihelminthic activity [2-5].

R. thyrsiflorus has flavonic substances with high P-vitamin activity [6]. Seeds of this species are used as astringent, laxative, antiscorbutic, and antihelminthic agents [7].

The varied biological activity of sorrels is due to the presence in them of various groups of biologically active substances, in particular, flavonoids, tanning agents, phenolic acids, anthraquinones, polyunsaturated fatty acids, etc.

A new phytopreparation was prepared by the literature method [8] and is a reddish-brown powder that is very soluble in ethanol (30%) and aqueous acetone (50%).

Descending one-dimensional paper chromatography and TLC on Silufol UV-254 plates using BuOH:AcOH:H₂O (40:12.5:29), toluene:ethanol (9:1), and toluene detected catechins and flavonoids (3.87%), tanning agents of the hydrolyzed and condensed types (38-40%), anthraquinones and their glycosides (1.74%), and phenols and phenolic acids (12.54%) in the phytopreparation.

The contents of tanning agents, anthraquinones, and flavonoids were estimated quantitatively by literature methods [9]; phenols and phenolic acids, by literature methods [10].

Substances were identified by one- and two-dimensional chromatography using specific developers [10] and by comparison with standards.

We identified in the phytopreparation caffeic, gallic, and *p*-hydroxybenzoic acids; phloroglucinol, hydroquinone, pyrogallol, quercetin, myricetin, rutin, isorhamnetin, isorhamnetin-3-*O*-rutinoside, myricetin-3-*O*-rhamnoside, (+)-catechin, (-)-epicatechin gallate, chrysophanol, emodin, and physcion and their glycosides; one of which was 5-methoxyphyscion 4-*O*-glucoside, a new compound for sorrels. The structure of this compound was established using UV, IR, and PMR spectra; products of total acid hydrolysis, and comparison with the literature [3, 11].

The antioxidant activity of the phytopreparation was studied at the Scientific-Research Center for Chemistry (Pakistan) by testing with DPPH (1,1-diphenyl-2-propylhydrazil radical) as before [12]. It was slightly more active (95%) than the standard propylgallate (94.12%). The phytopreparation can be recommended for use. The roots of *R. thyrsiflorus* F. can be used as raw material for its production. This expands the variety of natural antioxidants.

REFERENCES

1. *Flora of Kazakhstan* [in Russian], Vol. 3, N. V. Pavlov, ed., Alma-Ata (1960), pp. 93-105.
2. M. K. Kukenov, *Medicinal Plants of Kazakhstan and Their Use* [in Russian], Galym, Alma-Ata (1996), pp. 217-218.
3. R. A. Muzychkina, *Natural Anthraquinones. Biological Properties and Physicochemical Properties* [in Russian], Moscow (1998), p. 47-55.

Al-Farabi Kazakh National University, 050012, Almaty, ul. Karasai-batyr, 95a, fax (007)(3272) 92 37 31, e-mail: yuliya_litvinenk@mail.ru. Translated from *Khimiya Prirodnikh Soedinenii*, No. 2, p. 189, March-April, 2008. Original article submitted March 2, 2007.

4. A. I. Shreter, *Medicinal Flora of the Soviet Far East* [in Russian], Moscow-Leningrad (1975), pp. 78-82.
5. O. I. Romanyuk and L. V. Benzel', *Farm. Zh. (Kiev)*, 29 (1997).
6. V. G. Minaeva, *Medicinal Plants of Siberia* [in Russian], Novosibirsk (1991), pp. 214-215.
7. L. E. Pauzner, *Promising Plant Raw Materials of Uzbekistan and Their Culture* [in Russian], Tashkent (1979), pp. 3-24.
8. Yu. A. Litvinenko, K. T. Akzholova, and R. A. Muzychkina, *Vestn. Kaz. Nat. Univ., Ser. Khim.*, 22 (2005).
9. *State Pharmacopeia of the USSR* [in Russian], XIth Ed., parts 1 and 2, Meditsina, Moscow (1987, 1990), pp. 286, 367, 377.
10. R. A. Muzychkina, D. Yu. Korul'kin, and Zh. A. Abilov, *Qualitative and Quantitative Analysis of Principal Groups of BAS in Medicinal Plant Raw Material and Phytopreparations* [in Russian], Almaty (2004).
11. Yu. A. Litvinenko and R. A. Muzychkina, *Vestn. Kaz. Nat. Univ., Ser. Khim.*, 236 (2002).
12. R. S. Smeth, J. C. Reeves, R. C. Daga, and R. A. Schnettler, *Biochem. Pharmacol.*, **36**, 1457 (1987).