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LETTER TO THE EDITOR

FI-TR and GC-MS of volatile oil of schisandra chinensis

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In this paper, FT-IR spectroscopy and gc-ms were used to analyze the schisandra chinensis. The results show that the main components of schisandra solvent extraction in ft-ir spectrum analysis are phenols, alcohol compounds, fatty acids, alkanes, ether compounds, lipids and hydrocarbons. The main components of solvent extraction are phenols, alcohol compounds, fatty acids, alkanes, ether compounds, lipids and hydrocarbons, and the decomposed substances contain a variety of natural active ingredients.

I Introduction

Schisandra is a perennial deciduous plant (liana, magnoliaceae) rich in organic acids, vitamins, flavonoids and sterols. Lignin (e.g. schisandra fruit, an alcohol protectant; There's also schisandra b or Chinese magnolia, a fatty element. It has a good composition, controls the gas, and has several herbal benefits. Its powerful liver boosts cell efficiency, eliminating waste, replenishing oxygen, producing and consuming energy, and improving memory and endurance. Li shizhen, a doctor in the Ming dynasty, said, "schisandra fruit is sour and salty, filling the liver and kidney, filling the heart and lungs, and sweet, entering the spleen and stomach." "It's good for the kidneys, it's good for the lungs, it can relieve coughing, it absorbs water to stop diarrhea, it's good for the mind, it's good for the body." "It also reduces serum glutamase in hepatitis patients and improves vision and hearing."

II Test Materlals And Methods

Test materials

Fructus schisandrae chinensis, from Inner Mongolia region, dry after grinding and sieving its powder ready for use.

Test method

FT-IR analysis: The FT-IR spectrum of each sample was obtained using an FT-IR spectrophotometer (IR100) and KBr wafer containing 1.00% of a finely ground sample. According to the position and shape of the absorption peak in the spectrum, the structure of the unknown object could be inferred, and the content of its components could be determined according to the intensity of the characteristic absorption peak. In the experiments, the IR heating rate was 55 °C/min, held at 850°C for 2 h.

GC-MS analysis: An Agilent gas chromatographic mass spectrometer (GC7890B/MS5977A) was used for gas chromatography under the following conditions: a chromatographic column for HP - 5 ms (30 m × 250 mu m × 0.25 microns) elastic quartz capillary column and nitrogen as the carrier gas at a flow rate of 1 ml/min and an injection port temperature was 50°C. The conditions of the chromatographic column (Cheng Sheng) were as follows: initially 8 °C/min to 250°C, followed by a speed of 5 °C/min to 300°C without penetrating the sample. Mass spectrometry using MS El involved an ion source temperature of 230°C, 4-pole temperature of 150°C, and scanning and end points of 30-600 using the standard MS spectrum analysis software retrieval library for NIST14. L.

III Results

GC-MS analysis

GC-MS test results and discussion

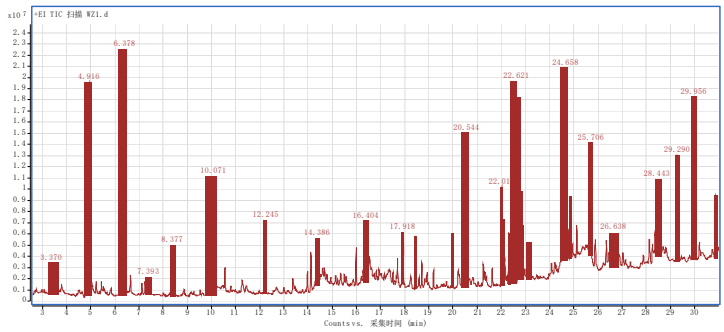

Fig. 1. Total ion chromatogram of schisandra chinensis

Under experimental conditions, to test and analyze the chemical composition of the fruit of Chinese magnoliavine, mass spectrum data and a GC-MS microprocessor were used to calculate the area normalization method of the relative percentage of each peak area of the spectra retrieved from the mass spectrum database. An artificial map was also used for verification against a standard atlas to identify some chemical constituents of fructus schisandrae as listed in Table 1.

Table 1. Extract analysis of fructus schisandrae chinensis

The serial number	RT	Percentage area (%)	Chemical component
1	3.37	1.93	Furfural. POB632X444
2	4.916	16.61	Formamide;
3	6.378	12.85	1 - Hexanol; 2 - Ethylhexyl acrylate
4	7.393	0.80	Clindamycin.Clindamycin
5	8.377	1.25	4 h - PYRAN 4 - ONE;2, 3 - Dihydro - 3, 5 - dihydroxy (H) - 6 - methyl - 4 - pyran 4 - one
6	10.071	9.83	5 - Hydroxymethylfurfural;Phloroglucinol
7	12.245	0.94	(-) - ALPHA COPAENE;(-) - alpha Cedrene
8	14.386	0.98	2 h - Indeno [1, 2 - b] furan - 2 - one
9	16.404	1.71	1 - Heptatriacotanol;HEXATRIACONTYL METHANETHIOSULFONATE
10	17.918	0.83	(2 r, 4 as, 8 ar) - 1, 4-trichlorobenzene a, 5,6,7,8,8 a - Octahydro - 2 - naphthalenol;
11	18.461	0.70	ACETIC ACID;
12	19.982	0.72	CCW02D961F;
13	20.544	6.12	Palmitic acid
14	22.013	1.39	8, 11 - Octadecadienoic acid, methyl ester
15	22.077	0.96	8 - octadecenoic acid
16	22.304	0.72	Phenol;
17	22.621	10.64	Linoleic acid
18	22.666	4.28	Oleic acid
19	22.841	1.53	Stearic acid
20	22.873	0.74	1 - Heptatriacotanol
21	23.132	0.80	INGENOL;
22	24.658	7.36	PIMARIC ACID
23	24.865	0.91	PIMARIC ACID
24	25.706	2.91	17 - Hydroxy - 10,13,17 - trimethyl - 4,5,6,7,8,9,10,11,12,13,14,15,16,17 - tetradecahydrocyclopenta [a] phenanthren - 3 - one
25	26.638	3.12	Azafrin
26	28.443	1.75	17 - (1, 5 - dimethylhexyl) - 2 - nitro - 10, 13 - ,5,6,7,8,9,10,11,12,13,14,15,16,17 - tetradecahydro - dimethyl - 4 h - 1 cyclopenta [a] phenanthren - 3 - yl acetate
27	29.29	2.33	Methyl acrylate
28	29.956	4.01	Azafrin
29	30.881	1.27	ACETIC ACID

