研究论文

基于主成分分析的骨碎补药材乙醇和环己烷提取物的高效液相色谱指纹图谱及指标成分的定量分析

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摘要　　建立了骨碎补药材乙醇和环己烷提取物的高效液相色谱(HPLC)指纹图谱, 并利用主成分分析法(PCA)对指纹图谱进行统计分析, 以各主要色谱峰的保留时间和峰面积为变量得到score图和loading图。在score图和loading图中, 骨碎补的正品和非正品可明显区分, 且揭示出对此区分贡献最大的4个潜在指标成分, 其中已知成分为柚皮苷、新北美圣草苷和E-4-O-β-D-葡萄糖酰咖啡酸。同时测定了这3种成分在19批正品和非正品骨碎补药材中的含量, 其中10批骨碎补药材正品中3种成分的含量为：柚皮苷6.36～10.1 mg/g, 新北美圣草苷5.14～9.21 mg/g, E-4-O-β-D-葡萄糖酰咖啡酸1.87～3.19 mg/g。该方法更全面地反映了药材的化学成分信息, 并能从定性和定量两方面控制骨碎补药材的内在质量。

关键词　　高效液相色谱　主成分分析法　指纹图谱　柚皮苷　新北美圣草苷　E-4-O-β-D-葡萄糖酰咖啡酸　骨碎补

High performance liquid chromatographic fingerprints of ethanol and cyclohexane extracts of Rhizoma Drynariae and quantitative analysis of index components based on principal component analysis

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Abstract

  The method of fingerprint analysis and quantification of Rhizoma Drynariae was performed by high performance liquid chromatography (HPLC). The sample was extracted by ethanol and cyclohexane. The extract was separated on a Diamonsil C18 column, and gradiently eluted with acetonitrile and 0.4% glacial acetic acid at 25 ℃. The fingerprint analysis of ethanol and cyclohexane extracts of Rhizoma Drynariae using HPLC profiling was established. The contents of naringin, neoeriocitrin and E-4-O-β-D-glucopyranosyl caffeic acid in nineteen batches of samples were determined simultaneously. Significant differences were observed between genuine and fake samples in the principal component analysis (PCA) score plot, finding four potential index components in the PCA loading plot as well. Three important potential index components were naringin, neoeriocitrin and E-4-O-β-D-glucopyranosyl caffeic acid, and the contents of them in ten genuine batches were 6.36~10.1 mg/g, 5.14~9.21 mg/g and 1.87~3.19 mg/g, respectively. Combining determination of the index components with fingerprint analysis of Rhizoma Drynariae using HPLC profiling, the quality of Rhizoma Drynariae can be assessed better.

Key words　high performance liquid chromatography (HPLC)　principal component analysis (PCA)　fingerprints　naringin　neoeriocitrin　E-4-O-β-D-glucopyranosyl caffeic acid　Rhizoma Drynariae

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