Chemistry of Natural Compounds, Vol. 48, No. 1, March, 2012 [Russian original No. 1, January–February, 2012]

WATER-SOLUBLE POLYSACCHARIDE FROM *Taraxacum platycarpum*: ISOLATION, CHEMICAL COMPOSITIONS, AND ANTIOXIDANT ACTIVITY

Guangren Sun,[1,2] Deli Wang,[1*] Bin Zhao,[3] Zhongling Guo,[2] and Tingcheng Zhu[1*]

UDC 547.917

Taraxacum platycarpum has been used as a traditional Chinese medicine (TCM) for more than a thousand years [1]. Recent pharmacological investigations show that the phenolic acids, triterpenes, phytosterols, flavonoids, and polysaccharides of *T. platycarpum* possessed several proven pharmacologic activities [2–4]. We focused on the elucidation, isolation, and chemical and physical characteristics of polysaccharides from *T. platycarpum* and antioxidant effects *in vitro*.

The yield of the crude polysaccharide (CTPP) was 9.54%. The main fraction (TPP-a) was purified on DEAE-cellulose and Sephacryl S-200 columns to yield 38.6% of the crude polysaccharide. The total sugar, protein, uronic acid contents, molecular weight, and monosaccharide composition of the polysaccharide fraction are summarized in Table 1. The carbohydrate content of TPP-a was 96.3%. TPP-a gave a negative response to the Bradford test and no absorption was detected at 280 and 260 nm, indicating the absence of protein and nucleic acid. TPP-a was composed of arabinose, mannose, galactose, and glucose in molar ratios of 2.1:1:1.5:4.8. The HPGPC profile demonstrated that TPP-a was a homogeneous polysaccharide, and its molecular weight was estimated as 58.6 kDa. The IR spectrum of TPP-a revealed a typical major broad stretching peak at 3409 cm^{-1} for the hydroxyl group, and the weak band at 2926 cm^{-1} was attributed to C-H stretching vibrations. The band at 847 cm^{-1} and 885 cm^{-1} indicated α- and β-configurations of the sugar units simultaneously existing in the polysaccharide.

Figure 1 demonstrates the DPPH scavenging activity caused by different concentrations of CTPP and TPP-a. The DPPH radical scavenging activity of CTPP and TPP-a reached 52.9% and 76.5% at 8 mg/mL, respectively. The DPPH scavenging activity of TPP-a was significantly higher ($P < 0.01$) than that of CTPP. The scavenging activity increased steadily at concentrations of 0.05–8 mg/mL for CTPP and TPP-a.

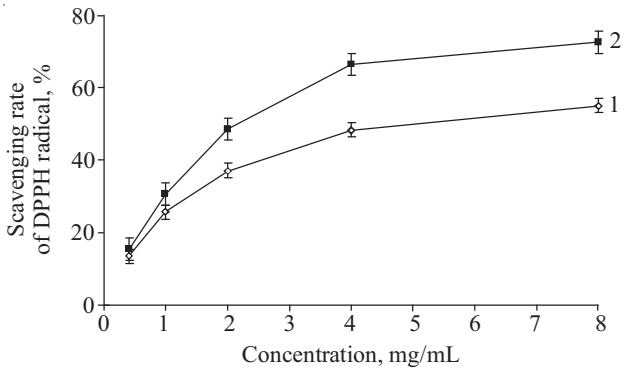

Fig. 1. Scavenging rate of polysaccharide from *T. platycarpum* against DPPH radical: CTPP (1), TTP-a (2). Results are presented as means ±S.D. (n = 3).

1) Institute of Grassland Science, Northeast Normal University, Changchun 130024, P. R. China, fax: + 86 431 85687517, e-mail: zhutc8189@163.com; wangd@nenu.edu.cn; 2) College of Forestry, Beihua University, Jilin 132013, P. R. China; 3) Institute of Genetics and Cytology, Northeast Normal University, Changchum 130024, P. R. China. Published in *Khimiya Prirodnykh Soedinenii*, No. 1, p. 101, January–February, 2012. Original article submitted October 19, 2010.

 0009-3130/12/4801-0110

TABLE 1. Chemical and Physical Characterization of TPP-a

Sample	Mw (Da)	Total sugar, %	Protein, %	Uronic acid, %	Molar ratios of monosaccharides (mol %)			
					Ara	Man	Gal	Glc
TPP-a	58,600	96.3	Nd.	Nd.	2.1	1	1.5	4.8

Nd.: not detected.

ACKNOWLEDGMENT

This research was financially supported by the National Key Technology R & D Program (No. 2008BAD95B10).

REFERENCES

1. K. Schutz, R. Carle, and A. Schieber, *J. Ethnopharmacol.,* **107**, 313 (2006).
2. H. Cheong, E. J. Choi, G. S. Yoo, K. M. Kim, and S. Y. Ryu, *Planta Med.*, **64**, 577 (1998).
3. J. Y. Jeong, Y. B. Chung, C. C. Lee, S. W. Park, and C. K. Lee, *Arch. Pharm. Res.*, **14**, 68 (1991).
4. S. I. Yun, H. R. Cho, and H. S. Choi, *Biosci. Biotechnol. Biochem.*, **66**, 1859 (2002).