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Abstract

Chromatographic Analysis of Active Components in *Semen Ziziphi Spinosae*

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The seeds of *Semen Ziziphi Spinosae* (Suanzaoren) were used as a sedative medicine in China. It has the central depressant action. Generally, saponosides and flavonoids were considered as major active components in Suanzaoren. However, some studies suggested that Suanzaoren oil was also favorable for its sedative and hypnotic effects.

Up to date, most studies of active components in Suanzaoren focused on saponins. Jujuboside A and B have already been used as markers for quality control of Suanzaoren materials based on *Chinese Pharmacopoeia* (2005). However, few quantitative and qualitative analyses of flavonoids, one kind of active component in Suanzaoren, were performed. In addition, fatty oil (~32%) is one of major components in Suanzaoren, and the relative contents of fatty acids in the oil were usually analyzed as methyl esters by GC-MS after saponification and methylation.

In our studies, an HPLC-ELSD method was developed for the simultaneous determination of two major kinds active components, saponins and fatty acids, in Suanzaoren. It is a novel, rapid and simple method for quantification, especially for the analysis of fatty acids. The thesis consists of 6 Chapter. **Chapter 1** was a brief review on active components in Suanzaoren. This part introduced the developments of chemical components, pharmacological activities and quality control methods of

sapinosides, flavonoids, fatty oil, respectively. **Chapter 2** was the isolation and identification of flavonoids from Suanzaoren. **Chapter 3** was GC-MS analysis of the fatty acids in Suanzaoren, which was a conventional method for fatty acids analysis. Although the results obtained were acceptable, the process of derivatization before GC-MS analysis was often undesirable and sensitive to reaction conditions. To simplify the analysis method, an HPLC-ELSD method for simultaneous determination of two major kinds of active components named saponins and fatty acids in Suanzaoren was developed. And the details were described in **Chapter 4**. Furthermore, **Chapter 5** was the qualitative analysis of three major kinds of active components in Suanzaoren by using LC-MS, which simultaneously detected all the major active components in Suanzaoren. Finally, **Chapter 6** was the comparison and evaluation of GC-MS and HPLC-ELSD methods for fatty acids assay. The results showed that HPLC-ELSD was a simpler method, where methylation was not necessary.

In sum, the chromatographic analysis of active compounds in *Semen Ziziphi Spinosae* by GC-MS, HPLC-ELSD and LC-MS had been studied. The results showed that HPLC-ELSD was a simple method for analysis of components such as saponins and fatty acids in Suanzaoren. Anyway, the studies mentioned above will be helpful to the quality control of Suanzaoren.

Key words: *Semen Ziziphi Spinosae*(Suanzaoren), GC-MS, HPLC-ELSD, LC-MS, chromatographic analysis, quality control