# POLYPHENOLS OF *Pyrethrum roseum*

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UDC 547.972

We have studied the chemical composition of the epigeal part of the *Pyrethrum roseum* (Adam) M. B. collected in the flowering period (July, 1978) in the region of Kislovodsk.

The comminuted raw material was extracted three times with 70% $C_2H_5OH$, the extracts were concentrated in vacuum to an aqueous residue and in this by two-dimensional chromatography using qualitative reactions [1], 16 substances of phenolic nature were detected.

Four substances were isolated from the products of the acid hydrolysis (5% $H_2SO_4$) of the dried aqueous residue by extraction with ether and chromatography on polyamide.

Substance (I), $C_{15}H_{10}O_6$, mp 326-327°C. UV spectrum: $\lambda_{max}$ ($C_2H_5OH$) 350, 268, 255 nm. The IR spectra of substance (I) and of 3',4',5,7-tetrahydroxyflavone (luteolin) isolated previously from species of Scabiosa [2] were identical.

Substance (II), $C_{16}H_{12}O_6$, mp 253-255°C. UV spectrum: $\lambda_{max}$ ($C_2H_5OH$) 345, 268, 255 nm. Isovanillic acid and phloroglucinol were found in the products of alkaline cleavage. The acetyl derivative, $C_{22}H_{18}O_9$, had mp 195-197°C. On the basis of these facts, the substance was characterized as 3',5,7-trihydroxy-4'-methoxyflavone (diosmetin).

Substance (III), $C_{15}H_{10}O_7$, mp 308-210°C [UV spectrum: $\lambda_{max}$ ($C_2H_5OH$) 370, 266 nm (melting point of the acetyl derivative 198-200°C)] was identified as quercetin.

Substance (IV), $C_{15}H_{10}O_6$, mp 273-275°C [UV spectrum: $\lambda_{max}$ ($C_2H_5OH$) 367, 265 nm] was identified as kaempferol.

From an ethanolic extract by chromatography on polyamide we isolated a glycoside $C_{28}H_{32}O_{15}$, mp 275-277°C. UV spectrum: $\lambda_{max}$ ($C_2H_5OH$) 342, 254, 265 nm. The UV spectra in the presence of diagnostic additives showed the presence of a free hydroxy group at $C_5$ and the absence of one at $C_7$. From the products of quantitative acid hydrolysis we isolated diosmetin (yield of aglycone 48.7%) and a carbohydrate component which was identified as rutinose. On the basis of the results obtained and a comparative analysis with an authentic sample, the glycoside isolated was identified as diosmetin 7-rutinoside (diosmin). The aqueous extract of the freshly collected epigeal part of *P. roseum* followed by chromatography on a column containing polyamide yielded a substance $C_9H_8O_4$, mp 195-198°C which was identified by UV spectroscopy, chromatography, and characteristic reactions as 3,4-dihydroxycinnamic (caffeic) acid [3].

The exhaustive extraction of a concentrated ethanolic extract with acidified diethyl ether yielded a compound $C_{16}H_{18}O_9$, mp 204-207°C which was characterized by its physicochemical constants as 3-caffeylquinic (chlorogenic) acid [3].

The study of the chemical composition of *Pyrethrum roseum* (Adam) M. B. is continuing.

## LITERATURE CITED

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Pyatigorsk Pharmaceutical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 4, pp. 577-578, July-August, 1979. Original article submitted March 21, 1979.

 0009-3130/79/1504-0504$07.50 