

Structural Characterization of Polysaccharides from Noni (*Morinda citrifolia* L.) Juice and Their Preventive Effect on Oxidative Stress Activity

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Abstract: Polysaccharides are very promising molecules in the field of pharmacotherapy. Knowing this, the aim of this study was to extract, characterize and evaluate the action of the polysaccharide of *noni juice* in biological models of Type 2 diabetes mellitus processes. In this study, one polysaccharide, named NJSPd-1 was separated from the fermented noni fruit juice. Characterization assay showed that NJSPd-1 had the molecular weight (*M_w*) of 18545 Da. NJSPd-1 consisted of galacturonic acid, galactose, rhamnose, and arabinose, with a molar ratio of 28.79:20.34:19.80:18.84 in HPGPC analysis, and the glycosidic bond mainly included $\rightarrow 4$)- α -D-GalAp-(1 \rightarrow , 4)- β -D-Glcp-(1 \rightarrow , $\rightarrow 2$)- α -L-Rhap-(1 \rightarrow , and $\rightarrow 3$)- α -L-Araf-(1 \rightarrow . The prevention of oxidative stress activities of NJSPd-1 was evaluated by high glucose induced oxidative stress in HepG2 cells. In vitro result showed that, NJSPd-1 influenced the down-regulation of the proteins and genes Nrf2, Keap1, HO-1, and NQO1 in HepG2 cells. The results suggest that NJSPd-1 exerted a protective effect against oxidative stress by activating the Nrf2/HO-1/NQO1 signaling pathway in HepG2 cells.

Keywords: *Noni juice*; Polysaccharides; Structural characterization; Oxidative stress; Signaling pathway

List of Supplementary Material

Figure S1. ^1H NMR spectrum of NJSPd-1

Figure S2. ^{13}C NMR spectrum of NJSPd-1

Figure S3. HSQC spectrum of NJSPd-1

Figure S4. ^1H - ^1H COSY spectrum of NJSPd-1

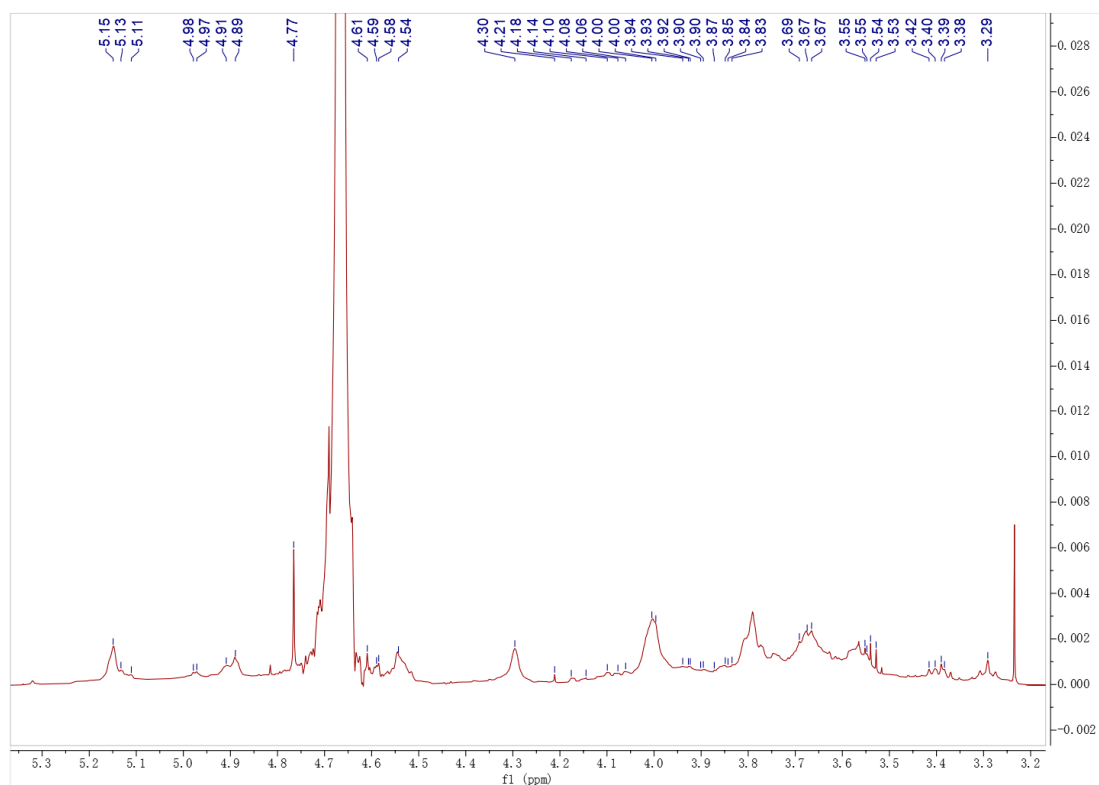


Figure S1. ¹H-NMR spectrum of NJSPd-1

