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ALLANTOIN FROM THE HERBAGE OF SOME SPECIES OF *Phaseolus*

V. I. Dikhtyarev, V. N. Kovalev
N. F. Komissarenko, Yu. A. Golubenko,
and I. P. Kovalev

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We have previously reported the isolation from *Phaseolus vulgaris* L. (kidney bean) of derivatives of coumarin and cinnamic acid [1]. Continuing an investigation of the chemical composition of the epigeal parts of plants of the genus *Phaseolus* – kidney bean, scarlet runner bean (*Ph. coccineus* L.), and mung bean (*Ph. aureus* (Roxb.) Piper), we have obtained a nitrogen-containing substance. For its isolation, the comminuted herbage was extracted exhaustively with 80% ethanol. The extract was concentrated to an aqueous residue and this was treated successively with organic solvents [1], and the aqueous residue was left at 10-12°C. Colorless crystals deposited. After recrystallization from water, a compound was obtained with mol. wt. 158 (mass spectrometry) having the composition $C_4H_6N_4O_3$, mp 234-236°C (decomp.).

When it was chromatographed on Filtrak FN-1 paper in the following systems: butanol–acetic acid–water (4:1:2) and (4:2:2) (R_f 0.35 and 0.39); water-saturated butanol (R_f 0.30); and butanol–pyridine–water (6:4:3) (R_f 0.41), followed by treatment with a 1% solution of p-dimethylaminobenzaldehyde in ethanol containing 5% of hydrochloric acid with heating to 50-60°C, the substance was revealed in the form of a yellow spot, which is characteristic for urea derivatives [2].

IR spectrum (KBr tablet), had absorption bands characteristic for the following functional groups: NH_2 (3442, 3346, 1606 cm^{-1}), NH (3230, 3070, 1538 cm^{-1}), and C=O (772, 1665 cm^{-1}).

The PMR spectrum (DMSO) had signals at 5.24 ppm (doublet, J = 8 Hz), 5.78 ppm (singlet), 6.83 (doublet, J = 8 Hz), 8.04 ppm (singlet), and 10.08 ppm (singlet), which characterize the protons at C-5, N-8, N-6, N-1, and N-3.

From its elementary composition and mass, IR, and PMR spectra and a comparison with an authentic sample, the substance isolated was identified as allantoin (5-ureidohydantoin).

Allantoin has been detected previously in the roots of scarlet runner bean [3]. The presence of allantoin in plants of the genus *Phaseolus* may, in all probability, serve as a chemotaxonomic index.

This is the first time that allantoin has been isolated from the epigeal parts of the *Phaseolus* species studied.

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