The isoflavan isolated proved to be the levorotatory isomer with $[\alpha]_D^{20}$ −15.8° (c 1.2; MeOH), which, according to the literature [4], determines its 3R configuration. Thus, this compound is (−)-2',7-dihydroxy-4'-methoxyisoflavan (vestitol). Vestitol has been isolated previously from a number of plants. It possesses a high antifungal activity and is considered to be the phytoalexin of alfalfa leaves and of the leguminous plant *Lotus corniculatus* [5].

On separating under similar conditions an acetone extract of red clover roots we detected no fractions containing vestitol and its very similar 2'-methyl analog (sativin), which possibly in part explains its lower resistance to fungal diseases.

LITERATURE CITED

1. N. A. Mukhina and Z. I.Shestiperova, Clover [in Russian], Leningrad (1978), pp. 28-29.
2. K. Kurosawa, W. D. Ollis, B. T. Redman, I. O. Sutherland, A. B. Oliveira, O. R. Gottlieb, and H. M. Alves, Chem. Commun., 1263 (1968).
3. A. Pelter and P. I. Amenechi, J. Chem. Soc., 887 (1969).
4. K. Kurosawa, W. D. Ollis, B. T. Redman, I. O. Sutherland, H. M. Alves, and O. R. Gottlieb, Phytochemistry, 17, 1423 (1978).
5. M. R. Bonde, R. I. Millar, and J. L. Ingham, Phytochemistry, 12, 2957 (1973).

CHEMICAL STUDY OF *Melampyrum elatius*

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We have studied the epigeal part of *Malampyrum elatius* Reuter, collected in the flowering period.

The air-dry raw material was extracted in the cold successively with 96% ethanol and with aqueous acetone, and the combined extracts were concentrated under reduced pressure and were investigated for their content of polyphenolic compounds. Paper chromatography revealed four compounds belonging, according to their color reaction, to the flavones and their 7-glycosides.

The concentrated residue of the extract was treated with hot water, and the aqueous extract was purified with chloroform and was then treated several times with ethyl acetate. The combined ethyl acetate extracts were dried with sodium sulfate and poured into a fivefold volume of dry chloroform. The mixture was left to stand in the refrigerator for several days, and then the intense yellow precipitate that had deposited, consisting of a mixture of two glycosides, was taken off. The substances were separated by sublimation [1], in which process substance (I) sublimed readily.

Substance (I) formed bright yellow crystals. UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 260, 340 nm. It readily underwent hydrolysis with the formation of luteolin and L-arabinose. The glycoside did not take part in the azo-coupling reaction, which shows the absence of a free hydroxyl at C_7 [2] and, consequently, it can be characterized as luteolin 7-arabinoside. Because of its lability, this substance has not been studied in more detail.

Substance (II) formed pale yellow crystals. UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 256, 350 nm. No bathochromic shift was observed in the presence of sodium acetate; on the addition of $AlCl_3$: λ_{max} 274, 328, 432 nm; $AlCl_3$ + HCl: 274, 294 sh, 387 nm; H_3BO_3 + CH_3COONa: 254, 372 nm. R_f 0.16 (15% CH_3COOH), 0.41 (n-butanol—CH_3COOH—H_2O (4:1:5)). Hydrolysis formed luteolin and D-glucose.

The substance was characterized as luteolin 7-glucoside.

From the aqueous ethanolic extract, after its concentration, the elimination of lipophilic impurities, and the extraction of polyphenolic compounds with butyl acetate, chromatography on a column filled with previously swollen filter paper (eluent aqueous ethanol) yield-

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ed a substance (III) having a blue fluorescence in UV light on chromatograms.

UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 326, 299 sh, 245 nm; AlCl : 335, 315, 240 nm; CH_3COONa: 310, 281 nm; H_3BO_3 + CH_3COONa: 321, 295 nm; C_2H_5ONa: 360, 251 nm, R_f 0.82 (n-butanol—acetone—H_2O (4:1:5)). The substance was identified as caffeic acid.

On standing, the aqueous ethanolic extracts deposited a white precipitate soluble in hot water and having mp 187-188°C. The substance was chromatographed in the presence of markers — polyhydric alcohols — and the chromatograms were treated with a 5% solution of silver nitrate in an excess of ammonia followed by heating and with a 4% solution of potassium permanganate containing 2% of sodium carbonate [3]. It was identified as dulcitol.

We have detected aucubin in the seeds of the plant.

LITERATURE CITED

1. L. Hörhammer and H. Wagner, Dtsch. Apoth. Ztg., 101, No. 26, 779 (1961).
2. L. K. Klyshchaev, V. A. Bandyukova, and L. S. Alyukina, Plant Flavonoids [in Russian], Alma-Ata (1978).
3. S. Barker, in: Biochemical Methods of Plant Analysis [in Russian], Moscow (1960).