

In the bark of the rhizomes and roots of *Onosma polyphyllum* Led., family Boraginaceae [1-3], we have detected a substance which is readily extracted by organic solvents and colors them an intense red.

Together with V. M. Kosykh and T. P. Khort, we gathered the plant in June, 1970, and 1971, in the Crimea, between Alushta and Sudak, and also in the environs of Simeiz.

The extracts were investigated chromatographically on paper impregnated with a 5% solution of silicone oil in cyclohexane in the ethanol-water-acetic acid (75:22.5:2.5) solvent system. The red substance had the same R_f value and color of the spot as shikonin, isolated from *Echium rubrum* Jacq. [4, 5].

The substance was extracted from the comminuted air-dry rhizomes and roots by a modification of Brockmann's method [6, 7]. The resulting crystalline precipitate was purified on a column of polyamide resin (a copolymer of caprolactam and hexamethylenediamine adipate, 60:40). Elution was performed with petroleum ether (fraction with bp 45-65°C). On cooling, the eluate which had been concentrated to saturation deposited a compound with the composition $C_{16}H_{16}O_5$, mp 144.5-145.5°C. Its IR spectrum coincided completely with that of shikonin, and solutions in benzene (0.005-0.01%) possessed dextrorotation. A mixture with an authentic sample of shikonin gave no depression of the melting point.

The substance isolated from *Onosma polyphyllum* Led. is (+)-shikonin [5,8-dihydroxy-2(1-hydroxy-4-methylpent-3-enyl)-1,4-naphthoquinone]. Its yield does not exceed 0.08% of the weight of the dry roots. Shikonin is present only in the bark of the rhizomes and roots.

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