

ALKALOIDS OF *Berberis crataegina*

M. Koshar,^a M. V. Telezhenetskaya,^b I. Khamidov,^b
and K. Kh. Zh. Basher^a

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Berberis crataegina (fam. Berberidaceae) is a shrub with a height of about 1 m having leathery leaves about 4 cm long. The berries are dark purple. The plant has not been investigated in detail for alkaloids but berberine, palmatine, jatrorrhizine, and magnoflorine have been isolated from *B. crataegina* of Iranian origin [1].

We have studied the plant gathered in Turkey in the environs of Eskişehir in the mountains of Bordag at a height of 760 m above sea level on May 28, 1994. The ground bark of the roots was extracted with ethanol, the solvent was evaporated off, and the residue was treated with 2% HCl, which led to the separation of berberine chloride [2]. The acid aqueous solution was washed with ethyl acetate and alkalized, and a mixture of bases was extracted with ether and with chloroform. Quaternary bases were precipitated from the alkaline aqueous solution with Mayer's reagent, and they were purified by passage through a column of Amberlite, and separated on a column of SiO₂ with elution by chloroform—methanol mixtures of increasing polarity. This led to the successive isolation of the iodides of palmatine [3] and jatrorrhizine [2] and the chlorides of berberine [3], columbamine [4], and magnoflorine [5]. The mixture of tertiary bases was separated on a column of Al₂O₃ with elution by C₆H₆—CHCl₃ (1:1), CHCl₃, and CHCl₃—MeOH. After rechromatography of the enriched fractions, we obtained isotetrandrine [6] and aromoline [7, 8]. A mixture of oxyacanthine and berbamine was separated by the sulfate—nitrate method [9], and the salts obtained were converted into the bases and rechromatographed on Al₂O₃ columns. Oxyacanthine and berbamine were isolated [6, 7].

All the compounds isolated were identified from their spectral characteristics and by comparison with authentic specimens (melting points, TLC, PMR spectra). For TLC we used plates with Al₂O₃ and SiO₂. Systems CHCl₃—MeOH—NH₄OH (9.5:0.5:0.1; 7:3:0.1): CHCl₃—MeOH (4:1); C₆H₆—MeOH (9.5:0.5); and CHCl₃—C₆H₆—EtOH—NH₄OH (7:2:1:0.15). We may note that in all the systems that we used the *R_f* values for oxyacanthine and berbamine practically coincided.

Thus, nine alkaloids have been isolated from the roots of *B. crataegina* and identified, five of them for the first time from this plant.

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a) Anadolu University, Drug Investigation Center, Eskişehir, Turkey, fax (222) 335 01 27. b) Institute of the Chemistry of Plant Substances, Academy of Sciences of the Republic of Uzbekistan, Tashkent, fax (3712) 89 14 75. Translated from *Khimiya Prirodnikh Soedinenii*, No. 1, pp. 106-107, January-February, 1996. Original article submitted May 1, 1995.