

# ISOLATION OF SHIKONIN FROM ONOSMA CAUCASICUM AND ECHIMUM RUBRUM

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Onosma caucasicum Levin (Caucasian onosma), family Boraginaceae, is a perennial herbaceous plant which grows on the rocky slopes, taluses, and cliffs of the Caucasus, and was collected in Teberda in 1965 by K. S. Bessarab and V. D. Rachkova. Echium rubrum belonging to the same family, a biennial herbaceous plant growing in the European part of the USSR, in the Crimea, in the Caucasus, and in Central Asia, was collected in Trans-Caucasia in 1964 by M. M. Molodozhnikov.

Qualitative reactions and paper chromatography showed that the roots of these plants contain a pigment similar to alkonin and shikonin [1-3]. However, we were unable to isolate this substance in the crystalline state from Onosma caucasicum by Brockmann's method [4], since a petroleum ether extract contained a fairly large amount of contaminating materials. Consequently, we used additional purification by chromatography on hydrated silica (yield 0.1%). The substance from the roots of Echium rubrum did not need additional purification on a column (yield 0.46%).

After recrystallization from benzene, the products obtained melted at 144-145°C; 0.01% solutions in benzene possessed a dextrorotation. Both substances had the composition  $C_{16}H_{16}O_5$  and their IR and UV spectra coincided with the spectra of shikonin isolated from the roots of Lithospermum erythrorhizon Sieb. et Zucc. Thus, the substances of composition  $C_{16}H_{16}O_5$  obtained from the roots of Caucasian onosma and E. rubrum is shikonin.

The IR and UV spectra were taken by A. A. Kir'yanov and M. E. Perel'son, and the microanalysis of the substances for carbon and hydrogen was carried out by E. A. Plokhova.

## REFERENCES

1. W. Karrer, Konstitution und Vorkommen der Organischen Pflanzenstoffe, Basel und Stuttgart, 490, 1958.
2. H. Arakawa and M. Nakazaki, Chem. Ind., No. 25, 947, 1961.
3. I. Morimoto, T. Kishi, S. Ikegami, and Y. Hirata, Tetrah. Lett., No. 52, 4737, 1965.
4. H. Brockmann, Ann., 521, 1, 1936.

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