Optimizing the ultrasonic-assisted extraction of liver protection components from Ajuga nipponensis

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ABSTRACT

Ajuga nipponensis belongs to the genus Ajuga (Labiatae) plant. Main active components flavonoids and ecdysterone are major active ingredients and possessed different, physiological activities including antioxidant activity, hepatoprotection, and improving cardiovascular disease. In recent years, the ultrasonic-assisted extraction has been extensively applied to extract active components of different Chinese medicinal herbs. The method has many advantages, such as high extraction rate, shorter extraction time, and lower costs. In this study, ultrasonic-assisted ethanol extraction collocated with the orthogonal experimental design was used to investigate the suitable condition for extraction of the active components from Ajuga nipponensis. The results showed that 50 minutes, 60oC, and the ratio of 1:20 for solid (dried Ajuga nipponensis) to liquid (70% ethanol) was the most optimal extractive conditions for flavonoids and ecdysterone. Their contents reached 7.87 mg/g and 0.73 mg/g, respectively. The extract (5 mg/mL in concentration) scavenged 84.8% of DPPH free radical and 60.8% of superoxide anion. The reducing power increased along with the concentration of the extract. On the chemical liver injury, the GPT and GOT were significantly decreased to 40.6% and 46.2% compared to CCl4 induced damage. According to the results, ultrasonic-assisted extraction was effective to extract large amount of active components with liver protection activity from Ajuga nipponensis. The extract might be potent for different application in food, cosmetics and medicine industry in the future.

Keywords : Ajuga nipponensis、Flavonoids、Ecdysterone、Ultrasonic-assisted extraction、Hepatoprotective activity

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