

## Abstract

*Curcuma* belongs to the family Zingiberaceae. It is widely distributed in China and some of which, such as *Ezhu*, *Yujin* and *Jianghuang*, are used as Traditional Chinese Medicine (TCM) for a long time. However, the raw materials from *Curcuma* are difficult to distinguish their origins because of their similar morphological characters, though their pharmacological activities and chemical characteristics are obviously different. Therefore, qualitative and quantitative analysis of these materials is very important for ensuring the safety and efficacy of the herbs. Sesquiterpenoids and curcuminoids are usually considered as the biological active components in *Curcuma* and used as markers for quality control of *Curcuma*. However, simultaneous determination of these compounds has not been achieved. In addition, volatile oils in *Curcuma* are reported to have antioxidation activity, but the active components are still unknown. Therefore, in this study, a thin layer chromatography (TLC) method was developed for discrimination of four species of *Curcuma* and simultaneous determination of sesquiterpenoids and curcuminoids in *Curcuma*. Then the antioxidant activity of volatile oils and raw materials were determined and compared by TLC coupled with DPPH coloration. The active components were also identified by GC-MS or UPLC.

The thesis is consisted of four chapters. Chapter 1 is advances of study on chemical components, quality control and antioxidant activity of *Curcuma*, as well as a brief introduction of TLC. Chapter 2 is focused on the qualitative and quantitative analysis of curcuminoids and sesquiterpenoids in four species of *Curcuma* using twice development TLC. The four species of *Curcuma* were easily discriminated based on their characteristic TLC profiles, and eight compounds, including five sesquiterpenoids and three curcuminoids, were simultaneously determined. Chapter 3 is the evaluation on antioxidant activity of volatile oils and raw materials from the four species of *Curcuma* using TLC coupled with DPPH coloration. The active components were identified by GC-MS or UPLC. Chapter 4 is a summary of this study.

In summary, a simple and reliable TLC method using twice development was developed for rapid qualitative and quantitative analysis of four species of *Curcuma*. The antioxidation activity of volatile oils and raw materials from *Curcuma* was

determined by TLC with DPPH coloration, and the antioxidant components were identified using GC-MS or UPLC. The developed TLC method can be used as an economical alternative method for routine quality control of *Curcuma*.

**Key words :** *Curcuma*, thin layer chromatography (TLC), curcuminoids, sesquiterpenoids, volatile oils, antioxidation, DPPH