

## **Antioxidant and hepatoprotective effects of purified *Rhodiola rosea* polysaccharides.**

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### **Abstract**

In this study, two polysaccharide fractions (RRP1: Mw = 5.5 kDa, and RRP2: Mw = 425.7 kDa) were isolated from *Rhodiola rosea* to investigate their antioxidation and hepatoprotective effects. Physicochemical analysis showed that RRP1 was composed of mannose, rhamnose, galacturonic acid, glucose, galactose and arabinose with a relative molar ratio of 0.69:0.11:0.15:1:0.51:7.5 and RRP2 was consisted of mannose, rhamnose, galacturonic acid, glucose, galactose and arabinose (relative molar ratio = 0.15:0.19:1.01:0.18:0.47:1). Periodate oxidation and Smith degradation analysis revealed that, in RRP1, part of the arabinose and glucose residues were 1 → 3,6/1 → 3/1 → 2,3/1 → 3,4/1 → 2,4/1 → 2,3,4-linked, and the mannose, rhamnose and galactose residues were 1 → 2,6/1 → 6/1 → 2/1 → 1 → 4,6/1 → 4-linked. In RRP2, the rhamnose, glucose and galactose residues were linked by 1 → 3,6/1 → 3/1 → 2,3/1 → 3,4/1 → 2,4/1 → 2,3,4 linkages, and the arabinose and mannose residues were 1 → 2/1 → 6/1 → 4-linked. The methylation analysis confirmed the structure information of the two fractions. Importantly, fraction RRP1 demonstrated stronger antioxidative activities than RRP2 by scavenging DPPH, hydroxyl and superoxide anion radicals *in vitro*. Correspondently, RRP1 showed more significant effects than RRP2 on decreasing the levels of ALT, AST and MDA, and increasing the GSH, SOD and CAT levels in the CCl<sub>4</sub>-treated mice. These data demonstrated that the polysaccharide RRP1 could be developed as a promising candidate for preventing and treating liver damage induced by toxic chemicals.

**KEYWORDS:** Antioxidation; Hepatoprotective; *Rhodiola rosea* polysaccharides