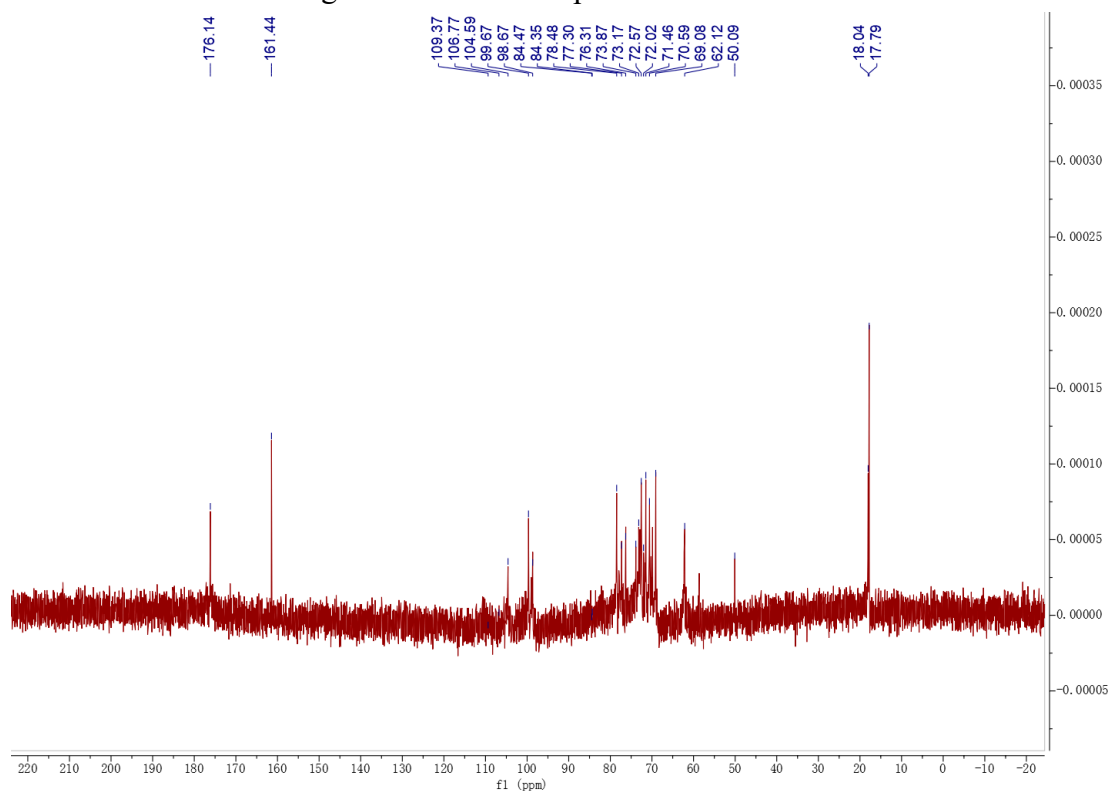


Figure S2. ¹³C-NMR spectrum of NJSPd-1

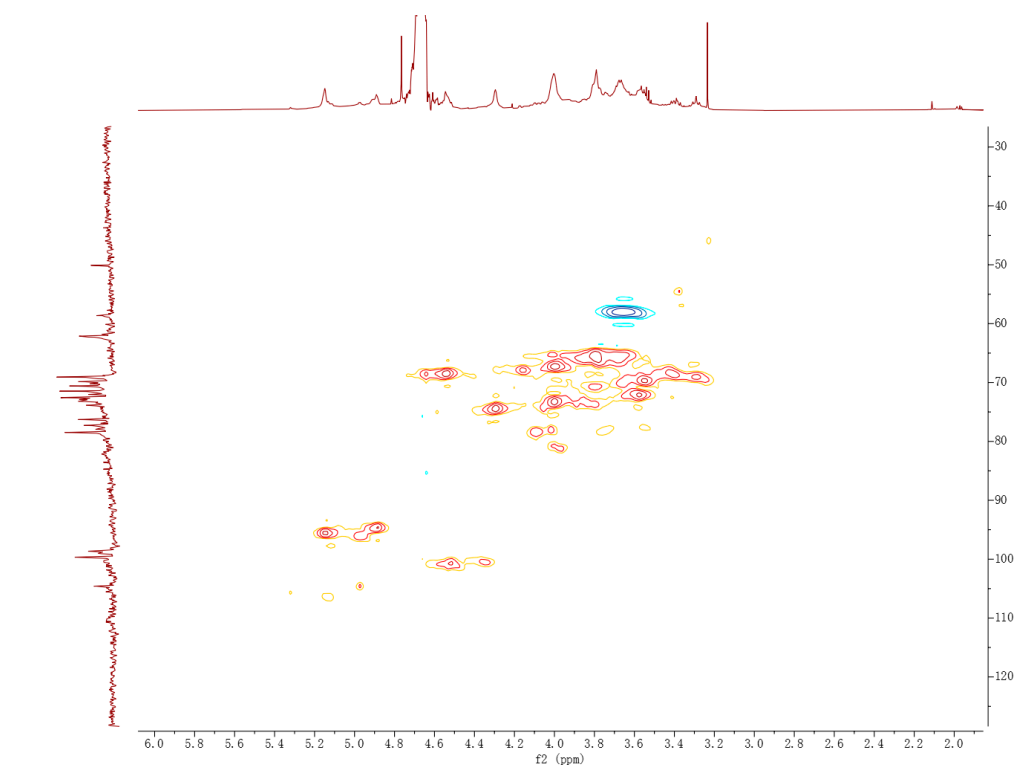


Figure S3. HSQC spectrum of NJSPd-1

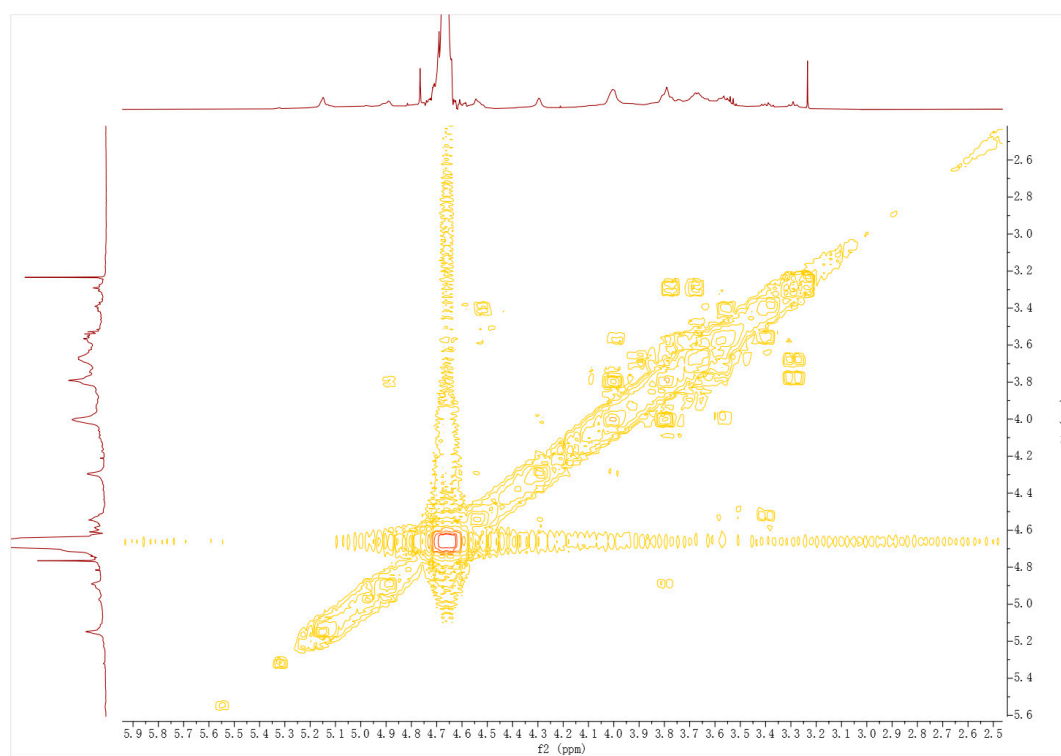


Figure S4. ^1H - ^1H COSY spectrum of NJSPd-1