The conformation of the galactose was established by Reeves' method [5]. The negative value of the difference between the molecular rotation of the cuprammonium complex of flavonoid (II) and the pure flavonoid (II) showed that the sugar of flavonoid (II) is in the C1 form. The rapid enzymatic hydrolysis of flavonoid (II) with rhamnodiastase, which is specific for a β- linkage, confirms the assumption that flavonoid (II) is glycosidated in the 3- position with β-D-galactose. Consequently, flavonoid (II) is 5, 7, 3', 4'-tetrahydroxyflavone-(3)-β-D-galactoside (hyperoside; cf. formula).

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ISOLATION OF SHIKONIN FROM MACROTOMIA UGAMENSIS M. POP.

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Macrotomia ugamensis (family Boraginaceae) is a perennial herbaceous plant which is distributed in Central Asia on stony slopes and crags in the alpine zone of the Tien-Shan.

The plants were collected in the Aksu-Dzhebagly reserve in August 1963 by M. I. Vlasov and K. I. Boryaev, staff members of All-Union Research Institute for Medicinal and Aromatic Plants. Qualitative reactions and paper chromatography have shown that the roots of Macrotomia ugamensis contain a pigment similar in properties to alkannin or shikonin [1, 2].

Using Brockmann's method [3], we obtained a dark red crystalline substance (yield 0. 67%).

Found: C 66. 96, 67. 20; H 5. 74, 5. 90; H (act.) 1. 22, 1. 11; OCH_3 0%. Calculated for $C_{16}H_{16}O_5$: C 66. 66; H 5. 56%; H (act.) 1. 04.

Mp 146. 5-147. 5° (from benzene), a mixture with the shikonin found in the roots of Lithospermum erythrorhizon Sieb. et Zucc.* gave no depression of the melting point. The IR and UV spectra of the substance that we isolated and those of shikonin were identical. We were unable to determine the angle of rotation accurately because the solution was very strongly colored. However, it was ascertained that a 0. 01% solution of the substance in benzene has a dextrorotation. Thus, the substance of composition $C_{16}H_{16}O_5$ obtained from the roots of Macrotomia ugamensis is shikonin.

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*Lithospermum erythrorhizon Sieb. et Zucc. has small roots in comparison with Macrotomia ugamensis M. Pop. and is very rarely found in the Soviet Union.