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ALKALOIDS FROM *Sophora alopecuroides* GROWING IN AZERBAIJAN. 1. SOPHOCARPINE

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The alkaloid composition of *Sophora alopecuroides* L. (= *Goebelia alopecuroides* Bunge ex Boiss., Leguminosae) growing in Azerbaijan has not been studied.

Screening of the aerial organs and roots of the plant showed that both parts contained at least five compounds of alkaloid nature, one of which was isolated pure.

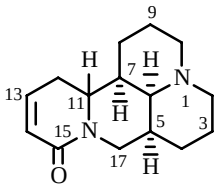
Air-dried and ground roots of *S. alopecuroides* (1 kg) were collected at the end of September 2004 near Bardy of the Republic of Azerbaijan, treated with ammonia solution (10%), and extracted three times with $CHCl_3$. The combined extracts were treated three times with H_2SO_4 solution (10%). The acidic solution was made basic with ammonia solution (10%) until the pH was 8 and extracted successively with hexane and $CHCl_3$. The hexane was evaporated. Repeated recrystallization of the remaining solid from hexane gave needle-like crystals of sophocarpine (**1**).

$C_{15}H_{22}N_2O$, mp 80-82°C, $[\alpha]_D$ -27° (*c* 0.5, ethanol), lit. [1] mp 53-54°C (81-82°C), $[\alpha]_D$ -29.4° (ethanol).

IR spectrum (ν_{max}, KBr, cm^{-1}): 1660, 1596 (α,β-unsaturated lactam).

Mass spectrum (*m*/*z*, %): $[M]^+$ 246 (64.8), 245 (100), 231 (2.9), 217 (10.5), 203 (25.7), 177 (20), 160 (8.6), 150 (38.1), 138 (40), 122 (18.1), 110 (14.3), 98 (31.4), 96 (76.2), 83 (14.3), 80 (16.2), 68 (31.4), 55 (1.9), 41 (63.6).

Interpretation of the PMR, ^{13}C NMR, and 2D NMR (Table 1, COSY, HMQC, HMBC, ROESY) spectra of **1** led to the structure of sophocarpine [1, 2].



1

Thus, spectral data and physicochemical constants led to the conclusion that the isolated compound (**1**) was sophocarpine.

PMR and ^{13}C NMR spectra were recorded on a Bruker AM-300 spectrometer in $CDCl_3$ (δ, ppm, 0 = TMS). ^{13}C NMR spectra were recorded with full proton decoupling and J-modulation. 2D NMR spectra (COSY, HMQC, HMBC, ROESY) were recorded using standard Bruker programs.

Chemical shifts of protons without multiplicities and SSCC were found using 2D spectra.

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TABLE 1. Chemical Shifts of C and H Atoms in **1**, J-Modulation Values, and 2D ^{1}H—^{1}H COSY, HMQC, HMBC, and ROESY Parameters (δ, ppm, J/Hz, $CDCl_3$, 0 = TMS)

C atom	J-mod	δ_C	δ_H (J)	HMBC (C atoms)	ROESY (H atoms)
2	CH_2	57.24	1.94 m, 2.80 m	3, 4, 10	
3	CH_2	20.71			
4	CH_2	27.34			
5	CH	34.57	1.79		
6	CH	63.41	2.09 t (2.4)	2, 4, 5, 10, 11, 17	5, 7
7	CH	41.48	1.68		
8	CH_2	26.57			
9	CH_2	21.05			
10	CH_2	57.24	1.94 m 2.80 m	2, 8, 9	
11	CH	51.41	3.97 td (9.9, 6.8)	7, 12, 13	12a, 12b
12	CH_2	27.73	a 2.19 ddt (18, 9.3, 2.7) b 2.60 dt (18, 5.5)		11, 12b 11, 12a
13	CH	137.50	6.45 dt (9.2, 4.1)	11, 12, 15	12a, 12b
14	CH	124.50	5.85 dt (9.8, 2.7)		12a, 13
15	C	165.58	-		
17	CH_2	41.94	β 3.15 t (12.8) α 4.12 dd (12.9, 4.7)	4, 5, 6, 11, 15 4, 5, 6, 11, 15	17α 17β

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2. A. S. Sadykov, *Izv. Akad. Nauk SSSR, Ser. Khim. Nauk*, 2432 (1983).