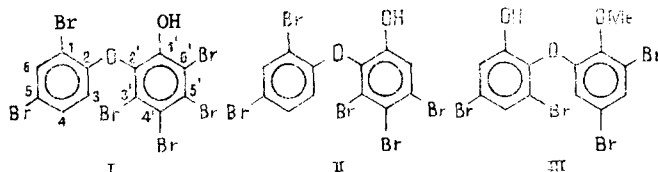


$J = 2$  Hz), 7.29 (dd,  $J = 8$  Hz, 2 Hz), 6.30 (d,  $J = 8$  Hz), and 3.86 (s,  $\text{OCH}_3$ ).

The second fraction contained a mixture of compounds (II) and (III) in a ratio of 1:1. After chromatography on Silufol-254 plates in  $\text{CHCl}_3$ , compound (II) was obtained with mp 198-199°C (hexane), yield 0.08%, identical in its spectral characteristics with a compound described in the literature [1, 4].

Crystallization of the third fraction from hexane gave a methoxydiphenyl ether (III) with the composition  $\text{C}_{13}\text{H}_8\text{O}_3\text{Br}_4$ , mp 143-145°C (colorless needles), yield 4.43%. The mass and NMR spectra coincided with those given in the literature for a compound of analogous structure isolated from the sponge *D. herbacea* [3], with the exception of a marked difference in the melting point (according to the literature: pale green wax, mp 32-33°C). The methylation of compound (III) with MeI led to a dimethyl ether in the form of an oil not differing in its indices from those given in the literature [2, 3]. The hydrogenation of (III) over 10% Pd-C gave 2-(2'-hydroxyphenoxy)anisole, mp 71-73°C (hexane).



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#### PIGMENTS AND VITAMINS OF THE LEAVES OF SOME PLANTS OF THE FAMILY LEGUMINOSAE

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In continuation of a study of the chemical composition of various parts of plants of the family Leguminosae, we have investigated the presence of vitamins and pigments in the leaves of representatives of this family (Table 1).

TABLE 1. Amounts of Pigment and Vitamins in Leaves

| Plant (collection site)                                  | Amount, mg/kg |                   |              |              |       | tocopherols |
|--|---------------|-------------------|--------------|--------------|-------|-------------|
|  | carotenoids   | $\beta$ -carotene | xanthophylls | chlorophylls |       |             |
|  |               |                   |              | a            | b     |             |
| Sophora pachycarpa C. A. Mey.<br>(Chimkent province)     | 59,6          | 9,5               | 59,0         | 37,2         | 37,5  | 6,6         |
| Sophora alopecuroides L.<br>(Environs of Alma-Ata)       | 225,9         | 197,5             | 28,4         | 146,7        | 117,0 | 37,0        |
| Thermopsis alpina (Pall.) Ledeb.<br>(Chimbulak boundary) | 148,6         | 31,7              | 116,9        | 109,3        | 98,7  | 32,0        |
| Thermopsis turkestanica Gand.<br>(Alma-Ata province)     | 50,0          | 19,2              | 30,8         | 257,2        | 247,6 | 28,0        |
| Glycyrrhiza glabra L.<br>(Alma-Ata province)             | 179,4         | 115,4             | 64,0         | 103,8        | 76,5  | 38,7        |
| Psoralea drupacea Bunge<br>(Chimkent province)           | 71,0          | 4,2               | 66,8         | 67,4         | 51,2  | 46,0        |

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The quantitative determination of the  $\beta$ -carotene and tocopherols was carried out on a single sample [1]. After saponification of the weighed sample, the vitamins were extracted with ether. The ethereal solution was washed with water to neutrality and was dried over  $\text{Na}_2\text{SO}_4$ , and the solvent was distilled off in a current of nitrogen. The residue was dissolved in petroleum ether and passed through a column of  $\text{Al}_2\text{O}_3$ .  $\beta$ -Carotene was eluted from the column with petroleum ether, and tocopherol with a mixture of petroleum ether and diethyl ether in a ratio of 88:12. The amount of  $\beta$ -carotene was determined by measuring the optical density of the solution at a wavelength of 440 nm. To determine the tocopherols we used the color reaction with  $\text{FeCl}_3$  in the presence of  $\alpha, \alpha$ -dipyridyl, measuring the intensity of the coloration that developed on a FEK-56 photocolormeter (with No. 6 filter). The chlorophyll and the combined carotenoids were extracted with 90% acetone, after which the volume of the extracts was measured and their optical density was determined on a Spectromon-204 spectrophotometer at wavelengths of 662, 644, and 440 nm [2].

Of all the plants that we studied, we found the largest amount of pigments and vitamins in the leaves of Sophora alopecuroides L. and Glycyrrhiza glabra L. These plants may form an additional source of obtaining vitamins. Glycyrrhiza glabra is grown on the large scale, but in the pharmaceutical industry only the roots are taken and the epigeal part is not utilized.

An all-sided study of the chemical compositions of the plants will permit the complex and rational use of raw material resources.

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#### $\alpha$ -PINENE DERIVATIVE POSSESSING RETARDANT PROPERTIES

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A considerable retardant activity of quaternary ammonium salts derived from  $\alpha$ - and  $\beta$ -ionones - N,N,N-trimethyl-N-[3-(2,6,6-trimethylcyclohex-2-en-1-yl)-1-methylallyl]ammonium iodide (I) and N,N,N-trimethyl-N-[3-(2,6,6-trimethylcyclohex-1-en-1-yl)-1-methylallyl]ammonium iodide (II) - has been discovered previously [1]. From  $\alpha$ -pinene derivatives we have obtained N,N,N-trimethyl-N-[3-(6,6-dimethylbicyclo[3.1.1]hept-2-en-2-yl)-1-methylallyl]ammonium iodide (III), which is of interest in the study of the structure-effect relationships in this series of substances, since it differs from the salts (I) and (II) only by the terpene radical.

The starting material for the synthesis of this compound was myrtenal [2], which, by the aldol condensation with acetone in 10% aqueous ethanolic KOH (0°C, 16 h), was converted into methyl 3-(6,6-dimethylbicyclo[3.1.1]hept-2-yl)allyl ketone (IV). The latter, after reduction with lithium tetrahydroaluminate to the alcohol (V), bromination ( $\text{PBr}_3$  in pyridine) to (VI), and the treatment of the latter without purification with dimethylamine in ethanol gave the tertiary amine (VII), which, on interaction with methyl iodide, was readily converted into the ammonium salt (III).

The ketone (IV) (yield 62%),  $\text{C}_{13}\text{H}_{18}\text{O}$ , bp 138-142°C at 14 mm Hg. PMR spectrum ( $\delta$ , ppm): 0.75, 1.32, 2.15 (s,  $3\text{CH}_3$ ); 5.90, 7.00 (2 d,  $J = 15.0$  Hz,  $\text{CH}=\text{CH}$ ); 5.95 (m,  $\text{C}=\text{CH}$ ). The alcohol (V) (89%),  $\text{C}_{13}\text{H}_{20}\text{O}$ , viscous oil, PMR spectrum ( $\delta$ , ppm): 0.78; 1.28 (s,  $2\text{CH}_3$ ); 1.13 (d,  $J = 6.5$  Hz,  $\text{CH}_3$ ); 4.14 (t,  $\text{CH}-\text{O}$ ); 5.44 (m,  $2\text{C}=\text{CH}$ ); 6.00 (d,  $J = 15.0$  Hz,  $\text{CH}=\text{CH}$ ). The

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