

# 21<sup>st</sup> Annual European Pharma Congress

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## Study on antioxidant activity of the polysaccharide from wild *Nostoc Commune*

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**Statement of the Problem:** *Nostoc Commune*, a kind of symbiotic fungus and algae, is widely distributed all over China as a kind of nutritional and delicious wild food. It is rich in proteins, extracellular polysaccharides, minerals, vitamins, calcium, phosphorus and other nutrients and active components, and has a strong anti-complement activity, as well as obvious effect in improving plant growth. *Nostoc Commune* has long been used in ancient medicine. But so far, studies on *Nostoc Commune* have been rare both in China and other countries. How to develop it into an additive for medicine/ food has not yet drawn enough attentions. Therefore, we focus on the studies on the antioxidant activity of the polysaccharide from wild *Nostoc Commune* with a view to expand its biological function and provide theoretical and experimental basis for its further application in medicine and food. Findings: A water-soluble polysaccharide from wild *Nostoc Commune* in Xuyi County (PNX), China was isolated and purified. For the first time, PNX and its sulfate (PNXS) were evaluated systematically for its antioxidant activity *in vitro*. Results showed that PNX had high radical scavenging activity with obvious dose-effect relation, and its IC<sub>50</sub> of superoxide anion radical scavenging was equal to that of ascorbic acid, and its effect of hydroxyl radical scavenging was the same with that of D-mannitol at the same dose. At higher concentration, PNX had significant protective effect on red blood cells from H<sub>2</sub>O<sub>2</sub>-induced oxidative hemolysis and protective effect on liver homogenate from lipid peroxidation. PNX formed PNXS through sulfation, which greatly improved its antioxidant activity. In particular, its effect on DPPH clearly increased. Conclusion & Significance: PNX can be applied in medicine / food as antioxidants. After artificial sulfated modification of PNX, the toxicity of PNX is reduced while activity enhanced, therefore, study on sulfated polysaccharide has new significance in polysaccharide research fields.

Table 3 Scavenging effects of PNX and PNXS on DPPH free radical (n=3, *F* < 0.05)

Concentration (mg/mL)	PNX	PNXS	IC <sub>50</sub> (mg/mL)
0	3.2±0.1 a	8.2±0.1 a	
10	3.8±0.1 a	11.4±0.1 a	
20	3.6±0.1 a	20.8±0.1 b	
40	4.1±0.1 a	38.7±0.2 b	
60	3.9±0.1 a	48.1±0.2 c	52.6±0.2 c
80	2.8±0.1 a	50.3±0.2 c	
100	2.4±0.1 a	52.2±0.3 c	
120	2.6±0.1 a	54.9±0.3 c	

\*Values in the same column followed by the same letter are not statistically different (*p*<0.05), using Duncan multiple test.

### Recent Publications

- Harold E, Seifried O (2007) Oxidative stress and antioxidants: a link to disease and prevention? J Nutri Biochem 18: 168–171.
- Kanski J, Aksenova M, Stoyanova A, Butterfield DA (2002) Ferulic acid antioxidant protection against hydroxyl and peroxy radical oxidation in synaptosomal and neuronal cell culture systems *in vitro*: structure–activity studies. J Nutri Biochem 13: 273–281.
- Li XM, Li XL, Zhou AG (2007) Evaluation of antioxidant activity of the polysaccharides extracted from *Lycium barbarum* fruits *in vitro*. Euro Polym J 43: 488–497.

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4. Weicheng Hu, Gongcheng Wang, Lilian Ji\*2015 Chemical composition, antioxidant and cytoprotective activities of lotus receptacle. Horticulture Enviro & Biotech 56:712-720.
5. Yang JH, Du YM, Huang RH (2005) The structure-anticoagulant activity relationships of sulfated lacquer polysaccharide: Effect of carboxyl group and position of sulfation. Inter J Bio Macromol 36: 9-15.

## Biography

Using medicinal plants and endophytic fungi as sources of natural products, biological antagonists and functional medicine/food, Lilian Ji have made a systematic study of the extraction, activity, pharmacology and application of the active metabolites from medicinal plants and endophytes. The antimicrobial activity of the herb *Eupaterium DC* and the antioxidant activity of wild *Nostoc Commune* were studied for the first time, which laid the theoretical and application foundation for the industrial production of new natural antimicrobial agents and antioxidant.

## Notes: