GC/MS STUDY OF THE CHLOROFORM FRACTION OF *Melilotus officinalis*

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UDC 543.544.3:543.64:633.366

Melilotus officinalis (L.) Desr. (Fabaceae Lindl.) is an official plant in the Netherlands, Germany, Poland, Austria, and Romania. Its principal pharmacological properties are hypocoagulative, anti-aggregation, antioxidant, and hepatoprotective. It also protects and restores the inner wall of blood and lymphatic vessels and prevents the formation of thrombi and embolisms. It has been demonstrated experimentally that *M. officinalis* regenerates liver parenchyma. The herb of *M. officinalis*, *Herba Meliloti*, is used as a medicinal raw material. Its biologically active compounds have been studied in detail. The plant contains 0.4-0.9% coumarin, coumaric acid, dicoumarol, melilitin, essential oil, and slime [1–3].

Our goal was to study the components of the lipophilic fraction from *M. officinalis* herb that was obtained by $CHCl_3$ extraction, on the basis of which we developed a drug form.

The qualitative and quantitative compositions of the $CHCl_3$ fraction were studied by GC/MS on a GCM spectrometer (Agilent Technologies, USA) consisting of an Agilent GC 6890 chromatograph and an Agilent 5973N mass-selective detector. Components were separated on an HP-5 (19091J-433) quartz capillary column (30 m × 0.25 mm) with phenylmethylsiloxane stationary phase (5%), column temperature 60–240°C, run time 1 h, temperature increase rate 3°C/min. The sample volume was 0.3 μL with a flow division coefficient 1:15 and pressure at the column inlet 40 kPa with He carrier gas. Mass was scanned in the range 38-300 amu. Compounds were identified by comparison of mass spectra with those in the Wiley 275 and NIST98 libraries and mass spectra of standards.

Table 1 lists the results.

TABLE 1. Component Composition of the Lipophilic Fraction of *M. officinalis*

Compound	Retention time, min	%	Compound	Retention time, min	%
1,1-Diethoxyethane acetal	2.55	5.874	Hexadecane	26.50	0.450
1,1-Diethoxy-2-methylpropane	4.42	0.411	Heptadecane	28.39	0.234
4-Ethoxy-2-butanone	4.68	0.061	1,3-Di-*O*-methyl-*myo*-inositol	31.55	75.503
1,1-Diethoxy-2-methylbutane	6.53	0.572	Palmitic acid	31.99	2.252
1,1-Diethoxy-3-methylbutane	7.73	0.072	Ethylpalmitate	32.23	0.524
1,1-Diethoxyhexane	10.71	0.051	Octadecene	33.18	0.640
2,3-Dihydro-3,5-dioxy-6-methyl-4*H*-pyran-4-one	12.67	1.161	Linoleic acid	33.79	1.958
			Ethyllinoleate	33.94	0.199
5,5-Diethoxy-2-pentanone	12.94	0.076	Oleic acid	33.99	0.785
2,7-Octanedione	13.69	0.099	Ethylstearate	34.22	0.240
Dihydrocoumarin (melitol)	20.35	1.154	Hexadecylacetate	34.36	0.837
Coumarin	22.09	0.912	*N*,*N*-Dimethylpalmitamide	34.84	0.136
Hexadecene	26.33	0.287			

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0009-3130/09/4504-0585

The dominant components in total lipophilic compounds of the $CHCl_3$ extract of *M. officinalis* were 1,3-di-*O*-methyl-*myo*-inositol (75.503%), acetal (5.874), palmitic acid (2.252), and linoleic acid (1.958). Dihydrocoumarin and coumarin constituted 2.066%; total fatty acids and their derivatives, 5.854%.

1,3-Di-*O*-methyl-*myo*-inositol, acetal, aldehydes, ketones, carbohydrates and their ethers were identified for the first time in *M. officinalis*.

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