

Abstract

Antioxidants have become an essential part of preservation technologies and contemporary health care. However, the currently used synthetic antioxidants have various side effects. Therefore, many efforts have been focused on searching natural antioxidants in recent years. Conventionally, separation followed with bioassay program for searching new natural antioxidants is blindest, time-consuming and labor-intensive. Recently, a method combing separation and antioxidative assay was reported, which is a simple and rapid method for on-line detection of antioxidative compounds in complex mixtures. It is suitable for screening new antioxidants from traditional Chinese medicine (TCM). The thesis includes three chapters.

Chapter 1 reviewed the development of antioxidation, including oxidation and diseases, antioxidant activity assays *in vitro*, and natural antioxidants discovery.

Chapter 2 described antioxidant activity determination of three essential oils from TCM, i.e. *Angelica sinensis*, *Curcuma longa*, *Curcuma wenyujin in vitro*. The methods included DPPH radical scavenging activity assay, ABTS radical scavenging activity assay and β -carotene bleaching test.

Chapter 3 introduced a HPLC-ABTS method for on-line screening antioxidants from the essential oils with antioxidant activity. The effect of the identified compound was confirmed using the three assays mentioned in Chapter 2.

The results showed that the essential oils from *Angelica sinensis*, *Curcuma longa*, *Curcuma wenyujin* had antioxidant activity in the three assays. One major active component in essential oils from *Angelica sinensis* and *Curcuma longa* was found by HPLC-ABTS on-line detection, respectively. The component in *Angelica sinensis* oil was identified as coniferyl ferulate by comparing its UV, MS data with those of reference compound. The antioxidant activity of coniferyl ferulate was also confirmed by the three assays mentioned in Chapter 2. The identification of the active component in *Curcuma longa* oil need further investigated. But no major active component in *Curcuma wenyujin* oil was detected.

In a word, HPLC coupled with ABTS assay is a useful method for screening antioxidants in TCM extract such as essential oil, which is a simple and rapid method.

Keywords antioxidant, essential oil, *Angelica sinensis*, *Curcuma longa*, *Curcuma wenyujin*, HPLC, bioassay detection, coniferyl ferulate