

Cupressaceae plants are used in traditional folk medicine, whose extracts have been found to possess some bioactivities. (-)-Yatein is a lignan of the dibenzyl-butyrolactone type, that has been isolated from some Cupressaceae plants. It was reported that (-)-yatein, isolated from plants, showed different activities from the synthetic yatein [3]. Hence, the enantioselective determination of yatein from synthetic materials and natural products would be necessary.

A capillary electrophoretic and high performance liquid chromatographic procedure was developed for the enantioselective determination of yatein from Cupressaceae plants. The separation by CE was done by using borate buffer (100 mM, pH 10.5) containing 30v/v% methanol and 20 mM CM-b-CD on a fused silica capillary (75 μ m i.d. x 34.6 cm, 30 cm to detector). (-)-Yatein enantiomers were also separated by HPLC using 81 % methanol on (R,R)-Whelk-O1 column (4.6 x 250 mm). The contents of (-)-yatein in Juniperus, Thuja and Chamaecyparis species, belonged to Cupressaceae plants, were 7.13, 0.24 and 0.11 mg/g, respectively, indicating this method could be applied for the quality control of (-)-yatein.

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Determination of the water content in Citrus leaves by portable near infrared (NIR) system

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The amount of water for the cultivation of citrus is different based on the growing period. The water content in the leaves of citrus can be a index for watering during cultivation. The purpose of this study is to determine non-destructively the water content of Citrus leaves by using near infrared spectroscopy (NIRS). Citrus leaves were prepared from satsuma mandarin leaves (Citrus unshiu Marc. var. okitsu) ranging from 62.20 to 69.98% of water content by loss on drying, NIR reflectance spectra of Citrus leaves were acquired by using a fiber optic probe. It was found that the variation of absorbance band due to OH vibration of water depending on the water content change around 1450nm in the second derivatives spectra. Partial least squares regression (PLSR) was applied to develop a calibration model over the spectral range 1100-1700nm. The calibration model predicted the water content for validation set with a standard errors of prediction (SEP) of 0.97%. In order to validate the developed calibration model, routine analyses were performed using newly prepared Citrus leaves. The NIR routine analyses showed good results with determination of water content with a SEP 0.81% compared with those of loss on drying. This study showed that the rapid and non-destructive determination of the water content in Citrus leaves was successfully performed by portable NIR system.

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Classification based on Near-IR spectra with application to Cnidium Rhizome

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A near infrared (NIR) method was developed to analyze specious diversity for morphologically similar umbelliferous herbal medicine, Cnidium officinale Makino. This herbal medicine has been widely used as 'chungung' without any discrimination of its quality and original plants, though it has the ambiguous origins of plants between various countries especially Korea, China and Japan. It is named by Cnidium officinale Makino in Korea and Japan, in comparison with Ligusticum chuanxiong Hort. in China. The rapid and accurate analytical method to classify according to its different genus name mentioned before. NIR spectroscopy with a reflectance fiber optic probe and a photo-diode array type InGaAs detector was also demonstrated. In order to select the best identification method, a pattern recognition technique using soft independent modeling of class analogy (SIMCA) was applied. In overall, NIR spectroscopy using pattern recognition technique is shown to have significant potential as a rapid and accurate method for identification of herbal medicines.

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