

ALKALOIDS OF *Corydalis marschalliana*

O. N. Denisenko, I. A. Israïlov, V. A. Chelombit'ko,
and M. S. Yunusov

UDC 547.943

Alkaloids, of which the main ones are adlumidine, bicuculline, and bulbocapnine, have previously been isolated from *Corydalis marschalliana* Pers., family *Fumariaceae* [1-4].

We have investigated samples of *C. marschalliana* raw material gathered in North Ossetia (Él'khtovo region) in the flowering period, April, 1991. A. I. Galushko has distinguished this as an independent species — *Corydalis rosea-purpurea* Glaushko [5]; however, S. K. Cherepanov did not consider this to be justified [6].

Chloroform extraction gave the total alkaloids (3.11 g), which amounted to 0.79% of the air-dry raw material. When the nonphenolic fraction was treated with alcohol, stylophine (0.10 g) and isocorypalmine (0.10 g) separated out. After the crystals had been removed, the mother liquor was chromatographed on a column of silica gel, with elution by benzene and mixtures of benzene and ethanol in various ratios. This led to the isolation of cheilanthifoline (0.08 g), adlumine (0.11 g), bulbocapnine (0.40 g), glaucine (0.50 g), corydine (0.09 g), norcorydine (0.005 g), isocorydine (0.02 g), and isoboldine (0.05 g).

A number of the alkaloids isolated were identified by direct comparison of the physical constants and spectral characteristics found for them with those given in the literature.

Corydine — mp 149–150°C (from ethanol, $[\alpha]_D^{20} +201^\circ$ (c 2.2; chloroform). M^+ 341. UV spectrum: λ_{\max} 204, 270, 300 nm (lgε 3.78; 3.47; 3.25). NMR spectrum: 2.54 (3H, s, N-CH₃), 3.73 (3H, s, OCH₃), 3.88 (6H, s, OCH₃), 6.70 ppm (1H, s, Ar-H), 6.83, 7.07 (each 1H, d, J = 8 Hz).

Bulbocapnine — mp 198–199°C (from ethanol), $[\alpha]_D^{20} +230^\circ$ (c 0.25; chloroform) [8, 9]. M^+ 325. UV spectrum: λ_{\max} 226, 303 nm (lgε 4.22; 4.15; 3.81) > PMR spectrum: 2.43 (3H, s, N-CH₃), 3.75 (3H, s, OCH₃), 5.82 and 6.00 (2H, quadruplet, CH₂O₂), 6.50 (1H, s, Ar-H). 6.83 (2H, s, 2 × Ar-H) [11].

Glaucine — mp 120–122°C (from methanol), $[\alpha]_D^{20} +84^\circ$ (c 0.76; abs. alcohol)[8]. M^+ 355. UV spectrum: λ_{\max} 219, 280, 301 nm (lgε 4.54; 4.17; 4.13) > PMR spectrum: 2.53 (3H, s, N-CH₃), 3.72 (3H, s, OCH₃), 3.93 (3H, s, OCH₃), 3.97 (3H, s, OCH₃).

Adlumine — mp 178–179°C (methanol–chloroform), $[\alpha]_D^{20} -51^\circ$ (c 0.53; chloroform). M^+ 383. UV spectrum; λ_{\max} 224, 294, 324 nm (lgε 4.36; 3.71; 3.68). PMR spectrum: 2.49 (3H, s, N-CH₃), 3.95 and 5.55 (each 1H, s, J = 8 Hz), 3.82, 3.88 (each 3H, s, 2 OCH₃), 5.94 (2H, s, CH₂O₂), 6.38, 6.70 (each 1H, s, n = Ar-H), 6.87, 7.17 (each 1H, d, J = 8 Hz) [10].

The other alkaloids were identified from their melting points, by a direct TLC comparison with authentic samples, and by the absence of a depression of the melting point of a mixture of the alkaloid isolated and a "marker" alkaloid.

Thus, we have isolated 10 alkaloids from the sample of *C. marschalliana* investigated, the main ones being bulbocapnine, adlumine, and corydine. It is the first time that norcorydine, glaucine, isocorypalmine, and adlumine have been isolated from this species. The samples of raw material investigated from the new population of *C. marschalliana* differed considerably with respect to the qualitative composition of the alkaloids. Thus, the alkaloids glaucine and adlumine, which had not previously been isolated from *C. marschalliana*, were the main ones in this sample, which indicates a definite variability of the alkaloid composition of this species.

Pyatigorsk Pharmaceutical Institute. Institute of the Chemistry of Plant Substances, Academy of Sciences of the Republic of Uzbekistan, Tashkent. Translated from *Khimiya Prirodnykh Soedinenii*, No. 5, pp. 768–769, September–October, 1993. Original article submitted April 22, 1992; revision submitted April 1, 1993.

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