

TRITERPENE ACIDS OF SOME REPRESENTATIVES
OF THE GENUS *Thymus*

A. V. Simonyan and A. L. Shinkarenko

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We have previously reported the isolation of ursolic acid from *Thymus dimorphus* Klok [1].

A chromatographic analysis of chloroform extracts from the herbs *Thymus dimorphus* Klok., *Th. nummularius* M. B., *Th. Kotschyanus* Boiss et Hohen, and *Th. transcaucasicus* Ronn. on paper [solvent systems: 1) petroleum ether-benzene- CH_3COOH (5:20:2); 2) petroleum ether-methanol- H_2O (10:5:5)] showed that all the species studied contain two substances giving spots with R_f 0.71 and 0.81 (system 1) and 0.10 and 0.30 (system 2), respectively. The spots were revealed with a saturated solution of antimony trichloride in chloroform and with a 25% ethanolic solution of phosphotungstic acid.

A chloroform extract from *Th. dimorphus* Klok., after the removal of the ursolic acid [1], was evaporated to a dry residue, and this was treated repeatedly with hot methanol. The methanolic extracts were combined and evaporated, and after repeated recrystallization a white crystalline substance with the composition $\text{C}_{30}\text{H}_{48}\text{O}_3$, mp 301-304°C (from methanol) (A) was obtained.

A chloroformic extract of *Th. transcaucasicus* Ronn. gave a white crystalline substance with the composition $\text{C}_{30}\text{H}_{48}\text{O}_3$, mp 279-282°C (from ethanol) (B).

Substances A and B gave a positive reaction with chlorosulfonic acid and positive Liebermann-Burchard and Sal'kovskii reactions. The R_f values of substance A coincide with those of an authentic sample of oleanolic acid, and the R_f values of substance B coincide with those for ursolic acid.

For substance A, $[\alpha]_D^{20} +76^\circ$ (c 0.82, chloroform), and for substance B, $[\alpha]_D^{20} +68^\circ$ (c 0.90, chloroform).

In the UV spectra of sulfuric acid solutions of the substances isolated (sulfuric acid with sp. gr. 1.835; c 0.4) [3], λ_{max} is 310 nm for both substances, but the $\log \epsilon$ values differ. For A, $\log \epsilon = 4.08$, and for B, $\log \epsilon = 4.11$.

In the IR spectra of both substances, absorption bands appear at 1714 cm^{-1} ($> \text{C}=\text{O}$) and also bands characteristic for ursolic acid at 1392, 1383, and 1250 cm^{-1} (geminal $-\text{CH}_3$ groups) (substance B) and bands characteristic for oleanolic acid at 1700, 1620, 1600, 1390, 1320, 1290, 1260, and 1230 cm^{-1} (substance A) [4].

The product of the acetylation of substance B (in a mixture of pyridine, benzene, and acetic anhydride) has mp 284-286°C (from ethanol), $[\alpha]_D^{20} +69^\circ$ (c 0.72, chloroform).

The acetyl derivative of substance A was obtained, with mp 258-260°C (from methanol), $[\alpha]_D^{20} +79^\circ$ (c 0.72, chloroform).

All the species of *Thymus* L. that we studied contained ursolic acid (substance B) and oleanolic acid (substance A).

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