Twenty-nine peaks were isolated from schisandra chinensis under the experimental conditions. The main chemical components were formamide (16.61%), 1-hexanol (12.85%), linoleic acid (10.64%), pimaric acid (8.27%), palmitic acid (6.12%), and oleic acid (4.28%). The dissolved substance contained a variety of natural active ingredients, such as formamide, an amide derived from

formamide with formula HCONH2. It is a colorless liquid, miscible with water with a similar smell to ammonia; it is mainly used in the production of sulfonamides, synthetic vitamins, and as a paper and fiber softener. Pure formamide dissolves many ionic compounds that are not soluble in water and is therefore used as a solvent. 1-hexanol is often used as part of the cephalic fragrance in spiced substrates and formulated essential oils such as geraniol; a single line of hexanol can be used to improve the flavor of violets, osmanthus, magnolia, and ylang and to create coconut, berry, and other fruit flavor essences. It is also used as a solvent, analytical reagent, preservative, and sleeping medication in the pharmaceutical industry, listed under GB 2760-96 in China. 1-hexanol can also be used as a plasticizer, fatty alcohol, and in chromatographic reagents and organic synthesis. Linoleic acid is mainly used in the production of raw paint and ink materials and in the production of polyamide, polyester, and polyurea products. Given its cholesterol-lowering effects, it can be used as a raw material for the treatment of atherosclerosis (e.g., yishouning and maitong). Refined linoleic acid can be esterified and hydrogenated to make unsaturated fatty alcohol and used as a surface active raw materials for detergents, shampoos, and cosmetics. Sodium linoleate or sylvite is an ingredient in soap and can be used as an emulsifier. Linoleic acid is also a raw material used in pharmaceutical applications.

FT-IR analysis

FT-IR test results and discussion

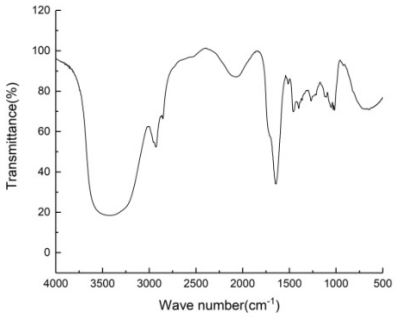

Fig. 2. FT-IR fingerprint of schisandra fruit extract.

The FT-IR fingerprint of schisandra chinensis was analyzed according to the correlation between the IR spectrum and functional groups of organic happiness. Results are shown in Table 2.

Table 2. FT-IR fingerprint used to analyze extract of fructus schisandrae chinensis.

Band/cm^{-1}	The absorption peak/cm^{-1}	The group of belonging	Corresponding chemical composition
3700-3000	3436	O-h stretching vibration	Phenols and alcohols
3000-2800	2928	C-h stretching vibration	Fatty acids, alkanes
1500-1390	1400	C-h bending vibration	Ether compound
1268	1268	C=O stretching vibration	lipid
1240-970	1054, 1033, 1014	C-o expansion vibration and in-plane deformation vibration of o-h	Phenols and alcohols
960-600	652	Bending vibration outside c-h plane	Hydrocarbon compound

Fig. 2 shows the baseline curve generated in ORIGIN software. Shisandra chinensis presents a complex vibration mode at a low wavelength (1500-900-1), belonging to the skeleton mode vibration of ether compounds and transcriptional compounds. In the FT-IR spectrum, 1054^{-1}, 1033^{-1}, and 1014 belong to phenols and alcohol compounds. The spectrum was relatively complex, rendering it difficult to identify precise spectral bands. The absorption peak of the sample around 2900 cm^{-1} moved slightly towards a high wavelength; the wavenumber of schisandra chinensis was 2928 cm^{-1}. Generally, the C-H stretching vibration associated with hydrogen bonding exhibits a narrow and weak absorption peak at 3000-2800-1. For the stretching vibration, a weaker hydrogen bond and narrower band results in less absorption strength and larger displacement in the high-frequency direction.

After the extraction experiment, the absorption peak did not change substantially at 4000 cm^{-1}, 2500 cm^{-1}, and 1800 cm^{-1}, but the absorption intensity declined. However, the absorption peaks extracted by schisandra chinensis extraction solvent were mainly concentrated at 3,700 cm^{-1}-3000 cm^{-1}, 3000 cm^{-1}-2800 cm^{-1}, and 1500 cm^{-1}-390 cm^{-1}. According to Lambert Beer's law, the change in absorbance

throughout the pyrolysis process can reflect a change in the relative content of pyrolysis gas products. The main components of solvent extraction were identified in this study as phenols, alcohol compounds, fatty acids, alkanes, ether compounds, lipids, and hydrocarbons.

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