Structural Characterization and Antioxidative Activity of Polysaccharide from *Adenophora Potaninii*

CHEN Qian[1], CHEN Xiao-Ming[1], LIN Xin[2], LI Xin-Fang[2], LI Zhi-Xiao[1]
([1]National Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, [2]Deparment of Pharmacology,m Lanzhou Medical College, Lanzhou 730000)

The bioactivity of polysaccharides extracted from *Adenophora Potaninii* have been investigated[1,2], but its chemical structure has not been reported. We now describe the structure and the antioxidation activity of a water soluble polysaccharide, AP_1, which was extracted from the roots of *Adenophora Potaninii* by boiling water. The crude polysaccharide was isolated and purified by DEAE-cellulose and Sephadex G-200 column, thus, AP_1, white powders, was obtained. The homogeneity of the polysaccharide was established by high-voltage electrophoresis and by gel filtration chromatography and its mean molecular weight is estimated to be 8.3×10^4 and $[\alpha]_D^{20}=+68^\circ$. PC and GC of acid hydrolyzate of AP_1 suggested that it was only composed of glucose. The AP_1 was methylated by the modified Hakomori method[3] and the derived alditol acetates analysed by GC-MS. This methylation analysis (Table 1) show that the polysaccharide is composed of (1→6) linked glucose residues. The absorption peak of 848 cm^{-1} on IR, the chemical shift of δ100.38 ppm for C-1, and the chemical shift of δ5.0 ppm for H-1 suggested that the D-glucose residues were α-linked[4]. Periodate oxidation, Smith degradation, ^1H NMR and ^{13}C NMR (Fig. 1) were further proved that it is α(1→6) linked D-glucan[5]. Thus , the structure of AP_1 was to be as following : $-[\rightarrow 6)$- α-D-Glc-$(1-]_n\rightarrow$

Bioactive experiences show that AP-polysaccharides have distinctive effect of antiaging. The superoxide anion ($O_2^{-}\bullet$) produced by NBT-PMS-NADH system was scavenged and the lipid peroxidation induced by Fe^{2+}-ascorbic acid in mouse liver microsome was inhibited. The content of MDA induced by Fe^{2+}-cystein in rat erythrocyte membranes was reduced and the hemolysis of rat RBC induced by H_2O_2 was antagonized. The erythrocyte membrabe fluidity was increased.

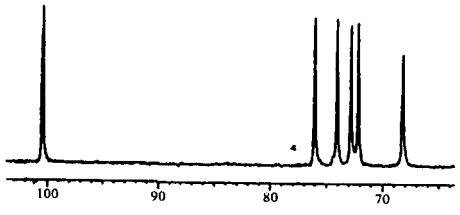

Fig. 1 ^{13}C NMR Spectrum of AP_1

Table 1 GC-MS data for methylation analysis of AP_1

Methylated sugar	MS main fragments(m/z)	Linkages types
2,3,4,6-Me_4-Glc	43,45,71,87,101,117,129,145,161,205	Glc-(1→
2,3,4-Me_3-Glc	43,87,99,101,117,129,161, 189,233	→6)-Glc-(1→

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